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Letter from the Editor

by Thomas Nace

Welcome to Issue No. 49 of the *Financial Reporter*. With year-end work behind us, and Spring just around the corner, it is a time to look forward with an optimistic view to the year ahead. Having survived the trauma of broken new year resolutions, the first Super Bowl in February, the sportsmanship and controversy of the Olympics and yes, the beginning of yet another Survivor series, things can only get better for the months ahead.

Before reviewing what's in store for you in this issue, I wanted to take a moment to mention something that I have seen develop during my tenure as editor. I remember when I first took on this assignment; I had made the request in one of the very first newsletters for potential authors to feel free to volunteer articles for publication in the *Financial Reporter*. My feeling was that while I could certainly recruit authors based on topics I thought might be of interest to the readership, having actuaries share some of their discoveries, analysis and thoughts through articles submitted voluntarily would make the newsletter even more interesting to the readers.

I am happy to say that after a slow start, the response has been much better than I could have dreamed. In this issue alone, three articles are presented that are the result of authors volunteering their services. The recent prior issues have had at least one or two articles, which have been volunteered. From a

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An Update on the Draft 2001 CSO Mortality Table

by Faye S. Albert

Brief Overview of Motivation and Work
In November 1998 the National Association of Insurance Commissioners Life and Health Actuarial Task Force (LHATF) asked for a new Mortality Table that would be appropriate for use in the current US valuation system. This new Mortality Table is intended to update mortality to reflect insurance experience for new business. Insurance mortality has improved significantly, as has population mortality, since experience was collected for constructing the 1980 CSO Mortality Table. The 1980 CSO Mortality Table is now the minimum standard for the valuation of standard ordinary life insurance.

The American Academy of Actuaries' Life Practice Council believes that a valuation system that gives the actuary responsibility for establishing adequate reserves is desirable and preferable to the current formula based system. In such a system there would be more flexibility



for determining mortality levels appropriate for each individual company.

The Society of Actuaries Individual Life Insurance Valuation Mortality Research Task Force (SOA Task Force) was responsible for developing an underlying basic mortality table that both represented current experience and was smooth enough to be the basis for a valuation Mortality Table. The American

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personal standpoint, I would like to think that the quality of the newsletter has been the attraction, which has drawn everyday actuaries into would-be authors. But whatever the reason, I applaud those who have taken the initiative to submit articles and I hope that the trend will continue. At the end of the day, the newsletter and the readers are the benefactors.

The lead story in this issue deals with the 2001 CSO table. Faye Albert provides

background on its development as well as its current status. In addition, Faye takes a look at the nature of the data used in developing the table, the margins reflected, and the potential effect on reserves.

A review of all the current topics discussed at the December 2001 NAIC meeting, including the new CSO Model Regulation, can be found in Ted Schlude's detailed account of the meeting. As always, Ted does a great job in summarizing the highlights of the meeting, as well as presenting what's new on the regulatory front.

Tony Zeppetella provides an update to an article that had been published in the

Financial Reporter back in 1993. In his update, Tony looks at the marginal effect on RBC of a change in risk, using the 2001 year-end NAIC Risk-Based Capital formula.

In issue 47, we had published the first of a two-part article by Joe Koltisko dealing with VOBA in a fair value environment. The second part of the article appears in this issue of the newsletter. While I apologize for the delay in getting the second part to you, I think you'll agree that it is well worth the wait.

Recent FASB pronouncements, SFAS 141 and SFAS 142, deal with Business Combinations and Goodwill and Other Intangible Assets. An upcoming seminar co-sponsored by the Section is promoted in this newsletter. More importantly, we have an excellent summary of the new pronouncements, which have been put together by Russell Menze and Vincent Tsang. Whether you attend the seminar or not, reading this article is a must if you have been involved in or expect to be associated with business combinations.

Finally, our Section Chair, Barry Shemin, provides his thoughts on the current bleak state of the industry and solicits opposing views.

Once again, we have an issue jam-packed with information and analysis which is yours for the taking. Bon appetit!



Tom Nace

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*Draft 2001 CSO Mortality Table
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Academy of Actuaries Commissioners Standard Ordinary Task Force (Academy Task Force) was responsible for developing appropriate margins for use in a valuation mortality table and evaluating the resulting mortality table. Both of these groups solicited input and had constructive suggestions from the National Association of Insurance Commissioners Life and Health Actuarial Task Force (LHATF).

What Mortality Tables are Available?

Two Mortality Tables have been constructed, a 2001 Valuation Basic Mortality Table (2001 VBT) and the Draft 2001 CSO Mortality Table.

The 2001 VBT was completed by the SOA Task Force. It is a graduated Mortality Table, based on experience for

Each mortality table has values for a 25-year select period and for ultimate ages. Each mortality table includes mortality rates for ages 0 to 120. The mortality rate at age 120 is 1.00.

Status of Academy Task Force Report

The Academy Task Force has been working with LHATF to assure that the new Mortality Table answers the needs of the National Association of Insurance Commissioners (NAIC). Both the 2001 Valuation Basic Mortality Table and the Draft 2001 CSO Mortality Table have been reviewed at quarterly meetings of LHATF to keep regulators informed of progress and address concerns and discuss choices in the Mortality Table construction. In addition, several members of LHATF have been active participants in the Academy Task Force discussions.

At the March 2001 LHATF meeting, the Academy Task Force reviewed the

first presented to LHATF in June 2001. Since that time the Draft has been discussed on a number of conference calls and has been redrafted twice. As of the LHATF meeting in Chicago in December 2001 only a couple of items still require expansion and clarification. Some companies have higher mortality than the Draft 2001 CSO Mortality Table. What would prevent them from using the Draft 2001 CSO Mortality Table in calculating their reserves if it were the minimum standard? The variability of small company mortality is also still being reviewed and will be considered in another appendix to the Academy Task Force Report.

Although the Draft 2001 CSO Mortality Table is sufficient for the majority of companies that submitted data to the experience study, it may not be adequate for some, perhaps many, U.S. companies. Thus using the Mortality Table could lead to inadequate reserves. There are different ways to approach this question besides accepting reserves for every company that submits reserves calculated using the minimum standard.

One approach might compare mortality results of the company under consideration to the valuation Mortality Table. An adjustment of the 2001 CSO Mortality Table, perhaps based on the experience itself, would then be used in computing reserves if the overall comparison were unacceptable.

Another way outstanding regulatory issues concerning the Draft 2001 CSO Mortality Table might be addressed is by using the valuation actuary analysis and opinion.

Asset adequacy analysis helps the actuary determine whether a particular company can meet its obligations. Such an analysis incorporates many company specific factors, including mortality.

Concurrent with the work on the Report, volunteers from the Academy Task Force are working with LHATF to complete drafting rules for use of the Draft 2001 CSO Mortality Table.

“Although the Draft 2001 CSO Mortality Table is sufficient for the majority of companies that submitted data to the experience study, it may not be adequate for some, perhaps many, U.S. companies.”

years 1990-1995. Mortality improvement from the central experience date underlying the 2001 VBT, 1992, is projected for 9 years to 2001. It is intended to be suitable as the basis for a valuation mortality table.

The Academy Task Force developed the Draft 2001 CSO Mortality Table. The Draft 2001 CSO Mortality Table has overall mortality margins of 15%. The margin formulae are of the same form as the 1980 CSO Mortality Table, i.e. an inverse function of the expectation of life.

Separate nonsmoker, smoker, and composite nonsmoker/smoker mortality tables were developed for males and females for a total of six mortality tables.

implications of either 10% or 20% margins combined with the 2001 VBT. Input was solicited for both the level of the load and the form of the load. LHATF indicated that the loading should strive to assure that the valuation mortality equals or exceeds the mortality experience of most companies. No single mortality table would be expected to produce adequate mortality rates for every company. However, on the basis of the analysis presented, LHATF indicated an overall 15% load to mortality and the same form of load used in the 1980 and 1958 CSO Mortality Tables would be reasonable choices.

The Draft Academy Task Force Report on the draft Mortality Table was

*Draft 2001 CSO Mortality Table
continued from page 3*

Appropriateness of Experience Data

The mortality in the Draft 2001 CSO Mortality Table is intended as a minimum valuation standard in the U.S. Whether this Mortality Table is appropriate as a minimum standard depends on whether it is constructed from representative experience in the U.S. life insurance industry.

If individual company mortality data were provided to the SOA Individual Life Experience Study Committee, the submitting company would benefit by having their own mortality experience

result, the two databases were not combined to produce a larger data source.

As mentioned before, the SOA Individual Life Experience Study Committee has had increasing difficulty obtaining individual company mortality experience for inclusion in their studies. On a going-forward basis, blending the SOA data with the Bragg experience before creating any new experience Mortality Table would broaden the applicability of the results.

Experience from Bragg and Associates and experience from the Veterans Administration was used to augment SOA experience where SOA experience was limited. In addition, three reports were supplied using the Bragg data to assist the Academy Task Force.

were applied fairly to male and female policyholders issued with different smoking underwriting characteristics at different times.

Review of the experience data showed wide variations in overall mortality experience among the companies included in the study. This was an area of considerable concern and analysis.

The Academy Task Force created a Mortality Table that produced valuation mortality using the Draft 2001 CSO Mortality Table that was equal to or greater than the experience for approximately 70% of the companies included in the SOA study. This corresponds to a 15% overall load to the VBT.

Reserve Testing

The reserve implications of the new valuation mortality are important to consider in addition to the mortality changes alone.

The Academy Task Force considered the appropriateness of the Mortality Table as a minimum industry standard using a notion defined as *comparison reserves*. *Comparison reserves* are formula reserves calculated on a 1-year preliminary term basis and comparison reserve factors are applied in the same fashion as the current statutory model. However, the factors are constructed from individual assumptions based on current industry experience. Also, the factors for term insurance reflect lapse rates. Each assumption is intended to cover 85% of current industry experience. Mortality is based on 1990-95 SOA study. Interest is based on 12/31/00 yield curve, NAIC C3 model, and 1995-99 NAIC investment returns. Lapse rate data was obtained from the LIMRA International study, "1993-94 United States Lapses by Duration and Product Line: Long Term Ordinary Lapse Survey," copyright ©1996 LIMRA International.

Comparison reserves were reviewed in conjunction with simulated statutory reserves. Simulated statutory reserves were calculated using the current industry formula but substituting the Draft 2001 CSO ultimate composite smoker and nonsmoker mortality Table for the 1980 CSO Mortality Table. The point of

"There are a number of reasons to load the VBT to produce a minimum industry valuation standard."

compiled. The submitting company would also have confidential reports comparing their experience to intercompany experience and to the valuation Mortality Table. Such an approach would have the salutary effect of increasing the intercompany data available. The SOA Individual Life Experience Study Committee has had difficulty, and increasing difficulty, obtaining mortality experience for inclusion in their studies.

The VBT was based primarily on the 1990-95 Report prepared by the SOA Individual Life Experience Study Committee. This study used a very large body of experience data for 21 life insurers: \$5.7 trillion exposed amount of insurance and \$14.0 billion of claims.

A comparable and slightly larger experience database from Bragg and Associates, 23 companies, some overlapping with the SOA, was considered for use in constructing the 2001 VBT. A comparison of Bragg experience with SOA experience using broad ratios of actual to expected did not indicate a material difference between the two. As a

These reviewed older age mortality, company mortality variations, and actual to expected 2001 VBT mortality results by age and duration.

Margins

There are a number of reasons to load the VBT to produce a minimum industry valuation standard. Since the VBT was based on a significant amount of data, the Academy Task Force felt confident that mortality would reproduce that expected for the appropriate underlying experience. However, even if expected experience conforms to the 2001 VBT, companies will experience random fluctuations in experience; and small companies will be subject to wider random fluctuations than larger ones. Differences in mortality experience may also be due to a different mix of health among the company's policyholders than was reflected in the intercompany data. Further, unknown and unanticipated changes in mortality experience may occur.

Testing by valuation cell was done to assure that reasonably consistent margins

these analyses was to test the appropriateness of the Draft 2001 CSO Mortality Table as an industry standard. The *comparison reserves* were roughly adequate to provide adequate reserves for companies within 85% of the industry experience for each of mortality, interest, and in the case of term, lapse.

