

The Financial Reporter

December 2006 Issue No. 67

The Newsletter of the Life Insurance Company Financial Reporting Section

The Principles-Based Approach to Statutory Reserves and Risk-Based Capital

by Arnold A. Dicke and David L. White, Jr.

Editor's Note: The views and opinions are those of the authors and do not necessarily represent the views of KPMG LLP.

The rules for setting reserves and capital requirements for individual life insurance products sold in the United States are about to undergo a dramatic overhaul.

Reserve rules have undergone a series of ad hoc changes in recent years. Regulators adopted the Model Regulation for the Valuation of Life Insurance, usually called "Regulation XXX," in 1999 to strengthen reserves applicable to the then newly developed, aggressively priced, preferred-class level premium life insurance. The introduction of secondary guarantees into universal life products occasioned Actuarial Guideline 38, often called Actuarial Guideline AXXX, to clarify the application of Regulation XXX to the new product form.

The formulaic nature of these new reserve rules was widely felt to be unsatisfactory, especially since it appeared to lead to the development of products that were structured to provide minimum reserves based on literal, and sometimes aggressive, readings of the rules. Because companies varied in their readings of the rules or in their willingness to take aggressive positions,



the range of interpretations, and hence of product prices, widened to an untenable degree. The result was public controversy between companies as well as between regulators who felt the range of interpretations included those leading to unacceptably low reserves and regulators who did not want the consuming public to lose access to low-priced coverage with significant and valuable guarantees.

Taking their cue from the proposal (now adopted) for a principles-based approach (PBA) to risk-based capital for variable annuities with secondary guarantees,¹ the regulatory actuaries on

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¹ See the KPMG white paper, "A Financial Executive's Guide to Reserves and Risk-Based Capital Proposals for Variable Annuities," July 2006, available from the authors at adicke@kpmg.com.

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December 2006 Issue No. 67

Published by the Life Insurance Company
Financial Reporting Section of the Society
of Actuaries

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This newsletter is free to section members. A subscription is \$15.00. Current-year issues are available from the communications department. Back issues of section newsletters have been placed in the SOA library and on the SOA Web site (www.soa.org). Photocopies of back issues may be requested for a nominal fee.

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Printed in the United States of America.

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the Life and Health Actuarial Task Force (LHATF) of the National Association of Insurance Commissioners (NAIC) asked the American Academy of Actuaries (Academy) to develop a similar approach for universal life insurance and term life insurance. The Academy formed the Life Reserve Work Group (LRWG) in 2004 to carry out this charge. By mid-2006, the scope of the project had expanded to include all life insurance products and the Academy and other actuarial organizations had 20 committees, task forces and work groups devoted to the project, with over 100 volunteers having already invested over 1000 hours of time.

The project was given additional momentum by the decision of the board of the ACLI in mid-2005 to support the PBA for life insurance. The ACLI's initiative was in response to the controversy surrounding AG 38, which was beginning to generate publicity. The ACLI proposed an interim solution involving an amendment to AG 38 that would sunset at the end of the first quarter of 2007, giving way to principles-based reserves at that time.

This approach received support from the NAIC committee responsible for life insurance. The Academy, in turn, committed to developing a workable draft of the PBA for both reserves and risk-based capital in time for adoption for 2007.

While many details remain to be resolved, and many observers are skeptical about the timetable, there is a possibility that the PBA for both reserves and RBC, with all the attendant drain on resources, will be required for the 2007 Annual Statement. It is not too soon for life insurers to review the implications that such a sea change in reserving would have on all aspects of the company's operations.

The Changing Profile of Life Insurance Risk

In order to address the changing needs of the consuming public, the 21st century life insurance product portfolio includes new products and features which have altered the the risk profile of life insurance products.

These changes have affected each of the risks inherent in the life insurance product to some degree. Mortality, for example, once a relatively docile, easily modeled risk, has been changed by the industry's adoption of preferred underwriting.

Similarly, in several of the more popular new products, insurers have taken on different and, in some cases, increased investment risks. The change in capital market risk is apparent in the equity-indexed products that emerged in the 1990s. In these products, interest credits to the policyholder's account value reflect not only the minimum guarantee traditionally offered with life insurance, but also participation in the performance of some market index. The ability of insurers to offer the best of both worlds is dependent on more or less sophisticated hedging strategies. Variable life insurance products are evolving and now offer many of the living benefits, such as guaranteed accumulation and withdrawal benefits, that are found in variable annuities. This increases the capital market risk associated with the product.

Policyholder behavior has always been an important element of life insurance risk. In the past, the policyholder behavior risk centered on the possibility of lapse before initial expenses were recouped. Policyholder behavior risk took on new dimensions in the signature product of the new millennium—universal life insurance with secondary guarantees (ULSG). In this product, the no-lapse guarantee that had long been a minor feature of universal life products, restricted to one or two policy years, was expanded to periods comparable to the level premium periods found in term products. This produced a market-pleasing combination that could, at the policyholder's discretion, become a highly competitive term policy or a tax-favored asset accumulation vehicle.

Traditional universal life policies expire when the cash value is exhausted, whether by internal charges or by withdrawals. The first generation of ULSG policies guaranteed that, if the deposits into the product at any point in the guarantee period exceeded the amount of stipulated premiums required up to that point, the policy would stay in force, even if the cash value was exhausted. The second generation of ULSG policies guaranteed continuance until both the cash value and a behind-the-scenes shadow account had no value. The design of the shadow account was unconstrained by regulation and unleashed the ingenuity of product development actuaries.

In order to address the changing needs of the consuming public, the 21st century life insurance product portfolio includes new products and features not seen in the past.

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Both stipulated premium and shadow account ULSG policies involve policyholder behavior risk. The impact of this risk on the financial performance of the life insurer is complex and not easy to analyze. The policyholder's response to different situations depends on factors that are not known to the insurer. For example, if the insured's health is impaired, the guarantee takes on greater value and the probability of lapse would tend to be minimal. At the same time, depositing funds in excess of what is required to maintain the guarantee may be suboptimal for the policyholder. However, if the insured's health is good, the value of the guarantee may be affected more by the level of interest rates. Low interest rates are likely to put the guarantee into the money, again reducing lapses to a very low level. High interest rates, on the other hand, may make the guarantee inconsequential, and replacement policies with more aggressive shadow fund assumptions may be available.

Newly emerging factors have made analysis of life insurance policyholder risk even more complicated.

The secondary market for life insurance policies, usually called the life settlement market, has progressed from speculation on the longevity of terminally ill insureds to a source of securitizable cash flows involving a risk not correlated to financial markets. As such, it has generated interest on the part of hedge funds and other entities employing sophisticated risk management strategies.

Separated from life settlement purveyors in technique, if not in spirit, are the arbitrageurs who have begun to search for irrationalities in the array of life insurance and annuity prices. A typical arbitrage is the LILAC structure, in which life insurance priced using preferred mortality is matched with annuities priced with aggregate rates. The differential in mortality assumptions for the same insured means the annuity can be used to provide a guaranteed stream of payments to cover premium requirements, with a risk-free profit emerging at death.

With intricate new product designs and with secondary markets and arbitrage now part of policyholder behavior, the reserve paradigms that served well in the 20th century appear to many observers to be inadequate to the 21st.

The PBA Framework

The array of risks facing the writer of 21st century life insurance policies can only be understood through extensive (and expensive) modeling. The situation is similar to that faced by banks entering the derivatives market in the 1990s. One of the outcomes of banks' entry into derivatives was a change in the approach that bank regulators, especially in Europe, took to solvency supervision. The new regime, called the Basel accords, emphasizes the bank's internal risk management processes and depends on the output of company-specific modeling rather than on formulas.

In the United States, similar issues have led to a similar set of initiatives. The framework for PBA reserves proposed by the Academy to the LHATF is based on company-specific modeling. The Reported Reserve,² as the amount recorded in the statutory financial system is called in the PBA framework, is the greater of a Deterministic Reserve and a Stochastic Reserve. The Deterministic Reserve is calculated on a policy-by-policy basis, while the Stochastic Reserve is based on aggregated cash flows from all policies. The Deterministic Reserve is based on a gross premium valuation with a cash-value floor, while the Stochastic Reserve is based on the greatest present value of the statutory deficiencies which have accumulated at any future duration. (See page 5.) To calculate the Stochastic Reserve, a large number of projections of the cash flows must be made, each based on a different scenario of future

² Capitalized terms not otherwise defined are terms defined and used in the September 2006 exposure draft of the Principles-Based Reserves for Life Insurance Model Regulation.

FRAMEWORK FOR PBA RESERVES

The exposure draft of the Model Regulation establishing a principles-based approach to life insurance reserves sets forth a framework that is summarized below. Capitalized terms are defined in the exposure draft (short-form definitions are given in square brackets).

