

# The Financial Reporter

*The Newsletter of the Life Insurance Company Financial Reporting Section*

## FASB Interpretation 48 for Actuaries

*by Robert Frasca and Vincent Tsang*

In June 2006, the Financial Accounting Standards Board (FASB) adopted *FASB Interpretation No. 48, Accounting for Uncertainty in Income Taxes, an interpretation of FASB Statement No. 109* (FIN 48). FIN 48 provides clarification whether a tax position taken on a prior year's tax return should be recognized on a company's U.S. GAAP financial statements and how the value of any position so recognized should be measured. FIN 48 is effective for fiscal years beginning after Dec. 15, 2006, so for most insurance companies this means that FIN 48 will have to be reflected for the first time in the March 31, 2007 financial statements. While the ultimate impact of adoption will vary by company, it is widely believed that FIN 48 will have a substantial impact on the recognition and measurement of tax positions at many insurance companies. Though mainly regarded as an interpretation that impacts a company's tax professionals, FIN 48 may have implications for actuaries as well, particularly with respect to its implications relative to tax-basis actuarial reserves.

### Background

FIN 48 applies to all tax positions accounted for under FASB Statement No. 109, *Accounting for Income Taxes* (SFAS 109). Prior to FIN 48, the practice for recording the value of uncertain tax positions typically followed guidance outlined in FASB Statement No. 5, *Accounting for Contingencies* (SFAS 5). FIN 48 effectively amends SFAS 5, replacing it as the primary source of guidance for accounting for uncertainty in income taxes.

FIN 48 establishes a two-step process for recognizing and measuring the tax position on the



financial statements. First, the financial statement effects of a tax position will be recognized only "when it is more likely than not" that such tax position would be sustained upon examination by the tax authorities. This means that any tax position that is less than 50 percent likely to be upheld upon examination should not be reflected on the company's financial statements.

Second, if a tax position passes the "more likely than not" threshold, then the value to be placed on the tax benefit is measured as the largest amount of tax benefit that is greater than 50 percent likely of being realized. This measurement methodology is based upon a cumulative probability approach under which all possible

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outcomes are ranked in order of benefit to the company and assigned a probability. The tax benefit to be reflected in the financial statements is the largest value of benefit that is realized in at least 50 percent of the outcomes. This differs markedly from the approach used under FAS 5 wherein the value of the tax provision would be determined on a best estimate (weighted average) basis.

FIN 48 applies both to permanent differences and to differences related to timing. When the deductibility of an expense, for example, is certain but the timing of the deduction is uncertain, then the more-likely-than-not rule should be applied relative to the most favorable timing of the deduction. A deferred tax liability would then be established to reflect the difference in the position taken by the company and the amount recognizable under application of FIN 48. A liability for interest and penalties should be accrued as well to reflect the timing that meets the 50 percent cumulative probability threshold.

FIN 48 defines other issues related to the determination of the value of tax positions, including establishment of the "unit of account." The unit of account is the level at which the more-likely-than-not test is applied under FIN 48. It is established using judgment based on the manner in which the company prepares its income tax returns. FIN 48 also covers the subsequent recognition, derecognition and measurement of previously classified tax position.

### How Does FIN 48 Affect Actuaries?

FIN 48 is expected to impact numerous items related to the tax positions taken by insurance companies. The most significant of these are likely to be items related to permanent tax differences and areas in which a high degree of judgment is used. These include transfer pricing, merger and acquisition activity and tax accounting methods to name a few. In addition, though normally reflecting a timing difference rather than a permanent difference, the calculation of tax-basis reserves is an area in which substantial work may be required as a result of FIN 48. This is where the actuaries come in.

Tax-basis reserves are perhaps the largest numbers on the balance sheet that enter into the calculation of taxes, both current and deferred, for many insurance companies. In addition, though much of the tax reserves are calculated using methods and assumptions that are highly prescriptive, uncertainty remains in the calculation of tax reserves particularly

for products under which the minimum statutory-basis reserves are unclear or ill-defined. Consequently, the calculation of tax reserves represents not only one of the most significant tax "positions" taken by an insurance company, but one in which areas of material uncertainty may exist. For these reasons, the provisions of FIN 48 must be considered and applied carefully as they relate to tax-basis reserves.

### What's an Actuary to Do?

As a new accounting interpretation, many of the practical aspects of the guidance will become clearer over time as practice develops. This is particularly true as the guidance relates to the need to document and assess those provisions that would appear to be highly certain. Consequently, companies may not get a sense of reasonable industry practice until it has been effective for several reporting periods. Nonetheless, actuaries may want to consider several steps to assist in complying with FIN 48 as related to the calculation of tax-basis reserves.

#### (I) Documentation of Tax-Basis Reserve Methodologies

FIN 48 applies to all tax positions accounted for in accordance with FAS 109. This includes tax positions that are typically considered to be routine and certain as well as those where subjectivity and judgment apply. While FIN 48 does not appear to require extensive documentation around highly certain tax positions, companies may want to review all tax positions related to the calculation of tax-basis reserves to ensure that support exists for the reserves used in tax calculations. For the larger tax-basis reserves, the process of determining tax-basis reserves (both the methodology and the calculations) may be documented as part of the company's process documentation under Section 404 of the Sarbanes-Oxley Act. Certainly, for those tax reserve methods that are uncertain to any significant degree, documentation should be maintained to demonstrate that the more-likely-than-not threshold for recognition has been satisfied and, assuming it has, that the deferred tax items on the balance sheet reflect the 50 percent cumulative probability threshold for measurement. The extent

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of such documentation would likely be greatest for those tax-basis reserve calculations that involve the most subjectivity and judgment or for which the guidance on methodology is not well-defined.

### (II) Topics with Ambiguous Guidance

While IRC 807 provides most of the guidance in preparing tax-basis reserves, innovation in the insurance industry generates cases that IRC 807 might not specifically address. These are the cases where judgment is involved and where the more-likely-than-not threshold of FIN 48 may be called into question. Consequently, definitive evidence that a company has considered these situations and documented its conclusions would appear to be a requirement for complying with FIN 48. Examples of uncertainty related to the proper calculation of tax-basis reserves are numerous. Many of these uncertainties arise (1) when the definition of the statutory minimum reserve is not clear within the statutory guidance, (2) when the appropriate time to recognize a new tax-basis reserve methodology or set of assumptions is unclear (again, usually a direct reflection of the statutory reserve ambiguity), (3) when product development results in new products that do not neatly fit the existing reserve frameworks and (4) when the classification of a liability as an actuarial reserve is brought into question.

In addition, the pending introduction of principles-based reserves for statutory purposes raises many issues with respect to reporting under FIN 48. Uncertainty around what the appropriate tax-basis reserve should be is likely to increase as the adoption of principles-based regulations approaches and may continue for some time depending upon how the

final definition of tax-basis reserves is ultimately resolved. Companies should consider the possible implications of principles-based reserves on FIN 48 as discussions around tax-basis reserves continue.

### (III) Approximations

Companies often use approximate methods for calculating tax-basis reserves. Such approximations could be interpreted as comprising part of the company's tax position and may require consideration and quantification under FIN 48. Areas where approximations are most likely to be found include non-core product areas. Of course, companies will want to assess the materiality of any impact from approximations in determining whether additional review under FIN 48 is necessary.

### (IV) Foreign Operations

While FIN 48 is an interpretation that impacts all financial reporting under U.S. GAAP, its applicability is not limited to taxes paid to the U.S. taxing authority. For companies with foreign operations, consideration must be taken of the likelihood of tax-basis reserves being accepted in the country in which the company or companies, subsidiary or subsidiaries, pay taxes. For example, whereas a company may be comfortable that its tax-basis reserves for business written in the United States are highly certain, tax rules in other jurisdictions may not be as prescriptive and may require significant analysis with respect to both the more-likely-than-not recognition threshold as well as application of the measurement rules. In addition, IRC 954 is less prescriptive than IRC 807 which may lead to a wider range of interpretations on how to calculate tax-basis reserves for foreign operations. This could require additional analysis from both recognition and measurement perspectives.

### (V) Quantification

To the extent that tax-basis reserves recorded by the company meet the threshold for recognition under FIN 48, the valuation of the tax-basis reserves becomes an issue under the second step of the two step process outlined in FIN 48. For the majority of tax-basis reserves, the measurement of the tax position represented by the company's reserve calculation method and assumptions will be highly certain and will equal the amount derived from the numbers reported in the company's tax returns. For example, to the extent that the company records a deferred tax asset to recognize the difference between tax-basis



reserves and GAAP reserves, the value may not need to be adjusted as a result of FIN 48, provided that the tax-basis reserves are at least 50 percent probable to be the “right” amount (i.e., the amount that the taxing authorities would deem appropriate under audit). In other situations, however, there may be uncertainty with respect to the tax-basis reserves that would hold up under examination. It may be necessary to apply the measurement methodology and to quantify adjustments to the deferred tax asset and related tax items in such cases.

For example, if the company’s actuaries were to review the applicable tax and statutory guidance and conclude that there are three possible ways of calculating tax-basis reserves, each as likely as the other of reflecting what the tax authorities would find to be the “correct” reserves, then the value of this tax position would be recorded on the GAAP financial statements at the amount represented by the second-most-favorable of the three outcomes (not because it is the mid-point of the range, but because it represents the largest beneficial value that the company can be 50 percent or more certain of realizing based on its assessment of all possible outcomes). The value of this tax position would be reflected in the deferred tax asset, current tax liability and other related items that are associated with the tax-basis reserves, including any penalties and interest that would be assessed were these tax reserves found to be correct. Therefore, the amounts recorded for deferred tax items may be calculated using tax-basis reserves different from those actually filed with the tax authorities.