Three plans were considered, representing the main sectors of current life insurance industry sales activity; Whole Life as proxy for all permanent life, a level premium Universal Life plan with zero cash value at maturity for all universal life plans, and Twenty-year Level Premium Term for all term products. Both types of reserve factors were calculated for these plans for each of Male and Female, ages 25, 35, 45, 55 and 65, and durations 1-20. Deficiency reserves were not considered, nor were any plans guaranteeing continuing coverage at the initially quoted level premium.

As you might imagine, there is not a consistent relationship between all these cells of reserve factors. For permanent life the *comparison reserves* are consistently less than simulated statutory reserves. For term life the *comparison reserves* are consistently greater than simulated statutory reserves, more so at

younger ages and earlier durations. Universal life reserves are the cash value when it exceeds the calculated reserve; cash values were held as the reserve for durations 10 and greater for our proxy plan. At earlier durations *comparison reserves* are consistently less than simulated statutory reserves for universal life.

Considering that *comparison reserves* incorporated individual assumptions, which each covered 85% of U.S. industry experience, these results are not surprising. Sensitivity testing was done to see what percentage improvement in each of the experience factors was necessary to produce reserves equal to 100% of the simulated statutory reserves.

Impact of Draft 2001 CSO Mortality Table on Life Insurance Reserves

The Academy Task Force considered valuation reserves consistent with the current statutory model. Reserves using the 1980 CSO Mortality Table were calculated and compared to reserves produced using the Draft 2001 CSO Mortality Table and the 2001 VBT.

In order to evaluate the impact of the Draft 2001 CSO Mortality Table a model

office was created. This model used the same representative products discussed in the reserve factor tests with proportions equal to those distributed by the industry in 1999 according to LIMRA. The inforce model reflected a growth rate of 5% per year and a lapse rate of 4% per year.

Overall, reserves based on the draft 2001 CSO Mortality Table are about 20% lower than reserves based on the 1980 CSO Mortality Table, with larger reductions for term.

The December 2001 draft of the Academy Task Force Report is available for more detailed discussion of the items sketched above. Many details of background work and analyses are included as appendices to the Academy Task Force Report. For example, Appendix K is [The Report of the SOA Task Force](#) and it describes the data and methods used in constructing the VBT.

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Society of Actuaries Announces Triennial Prize

The Society of Actuaries and its Committee on Life Insurance Company Expenses (CLICE) announces the inaugural \$5,000 Arthur Pedoe Life Insurance Company Expense Study Award. The first award will be presented in 2004 for the best paper published between July 1, 2001 and June 30, 2004.

The purpose of the award is to increase awareness of the importance of expense analysis among company management by encouraging informative, high-caliber papers on the subject. The award will be offered once every three years for a paper that is judged to be the best paper on life insurance company expense analysis published by a suitable actuarial publication.

To be considered, a paper must be based on sound actuarial and accounting principles and should be of such caliber as to advance the state of the art of expense analysis and related life insurance financial information. Members of the CLICE will judge entries in conjunction with the editors of the *North American Actuarial Journal* (NAAJ). The CLICE reserves the right not to make an award in any period in which it does not consider any paper worthy of the award.

The award is named for Arthur Pedoe, an actuary who was well known for his studies of life insurance company expenses. Mr. Pedoe was a Fellow of the Institute of Actuaries, the Actuarial Society of America, the Canadian Institute of Actuaries, and the Society of Actuaries where he held the office of Vice President in 1958-59. He spoke frequently at Society meetings on trends in expenses and on the importance of controlling increases in expenses. For this purpose, he developed methods of calculating expected expenses to be compared with actual expenses. These methods were still in general use at his death in 1979.

Highlights of the December 2001 NAIC Life and Health Actuarial Task Force

by Raymond T. (Ted) Schlude

Author's Note: I attended the NAIC winter meeting held December 6-11, 2001 in Chicago, Illinois. Summarized below is what took place at the various task force and working group meetings.

Life and Health Actuarial Task Force

On Thursday, December 6, 2001, the Life and Health Actuarial Task Force (LHATF) met to discuss three pending projects discussed below. Subsequent to the meeting, three documents were issued for exposure and comment.

- VAGLB Actuarial Guideline MMMM
- Actuarial Guideline AXXX
- New CSO Model Regulation

1. Variable Annuities with Guaranteed Living Benefits (VAGLB):

LHATF received the Academy's December 2001 report upon which the discussion was based. Several issues were addressed as summarized below.

- Money Market Class: Concerns were expressed that money market returns based on a forty-year database are too high and may not be appropriate in today's interest environment. A change was made to use the lower of the most recent ten-year or forty-year database, but to retain the current volatility. This reduced the guideline MMMM return by 2.1% from the prior guideline.
- Equity Classes: LHATF had asked the Academy to research whether the equity class should be expanded for the purposes of a VAGLB guideline. Analysis performed by the Academy supported continued use of a single equity class rather than four separate classes which had been contemplated for AG 34 GMDB prior to being collapsed into one class in the final AG 34. This ensures consistency between GMDBs and VAGLBs in the integrated CARVM framework.

- Effective Date - December 31, 2002: The effective date was deferred one year to December 31, 2002, but with a two-year rather than a three-year phase-in as permitted by the Commissioner.
- Retrospective Floor: The regulators preferred to keep the minimum reserve floor equal to the retrospective accumulated charges in the guideline until more work is completed on the C-3 Phase II project. Most regulators were receptive to eliminating the retrospective floor once RBC for VAGLBs has been developed and adopted. Further work will be done related to the release of any excess reserve created by the retrospective floor.
- C-3 Phase II Update: LHATF received a report from the Academy related to developments with respect to the C-3 Phase II project. The Academy plans to have a draft recommendation to the Life RBC Working Group for discussion at the March 2002 NAIC meeting. Focus is on development of a total capital requirement (RBC plus VAGLB reserve) that would satisfy CTE 90% (conditional tail exposure for the average of the worst 10% of stochastic scenarios) rather than the more traditional 95th percentile.

Finally, the guideline (AG MMMM) was exposed for adoption contemplated in March, 2002 with anticipation that some additional modifications could be made based on interim conference calls and to accommodate some phase out language for the retrospective floor.

- 2. Issues Pertaining to XXX - Actuarial Guideline AXXX: LHATF moved forward and exposed a draft actuarial guideline AXXX to be effective December 31, 2002, but with application to prior periods' issues retrospectively to a state's effective



date for the XXX model regulation. For universal life policies with shadow account secondary guarantees (item #8 in AXXX), the application would be to policies issued subsequent to December 31, 2002.

The exposed document included certain refinements for comments received from interested parties. Note that based on the meeting, a revised AXXX was created as described previously.

3. New CSO Mortality Table:

Discussion first focused on a review of the process to this point, which included development of a basic table, determining the appropriate margins, developing the valuation table and comparing reserves for various plans under the 80 CSO and new CSO tables.

Next, the discussion revolved around the appropriateness of this table for all products including guaranteed issue, simplified issue, and other products of a substandard nature. Given that the basic table includes a relatively small number of companies with four companies having half the exposure and given that guaranteed issue was excluded from the study, some regulators suggested that use of the new table should coincide with a Section 8

opinion. Others expressed a need for timely adoption and also to consider the impact of the new table in other areas such as non-forfeiture, universal life model regulation, 7702 limitations, etc.

Finally, the model regulation implementing the new CSO table and several outstanding issues were discussed, including:

- **Calculation of Deficiency Reserves:** Basic reserves and deficiencies should be calculated using the same select and ultimate or ultimate tables and there should be no mixing and matching in the regulators' eyes. Language to this effect was inserted into the exposed model regulation.
- **Appropriateness of Table for Certain Risks (guaranteed issued, simplified issue, substandard, etc.):** A conference call in January 2002 will review the revised language requiring asset adequacy analysis if the new table is used by a company.

A copy of the revised model regulation was exposed for comment in mid-December with certain modifications prescribed by LHATF at the December 6, 2001 meeting.

On Friday afternoon, LHATF held its general matters meeting and discussed the following life and annuity projects.

1. **Non-forfeiture for Universal Life Products with Secondary Guarantees - AG XYZ:**

This guideline would require non-forfeiture values for UL products with longer-term secondary guarantees. The regulators discussed a proposal from various interested companies to drop this project and rather rely on appropriate disclosure with respect to the UL secondary guarantee being provided (in particular, that there could be no cash value).

Regulators took a vote and decided to continue to move forward with the project, incorporate certain other recent comments and have a draft for

exposure by the end of January. There may be a drafting note added emphasizing that non-forfeiture is a state issue and each state can determine what, if anything, to do with AG XYZ. Adoption of this Guideline is expected in March, 2002 by LHATF.

Opponents to the Actuarial Guideline argue that UL products with zero minimum non-forfeiture benefit, but with longer term insurance guarantees, are desired by the consumer and clearly

"Opponents to the Actuarial Guideline argue that UL products with zero minimum forfeiture benefit, but with longer term insurance guarantees, are desired by the consumer and clearly explainable by agents."

explainable by agents. XYZ will eliminate a simple to define benefit which satisfies consumer demand for a long-term insurance guarantee in a universal life product. Proponents of XYZ argue that if a level premium long-term guarantee is provided, the product should have to comply with standard non-forfeiture laws otherwise there is an un-level playing field between traditional life and universal life products.

As a result of complexities in the way in which the required non-forfeiture benefit is described, it will be a burden for companies selling UL with longer-term secondary guarantees to set up systems to comply with the requirements of the guideline. The proposed effective date is January 1, 2003, but this may be deferred to some point in 2004 by LHATF.

2. **General Non-forfeiture Project:**

LHATF briefly discussed the general non-forfeiture project including a September 8, 2001 draft model law which reflects certain principles regulators have reached consensus on including: retrospective design, a minimum floor, cash values, the

concept of a plan for determining charges, credits and non-forfeiture benefits, and some degree of regulatory oversight for non-guaranteed elements.

It was also noted that the Academy is beginning a project to explore reliance on professionalism as the standard. They are currently surveying chief actuaries at mutual life insurers and universal life writers to compare dividend principles with universal life

non-guaranteed element credits and charges and will report to LHATF at the March, 2002 meeting.

Finally, it was noted that there is an IAA document which deals with The Role of the Actuary in Prudential Supervision which may be of interest given the direction being contemplated.

3. **Possible Areas of Revision to the Standard Valuation Law:**

Various issues with respect to the long-term viability of the current standard valuation law were discussed including: the formulaic reserve approach generally, impact on tax reserves of any changes in approach and the desirability of having a single state of domicile opinion, which has not been accomplished by the recent changes to the AOMR.

As part of the Academy Life Practice Council's reorganization, to be more effective, an informal working group is beginning to consider/create a framework for a strategic long-term vision for reserves.

*Highlights of the December 2001 NAIC Life and Health Actuarial Task Force Meeting
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4. Reserves for GICs with Bailout Provisions:

LHATF briefly reviewed a draft actuarial guideline which resulted from work of the Life Liquidity Risk Working Group. This guideline was directed back to LHATF and will be put on its March 2002 agenda. The guideline deals with the typing of valuation rates for GICs and funding agreements with bailout or put provisions. The guideline would allow a higher valuation rate than Type C if the valuation actuary can demonstrate that there are written provisions in the contract that substantially reduce liquidity risk. The actuarial guideline will be exposed for comment at the March 2002 meeting.

5. Moody's Corporate Bond Yield Average:

As a result of Moody's information no longer being publicly available, the NAIC is trying to reach agreement with Moody's to post the most recent two months' data on its website. It would be the responsibility of companies to obtain this data, calculate the 12-month and 36-month averages, and compute valuation rates from this information.

6. Annual Statement Changes:

LHATF briefly reviewed blanks proposals to eliminate the following exhibits:

- Analysis of Increase in Reserves
- Interest Sensitive Life Report
- Dividend Exhibit Information

A communication will be drafted and forwarded to the Blanks Task Force with LHATF's comments.

Finally, Tom Foley (Kansas department) and Don Sanning (Principal), who are retiring, were recognized for their contributions to LHATF and various industry working groups over the years.

Life Insurance (A) Committee

I attended two meetings of working groups other than LHATF that report to the Life Insurance (A) Committee.

1. Life Liquidity Risk Working Group:

The Life Liquidity Risk Working Group discussed the approach contemplated for liquidity risk disclosure on which they have received much industry comment. The problem seen with public disclosure in the notes to the financial statement involves a



trade off between clearly communicating the liquidity risk exposure vs. disclosure of confidential information. The industry would prefer to see an approach similar to the one used by New York where a confidential response to a survey is filed with the State.

