



# THE FINANCIAL REPORTER

NEWSLETTER OF THE LIFE INSURANCE COMPANY FINANCIAL REPORTING SECTION

NUMBER 48

DECEMBER 2001

## Letter from the Editor

by Thomas Nace

This is the final issue of 2001. I am happy to report that with this issue, we have once again been able to provide to our readership four issues per year on a somewhat regular basis. While this may not seem like much of a feat, it is a goal for our Section. My hat goes off to all of the authors who have contributed to the *Financial Reporter* over the past year. The quality of the articles that have been submitted has been exceptional. Thanks to all of you!

In case you placed one of the 2001 issues aside, intending to get back to it when you had more time, but have since lost your yellow-sticky reminder, the following list might jog your memory. Below are some of the topics covered by technical articles that have appeared this past year in the *Financial Reporter*:

- Update on the UVS Project
- DAC unlocking for variable annuities
- Admitting an asset under new codification rules
- UL nonforfeiture issues
- The proposed new Standard Non-forfeiture Law
- Fair Value (2 different articles)
- Update on the Liquidity Working Group
- GAAP reserves for GMDB's
- GAAP for non-traditional products
- XXX issues, including the effect on deficiency reserves
- PGAAP VOBA within a fair value of liabilities context

continued on page 2

## Why More U.S.A. Life Insurance Companies Are Considering Economic Value as an Additional Internal Accounting System

by Armand de Palo

Economic Value is an accounting method that was not widely used in the United States, but recently has been adopted by an increasing number of U.S.A. insurance companies. The reasons for using Economic Value vary by company, but part of this increased use is due to the fact that many of these companies are now owned by foreign parent companies. International companies have to deal with accounting systems that vary widely by country, and they therefore, need a consistent internal accounting system for all subsidiaries.

Countries like Canada<sup>1</sup> are now also looking to establish public disclosure standards, which currently do not exist because Economic Value is not normally used for public disclosure purposes. Although one of the biggest advantages of Economic Value is that it can be linked to pricing and is not subject to standard-

ized rules, standards are needed if Economic Value numbers are to be disclosed to the public.

Many U.S.A. insurance companies may ask why they should consider the additional expense of adopting yet another accounting system that is only useful for internal reporting, if they are not owned by a foreign parent company. The answer from those companies

continued on page 3



### In this Issue

	page		page
Letter from the Editor <i>by Thomas Nace</i> .....	1	VA GMDBs: Contemplating the Impact of the Proposed SOP on GAAP Income <i>by David C. Heavilin &amp; Karen J. Sasveld</i> .....	10
Why More U.S.A. Life Insurance Companies Are Considering Economic Value as an Additional Internal Accounting System <i>by Armand de Palo</i> .....	1	A New Perspective on Risk Management: Creating Value by Managing Risk <i>by Francis P. Sabatini &amp; Joseph Weiss</i> .....	16
Some Observations on Fair Value Accounting <i>by Paul Margus</i> .....	5	Treasurer's Report .....	20
Chair's Corner <i>by Barry L. Shemin</i> .....	9	2001 Annual Meeting Photos from New Orleans.....	21
		U.S. GAAP for Life Insurers .....	24

**Letter from the Editor***continued from page 1*

Supplementing this list, of course, are the many articles that appeared in the newsletter whose focus was to provide updates to current developments in the industry and the Section.

Rounding out the list of technical articles for 2001 are the articles which appear in this issue of the newsletter.

The cover article deals with Economic Value (sometimes called Embedded Value). More and more companies are

turning to this as a secondary or even primary means of internal management reporting. I am very pleased to have engaged Armand de Palo to write an article on this topic.

It has been a goal of mine to get an article addressing Risk Management for some time now, as it is a topic which has not received a lot of press in our newsletter over the years. Frank Sabatini and Joseph Weiss have stepped up to the plate to co-author a comprehensive article dealing with this subject. I know you'll agree with me that it has been worth the wait.

Paul Margus addresses some interesting issues involving fair value accounting

in his article which appears in this newsletter.

Specifically, Paul looks at an approach for valuing liabilities in a fair value reporting system.

David

Heavilin and Karen Sasveld team up once again, this time to provide an analysis of the impact of the new SOP dealing with long duration contracts. While this topic was highlighted in the last issue of the newsletter, this article provides a detailed look at the reserves required for GMDB's under the new SOP and their impact on the pattern of GAAP earnings. This is scheduled to be the first of two articles dealing with this topic, the next article tentatively scheduled for the following issue.

At the Annual Meeting in New Orleans, Mike Eckman turned over the green jacket, symbolizing the position of Section Chair, to our new Chairperson, Barry Shemin. Don't miss the pictures included in this issue capturing the changing of the guard. (Fortunately, the black and white photos cannot capture the true style and beauty of this fine garment.) One of Barry's first acts in his new position is to contribute his Section Chair article to the newsletter. Catch Barry's views on the Section and the challenges that lie ahead in this, his first article as Section Chair.

Here's to a new year of success and accomplishment for our new Chair and the entire Section!



*Tom Nace*

THE FINANCIAL REPORTER

Issue Number 48

December 2001

Published quarterly by the Life Insurance Company Financial Reporting Section  
of the Society of Actuaries  
475 N. Martingale Road, Suite 800  
Schaumburg, IL 60173

Phone: 847-706-3500

Fax: 847-706-3599

World Wide Web: <http://www.soa.org>

This newsletter is free to Section members. A subscription is \$15.00 for nonmembers. Current-year issues are available from the Communications Department. Back issues of Section newsletters have been placed in the Society library and are on the SOA Web Site. Photocopies of back issues may be requested for a nominal fee.

**Chairperson**, Barry L. Shemin, FSA

**Vice-Chairperson**, John F. Bevacqua, FSA

**Treasurer**, David Y. Rogers, FSA

**Secretary**, James P. Groaton, Jr., FSA

**Editor of Financial Reporter**

Thomas Nace, FSA

PolySystems, Inc.

6981 North Park Drive, West Bldg. - Suite #303

Pennsauken, NJ 08109

Phone: (856) 663-8711

Fax: (856) 663-8712

E-mail: [tnace@polysystems.com](mailto:tnace@polysystems.com)

**Council Members:**

Mark J. Freedman, FSA

Theodore J. Kitsos, FSA

Mark D. Peavy, FSA

Deborah M. Poorman, FSA

Robert W. Wilson, FSA

**Staff Liaison**, Lois Chinnock

Phone: (847) 706-3524

E-mail: [lchinnock@soa.org](mailto:lchinnock@soa.org)

**DTP Coordinator**, Joe Adduci

Phone: (847) 706-3548

Fax: (847) 273-8548

E-mail: [jadduci@soa.org](mailto:jadduci@soa.org)

Expressions of opinion stated herein are, unless expressly stated to the contrary, not the opinion or position of the Society of Actuaries, its Sections, its Committees, or the employers of the authors.

The Society assumes no responsibility for statements made or opinions expressed in the articles, or criticisms, and discussions contained in this publication.

Copyright © 2001 Society of Actuaries. All rights reserved.

Printed in the United States of America.

**Tom Nace, FSA, MAAA, is vice president with PolySystems Inc., Pennsauken, N.J. He can be reached at [tnace@polysystems.com](mailto:tnace@polysystems.com).**

## Why More U.S.A. Life Insurance Companies Are Considering Economic Value as an Additional Internal Accounting System

*continued from page 1*

already using this method is that none of the current accounting systems provide management with useful information to manage the company. Insurance companies are regulated on a statutory basis and management must have a means to better understand the effect of all changes on a statutory basis, both for current and future earnings.

The following is a brief comparison between Economic Value and the various other accounting methods currently in place:

**Statutory Accounting** is a solvency-based method of accounting and is useful for state regulators. It does not assign any value to the future statutory earnings that are expected to be earned on in-force business. If you write new business the sale looks like a loss and if you lapse business it may appear to be a gain. A company that is going out of business may look very profitable on a Statutory Accounting basis, even if true Economic Value is not growing.

**Tax Accounting** is similar to Statutory Accounting, except that minimum statutory reserve bases are used with higher discount rates. It inherently has all the same problems as Statutory Accounting with respect to understanding the true profitability of the company.

**GAAP Accounting** is governed by rules that are set by accountants so as to try to reflect some uniformity between companies. While GAAP may amortize new business or acquisition expenses over the life of the business, it does not show the value created by new sales. Its purpose is to give an investor a reasonable estimate of expected annual profits. GAAP is also dependent upon the past; this means that two companies that have identical in-force may have very different current GAAP earnings and GAAP equity because of the way they got there.

*Note:* Some companies use a modification to GAAP that they call "Value

Added," but this is not the same as Economic Value, which is based on a statutory accounting system and not subject to GAAP rules.

**Economic Value** helps to determine whether a company is actually creating or destroying value. Economic Value has no memory of the past. It only looks at what statutory capital exists and the value of future statutory earnings on existing in-force. Since the method values the future earnings on existing in-force, anything that affects the in-force can have a very

large effect on Economic Value and the change in Economic Value in any year. The advantage to management is that any event that has a significant effect, either good or bad, on Economic Value will be brought to management's attention.