### Summary

FIN 48 is generating a considerable amount of change in the way in which companies report provisions for taxes on their financial statements. While actuaries may not be directly involved in many of the items that require a change in reporting methodology, they should be aware of its implications and consider how it impacts the reporting and calculation of items associated with the tax-basis reserves filed with the tax authorities. 



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# Thoughts from the Chair

by Henry W. Siegel



The structure of the inaugural column for each chairperson's corner is, by tradition: 1) perfunctory remarks; 2) thank the previous chairperson; 3) laud heaping praise on the other council members; and 4) briefly describe your vision for the direction of the council in the upcoming year. Not wanting to break that tradition any more than my predecessor (from whose inaugural column the above is plagiarized) I will follow that structure. Therefore...

- 1) It is a great honor to be chair of this section council and I look forward to the year that will be half completed by the time you read this.
- 2) I want to thank my predecessor, Darin Zimmerman, not only for the introductory sentence but for all the hard work he did in bringing the section council into the new SOA organization. It was largely in his term that the SOA moved from a board oriented organization to a section oriented organization and Darin led that transformation with great skill and sensitivity.
- 3) We have a great bunch of council members and I am thankful for their cooperation and willingness to volunteer for the important roles in the section. Jerry Enoch is vice chair, Mike Leung is treasurer and Craig Reynolds is secretary. They have already moved into those positions with great energy. The remaining members of the council have taken on additional roles that I will discuss in the next section.

- 4) Briefly, our major goals for the year can be summarized as follows:
  - a. Organize sessions at the SOA Spring and Annual Meetings so that our members can get the best continuing education from them
  - b. Organize a broad range of seminars and webcasts to meet the needs of our members
  - c. Conduct important research to assist in the work currently going on to revamp U.S. GAAP and statutory reporting
  - d. Prepare a write-up of the financial reporting topics that all actuaries should understand by the time they achieve their fellowship

Now, some details on these goals.

The first two goals are related, having to do with continuing education for the section members. Vincent Tsang is our leader for the spring meetings, and by the time you read this he will have almost all of the sessions defined with speakers recruited. He didn't do this by himself, of course, as the other council members have taken responsibility for organizing specific sessions.

Rod Bubke has agreed to be our leader for the Annual Meeting. **If there are topics you would like to see on the agenda, you should definitely let him know ASAP.**

Seminars and webcasts for the year will be discussed at our face to face meeting in late March. I'm sure we'll have the beginning and advanced GAAP seminars again this year as well as a GAAP seminar in Hong Kong (last year's had 110 attendees and 60 more who signed up too late!) **If there are topics you want to suggest, or that you want to volunteer to speak at, get in touch with anyone on the council right away.**

Rod has also agreed to be our czar on education and he's working on putting together a curriculum on financial reporting. This is a very important endeavor, one that probably will take a couple of years to complete. When complete, it will give us a basis on which to evaluate exam syllabuses to deter-

mine if their content meets the needs of our members. We will be sharing this with you when drafts are available.

Sue Deakins has agreed to be our head of research. Of all the things the section will do this year, research is likely to be the most far-reaching. We have already four projects underway and we're always looking for more. One of these projects, on the proposals from the International Accounting Standards Board for a new international standard, is of such importance that I want to comment a bit on it here.

The IASB and FASB will almost certainly both publish a discussion paper on accounting for insurance liabilities this spring. They will then begin a joint project on insurance liabilities that would, if implemented, completely change GAAP reporting in the United States. The goal of our project is to examine the effects of the initial proposals contained in the discussion paper on real U.S. products actually being sold. The work on the discussion paper has entirely been done by the IASB, albeit with United States input, and it's quite possible that the proposals will have very negative impacts on U.S. products.

We have chosen a researcher (name unknown at this writing) to coordinate the research and write up the results. We are counting on our members to contribute models illustrating the results of the new proposals on their products. Every company does not need to do all its products. If every company does two or three of its products, we will get a very good cross-section of the U.S. industry. We also want to accumulate the questions that turn up in order to know what guidance is necessary in order to implement the proposals.

This will be a big project; if you haven't volunteered to help already, now is the time!

This is a big agenda. More things will be coming up. If you want to be part of it, volunteer your ideas and suggestions. You can become a "Friend of the Section" and get direct information on all the section is doing (e-mail Jeremy Webber at [jwebber@soa.org](mailto:jwebber@soa.org) if you want to become a "Friend"). Or you can think

about running for the section council this summer (it's not too early to start thinking about it).

I hope everyone had a good holiday, a profitable financial closing and is looking forward to a challenge-filled year. 



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# Risk Transfer Dilemma in Triple-X Funding

by Shanker Merchant



## I. Introduction

Insurance companies in the term life or universal life business may employ a *long-term* and *non-recourse* funding for statutory reserves to achieve operating leverage treatment of the funding by the rating agencies. S&P treats a non-recourse funding as operating leverage if, among other things, the duration of the funding is at least up to the reserve peak year for term life policies as well as universal life policies with secondary guarantees. The domiciliary regulator of a company allows the company to take reserve credit for the funding if the reinsurance treaty underlying the funding transaction complies with the risk transfer rules for the business. Companies are using a variety of funding devices with varying provisions in the reinsurance treaty to meet the rating agency requirements and satisfy their regulators. The funding devices can be classified into two groups, securitization and non-securitization, as described below:

### (A) Securitization

A securitization transaction provides a company with a *full-term* and *non-recourse* funding through a special purpose reinsurance vehicle as captive or non-captive of the company, and enables the company to achieve both the operating leverage treatment of the funding for rating agency purposes and reserve credit for regulatory purposes, because securitization satisfies the operating leverage requirements and complies with risk transfer rules.

### (B) Non-Securitization

A non-securitization transaction provides a *partial term* and *non-recourse* funding to the company but with *recourse* to its parent, through a captive or third-party reinsurance vehicle, and the company may achieve: (a) the operating leverage treatment of the funding if the duration of the partial term is long enough, among other things, to satisfy the rating agency requirements; and (b) the reserve credit for regulatory purposes, but the validity of the reserve credit is questionable due to a lack of strict adherence to risk transfer rules, as discussed herein.

Since 2003, four companies have concluded securitization transactions totaling approximately \$6.6 billion, but more companies have concluded non-securitization than securitization transactions, in spite of the benefits of securitization and the questionable validity of the reserve credit in non-securitization, as summarized in Exhibit I. Which approach is then better to manage the funding of statutory reserves? That is a *dilemma*.

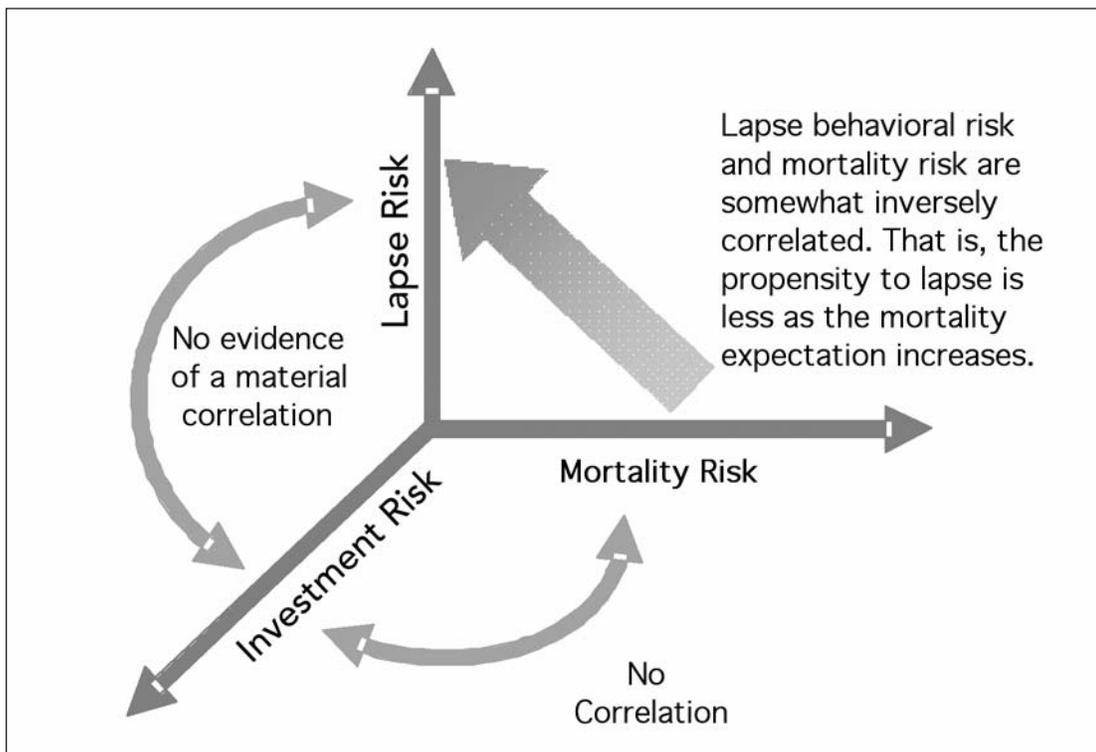
The compliance of a securitization or non-securitization transaction with risk transfer rules is enforced by a tacit approval of the company's regulator, but not also by the reinsurer's regulator in assuming the transferred risks, causing an *asymmetry* in approval of the transaction. While risk transfer rules are unambiguously clear, its enforcement is not. As a result, a transaction approved by one state regulator may be disapproved by another state regulator. The asymmetry in approval of transactions, and non-uniformity in the enforcement of the risk transfer rules create dislocation of capital among companies in the industry. That is a major dilemma.