Regulators are considering paring down the template for liquidity risk disclosure to simply request information on institutional exposures, as these buyers of products may be able to negotiate terms that are favorable.

They plan to continue work on the prototype or template via a conference call in February 2002.

2. Suitability Working Group:

The Suitability Working Group reviewed a summary of comments received on the draft Suitability Model Law and Model Regulation implementing the law.

RBC Task Force and AVR/IMR

The following topics were discussed by various working groups related to RBC and AVR/IMR issues.

1. Life Risk Based Capital Working Group:

A variety of agenda items were included related to possible formula modifications. Topics discussed included:

- **C-4 Risk and Annuity Deposits:** Regulators confirmed that it was an intended consequence when the deposit line (1A in the old blank) was eliminated from the annual statement and some annuity business, which may have been previously reported by companies on line 1A deposits, is now reported on line 1. The result is that this premium which had been excluded from C-4 is subject to the C-4 risk factor of 2%.
- **DTA/DTL Sensitivity:** This item deals with structural changes to the 2001 RBC formula to allow a sensitivity test for elimination of DTA/DTL from the RBC calculation. RBC factors that previously contained tax adjustments have been grossed up with tax adjustments made in aggregate on the back end. As a result, the basic factors were grossed up to a pre-tax basis reflecting the implicit tax recognition inherent in the basic factors.
- **Worker's Comp in Life Insurance Companies:** As a result of the work of the Underwriting and Reinsurance Pools Working Group, blanks recommendations for worker's comp carve-out coverages will be implemented in

the 2003 statement. Therefore, the Life RBC Working Group needs to begin work on RBC so that they have a proposal for exposure in September 2002 for adoption in December 2002 with respect to RBC for worker's comp coverages in the life statement.

- Wisconsin Request to Review the Appropriateness of 50% Authorized Control Level Factor in RBC Formula: Regulators discussed a proposal from Wisconsin to review the 50% factor as a result of observations that there have been many refinements to accounting (codification) and the RBC formula itself which have caused surplus to increase or RBC to go down, both of which result in an improvement to the overall RBC ratio. This item was forwarded to other RBC working groups and additional research will be performed as to the need to review the 50% factor.
- Separate Accounts That Guarantee an Index: These products historically were thought to have little risk because the investments mirrored the index guaranteed (C-1 factor equal to NAIC Class 1 Bonds). The revised RBC approach would adjust the RBC factor for "tracking error" in cases where the investment strategy employed by a company does not track closely with the index being guaranteed. This proposal was exposed for comment.
- C-3 Phase II Project: A recommendation from the Academy related to the Phase II project will be presented at the March 2002 meeting.
- Refinement to LTC and Stop Loss C-2 Factors: The Academy gave a brief report on progress made with respect to analysis of experience data for LTC and Stop Loss for purposes of refining the C-2 factors. Findings and recommendations with respect to long-term care are expected to be presented at the March 2002 meeting.

Finally, there is a new Ad Hoc subgroup which will assist the RBC Task Force in addressing specific risk issues and in

coordinating the activities of the Life, Health and P&C RBC Working Groups.

2. Health RBC Working Group: Items discussed by the Health RBC Working Group include:

- Health Care Receivables: Health RBC was modified to recognize health care receivables which will be allowed in the 2002 blank.
- Other Items: The working group received reports on the LTC/Stop Loss C-2 project and discussed the Wisconsin proposal similar to Life RBC. It is the preference of the Health RBC Working Group to see a few years of experience under its new formula before considering a change to the Authorized Control Level factor. Finally, instructional changes for the revisions to the DI C-2 factors were adopted. It was also noted that a refinement to the Life RBC instructions is necessary to ensure proper application of the DI C-2 revisions adopted for 2001 yearend.

3. AVR/IMR Working Group: The working group discussed its charges and agenda for 2002. Items include making any necessary changes to the AVR maximum factors as a result of changes made to RBC due to codification, a review of the approach proposed by the Academy for real estate factors (cash on book approach), work related to updating the "bluebook" AVR/IMR question and answer document developed by the Academy and regulators years ago which has become dated, and to consider certain refinements to the equity component to recognize spreading of capital gains. They also discussed incorporating recognition of replication transactions into AVR as use of replication transactions increases. Finally, negative IMR recognition will be dropped from the agenda.

The RBC Task Force met and reviewed the projects discussed by the various working groups reporting to this Task Force. The Ad Hoc Subgroup will be staffed in January/February 2002 based

on those individuals expressing an interest in participating. Further research will be performed to understand whether there is a need to review the 50% Authorized Control Level Factor based on a study of recently troubled companies.

Accounting Practices and Procedures Task Force

Summarized below are highlights of what transpired at various working group and task force meetings related to accounting issues.

1. International Accounting Standards Working Group (IASWG):

The International Insurance Relations (H) Committee is now becoming more actively involved in IASB activities. The ACLI indicated they will be more active in IASB activities because it appears that FASB is now deferring on certain items for consideration by the IASB. The NAIC staff provided an update on recent IASB activities. The IASB continues to move forward on the Insurance Project with portions of the Draft Statement of Principles (Chapters 1-3) in exposure and remaining chapters expected to be exposed in December and January. It was noted by the industry that there has been little public discussion by the IASB of the Insurance Project to date.

2. Emerging Accounting Issues Working Group (EAIWG):

The following items were discussed by the EAIWG:

- Credit Life Refund Reserves: EAIWG concluded that it was acceptable to net commission and premium tax refunds against the premium refund for purposes of determining the cash surrender value floor in single premium credit life. Any excess reserve is then determined by aggregating all credit life and A&H policies.
- 90-Day Reinsurance Non-Admission Rule: EAIWG will clarify that the 90-day non-admission rule applies to premiums, recoverables and any other

*Highlights of the December 2001 NAIC Life and Health Actuarial Task Force Meeting
continued from page 9*

reinsurance receivables for all types of reinsurance agreements. Interested parties asked for clarifications to be incorporated directly into the SSAPs (No. 61 Life and No. 62 P&C) rather than via an Interpretation.

- **9/11 Events Impacting Year-end 2001 Statements:** EAIWG determined that reinsurance credits not supported by fully funded trusts as of 2001 year-end which were related to 9/11 are not disclosable items because the partial funding at 2001 year-end was permitted by the NAIC.

EAIWG also heard a request from interested parties related to commercial mortgage loan impairments and the impact of 9/11. IPs had requested that the impairments be treated as temporary rather than permanent (as Codification would require) because these impairments are felt to truly be temporary, particularly to vacation or recreational properties. Because it is impossible to distinguish between the impact of economic downturns prior to 9/11 and the 9/11 event itself, no relief was provided by EAIWG. Therefore, impairments to commercial mortgage loans will have to be permanently written down to current market appraisal value at 12/31/01.

- **Int 01-26—Reserve Disclosure Under Codification:** EAIWG heard an attempt by LHATF to have this interpretation reconsidered. The issue pertains to cases where stronger than minimum codified reserves are established. EAIWG did not change its original position which is that any

material differences are subject to disclosure.

3. **Statutory Accounting Principles Working Group:** The SAP Working Group held two meetings, a hearing agenda and a meeting agenda as discussed below.

- **Hearing Agenda:** Notable items that were discussed include Issue Paper No. 117 Accounting for Demutualizations, Adoption of AICPA SOP 00-3. By considering adoption of AICPA SOP 00-3 in Issue Paper No. 117, SAPWG is commingling GAAP with statutory concepts which creates problems with respect to lock-in and the glide path projection. Interested parties believe that adopting the concept of a Policyholder Dividend Obligation (PDO) for statutory reporting is not appropriate, especially one based on GAAP accounting. Finally, closed block disclosure was discussed.



IPs believe that disclosure such as that required in New York and New Jersey should be left to the states and not be an NAIC requirement. NAIC staff will work with IPs to address some of the concerns raised. The goal is to have finalized language for the Issue Paper in March and to begin the SSAP itself in June 2002.

- **SSAP No. 10 Income Taxes—Q and A Guidance to SSAP No. 10:** SAPWG discussed a draft dated 10/16/01 prepared by a group of industry interested parties related to questions and answers on SSAP No. 10. Most of the discussion focused on the requirements in SSAP No. 10 for legal entity specific tax calculations, given the

industry practice of filing consolidated tax returns and subsequently allocating taxes to legal entity based on tax sharing agreements.

The SAPWG adopted the tax Q and A and it is now available on the NAIC SAP Web site.

- **Meeting Agenda:** The meeting agenda included discussion of an implementation guide for SSAP No. 84 Health Care Receivables as well as a proposal to replace SSAP No. 46 Investments in Subsidiary, Controlled and Affiliated Entities (SCAs) with a new SSAP that more clearly defines valuation procedures for SCAs.
4. **NAIC/AICPA Working Group:** A hearing took place related to revisions to the Model Regulation Requiring Annual Audited Financial Reports. After hearing arguments against the revisions to the model from the AICPA and various accounting firm representatives, the NAIC voted to adopt provisions in the model which forbid the use of indemnification agreements and alternative dispute resolution provisions by accounting firms in annual statutory audit work.

Other Meetings

Several other meetings of interest took place as described below.

1. **Symposium on Debt Cancellation Contracts and Credit Insurance:** The NAIC heard a presentation sponsored by the CPCU Society on debt cancellation agreements (DCAs) and credit insurance. A debt cancellation agreement is a banking product where the lender agrees to suspend debt if certain conditions occur. The presentation contrasted this product with credit insurance where an insurer must pay off the loan. There is no regulatory solvency or capital adequacy risk under DCAs because the lender simply defers or waives repayment of

a loan. An industry representative predicted that credit insurance will move from a \$6 billion industry to a \$2 billion industry over the next 5 years because of the many problems created by a 51 jurisdiction regulatory scheme with different requirements and standards for credit insurance. Individual states do not want to lose premium tax revenue and are considering whether debt cancellation agreements should be considered insurance. Consumer representatives emphasized that there could be a place for debt cancellation agreements provided there is adequate disclosure, some minimum floor on benefits, and guaranteed type renewal provisions such that benefits cannot be cancelled when they are needed most (such as during economic downturns).

2. Reinsurance (G) Task Force: The Reinsurance Task Force discussed briefly an International Association of Insurance Supervisors paper entitled Principles on Minimum Requirements for Supervision of Reinsurers. Next they heard a presentation on a new Act in France effective May 15, 2001 related to more stringent supervision applicable to French reinsurers. Finally, they went into Executive Session to discuss funding require-

ments and other issues with respect to losses resulting from September 11, 2001.

3. American Academy of Actuaries Risk Management Education Session: The NAIC received a presentation by the AAA on risk management practices employed in the insurance industry.

4. Coordinating with Federal Regulators Subgroup on Financial Issues (Insurance Risk): This subgroup discussed a project related to mapping insurance risks into a banking risk grid. The document deals with Life and P&C risks only. Managed care was intentionally omitted. The subgroup received a letter from the American Academy of Actuaries commenting on the approach and differences between banking and insurance risks. The hope is to finish this project at the March 2002 NAIC meeting.

5. Race-Based Premium Working Group: The working group provided a status report on progress to date. A three-phase process is underway:

1) Identify companies through a survey;

2) Examination process; and
3) Remediation.

Currently, 93 companies have been reviewed to one extent or another.

- 21- Preliminary examination is completed
- 29- Examinations have been scheduled
- 17- Resolved
- 13- Examination in Process
- 9- Examinations Completed
- 2- Finalized and Complete
- 1- Remediation Process

* * *

The next NAIC meeting will be held in March 2002.

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Candidates Needed For Section Council



Elections for the Section Councils, as well as the Society of Actuaries, are fast approaching. The Financial Reporting Section has three positions which will require replacements, due to current members' terms expiring this October.

The Section is looking for candidates to add to the slate to fill the three open positions. If you, or a person you know, is willing to serve and would be interested in taking an active part in the direction of the Financial Reporting Section, please forward the names to our Section Chair, Barry Shemin at Bshemin@jhancock.com.

Don't hesitate! The deadline for submitting names is Friday, April 26; the section council slate will be finalized in early May.

SFAS 141 and 142 — A Primer

by Russell Menze and Vincent Tsang

In June 2001, the Financial Accounting Standard Board (FASB) adopted Statement of Financial Accounting Standard (SFAS) No. 141 “Business Combinations” (SFAS 141), and SFAS No. 142 “Goodwill and Other Intangible Assets” (SFAS 142). These two Statements provide guidance for financial reporting of business combinations under Generally Accepted Accounting Principles (GAAP).