One of the key advantages to using Economic Value is that, unlike GAAP, it is not a publicly disclosed result and therefore not subject to arbitrary external rules as to how it should be calculated. It therefore can provide far more meaningful numbers to the company's management since it can be consistent with and directly linked to the pricing assumptions and methods of the company's products. It is actually more of an internal management information system. However, because it is not subject to external rules, there is also variation in how this method is actually applied and defined in different companies.

We can define **Economic Value** as the sum of the current and future statutory value of the company. It is calculated at the valuation date as the sum of free (or

excess) surplus and the present value of distributable earnings, where distributable earnings equal after-tax statutory earnings plus after-tax investment income on target surplus less the increase in target surplus. Free (or excess) surplus is the excess of total surplus over target surplus. If the company pays dividends to stockholders during a given year, then you need to look at the change in Economic Value before the payment of these dividends.

The amount of target surplus is a risk adjustment. Many companies use what they believe is the minimum Risk Based Capital that the company can hold. However, other measures of risk are also used.

**A Hurdle Interest Rate** is used to calculate the present value of the future

*"We can define 'economic value' as the sum of the current and future statutory value of the company."*

after-tax expected statutory earnings. The Hurdle Interest Rate chosen is very important. If justified, this rate can vary by company or product line. If you choose a high rate, the result is a lower Economic Value, but the annual change, particularly on a percentage basis, is larger. The rate chosen should be a long-term rate that is not changed very often. Some actuaries believe that it should be the company's cost of capital rate; others believe it should be directly related to the discount rate used for the pricing of products. It is critical that the Hurdle Interest Rate be at least as high as the company's real cost of capital.

Mutual life companies that finance new business with after-tax internal retained capital may use a lower rate than a Stock life company that uses a pre-tax outside capital rate. If a mutual life company demutualizes, the Economic Value, at least for new business, may need to be revalued using a higher hurdle rate consistent with the cost of outside capital. In addition, if used to evaluate an

*continued on page 4*

## Why More U.S.A. Life Insurance Companies Are Considering Economic Value as an Additional Internal Accounting System

*continued from page 3*

acquisition, an external cost of capital rate should be used, regardless of the type of company.

Economic Value does not usually include the value of future new business. However, if it is to be used to value an acquisition, you can derive the **Appraisal Value** by adding the Economic Value of assumed future new business. If future sales are valued, it is dependent upon new sales projections, which are subjective. Changes in these projected sales can have major changes on the total Appraisal Value. It is therefore very useful to report current statutory capital, the future economic value of existing in-force and the economic value of assumed future sales as three separate items.

The annual change in Economic Value, sometimes called **Economic Gain**, is useful for determining whether the company has actually increased in Economic Value during the year. If dividends are paid to stockholders, they need to be added to this amount. Even if the company has not written any new business and experience is as expected, this change is generally a positive amount since, the Economic Value is expected to grow by the Hurdle Interest Rate each year. The relative change in Economic Value between years is more important than the absolute value since it is the change in Economic Value that provides useful information to management.

To determine whether a company has created additional value in excess of the expected return on in-force business, a Gain and Loss analysis that calculates the difference between expected growth and actual growth is used. It demonstrates whether the company has created or destroyed company economic value; this is sometimes called **Economic Value Added**. If Economic Value is not growing at least as fast as the Hurdle Interest Rate, the company is not creating additional economic value. Also, a company can appear to be profitable, but may actually

be destroying value if value is not growing at least as fast as the cost of capital (i.e. Hurdle Interest Rate).

If actual results are as expected, the only element that is creating new Economic Value is new sales. It is very important in any Gain and Loss analysis to separate all statutory accounting information between in-force and new business. This allows you to see whether new sales have added value to the overall company. If new sales show a loss, it means that the company is selling unprofitable new business. The in-force Gain and Loss can further be analyzed by gain by source. It is also important to separate Gain and Loss variances between what happened in a given year from the variance in future value.

The models used also need to be consistent with how statutory accounting is split between starting in-force and new business in the year. It is important to realize that first year is not the same as new business in the year.

In addition to providing senior management with important company growth information, Economic Value is also an excellent basis for long-term compensation of senior management since the compensation reward would be linked to real growth in company value. If this type of compensation program is established, the Economic Value of the company would have to be converted to a value per unit and compensation would be linked to the change in the value of these units. Since Economic Value is based on a model of the in-force, any change in value due to a change in the model should affect the number of units, but not the value of the units. Only events that actually change the real Economic Value of the company should impact upon the units used for compensation. For example, a change in pricing assumptions, which is a real event, changes both Economic Value and the value of each unit.

Even though the results of this methodology are not normally disclosed to the public, it may be desirable to have an outside consultant review the method for consistency in application between years, particularly if it is used as a basis to pay compensation.

The administrative cost of calculating Economic Value is not minor and, if not supported by senior management, the adoption of an additional accounting system will create a problem. Therefore, if the company's actuaries want to adopt this useful tool, they must demonstrate to senior management how it will be used to benefit the management of the company.

If a company does adopt this method, it should also expect that it will take several years to fully implement and that each year the actuary will refine the model. Therefore, an actuary must calculate any change that is merely due to some refinement of the model. For the long term, however, these models will give the company a real tool to project future statutory earnings of the company, which will be useful in the dynamic management of the company's statutory surplus.

If a company chooses to consider this additional accounting method, hiring a consultant that has actually helped develop this methodology for a peer company would be very useful. Some software packages are also beginning to add Economic Value to the functions that are available.

*Armand de Palo, FSA, MAAA is Executive Vice President and Chief Actuary for The Guardian Life Insurance Company of America, New York, NY. He can be reached at [adepalo@glic.com](mailto:adepalo@glic.com).*

### Footnotes

1 "Interim Draft Paper on the Considerations in the Determination of Embedded Value for Public Disclosure in Canada," The Committee on the Role of the Appointed/Valuation Actuary, Canadian Institute of Actuaries, August 2000

## Some Observations on Fair Value Accounting

by Paul Margus

In our first exposure to accounting, the balance sheet was fundamental. It is an instantaneous snapshot of an enterprise's net worth, defined as assets minus liabilities. Only after understanding the balance sheet were we able to grasp the concept of earnings. Earnings are defined as the change in the balance sheet net worth. To get a better understanding of the sources of earnings, we learned to prepare an income statement, including individual income and expense items. Collectively, all such items reconcile changes in the balance sheet.

Under Generally Accepted Accounting Principles as defined for life companies (U.S. GAAP), earnings "emergence" is considered more important than the balance sheet, which is severely bent to suit that purpose. The intangible Deferred Acquisition Cost (DAC) asset arises out of money spent in the past, written off over a set period, in proportion to premiums, gross profits, or some other convenient quantity. This intangible asset must be carried on the balance sheet to reconcile the reported earnings. Therefore, the balance sheet is difficult to interpret as a meaningful snapshot of assets minus liabilities.

But if we are investing in an enterprise, or lending it money, we want to measure its ability to deliver future earnings, or at least pay its bills. Such an evaluation is necessarily prospective in

nature. Our actuarial training emphasizes prospective calculations. We certainly price our products that way, and rational business decisions look only at the present situation, and how a proposed course of action will affect the future wealth of the enterprise. Our problem is to restore the balance sheet to its rightful role of measuring an enterprise's net worth. Such a valuation is based solely on prospective actuarial considerations, calibrated to actual market values whenever possible. The net worth of the company will reflect the estimated market value of its asset and liability components. If the balance sheet measures the fair value of a company, then the earnings will emerge naturally as the balance sheet progresses.

An asset may exist because of a past expenditure; but its actuarial value arises solely out of its future cash flows, as perceived

in a public market or some reasonable proxy. For example, a common stock commands a market value equal to what someone else is willing to pay for it. In the long run, a stock is worthless unless it has some chance of paying dividends someday, although not necessarily to the present owner. Because dividends are impossible without earnings, the marketplace responds to earnings expectations.

In recent months, several excellent articles in the *Financial Reporter* and elsewhere have dealt with "fair value accounting," an idea that is catching on in some other countries. In fair value

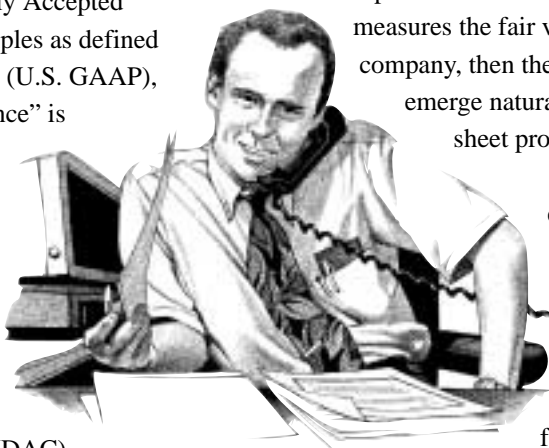
accounting, the value of each asset and liability is the price that two knowledgeable traders would agree on in a free market.

The writers have pointed out that assets are relatively easy; their fair value is the same as their market value, easily ascertainable because they are traded every day in large volumes.

Unfortunately, getting a fair value for insurance liabilities is more difficult. They are not "publicly traded" except in a very limited sense. One example involves reinsurance transactions, but these "trades" are usually not "public" knowledge, and occur sporadically in low volume. In this article, I will discuss one possible approach to this problem.

Some authors have suggested discounting liability cash flows at zero-coupon rates, derived from the assets. For example, a conventional coupon bond provides a series of interest payments, followed by a lump sum for its face value. Knowing the market values for various maturities at a given time, we can extract the market value of each of the zero-coupon components.