Reported Reserve [the amount reported on the annual statement balance sheet]
 = **max (Deterministic Reserve, Stochastic Reserve)**

Steps to calculate the Deterministic Reserve:

1. Set up Cash Flow Model for each Asset Segment [group of policies for which assets are aggregated] based on Prudent Best Estimate Assumptions
2. Calculate Net Asset Earned Rates [rates derived from existing assets and reinvestment under investment guidelines] for each Asset Segment
3. Calculate Seriatim Reserve for each policy using the Net Asset Earned Rates as Discount Rates

**Seriatim Reserve_n = Present Value @ Discount Rates of net cash flows
 determined using Cash Flow Model for Asset Segment**

4. Determine Per Policy Reserve for each policy:

Per Policy Reserve_n = max(Seriatim Reserve_n, Cash Surrender Value_n)

5. Calculate the Deterministic Reserve as sum of Per Policy Reserves for all policies

Deterministic Reserve = Sum_n (Per Policy Reserve_n)

Steps to calculate Stochastic Reserve:

1. Determine groups of policies, if any, that can be excluded from Stochastic Reserve Requirement
2. Group remaining policies for modeling
3. Obtain Scenario Set
4. For each Scenario, obtain a Scenario Reserve by
 - Determining the path of Net Asset Earned Rates for the Scenario and the net accumulated assets at each duration for each Asset Segment
 - Calculating the Accumulated Deficiency for each Asset Segment:

Accumulated Deficiency = Working Reserve - net accumulated assets

- Calculating the present value of the accumulated deficiency at each duration t ($PVAD_t$) for each asset Segment using its Net Asset Earned Rates for the Scenario as Discount Rates
- Setting the aggregate $PVAD_t$ equal to the sum of the $PVAD_t^k$'s over all Asset Segments k

Aggregate $PVAD_t$ = Sum_k $PVAD_t^k$

- Determine the Scenario Reserves as the statement value of the starting assets for all asset segments plus the greatest of the Aggregate $PVAD_t$'s

**Scenario Reserve = Value of Starting Assets for all Asset Segments
 + max_t (Aggregate $PVAD_t$)**

5. Set the Stochastic Reserve equal to average of the highest 35% of the Scenario Reserves plus the result of an alternative calculation for any excluded policies

**Stochastic Reserve = CTE₆₅ {Scenario Reserve_k}
 + Sum_m (Alternatively Calculated Reserve_m)**

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interest rates and equity experience. For policies that are not sensitive to interest rates or equity unit values, the Principles-Based Reserves for Life Insurance Model Regulation (Model Regulation PBR) provides an exemption from the (probably costly and time-consuming) stochastic modeling. In the September 2006 exposure draft of Model Regulation PBR, the actuary is permitted to set the reserve for any group of policies equal to the result of a special calculation plus an arbitrary extra amount, provided that the actuary can provide a demonstration that gives reasonable assurance that the resulting aggregate reserve will exceed the Stochastic Reserve calculated for that group of policies. The details of the exclusion calculation are still under discussion.

Scenarios used to calculate the Stochastic Reserves are determined in one of four ways:

- (1) using stochastic generators and model parameters prescribed by the NAIC,
- (2) using prepackaged scenarios generated as described in (1),
- (3) using Proprietary Predetermined Scenario Sets developed by the company under guidelines provided by the regulators, or
- (4) using stochastic models developed by the company that meet certain prescribed calibration requirements.

The number of scenarios and the method of generating the scenarios must be certified by a Qualified Actuary. The Qualified Actuary may be a company employee or company-engaged consultant. However, as part of the governance process that forms an important part of the framework, the work of the Qualified Actuary must be reviewed by an independent reviewing actuary.

A draft of a Principles-Based Valuation Review Opinion Model Regulation, which would govern the activities of the independent reviewing actuary, was exposed for comment following the September 2006 NAIC meeting. The draft provides that the reviewer be hired by the company, with the results of the review submitted to the insurance commissioner on a confidential basis. The review will contain an opinion regarding the methodology and assumptions used by the Qualified Actuary, but will not include an opinion regarding the adequacy of the Reported

Reserve. The draft also addresses the question of the reviewer's independence: the reviewer cannot be part of management, cannot have participated in the work being reviewed, cannot serve in an advocacy role for the company and must be free of certain specified conflicts of interest.

In addition to choosing the scenarios used for projecting the cash flows, the Qualified Actuary must also select a set of Prudent Best Estimate Assumptions. Prudent Best Estimate Assumptions are Best Estimate Assumptions to which appropriate Margins are applied. The Prudent Best Estimate Assumptions for future years may differ for different scenarios. For example, higher lapses may be expected for universal life policies under those scenarios in which future interest rates exhibit greater increases.

Prudent Best Estimate Assumptions are unlocked whenever necessary to reflect changes in anticipated experience. This is a major departure from previous statutory practice and could dramatically increase the volatility of a company's statutory gain from operations and its RBC ratio. Prudent Best Estimate Assumptions are required for mortality, policyholder behavior, investment income and expenses. The framework includes an actuarial guideline³ spelling out in some detail the process for setting these assumptions. This process is described briefly in the remainder of this section.

Best Estimates (and consequently, Prudent Best Estimates) may be based on company experience, if it can be shown to be credible. For mortality assumptions, the framework contemplates the availability of 12 – 15 officially adopted "CSO" tables, representing expectations for the mortality of insureds with a variety of underwriting outcomes. To assign the correct table to a specific policy, a mortality scoring process is being developed in conjunction with the new tables.

Prudent Best Estimate Assumptions are also needed for various aspects of policyholder behavior. The choice of policyholder behavior assumptions can be complicated by policyholder options built into the life insurance policy. The most familiar policyholder option is the right to terminate the policy at any time. Partial termination or death benefit reduction is

³ Actuarial Guideline PBR-VAL. See the Academy Web site www.actuary.org. While the exposure drafts are in the form of a model regulation and accompanying actuarial guidelines, the current plan is to create a valuation manual that would subsume the model regulations and actuarial guidelines.

IMPLICATIONS OF PBA—EXPECTED AND UNEXPECTED

FINANCIAL OPERATIONS: When PBA was applied to RBC for variable annuities, computer time was as high as 240 hours.

FINANCIAL VOLATILITY: Assumptions, including discount rates, are unlocked every year if needed to reflect experience.

FINANCIAL RESULTS: For term products the reserve “hump” is likely to be cut in half, but early reserves can be substantial, causing sales strain.

PRICING: Aggressive pricing could lead to reserve increases, and possibly statutory losses, in later years if assumptions are not met.

PRODUCT DEVELOPMENT: Lower reserves could lead to a wave of replacement activity, with GAAP as well as statutory implications.

MODEL RISK AND CONTROLS: A huge set of models, some untested or used in a new way, will produce key statutory numbers.

RATING AGENCY REACTION: Statutory reserves directly impact a company's available capital, an effect the rating agencies will react to—but exactly how?

often allowed as well. Policies with cash values offer options to withdraw or borrow against a portion of that value. Some policies require payment of premiums on a predetermined basis, but most current policies provide the option to vary the pattern of premium payments.

The availability of contractual options makes policyholder behavior an important risk factor for life insurance. In setting Prudent Best Estimate Assumptions for this risk factor, the qualified actuary must estimate how “efficient” policyholder use of available options will be. While an analogy can be drawn to the behavior of investors holding options of one kind or another, factors come into play with life insurance that do not affect the behavior of investors. To begin with, most purchasers of life insurance are primarily interested in the death benefit, usually to offset some undesirable consequence such as loss of income, need for liquidity at death, or the like. Still, price is a strong incentive for policyholders, and the availability of a cheaper alternative will often result in a lapse. Similar considerations apply to the other policyholder options.

The draft actuarial guideline dealing with assumptions has a lengthy section that tries to strike a balance between assuming the policyholder will ignore short-term advantages and assuming the policyholder will act like the holder of capital markets options, constantly taking the action that would bring the highest return from the policy. The actuarial guideline requires sensitivity testing of the behavioral assumptions. For example, the guideline calls for tests of different premium payment patterns, from single pay at one extreme to minimum level payments required to maintain guarantees at the other.

Investment income assumptions are needed not only for projecting account values, non-guaranteed elements and other elements of cash flow, but also as a basis for setting Discount Rates. The framework is based on book values, not market values. To obtain the Discount Rates, assets are allocated to the asset segments on a book value basis. The allocation should follow any allocation procedures normally used by the company, and the amount of assets should approximate the expected level of reserves. The allocated assets are used to calculate a path of Net Asset Earned

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Rates, with investment of new cash assumed to be made in accordance with company investment policies and guidelines. Discount Rates are set equal to Net Asset Rates.

Expenses are projected with appropriate allowance for inflation and for expected increases in unit expenses due to other causes, but no reduction for expected future improvements.

Implications of the PBA

The principles-based approach to reserves and RBC, if adopted in the form proposed by the LRWG, will have implications for many aspects of a life insurer's operations. Taken together, these implications could impact the company's short- and long-term strategic plans.

Implications for Financial Results

If adopted, the LRWG framework is likely to impact the statutory financial results of life insurance companies. Although statutory gain from operations is not usually used as a performance measure, the primary determinant of company solvency is statutory capital and the statutory RBC ratio. Both rating agencies and regulators focus on these numbers, and the availability of capital for strategic purposes is limited by these considerations.

Modeling carried out by the LRWG⁴ showed a pattern of reserves for term insurance that was lower at most durations than the current statutory reserves, with a "hump" that was, for some reasonable choices of Margin, as low as 30 percent of that produced by the current formulaic statutory reserve requirements. However, depending on the Margin added to the

Best Estimate Assumptions, the early duration reserves could be considerably higher than under the current methodology.

Modeling of a universal life product with secondary guarantees also showed potential reductions of reserves relative to those required by Actuarial Guideline 38. In the case of the ULSG product—a product with significant tail risk—the Stochastic Reserve was found to be larger than the Deterministic Reserve, as would be expected. For the term product, this was not the case. In fact, for a model office of inforce term policies, the Stochastic Reserve was almost identical to the Deterministic Reserve.