The FASB adopted SFAS 141 with the main purposes of (a) providing better and more complete information on intangible assets associated with business acquired and (b) improving the comparability of financial statements by requiring that all business combinations be accounted for using a single method, the “Purchase Method.” The FASB also adopted SFAS 142 to address the proper accounting treatment for goodwill and other intangible assets in the accounting period during which the combination occurs and the proper accounting for impairment losses related to goodwill and other intangible assets in subsequent accounting periods. The adoption of SFAS 142 is important to users of financial statements since goodwill and other intangible assets are becoming more significant proportions of assets acquired in recent business combinations.

In order to comprehend the FASB’s guidance on financial reporting for business combinations, SFAS 141 and SFAS 142 should be reviewed concurrently. We have summarized some of these Statements’ key provisions below.

SFAS 141

SFAS 141 focuses on business combinations initiated after June 30, 2001. In addition, the provisions of SFAS 141 also apply to all business combinations accounted for using the Purchase Method for acquisition dates of July 1, 2001 or later. SFAS 141, however, does not affect GAAP financial reporting for previous business combinations that have been accounted for using the “Pooling-of-

Interests” method. Some of the significant provisions of SFAS 141 are summarized below:

- SFAS 141 provides a definition of “business combination” and examples of transactions that are not considered business combinations under GAAP.
- Although SFAS 141 supercedes Accounting Principles Board (APB) Opinion No. 16, “Business Combinations” (APB 16) and SFAS No. 38 “Accounting for Preacquisition Contingencies of Purchased Enterprises” (SFAS 38), many provisions and much of the guidance on purchase accounting from APB 16 and pre-acquisition contingencies from SFAS 38 are carried forward to SFAS 141.
- SFAS 141 affirms the guidance in FASB Interpretation No. 4 that tangible and intangible assets associated with research and development projects that have no alternative future use shall be charged as expenses at the acquisition date.
- The excess of purchase price over the net assets acquired or liability assumed continues to be recognized as goodwill.
- Intangible assets not satisfying either the “contractual-legal” criterion or the “separability” criterion (both of which are described in SFAS 141) shall be classified as goodwill. For business combinations with an acquisition date before July 1, 2001 accounted for under the Purchase Method, transition provisions require intangible assets not satisfying either criterion to be re-classified as goodwill upon implementation of SFAS 142.
- The reclassifications of intangible assets, however, should not affect the originally allocated prices for the assets acquired or liabilities assumed.



- The financial effects of the initial reclassifications of goodwill and intangible assets, net of income tax, shall be recognized as effects of a change in accounting principle.

SFAS 142

SFAS 142 is immediately effective for business combinations after June 30, 2001 and addresses financial reporting of goodwill and other intangible assets of an acquired entity. The Statement applies to GAAP financial statements with fiscal years beginning after December 15, 2001, and its provisions are applicable to all acquired goodwill and other intangible assets regardless of when these assets were initially recognized. Early adoption for entities with fiscal years beginning after March 15, 2001 is permitted, provided that the first interim statement has not been issued.

Provisions of SFAS 142 are not applicable to goodwill and other intangible assets generated from any of the following combinations:

- A combination between two or more mutual enterprises.
- A combination between two or more not-for-profit organizations.
- An acquisition of a for-profit business entity by a not-for-profit organization.

Goodwill and intangible assets of these specific types of business combinations shall continue to be accounted for

in accordance with APB Opinion No. 17 "Intangible Assets" (APB 17). The FASB will, in a separate project, provide guidance on the application of the Purchase Method for such combinations.

Some of the significant provisions of SFAS 142 are summarized below:

- SFAS 142 supercedes APB 17. However, APB 17 provisions regarding internally developed intangible assets are carried forward to SFAS 142.
- SFAS 142 does not change the requirement in FASB Interpretation No. 4 to expense the costs of certain acquired research and development assets at the date of acquisition.
- Intangible assets with a finite useful life should be amortized over that useful life (or the most probable estimate of useful life). The amount for amortization is the "initial recognized value" (the amount of value initially assigned to the asset) less the "residual value" (the value of the asset at the end of the amortization period if the asset is expected to have a useful life to another entity). The amortization schedule shall reflect the pattern of the intangible asset's economic benefits. If the pattern cannot be reliably determined, the straight-line method can be used as the default method. If the estimate of an intangible asset's useful life is changed, the intangible asset's remaining carrying amount should be amortized prospectively over the revised remaining useful life.
- Intangible assets subject to amortization shall be tested for impairment in accordance with paragraphs 4 to 11 of SFAS No. 121 "Accounting for the Impairment of Long-Lived Assets and Long-Lived Assets to be Disposed."
- If an intangible asset is considered to be an asset with indefinite useful life, the value of the intangible asset shall remain unamortized until its useful life is no longer considered indefinite. Determination on the status of an intangible asset's indefinite useful life

shall be made in each reporting period.

- Intangible assets that are not subject to amortization shall be tested for impairment at least annually. If an intangible asset's carrying value exceeds its fair value, the excess shall be recognized as an impairment loss. The "adjusted" carrying value (which equals the fair value) then becomes the new accounting basis. Reversal of a previously recognized impairment loss is prohibited.
- Goodwill shall not be amortized but shall be tested for impairment. Contrary to prior guidance on goodwill, SFAS 142 adopts an aggregate view on goodwill and incorporates the expected synergies between the acquired and acquiring entities in determining goodwill impairment.



Accordingly, goodwill shall be tested for impairment at the reporting unit level, defined as an operating segment or one level below an operating segment. The definition of an operating segment is stated in paragraph 10 of SFAS No. 131 "Disclosure about Segments of an Enterprise and Related Information."

- Goodwill shall be tested for impairment in a two-step process as follows:
 - The first step is to screen for potential impairment. Under the first step, impairment is indicated if the carrying value of a reporting unit (including goodwill) exceeds the fair value of the reporting unit. Guidance from paragraphs 23-25 of SFAS 142 is to be

used for determining the fair value of a reporting unit. If the carrying value of the reporting unit exceeds its fair value, then the second step is performed to measure the amount of impairment loss.

- The second step is to quantify the amount of impairment. Under the second step, the "implied fair value" of reporting unit goodwill is compared with the carrying amount of such goodwill. As goodwill is a residual value and cannot be measured directly, the implied fair value of goodwill shall be determined in the same manner as the amount of goodwill recognized in a business combination (as if the reporting unit were acquired as of the financial statement date). Accordingly, the fair value is assumed to be the "purchase price" of the reporting unit as of the financial statement date. The reporting unit then allocates its fair value to all of its assets and liabilities, with the resulting goodwill amount (the implied fair value of the goodwill) being the excess of the fair value of the reporting unit over amounts assigned to its assets and liabilities. The excess of the carrying amount of the goodwill over the implied fair value equals the impairment loss.

- If an acquiring entity re-organized its reporting unit structure resulting in the disposition of a portion or all of a reporting unit, SFAS 142 provides additional guidance on reassignment or write-off of goodwill associated with such reporting unit.
- Goodwill of a public or non-public subsidiary shall be tested for impairment at the subsidiary level using the subsidiary's reporting unit. If a subsidiary's reporting unit belongs to a reporting unit at a higher consolidated level, and the goodwill of that subsidiary's reporting unit is considered to be impaired, the goodwill impairment would be recorded at the subsidiary level and, if the event that triggered the impairment at the subsidiary level would "more likely than not"

continued on page 14

*SFAS 141 and 142 — A Primer
continued from page 13*

reduce the fair value of the reporting unit at the consolidated level, then the goodwill impairment test needs to be performed at the consolidated level as well.

- Previously recognized intangible assets deemed to have indefinite useful life shall be tested for impairment as of the beginning of the fiscal year when SFAS 142 is initially applied. A transitional impairment test shall be completed before the end of the first interim period and any impairment loss shall be recognized as the effect of a change in accounting principle. The amortization expense and impairment losses in subsequent periods shall be reflected in Income from Continuing Operations.
- Previously recognized goodwill shall be tested for impairment as of the

Accounting Measurement”, for estimating fair values used in testing impairment of goodwill and other intangible assets.

Estimating the Fair Value of a Reporting Unit—Implementation Considerations

Paragraphs 23 through 25 of SFAS 142 discuss a number of ways (for example, market value of stock, multiple of earnings or other indices, present value techniques, and so forth) to estimate the fair value of a reporting unit. The overriding concept is that the fair value of the reporting unit is the amount at which the unit could be bought or sold in a current transaction between willing parties. In applying this concept to insurance liabilities, valuation techniques used to value insurance companies or blocks of business are applied to the reporting unit.

“leverage” actuarial analyses performed for other purposes by making adjustments to such analyses for SFAS 142 reporting purposes. Examples of such analyses might include the following:

- Cash flow testing performed in support of the Actuarial Opinion and Memorandum.
- Actuarial appraisals performed in conjunction with previous acquisitions.
- Other special-purpose analysis such as profitability analyses, Embedded Value analyses, or demutualization-related calculations.

As an example, following is a discussion of how cash flow testing (CFT) may be leveraged for purposes of meeting the requirements of SFAS 142.

Per statutory requirements regarding the Actuarial Opinion and Memorandum regulations, most life insurance companies are required to perform CFT analysis on their in-force policies for year-end Actuarial Opinion filings. In leveraging CFT analysis for purposes of SFAS 142, actuarial models and related analysis should be used with caution for the following reasons:

- The CFT actuarial models are created primarily for testing the adequacy of statutory reserves. As goodwill is a GAAP intangible asset and statutory reserves are statutory liabilities, use of such actuarial models may create a “disconnect” in testing goodwill impairment.
- The fair-value of a reporting unit should be based on the most probable assumptions. Actuarial assumptions for CFT analysis, on the other hand, are typically chosen from a valuation actuary perspective and would likely reflect conservative margins.

“Because the fair value of a reporting unit is not limited to the value of its in-force business, synergies, control premiums, and other relevant factors should also be considered.”

beginning of the fiscal year when SFAS 142 is initially applied. The first step of the transitional impairment test shall be completed within six months, and the second step shall be completed no later than the end of the fiscal year. Any transitional goodwill impairment loss shall be recognized as the effect of a change in accounting principle. The impairment losses of goodwill in subsequent periods shall be reflected in Income from Continuing Operations.

- SFAS 142 affirms the utilization of guidance in the FASB Concept Statement 7, “Using Cash Flow Information and Present Value in

Accordingly, as is the case in an acquisition situation, actuarial appraisal analyses (per Actuarial Standard of Practice No. 19, “Actuarial Appraisals”) may be considered an appropriate method to estimate the fair value of an insurance company’s reporting units. Because the fair value of a reporting unit is not limited to the value of its in-force business, synergies, control premiums, and other relevant factors should also be considered.

The challenge for many insurers in implementing SFAS 142 is the additional time, company resources, and cost needed to perform actuarial appraisal analyses needed to effect such implementation. However, insurers may be able to

- The year-end CFT actuarial models do not include new business and do not necessarily reflect the anticipated synergies between the acquiring and acquired entities.

Thus, in order to perform the goodwill impairment test using CFT analyses, adjustments should be made to reflect inherent differences between CFT analysis used for statutory compliance, and actuarial appraisal analysis used for fair valuation purposes. One might take an approach to adjusting the CFT analyses, with steps as follows:

1. Convert the CFT models from a “cash flow” approach to a “valuation” approach. Typically this would involve implementing “required capital” cash flows such that the CFT model projects “distributable earnings”, that is, statutory earnings adjusted for required increases and decreases in capital required to support the block of business.

2. Substitute “most probable” assumptions into the CFT model determined in (1) above.
3. Construct a “new business” model to estimate the value of profits from future sales.
4. Refine the Models in (2) and (3) to include anticipated “synergies” between the acquiring and acquired entities.

The number of steps and the degree of refinement needed will depend on the specific characteristics of a particular reporting segment being tested. These characteristics include, among other things, the amount of goodwill, the size of the segment relative to the goodwill, the anticipated profitability of the business generating the goodwill, and the anticipated profitability of other business in the segment not related to the goodwill.

The steps outlined above are easier said than done. Significant effort may be required to perform the adjustments to the CFT model just for step (1). However, this approach could assist with effective “leveraging” of existing actuarial modeling, saving some of the effort and expense that may be required for a “from-scratch” actuarial appraisal analysis.

