



SOCIETY OF ACTUARIES

Article from:

The Financial Reporter

September 2008 – Issue No. 74

The Financial Reporter

ISSUE 74 SEPTEMBER 2008

- 1 Fair Value Disclosures for Financial Instruments under FAS 157**
This is one of a series of articles by the American Academy of Actuaries' Life Financial Reporting Committee.
Leonard Reback
- 2 Chairperson's Corner Section Council Update.**
Jerry Enoch
- 8 Liability Valuation in a Current Exit Value Environment: The Interest Credited Rate Dilemma**
Methodologies for determining current exit value for a sample SPDA product.
Tara Hansen and Mark Friedman
- 16 A Change in Own Credit Risk**
A new perspective on the use of own credit risk in the valuation of liabilities.
Steve Malerich
- 20 Principle-Based Reserves Update**
An update on activities surrounding the principle-based approach to statutory reserves and minimum regulatory capital.
Karen Rudolph
- 23 SEC Objects to Prospective Unlocking of LTC Reserves**
Discussion of the recent SEC determination regarding prospective unlocking of long-term care reserves.
Rowen Bell
- 28 From Those Wonderful Folks Who Brought You the Subprime Crisis**
Commentary from the International Accounting front.
Henry Siegel

Fair Values Disclosures For Financial Instruments Under FAS 157

by Leonard Reback, FSA, MAAA

Most companies spent much of 2007 and early 2008 interpreting and implementing Financial Accounting Standard Board (FASB) Statement No. 157 (FAS 157) on Fair Value Measurement. This GAAP accounting standard addresses the measurement of fair value wherever fair value is required under GAAP. Valuations of derivatives, embedded derivatives (such as GMABs and GMWBs), and certain securities were required to conform to FAS 157 in early 2008 for most insurance companies. However, certain fair value measurements involving actuarial work may not have been required to conform to FAS 157 until late 2008 or early 2009. The purpose of this article is to discuss those items and propose possible methods for actuaries to consider when performing the necessary valuations, from an actuarial standpoint only. This article does not portend to determine FASB's interpretation of FAS 157 or any other FASB statement discussed herein.

A different accounting standard, FASB Statement No. 107 (FAS 107), covers Disclosure about Fair Value of Financial Instruments. FAS 107 requires a footnote disclosure to a company's financial statements showing the fair value of certain financial instruments. Even though these items are reported on the balance sheet on a basis other than fair value, a fair value calculation is required for the footnote. This footnote is generally only included in year-end GAAP financial statements. So, for most companies, fair value calculations under FAS 157 have not yet been required for FAS 107 footnote purposes. But those calculations will likely be required when SEC 10-K filings are prepared in early 2009.

FAS 107 does not cover all financial instruments because there are certain exceptions. The exception of most interest to actuaries is the



Leonard Reback, FSA, MAAA, is vice president and actuary, Metropolitan Life Insurance Co. in Bridgewater, NJ. He can be contacted at 908.253.1172 or lreback@metlife.com.

exception for insurance contracts. Contracts that are considered insurance contracts under FAS 60, FAS 97 or FAS 120 are exempt from the requirement to disclose a fair value in this footnote.

Despite this exemption, many contracts sold by insurance companies are included in the scope of this footnote, and fair value calculations conforming to FAS 157 will be required. One major class includes investment contracts. This category includes many fixed annuities, variable annuities without significant death benefits, guaranteed investment contracts (GICs), and reinsurance contracts that use deposit accounting. Policy loans may also fall into this category. These financial instruments will soon need to have fair value calculated in a manner consistent with FAS 157 for purposes of the FAS 107 footnote.

FAIR VALUE UNDER FAS 157

In order to calculate the fair value of financial instruments for FAS 107 disclosures, the actuary needs to make several decisions. One decision is to determine which fair value calculation methodology will be used. Other decisions include own credit adjustments and risk margins required by FAS 157. These decisions are similar to the decisions actuaries faced in determining fair values for embedded derivatives.

Several methods may be appropriate to calculate fair value of financial instruments for FAS 107 disclosures. For some contracts, the value may be small enough that

Several methods may be appropriate to calculate fair value of financial instruments for FAS 107 disclosures.

cash value or account balance should not be materially different from fair value. Similarly, for contracts with floating interest rates and no optionality, the account balance may be an appropriate estimate of fair value, regardless of size.