This article outlines the risk transfer rules for term life policies and universal life policies with secondary guarantees, describes the framework of securitization and non-securitization, outlines certain structural features of non-securitization, and discusses the risk transfer dilemma in non-securitization from recourse, funding and regulatory perspectives. Also, the article urges reinsurers' regulators to have an active role in ensuring compliance of non-securitization with risk transfer rules to mitigate dislocation of capital among companies in the industry.

## Exhibit I

Perspective	Securitization Funding	Non-Securitization Funding
<b>Source</b>	Capital markets	Bank or its affiliate
<b>Duration</b>	Full-term of the business	Partial-term of the business, up to 20 years
<b>Recourse</b>	None	Not to the company, but to its parent
<b>Execution</b>	Private placement offering	Bi-lateral agreement
<b>Re-financing</b>	None	Future pricing and availability risks
<b>Funding Cost</b>	Lower	Higher
<b>Recapture</b>	At the option of the company	At the option of provider of the funding
<b>Risk Transfer</b>	Complies with the rules	Fails to comply with the rules
<b>Reserve Credit</b>	Valid	Validity is questionable
<b>Leverage</b>	Operating leverage	May not qualify for operating leverage
<b>Rating</b>	Triple-A rated obligation	Non-rated obligation

## Exhibit II-A: Correlation Among Risk Components of Term Life Business



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## II. Risk Transfer Rules

In financial markets except the insurance market, risks underlying an asset are transferred through “sale,” and the validity of the transfer is established by a “true sale” legal opinion. In the insurance market, risks underlying an insurance policy are transferred through “reinsurance,” and the validity of the reinsurance is established by a tacit approval of the company’s regulator, not by a legal opinion. The approval is based on the regulator’s perspective on the risk transfer rules, and facts and circumstances surrounding the company. The risk transfer rules for term life policies and universal life policies with secondary guarantees, as set forth by the NAIC, are provided below.

### (A) Term Life Policy

A level premium term life policy can be viewed as an option contract wherein the company grants the policy-beneficiary the right to receive the policy-benefit in the event of death of the insured under the policy, in exchange for payment of a level policy-premium. Therefore, the company is exposed to three risks - mortality, lapse and investment, none of which is controllable by the company and the risks are by and

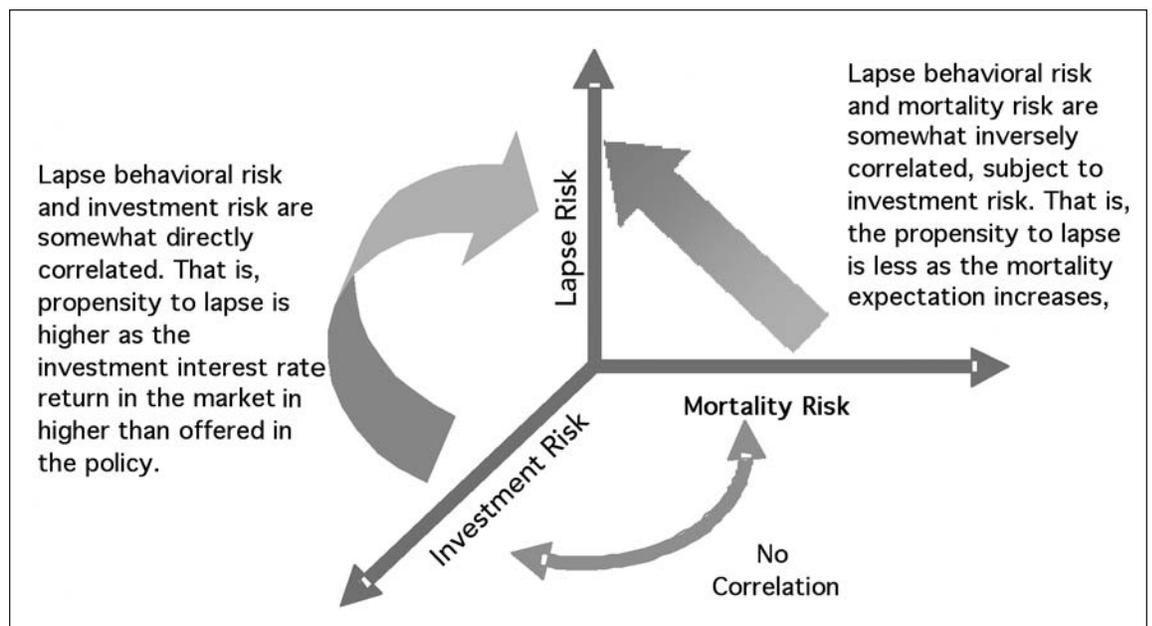
large uncorrelated (see Exhibit II-A on page 9). Therefore, if a company does not want to retain exposure to these risks, it must transfer them to a reinsurer.

The NAIC has established that the investment risk does not constitute a significant risk for term life insurance. Accordingly, the risk transfer rule for the term life policy business is that the company must transfer mortality and lapse risks to a reinsurer to eliminate its exposure to the business.

### (B) Universal Life Policy with Secondary Guarantee

A universal life policy with secondary guarantee can be viewed as an option contract wherein the company grants (a) the policy-beneficiary the right to receive the policy-benefit in the event of death of the insured under the policy and (b) the policy-owner the right to cash-out the policy at its net account value, in exchange for payment of policy-premium without any restriction on the amount and timing of such payment, provided, however, that a minimum premium is paid to keep the policy effective.

## Exhibit II-B: Correlation among Risk Components of Universal Life Business with Secondary Guarantee



Therefore, a company writing a universal life policy with secondary guarantee is also exposed to three risks—mortality, lapse and investment. The investment risk arises from (a) the guaranteed crediting rate for the policy, and (b) premium payment pattern of the policy-owner. Therefore, unlike the term life policy, lapse is directly correlated to investment interest rate; but somewhat inversely correlated to mortality, subject to investment risk (see Exhibit II-B on page 10]. As a result, if a company does not want to retain exposure to risks underlying the policy, it must transfer them to a reinsurer.

The NAIC has established that the three risk factors constitute significant risks for universal life policies. Accordingly, the risk transfer rule for the universal life business is that the company must transfer each of these three risks to a reinsurer to eliminate its exposure to the business.

In order for a company to receive regulatory reserve credit for its policy liabilities, a reinsurance treaty must comply with the risk transfer rules and other relevant considerations to ensure the validity of the treaty.

### III. Framework of Securitization

Securitization provides *full reserve relief* to a company *without recourse*. In other words, securitization is a *reserve relief with risk relief* funding transaction for the company. The framework of the basic structure and key features of securitization are described below.

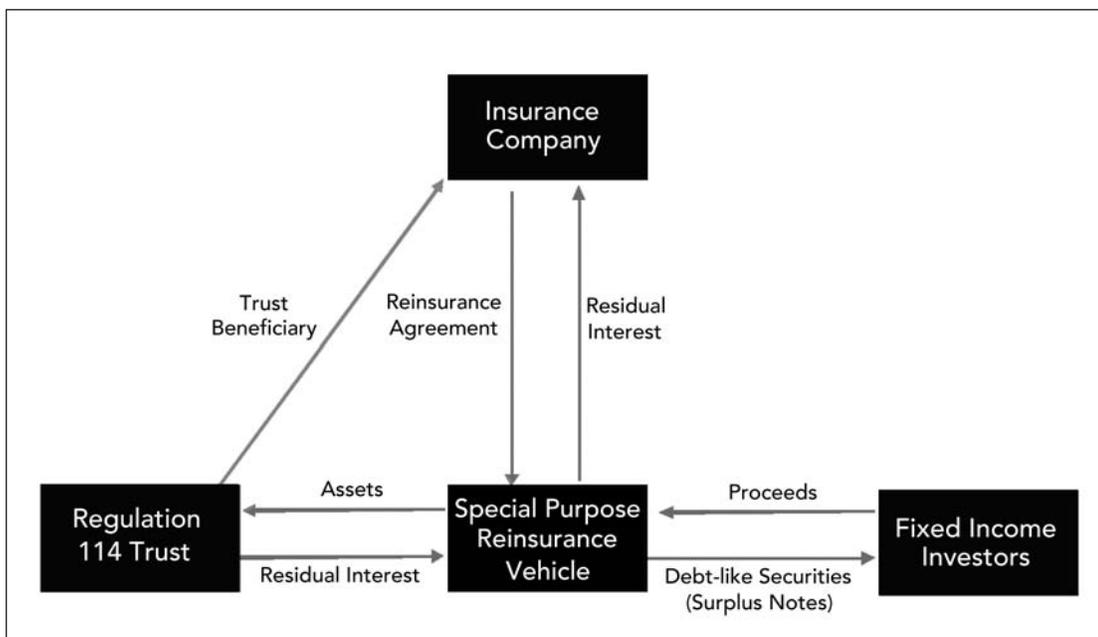
#### (A) Basic Structure

There are two structures for securitization: direct funding and indirect funding. The main difference between the two structures lies in their relative tax robustness, and not in the risk transfer aspects of the structure. The key aspects of the direct funding structure are described below for the purposes of comparing the framework of securitization with that of non-securitization.