Consider the following publicly traded bonds (Table 1). Note that the coupon rates and yields were chosen randomly, and the years remaining are at 6-month intervals. The nominal yield to maturity is the yield curve corresponding to the class of investments. Because of past market value fluctuations, the nominal yield to maturity probably differs from the original yield to maturity on the purchase date. The market values are the present value of the maturity value and coupon stream, at the nominal yield to maturity.



**Some Observations on Fair  
Value Accounting**  
*continued from page 5*

**Table 1 — Bond Parameters**

	<b>Bond 1</b>	<b>Bond 2</b>	<b>Bond 3</b>	<b>Bond 4</b>
<b>Face Value (Maturity Value)</b>	\$100	\$100	\$100	\$100
<b>Nominal Coupon Rate</b>	8.0000%	8.5000%	7.5000%	6.0000%
<b>Semi-annual Coupon</b>	\$4.0000	\$4.2500	\$3.7500	\$3.0000
<b>Years remaining to Maturity</b>	0.5	1.0	1.5	2.0
<b>Nominal Yield to Maturity</b>	7.0000%	7.1000%	7.3000%	7.5000%
<b>Market Value</b>	\$100.4831	\$101.3288	\$100.2794	\$97.2615

The resulting cash flows are shown in Table 2. At time 0.0 (the present), either we purchase the bond or forgo selling an existing bond. In either case, that's considered a negative cash flow equal to the market value.

**Table 2 — Future Cash Flows for Each Bond**

<b>Time (years)</b>	<b>Bond 1</b>	<b>Bond 2</b>	<b>Bond 3</b>	<b>Bond 4</b>
<b>0.0</b>	(\$100.4831)	(\$101.3288)	(\$100.2794)	(\$97.2615)
<b>0.5</b>	\$104.0000	\$4.2500	\$3.7500	\$3.0000
<b>1.0</b>		\$104.2500	\$3.7500	\$3.0000
<b>1.5</b>			\$103.7500	\$3.0000
<b>2.0</b>				\$103.0000

For each bond, using its nominal yield to maturity (Table 1), we can generate discount factors and apply them to its Table 2 cash flows. By definition of yield to maturity, we know that the sum of the discounted cash flows is zero. That means generating a separate set of discount factors for each bond, based on its own yield rate. However, in Table 3, we apply a uniform set of discount factors to all the bonds, but we still want each sum of discounted flows to be zero. We follow this recipe.

- For Bond 1, we need just two discount factors. At time 0.0, the factor must be 1.0000000. Half a year later, we use 0.9661837, derived algebraically to achieve the required sum of zero.
- For Bond 2, at times 0.0 and 0.5, we use the Bond 1 discount factors. At time 1.0, we use 0.9325901, chosen so that the discounted Bond 2 cash flows add up to zero.
- For Bond 3, we use the Bond 2 discount factors, and append a new discount factor of 0.8979181 at time 1.5.
- For Bond 4, we use the Bond 3 discount factors, and append a new discount factor of 0.8628294 at time 2.0.

**Table 3 — Cash Flows, Discounted Using Uniform Discount Factors**

<b>Time (years)</b>	<b>Discount Factor</b>	<b>Bond 1</b>	<b>Bond 2</b>	<b>Bond 3</b>	<b>Bond 4</b>
<b>0.0</b>	1.0000000	(\$100.4831)	(\$101.3288)	(\$100.2794)	(\$97.2615)
<b>0.5</b>	0.9661837	\$100.4831	\$4.1063	\$3.6232	\$2.8986
<b>1.0</b>	0.9325901		\$97.2225	\$3.4972	\$2.7978
<b>1.5</b>	0.8979181			\$93.1590	\$2.6938
<b>2.0</b>	0.8628294				\$88.8714
<b>Total Present Value</b>		<b>\$0.0000</b>	<b>\$0.0000</b>	<b>\$0.0000</b>	<b>\$0.0000</b>

In Table 4, each discount factor is expressed in terms of its nominal semiannual yield. The yield for 0.5 years is no surprise; it's the yield to maturity for Bond 1. The other bonds are more complicated. For example, Bond 4 uses 7.0000% on its cash flow at time 0.5; but 7.1021% applies to its cash flow at time 1.0 (the entire 12-month period). 7.3088% applies concurrently to the 18-month discount period of the next cash flow; and 7.5147% applies concurrently for its 24-month period.

**Table 4 — Nominal Yield Rates Corresponding to the Uniform Discount factors**

Time (years)	Discount Factor	Equivalent Nominal Yield Rate
0.0	1.0000000	—
0.5	0.9661837	7.0000%
1.0	0.9325901	7.1021%
1.5	0.8979181	7.3088%
2.0	0.8628294	7.5147%

None of these nominal interest rates are really important, nor do we need to know the yields to maturity. All we really need are the market values of the assorted assets and their future cash flows. From these, we derive the discount factors as above. Each discount factor represents the “fair value” that the market has implicitly assigned to a single cash flow. A liability cash flow is the same as an asset flow, but in the other direction. So, in the absence of a public market for liabilities, we can discount each future liability cash flow, using our array of zero-coupon discount factors. For private placements and other assets with a limited market, we can use similar discounting. In performing these calculations, we must recognize that all cash flows are contingent, among both assets and liabilities.

- Among assets, bonds have credit risks, and stocks have unknown future earnings. Therefore, in Table 3 above, we

should have multiplied each cash flow by its probability of being realized, according to the published bond-rating. This introduces a new actuarial assumption, and results in lighter discounts (because defaults must necessarily decrease our yield). Should we assume that bonds are held to maturity? If not, then we would also need an assumed trading incidence and realized sales price. Both of these are very sensitive to yield curve fluctuations.

- Among insurance liabilities, the cash flows are subject to mortality, lapse, and other contingencies. We are already accustomed to dealing with them.

This zero-coupon method raises several questions and additional observations.

1. Ideally, the zero-coupon calculation should be performed on the investment portfolio as a whole, probably segmented by line of business. Therefore, the required calculations will be considerably more complicated.
2. Some life insurance liabilities could extend for 50 or 75 years. Of course, few assets run that long. One remedy is to extend our discount factors using the longest observed interest rate, derived from the above method.
3. Any general-purpose method will have to include assets other than bonds.
4. The zero-coupon calculation does not measure the degree of asset-liability matching. Even with severe mismatching, the zero-coupon calculation may proceed smoothly. A badly-matched portfolio will result in a

quarterly earnings roller coaster. A company with a well-matched portfolio will report earnings that are less sensitive to shifting yield curves.

5. For newly-issued single premium life or annuities, the fair value is what the policyholder has just paid the company, less acquisition costs and company profit. The net result is the “fair value” using our zero-coupon method, where as usual, the company profit is the balancing item.

In this formulation, fair value is the product of the competing interests of

- a. insurance shoppers willing to pay a certain price,

- b. agents willing to do their work for a certain level of compensation, and

- c. insurance companies that seek a certain profit.

Each of these free-market players operates solely in its own interest, but is constrained by the other players and by our legal environment.

6. For annual premium policies, we can view the stream of premiums as purchasing one-year term coverage and annual increases in paid up value. Thus, each policy is really a series of single premium purchases that can be analyzed as in item 5 above. This approach seems valid if we consider each renewal premium as a conscious purchasing decision. In that case, each paid premium will generate a profit only when it is received.

Some writers have observed that fair value accounting will front-end the profits. In item 5 above, single premium profits are taken entirely on the issue

## Some Observations on Fair Value Accounting

*continued from page 7*

date. The anticipated profit is taken at the point of sale. The same could happen to annual premium policies, although item 6 offers a way to spread them over the premium paying period, treating each successful premium collection as a new sale. Under fair value accounting, subsequent profits and losses emerge only on deviations from expected, as expressed in the actuarial assumptions.

I believe that such front ending is more relevant to the purpose of financial

improved, we should likewise modify the assumptions appropriately. That's exactly what the market would do if it had the data available. U.S. GAAP has a mixed approach to such improvements.

Under U.S. GAAP, expected mortality profits (for example) are the valuation mortality minus the expected actual claims. Deviations from expected actual claims are an additional profit component. This method of disclosure is

move us closer to the spirit of fair value accounting.

Should fair value accounting replace U.S. GAAP? Any abrupt abandonment of U.S. GAAP would complicate year-by-year comparisons, because fair value accounting produces such hugely different results. Probably both methods should be publicly available. On the other hand, life insurance reporting is already cursed with at least three sets of books, (Statutory, U.S. GAAP, and Tax) and it would be a pity to make it four!

Meanwhile, stocks continue to trade at seemingly arbitrary multiples of GAAP book value (often greatly exceeding 100% during bull markets, but sometimes well below that level, especially in our own industry). This certainly suggests that the market implicitly adjusts our GAAP balance sheet. If we devise a credible system of fair value reporting, how would stock prices relate to this new book value? Dare we hope for some ratio closer to 100%?

By adjusting published GAAP statements, stock analysts already do a "quasi-fair value" financial statement. They must do this work with limited data and rule-of-thumb approximations, all under a cloud of conflicting interests. Can't we do better a better job in our own shop?