But, for other contracts, a more elaborate actuarial calculation may be needed. For example, fixed deferred annuities may have current credited rates guaranteed for a period of time, and potential impacts from policyholder withdrawals, future premium payments and minimum interest guarantees, in which case the fair value is likely to be different from the account balance, depending on the value of the guarantees. GICs may have a fixed credited rate for a period of time and may also have potential policyholder behavior impacts and options. And reinsurance contracts that use deposit accounting often have a fixed interest rate, and may have other characteristics that indicate the fair value is different from the account balance. Two classes of methodologies that may be appropriate for fair value calculations of such contracts are actuarial appraisal-like methods and risk-neutral methods.

In an actuarial appraisal-like calculation, cash flows, net income, or capital flows are projected. The assumptions used include actuarial assumptions, such as mortality, persistency and expenses, as well as assumptions for asset returns and any other relevant capital market parameters. The capital market parameters would normally be based on real world assumptions. Typically, a single scenario is used for the projection. The resulting cash flows, income or capital flows are discounted at an appropriate discount rate.

In a risk neutral valuation,¹ cash flows are projected using actuarial assumptions for items like mortality, persistency and expenses. But capital market assumptions—asset returns, interest rates, default rates and equity volatility—are calibrated to capital market prices. Asset returns are assumed to be the observed risk free rates. The capital market assumptions may differ from real world assumptions. For example, we typically expect that equity assets will return something higher than risk free rates. The difference is essentially a market-consistent risk margin on the capital market assumptions.

FOOTNOTES:

¹Many finance textbooks, for example, Hull (2003) *Options, Futures and Other Derivatives*, contain more complete details on how to perform a risk neutral valuation.

A single scenario may be used for some products, but for products with embedded options, such as interest rate floors or book value withdrawals, multiple scenarios may be necessary. Discounting of cash flows is also done at risk free rates (although an adjustment for own credit risk may be made to the discount rates if that is not accounted for in the cash flow projection).

Each of the methods has certain advantages. The actuarial appraisal method is familiar to actuaries and is commonly used in pricing insurance companies' products. FAS 157 requires identification of the exit market. If the exit market for a particular instrument is other insurance companies, then the actuarial appraisal method may be particularly appropriate. And, since the actuarial appraisal method does not necessarily require multiple scenarios or calibrations to capital market prices, it may be simpler to apply.

The risk neutral approach has certain advantages as well. By calibrating to observable capital market prices, it maximizes the use of observable inputs. It also insures that embedded options in the product, such as interest rate floors, are valued consistently with similar options traded in capital markets. By calibrating inputs to capital market prices, any risk margin included in those prices is automatically incorporated into the valuation, avoiding the need for a separate risk margin. This may be of particular value since risk margin calculation techniques for fair valuing insurance company products are not currently well developed. Plus, if the exit market for the product being valued includes financial institutions other than insurance companies, the risk neutral approach may be particularly appropriate.

The risk neutral approach can be more complicated to apply than the actuarial appraisal approach, but this is not always the case. Take, for example, a GIC that pays a fixed cash flow after three years. Assume the GIC has no embedded options and no provision for withdrawal before maturity. In this case, the fair value calculated by the risk neutral approach may simply be the cash flow at maturity discounted at a risk free rate. An adjustment may be needed to the cash flow or discount rate to reflect the insurer's own credit stand-



ing. Multiple scenarios may be avoided and a separate risk margin may not be needed either.

For other products, a risk neutral calculation may be complicated. Characteristics that will typically increase complexity include policyholder behavior and embedded options. Embedded options may require the use of multiple scenarios in order to reflect cases where the option becomes valuable. The multiple scenarios would have to be calibrated to current capital market conditions, insuring no arbitrage opportunities. And cash flows would have to be projected and discounted along each scenario.

RISK MARGINS AND OWN CREDIT

Two concepts that need to be addressed for embedded derivative fair values under FAS 157 are risk margins and own credit adjustments. These will likely also need to be addressed for the fair values of financial instruments for FAS 107 disclosures.

According to FAS 157, the risk margin or risk premium should “reflect the amount market participants would demand because of the risk in the cash flows.” If a risk neutral approach is used, that may eliminate the need for separate, explicit risk margins on capital market assumptions. That is because risk neutral approaches automatically provide implicit risk margins on capital market assumptions. They do this by biasing the probability weights on the scenarios used in order to replicate market prices.