- **Reinsurance Treaty:** Company transfers the business as coinsurance to its special purpose captive reinsurance vehicle (SPRV) in a convenient domestic jurisdiction, say, South Carolina, pursuant to a reinsurance treaty which complies strictly with the risk transfer rules for the reinsured business.

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## Exhibit III: Basic Structure of Securitization Funding



- **Initial Consideration:** Company pays an initial consideration, including economic reserve and fees and expenses, to SPRV in an aggregate amount necessary to transfer its liabilities to SPRV, pursuant to the terms of the reinsurance treaty.
- **Reserve Funding:** SPRV funds a Regulation 114 trust for statutory reserves from two sources: (i) net reinsurance premium for economic reserves, and (ii) capital markets through the issuance of surplus notes for excess reserves.
- **Non-Recourse Funding:** The funding is non-recourse to the company, and represents an unsecured subordinated obligation of SPRV.
- **Rating:** The funding is rated triple-A by the rating agencies based on the strength of a financial guarantee company guaranteeing the timely payment of interest on and ultimate payment of principal of the funding.

### (B) Funding Feature

The following outlines the structural features which are incorporated into the funding component of a securitization transaction.

- **Full Term Funding:** The term of the funding is for the full expected life of the business, which is in the range of 30 years for term life and 50 years for universal life business. The funding is in the form of term notes, medium-term notes, short-term notes or a combination thereof.

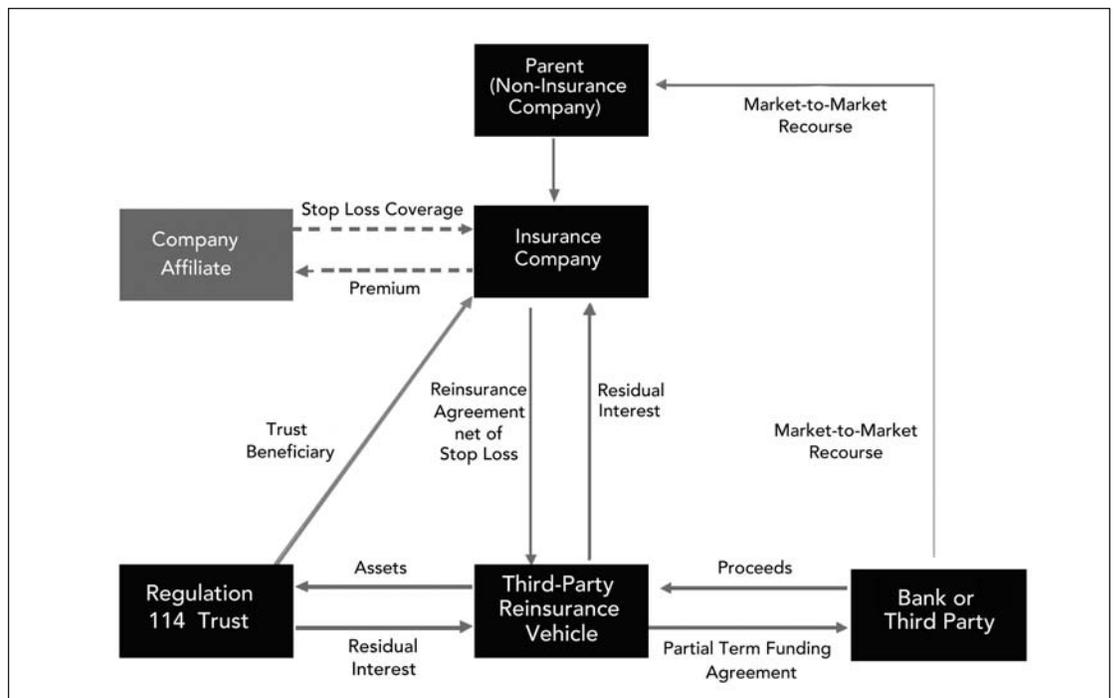
### IV. Framework of Non-Securitization

Non-securitization provides *full reserve relief* to a company with recourse its parent. In other words, non-securitization is a reserve relief with no risk relief funding transaction for the company enterprise, inclusive of the parent. The framework of the basic structure and key features of non-securitization are described below.

#### (A) Basic Structure

There are many forms of non-securitization. But the form that closely resembles securitization is described on the next page.

Exhibit IV: Basic Structure of Non-Securitization Funding



- *Reinsurance Treaty:* Company transfers the business as coinsurance to a third-party reinsurance vehicle (TPRV) in a convenient offshore jurisdiction, pursuant to a reinsurance treaty. Some of the features of the treaty are outlined below.
- *Initial Consideration:* Company pays an initial consideration, including economic reserve and fees and expenses, to TPRV in an aggregate amount necessary to transfer its liabilities to TPRV, pursuant to the terms of the reinsurance treaty.
- *Reserve Funding:* TPRV funds a Regulation 114 trust for statutory reserves from two sources: (i) net reinsurance premium for economic reserves, and (ii) a bank for excess reserves. The bank provides TPRV with either assets or letters of credit to post in the trust.
- *Recourse Funding:* Parent of the company enters into a recourse arrangement with the bank whereby the parent agrees to either (a) collateralize the bank's exposure in the transaction on a formulaic mark-to-market basis or (b) reimburse the bank for payment of losses as and when incurred in the transaction.

## (B) Reinsurance Feature

The following outlines two structural features which may be employed in the reinsurance component of a non-securitization transaction.

- *Stop Loss Coverage:* The company enters into a stop loss coverage with its offshore affiliate for an aggregate amount of claims arising from a defined mortality risk band (that would otherwise be borne by TPRV), in exchange for payment of a fixed percentage of the gross policy premium by the company. The primary motivation for the company to utilize the stop loss coverage is to retain the corresponding premium within the company enterprise, without subjecting the affiliate to reserving requirements due to non-proportional nature of the coverage.
- *Retained Loss Coverage:* The company transfers the mortality risk to TPRV up to a fixed amount per life under the reinsurance component and the risk in excess of the fixed amount to third-parties under a YRT coverage. With respect to policies subject to such bifurcated risk transfers, the company pays a fixed premium to TPRV, and manages the YRT coverage and the premium variability risks on its books. The motivation of the company for such risk management includes potential profit opportunity from the YRT coverage and funding benefit from stabilization of the premium cash flows to TPRV.

## (C) Funding Feature

The following outlines the structural features which are incorporated into the funding component of a non-securitization transaction.

- *Partial Term Funding:* The term of the funding has been up to 20 years, which is about 2/3 of the maximum duration of term life business and less than one-half of universal life business. The motivation for a company to enter into a partial term funding lies primarily in compliance with operating leverage requirements of the funding by the rating agencies, without incurring extra costs of a full-term funding.
- *Involuntary Recapture:* The transaction is designed to force the company to take back (recapture) the business at the end of the funding term by increasing the interest rate to a prohibitive level and restricting distribution to the company of profit from the business, among other things. The motivation for the company to agree to an involuntary recapture is the unavailability of a longer than 20-year term funding currently from the bank market. More importantly, the motivation for a bank to force recapture is to avoid increased uncertainty to mortality risk exposure in later years of the business.
- *Recourse Funding:* As mentioned above, the parent of the company provides recourse to the bank for losses due to adverse performance of

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the business. The motivation for the company to have its parent provide the recourse is to avoid a comprehensive actuarial analysis of the business or rating on the funding required otherwise for a non-recourse transaction, which makes non-securitization a “credit trade” rather than an “asset trade.”

- *Asset Alternative:* The company requires funding by posting either assets or letters of credit in a Regulation 114 trust. The motivation for the company to select assets or letters of credit depends on the accounting objective of the transaction.
- *Rating:* The funding is not rated by any of the rating agencies, nor is it required because of the reliance on recourse to the parent of the company for the repayment on any loss on the funding, in general.

## V. Recourse Funding Dilemma

A non-securitization transaction has an implicit recourse to the company, which makes the compliance of the reinsurance treaty with risk transfer rules questionable, as discussed below.

### (A) Involuntary Recapture

The company is forced to recapture the business due to onset of prohibitively uneconomic provisions at maturity of the funding—a form of recourse to the company. This implies that the company did not transfer the risks to TPRV, because the business did not leave the company permanently. Instead, the company simply parked the risks with TPRV until the maturity of the funding. Therefore, non-securitization does not justify risk transfer, and that is a *dilemma* (which can be cured by the removal of the uneconomic provisions in the funding).

### (B) Stop Loss Coverage

TPRV reimburses the company for mortality claims net of claims payable under the stop loss coverage by the company’s affiliate. In the event that the affiliate fails to pay the claims, the company pays for such claims as if the stop loss coverage did not exist—a form of recourse to the company. Therefore, a non-securitization transaction does not transfer the risk from the company to TPRV, hence the transaction lacks compliance with risk transfer rules. Others may

differ from this conclusion notwithstanding that the rules are very clear, and that is a *dilemma* (which can be cured if the affiliate provides the coverage directly to TPRV under market terms, and TPRV, not the company, be exposed to non-payment risk of the affiliate).

### (C) Retained Loss Coverage

The company pays a fixed premium to TPRV on policies subject to bifurcated mortality risk coverage, whereas the actual premium (net of YRT premium) payable by the company to TPRV may be higher or lower than the fixed premium—a form of recourse to the company. Furthermore, the company has the option to cancel the YRT coverage altogether. Therefore, the company does not transfer the mortality and premium volatility risks to TPRV, not in compliance with risk transfer rules, and that is a *dilemma* (which can be cured by retroceding the YRT coverage to TPRV, and charging the actual premium for the coverage to TPRV).