***Paul Margus, FSA, MAAA, is a consulting actuary at Berkshire Life Insurance Company in Pittsfield, MA. He can be reached at [pmargus@berkshirelife.com](mailto:pmargus@berkshirelife.com).***

***"To some extent, U.S. GAAP very roughly recognizes a fair value process. A depreciated asset has an original purchase price (market value), and many assets certainly lose market value as they age."***

reporting, which is helping the public to estimate the value of the company's stock. Here, a policy is sold with a certain profit expectation, which fully emerges at the time of sale. It does not seem appropriate to report subsequent profit merely for meeting original expectations. Gains or losses after issue should reflect only genuine deviations from these expectations. In particular, an adverse deviation from original expectations should be reported as a loss on that block of business. If we believe that the deterioration is permanent, we should change our assumptions and report all the future losses immediately, just as required under current U.S. GAAP.

On the other side of the coin, if the environment has permanently

probably not very understandable to the share-buying public.

To some extent, U.S. GAAP very roughly recognizes a fair value process. A depreciated asset has an original purchase price (market value), and many assets certainly lose market value as they age. Depreciation schedules are an attempt to simulate this erosion. The DAC asset relies on the company's initial judgment. Nobody would have paid the compensation without some apparent prospective business justification. U.S. GAAP requires ongoing monitoring of prospective DAC recoverability (ignoring past acquisition costs), implicitly recognizing the sole source of all values. Substituting the DAC recoverability ceiling for the DAC asset would probably



## CHAIR'S CORNER

by Barry L. Shemin

I consider it an honor to be able to serve as Chair of the Life Insurance Company

Financial Reporting Section for the upcoming year.

One of the reasons I consider it an honor is that this section has a history of excellence and dedication in the Section Council. And I specifically want to thank Mike Eckman for his leadership over the past year in keeping the Section on a steady course.

I also consider it an honor because, by almost any measure, the Section is a very successful one. At nearly 4000 members, we are one of the Society's largest sections; we organize a significant number (usually around 15) of the sessions at the Society's Spring and Annual meetings; we sponsor several well-attended Seminars each year and we publish this newsletter, *The Financial Reporter*, which, from all the feedback I have received, is viewed as an extremely valuable publication by its readership. We do all this while maintaining reasonable dues and a very strong financial situation.

One might infer from the foregoing that I intend to spend my year as Chair making sure we maintain the current level of success. And that would be correct, at least as a minimum standard of performance.

But I think we can do even better.

One area where I think we can do better is in the participation by members in the activities of the Section. The

Section Council puts in a lot of time, and there are a few others who make significant contributions, like our newsletter editor and our Web coordinator. But there is plenty of room for more members to be more involved.

One of the problems is that members do not have an easy outlet to express their opinions or to volunteer for service. The blast e-mail asking for suggestions for Spring Meeting sessions was a very small start to what I hope will be a broader effort to provide you with easy ways to let the Section Council know what kinds of activities you would like us to sponsor. We could also use ideas about seminar topics and areas for research the Section could sponsor.

Periodically the Section is given the opportunity to nominate a representative on Society or Academy task forces. When this happens, we don't have an organized method of soliciting volunteers and usually resort to informal networking. Sometimes this works well, but not always. I hope we can develop mechanisms for members who want to become more involved to let us know.

Another area where I think we can do better is using the Web site as a tool for enhancing the value of the Section to its members. This whole area is evolving rapidly in the world at large, so there is no shortage of ideas and examples. Although the Society, like every other organization, has technology limits, I hope we can develop and put into place a few good ideas. Here, too, your suggestions would be most welcome.

A third area where we have the capability to do more is in our research activities. We have the financial wherewithal to sponsor additional research, but our activities so far have been limited to

funding already developed ideas which others have brought to our attention. I hope that we can begin to develop some ideas based on the priorities and needs of our membership.



Barry Shemin

A final area where I hope we can increase the Section's role is in helping our members get comfortable with new financial reporting systems which are coming over the horizon. These include Embedded Value and Fair Value Accounting, both of which appear to be headed to the U. S. from Europe. Although the timing is uncertain, I believe financial reporting actuaries will need to learn much more about these new systems.

So I do think there is a lot that can be accomplished to build on this already strong foundation. While we are working on new communications ideas, I encourage you to send an e-mail to me at [bshemin@jhancock.com](mailto:bshemin@jhancock.com) or to Lois Chinnock, our very capable staff representative at [lchinnock@soa.org](mailto:lchinnock@soa.org) if you have ideas about any of the subjects mentioned in this article, or if you would like to volunteer to get involved in Section activities.

**Barry L. Shemin, FSA, MAAA, is senior vice president and corporate actuary at John Hancock Life Insurance Company in Boston, MA. He can be reached at [bshemin@jhancock.com](mailto:bshemin@jhancock.com).**

## VA GMDBs: Contemplating the Impact of the Proposed SOP on GAAP Income

by David C. Heavilin and Karen J. Sasveld

**A**s discussed in a previous issue of the *Financial Reporter*, the AcSEC has recently released an exposure draft of the proposed Statement of Position (SOP), *Accounting and Reporting by Insurance Enterprises for Certain Non-Traditional Long-Duration Contracts and for Separate Accounts*. This SOP addresses multiple issues, including accounting for separate accounts, accounting for sales inducements, and liability valuation for products with multiple account balances or returns based on contractually referenced pools of assets or indices. In addition to these issues, the SOP also proposes a methodology for the calculation of GAAP reserves for Guaranteed Minimum Death Benefit (GMDB) provisions on variable annuities.

This article provides an introduction to the new requirements and begins to investigate what impact they may have on GAAP earnings. To this end, we designed a GAAP model for a sample product which calculates the GAAP reserve and DAC asset and computes a stream of GAAP earnings. We ran this model under a variety of scenarios. Those scenarios and the resulting GAAP earnings are presented here, along with commentary and conclusions regarding the potential impact of the GMDB provisions of this proposed SOP. We did not reflect the other provisions of the exposure draft in this exercise, as we wished to focus on the impact of the GMDB reserve requirements.

We intend this article to be a first look at the calculations required by the SOP. Actual application of the SOP requires that a range of scenarios be used to calculate GMDB reserves. For illustration

purposes, we primarily chose to focus here primarily on deterministic scenarios. We will study the implications of multi-scenario reserving, and the issues this raises, in a future article

### GMDB Reserving Under the Proposed SOP

#### *Insurance or Investment Contract?*

The requirements for calculating a GMDB reserve differ based on whether the contract under consideration is deemed to be an insurance or investment contract. Although this concept was first put forth in SFAS 97, the SOP provides additional guidance for making this determination for variable annuity products. Under the provisions of the SOP, classification is determined solely at contract inception and should not be reevaluated during the contract lifetime. Consistent with SFAS 97, a contract is considered an insurance contract if it has significant mortality or morbidity risk. According to the SOP, this risk is assessed by calculating the following ratio:

$$\frac{\text{(Present value of expected excess payments under GMDB provision)}}{\text{(Present value of all amounts assessed against the contract holder)}}$$

Unfortunately, the SOP is not entirely clear on how to evaluate this ratio, although SFAS 5 provides some relevant guidance on issues of materiality. A rule of thumb is that if the above ratio is greater than 2 to 5%, the contract should be deemed to have significant mortality risk, thereby classifying it as an insurance contract. There is currently no definitive guidance on where to set this threshold.



#### *Calculating the Reserve*

If the contract is classified as an investment contract, no additional GMDB reserve is permitted to be held under the SOP at any time during the life of the contract. If the contract is classified as an insurance contract, it is necessary to calculate a reserve for the GMDB provision. This is done by first calculating another ratio, called the current benefit ratio. This is analogous to the ratio calculated at inception and is defined as:

$$\frac{\text{(Present value of expected excess payments and settlement costs of GMDB provision)}}{\text{(Present value of total expected assessments)}}$$

evaluated over the life of the contract. Total expected assessments consist of all charges; including administration, mortality and expense, plus investment margin if included in estimated gross profits. The reserve is then calculated as:

$$\text{Current Benefit Ratio} \times \text{Cumulative Assessments} - \text{Cumulative Excess Payments}$$

accrued with interest.

### *Relationship to SFAS 60 and SFAS 97*

Some provisions of the SOP uphold principles or concepts introduced in SFAS 60 and SFAS 97, while others deviate from the prior guidance. First, the SOP reinforces the need to make a determination of whether the contract is an insurance or an investment contract. The SOP also justifies the holding of a reserve for GMDB provisions by referring back to paragraph 17(b) of SFAS 97, which requires the establishment of a liability for payments made to an insurer for services to be rendered in the future. Also in accordance with SFAS 97, the SOP specifically calls for the unlocking of prospective assumptions and the true-up for historical experience in the determination of the reserve. The assumptions used in the reserve calculation should be consistent with those used for amortization of DAC. The calculation itself is a retrospective reserve calculation and is similar conceptually to the SFAS 60 benefit reserve calculation, where the GAAP benefit net premium equals a constant percentage of the gross premium, and the gross premium equals the assessments.