These results should be interpreted with caution. First, the modeling was based on an earlier version of the model regulation, and the Stochastic Reserve was not set equal to the greatest present value of accumulated statutory deficiencies, as is required in the September 2006 exposure draft. The interest rate generator was an older version of the generator developed by the Academy in connection with the C-3, Phase I risk-based capital requirements that had a higher mean reversion target than does the current version. Moreover, a change in reserve paradigm will result in changes in product design and pricing. The LRWG was forced to make assumptions about such changes in order to produce consistent models.

Regardless of the exact amount of reduction, it is likely that reserves for the modeled products will tend to be lower. However, since the reserves depend inversely on the level of gross premiums, products under-priced relative to the Prudent Best Estimate Assumptions chosen by the Qualified Actuary will require higher reserves.

Unlocking will affect statutory financial results and could result in surprises. Unlocking occurs whenever anticipated experience differs significantly from that underlying current assumptions. Thus, the result could be either increased or reduced reserves. Over a large block of business, the effects of unlocking may cancel out in many cases. However, risk factors that are correlated, such as those that move with the overall market value of equities, could cause a large change in the aggregate reserve level.

⁴ See the reports of the Modeling Subgroup of the LRWG on the Academy Web site, www.actuary.org.

While there is a great deal of uncertainty about how tax reserves would be calculated under the PBA, current law bases tax reserves for a policy on the assumptions that apply at issue and caps the tax reserve by the statutory reserve. If this continues to be the case, unlocking may cause a one-sided tax effect: increases in the statutory reserve due to unlocking will not result in an increase in the tax reserve, while decreases will reduce the cap and thus the tax reserve.

No modeling of the PBA RBC was completed for the NAIC fall meeting in 2006. However, since the current formulaic C-3 component of RBC is the statutory reserve multiplied by a simple factor, the proposal to use modeling instead is likely to result in a capital requirement that is more reflective of the interest rate and equity market risk in the product portfolio. Whether the requirement is larger may depend on the company's use of risk mitigation tools such as reinsurance and hedging. For variable annuities with supplemental guarantees, the introduction of modeling-based RBC resulted in increases for one-third of the companies responding to an Academy poll and reductions for another third, with the remainder experiencing almost no change.⁵ Reductions were assumed to be due to effective hedging programs. Note that unlocking affects RBC as well as reserves, since the RBC is based on the same set of Prudent Best Estimate Assumptions.

Implications for Financial Operations

The need to base important financial statement items on complex models has the potential to impact the ability to meet deadlines for financial close. Running the models and performing the necessary controls will require significant time and effort. Also, the need for an independent review of the reserve calculations adds another complex step to the process. While the Academy recommendations favoring the independent review process visualize a cooperative process carried on in tandem with the reserve setting process, the impact of disagreement late in the process could present the financial executive with a dilemma: accept the independent reviewer's position or face potential delay in closing statutory books.

Designing controls is another area that will require the attention of life insurers. While statutory financials are not themselves subject to the Sarbanes-Oxley review of internal controls on financial reporting, an analogous discipline will apply to statutory reporting starting in 2011. In any case, the lack of bright-line rules and mandated factors for PBA reserves and RBC makes effective controls essential.

In addition to requiring stochastic modeling, the PBA requires a Deterministic Reserve calculated on a seriatim basis using an approach that differs significantly from the current statutory method. For each policy, a full set of projection assumptions on a Prudent Best Estimate Basis must be updated regularly, and the calculated Seriatim Reserve must be compared to the policy's cash value. Current systems are likely to require extensive revision or replacement, especially for flexible premium policies. The lead time required is likely to be significant.

The requirements placed on reinsurers by Model Regulation PBR may require more extensive data from cedants than was previously the case. This could also affect financial operations.

Implications for the Pricing Process

Under a principles-based approach to reserves and RBC, decisions made in the pricing process will impact reserves and thus financial reporting, not only at issue, but also in later years. Pricing assumptions are based on the same experience studies as valuation assumptions. Any differences must be understood by the Qualified Actuary and may be analyzed in the report that accompanies the reserve certification. Thus, cooperation between the pricing actuary and Qualified Actuary will be essential to the smooth functioning of the PBA. For example, a decision to decrease gross premiums to make a product line more competitive will result in higher reserves throughout the life of the product.

The need to base important financial statement items on complex models has the potential to impact the ability to meet deadlines for financial close.

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⁵ See "Summary of C-3 Phase II Survey Results from the American Academy of Actuaries' Life Capital Adequacy Subcommittee, presented to the National Association of Insurance Commissioners' Life Risk Based Capital Work Group," June 2006.

The involvement of other executives in the pricing process may be beneficial as well. Choice of investment strategy, for example, will affect the Discount Rates for reserves, as well as non-guaranteed elements and other cash flow items. A carefully designed hedging program,⁶ if it qualifies as a Clearly Defined Hedging Strategy, can significantly reduce the Stochastic Reserve for products with tail risk.

The PBA to reserves and RBC has other implications for the pricing process that impact the financials less directly. For example, to carry out the pricing process for a product with tail risk with complete precision, the pricing actuary would need software that could carry out a “stochastic within stochastic” projection—at each point on each scenario used in the pricing projection, a full stochastic run, based on the projected yield curve and equity market values, would have to be carried out to produce the reserves and RBC. The Modeling Subgroup of the LRWG reported that, for its ULSSG runs, it was able to find surrogates for the reserves and RBC based on the Deterministic Reserve and the gross premium. Techniques of this kind may be essential to a responsive and cost-effective pricing process.

Implications for the Product Development Process

Once reserves are based on the PBA, life insurers may have questions for the product development team:

How will policyholder options and guarantees affect reserve levels? Will some forms of options and guarantees produce lower reserves? Is the lower demand on capital for such designs reflected in the premium?

Will premiums for any product fall enough to fuel a round of replacements? If so, what is the best response? What impact will any such replacement activity have on GAAP financials?

What will be the impact on current and future reinsurance arrangements? What do the current treaties say about reserves? Replacements? Is recapture allowed? Is it advantageous? Will financial reinsurance disappear? Be reinvented? Will new forms of reinsurance become possible?

Will any new product designs emerge? If so, is there a good understanding of the risk profile, both the aspects that will be reflected in PBA reserves and RBC and those that will not?

Strategic Implications

Owners and senior managers of life insurers may find that the new approach to reserves and capital requirements improves their ability to make the strategic choices that determine the company’s future.

To begin with, the tools needed to carry out the PBA calculations may improve the ability of the company’s management to understand its risk profile. The PBA apparatus should facilitate the calculation of economic capital, including (if the model is generalized to include stochastic modeling of other risk factors) the analysis of the benefits of risk diversification.⁷ Even companies that already calculate economic capital often report using simplistic methods for determining diversification credit.⁸ The conditional tail expectation (CTE) metric used in the PBA produces additive results when applied to multiple risk factors and thus is a useful tool for determining capital allocations in the face of correlations.

In addition, the advent of the PBA may lead management, investors and other interested parties to ask far-reaching strategic questions. For example:

Will PBA-based reserves and RBC make U.S. life insurers better able to compete in the national and global financial services markets? Redundant reserves have been a major capital sink for U.S. life insurers,

⁶ See Section 7E(9) of Model Regulation PBR for a list of the requirements that a hedging strategy must meet to qualify as a Clearly Defined Hedging Strategy.

⁷ Diversification credit arises because less capital is required to back correlated risks within one entity than would be needed if each risk were in a separate entity.

⁸ See A. Dicke, “New Survey of the Use of Alternative Financial Metrics by U.S. Life Insurers,” *The Financial Reporter* (63), December 2005.

limiting the financial resources and flexibility needed to compete at the highest level with financial institutions, both in the U.S. and abroad, that are subject to less stringent requirements. However, the PBA regulations are complex and not fully formed, so that answering this question requires judgment and foresight.

Will return on statutory capital become more meaningful? Should future capital deployment be based on PBA reserves and RBC? Statutory financial results are rarely used as a performance measure currently. With a uniform system based on realistic estimates of anticipated experience, the PBA may provide a better yardstick than either current statutory or GAAP financials. While some companies use a multiple of company-action level RBC to allocate capital, the limitations of the current formula can lead to anomalies, and have caused many insurers to adopt other capital formulas. Using PBA models for capital allocation will be more company-specific, and may thus prove to be more effective, than alternatives, such as the formulas used by rating agencies.

Will the new risk/reward profile cause entries or exits from the U.S. life insurance market? Improved information has a tendency to shake up an industry. Current investors may find the new reserve and RBC data makes specific insurers appear to have a risk/reward profile that is not what had been assumed. Management may find that a product line was riskier than assumed, or that the uncertainty introduced by, say, unlocking is not consistent with its approach to the market. It would not be surprising to see a number of transactions take place soon after the PBA is adopted. §



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Thanksgiving

by Darin G. Zimmerman



If my calculations are correct, many of you will still be digesting the last piece of pumpkin pie from Thanksgiving dinner as you read this column. (Provided you are a U.S. actuary. If you're still eating Canadian Thanksgiving leftovers, prepare for a nasty bout of food poisoning.) Either way, Thanksgiving is a fitting theme for my final message as chairperson.

It goes without saying that I am very thankful for my family. I'm thankful that Mary and the boys are still speaking to me despite the fact that I moved them halfway across the country this summer. I am also very thankful for the professional opportunity I received this year. I was picked to be chief actuary for Transamerica Reinsurance in Charlotte (a division of AEGON). Charlotte is a beautiful, progressive city and my new co-workers are exceedingly kind and friendly. (As are my former co-workers from Cedar Rapids.) Thank you, everyone, who made my relocation smooth and has helped me fulfill my new responsibilities and transition out of my former responsibilities.