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Chair's Corner

by Barry Shemin

As I write this, in the beginning of 2002, the environment for life insurance companies in North America comes close to being the worst of all possible worlds. It features the following menu of attractions:

- *Lackluster equity market performance*—which not only depresses sales of variable annuities and variable life insurance, the industry's previously hottest products, but also reduces asset-based fees on inforce variable business.
- *Low interest rates*—which reduce the sales advantages of the industry's fixed products in comparison with other savings media, because expenses become proportionately more important in a low-interest-rate environment. In addition, the tax advantages of our products are worth less. Of course, there is usually a temporary opportunity to achieve wider interest spreads in a declining interest rate environment, and wide corporate bond spreads amplify this effect, but in the longer term there may be a danger of hitting the long term interest guarantees built into life and annuity products if interest rates continue to decline.
- *A recessionary economy*—which increases default rates on fixed income investments and reduces disposable income and consumer confidence, key drivers of product sales.
- *Reduction of estate taxes*—which cuts the amount of life insurance needed for estate liquidity, and reduction of income tax rates, which lowers the value of tax-advantaged products.

What are the implications of this environment for financial reporting actuaries?

For those financial reporting actuaries who function as appointed actuary, or whose work supports their company's appointed actuary, one obvious implication is to review carefully the results of cash flow testing to understand fully

what is projected to happen in declining interest scenarios. Even if margins remain under these scenarios, it is worthwhile to evaluate the amount of margins and to examine trends from prior years so as to get a sense of the exposure to future interest rate declines. How much would interest rates (or corporate bond spreads) have to decline before it would be necessary to establish additional reserves? Are there asset-liability management initiatives that should be undertaken to avoid this possibility?

For variable annuities, Actuarial Guideline 34 already requires the establishment of significant additional statutory reserves for guaranteed minimum death benefits in the aftermath of a stock market decline. Now that many contracts are either "in the money" or close to it, it would be useful to model the emergence of additional reserves in the future for given levels of additional stock market decline. For new products, stochastic modeling of GMDBs is going to become a necessity now that the exposures of these benefits have been experienced, both to quantify the emergence of AG 34 reserves on a probabilistic basis as part of the statutory pricing flows and to determine the appropriate target capital amounts. I would not be surprised to see increasing restraint in the design of these benefits going forward. Similar issues are present, although of smaller size (so far), for variable annuity guaranteed living benefits and variable life GMDBs.

The current environment has significant implications under U.S. GAAP accounting, as well. The most obvious, and one which has been addressed by most companies by now, is volatility of earnings (in the downward direction) from higher variable life and annuity DAC amortization, caused by lower future fees/margins as the account values decline with the stock market. Many companies have developed methods which moderate this volatility, but generally such methods increase the company's exposure to future earnings declines if stock market performance continues to lag behind GAAP assumptions.

For universal life and fixed annuities, there are the growth issues mentioned earlier, but current interest spreads are generally favorable, reflecting the decline in crediting rates and the increase in corporate bond spreads (not yet severely impacted by defaults). A question to consider in estimating the

future gross margins for DAC amortization is whether this situation is likely to continue indefinitely into the future. If spreads in the future are smaller than assumed,

there could be adverse earnings impacts from increased DAC amortization.

In low-interest-rate environments expense levels begin to assume greater relative importance. Life insurance companies tend to have higher expense levels than other financial services companies with whom we compete for savings and investment dollars, and this probably causes increased pressure on future expense levels.

The role of actuaries in expense analysis varies significantly from one company to another. At a minimum, actuaries are usually involved in developing unit expense factors for pricing and GAAP estimated margins. But there would seem to be a real need for better information for benchmarking unit expenses, and actuaries have much to contribute in this area. The SOA has established the Committee on Life Insurance Company Expenses both to continue to produce the NAIC Generally Recognized Expense Table (GRET) used in some life insurance illustrations, and to develop additional expense information that might be of value to actuaries. Here's hoping this group can use the resources of the actuarial profession to meet a need for better expense information.

Maybe I'm being too pessimistic in describing this environment as "the worst of all possible worlds." If you disagree with me, please write a note to Tom Nace, the Editor of this newsletter, and tell us why. I would sure like to be convinced otherwise.

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Barry Shemin

Financial Reporting Section Co-Sponsors Seminar on FAS141 and FAS142 Business Combinations, Goodwill and Other Intangible Assets

The American Academy of Actuaries and the Society of Actuaries Financial Reporting Section will be co-sponsoring the seminar, Accounting for Business Combinations, Goodwill and Other Intangible Assets: FASB Statements 141 and 142 (Seminar #010).

The seminar will be held on April 23, 2002 at the New York Hilton and Towers, New York City, NY.

The rules have changed. It's vitally important—now more than ever—to understand both the numbers and what they mean, since the new accounting pronouncements will have a significant impact on the M&A marketplace. Public companies can expect heightened scrutiny from the financial community—the SEC, analysts, rating agencies and investors—on how they are applying the new guidance. Going forward, companies will need to give even more thought to how they organize to wring out the synergies and opportunities promised in “the deal.”

Attendees to Accounting for Business Combinations, Goodwill and Other Intangible Assets will learn both the details and the business implications of the new guidance. They will gain an understanding of how the broad principles of Statements 141 and 142 are being applied in real life situations from a faculty of experienced practitioners.

The seminar is geared towards professionals involved in the acquisitions market, actuaries responsible for or working in financial reporting, reinsurance and smaller insurance companies, along with insurance company accountants. This seminar has been approved for six units of Professional Development credit.

If you have not received the brochure in the mail with the registration form, you can contact the Society office for more information.

Joint AAA/SOA Seminar on FASB Statements 141 & 142 April 22, 2002

6:00 - 7:30 pm	Early Bird Reception
April 23, 2002	
9:00 - 9:15 am	Welcoming remarks and introductions
9:15 - 10:45 am	<i>Teaching Unit 1 - A Brief Review of the Basics of Purchase Accounting</i> - The PGAAP balance sheet - Emergence of profit under PGAAP - Determining opening values for the balance sheet
10:45 - 11:00 am	Break
11:00 - 11:30 am	<i>Teaching Unit 2 - Summary of Changes in Statements 141 & 142</i> - Review major changes - Post-acquisition organization - identifying reporting units
11:30 - 11:45 am	Morning questions and answers
11:45 - 1:00p	Lunch
1:00 - 2:30	<i>Teaching Unit 3 - Intangible Assets in Depth</i> - Identifying and assigning intangible assets other than goodwill to reporting units - Assigning goodwill to reporting units
2:30 - 2:45	Break
2:45 - 4:15	<i>Teaching Unit 4 - Goodwill Impairment Testing</i> - Goodwill impairment testing - Goodwill impairments and write downs (summarize) - Fair value guidance in Statement 142 and elsewhere - Financial statement disclosures
4:15 - 4:45	Ask the experts
4:45 - 5:00	Post-seminar critique forms/concluding remarks

Marginal Analysis of Risk-Based Capital

by Tony Zeppetella

Capital Cost of Equity Investments Reduced For Life Insurers

The NAIC formula for Risk-Based Capital (RBC) has been in use for nearly 10 years and in that time many changes have been made. A great deal of complexity has been added. Starting with the calculation for year-end 2001, a structural change in the treatment of equity risk will have a major effect on the capital requirements for equity investments for most companies. In the June, 1993 issue of *The Financial Reporter*, I published an article entitled "Marginal Analysis of Risk-Based Capital" which investigated the effect of changes in the various independent variables, which enter into the formula. This is an appropriate time to update that analysis. Knowledge of the aforementioned paper and a history of the formula's evolution is not required, but I will assume a moderate level of familiarity with the current formula so that a detailed description need not be presented.

Among the most significant of the recent changes are the separation of common stock equity risk from other C-1 asset risk, and the adjustment of some factors for the effect of taxes. Regulators want to be able to look at the sensitivity of the result to the tax effects so the calculation is done with pre-tax factors and subsequent adjustments are made for taxes at the end. The separation of the common equity risk from other asset risk is based upon the assumption of zero correlation between them. The formula actually includes a correlation factor, which is currently set to zero. There are also many changes in the factors applied to each item so that the net after-tax factor is generally the same as or lower than in previous years.

The current formula is

$$RBC = C-0 + C-4a + \sqrt{(C-1_o + C-3a)^2 + (C-1_{cs})^2 + (C-2)^2 + (C-3b)^2 + (C-4b)^2}, \text{ where}$$

- C-0 = subsidiary insurance companies' RBC
- C-4a = business risk
- C-1_o = asset risk, for other than common equity-like assets
- C-3a = interest rate risk
- C-1_{cs} = risk from common equity-like assets (common stocks, affiliated preferred stocks, and Schedule BA assets classified as common equity)
- C-2 = insurance risk
- C-3b = health credit risk
- C-4b = health administrative expense business risk.

Since C-0 is computed by a look-through approach and C-4a is a simple linear function of premiums and separate account liabilities, this article will concentrate on the part of the formula under the square root. Each type of risk C-j is a function of many risk factors X_i which represent values such as the net amount at risk on individual or group life insurance, the statement values of the NAIC Classes 1-6 bonds, the number of different bond issuers held, premiums levels, etc. In general, the C-j are differentiable, even linear, functions of the independent variables X_i. Some are piecewise linear since they have break points, like the net amount at risk and certain health premiums in C-2. These can be differentiated except at the isolated break points. The number of bond issuers, which is a discrete variable, and the asset concentration factors are examples which either have to be treated as constant or analyzed separately.

For any variable x,

$$\frac{\partial RBC}{\partial x} = \frac{\partial C-0}{\partial x} + \frac{\partial C-4a}{\partial x} + \frac{\partial RBC}{\partial C-1_o} \frac{\partial C-1_o}{\partial x} + \frac{\partial RBC}{\partial C-3a} \frac{\partial C-3a}{\partial x} + \frac{\partial RBC}{\partial C-1_{cs}} \frac{\partial C-1_{cs}}{\partial x} + \frac{\partial RBC}{\partial C-2} \frac{\partial C-2}{\partial x} + \frac{\partial RBC}{\partial C-3b} \frac{\partial C-3b}{\partial x} + \frac{\partial RBC}{\partial C-4b} \frac{\partial C-4b}{\partial x}$$

The variable x will in general only affect a couple of the C's so several of the above terms will be zero.

$$\text{Letting } SQRT = \sqrt{(C-1_o + C-3a)^2 + (C-1_{cs})^2 + (C-2)^2 + (C-3b)^2 + (C-4b)^2}$$

and taking the partial derivatives, we find that

$$\frac{\partial RBC}{\partial C-1_o} = \frac{(C-1_o + C-3a)}{SQRT}, \text{ which I will call } w-1_o \text{ and this also equals } \frac{\partial RBC}{\partial C-3a}.$$

Similarly, the other partial derivatives of RBC with respect to the various C's are

$$w-1_{cs} = \frac{\partial RBC}{\partial C-1_{cs}} = \frac{C-1_{cs}}{SQRT}$$

$$w-2 = \frac{\partial RBC}{\partial C-2} = \frac{C-2}{SQRT}$$

$$w-3b = \frac{\partial RBC}{\partial C-3b} = \frac{C-3b}{SQRT}$$

$$w-4b = \frac{\partial RBC}{\partial C-4b} = \frac{C-4b}{SQRT}$$

Then,

$$\frac{\partial RBC}{\partial x} = \frac{\partial C-0}{\partial x} + \frac{\partial C-4a}{\partial x} + w-1_0 \frac{\partial C-1_0}{\partial x} + w-1_0 \frac{\partial C-3a}{\partial x} + w-1_{cs} \frac{\partial C-1_{cs}}{\partial x} + w-2 \frac{\partial C-2}{\partial x} + w-3b \frac{\partial C-3b}{\partial x} + w-4b \frac{\partial C-4b}{\partial x}.$$

The w's are weights reflecting the ratio of each risk component to the total square root of the sum of the squares of all the risk components in the square root. They summarize the company's risk profile, at least according to the NAIC formula. A company with a high $w-1_0$ near 1 has a lot of its risks in asset and/or interest rate risk. A health insurer would have a higher $w-2$ and possibly higher $w-3b$ and $w-4b$ weights. Note that $(w-1_0)^2 + (w-1_{cs})^2 + (w-2)^2 + (w-3b)^2 + (w-4b)^2 = 1$.