The SOP deviates from prior guidance in the selection of assumptions to be used. Specifically, the SOP requires that a range of reasonably possible assumptions should be used in determining the reserve. This is a significant departure from the single best estimate approach used in selecting assumptions under SFAS 60 and SFAS 97. We expect that, barring further clarification or guidance, insurers could interpret this provision to require anything from a handful of reasonable scenarios to a full-blown stochastic model with thousands of scenarios. Furthermore, since the SOP states that assumptions should be consistent with those used for DAC amortization, this raises some question as to what constitutes consistency. Although SFAS 97 does not prohibit the use of stochastic models, it also does not require their use, and so most insurers currently

use a single set of best estimate assumptions. A reasonable approach for GMDB reserving might be to construct a range of scenarios around the single best estimate scenario used for DAC amortization. It is interesting to note that the SOP does not specifically call for a fair value or option pricing methodology to be used in estimating the present value of expected excess payments, but neither does it preclude their use.

## **Assessing the SOP's Impact**

### *Model and Base Assumptions*

To begin to assess the impact of the SOP's guidance on GAAP earnings, we created a model of a single sample product. The model was created using Classic Solutions' MoSes™ software. Our main product assumptions, used in all scenarios, are outlined below. These assumptions are hypothetical and are not intended to reflect any one company's product.

- Male, nonsmoker, issue age 60
- Single \$100,000 premium
- 6.5% commission rate
- Initial expenses: \$20 per policy and 0.6% of premium
- Maintenance expenses: \$30 per policy and 0.25% of account value
- Mortality: 1996 US Annuity 2000 Basic Male
- Fees: M&E charges of 1.50% of account value and investment fee of 25 bps.
- Lapses: 3% for 7 years, followed by 15% thereafter
- Surrender charges: 7%, 6, 5, 4, 3, 2, 1, 0%
- GMDB: Annual 6% rollup on premium with a fee of 25 bps

For our base case, we used a single deterministic scenario with a 7.5% assumed market return. In all cases,

regardless of the assumed market return, our DAC and reserve discount rate was assumed to be 7.5%. We assumed a ten-year GAAP horizon in all cases (i.e., assumed all policies surrendered after the tenth year). For purposes of calculating DAC, we assumed that all first-year expenses in excess of maintenance expenses were deferrable, up to the amount allowed by recoverability testing (i.e., the k-factor was restricted so as not to exceed 100%). Any first-year expenses in excess of those determined to be recoverable went directly through income.

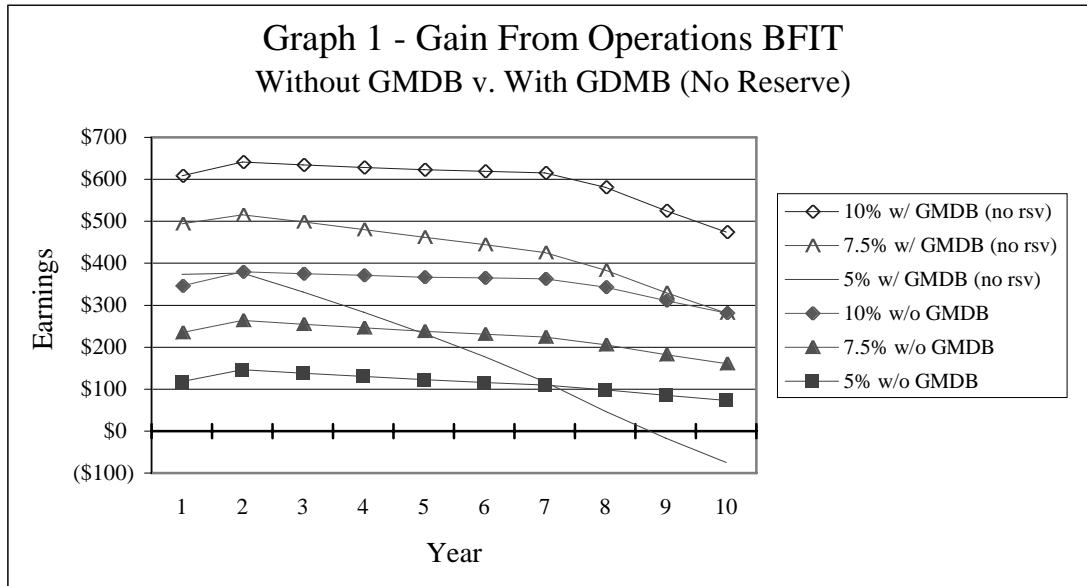
The initial step was to model the product without any GMDB provision whatsoever, simply to test that the product was indeed profitable. We ran the model using three different assumed market returns (before fees): 5%, 7.5% and 10%. In all three cases, the model produced positive GAAP earnings in all ten years of the horizon.

### *Exercise One: With and Without the GMDB Provision*

Before analyzing the impact of the SOP, we first wanted to isolate the impact of adding a GMDB provision to the product without holding any additional reserves. We did this by comparing the stream of GAAP earnings for the product with and without the GMDB at our three assumed market returns. This case reflects the present position of many insurers who currently hold no reserve for this feature. Graph 1 shows a comparison of the product without GMDB to the product with GMDB with a zero reserve at our three assumed market rates.

**VA GMDBs: Contemplating the Impact of the Proposed SOA on GAAP Income**

*continued from page 11*

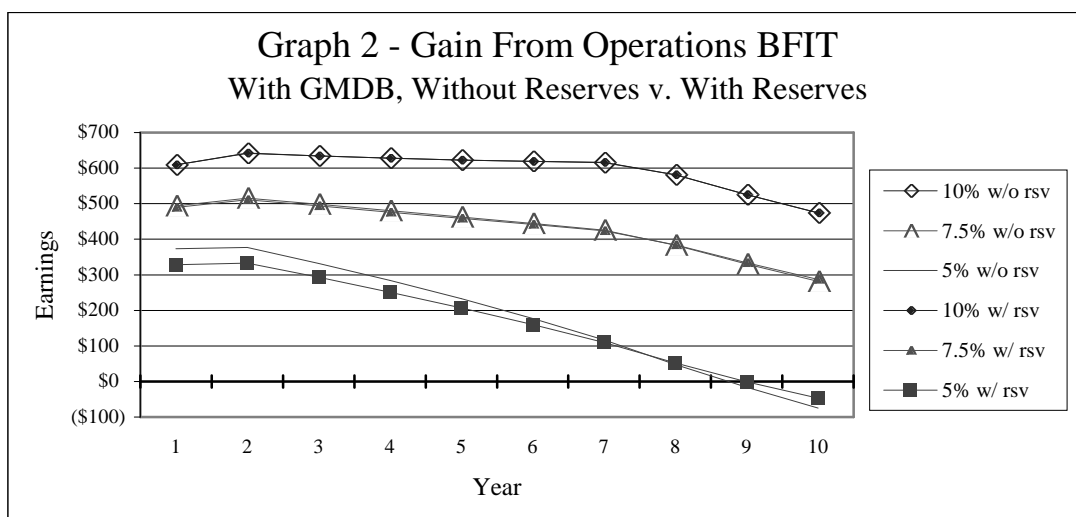


Note that this particular product has much higher GAAP earnings with the GMDB than without, except at the 5% market return. In general, the higher earnings result from the fact that fees are being paid for the GMDB, but an immaterial amount of claims are paid because the assumed market returns generally exceed the 6% GMDB roll-up provision. In the case of the 5% market return, the product with the GMDB becomes less profitable than the product without GMDB in durations nine and ten. This is due to the payment of excess claims under the GMDB feature.

*Exercise Two: Pre- v. Post-SOP*

The next analysis we performed considered the stream of GAAP earnings before and after the application of the GMDB reserving methodology proposed in the SOP. For the sake of simplicity, we calculated the GMDB reserves on a deterministic basis using the applicable assumed market return in each scenario.

Graph 2 shows a comparison of GAAP earnings for a product that has a GMDB with and without the additional GAAP liability. These results are shown for all three assumed market returns.



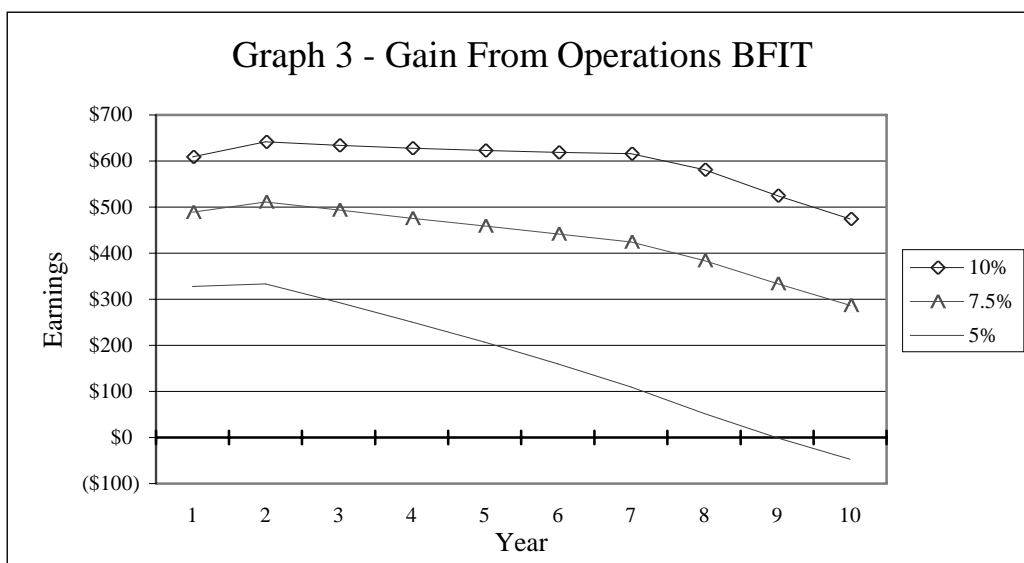
Although this is not shown on Graph 2, we note that when deterministic GMDB reserves are held, the product with the GMDB is still more profitable than the product without the GMDB at both the 7.5% and the 10% market returns. For the 5% market return, the product with GMDB reserves is more profitable than the product without GMDB until duration 7. It is important to note that while the inclusion of the reserve modifies the pattern of GAAP earnings, it does not alter the total amount of earnings over the life of the contract.