Regarding the section council, I am incredibly grateful that Henry Siegel was vice chair this year. Henry did a phenomenal job. He was organized, dependable, proactive, insightful, and a lot of fun to work with. Thank you, Henry, for making my job so easy. I am convinced that we could not have accomplished all of the things we did this year without your willingness, and eagerness, to take responsibility and to see things through to completion.

I'd also like to thank the council's other officers: Jerry Enoch as secretary and Rick Browne as treasurer. They both did admirable work in their section officer positions, but I'm truly grateful for their work on our newsletter. Jerry is the former editor and Rick is the current editor. Thank you for making the editorial transition smooth and for continuing a tradition of excellence with respect to the quality of our quarterly newsletter.

The rest of council also has earned my heartfelt thanks. In addition to the day-to-day work of recruiting for sessions and planning Webcasts, Kerry Krantz was a pioneer in the development of our Web site and its design and functionality are a testament to Kerry's dedication and hard work. I want to thank Mike Leung for all of his efforts as annual meeting coordinator. The joint meeting with the CIA presented unique challenges relative to a "regular" meeting, but I was impressed with the quality of the programs our section council presented. Thank you, also, to Yiji Starr and Vincent Tsang for all of your hard work during the past year.

I am thankful for the knowledge that, as Kerry, Rick and I retire, we are leaving the council stronger than when we joined. We had a great recruiting year and I am confident our incoming council members are going to do a great job. Thank you, Jason Morton, Rod Bubke, Craig Reynolds and Sue Deakins.

I'm thankful for all of the support I received from the SOA staff. Thank you Errol Cramer, our board partner. Thank you Ronora Stryker, for all of your help as we expanded our efforts into supporting more research projects. Thank you Mike Bell and Jeremy Webber, for your dedicated efforts to our council. And thank you Kara Clark, Amy Wojcik,

Meg Weber and everyone else at the SOA who help make the section chairs more effective leaders.

WOW! It's surprising that the Academy Awards don't take 10 hours. When one takes a moment to reflect on the hundreds of people who contribute the successes we take credit for it's a truly humbling experience. But I'm not done yet.

The most important "thank you" goes out to you, the members of the Life Insurance Company Financial Reporting Section. I am incredibly thankful that I was given the opportunity to serve on your council these past three years. It has been a rewarding and satisfying experience. It has been a

tremendous opportunity for professional growth, but more importantly, it has been a tremendous opportunity to make new friendships that I will cherish for years to come.

We're all familiar with the Chinese curse: "May you live in interesting times." It seems very likely that all North American countries will undergo a substantial changes to statutory and GAAP accounting in the next several years. What could possibly be more interesting than that? Fortunately, our section's council is well positioned to meet the challenges of the upcoming years and will keep us all informed of the changes taking place. §



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Research Efforts of the Life Insurance Financial Reporting Section

by Rick Browne

One of the purposes of our section is to sponsor research studies in the field of life insurance financial reporting. Three projects which are currently or soon to be underway are:

Validity of the Z-Factor—The purpose of this research is to perform analysis to determine the validity of the proposed Z-factor metric methodology under principles-based reserving.

Asset Spread Benchmarks—This project investigates the suitability of various capital market measures as a possible benchmark for asset spreads.

Market-Consistent Valuations of Life Insurance Business: The U.K. Experience—This project analyzes the U.K. experience of life insurance companies preparing market-consistent valuations for assets and liabilities and is to help actuaries understand the applicability of fair value accounting.



If you have any ideas for other research projects that would be of interest to the section membership please contact any member of the section council. §

Principles-Based Reserving: The View from the Margin

by Donald D. Solow



The actuarial profession has generally been supportive of the move toward principles-based statutory reserves. It is purported that not only would such a move reduce the amount of “redundant” reserves held by insurers, but that the professional judgment of the actuary would increase substantially in importance. In spite of this, I submit there has been inadequate debate on the real economic benefit of reducing reserve redundancies. The purpose of this article is to serve as a partial remedy to this inadequacy.

Let us consider \$1 of redundant reserves. For clarity, let us define “redundant reserves” as a liability amount substantially in excess of (1) an economic (or fair value) reserve plus (2) a margin for adverse deviation, such that the sum of (1) plus (2) also equals the statutory reserve under a principles-based reserving scheme. In other words, the redundancy is the amount by which the statutory reserve liability under the current formulaic approach exceeds the amount held under a principles-based approach. Let us assume that a portion p of this redundancy is tax-deductible.

In the absence of a principles-based reserving scheme, this \$1 redundancy will need to be funded. The annual net after-tax cost of funding \$1 of redundancy is:

Cost = \$1 (K - I) (1 - T), where

K = the pre-tax cost of capital,

I = the interest earned on the raised capital net of credit risk and other risk spreads, and

T = the tax rate.

There is a tax benefit in holding the redundant reserve. Because a portion of the redundancy is tax-deductible, and because this deduction will reverse when the redundant reserve is released, the tax benefit of the redundancy is the time value of the deduction. Therefore, the annual benefit of the tax deduction is simply the after-tax interest earned for the year on the tax saved. (This can be seen to be equivalent to an interest-free loan from the U.S. Treasury).

The value of this is:

$$\text{Benefit} = \$1 T p I (1 - T).$$

We can see that if cost exceeds benefit, then the economic burden of funding the redundant reserve exceeds the tax advantage of holding the reserve, and we should seek to avoid reserving schemes that create redundancies. On the other hand, if benefit exceeds cost, then the value of the tax deduction exceeds the cost of funding the redundancy.

Holding economics aside, we know (as historical data points from various transactions executed in the market) that redundant reserves can be funded with non-recourse debt at a cost of LIBOR + X percent, where X percent is the credit spread demanded by investors to accept the risk that the redundant reserves are not truly redundant (in other words, these reserves are actually used to pay insurance claims). For simplicity, we can set I = 12-month LIBOR + 0 percent (approximately 5.5 percent as of the time of this writing) and T = 35 percent. Then the annual net after-tax cost of funding the redundant reserve reduces to:

$$(0.65)(X).$$


The annual after-tax value of the tax deduction is:

$$(.35) p (0.055)(.65) = 0.0125125p.$$

We may note a few points here before continuing. First, the annual net cost of funding the redundancy is a function of the spread between the cost of funds (shown as LIBOR + X percent) and the earned rate (shown as LIBOR flat). Second, the annual tax benefit is a function of the absolute level of interest rates. (The interest-free loan from the U.S. Treasury increases in value as interest rates rise). Finally (and obviously), the tax benefit is reduced as the tax rate goes down and as the deductible portion of the redundancy goes down.

In recent market transactions, non-recourse debt has been raised to fund reserve redundancies at an all-in cost of (roughly) LIBOR + 0.65. percent. This

means the after-tax cost of funding equals $(0.65)(.65 \text{ percent}) = 42.25$ basis points per annum. We have seen, for many blocks of business subject to redundant reserve requirements, $p > .90$. Therefore the after-tax value of the tax deduction is generally greater than $(0.0125125)(0.90) = 112.6125$ basis points per annum, which in turn is substantially greater than the cost of funding the redundant reserves.

Under current conditions, then, it would appear that the economic argument strongly favors retaining and funding tax-deductible redundancies, rather than eliminating such redundancies through a principles-based reserving scheme. I therefore submit that, by moving to a principles-based approach to reserving under which tax-deductible redundant reserves are lost, economic value (for a tax-paying entity) is destroyed. 

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Fair Value Accounting Update

by Leonard J. Reback



Disclaimer: The author is not a CPA and is not purporting to give accounting advice, but is describing what the Life Financial Reporting Committee (LFRC) understands to be a developing area of interest and concern for actuaries. Companies should seek accounting advice from their accountants in the application of all FASB standards.

Recently there has been a significant amount of activity by the Financial Accounting Standards Board (FASB) on Fair Value Accounting. This activity has the potential to significantly impact the way insurance companies report GAAP financial statements. There has been activity moving towards fair value accounting for several years. However, that activity has rapidly accelerated over the past two years, as part of a broad fair value project initiated by FASB. The acceleration has been largely driven by a desire for more convergence between the US accounting standards promulgated by FASB and international accounting standards promulgated by the International Accounting Standards Board (IASB). FASB also believes that fair value is a more relevant measure of balance sheet items than the current book value.

Past Activity

Historically, several FASB pronouncements have referred to fair value. Notably, FASB Statement No. 13 (Accounting for Leases), issued in 1976, requires comparison of lease payments to fair value in some circumstances. FASB Statements No. 87 and 106,

dealing with pension and post-retirement benefits, also make reference to fair value.

But the real beginning of a general movement towards fair value accounting can probably be traced to FASB Statement No. 107 (Disclosures about Fair Value of Financial Instruments), issued in 1991. FASB Statement No. 107 requires that the fair value of financial instruments be disclosed within the financial statements, either within the body of the financial statements or within the footnotes to the financial statements. However, certain financial instruments are exempted from these disclosure requirements. Among the FASB Statement No. 107 exemptions of relevance to actuaries are “insurance contracts, other than financial guarantees and investment contracts” and obligations for “pension benefits, post-retirement benefits, post-employment benefits ... and other forms of deferred compensation arrangements.” But while insurance contracts are exempted from these fair value disclosure requirements, certain contracts issued by insurance companies are subject to these requirements. Notably, investment contracts such as most single premium deferred annuities (SPDAs) and guaranteed investment contracts (GICs) are subject to the fair value disclosure requirements of FASB Statement No. 107.