The derivatives of the C's with respect to x are what people often think of as the RBC factor for the variable x . For example, the factor for Class 2 bonds is .01. In fact, the partial derivative formula shows that this has to be multiplied by the weight $w-1_0$. In addition, it is modified by the bond size factor. The complete calculation would be: Pre-tax factor \times (1- tax factor) \times bond size factor \times $w-1_0$.

The weights can make a substantial difference in the marginal effect and hence in a company's determination of its strategies. Many investment decisions are made based upon a comparison of the extra return versus the extra RBC charge. Such a determination may rule out equity investments if one uses the (approximate) 30% factor for equities. Yet a company with no equities, has $w-1_{cs} = 0$ and has nearly no additional RBC for adding small amounts of equity!

An example is helpful in understanding the effect of the RBC formula change and the marginal analysis presented above. Consider a simplified individual life and annuity company with the following balance sheet (amounts in millions):

Bonds	7,000	Individual Life Reserves	6,750
Mortgages	1,500	Individual Annuity Reserves	2,250
Common Stock	500	Dividend Liability	400
Real Estate	200		
Policy Loans	500		
Cash & S-T	300		
Other Assets	<u>300</u>	Surplus & AVR	<u>900</u>
Total Assets	10,300	Total Liabilities & Surplus	10,300

The asset allocation is intended to be representative of such a \$10 billion company. With further assumptions about the quality distribution of the bonds and commercial mortgages and types of real estate and other items, the RBC formula produces:

$$C-1_0 = 172, C-3a = 69, C-1_{cs} = 156, C-2 = 21, C-4a = 12 \text{ and } C-0 = C-3b = C-4b = 0.$$

$$SQRT = \sqrt{(172+69)^2 + 156^2 + 21^2} = 288, w-1_0 = (172+69)/288 = .8368, w-1_{cs} = 156/288 = .5417,$$

$$w-2 = 21/288 = .0729.$$

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These w 's indicate that the company's risk is mostly asset risk, with negligible insurance risk, and with common stock RBC factors reduced to 54% of the basic formula factors. The marginal effect of a change in common stock is: pre-tax factor \times (1- tax factor) \times $w-1_{cs} = .45 \times (1-.35) \times .5417 = 15.84\%$, which is about half of what would be expected from the common stock factor. A company which has a lower stock allocation (or a portfolio with a lower β) would have a lower $w-1_0$ and hence an even lower marginal cost of equity investments. Added insurance risk through additional net amount at risk or adding health premium would add only about 7% of the expected RBC for this company.

The total RBC in this example is $C-0 + C-4a + \text{SQRT} = 300$ under the new 2001 formula. Note that under the old formula's structure in which $C-1_{cs}$ is combined with the rest of the asset risk $C-1_0$ (i.e., equity risk is assumed to be fully correlated with other asset risk), the RBC would be $12 + ((172+156+69)^2 + 21^2)^{1/2} = 410$. The structure of the new formula has reduced the RBC from 410 to 300, a 27% reduction. The RBC ratio went from 268% to 367%.

Optimal Allocation of Risks

If insurers are paid to take risks, it is interesting to consider the question of optimal allocation of risks (per NAIC formula) to produce the minimum RBC given a constant total $C-1_0 + C-3a + C-1_{cs} + C-2 + C-3b + C-4b$ or constant total of the subset of the nonzero C 's. The solution to the mathematical problem:

Minimize $\sqrt{(x_1^2 + x_2^2 + \dots + x_n^2)}$ subject to $x_1 + x_2 + \dots + x_n = k = \text{constant}$, is $x_i = k/n$ for each i .

Thus the mix of risks optimal in this sense would require arranging the company's business so that its various RBC components are equal. The opposite problem of maximizing the RBC for a constant total of the C 's has n distinct solutions with one $C-j = k$ and all other $C-i = 0$. This shows that the more the risks are spread among the various components, the lower the RBC. Extreme concentration of risk produces higher RBC, more diversification lowers the RBC. Certainly in this sense the formula gives the intuitively desired result.

The investment managers may have to take the liability risks as fixed and might want to consider allocating investment risks to minimize the RBC capital requirement. Only $C-1_0$, $C-3a$, and $C-1_{cs}$ are able to be varied. If their total is to be constant, the solution to this problem is to arrange assets so that $C-1_{cs} = (C-1_0 + C-3a)$, if one so desires. Obviously, the asset and risk allocation decisions should not be made purely from these considerations but it is interesting to understand how RBC is affected.

In summary, this article has shown that each factor in the RBC calculation has an associated weighting which moderates its effect on the formula. The weighting depends on the relative sizes of the various risk components in the formula and must be considered when estimating the marginal effect on RBC of changes in the risk factors.

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On the Fair Value of Business Acquired

by Joe Koltisko

Editor's Note: The first part of this article appeared in issue No. 47 of The Financial Reporter.

The first half of this article promised a lot. Here I will provide all the formulas hinted at previously. I asserted that: (a) the root cause of controversy, in setting the VOBA asset for life insurance PGAAP, is lack of clarity about the mechanism which links profit margins, cash flows, and their respective discount rates; (b) The right actuarial appraisal hurdle rate is a function of value, risk and tax costs on each side of the balance sheet; (c) There is a simple formula for applying the Milholland method, to calculate GAAP VOBA from a stat-based actuarial appraisal:

$$VOBA = [PVDE - \text{tax basis adjustment}] / (1 - \text{tax rate}) - [(\text{Mkt value of assets}) - (\text{PGAAP reserves})]$$

where PVDE is the usual present value of distributable earnings, and the tax basis adjustment is 35% of the tax basis equity. I defended this approach if the actuary can demonstrate that the hurdle rate is a leverage-adjusted "true" cost of capital.

Economic Rates of Return

To understand what is "leverage-adjusted" vs. "risk adjusted" cost of capital, let's distinguish between a few key rates of return in a multi-scenario, multi-year projection:

$i(s,t)$ Yield on the asset portfolio in scenario s , year t , pretax

$d(s,t)$ Company's marginal pretax borrowing rate, loaded for credit risk and liquidity, in year t

$K(s, t)$ Marginal rate of return on capital required in scenario s , year t

K_L Leverage-adjusted cost of capital

The scenario set S should be consistent with the purpose of the projection. For fair valuation of VOBA, it should be a risk neutral scenario set, such that the mean present value of traded securities equals the current price for those securities. The algebra provided below works regardless of whether the scenario set is calibrated to market or not.

Common practice is to set $d(s, t)$ equal to current interest rates in scenario s at time t , plus a load for credit risk as indicated by the company's outstanding debt. Now, this is simplistic but reasonable from the perspective of external investors. The best tools for internal pricing managers to use in directly risk-adjusting the claims liability involve transforming its cumulative probability distribution, and not loading a spread onto the discount rate. I will follow the loaded spread approach in this article though, under the implicit assumption that the company's next promise to all policyholders is as good as its last promise to creditors. This is a complicated issue. Suffice it to say that in actual pricing it could create the incentive for any one line of business to bet the company's credit rating.

Typical practice in appraisal work is to pick K_L with reference to the cost of recent IPOs or to manager's guesses about investor expectations for GAAP ROEs. The scenario set is usually a deterministic base case with sensitivity tests. Our intuition about what is a reasonable value for K_L breaks down when we move to multi-scenario, multi-period valuation. $K(s,t)$ should vary over time as the level of risk and the value of the related assets and liabilities changes. I refer to $K(s,t)$ as the "price" rather than the "cost" of capital.

Here is the main idea, which I illustrate in Example 1 below. We use i (asset market yield) and d (liability borrowing rate) to value future investment and insurance cash flows directly. We also have to present value the *future tax gains and losses* (here generically called "tax deductions") earned on assets and liabilities. The tax deduction for a given asset is earned only when we credit the tax value of the asset. For



instance, if the market value of the assets is \$1000 and the present value of future tax deductions is \$400, those assets are worth $(1-35%)*1000 + 35% * 400 = \790 on an after-tax basis. If that tax deduction comes tomorrow, there will be almost no difference between the pretax and after tax value of the asset. If

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Example 1

Asset yield (i)										IRR = 36%	
Liability borrowing rate (d)										A	
Time	Premium	Nil	Benefits	Chg Reserve	Expenses	FIT	A/T Income	Chg in Target Surplus	Distributable Earnings		
0	134			234		7	(107)	30	(137)		
1	1200	21	300	635	220	22	44	15	29		
2	1100	73	450	466	150	23	84	65	19		
3		116	1100	(1,335)	150	44	156	(110)	266		
Time	Stat Assets	Stat Reserves	Target Surplus	Tax Assets	Tax Reserves	Taxable Income	TBA = 35%*(TVA - TVL)				
0	264	234	30	264	115	19	52				
1	914	869	45	914	754	63	56				
2	1,445	1,335	110	1,445	1,261	65	64				
3	-	-	-	-	-	127	-				
B		C		D		E					
Time	Chg tax Assets	Chg tax Liabilities	PV of future tax deductions								
0	264	115	Assets (i)	Liabilities (d)							
1	650	638	90	5							
2	531	508	747	644							
3	(1,445)	(1,261)	1,338	1,190							
			-	-							
F		G		H		I		J		K	
Time	Pretax Asset value	Asset Tax Costs	After tax Asset value	Liability Cash flow	Pretax Liab Value	Liability Tax Costs	After tax Liab Value	Shareholder Value			
0	264	90	203	(134)	(37)	5	(22)	225			
1	914	747	856	(680)	641	644	642	214			
2	1,445	1,338	1,407	(500)	1,179	1,190	1,183	224			
3	-	-	-	1,250		-	-	-			
L		M		N		O		P			
Time	Asset yield * a/t value	Liab yield * a/t value	K(s,t)		Distributable Earnings	PVDE at K(s,t)	PVDE at 13.0%	PVI-A	PVI-L		
0			7.8%		(137)	225	225	174	110		
1	16	(1)	14.0%		29	214	225	167	110		
2	68	39	18.5%		19	224	235	107	71		
3	113	71			266			-	-		

the tax deduction effectively never comes (steady state assumption) then the effective tax rate is the marginal corporate rate (here 35%).

For ease of illustration I am using a single scenario with loaded discount rates applied to the tax deductions.

According to economic theory, the right discount rate to use for these tax deductions is the risk free rate, not *i* and not *d*, since the counterparty to these cash flows is the government.

Recall this has almost nothing to do with the tax position of shareholders and

creditors. It is about the tax burden from taking investment gains and losses within a U.S. corporation. Armed with the after (corporate) tax value of the assets and liabilities in the company, we can subtract to get the after tax net value of equity. This may change sign in some

Example 2

Deferred Annuity Acquisition
 Asset market yield = book yield

Section 1

Change in asset market yields **0.0%** vs base 7%
 Change in liability spread **0.0%** vs. base 6.5%

Amounts per unit issued

Time	Acct Value	Stat Reserve	Target Surplus	Assets Mkt Value	Asset Book Yield	Int Credited	Policy Loads	Surr Chg	NII on Reserves	TS NII	Interest Credited	Surr Rate	Survivorship
0	100,000	94,000	4,700	98,700				6.0%					100.0%
1	106,900	100,486	5,024	105,510	7.0%	7.0%	100	6.0%	6,580	329	7,000	15.0%	85.0%
2	114,283	108,569	5,428	113,997	7.0%	7.0%	100	5.0%	7,034	352	7,483	10.0%	76.5%
3	121,040	114,988	5,749	120,737	7.0%	6.0%	100	5.0%	7,600	380	6,857	10.0%	68.9%
4	126,992	121,912	6,096	128,008	7.0%	5.0%	100	4.0%	8,049	402	6,052	10.0%	62.0%
5	133,242	127,912	6,396	134,308	7.0%	5.0%	100	4.0%	8,534	427	6,350	10.0%	55.8%
6	139,804	134,212	6,711	140,922	7.0%	5.0%	100	4.0%	8,954	448	6,662	10.0%	50.2%
7	146,694	142,293	7,115	149,408	7.0%	5.0%	100	3.0%	9,395	470	6,990	10.0%	45.2%
8	153,929	149,311	7,466	156,776	7.0%	5.0%	100	3.0%	9,961	498	7,335	15.0%	38.4%
9	161,525	158,294	7,915	166,209	7.0%	5.0%	100	2.0%	10,452	523	7,696	25.0%	28.8%
10	169,501	166,111	8,306		7.0%	5.0%	100	2.0%	11,081	554	8,076	100.0%	0.0%