As shown in Graph 2, the additional reserve dampens earnings in those scenarios where an additional reserve is required. Although our rollup rate is set at 6%, the 7.5% scenario gives rise to a small amount of GMDB reserves because of the fees and charges, totaling 200 basis points, that are assessed against the 7.5% return, resulting in a net return of 5.5%. The 10% scenario generates no GMDB reserve because the net return exceeds the 6% roll-up, so no excess benefits are ever paid.

In any duration, the increase in the GMDB reserve does not fall directly into income. This is because the impact of the additional reserve on income is partially offset by its impact on DAC amortization. Specifically, when the GMDB reserve is implemented, DAC amortization in the early durations is slowed, while it is increased in the later durations.

*Exercise Three: Level Assumed Return*

Next, we considered the impact of the GMDB reserve under various level assumed returns. We again used 7.5% as the expected return for our base case, and compared this to cases with 5% and 10% returns. Graph 3 shows the earnings pattern over ten years for each of these cases.



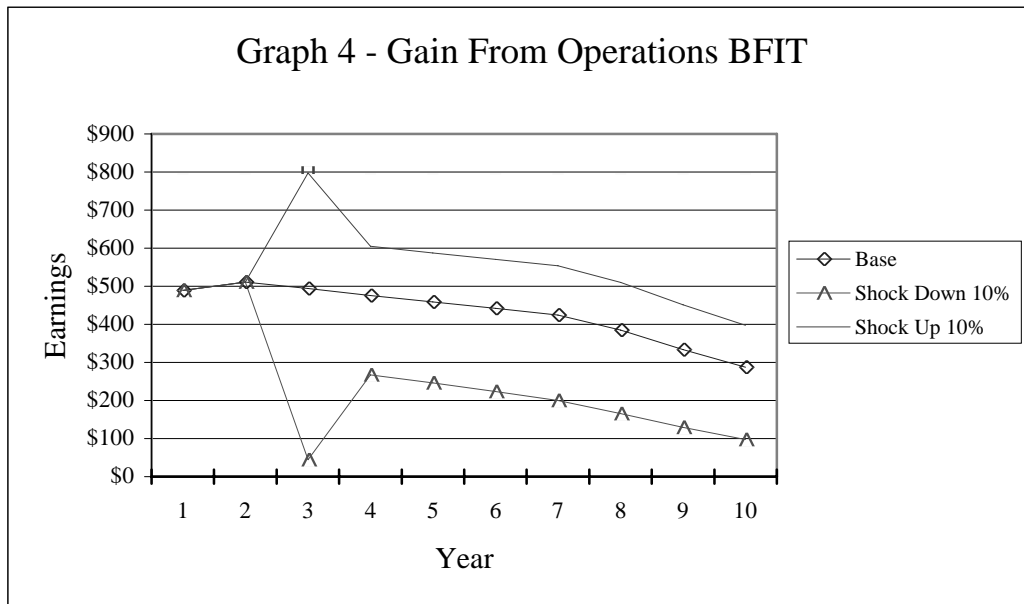
As might be expected, the results do not exhibit symmetry; in other words, the additional 2.5% of return (from 7.5% to 10%) has much less positive impact on earnings than the negative impact generated by the reduction of market return by 2.5% (from 7.5% to 5%).

*Exercise Four: Shock Market Return*

Our next test involved a 10% spike or drop in market values in the 25th month of our projection. We used the base case of a 7.5% return and applied either a spike or drop to this case. The resulting patterns of GAAP earnings are illustrated in Graph 4 on page 14.

**VA GMDBs: Contemplating the Impact of the Proposed SOA on GAAP Income**

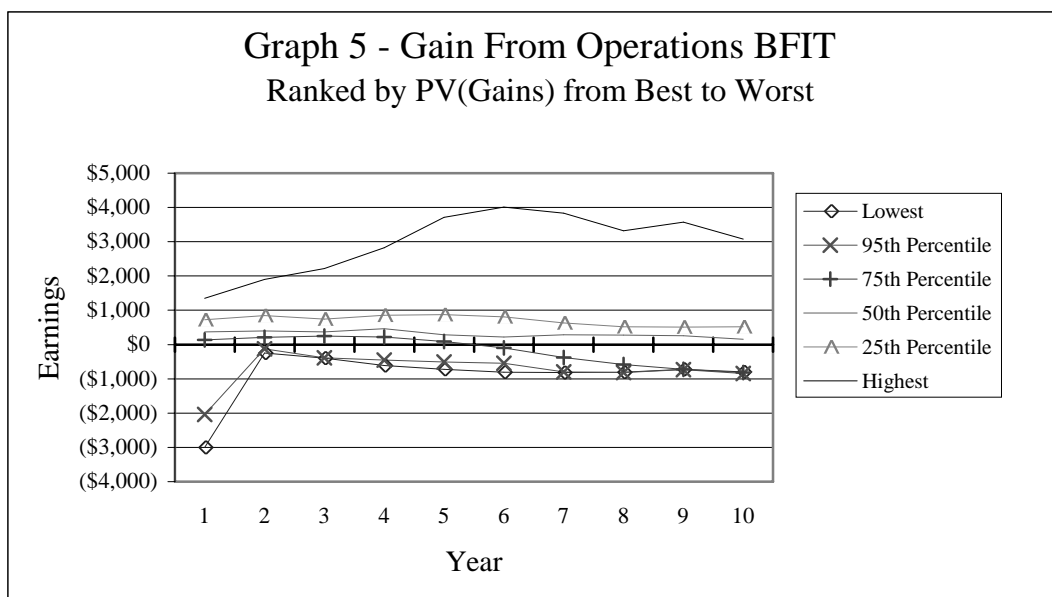
*continued from page 13*



We notice that the spike and drop have a huge impact in GAAP earnings in the year in which they occur (duration three). In the remaining durations of the projection, the earnings patterns are consistent with duration three in direction, although the magnitude of the effect is significantly dampened. The large spike for the shock down scenario reflects the large increase in the additional reserve for the GMDB; in duration four, much of the additional reserve is released bringing earnings back up. The opposite pattern occurs for the shock up scenario. The earnings continue to deviate from the base pattern even after the duration in which the shock occurs because the fees, which drive earnings, are generated from a larger or smaller fund value, as the case may be.

*Exercise Five: Stochastic*

Finally, we performed a stochastic analysis using 100 randomly generated scenarios. The scenarios were generated by the ESE application in MoSes based on a 7.5% average return and 20% volatility. GAAP earnings were calculated on a deterministic basis for each scenario with no true-up or unlocking in future periods. Graph 5 shows the pattern of earnings for specific scenarios ranked according to present value of earnings.



We note that approximately 50% of the scenarios resulted in a ratio in excess of 2% at inception, which would suggest classifying the contract as an insurance contract. We note also that a significant number of the scenarios result in materially negative earnings. This reflects the cliff-type profile of this risk: under many scenarios there is no significant impact to insurer's earnings, but under the few scenarios with significant declines in the market, there is the potential for a significant hit to GAAP income.

### Conclusions and Remarks

Based on our study, we have identified several significant points regarding the proposed GAAP reserve methodology:

1. The distinction between investment and insurance contract as defined in the SOP is important. If insurer's assumptions regarding future expected earnings are overly optimistic at contract inception, they may lose the opportunity for the remainder of the contract life to post a reserve for the GMDB benefit, despite the fact that there is a reasonable chance the GMDB option will be in the money at a future date. Therefore, it is important for insurers to include a reasonable range of assumptions when considering the significance of insurance

risk at contract inception.

2. Since a range of assumptions is used to determine the classification of the contract, it is natural to wonder how many scenarios must give rise to a significant ratio before the contract should be considered an insurance contract. 25%? 50%? All of them? While there is no definitive answer to this question, insurers must carefully weigh the potential for significant losses on these contracts and the potential need for future reserves when determining how to evaluate these results.
3. The GMDB reserve could have a material earnings impact when the separate account performance deviates from expected.
4. DAC amortization impacts will help to dampen but not eliminate the impact of the GMDB reserve requirements.

The SOP provides the first guidance specifically addressing the issue of reserving for VA GMDBs. However, this guidance may raise more questions than it answers. In particular, the determination of insurance risk, the question of consistency between DAC and GMDB

reserve assumptions, the calculation of the present values required for the ratios, and the determination of a reasonable range of assumptions will all require careful consideration and interpretation by insurers applying the SOP.

The interpretation and implementation of this guidance will provide challenges for VA writers, especially since many currently hold no reserves for these products and others are using reserve methodologies that are inconsistent with the proposed approach. Companies will need more sophisticated valuation models and processes to accommodate the proposed requirements, and actuaries will need to exercise judgment in several important aspects of the reserve determination. In a subsequent article, we will illustrate the reserve and earnings implications of the proposed requirements using multi-scenario valuation techniques.