## VI. Reserve Funding Dilemma

Companies in the life insurance industry believe that statutory reserves in excess economic reserves are by and large risk-free liabilities, and therefore cause undue capital burden for the business. Furthermore, they believe the principles based reserving regulations when adopted by states would be significantly less burdensome than the current formulaic reserving regulations. As a result, some companies are using non-securitization as a stop-gap measure for the funding of reserves rather than securitization as a permanent measure. Which funding strategy is then the right one for a company to adopt at this juncture? The views differ widely in the industry, and that is a *dilemma*.

Non-securitization has a built-in recourse to the company and a direct recourse to its affiliate. In contrast, securitization does not have either. In spite of the recourse burden, which could be detrimental to both the company and its affiliate, companies have selected non-securitization for funding reserves, and that is also a *dilemma*.

## VII. Reserve Credit Dilemma

A company is entitled to take a reserve credit in the amount of assets funded (or letters of credit posted) in a Regulation 114 trust by TPRV, if the reinsurance component of a funding complies with risk

transfer rules. Otherwise the funding is construed as a “deposit” with the company by TPRV, which would disqualify the reserve credit taken by the company. Since the reinsurance component of a non-securitization transaction may lack compliance with risk transfer rules, the validity of the reserve credit is then questionable, and that is a *dilemma*.

### VIII. Regulatory Approval Dilemma

The domiciliary regulator of a company either approves or does not disapprove the company to enter into a non-securitization transaction and take the reserve credit. The approval or non-disapproval of the reserve credit is based solely on the regulator’s analysis of the compliance of the reinsurance component of the funding with the risk transfer rules, notwithstanding the fact the regulator reserves the right to approve the reserve credit to the company based on facts and circumstances surrounding the company even if treaty does not adhere strictly to the risk transfer rules.

On the other hand, the domiciliary regulator of TPRV (reinsurer) neither examines nor approves or disapproves the validity of the assumption of the transferred risks and the reserve liability incurred by the reinsurer. In other words, the requirement for compliance with risk transfer rules is asymmetric between the company and the reinsurer, not a mirror image, and that is a *dilemma*. Issues relating to the existing regulatory approval process are outlined below.

#### (a) Disparity in Approval

A transaction that satisfies the regulator in one state in respect of the risk transfer rules may be rejected by the regulator in another state, because of the regulator’s perspective on the application of the risk transfer rules, and the facts and circumstances surrounding the company’s solvency capital, among other things. The risk transfer rules are unambiguously clear, but its uniform enforcement by regulators to ascertain strict compliance is not clear, and that is another *dilemma*.

#### (b) Disparity in Capital Allocation

A disparity in the enforcement of the risk transfer rules by regulators creates a potential dislocation of capital among companies in the industry. In other words, a company in one state may benefit from access to capital, while

its competition in another state may be denied access to capital based on the same transaction and the application of the same risk transfer rules, and that is a major *dilemma*.

The disparity would be mitigated and uniformity in risk transfer compliance would be enhanced if the regulator of the reinsurer also participated actively in the approval of the transaction to ensure that risks are in fact transferred to and assumed by the reinsurer in accordance with the risk transfer rules. If such an approval process is instituted, non-securitization transactions would fail to comply with the risk transfer rules.

### IX. Conclusion

Non-securitization may not strictly adhere to the risk transfer rules. As a result, the validity of its risk and reserve relief benefits becomes questionable. Furthermore, non-securitization is a potential source of capital dislocation in the industry. The author believes that active participation of the reinsurer’s regulator in the approval of the reinsurance treaty in respect of risk transfer would mitigate the capital dislocation. Based on its experience, the author believes that the regulator of the captive SPRV in South Carolina does enforce uniformly the compliance of securitization with risk transfer rules. The author therefore urges all regulators to require reinsurers to seek their approvals for the validity of risk assumption and providing reserve credit in non-securitization transactions. 

In other words, the requirement for compliance with risk transfer rules is asymmetric between the company and the reinsurer...not a minor image ...



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# Insurance Bifurcation Invitation to Comment

*by Leonard Reback and Darin Zimmerman*



The Financial Accounting Standards Board (FASB) issued an “Invitation to Comment” or ITC last spring titled “Bifurcation of Insurance and Reinsurance Contracts for Financial Reporting”. An ITC is a preliminary step toward promulgating new accounting guidance, representing some initial ideas on a topic. The proposed guidance contained in this ITC was meant primarily to address concerns about risk transfer in reinsurance contracts, but would have impacted many direct insurance contracts as well. However, in response to the concerns of many constituents, including several American Academy of Actuaries committees, FASB decided in December to drop this specific project. FASB will now pursue other means of addressing its risk transfer concerns.

The proposed accounting guidance contained in this ITC would have dramatically changed the accounting treatment for many insurance and reinsurance contracts. The proposed standard would not only have affected insurance and reinsurance enterprises, but also any corporate policyholders that file financial statements with the SEC. For instance, any corporation that provides group insurance to employees would have been required to value the policy using this new standard. The American Academy of Actuaries’ Life Financial Reporting Committee (LFRC) responded to the FASB as did the Health and Property and Casualty counterparts within the

Academy. The Academy’s comments were similar to the comments from several industry groups including the American Council of Life Insurers (ACLI), The Group of North American Insurance Enterprises (GNAIE), the European CFO Forum as well as several insurance companies, and group insurance policyholders, such as Microsoft. All of them urged the FASB to abandon the project.

The accounting framework for insurance products to date has been that a contract either is or is not insurance in its entirety. If a contract contains significant insurance risk it is accounted for as an insurance or reinsurance contract. If it contains no or insignificant insurance risk it is accounted for as an investment contract.

Under the views expressed in the ITC, the treatment for many contracts that contain insurance risk would have changed. Unless the contract met certain scope exceptions, the contract would have had to be “bifurcated” into an insurance component and an investment component. The insurance component would have been accounted for similar to current insurance accounting. The non-insurance component would have been accounted for under deposit accounting.

The ITC suggested three possible methods by which to achieve bifurcation—the cash flow yield method, the proportional method and the expected payout method. All these methods would have been complex and ambiguous to implement, and the ITC even recognized that some of the proposed methods may not have been feasible.

The ITC attempted to address several issues. One issue was the perceived abuses that have occurred with a certain type of reinsurance arrangement that is sometimes referred to as a finite risk agreement. Under finite risk agreements the insurance risk is often limited or even nonexistent, but in some cases such agreements have been accounted for using insurance accounting. In some such instances there

The experience with this bifurcation project indicates the importance to the actuarial profession of staying abreast of developments within FASB and responding appropriately to our concerns.

have been questions as to whether insurance accounting was appropriate in view of the magnitude of the risk limitations.

Another issue the ITC addressed was “dollar trading”. That is a situation where a group insurance policyholder pays a premium for insurance, but it is anticipated that some portion of that premium will be recovered through “expected claims”. In that case there is an argument that the portion of premium that will be recovered through expected claims would be considered a deposit, while any excess premium would be considered insurance.

FASB received 63 responses to the ITC. Virtually all of the responses indicated that their authors believed that the ITC was unnecessary, would be extremely cumbersome and costly to implement, and contained many ambiguities in interpretation. Some also noted that the recent, high profile abuses in reinsurance accounting were due to misapplication of current accounting guidance and were not due to any flaws in existing guidance.

FASB listened to the industry’s concerns. In December 2006, FASB decided to abandon the bifurcation project. They will however be pursuing other means to address concerns over risk transfer in insurance and reinsurance contracts. Future efforts will be devoted to enhancing insurance and reinsurance disclosures to highlight any risk-limiting features in those contracts. In addition, FASB will work to develop more robust language around the current guidance in FASB Statement No. 113, *Accounting and Reporting for Reinsurance of Short-Duration and Long-Duration Contracts*, to increase the level of risk transfer required for a contract to be reported as insurance. Also, FASB will work on modifying the risk transfer guidance of Statement No. 113 to apply to direct insurance contracts as well.

The experience with this bifurcation project indicates the importance to the actuarial profession of staying abreast of developments within FASB and

responding appropriately to our concerns. FASB may not always decide to do what we would like. But this experience indicates that FASB is willing to listen to the actuarial profession’s legitimate concerns, and willing to alter its course accordingly if convinced such a course can adequately address its issues. §



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# Embedded Value Webcast Polling Results

The Financial Reporting section sponsored an Embedded Value Webcast on Sept. 27, 2006, presented by Chad Noehren, Charles Carroll and Noel Harewood. The webcast had 91 registrants and was attended by at least 600 people. The following are the polling results the reader may be interested in. 

## Does your company currently calculate Embedded Value?

Choice	Number of Votes	% total Votes Cast
Yes, for external disclosure and internal use	17	35%
Yes, for internal use only	15	31%
No, but considering	11	22%
No, but wanted to learn more about it	5	10%

## When dealing with options and guarantees in your company's products (pricing and/or valuation), which of the following best describes the methodology employed?

Choice	Number of Votes	% total Votes Cast
Stochastic analysis using real-world scenarios	26	41%
Stochastic analysis using risk-neutral scenarios	14	22%
Deterministic analysis (sensitivity testing)	11	17%
My company's products do not contain material options or guarantees	12	19%

## If your company calculates Embedded Value, which of the following is the most accurate statement about the methodology employed?