Amounts per unit in force

Time	Stat Assets	Stat Reserve	Target Surplus	Net Inv Income	Paid Surr Benefits	Chg Reserve	Stat Book Profits	Tax	After Tax Profits	Chg TS	Dist Earnings	14.1% PVDE	MV Assets
0	98,700	94,000	4,700									4,803	98,700
1	89,684	85,413	4,271	6,909	15,073	(8,587)	423	148	275	(429)	704	4,775	89,684
2	87,208	83,055	4,153	6,278	9,228	(2,358)	(593)	(207)	(385)	(118)	(267)	5,714	87,208
3	83,128	79,169	3,958	6,105	8,797	(3,886)	1,194	418	776	(194)	970	5,548	83,128
4	79,320	75,543	3,777	5,819	8,394	(3,626)	1,052	368	684	(181)	865	5,464	79,320
5	74,901	71,335	3,567	5,552	7,926	(4,208)	1,835	642	1,193	(210)	1,403	4,830	74,901
6	70,731	67,363	3,368	5,243	7,485	(3,972)	1,730	605	1,124	(199)	1,323	4,187	70,731
7	67,491	64,277	3,214	4,951	7,142	(3,086)	895	313	582	(154)	736	4,040	67,491
8	60,197	57,330	2,867	4,724	10,117	(6,947)	1,554	544	1,010	(347)	1,358	3,251	60,197
9	47,864	45,585	2,279	4,214	15,195	(11,745)	764	268	497	(587)	1,084	2,625	47,864
10	-	-	-	3,350	47,836	(45,585)	1,099	385	715	(2,279)	2,994	0	-

Section 2

Time	Account Value	Lapse of Acct Val	Policy Loads	Normalized Crediting Rate	PGAAP Reserve	Interest Earned	PGAAP Adj	Interest Credited	PGAAP Interest Margin	Surrender Charges	Gross Profits	PV Gross Profits Crediting Rate	Risk Rate
0	100,000				104,308							13,914	10,468
1	90,865	16,035	100	5.0%	93,389	6,580	1,785	7,000	1,365	962	2,427	12,184	9,282
2	87,426	9,714	85	5.0%	88,259	5,979	1,691	6,361	1,309	486	1,880	10,913	8,503
3	83,336	9,260	77	5.0%	83,336	5,814	833	5,246	1,401	463	1,940	9,518	7,571
4	78,691	8,743	69	5.0%	78,691	5,542	0	4,167	1,375	350	1,794	8,200	6,676
5	74,307	8,256	62	5.0%	74,307	5,288	0	3,935	1,353	330	1,746	6,864	5,722
6	70,170	7,797	56	5.0%	70,170	4,993	-	3,715	1,278	312	1,646	5,562	4,755
7	66,265	7,363	50	5.0%	66,265	4,715	-	3,508	1,207	221	1,478	4,362	3,841
8	59,103	10,430	45	5.0%	59,103	4,499	(0)	3,313	1,186	313	1,544	3,036	2,752
9	46,515	15,505	38	5.0%	46,515	4,013	-	2,955	1,058	310	1,406	1,781	1,672
10	-	48,812	29	5.0%		3,191	-	2,326	865	976	1,870		

Time	Invested Assets	VOBA	Goodwill	PGAAP Reserve	DTL	Equity	Interest Margin	Policy loads	Interest on TS	Surr Chgs	VOBA Amrt	Pretax Income	
0	98,700	10,468	-	104,308	56	4,803							
1	89,684	9,165	-	93,389	416	5,044							
2	87,208	8,209	-	88,259	1,052	6,106		1,365	100	329	962	1,454	
3	83,128	7,160	-	83,336	1,048	5,904		1,309	85	299	486	1,223	
4	79,320	6,169	-	78,691	1,057	5,741		1,401	77	291	463	1,182	
5	74,901	5,164	-	74,307	767	4,991		1,375	69	277	350	991	
6	70,731	4,184	-	70,170	482	4,263		1,353	62	264	330	1,005	
7	67,491	3,281	-	66,265	453	4,055		1,278	56	250	312	980	
8	60,197	2,284	-	62,665	453	4,055		1,207	50	236	221	903	
9	47,864	1,340	-	59,103	179	3,198		1,207	45	225	313	998	
10	-	-	-	46,515	143	2,545		1,186	38	201	310	944	
								865	29	160	976	1,340	690

scenarios if assets become worth less than liabilities.

Because we know the value of the block at each time t, we can back in to K(s,t). It is the weighted average of the

pretax yield on assets and liabilities (here, “i” and “d”) where the weights are the after tax values of assets and liabilities. Note the liability weight has a negative sign. If the net value of equity changes

sign, K(s,t) becomes infinite for a moment; it may stay negative for some periods. You wouldn’t want this to happen in many scenarios most of the time—but this is reasonable behavior for a marginal

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EXAMPLE 2 (CONT.)

Section 3

Time	Incurred Taxes	After tax Income	Dividends Paid	ROE	PVI-a	After tax Assets	6.500% Liab value	PVI-I	After tax Liabilities	A - L Value	GAAP Equity / Fair Value
0					38,643	85,175	91,824	34,898	80,371	4,803	100%
1	509	945	704	19.7%	34,439	77,630	82,720	31,056	72,793	4,837	104%
2	428	795	(267)	15.8%	30,572	76,508	78,868	27,523	70,700	5,807	105%
3	414	768	970	12.6%	26,608	73,815	75,198	23,913	68,218	5,597	105%
4	378	702	865	11.9%	22,651	71,392	71,692	20,322	65,927	5,465	105%
5	352	653	1,403	11.4%	18,685	68,362	68,426	16,732	63,588	4,774	105%
6	320	595	1,323	11.9%	14,749	65,569	65,389	13,183	61,466	4,103	104%
7	284	527	736	12.4%	10,831	63,700	62,497	9,661	59,739	3,962	102%
8	270	502	1,358	12.4%	6,865	57,794	56,442	6,111	54,614	3,180	101%
9	232	431	1,084	13.5%	3,131	46,768	44,916	2,782	44,176	2,592	98%
10	241	448	2,994	17.6%	-	-	-	-	-	-	-
		Weighted avg		13.6%							

Time	A/T assets * yield	A/T liability * debt rate	Net Return	K(s,t)	PVDE at K(s,t)
0					4,803
1	5,962	5,224	738	15.4%	4,837
2	5,434	4,732	703	14.5%	5,807
3	5,356	4,596	760	13.1%	5,597
4	5,167	4,434	733	13.1%	5,465
5	4,997	4,285	712	13.0%	4,774
6	4,785	4,133	652	13.7%	4,103
7	4,590	3,995	595	14.5%	3,962
8	4,459	3,883	576	14.5%	3,180
9	4,046	3,550	496	15.6%	2,592
10	3,274	2,871	402	15.5%	

Weighted average ROE uses beginning of period equity as weights

rate in a realistic scenario set. Because we know the value at the start of each scenario, we can determine a pathwise IRR. This rate of return to shareholders is “leverage adjusted”, since it is a function of the relative weight (in market value terms) and the required return on assets and liabilities. For instance, if liabilities are practically zero, the fair rate of return should be close to the market yield on the asset portfolio.

K_L is easy now. We determine the value of the block under all the given scenarios, and choose the mean value for our target. This is the capital markets price for the block of business. K_L is that level discount rate which, when applied to the expected case distributable earnings, reproduces capital markets price. Such a hurdle rate has been adjusted for leverage; it is risk-adjusted to the extent the scenario set fairly prices a given risk factor.

Basic Fair Value

Illustration—Example 1

In this transparent example, column A is the item actuaries usually focus on—distributable cash flows to the providers of capital. The IRR in this example is 36%. Assets are assumed to yield 8% and the liability borrowing rate (loaded for credit risk) is 6%. Here market, stat, and tax value of the assets are all identical. Columns B and C show a projection of the change in the tax basis value of required assets and liabilities. At the end of the projection, these all go to zero. Columns D and E show the present value of the remaining items from columns B and C at the respective risk rate. Columns F and G show the calculation of after tax value for assets. Column H shows net insurance product cash flows (excluding target surplus items). In column I, we show the present value of those cash flows at 6%. Column K, shareholder

value, is just column G minus column J. Column N is a weighted average of 8% and 6%, where the weights depend on the after tax values in columns G, J, and K. For example, in year 2,

$$K(s,t) = [856 * 8\% - 642 * 6\%] / 214 = 14\%$$

As a check, when we discount the distributable earnings at the hurdle rates $K(s,t)$ we get the same shareholder values as we do from column K. Isn't that remarkable?

There is an even easier way to calculate the value of future tax deductions. Let

$$PVI-A_t = [i * TVA_t + PVI-A_{t+1}] / (1+i)$$

$$PVI-L_t = [d * TVL_t + PVI-L_{t+1}] / (1+d)$$

Then the present value of future changes in tax assets is the same as $TVA_t - PVI-A_t$

Example 3

Deferred Annuity Acquisition
Asset market yield falls

Section 1

Change in asset market yields **-2.0%** vs base 7%
Change in liability spread **-2.0%** vs. base 6.5%

Amounts per unit issued

Time	Acct Value	Stat Reserve	Target Surplus	Assets Mkt Value	Asset Book Yield	Int Credited	Policy Loads	Surr Chg	NII on Reserves	TS NII	Interest Credited	Surr Rate	Survivorship
0	100,000	94,000	4,700	110,543				6.0%					100.0%
1	106,900	100,486	5,024	117,818	7.0%	7.0%	100	6.0%	6,580	329	7,000	15.0%	85.0%
2	114,283	108,569	5,428	126,012	7.0%	7.0%	100	5.0%	7,034	352	7,483	10.0%	76.5%
3	121,040	114,988	5,749	132,221	7.0%	6.0%	100	5.0%	7,600	380	6,857	10.0%	68.9%
4	126,992	121,912	6,096	138,722	7.0%	5.0%	100	4.0%	8,049	402	6,052	10.0%	62.0%
5	131,972	126,693	6,335	142,683	7.0%	4.0%	100	4.0%	8,534	427	5,080	10.0%	55.8%
6	135,831	130,398	6,520	145,226	7.0%	3.0%	100	4.0%	8,868	443	3,959	10.0%	50.2%
7	139,806	135,612	6,781	149,043	7.0%	3.0%	100	3.0%	9,128	456	4,075	10.0%	45.2%
8	143,900	139,583	6,979	151,427	7.0%	3.0%	100	3.0%	9,493	475	4,194	15.0%	38.4%
9	148,117	145,155	7,258	155,315	7.0%	3.0%	100	2.0%	9,771	489	4,317	25.0%	28.8%
10	152,460	149,411	7,471		7.0%	3.0%	100	2.0%	10,161	508	4,444	100.0%	0.0%

Amounts per unit in force

Time	Stat Assets	Stat Reserve	Target Surplus	Net Inv Income	Paid Surr Benefits	Chg Reserve	Stat Book Profits	Tax	After Tax Profits	Chg TS	Dist Earnings	9.4% PVDE	MV Assets
0	98,700	94,000	4,700									8,357	110,543
1	89,684	85,413	4,271	6,909	15,073	(8,587)	423	148	275	(429)	704	8,441	100,145
2	87,208	83,055	4,153	6,278	9,228	(2,358)	(593)	(207)	(385)	(118)	(267)	9,505	96,399
3	83,128	79,169	3,958	6,105	8,797	(3,886)	1,194	418	776	(194)	970	9,431	91,034
4	79,320	75,543	3,777	5,819	8,394	(3,626)	1,052	368	684	(181)	865	9,456	85,959
5	74,187	70,655	3,533	5,552	7,851	(4,888)	2,590	907	1,684	(244)	1,928	8,420	79,572
6	68,721	65,449	3,272	5,193	7,272	(5,206)	3,127	1,094	2,033	(260)	2,293	6,921	72,891
7	64,322	61,259	3,063	4,810	6,807	(4,190)	2,193	768	1,426	(209)	1,635	5,939	67,326
8	56,275	53,595	2,680	4,503	9,458	(7,664)	2,709	948	1,761	(383)	2,144	4,355	58,143
9	43,891	41,801	2,090	3,939	13,934	(11,794)	1,800	630	1,170	(590)	1,760	3,007	44,727
10	-	-	-	3,072	43,027	(41,801)	1,847	646	1,200	(2,090)	3,290	0	-

EXAMPLE 3 (CONT.)