FASB Statement No. 107 is also significant in that it sets down principles for determining the fair value of a financial instrument. If available, quoted market prices are considered the best evidence of fair value. If quoted market prices are not available, fair value can be determined based on the quoted market price of a similar financial instrument, or it can be calculated using valuation techniques, such as discounted cash flows or option pricing models.

Another major step in the direction of fair value accounting was FASB Statement No. 115 (Accounting for Certain Investments in Debt and Equity Securities), issued in 1993. FASB Statement No. 115 requires that equity and debt securities held as investments are to be categorized as held-to-maturity, available-for-sale or trading. While held-to-maturity debt securities can continue to be held on the balance sheet at book value (typically amortized cost), available-for-sale and trading securities are required to be shown on the balance sheet at fair

value. For trading securities the change in fair value is recorded through net income. For available-for-sale securities net income continues to be based on change in book value, with the difference between change in book value and change in fair value recorded directly to the balance sheet (or through other comprehensive income).

Probably the most significant move until recently towards fair value reporting occurred in 1998 when FASB Statement No. 133 (Accounting for Derivative Instruments and Hedging Activities) was issued. Among other things, FASB Statement No. 133 defines derivative instruments and requires such instruments be reported at fair value with changes flowing through net income (except for those used in certain defined hedging activities). FASB Statement No. 133 explicitly excludes insurance contracts (as defined in Statements No. 60, 97 and 113) from its definition of derivative instruments.

However, FASB Statement No. 133 does note that a contract that does not in its entirety meet the definition of a derivative instrument might contain an embedded derivative if that contract included implicit or explicit terms affecting some or all cash flows or other exchanges in a manner similar to a derivative instrument. Such contracts are considered hybrid financial instruments. Under the Statement, such embedded derivatives are generally required to be bifurcated from the host contract, unless the economic characteristics and risks of the embedded derivative are clearly and closely related to the economic characteristics and risks of the host contract. When an embedded derivative needs to be bifurcated, the cash flows associated with the embedded derivative must be measured and reported in accordance with fair value, separate and irrespective of the reporting requirements governing the remaining cash flows in the host contract.

Thus, even though insurance contracts themselves are excluded from the definition of derivatives under FASB Statement No. 133, insurance companies do need to apply the provisions of the Statement to certain embedded derivatives within insurance contracts. A notable example is a guaranteed minimum accumulation benefit (GMAB) within a variable annuity that includes a death benefit meeting the GAAP definition of significant insurance risk. Although the host contract (the variable annuity) is considered an insurance contract and is valued accordingly, the GMAB needs to be bifurcated and

valued and reported at fair value, since the GMAB payment is not based on a significant insurance risk and otherwise meets the definition of an embedded derivative.

Subsequent accounting pronouncements that involve fair value include FASB Statement No. 140 (Accounting for Transfers and Servicing of Financial Assets and Extinguishments of Liabilities), No. 141 (Business Combinations), and No. 142 (Goodwill and Other Intangible Assets).

Recent Activity

While over the past 15 years FASB had made some moves towards fair value reporting requirements, over this past year the activity has rapidly accelerated. FASB Statement No. 155 was issued in February 2006, expanding the reach of fair value reporting. FASB Statement No. 157 was issued in September 2006, providing guidance for how to calculate fair value. And, as of September 2006 there was an outstanding exposure draft of an additional possible Statement that would expand fair value reporting.

FASB Statement No. 155

FASB Statement No. 155 (Accounting for Certain Hybrid Financial Instruments) amends FASB Statement No. 133. FASB Statement No. 155 updates the accounting for hybrid financial instruments. Prior to FASB Statement No. 155, hybrid financial instruments generally were required to be bifurcated. The host portion of the instrument had to be reported in accordance with the accounting guidance governing such contracts, while the embedded derivative was required to be reported at fair value.

Under FASB Statement No. 155, subject to the exceptions in FASB Statement No. 107, companies have a one-time, irrevocable option to value the entire hybrid instrument at fair value, with changes in fair value reported through net income. The fair value election may be made on an instrument by instrument basis—thus a company may elect to fair value one contract, but would not be required to fair value a similar contract if it did not wish to. The fair value election must be made when the instrument is acquired or issued, or when it is subject to a remeasurement (new basis) event. Upon adoption of FASB Statement No. 155, companies

Suggestions were made that there should be more guidance on the importance of sensitivity testing and the value of communicating the results to senior management.

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Under FVO, the fair value election could be made on the date a financial asset or liability is initially recognized, or upon an event that gives rise to new basis accounting ...

can also elect to apply this option to inforce hybrid instruments that have been measured under the bifurcation rules of FASB Statement No. 133. Once the fair value election is made for an instrument, the election is irrevocable, and the instrument must continue to be fair valued in its entirety for evermore.

election could be made on a contract by contract basis, so that, for example, a company could elect to fair value one universal life contract, but not another similar universal life contract. While the election could be made on a contract-by-contract basis, the election must be made for the entire contract, rather than just certain cash flows within a contract. Thus a company could not elect to fair value a guaranteed minimum annuitization benefit within a variable annuity contract unless it elects to fair value the entire annuity contract.

FASB Statement No. 155 is effective upon the beginning of fiscal years that begin after September 15, 2006. However, this Statement probably has limited application to insurance company liabilities. As noted above, Statement No. 155 exempts contracts that are exempt from FASB Statement No. 107. Thus insurance contracts (under the GAAP definition) are excluded. Still, certain hybrid instruments issued by insurance companies may be covered by the fair value election provided by FASB Statement No. 155. For example, SPDA contracts or GICs that contain embedded derivatives would typically not be exempt under FASB Statement No. 107, and thus a fair value election could be applied to such contracts. One notable example of such a contract would be an Equity Indexed Annuity. Some variable annuities with embedded options may be covered as well, provided that the mortality benefits on these contracts are deemed to be nominal.

Under FVO, the fair value election could be made on the date a financial asset or financial liability is initially recognized, or upon an event that gives rise to new-basis accounting (the latter is defined as an event that under existing accounting literature requires a financial instrument to be measured at fair value on a one time basis, but not on a continuous basis). So for a payout annuity contract, for example, the election would be available at contract issuance. The transition rules also permit a fair value election to be made for any eligible inforce financial asset or liability upon a company's adoption of the Statement. As currently written, adoption would be required by the beginning of an entity's fiscal year beginning after December 15, 2006 (although many hope this date will be extended in any final pronouncement). Of course, extensive disclosures are required for assets and liabilities for which the fair value option is elected.

Fair Value Option Exposure Draft

One outstanding FASB exposure draft is a Proposed Statement on "The Fair Value Option for Financial Assets and Financial Liabilities," or Fair Value Option (FVO) for short. FVO would expand the fair value election from FASB Statement No. 155 to many additional financial assets and liabilities. Such financial assets and liabilities will be eligible for a fair value option election whether or not they contain embedded derivatives. Also, as currently written, FVO does not exempt insurance contracts from its provisions. Thus insurance contracts would be eligible for the fair value election just like other financial instruments. FVO does still exempt some financial assets and liabilities, including pension benefits, post-retirement benefits, post-employment benefits and deferred compensation arrangements from its provisions.

As with FASB Statement No. 155, FVO would permit a one-time irrevocable election to value and report a financial asset or liability at fair value. The

FASB Statement No. 157

FASB Statement No. 157 Fair Value Measurement (FVM), was issued in September 2006. This statement sets down a GAAP framework for calculating fair value of any asset and liability—including insurance and, in fact, including non-financial assets and liabilities. The guidelines provided are in many ways elaborations of the fair value measurement guidance in FASB Statement No. 107, and do not provide much specific guidance for most assets or liabilities, except those for which a quoted price on an active market is readily and regularly available.

FASB Statement No. 157 defines fair value as "the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date." Effectively, this requires an exit value calculation of fair value. The exposure draft identifies three types of fair valuation techniques, as shown in Table A on page 19.

Table A

Market Approach	Uses prices and other relevant information generated by market transactions involving identical or comparable assets or liabilities.
Income Approach	Uses valuation techniques (such as present value calculations or option pricing formulas) to convert future cash flows or income into a single discounted present value amount.
Cost Approach	Considers the cost required to replace a given asset's service capacity; essentially the cost of a substitute asset of comparable utility, adjusted for obsolescence.

Table B

Level 1 Inputs	Quoted prices for an identical assets or liabilities in an active reference market.
Level 2 Inputs	Inputs other than quoted prices that are observable. Examples would be quoted prices for similar assets or liabilities, interest rates observable at commonly quoted intervals, volatilities and inputs that can be corroborated by observable market data by correlation.
Level 3 Inputs	Unobservable inputs that reflect the reporting entity's own assumptions about the assumptions the market participants would use in pricing the asset or liability.

Regardless of the valuation technique used, observable inputs are preferred in the valuation rather than unobservable inputs. Observable inputs are those that reflect assumptions that market participants would use developed based on market data obtained from sources independent of the reporting entity. Unobservable inputs are those that reflect the reporting entity's own assumptions about the assumptions market participants would use. Three levels of inputs are defined, in order of priority, as shown in Table B above.

Four types of markets are defined within the exposure draft, as shown in Table C on page 20.

In general, fair value measurements should assume the transaction to sell the asset or transfer the liability being valued occurs in the principal market for

the asset or liability. In the absence of a principal market, the measurement should be based on the most advantageous market. The principal market is the market in which the reporting entity would transact the asset or liability with the greatest volume or level of activity for the asset or liability. The most advantageous market is the market that maximizes the amount received for an asset or minimizes the amount paid to transfer a liability after considering transaction costs. However, regardless of the market used, transaction costs are excluded from the fair value of the asset or liability.