Choice	Number of Votes	% total Votes Cast
It is not in conformity with EEV principles	15	29%
It is compliant with EEV principles but it is not on a market consistent basis	26	50%
It is market consistent	7	13%
Don't know	3	5%

## How many individuals viewed the webcast at your location?

Choice	Number of Votes	% of total Votes Cast
1	6	7%
2-3	12	15%
4-5	13	16%
6-8	11	13%
9-10	9	11%
11-15	14	17%
16+	15	18%

# FROSTies and FRUMPIes

by Rick Browne

The *Financial Reporter* is pleased to announce the FROSTies and FRUMPIes for 2006. These coveted awards are given annually to recognize Financial Reporter Outstanding Treatises (FROSTies) and Financial Reporter Uniquely Memorable Papers (FRUMPIes) which were published during the year. There were many excellent papers written this year and the competition was fierce. But, after long and careful deliberation, the judges have declared the winners.

## FROSTies

Five FROSTies were awarded to outstanding treatises in four categories this year.

Our first award, the “Substantially Unchanged” award, is shared by **John W. Morris**, “AICPA Releases SOP 05-1” (March 2006) and **Andy Ferris** and **Patricia Matson**, “Implementation Issues Arising from SOP 05-1” (September 2006). These articles covered the new regulation that is forcing companies to make some substantial changes to their processing systems to implement new accounting rule changes that many of us wish had been substantially unchanged.

The “Standard Scenario” award goes to **Patricia E. Matson** and **Don P. Wilson**, for their article “RBC C3 Phase II: Easier Said Than Done” (March 2006). Their follow-up article “RBC Phase II: How Did Companies Fare at December 31, 2005” (September 2006) was runner-up in this category.

The 2006 “Z-Factor” award goes to **Stephen J. Strommen** for his ground-breaking article in the June issue, “Setting the Level of Margins in a Principles-Based Valuation Using a Cost-of-Capital Approach with Exponential Utility.” It looks like Z may join k-, X- and r- in the list of most renowned actuarial factors.

Finally, **Ken LaSorella** wins the “Intangible Asset” award for making the complexities of business combinations tangibly understandable in “FASB Releases Exposure Draft on Business Combinations” in the June issue.

Congratulations to all the FROSTie winners!

## FRUMPIes

We have an incredible 10 uniquely memorable FRUMPIe recipients for 2006.

The “Longevity” award for 2006 goes to **Don P. Wilson** and **Patricia E. Matson** for their survey article, “RBC C3 Phase II: How Did Companies Fare at December 31, 2005?” in the September issue. This article contained an amazing 4,442 words, and puts Wilson and Matson just behind the all-time Longevity Leader, “Iron-Man” Ted Schlude, whose September 2003 record of 4,464 words still stands.

The “Also Ran” award goes to Longevity award contenders **Arnold Dicke** and **David White**, who also made a great showing with 4,396 words. The article is “The Principles-Based Approach to Statutory Reserves and Risk-Based Capital” (December 2006), which now holds third place in the all-time Longevity rankings.

The “Brevity” award for the shortest feature article goes to **Don Solow** (December 2006) for “Principles-Based Reserving: The View from the Margin” with 787 words. Enough said.

“The Fair Value of Insurance Liabilities: The Information Set Perspective” earned the “Fresh View” award for **Mike Davlin**. This article in the March issue cast own credit rating issue in a new light and gave us a new perspective.

**Ted Schlude** is the recipient of the “Alphabet Soup” FRUMPIe in 2006, award for his March 2006 article “Highlights of the December 2005 NAIC Life and Health Actuarial Task Force Meeting and Other NAIC Topics.” The judges were certain that this article contained more acronyms than any other article in recent history, though no one was willing to actually count them.

**Alfonso P. Gonzales III** wins the “Chicken Scratches” award this year for having the most equations and formulas in a single article, “Simplifying



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Actuarial Foundations: Life Insurance Financial Reporting Based on Free Cash Flows.”

For his insights into the pitfalls as well as the more appropriate uses for spreadsheets as actuarial tools, **Robert B. Crompton** received the “#VALUE!” award for the article “Spreadsheets—Yea or Nay?” in the June issue.

The “Not Another SOX 404 Article?” award goes to **Arnold Dicke** and **Shane Elenbaas** for their SOXy view on spreadsheets and other end user applications in “End User Applications in Actuarial Processes: Risks and Controls” in the June issue.

**Leonard Reback** set a record for most references to a FASB Standard in a single article by recognizing by name no less than 11: SFAS 13, SFAS 60, SFAS 87, SFAS 97, SFAS 106, SFAS 107, SFAS 115, SFAS 133, SFAS 140, SFAS 155 and SFAS 157. For this achievement his article “Fair Value Accounting Update” won the “FASB Pronouncement” award.

The “Better Late than Never” award goes to **Dennis Lauzon** for his December article “The Problems with Own Credit Rating,” which focused on apparent problems with SFAS 157. Unfortunately, FASB had already adopted the Standard.

Finally, a special new award was introduced this year, the “Moe, Larry, and Curly” award. This goes to **Don Solow** for his March article “On the Fair Value of Insurance Liabilities: The Continuing Debate.” The judges found it remarkable that anyone could get a reference to the Three Stooges into an actuarial treatise and felt this feat needed to be honored.

Congratulations to our FRUMPie winners!

\* \* \* \* \*

The Life Insurance Company Financial Reporting Section Council would like to thank everyone who contributed articles to *The Financial Reporter* in 2006. §

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## 2007 SOA Life Spring Meeting

**May 10-11**

JW Marriott Desert Ridge  
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Join us for a uniquely designed meeting that will offer one-of-a-kind educational programs aimed at energizing life industry professionals and helping them grow their positions and their companies via networking and important, specialized learning opportunities.

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<http://lifespringmeeting.soa.org>

# Principles-Based Reserves in a Smaller Insurance Company

by Norm Hill and James Thompson

## Introduction

Principles-Based Reserves (PBR) will change financial regulation radically, and we should all pay attention to the ways it will affect operations of insurers, both large and small.

Much of this article was composed before the NAIC's December 2006 meeting. During this time interval, we had spoken at the Annual Meeting of the Society of Actuaries and had followed subsequent telephone calls of LHATF. We have never seen components of a radically new proposal, such as a standard valuation law, accompanying model regulation and guidelines for PBR, generated so quickly. A related aspect of this rapidity was NAIC adoption of the ACLI's interim solution for certain types of term reserves.

Frankly, it has been a challenge to follow all the proposed changes. At one point, we had prepared a talk based on a particular draft, only to find that it had changed substantially right before the talk.

## Reserve Effect and Scope

The major impetus behind both the interim proposal and PBR was the desire to eliminate what many in the industry believe to be redundant statutory reserves. These reserves are primarily found with competitive term life with preferred mortality and its very large deficiency reserves, with secondary guarantees of universal life with long-term minimum guaranteed premiums, and variable life and annuities with various types of minimum guarantees. The belief of many actuaries is that reserve reduction can be achieved without impairing solvency. In other words, the argument is that reserves on an economic basis are substantially below current statutory reserve levels.

With certain proposed exemptions, PBR would affect all new issues of all lines. Little testing and analysis have been done for traditional whole life, annuities, and health insurance, including long-term care. There has been no clamor to lower reserves on



these lines. In fact, for long-term care, regulators have occasionally voiced concern that reserves are too low. The impact here of PBR implementation here is not certain.

## Cost

When the Smaller Insurance Company Section analyzes anything, we look for aspects which uniquely affect smaller insurers. "Smaller," of course, is a relative term, which, especially for PBR, may extend to many medium sized companies. One way to view "small" is a company with no actuarial staff, or one that only handles basic activities of current reserving. If PBR is adopted as currently proposed, many small and medium sized companies may find their staffs are too small to cope.

So far, Academy committees have not considered cost questions. Some smaller companies have estimated that additional compliance costs for them will be enormous. For example, company experience would have to be filed. If prepared in accordance with general SOA requirements for formatting, this would be a key additional step. Due to credibility requirements for a company to use its own experience, internal data may have to be weighted with industry tables.

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Actuaries who perform asset adequacy analysis know that the cost is not necessarily related to the size of reserves. For example, a company selling large volumes of one type of SPDA may produce much larger reserves than a company that has sold many generations of whole life. Even so, the modeling for the former may be simpler. Therefore, small companies with, say, \$20 million assets, may incur PBR costs that are as high as companies with \$100 or even \$500 million assets

### Recent Developments

The Life Reserve Working Group (LRWG) of the Academy recently produced a revised Model Regulation to implement a revised Standard Valuation Law allowing PBR. This contained several significant changes which were summarized separately. They devoted time to consider some small company concerns.

In Section 3, Scope, significant changes were made. Specific blanket exemptions from PBR would apply to credit insurance, industrial life, final expense and pre-need life. Other products are specifically included. If it wishes, a company may make an irrevocable decision to include these exempted products.

The revised draft states that the NAIC may want to consider the idea of allowing a company to provide a demonstration for its commissioner that risks associated with specified subsets of policies or product categories are adequately handled by current formulaic reserves.

These types of exemptions are very significant. Many smaller companies have specialized in the above types of products and would thus be spared PBR implementation. However, it should be emphasized that many other small insurers sell non-exempted products.