Section 2

Time	Account Value	Lapse of Acct Val	Policy Loads	Normalized Crediting Rate	PGAAP Reserve	Interest Earned	PGAAP Adj	Interest Credited	PGAAP Interest Margin	Surrender Charges	Gross Profits	PV Gross Profits Crediting Rate	14.3% Risk Rate
0	100,000				109,805							15,445	9,588
1	90,865	16,035	100	4.5%	98,612	5,264	2,059	7,000	323	962	1,385	14,755	9,573
2	87,426	9,714	85	3.5%	92,264	4,769	2,909	6,361	1,317	486	1,888	13,384	9,053
3	83,336	9,260	77	3.0%	85,696	4,590	2,478	5,246	1,823	463	2,362	11,423	7,984
4	78,691	8,743	69	3.0%	79,455	4,335	1,596	4,167	1,764	350	2,183	9,583	6,942
5	73,599	8,178	62	3.0%	73,599	4,093	764	3,148	1,710	327	2,099	7,772	5,835
6	68,176	7,575	56	3.0%	68,176	3,789	-	2,208	1,581	303	1,940	6,065	4,729
7	63,154	7,017	50	3.0%	63,154	3,471	-	2,045	1,426	211	1,686	4,561	3,718
8	55,253	9,750	45	3.0%	55,253	3,206	0	1,895	1,311	293	1,649	3,048	2,600
9	42,654	14,218	38	3.0%	42,654	2,769	(0)	1,658	1,111	284	1,434	1,706	1,537
10	-	43,905	29	3.0%		2,130	0	1,280	850	878	1,757		

Time	Invested Assets	VOBA	Goodwill	PGAAP Reserve	DTL	Equity	Interest Margin	Policy loads	Interest on TS	Surr Chgs	VOBA Amrt	Pretax Income
0	110,543	9,588	-	109,805	1,969	8,357						
1	100,145	9,160	-	98,612	2,248	8,446	323	100	263	962	428	1,220
2	96,399	8,309	-	92,264	2,902	9,542	1,317	85	238	486	852	1,275
3	91,034	7,091	-	85,696	2,965	9,465	1,823	77	230	463	1,217	1,374
4	85,959	5,949	-	79,455	3,037	9,417	1,764	69	217	350	1,142	1,257
5	79,572	4,825	-	73,599	2,543	8,255	1,710	62	205	327	1,124	1,179
6	72,891	3,765	-	68,176	1,823	6,658	1,581	56	189	303	1,060	1,070
7	67,326	2,831	-	63,154	1,379	5,625	1,426	50	174	211	934	926
8	58,143	1,892	-	55,253	736	4,047	1,311	45	160	293	939	871
9	44,727	1,059	-	42,654	365	2,767	1,111	38	138	284	833	739
10	-	-	-	-	-	-	850	29	106	878	1,059	805

You can verify this recursively. The same holds on the liability side. The present value of future tax deductions is $TVL_t - PVI-L_t$

In the example on page 22, the block is worth 225 after initial capital infusion of 137, so value created at point of sale is 89. If we take 89 from the initial distributable earnings, the resulting IRR of the distributable earnings stream becomes 13%. That

pathwise IRR is consistent with the marginal annual price of capital shown in column N. This shows the direct tie to the actuarial appraisal method.

Again, if you try this at home, please use the risk free rate in the PVI formulas

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Section 3

Time	Incurred Taxes	After tax Income	Dividends Paid	ROE	PVI-a	After tax Assets	4.500% Liab value	PVI-I	After tax Liabilities	A - L Value	GAAP Equity / Fair Value
0					29,609	96,035	98,240	25,936	87,678	8,357	100%
1	427	793	704	9.5%	26,154	87,330	87,588	22,873	78,821	8,509	99%
2	446	829	(267)	9.8%	22,978	85,140	82,301	20,059	75,544	9,596	99%
3	481	893	970	9.4%	19,766	81,349	77,208	17,224	71,866	9,483	100%
4	440	817	865	8.6%	16,598	77,826	72,288	14,437	68,375	9,452	100%
5	413	766	1,928	8.1%	13,462	72,976	67,691	11,687	64,638	8,338	99%
6	374	695	2,293	8.4%	10,426	67,783	63,465	9,034	60,997	6,785	98%
7	324	602	1,635	9.0%	7,511	63,646	59,514	6,495	57,852	5,794	97%
8	305	566	2,144	10.1%	4,670	55,855	52,734	4,030	51,625	4,230	96%
9	259	480	1,760	11.9%	2,090	43,703	41,174	1,800	40,763	2,940	94%
10	282	523	3,290	18.9%	-	-	-	-	-	-	-
			Weighted avg	9.6%							

Time	A/T assets * yield	A/T liability * debt rate	Net Return	K(s,t)	PVDE at K(s,t)
0					8,357
1	4,802	3,946	856	10.2%	8,509
2	4,366	3,547	820	9.6%	9,596
3	4,257	3,399	858	8.9%	9,483
4	4,067	3,234	833	8.8%	9,452
5	3,891	3,077	814	8.6%	8,338
6	3,649	2,909	740	8.9%	6,785
7	3,389	2,745	644	9.5%	5,794
8	3,182	2,603	579	10.0%	4,230
9	2,793	2,323	470	11.1%	2,940
10	2,185	1,834	351	11.9%	

Weighted average ROE uses beginning of period equity as weights

above, instead of using i and d. Then also use a scenario set which fairly prices credit risk. For ease of illustration I'm showing one scenario with loaded discount rates.

On To PGAAP

Examples 2 and 3 apply these concepts to a simple deferred annuity purchase GAAP situation. The point of these examples is how important it is to maintain consistency, in purchase GAAP, between the appraisal assumptions, reserve assumptions, asset market values, and VOBA. In example 2, the market value of the assets equals the statutory basis used in the appraisal. The first section shows account value per unit at the purchase date. Statutory reserves are held at cash value. Target surplus is 5% of reserves. The assets are yielding 7%, but currently the policyholders are credited with 7% also. The purchaser has a target crediting spread of 200 bp, so their intention is to drop credited rates to 5%. The product has a

small load. No maintenance costs or fixed costs are shown here, for simplicity.

The second section of example 2 shows statutory results per unit in force. We discount distributable earnings at 14.1% to get a value of \$4,803 for the block.

This example illustrates one possible approach for setting the PGAAP reserve liability for a FAS 97 product. Since the company is currently crediting more than its target rate, the PGAAP liability has been set greater than account value. In effect, it sets up an unrealized loss that offsets the unrealized gain on matched assets. It is derived by discounting the future loads and release of account value, at the target crediting rate. The resulting PGAAP reserve is \$104,308, vs. an initial account value of \$100,000. The runoff of this extra liability normalizes the interest margin, and becomes a part of gross profits for VOBA amortization. Whether this approach is acceptable is a matter for discussion with the auditors. It

is one of the many accounting conventions that make target ROE "risk rates" different from actuarial hurdle rates.

However we got the PGAAP liability, we can apply the Milholland method for VOBA. Here tax assets and reserves are assumed to be the same as statutory. The tax basis adjustment at the purchase date is thus

$$35\% * (98,700 - 94,000) = 1,645$$

And under the method given in part I of this article, VOBA is:

$$(4,803 - 1,645) / .65 - (98,700 - 104,308) = 10,468$$

We amortize VOBA according to the present value of future gross profits (including the runoff of the excess reserve liability) at the target credited rate of 5%. Deferred tax follows the usual formula. Now we have all the items for PGAAP income and balance sheet.

Example 2 illustrates this. Equity rolls forward appropriately and consistently with stat-based cash flows.

The last section of Example 2 validates the hurdle rate assumption. Here, based on a direct calculation of the value of assets and liabilities, we obtain the same value for the company as we got previously using the indirect method and a hurdle rate of 14%. In the direct calculation, the benefit cash flows (here just paid surrenders) are discounted at a 6.5% cost of funds. The calculation of $K(s,t)$ is the same as in Example 1. "Net return" is just the weighted average of the yields on assets and liabilities (7% and 6.5%)

"The direct approach to revising the value is more robust than the traditional actuarial approach."

where the weights are the after-tax values of those items. Net return divided by prior year value gives the price of capital. We can discount the distributable profits at the price of capital to get the same value as under the direct method. Weighted average ROE comes out close to the appraisal hurdle rate.

Yields Decline

Example 3, market rates decline by 200 bp, from 7% to 5%. The purchaser still intends to credit 200 bp below new money rates, so the crediting rate target steps down to 3%. This creates a larger excess of PGAAP liability over account value than before.

The direct valuation method provides an important check on the traditional actuarial appraisal value. Since interest rates have fallen, the value of assets, future benefits, and the related tax deductions have all risen together. The fair-value VOBA only goes from \$10,468 to \$9,588. With a 200 bp drop

in market rates (for both assets and liabilities), the fair value of the business increases from \$4,803 to \$8,357. This is equivalent to letting the hurdle rate in the indirect appraisal drop from 14.1% to 9.4%. Since asset book yields have not changed, the source of the gain is that we expect to lower credited rates in the new economic environment. In actual practice, it would be critical to adjust the resulting lapse assumption.

The direct approach to revising the value is more robust than the traditional actuarial approach. A traditional actuary might reason that interest rates, in falling from 7% to 5%, would lead to a propor-

tioned drop in the cost of capital. This produces a new hurdle rate of about 10%. Such estimates are not reliable when the resulting value of the business becomes very small or negative. The direct method provides a transparent, auditable mechanism that links external rates with the resulting value (or equivalently, with the resulting cost of capital). Under the indirect paradigm, we can't reliably quantify the change in the cost of capital as the economic environment changes.

The Milholland-method VOBA would be acceptable if it used PVDE based on the 9.5% hurdle rate. Such a rate is leverage-adjusted. The mechanics of the method would still work if we used the old PVDE numbers calculated at 14.1%, but this is inconsistent with the value on each side of the balance sheet. For a large rise in interest rates, it is conceivable that the value of the block would become negative. The assumptions needed to produce a negative value with the indirect method are counterintuitive. In

practice it comes down to a question of materiality. Is the VOBA under the indirect appraisal method materially different from the one based on fair value?

At a purchase price of \$8,357, the weighted average ROE is again about the same as the appraisal hurdle rate, here just 9.6%. What happens if the purchase price had already been set at \$4,803 before rates fell? In that case, there would be negative goodwill at the purchase date, which should be used to write down the VOBA asset. The resulting weighted average ROE would be about 20%.

Similarly, it is possible to calculate VOBA by discounting gross profits at a "risk rate". If we don't know the value of the business beforehand though, the VOBA calculation under that approach is rather arbitrary. We can back into a risk rate that produces the same value that we get from the direct method. Instead of performing a precise, auditable measurement, we simply set the stage for a negotiation among the professionals. The correct risk rate for VOBA should be 11.9% in the Example 2, but 14.3% in Example 3. This is not obvious because the "risk rate" adjusts for business risk and also for the nuances of the accounting conventions that make reported earnings different from cash flows.

Summary

The direct valuation method can produce an after-tax "shareholder value" at each time and for each scenario, which changes as interest rates change. This approach naturally can incorporate the effect of large swings in interest rates, and of additional leverage and tax effects due to target surplus, reserve margins and debt.

A "leverage adjusted" cost of capital is one which is consistent with current value and risk of both assets and liabilities. This article has illustrated how to easily calculate the after-tax value of

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each component as well as the net shareholder value. In practice, all we need from the liability projection system is projected premium, benefits, expenses, tax reserves, and tax basis of required assets. For fair valuation in a market-calibrated scenario set, we discount tax deductions at the risk-free rate.

In purchase GAAP, it is difficult yet critical to maintain consistency between the reserve assumptions, the VOBA asset, the market value and yield of

assets, and the value of the business. I have illustrated one scheme for demonstrating how one value ties to another.

Both stat and direct GAAP methods for calculating VOBA can be misused. It is possible to apply the Milholland method without regard for the true leverage-adjusted hurdle rate. We can also apply a "risk rate" to future expected profits.

Unfortunately this approach also requires one to adjust for the accounting conventions that make future GAAP profits

different from future cash flow. Few can do that in their heads. Capital markets pricing provides a more objective and auditable link between these approaches.

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