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Table C

Market	Description	Example
Exchange Market	Closing prices are typically readily and regularly available.	New York Stock Exchange
Dealer Market	Dealers stand ready to trade from their own accounts, and usually bid and asked prices are more readily available than closing prices.	NASDAQ
Brokered Market	Brokers attempt to match buyers and sellers, and prices of completed transactions are sometimes, but not always, available.	Residential Real Estate. Some reinsurance markets.
Principal-to-Principal Market	Principal to principal transactions negotiated without intermediary, where little transaction information is necessarily released publicly.	Some reinsurance markets.

FASB Statement No. 157 imposes one additional requirement for fair valuation of liabilities. That is that the fair value of a liability needs to incorporate “nonperformance risk”—the risk that the obligation will not be fulfilled. Thus a reporting entity is required to consider the effect of its own credit standing on the valuation of a liability (adjusted for the effect of any credit enhancements related to the liability). Thus a liability of an entity with poor credit risk may have a lower fair value than an otherwise identical liability of an entity with a strong credit standing. And changes in liability fair value due to change in an entity’s own credit standing are generally required to be reflected in net income.

Potential Benefits of Fair Value to Insurance Companies

While fair value accounting introduces a number of issues, particularly with respect to insurance contracts, it also provides a number of benefits, especially when use of fair value is optional. One major issue many insurance companies have faced recently is that guaranteed minimum income and death benefits (GMIBs and GMDBs) on annuity contracts are accounted for differently than the assets used to hedge those benefits. GMIB and GMDB reserves are based on AcSEC Statement of Position 03-1 (SOP

03-1). SOP 03-1 requires a reserve to be accrued in proportion to assessments based on benefit projections over multiple scenarios consistent with best estimate assumptions—a book value reserve calculation. But GMIBs and GMDBs are typically hedged using derivative contracts, and derivative asset values are based on FASB Statement No. 133, requiring fair value. And since most GMIB reinsurance contracts are also subject to FASB Statement No. 133, reinsurance recoverables for GMIBs generally need to be held at fair value as well. The difference in accounting treatment can cause significant income volatility, even if the GMIB or GMDB is “perfectly” hedged from an economic standpoint. Under FVO, an insurance company could alleviate this issue by applying fair value to both the annuity (including the GMIB or GMDB) and the assets (including any derivatives and reinsurance) backing the annuity. Then if the assets and liabilities are “perfectly” matched and hedged, any earnings volatility in the accounting would be eliminated, matching the economics.

It should be noted that in the case of hedging a GMIB or GMDB risk, obtaining the benefit of FVO requires more than just fair valuing the GMIB or GMDB itself. Since FVO needs to be applied to

entire contracts, the entire annuity containing the GMIB or GMDB would have to be fair valued in order to obtain the benefit. Thus in order for the accounting to be matched, all the assets—not just derivatives—backing these annuity contracts would likely need to be fair valued too, and any hedging or duration mismatches could cause earnings fluctuations. But these earnings fluctuations would be based on the true underlying economics.

Another example of an FVO benefit to an insurance company is in the accounting for certain separate account market value annuities and group pension contracts where the investment performance of a contractually referenced pool of assets is passed through to the policyholder. Under SOP 03-1, many such liability contracts are currently required to be held at fair value. However, some of the assets backing the liabilities (such as mortgage loans) may not be eligible for fair value treatment under existing accounting literature. Again, these accounting differences can cause distortions in the company's net income, even though the investment earnings from the assets are passed through directly to the policyholder. Under FVO an insurance company could elect to hold all the reference assets backing such pass through pension contracts at fair value, achieving a match between the asset and liability accounting, again reflecting the true economic reality.

Similar benefits could arise in many situations where a company's assets and liabilities are required to be valued under different standards. This arises particularly often when derivatives are used to back insurance liabilities. As in the GMIB/GMDB example, the derivatives have to be fair valued while the liabilities are often held at book value. Such a situation can arise in international operations, where derivatives may be used to hedge currency exchange risk. Here too, FVO may be used to produce desirable matching of accounting treatment between the asset and the liability that better reflects the economic reality.

There are also some situations that do not involve instruments currently measured at fair value where FVO may be beneficial to an insurance company. One example would be a universal life contract accounted for under FASB Statement No. 97 with risks ceded under a reinsurance contract accounted for under FASB Statement No. 60. In this case, the difference between accounting for the direct contract and the ceded contract under different FASB pronouncements may create earnings volatility for risks that are completely ceded to the reinsurer.

Under FVO, the insurance company could elect to account for both the direct universal life contract and the ceded reinsurance contract at fair value, eliminating this counterintuitive earnings mismatch. The company would probably also want to account for any invested assets backing any retained universal life risks at fair value as well, to avoid any accounting mismatches.

Potential Issues Surrounding Fair Value

Despite the benefits, there are several controversial issues surrounding the FVO. Some are unique to insurance companies, and some are more general.

One key general issue is that a company would need to value its liabilities at a discount rate that reflects its own credit risk. Thus a company near default would use a very high discount rate for its liability valuation, producing a low liability value. Conversely, a company with a very strong credit standing would use a low discount rate, producing a high liability value. Some see this as providing a distorted picture of a company's financial position to users of financial statements, especially creditors. Some also see this as inconsistent with the going concern principle used in accounting, since gains due to low credit standing would only be realizable in a bankruptcy situation. However, doing otherwise would not be entirely consistent with fair valuation, and would produce different current liability values for identical amounts of debt depending on when the debt was initially incurred.

While incorporating own credit standing into a liability valuation may be acceptable to some for balance sheet presentation purposes (combined with suitably strong disclosures), the current fair value literature compounds the issue by requiring the change in liability value due to change in own credit standing to flow through net income (rather than, say, other comprehensive income). This means a company's net income would decrease when its credit rating improves, and would increase when its credit rating deteriorates. On the surface, this is counterintuitive and confusing.

Under FVO, an insurance company could elect to hold all the reference assets backing such pass through pension contracts at fair value, achieving a match between the asset and liability accounting. ...

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Another general issue is the comparability of financial statements. Under FVO different companies may elect to account for similar assets and liabilities in different ways. One company may elect to fair value some or all of its annuities with GMIBs, while another company may elect to continue holding book value liabilities for such contracts. This inconsistency will reduce the comparability of financial statements between similar companies. FASB has noted this concern in its fair value literature, but most of its members consider taking this step towards a more complete fair value environment to be more important than the reduction in financial statement comparability.

Concerns over comparability become even more acute for insurance companies. There is little market information available for valuing insurance contracts. To the extent such markets even exist (most notably the reinsurance market) the relevant markets are typically brokered markets or principal-to-principal markets, where little or no public information is available. Also, each insurance contract reflects its own unique blend of company specific characteristics. For example, each company's underwriting differs. So most insurance contracts could only be fair valued using modeling techniques incorporating many unobservable inputs. Such models would in many cases be costly to produce and complex to implement and analyze.

Furthermore, these "level 3" estimates using company specific information that may be subjective would likely incorporate inconsistencies from one company to another, further reducing comparability. Also, some question the reliability and relevance of such insurance contract fair value calculations, since there is no single accepted method for calculating the fair value of an insurance contract. For these reasons many insurance companies hope that—if and when a final Fair Value Option standard is adopted—insurance contracts will continue to be scoped out, similar to FASB Statements No. 107 and 155.

One additional issue involves the transition rules and timing of the FVO standard. Under the current exposure draft, the option could be applied to future new issues on a contract-by-contract basis after the standard becomes effected. However, it could only be applied to existing inforce business *at the time* the standard becomes effective. Thus, after that date, a company loses the fair value option for all inforce business.

The effective date for most companies under the current exposure draft would be January 1, 2007. This leaves inadequate time to prepare the necessary valuation models, so most inforce business could not elect fair value. Many (including me) hope, however, that if and when a final Fair Value Option standard is adopted, the effective date will be pushed back, though perhaps with early adoption permitted.

Conclusion

The FASB appears intent on applying fair value as broadly as possible. While fair value may or may not be appropriate for insurance contracts, there is one suggested argument that all actuaries should reject, that "insurance contracts just cannot be fair valued".

As actuaries, our skill and training allows us to perform such calculations. The actuarial profession is best equipped to calculate fair values for insurance contracts – even if imperfectly. With the adoption of FASB Statement No. 133 actuaries have already been required to and proved capable of fair valuing insurance-related liabilities. So we ought to make sure that if insurance contract fair values are required we are prepared to calculate them. §



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The Problems with Own Credit Rating

by Dennis P. Lauzon

ASB has adopted Statement of Financial Accounting Standard No. 157 (SFAS 157) on Fair Value Measurements. SFAS 157 is effective for financial statements issued for fiscal years beginning after November 15, 2007. Paragraph 15 of SFAS 157 notes, "The reporting entity shall consider the effect of its credit risk (credit standing) on the fair value of the liability in all periods in which the liability is measured at fair value." This means a company with a lower credit rating can use a higher rate of discount in valuing liabilities, thus reducing the value of the liabilities.

A primary objective of financial statements is usefulness. However, the use of own credit rating will make financial statements less useful, less comparable and less understandable. The following simple example and observations illustrate the problems with the use of own credit rating.