The revised model regulation liberalizes the approaches for exemptions from stochastic processing. In Section 7, a company no longer would necessarily have to apply stochastic processing to reserves to justify exemption from the process. In other words, non-stochastic approaches would suffice in requests for exemption. However, it should be noted that the clear implication is that the stochastic approach is the standard or ideal one for all products.

### Small Company Implementation under PBR

Very frequently, if not always, small companies will not possess credible experience. Greater coordination of assumptions with reinsurers may help. Small companies will be more dependent on updated industry experience studies than larger ones. Any delays in preparation of such studies could impact their ability to use PBR assumptions that would be comparable to larger competitors.

As mentioned above, small companies would have to report experience to some type of statistical agent. This experience would be very broad, extending to interest, mortality, lapse, commissions and expenses.

Section 6 of the model regulation deals with an annual actuarial report under PBR. The extent of required details on assumptions and methodologies is at least comparable to the details of current asset adequacy memorandum.

This report must be provided to an independent reviewer. He must provide an opinion as to whether documentation, disclosures and methodology of the company comply with PBR. This means that the company actuary must work closely with the reviewer. For smaller companies, where the valuation actuary is often bogged down with other projects, this intense interaction with another actuary might often be quite burdensome.



## Other Points about the Model Regulation

It is significant to point out what the revised model does not include.

1. No opt in—some actuaries have proposed that, at time of PBR initial implementation, the company provide an irrevocable election of what products will be reserved on either a formulaic, PBR stochastic or PBR deterministic with numerous sensitivity scenarios.
2. Federal income tax qualification of PBR reserves—discussions with the Treasury will not even begin until 2007. The cash value floor for PBR reserves does not cover term, health and single premium annuity reserves. The traditional requirement for tax qualified reserves has been use of a standard mortality table. Excluding likely elimination of deficiency reserves, the aggregate difference between formulaic and PBR reserves may not be drastic. The Treasury may catch on to the fact that lower PBR reserves would result in additional tax liabilities. Of course, there is always the risk that they could mandate a PBR-type approach for all issue years, not just new business contemplated under PBR. In any event, the viability of PBR without Treasury approval is highly doubtful.
3. Stochastic processing has been described as required for coverage with material tail risk. However, the term is still not objectively defined.
4. The agency receiving experience filings has not been determined, whether a new agency, a branch of the NAIC, or other, much less its legal status.
5. The status of a Central Examination Office has not been determined. Presumably, this entity would compile all actuarial memorandums and review opinions under PBR. However, its legal powers to challenge findings and to be delegated state powers are still quite uncertain.

## NAIC Developments

At the recent NAIC annual meeting, further significant PBR developments occurred. These include:

1. A general realization that more time is needed for completion of tasks. In September, some proponents of PBR claimed that complete adoption by the NAIC would take place in December 2006. However, now, general statements were made that various facets of PBR (standard law, regulation, valuation manual, governance, CEO, etc.) can't be exposed or adopted until at least some time in 2007.
2. The ACLI and National Alliance of Life Insurance Companies (NALC) both gave presentations to LHATF. The ACLI stressed the need for coordination between LHATF, Life Risk Based Capital WG of the Capital Adequacy Task Force, and various Commissioner committees at the A and E levels. The NALC made several significant points:
  - a. The expense impact of PBR implementation must be considered.
  - b. Small companies don't necessarily want exemptions for certain products, but would rather see reserve methodologies that reflect risk differences among products.
  - c. Credibility should be defined to bring in qualitative as well as quantitative variables. In other words, some small companies may have expertise in certain products which could outweigh small volumes as such.
3. Originally, the objective of PBR was use of actuarial judgment in setting reserve assumptions. Gradually, considerable restrictions on assumptions have been introduced by regulators. This tendency toward prescription was extended at the December LHATF:

The Treasury may catch on to the fact that lower PBR reserves would result in additional tax liabilities.

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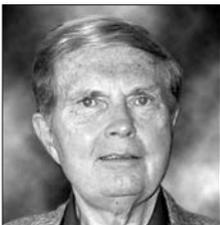
- a. Originally, interest assumptions were to correspond to portfolio rates over the current life of invested assets, and Treasury rates for reinvested assets. However, New York has proposed further restrictions on the former set.
  - b. New York has also proposed more restrictions on actuarial judgment in setting lapse assumptions.
4. The Academy provided its report and recommendations for revised C3 calculations under risk based capital. This report would require an even more revolutionary change in calculations than PBR itself. In a sense, the report contained the initially discussed approaches for PBR, before changes to the model regulation described above.
- a. All life and health would be covered, including all issue years, with no exemptions.
  - b. All reserve calculations would be based on stochastic processing.
  - c. Total reserves calculated this way would be considered total adjusted reserves (TAR). Risk based capital, i.e. allocated surplus, would be the excess of TAR over statutory reserves under PBR.

compromise would be to have an initial formulaic floor that would grade off over a period of years.

In summary, PBR has many complex aspects which must be ironed out. Some may feel that the entire proposal has entered its home stretch. However, the proposal's status still needs a great deal of analysis. Regardless of the final details, if the conceptual approach adopted is opt-in, numerous smaller traditional companies would not feel burdened and thus would have no motivation to lobby against it. This would leave those companies wishing to utilize the PBR approach able to work on the details as they see fit. §



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The NAIC's life risk based capital working group received the Academy report, and gave it a 60-day exposure period.

#### Summary:

Small companies, indeed any company, must consider the impact of this proposal together with PBR itself. At the December NAIC meeting, in the Monday morning PBR Executive Committee meeting, the chair of this committee, Commissioner Jim Poolman of North Dakota, indicated that the Executive Committee would be providing policy guidance to the PBR process during 2007. He said that he would like PBR to be good for smaller companies. In addition, he noted that some regulators would like a formulaic minimum floor for the PBR reserves. Commissioner Poolman suggested that one

# Context-Sensitive Modeling of Elective Guaranteed Living Benefits in Variable Annuities

by Chris Perrin

Without sufficient empirical evidence, forming assumptions regarding future policyholder behavior is problematic. A staunch empiricist must then resort to an educated guess; a guess that appeals to one's sense of rationality. But even with empirical evidence to the contrary, others may hold a stronger belief in the rationally appealing assumption; if past evidence does not stand to reason, why assume the unreasonable to hold in the future? All else being equal, we believe that somewhat higher lapse rates will occur in fixed annuities whenever competitors' new money rates are higher than the present credited rate, so a dynamic assumption that increases lapse rates proportionally to the interest rate difference is the orthodox way of modeling interest-sensitive lapse rates. But in some contexts, leaning on the phrase "all else being equal" can prevent a clearer understanding of the risks faced. In those situations, a more holistic approach to modeling behavior can reveal insights that would otherwise be missed.

The utilization of elective guaranteed living benefits (GLBs) in variable annuities is another area where too little experience exists. Valuations that involve such benefits (such as GMIB) are also quite sensitive to the "utilization" assumption. It is perhaps too early to speak of the "orthodox" treatment of these relatively new benefit designs, but an approach similar to that used for interest-sensitive lapse is usually taken. First, one measures the degree to which the GLB is "in the money" using the guarantee amount and the account value (and perhaps information regarding immediate annuity costs relative to the guaranteed annuity rates under the GMIB design). Then, one makes utilization proportional to this measure. Indeed, the C3 Phase 2 Standard Scenario requires an annual 20 percent election rate (except that it is 100 percent at the last chance to elect) for such elective GLBs. But a typical model will gradually move GMIB utilization upward toward some ultimately high level as the "in-the-money" measure increases and then will



level it off. But does this measurement really characterize the policyholder's decision to elect the GMIB?

What I am calling the orthodox in-the-money measure is based on the presumption that upon exercising the GMIB option, the policyholder is only giving up the account value. But that is a false premise. A contract that is in-the-money under this definition may have a valuable death benefit that also would be relinquished when the GMIB is exercised. There may be other non-elective living benefits that would be foregone as well. The decision to exercise the GMIB option ought to be made in the context of the whole variable annuity contract (and one can easily imagine the broader context of the policyholder's overall financial situation).

Now, suppose the orthodox in-the-money measure is high, but that a valuable death benefit also exists. Perhaps holding the whole variable annuity at that time is more valuable than exercising the GMIB. At any given time at which the GMIB could be elected, we should calculate the value of holding the annuity as well as the value of exercising the GMIB. If the value of holding exceeds the value of exercising, the characteristic function (due to "in-the-

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moneyness”) is zero; otherwise it is 100 percent. This provides a more appropriate definition of “in-the-money”, but it does not measure the degree to which it is in-the-money. For that, one may consider (some function of) the difference between the exercise value and the holding value. This difference measure might be used to calibrate the efficiency of the GMIB utilization.

The following describes an alternative way to model utilization rates. It is a technique (directly) borrowed from the pricing of American put options on a binomial lattice. Actual behavior will doubtless differ, but this is a way to model this feature in a rational and objective fashion. One’s differing opinion regarding utilization may be expressed by overlaying onto the all-or-nothing result an “efficiency” assumption:  $x\%$  exhibit the option optimizing behavior, and  $100-x\%$  do not. The example which follows considers a GMIB rider on a contract with a GMDB.

**Example:**

The GLB used below is a standard GMIB rider. We do not make explicit the impact of such decision-making on mortality of those who choose to stay, though that can be built into the mortality rates.

Let “M” denote the maturity age of the annuity; this is the age at which the variable annuity must go into pay-out or be surrendered.

Let “t” denote the number of time-steps from the valuation date.