*David C. Heavilin, ASA, is a Senior Consulting Actuary with Ernst & Young LLP in Chicago, IL. He can be reached at [david.heavilin@ey.com](mailto:david.heavilin@ey.com).*

*Karen J. Sasveld, ASA, is a Consulting Actuary with Ernst & Young LLP in Chicago, IL. She can be reached at [karen.sasveld@ey.com](mailto:karen.sasveld@ey.com).*

## U.S. GAAP for Life Insurers

For experienced professionals who use U.S. GAAP in the life insurance industry, U.S. GAAP for Life Insurers is the most up-to-date and comprehensive reference book that consolidates the practices and policies of GAAP surrounding life insurance products.

U.S. GAAP offers perspectives on the objectives of GAAP and shows the application of GAAP to various insurance products, such as: traditional life, deferred annuities, variable and other non-fixed products, income-paying annuities, individual health, credit insurance, group contracts and more.

U.S. GAAP extends beyond the U.S. border to multi-national companies and/or companies interested in accessing the U.S. capital market.

U.S. GAAP for Life Insurers is available from the SOA for \$100 within the U.S. and Canada and \$110 for all other countries. For ordering information, please contact the SOA Books and Publications Department at 847-706-3526 from 8:00 a.m. to 5:00 p.m. central time.



## A New Perspective on Risk Management: Creating Value by Managing Risk

by Francis P. Sabatini and Joseph Weiss

### What Is Risk Management?

Typically, risk management has been associated with interest rate risk, and the programs put into place to explicitly manage this risk have been fairly good. However, there is usually less emphasis placed on managing other risks inherent in the insurance industry. Industry risk management practices are not usually holistic, meaning risk is not viewed on a total company basis.

True enterprise risk management incorporates all company risk into a valuation and measurement system. These risks go beyond typical financial risks—interest rates, equity exposure, lapses, etc.—to risks such as market conduct exposure, operational risk, event risk, and even risks arising from changes in legislation. Unlike most other performance measurement programs within a company, risk management is a prospective measurement system. Typically, management looks at past results and/or current position, but risk management looks ahead, and deals not only with current issues, but also with issues yet to occur.

The financial services industry presently is a very dynamic industry, as it continues to go through a period of consolidation and convergence. Companies are finding it more difficult to compete in today's financial markets.

Companies also have to fight harder to generate or maintain market share. Buyers today are more educated and savvy, and with a more astute marketplace, companies are seeing greater shareholder expectations. Risk management procedures can have a direct influence on company performance, and consequently a direct influence on stock price.

When implemented correctly, a successful risk management program is difficult to duplicate. One consistent feature of most successful programs is discipline. This includes infrastructure, frequent monitoring, solid information gathering, development of credible and actionable information providing management with a sound decision making framework. Quick decisions can then be made based on the information produced, enabling the company to take advantage of new opportunities.

Making the right choices within many areas of the company's business adds shareholder value. In addition to segment focus and product distribution, the company must determine its risk tolerance, decide to what extent it is prepared to handle risks, and finally, an appropriate capital and intellectual investment must be made to

successfully implement the strategy. Making the right choices requires having the right information. Otherwise, success may be a result of being lucky, rather than being good, and it's hard to rely on consistent luck.

There are many drivers of value (e.g., earnings, volatility, public perception), and much of optimizing shareholder value

deals with risk and the management of it. Value is a function of both the quality and volatility of earnings. The level of earnings is less meaningful on an absolute basis, but becomes more interesting when viewed relative to the risks assumed by the company. Along with tangible risk on the balance sheet, the company must also consider and respond to risks perceived by the marketplace. Value will then be optimized when the company is able to create the highest value for the risks assumed by the organization as a whole.

### Old Paradigm vs. New Paradigm

There are two schools of thought concerning risk management techniques—The Old Paradigm (Risk Mitigation) and The New Paradigm (Capturing Opportunities).

Risk management has traditionally been viewed under the old paradigm as a defensive process, and is measured by the impact of these defensive measures. The ultimate goal of risk management is minimizing the negative effect of the risks to which the company is exposed. Risks are identified and assessed on a line-by-line basis, with no consideration given to interactions between lines. After risks have been identified and evaluated, a strategy is devised on a business line basis, with independent tolerances within each line. The strategies are then implemented, with the intent of mitigating existing risks within each line. The effectiveness of each plan of action is then monitored on a line-by-line basis, and the process repeats itself.

Under the new paradigm, risk management is viewed as a possibility to capture opportunities, using it as an offensive and differentiating weapon. If implemented properly, the risk/reward relationship is optimized, and the results are very difficult to replicate by competitors. In addition to the aggressive,





offensive approach of the new paradigm, another distinguishing feature is the broad scope of risk management strategy. Traditionally viewed separately for each business line, the new paradigm uses risk management on a total enterprise basis.

As with the old paradigm, the risk management process under the new paradigm begins by identifying risks, but as the risks are identified, so too are opportunities, optimizations and synergies across business lines. In other words, aggregating risks produces a holistic view rather than a line-by-line view. By aggregating risks, companies are able to take advantage of the fact that many of the risks in the financial services industry are not correlated. Once the risks and opportunities have been identified, they must be presented to management in a way such that management can determine a

risk management process, that is, making it a full-time rather than a once-a year practice, is how best practice companies distinguish themselves from others.

Leveraging risk management as an opportunity rather than a defense mechanism is intended to add value, such as:

- Pursuit of a unique product opportunity based on the ability to recognize the risk/reward relationship
- Reduction of mitigation costs by tolerating risks which may be excessive for a specific business line, but are acceptable overall
- Growth without experiencing an increase in risk by taking advantage of natural hedges implicit across business lines

company, the following three key elements are identified:

- Risk elements – Equity Markets risk, Interest Rate risk, Credit risk, Lapse risk and Mortality risk
- Risk measurement metric – Earnings at Risk (EaR™)
- Measurement horizon – 1, 5 and 10 years

A stochastic process will define each of the risk elements identified. Equity returns are stochastically generated on a correlated basis with interest rates. The interest rates are produced using a robust economic interest rate scenario generator. Credit risk is a fitted distribution based on historical default experience. In reality, there are periods with very little default experience, and there are rare occasions with substantial defaults. The distribution used reflects the frequency of these events. Lapses have a base lapse and dynamic lapse component. Lapses are a difficult component to specify, and could potentially be one of the more significant risks. Recent history has experienced a relatively low level of lapses, thanks in part to a low and declining interest rate environment. Should interest rates increase significantly, the actions of policyholders will be very difficult to predict. Mortality is distributed to simulate a long-term secular deterioration in mortality.

The Earnings at Risk (EaR) metric is one of many which could be used, and will be measured over a one, five and ten-year horizon. For each scenario the statutory book profits are summed over the horizon. The resulting scenario values are then ranked from lowest to highest. EaR is simply the difference between the mean value and the value at the 5th percentile. Other levels of EaR could also be used, such as the difference between the mean and the 10<sup>th</sup> or 20<sup>th</sup> percentile.

Table 1 presents the UL results using five-year earnings. The total column contains the results for the aggregate UL line, and the Lapse, Credit, Mortality and Interest columns include results isolated for each of the risk components. Using expected values for the other risk elements while credit processing is performed stochastically develops the

*“The ultimate goal of risk management is minimizing the negative effect of the risks to which the company is exposed.”*

comfortable level of risk. And with the holistic view, management is usually a senior company officer rather than the head of a business line. Ordinarily, increased risk should produce a commensurate increased reward, and a plan is devised to optimize the risk/reward relationship on a total company basis.

Much of the analysis in developing this type of strategy requires extensive modeling capabilities, including appropriate hardware, software, modeling skills, and processes. Companies need to produce appropriate scenarios and use a suitable metric to measure results. Sensitivity and stress tests are required to determine the optimal strategy. The strategy is then implemented, with the goal to constantly improve the risk/reward trade-off. The plan is constantly reevaluated and monitored to determine the effectiveness of the process, all the while considering dynamic changes in market conditions. Changes must be made rapidly to seize opportunities through real-time decisions. Institutionalizing the

**Case Study**

The following case study will demonstrate the value of a financial risk management process. A comprehensive process including financial risk as well as business risk, operational risk and event risk will provide even greater benefit.

Suppose, in this simplified example, we have the following distribution of assets and liabilities:

<b>LIABILITIES</b>	
Universal Life	\$400
Variable Annuities (with 5% roll-up GMDB)	\$1,300
Bank CDs	\$100

<b>ASSETS</b>	
UL backed by Corporate bonds and mortgage pass-throughs	
Bank CD backed by mortgage pass-throughs	

In order to measure the risk of this

## A New Perspective on Risk Management: Creating Value by Managing Risk

*continued from page 17*

credit risk-only result. A similar approach is used to isolate the contribution from each risk element (See Table 1 to the right).

Several observations can be made from the results.

- The Earnings at Risk is \$8.4 (Mean of \$9.7 less 5<sup>th</sup> percentile value of \$1.3).
- The distribution of earnings is quite wide, going from a low value of negative \$9.7 to a high value of \$23.9.
- When looking at the individual risk elements, it is quickly apparent the sum of the individual risk components is greater than the total risk of the block of business. This outcome demonstrates the correlation effect between the different risk elements. The sum of the individual EaRs is \$16.8, and the total EaR is \$8.4, revealing a negative correlation of \$8.4. What this illustrates is that the worst credit event does not necessarily occur at the same time as the worst interest rate event. And neither of those events occurs at the point in time of the worst mortality event. The different elements are not one 100% positively correlated, and, in fact, may be slightly negatively correlated.