Example

Entity B borrows \$356 now for a payment of \$500 in three years. The \$500 payment is the \$356 loan compounded with interest at 12 percent for three years. Entity G borrows \$432 for a payment of \$500 in three years. The \$500 payment is the \$432 loan compounded with interest at 5 percent for three years.

Because G can legally print as much currency as it likes, 5 percent is the nominal risk-free rate. If the loan repayment by B in three years was certain, then B could borrow at the same rate as G and would only need to make a certainty equivalent payment of \$412 in three years.

However, the full repayment by B is not certain. Assume there is a 60 percent probability B will make the \$500 payment in three years and there is a 40 percent probability that B will make a lesser payment.

In a risk neutral world investors are indifferent to cash flows with the same expected value. In a risk neutral world the expected payment from B in three years would equal the certainty equivalent payment of \$412. In a risk neutral world, with a \$500 payment 60 percent of the time, the payment the other 40 percent of the time would be \$280.



$$\$412 = .6 \times \$500 + .4 \times \$280$$

However, empirically investors are not risk neutral. In the real world investors are risk averse. In the real world when payments are uncertain, investors require margins in the form of a higher expected payment than the certainty equivalent payment.

A utility function is one way to incorporate the risk aversion of investors in valuations. A utility function can be used to quantify the level of payments at a given probability that a risk adverse investor would value as equivalent to a certain payment (i.e., the investor is indifferent between the certain payment and the alternative payments at the given probabilities). The following utility function is used for this example:

$$U(x) = 1 - \exp(-x/100)$$

In a risk adverse world with the above utility function, a certainty equivalent payment of \$412 would have the same value as \$500 received 60 percent of the time and \$349 received 40 percent of the time.

$$U(\$412) = .6 \times U(\$500) + .4 \times U(\$349)$$

The example is summarized in the following table on page 24.

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For payment of \$500 in 3 years	Entiy "B"	Entity "G"
Current Cash	\$356	\$432
Rate	12%	5%
Certainty Equivalent Payoff		
Accumulate Cash at 5% for 3 years	\$412	\$500
Risk Neutral World		
Payment at 40% probability	\$280	\$500
Payment at 60% probability	\$500	\$500
Expected Payment	\$412	\$500
Present Value of Expected at 5%	\$356	\$432
Risk Adverse (Real) World		
Payment at 40% probability	\$349	\$500
Payment at 60% probability	\$500	\$500
Expected Payment	\$440	\$500
Present Value of Expected at 5%	\$380	\$432
View of Equity Investor/Subordinated Creditor		
Value Based on 100% Payment	\$500	\$500
Present Value at risk-free rate, 5%	\$432	\$432

Investors have a real world expectation that \$356 lent to B should have an expected pay out of \$440. This is \$28 more than the \$412 certainty equivalent or expected risk neutral payment.

If the \$500 payment is made, the real world margin above real world expected will be \$60 (500 - 440). Thus the total risk margin above the certainty equivalent payment is \$88 (500 - \$412). The margin has two parts, a real world expected payment \$28 above the risk neutral expected payment and an upside risk margin from the full payment being \$60 above real world expected payment. The present value of the \$88 margin at the risk-free rate is \$76 (\$432 - \$356).

Observations

Paragraph A31 of SFAS 157 has an example similar to this example and states, "The reporting entity should consider the effect of its credit risk (credit standing) on the fair value of the liability in all periods in which the liability is measured at fair value because those who might hold the entity's obliga-

tions as assets would consider the effect of the entity's credit standing in determining the prices they would be willing to pay." By equating the liability value to the counter party's asset value, FASB is failing to recognize the uncertainty created by the transaction for which the real world extracts a price. I argue below that accounting will be more useful if this price is recognized by a higher liability value than the counter party's asset value.

B cannot repay the loan by segregating the \$356 and investing the \$356 in risk-free investments. In order to repay the loan and make some profits, B will need to invest the \$356 dollars, presumably in business operations or even riskier investments, so that something in excess of 12 percent will be earned on the \$356 dollars. This would be impossible if the \$356 was invested in risk-free investments. Useful accounting for investors will reflect cash flow uncertainty. **In a risk adverse world, when uncertainty is created value is destroyed; therefore, the certain cash flow from the loan, \$356, and the value of**

the uncertain claim on resources in three years, \$500 should not be equated.

The 12 percent return needed by B on the \$356 of resources from the loan commits B to risk taking (leverage). The capital (equity) of B should reflect the market price of this leverage by a \$76 reduction (i.e., record the loan at \$432). The \$76 dollar difference between \$432 and the proceeds of \$356 would get amortized back into capital as B is released from the risk that must be assumed in order to make the \$500 payment (i.e., as the uncertainty of the repayment decreases).

By carrying the loan at \$432, future income statements would not show a gain or loss if B earns the risk-free rate, 5 percent, on the \$432. Hence the current balance sheet would not imply future earnings on current resources greater than the risk-free rate, which would implicitly release B from risk (the cost of uncertainty) before the risk has passed. Under SFAS 157, if B books the loan at \$356 and achieves a risk-free rate of return on those resources, the income statement would show a loss each year as the present value of the \$500 payment is accrued at 12 percent. In essence, under SFAS 157 B gets credit for a release from risk before the release from risk actually occurs; hence B needs to show losses when resources generate income at the risk-free rate.

If the loan was public debt and trading at \$356, B could pay off the loan for \$356 (presumably the cash would come from gains generated by operations that reflect a release from risk as operations are completed). All things being equal, the buyback of debt reduces the need for operating leverage; therefore, an improvement in the capital position of B is warranted (i.e., capital should result from eliminating a debt with a rate higher than the risk-free rate). This would just reflect the value of eliminating uncertainty in a risk adverse world and is consistent with an investor's preference for a reduction in uncertainty.

If the loan is not public debt, B could lend the \$356 to an entity "L" with a similar credit rating in return for a \$500 payment in three years. However, this does not cancel the debt of B and B is not in the same position as before borrowing as the payment from L is subject to credit risk. To leave B with the same credit obligations as before borrowing, B would need to secure a payment of \$500 in three years from G at a current cost of \$432.

From the view of investors or creditors subordinated to the \$500 payment, the capital available to meet their needs has declined because available resources must first absorb the risk that must be taken to pay the \$500. From the perspective of investors or creditors subordinated to the \$500 payment, the capital available to support their claims on economic resources is diverted to support the \$500 payment and should reflect a reduction. SFAS 157 does not recognize this change in the claim to economic resources inherent in an investor's risk adverse valuation system and prematurely releases B from the risk that must be taken to make the \$500 payment. SFAS 157 statements will not only be less useful to investors, they will be misleading as they overstate the value risk adverse investors would place on B. **Financial statements should reflect the risk adverse preferences of investors.**

The use of own credit rating results in a balance sheet that fails to reflect that investors are risk averse. Somewhat surprisingly, by using own credit rating SFAS 157 will result in a balance sheet that fails to take into account the market price of risk. By using own credit rating there will be no change in capital for the increase in uncertainty and no reflection that the claim on the resources requires a return 7 percent above the risk-free rate.

If the \$500 payment were to go on the balance sheet based on discounting at the nominal risk-free rate, there would be an adjustment for the value investors place on cash flow uncertainty through a reduction in capital. This would account for the amount, timing and uncertainty of cash flow. Future income statements and balance sheets would reflect the reduction in uncertainty by writing up the loan at the nominal risk-free rate and offsetting this cost with income actually earned on supporting resources. If the income earned on supporting resources exceeds the risk-free rate there would be a gain, if not there would be a loss. This accounting provides a better understanding of the entity's ability to generate income relative to a universal benchmark, the nominal risk-free rate. This would foster comparability in financial statements.

Somewhat surprisingly, by using own credit rating SFAS 157 will result in a balance sheet that fails to take into account the market price of risk.

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With own credit rating, the benchmark for an entity to generate earnings is relative to its credit rating. One entity would generate net income with a 6 percent return on its resources while another entity would generate a loss with a 10 percent return on its resources. With own credit rating, the information in the income statement on the ability of the entity to generate value is relative to varying benchmarks and hence it is less useful and less comparable. Discounting liabilities at the risk-free rate results in all entities generating value relative to the same benchmark. Hence income statements and balance sheets would be more comparable and more understandable.

If the primary users of financial statements are investors and creditors, then liabilities that have a superior claim to resources (e.g., insurance contract claims), should be discounted at the nominal risk-free rate to appropriately reflect the net resources available to investors and creditors and the uncertainty of claims to resources.

There are other problems with SFAS 157. Let me mention a few. It treats a ratings downgrade as a capital enhancing event. Credit rating agencies may need to ignore financial statements or else they may chase their tails with downgrades triggering upgrades, which trigger downgrades, which trigger upgrades, etc. Own credit rating is inconsistent with the exit value concept because the price an entity would require to assume liabilities is not dependent on the transferring entity's credit rating. The use of own credit rating in the valuation of liabilities implicitly assumes some probability that the entity will default. This is inconsistent with assuming the entity is a going concern.

In summary, if a useful fair value accounting:

- reflects the uncertainty of cash flows;
- reflects that there is a market price for risk;
- does not recognize earning from risk (leverage) until the risk is released;
- reflects investor's subordinated claims to resources;
- provide earnings that are comparable across entities;
- reflects exit prices independent of the exiting entity;
- is based on a going concern concept, and
- does not treat a ratings downgrade as a capital enhancing event;

then SFAS 157 is not useful accounting. S



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The Changing Role of the Financial Reporting Actuary

by Rick Browne

Two articles in this issue of *The Financial Reporter* underscore the growing demands that are likely to be placed on financial reporting actuaries as increasingly complex regulatory and accounting rules loom on the horizon. Arnold Dicke and David White discuss recent activities with regard to principles-based reserving for life insurance products and Leonard Reback gives us an update on FASB activities on fair value accounting. Both principles-based reserving on the statutory front and fair value accounting for GAAP are excellent examples of how more sophisticated systems and products are requiring more sophisticated measurement and reporting, thereby requiring greater sophistication in actuarial methods and tools.