AV(t) is the account value at time t.

“Age\_nearest(t)” is the attained age nearest birthday at time t.

So,  $n = M - \text{Age\_nearest}(t)$  is the number of years to contract maturity.

Let “max\_age\_gmib” denote the age at which the GMIB option expires.

GMIB(t) is the notional amount of the GMIB guarantee.

$ax\_gmib(\text{sex}, \text{age})$  is the cost of an annuity of \$1 per month guaranteed in the GMIB rider (life and 10 years certain).

$ax\_curr(\text{sex}, \text{age})$  is the cost of an annuity of \$1 per month based on interest rates and mortality prevailing at time t (the cost of a newly priced immediate annuity without commissions or profit).

GMDB(t) is the amount of the guaranteed death benefit at time t. The excess death benefit, DB(t), is equal to the maximum of zero or  $\text{GMDB}(t) - \text{AV}(t)$

After the 10-year waiting period, the GMIB can be exercised. The claim to the company or the additional value (over and above the account value) realized by the contract-holder is

$$\text{MAX}[ 0, \text{GMIB}(t) * \frac{ax\_curr}{ax\_gmib} - \text{AV}(t) ]$$

If  $t \geq 120$  (months) then the GMIB holder must make a decision to elect the irrevocable life with 10 years certain annuity or not. This decision will be modeled using a binomial lattice approach. We will calculate a “fair value” (the supposed objective valuation of what is arguably subjective) for the option at time t. This value will be equal to or greater than the value of exercising the option. Only if the value of exercising the option is equal to the option’s overall value will the GMIB be exercised at time t. An important factor in this decision is the attending guaranteed minimum death benefit; for once the GMIB is exercised, the death benefit is surrendered. The death benefit is thus part of the value we will be comparing to the exercise value of the GMIB.



A lattice is a set of nodes (i,j) where i ranges from zero to n, and j ranges from zero to i. The account value at each of these nodes is calculated as follows:

$$AV_{lat}(i+1, j) = AV_{lattice}(i, j) * u * (1 - q_{x+i}) - fees(i+1)$$

for j = 0 to i, and

$$AV_{lat}(i+1, i+1) = AV_{lattice}(i, i) * d * (1 - q_{x+i}) - fees(i+1)$$

where  $q_x$  is the mortality rate (or non-elective rate of decrement) for the time period.

$$u = e^{\sigma\sqrt{h}} \quad \text{and} \quad d = e^{-\sigma\sqrt{h}}$$

where  $\sigma$  is the annual volatility of the underlying fund and h time (real number in years) between forward moves (from i to i+1) on the lattice.

The probability of an up-move on the lattice (that is, from i,j to i+1, j+1) is Q (we use upper case here in order to distinguish this from a mortality rate) and the probability of a down-move from (i,j) to (i+1,j) is 1-Q. Now this binomial probability measure is required to be risk-neutral which means that it has the martingale property.<sup>1</sup> That is, the *expected* (present) value (conditioned on today's value) at the next time-step is today's value. If such a risk-neutral probability measure exists, we can determine the fair market value by simply calculating the mean; this computational convenience is option pricing theory's primary appeal. Therefore we must have

$$1 = Q * u * e^{-rh} + (1 - Q) * d * e^{-rh}$$

or (multiplying both sides by  $e^{rh}$ )

$e^{rh} = Q * u + (1 - Q) * d$  where r is the risk-free force of interest (greater than zero). Thus the expected

return over one holding period (h years) is no better or worse than can be obtained by holding a risk-free investment.

$$\text{Thus } Q = \frac{(e^{rh} - d)}{(u - d)}$$

Note that we must have  $\sigma > r\sqrt{h}$  otherwise it would not be the case that  $1 > Q > 0$  and so Q (*qua* probability measure) would not exist.

Now the value of electing the guaranteed benefit is

$$E(i, j) = \text{MAX}[0,$$

$$GMIB_{lat}(i, j) * \frac{ax_{curr}(sex, age + i)}{ax_{gmib}(sex, age + i)} - AV_{lat}(i, j)]$$

The value of holding the benefit is

$$H(i, j) = e^{-rh} * Q *$$

$$\left( V(i+1, j+1) * p_{age+i} + DB(i+1, j+1) * q_{age+i} \right)$$

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<sup>1</sup> See H. Panjer, editor, *Financial Economics*, section 5.3.3, pp 209-216, published by The Actuarial Foundation (1998).

$$+ e^{-rh} * (1-Q) * \left( V(i+1, j) * p_{age+i} + DB(i+1, j) * q_{age+1} \right) .$$

The value of the option is

$$V(i, j) = \text{MAX} = [E(i, j), H(i, j)] \text{ for } i = 0 \text{ to } n \text{ and}$$

$$V(i, j) = 0 \text{ for } i > n .$$

GMIB\_lat(i, j) is the projected guaranteed income base at each node considering the ratchet and roll-up features, as well as the maximum age at which it can be exercised (it is zero beyond that age).

$$DB(i, j) = \text{MAX}[0, \text{GMDB\_lat}(i, j) - \text{AV\_lat}(i, j)]$$

where GMDB\_lat(i, j) is the projected guaranteed minimum death benefit considering any ratchet, roll-up and tax relief features as well as the contract's maturity age.

If  $E(0,0) = V(0,0)$ , then the GMIB option is exercised at time  $t$  and the policy lapses after experiencing the excess expense of providing the enhanced payout annuity.

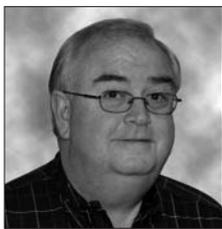
We may believe that this process is only  $\alpha$  percent efficient, *qua* financial option; that  $1 - \alpha$  use the annuity as a retirement planning vehicle and have definite plans to annuitize regardless of the in-the-moneyness measure while the rest view it as a pure financial option (there might even be a third group who annuitize no differently from those without a GMIB attached to their contract). In that case we have an "actuarial" assumption as to the value of  $\alpha$ . As was mentioned above, the  $\alpha$  may be a function of  $E(0,0)$  minus  $H(0,0)$ .

The use of the binomial lattice is a convenience. Alternatively, a stochastic-within-stochastic model

could be used if already available to develop the exercise and holding value. In fact, if the inner scenario set is realistic (as opposed to risk neutral), one could develop these valuations in terms of the expected logarithmic utility (sure-thing value with equivalent expected utility); this is very arguably a conceptual improvement over risk-neutral valuation.<sup>2</sup>

There is one final aside. This same framework can be used for dynamic lapse assumptions. The value of surrendering is the cash surrender value. Now this will never exceed the value of holding the contract. But to the extent the holding value exceeds the cash surrender value, fewer baseline surrenders will be expected.

§



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<sup>2</sup> See C. Perrin, "Value and Actuation," 2006 Enterprise Risk Management Symposium SOA Monograph M-AS06-1, July 2006 available on the Society of Actuaries Web site.

# 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:

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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.

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Thank you for your help.

# Academy Task Force on Risk Margins

by Henry Siegel

*Editor's Note: The following announcement was sent out to members by Henry Siegel, chairperson of the Financial Reporting Section of the Society of Actuaries on Jan. 9, 2007. Anyone interested in joining the task force may still do so.*

particular, the Academy is looking for a person to be its representative at RMWG meetings, most of which are in Europe, with dialing-in usually possible. The thought is that this person would also chair the Academy's task force although that work could be separated if necessary. **S**

**W**e are establishing a task force within the Academy's Financial Reporting Committee to assist the International Actuarial Association (IAA) in developing actuarial guidance for implementing a principles-based valuation approach such as the International Accounting Standards Board (IASB) and International Association of Insurance Supervisors (IAIS) are now contemplating.

## Risk Margin Task Force

The IAA's Risk Margin Working Group (RMWG) is currently developing guidance on how actuaries should determine estimates of liabilities and the appropriate margins for those liabilities under the proposals being produced by the IASB. While this work has been underway for some time, a completion date is still not known (although there is hope for an exposure draft soon).

This task force would be expected to review the drafts being produced by the RMWG and provide comments on behalf of the U.S. profession. Furthermore, it will request research from the SOA or CAS, to the extent it believes it necessary, and will seek to assure that the results being produced by the RMTF are representative and practical. Since the RMWG work would apply to life, health and P&C products, it is essential that this task force include adequate representation from all the practice areas.

A copy of the most recent draft documents from the RMWG is available from the Academy Web site for those not already familiar with this work. A later draft is expected in the next few days that will include more P&C modeling in the appendix.

Anyone interested in being on this task force should contact Tina Getachew at [Getachew@actuary.org](mailto:Getachew@actuary.org). In



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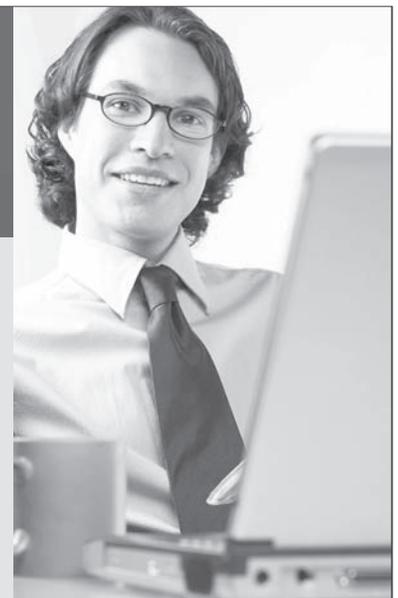
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