**Table 1 - UL Results (5-year Earnings)**

Percentile	Total	Lapse	Credit	Mortality	Interest
1st	(\$9.7)	\$16.6	\$11.0	\$7.6	(\$0.4)
5th	1.3	16.9	13.0	11.1	4.4
25th	7.2	17.1	14.4	14.9	10.3
50th	11.2	17.3	15.1	17.3	15.0
75th	14.9	17.4	15.8	18.7	18.0
100th	23.9	18.0	17.1	27.2	22.8
Mean	\$9.7	\$17.3	\$14.7	\$17.4	\$12.9
EaR	8.4	0.4	1.7	6.2	8.5

When looking at these risk elements independently, they will produce a total amount of risk exposure that is greater than the aggregate result.

In addition to the correlation effect of the risk elements, there is also a correlation effect across different products. Since the risks are not all positively correlated, there is a natural benefit among the products. For example, when people lapse on variable annuities, they probably will persist with their UL policy or bank CD. Table 2 below includes the EaR for each product, as well as the correlation effect and the total company (holistic) results.

When taking a holistic view of the business, the interaction of the risk

elements within the products, as well as the risk elements across the products is most evident. Summing the EaR for each product, and accounting for the risk element correlation effect produces a total EaR of \$30.1. However, when including the total correlation effect across products, the EaR is reduced to \$17.9.

The time horizon can also cause a substantial impact on the results of the analysis. The EaR for a one-year, 5-year and 10-year horizon for all products combined is included in Table 3 on page 19.

The total EaR does not change substantially over the different time horizons (3.9

**Table 2 - Total Company Earnings at Risk**

Risk Element	UL	VA	CD	Uncorrelated	Correlation Effect	Holistic
Interest	\$8.5	\$2.1	\$1.2	\$11.8	(\$0.4)	\$11.4
Equity		21.3		21.3		21.3
Credit	1.7			1.7		1.7
Lapse	0.4	1.0		1.4	(0.2)	1.2
Mortality	6.2	0.3		6.6		6.7
Uncorrelated Total	16.8	24.7	1.2	42.7	(0.4)	42.3
Correlation Effect	(8.4)	(4.2)	(0.0)	(12.6)		(24.4)
Correlated Total	8.4	20.5	1.2	30.1		17.9

**Table 3 - Earnings at Risk, Multiple Horizons**

Risk Element	EaR <sup>1</sup>	EaR <sup>5</sup>	EaR <sup>10</sup>
Interest Rate	\$1.1	\$11.4	\$27.4
Equity	5.9	21.3	50.4
Credit	0.9	1.7	1.9
Lapse	0.0	1.2	7.6
Mortality	1.3	6.7	14.7
Uncorrelated Total	9.1	42.3	102.1
Correlation Effect	(5.2)	(24.4)	(64.2)
Correlated Total	3.9	17.9	37.9

for one year, 3.6 per year for five year, and 3.8 per year for ten year), but the relative impact of the different risk elements has changed. For example, the interest rate risk is a much smaller percentage of the total on a one-year horizon than the five or ten-year horizon, and the equity exposure is a much greater percentage of the total for the one-year horizon.

Based on the product structures, the reasons for the patterns of the risk elements are intuitive. Interest rates are unlikely to have an immediate, short-term impact on the products, while equity markets have a significant probability of quick drops in value. Credit is more significant on a short-term basis, because while credit events are not common, they are quick and severe. Mortality maintains a consistent level of total risk for all horizons.

Now suppose the business mix is changed as follows:

- UL - \$500 (formerly \$400)

- Variable Annuities - \$800 (formerly \$1,300)
- Bank CDs - \$500 (formerly \$100)

Under the original business mix, the total correlated five-year EaR (from Table 2) was \$17.9. Under the new business mix, the total correlated EaR is \$17.3. At first, there does not appear to be a significant risk exposure difference between the original and new business mixes. However, Table 4 breaks down the EaRs on a percentile distribution basis.

The picture is quite different when viewing results over the entire range of outcomes. Clearly, the original mix with an emphasis on variable annuities is considerably more volatile. The old mix produces far lower earnings in the lower percentiles; even substantially negative earnings in the worst-case scenario, and earnings are not as high in the favorable scenarios. There is an obvious conclusion

here. The more balanced product mix results in a significantly greater expected value without increasing the overall risk exposure. Arguably companies that have followed a more balanced product mix strategy have better valuations today because of the mix decisions.

Although this is a simplified example, the benefits of an integrated offensive approach to risk management are quite evident. Integrating other risks with the results from this type of analysis will produce a more effective process. This offensive use of risk management practices can be used strategically and tactically in setting investment strategies, product management tactics such as crediting strategies, product development decisions, etc. Making risk management a full-time practice, and taking an offensive rather than a defensive approach to risk management will put the company in a position to capture opportunities.

*Francis P. Sabatini, FSA, MAAA, is a partner at Ernst & Young LLP in Hartford, CT. He can be reached at [Frank.Sabatini@ey.com](mailto:Frank.Sabatini@ey.com).*

*Joseph M. Weiss, FSA, MAAA, is a consulting actuary at Ernst & Young LLP in Hartford, CT. He can be reached at [Joseph.Weiss@ey.com](mailto:Joseph.Weiss@ey.com).*

**Table 4 - Earnings at Risk, Old Mix vs. New Mix**

Percentile	Old Mix	New Mix
0th	(\$20.4)	\$1.1
5th	7.7	17.4
25th	20.8	29.7
50th	28.7	36.9
75th	37.5	44.3
100th	46.5	51.8
Mean	25.6	34.7
EaR (Mean - 5th)	17.9	17.3

**FINANCIAL REPORTING SECTION**

SOCIETY OF ACTUARIES

FINANCIAL STATEMENT

PERIOD ENDING SEPTEMBER 30, 2001

FUND BALANCE AS OF JANUARY 1, 2001 \$380,726

	JUNE YTD	SEPTEMBER	SEPTEMBER YTD
<b>INCOME:</b>			
Dues	\$36,240	\$550	\$36,790
Seminars	0	0	0
GAAP Book Sales	51,761	21,424	73,185
Newsletter	105	106	211
Monograph	60	0	60
Interest	6,106	3,166	9,272
<b>Total Income</b>	<b>\$94,272</b>	<b>\$25,246</b>	<b>\$119,518</b>
<b>EXPENSES:</b>			
Travel	\$968	\$0	\$968
Honorarium	5,000	0	5,000
Printing	4,335	2,475	6,810
Postage & Mailing	2,981	3,489	6,470
GAAP Book Expenses	21,874	12,938	34,812
Special Supplies	0	1,119	1,119
Functions	0	0	0
Conference Calls	58	91	149
Seminars	0	3,500	3,500
Research Projects	0	2,500	2,500
Course Development	0	8,750	8,750
Administrative Charge	18,560	0	18,560
<b>Total Expenses</b>	<b>\$53,776</b>	<b>\$34,862</b>	<b>\$88,638</b>
<b>Net Income</b>	<b>\$40,496</b>		<b>\$30,880</b>
<b>FUND BALANCE</b>	<b>\$421,222</b>	-----	<b>\$411,606</b>

Notes to Financial Statement:

Printing: Newsletter - 9/01

Postage &amp; Mailing: Newsletter - 6/01, 9/01

GAAP Book Expenses: Printing + Royalties

Special Supplies - elective transcription of two Toronto sessions+ retiring chair's gift

Conference Calls: 5/01, 7/01

Seminars: Section contribution to SOA international programs

Research: Section support of Futurism mortality project

Course Development: Section support of Wharton ALM Program

*This Section has made the following financial commitments:*

Distribution of expense monograph - up to \$20,000

1995 Specialty Guides -\$5,000 (to date - paid \$2,020)

Wharton Program on ALM - \$35,000 (to date - paid \$8,750)

Futurism Section Research on mortality at advanced ages \$3,500 (to date - paid \$2,500)

2001 Annual Meeting Photos from New Orleans!!



**Above** — The Financial Reporting Section Council takes a break from planning Section activities for the coming year to pose for the camera....**Left to Right:** John Bevacqua, David Rogers, Mike Eckman (2000-2001 chair), Deb Poorman, Barry Shemin (2001-2002 chair), Jim Greaton, and Mike McLaughlin (1999-2000 chair)

**Below** — Dick Robertson speaking on recent developments in international financial reporting standards at the Financial Reporting Section breakfast (with Mike Eckman in his chairperson's jacket looking on).



2001 Annual Meeting Photos from New Orleans!!

**Right** — Mike Eckman passes on the green jacket to the new section chairperson, Barry Shemin



**Left** — Barry Shemin, now wearing the coveted green jacket, presents a gavel to outgoing chairperson, Mike Eckman, in appreciation of Mike's leadership in the past year

2001 Annual Meeting Photos from New Orleans!!



*Above — Is everyone talking about financial reporting at the section reception?*



Society of Actuaries  
475 N. Martingale Road  
Suite 800  
Schaumburg, Illinois  
60173

Phone: (847) 706-3500