Twenty-five years ago it was often considered reasonable for the actuary to rely on the basic conservatism in the statutory minimum reserve standards in concluding on the adequacy of reserves. Even with the passage of the AOMR and the asset adequacy testing required in more recent years, demonstrating that there is adequacy in conservatively set formula reserves by running a series of cash flow testing models is much less a daunting task than the principles-based reserving exercise. Why is this? Consider the multitude of skills and competencies that are necessary to give an opinion on principles-based reserves. For example, the system requirements to run thousands of scenarios on today's products are huge and complex, requiring the actuary to have increasingly technical computer and data processing knowledge. The stochastic approaches require a high degree of sophistication in statistical analysis, both in setting appropriate margins and interpreting results. The use of stochastic investment models requires strong knowledge of the bond, equity and interest-rate markets. The list is endless. I know a number of actuaries who are experts in one or two of these areas, but I know of no super actuaries who have a real competency in all the required areas of expertise.

Therefore many actuaries will need to place more reliance upon other experts, either internally or externally. For example, most companies have investment gurus and technology experts upon which reliance might be placed. But this raises two impor-

tant questions. First, to what extent does the increasing reliance of the actuary on others in giving a reserve opinion diminish the quality of that opinion? And second, to what extent does the reliance on others diminish the potential personal liability to the actuary should the reserves turn out to be disastrously inadequate?

A similar increased amount of sophistication in actuarial techniques will be required as we move from book valuation to fair valuation of insurance liabilities. As noted in the Reback article, lack of a public market for insurance contracts probably means the fair valuation will require income approaches such as option pricing formulas and discounted cash flow modeling. Valuation techniques will, like principles-based reserving, require more sophisticated systems and models than are currently in use. Moreover, fair valuation for insurance products will require setting market assumptions based on unobservable inputs from the company's own experience, placing higher demands on the actuary to continually monitor and analyze company and industry experience.

As actuaries work with regulators and accountants in developing the means to accommodate these changing and more challenging developments for life insurers, it is of utmost importance that the profession step up to the task of creating the sophisticated tools that are needed. And because the profession is largely self-educated, it needs also to step up to the task of making sure today's actuaries are adequately trained to use these tools to meet the challenges. **S**

— Rick Browne



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2004 Inter-Company Expense Study of U.S. Individual Life Insurance and Annuities

by Steven C. Siegel



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Editor's Note: The following article previously ran in the September 2006 issue of Product Matters newsletter and is reprinted with permission.

The SOA's Committee on Life Insurance Company Expenses (CLICE) has recently completed its fourth inter-company study of expenses for individual life and annuity business issued in the United States. The full report of this study is now available on the SOA's Web site. This article provides highlights from that study.

The data requested was identical to that requested for the 2003 study. In addition, the total number of contributors (28) providing data remained the same. However, a number of contributors were new to the study this year, while some previous contributors were unable to contribute. CLICE is hoping to increase the number of contributors for the 2005 study and future ones—if your company has not previously contributed, CLICE welcomes your participation!

Contributors were asked to provide expense data for the following product categories:

- Life insurance—term, permanent (non-variable), variable, COLI and BOLI. Contributors were further asked to provide acquisition expense data broken down by the following distribution channels: career, brokerage, PPGA, multi-line, direct

response, other, and unallocated (those expenses that were not split by channel).

- Annuities—Immediate (non-variable), deferred (non-variable), variable immediate and variable deferred. The following distribution channel detail was requested: career, brokerage, PPGA, stockbroker, financial institutions, other and unallocated.


The data received from the contributors were aggregated and unit cost calculations were developed. As part of the aggregation process, a series of data integrity checks were performed and contributors were contacted to resolve missing or anomalous data.

Overall, the data submitted to the study continues to improve in reliability and data integrity. This is due, in part, to the number of repeating contributors familiar with the data submission form and the scope of data requested.

In the study, a unit cost called per policy index is used to facilitate the comparison of first year expenses (excluding commissions and premium taxes) among contributors. Similarly, a per policy in force unit cost is used to compare operating expenses (excluding commissions, termination expenses, premium taxes, and for annuities, annuity payout expenses). These two unit costs provide the reader with a high-level basis for making comparisons. To the left is a table comparing these unit costs for 2003 and 2004 for companies that contributed to both studies.

Please note that due to variations in expense allocations used by the contributing companies, the variety of companies that contributed, and the limited number of contributors in certain categories, the results should be viewed with caution, particularly the comparison of this study with the corresponding 2003 figures.

The exhibits in the full report show unit expense calculations for the various product and distribution channels for which sufficient data was available, including the weighted average by company, median, unweighted average by company and 25th and 75th percentile unit expenses where there was a sufficient number of contributors. Summarized acquisition and non-acquisition unit costs are illustrated in the tables on page 23.

The committee has distributed a request for, and received contributions to the 2005 study, which will further continue this annual effort. The committee expresses its appreciation to all of the contributing companies for their assistance and support of this study. 

Comparison of 2003 and 2004 Per Policy Index Unit Costs For Companies Contributing to both 2003 and 2004 Studies

	Products	Year	First Year*			Inforce#		
			25% Percentile	Weighted Average	75% Percentile	25% Percentile	Weighted Average	75% Percentile
Life	Term	2003	\$499	\$541	\$758	\$61	\$75	\$133
		2004	496	672	1,160	71	75	133
	Permanent	2003	545	1,069	1,515	57	62	120
		2004	445	1,572	2,307	51	53	116
	Variable	2003	609		2,262	112	125	195
		2004	2,129	3,319	3,974	187	195	427
Annuities	Deferred	2003	\$346	\$897	\$1,287	\$99	\$105	\$139
		2004	516	943	753	94	119	167
	Immediate	2003	258	1,246	750	78	100	107
		2004	332	731	773	53	133	137
	Variable deferred	2003	634	1,686	1,562	124	145	185
		2004	620	1,830	1,151	136	259	253

*Excludes commissions and premium taxes

#Excludes commissions, premium taxes, termination expenses and contract expenses during payout period

Acquisition Expense for Individual Life Insurance

Product Type	Number of Companies	Per Policy Issued	Per \$1,000 Face Amount Issued	Percent of First Year Premium	Commissions (% of premium)		
					First Year	Single Premium*	Renewal
Term	25	\$190	\$0.44	45.5%	61.3%	N/A	3.3%
Permanent	26	\$183	0.86	47.7%	50.9%	3.3%	3.6%
Variable	14	\$375	0.39	38.3%	35.4%	2.0%	4.9%
Total	27	\$197	0.54	45.6%	49.8%	3.1%	3.8%

* includes dumps/pour-ins and dividends applied

Non-Acquisition Expense for Individual Life Insurance

Product Type	Number of Companies	Per Policy In force	Per Claim	Premium Tax
Term	25	\$66	\$409	1.6%
Permanent	26	\$62	\$96	1.2%
Variable	14	\$218	\$333	2.5%
Total	27	\$72	\$109	1.4%

Acquisition Expense for Individual Annuities

Product Type	Number of Companies	Per Policy Issued	Percent of First Year Premium	Commissions (% of premium)	
				First Year/Single	Renewal Commission
Deferred - Fixed	15	\$145	1.5%	4.9%	5.1%
Deferred - Variable	13	\$144	2.3%	4.8%	3.8%
Immediate - Fixed	17	\$168	1.6%	2.4%	N/A
Total	24	\$145	2.0%	4.8%	4.1%

Non-Acquisition Expense for Individual Annuities

Product Type	Number of Companies	Per Policy In force	Per Termination	Per Contract	Premium Tax
Deferred - Fixed	15	\$113	\$45	\$12	0.1%
Deferred - Variable	13	\$192	\$32	\$12	0.1%
Immediate - Fixed	17	\$135	\$27	\$5	0.2%
Total	24	\$154	\$37	\$10	0.1%



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Articles Needed for *The Financial Reporter*

Your ideas and contributions are the most important component of this newsletter. All articles will include a byline to give you full credit for your effort.

The Financial Reporter is published quarterly as follows:

Publication Date	Submission Deadline
March 2007	December 15, 2006
June 2007	February 15, 2007
September 2007	June 15, 2007

Preferred Format

Please e-mail your articles as MS Word documents (.doc) to the newsletter editor. Headlines are typed upper and lower case. Please use a 12-point Times New Roman font for the body text. Carriage returns are put in only at the end of paragraphs. The right-hand margin is not justified. Author photos are accepted in .jpg format (300 dpi) with dimensions of at least 2" x 2" to accompany their articles.

If you must submit articles in another manner, please contact Joe Adduci, (847) 706-3548, at the Society of Actuaries for help.

Please send articles via e-mail or in hard copy to:

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Thank you for your help.

Editorial Correction



In the September 2006 issue of *The Financial Reporter* there was incorrect information regarding name and employer of the author of the article "Implications of Economic Capital for the Financial Reporting Actuary." The author of this article is Matthew P. Clark, who is a senior manager with Ernst & Young, LLP, in Chicago, Ill. He may be reached at matthew.clark@ey.com.

The Financial Reporter would like to apologize for this error.





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