But other valuation approaches may require a risk margin for capital market assumptions. And, regardless of the valuation approach, unobservable actuarial assumptions that significantly impact the valuation, such as policyholder behavior, may require a risk margin.

Several methods have been suggested for calculating risk margins on insurance products. These approaches may also be appropriate for financial instruments subject to FAS 107 disclosures. Among the methods² are:

1. Quantile methods;
2. Cost of capital methods;
3. Discount related methods;
4. Explicit assumptions; and
5. Methods based on utility functions or hazard transforms.

Quantile methods encompass several approaches,³ including:

1. Basing the risk margin on a percentile or confidence interval;
2. Using a Cumulative Tail Expectation (CTE) calculation, similar to C3 Phase 2; or
3. Basing the risk margin on a multiple of the second or higher moments of a distribution, such as a Wang Transform applied to a normal distribution.⁴

Cost of capital methods apply a cost of capital rate to the capital required to cover the risks at each future period. The required capital may be based on regulatory requirements, rating agency requirements or internal economic capital calculations (or some combination). The resulting cost of capital at each period is discounted to produce the risk margin.

Discount related methods adjust the rate used to discount expected cash flows in order to reflect the risk. Explicit assumption related methods incorporate an explicit element of conservatism to the assumptions used to generate cash flows. Methods based on hazard functions include the general case of the Wang Transform methodology.⁵

Regardless of the method chosen to calculate the risk margin for a particular risk, it is necessary to calibrate that to the margin a market participant would charge for bearing the risk. This can be a challenge, since the methodologies for calculating insurance companies' products' risk margins are still being developed. Furthermore, observable market risk margins are rarely available to calibrate to.

FAS 157 also requires that "the fair value of the liability shall reflect the non-performance risk related to that liability." Non-performance risk "includes but may not be limited to the reporting entity's own credit risk." But the non-performance risk of a particular instrument subject to FAS 107 disclosures may be different from that of the entity's debt, due to the primacy of most claim liabilities over debt liabilities. Reflecting own credit risk has the possibly counterintuitive impact of reducing the liability (and raising surplus). Again, there are several ways this can be done.

One way is to reduce the expected liability cash flows by the appropriate default probability. If multiple scenarios are being generated to calculate the expected cash flows, default scenarios can be included. Another way is to increase the discount rate to reflect the credit standing of the instrument.

If a risk neutral approach is used to calculate fair value, it may seem odd to discount the cash flows at a rate higher than the risk free rate. However, this would be an appropriate approach. If the cash flows were discounted at the risk free rate, the cash flows would have to incorporate a default probability. Under a risk neutral approach, the default probability would have to be calibrated to capital market prices. Since the capital market prices would be based on the relevant credit spreads, the same result is achieved by either:

FOOTNOTES:

²International Actuarial Association ad hoc Risk Margin Working Group (2008), *Measurement of Liabilities for Insurance Contracts: Current Estimates and Risk Margins, March 2008 Re-Exposure Draft*, p. 51-52.

³Ibid, p. 51-52.

⁴Zinkovsky, V. (2007), *Risk Margins to the Non-Market Risks under FAS 157: Suggested Approach*, Society of Actuaries *Financial Reporter*, December 2007.

⁵Ibid.

1. Calculating cash flows without a default assumption and discount at the risk free rate plus the credit spread; or
2. Calibrating default probabilities to credit spreads, adjusting the cash flows for the default probabilities, and discounting at the risk free rate.⁶

The first approach would generally be simpler to apply.

FUTURE DIRECTIONS

Currently, fair value for financial instruments within the scope of FAS 107 is generally only needed for footnote disclosures. However, both FASB and the International Accounting Standards Board (IASB) recently released a discussion paper entitled Reducing Complexity in Reporting Financial Instruments.⁷ In that discussion paper, FASB and IASB express a

long-term goal of accounting for all financial instruments at fair value.

One of the potential obstacles to achieving this long-term goal is the difficulty of estimating fair value for certain financial instruments. But FASB and IASB note that today's financial reporting standards (such as FAS 107) already require fair value disclosures of many such instruments. If this long-term goal of fair value reporting for all financial instruments ever becomes a reality, the fair value calculations actuaries currently need to do only for disclosure purposes may eventually impact net income and GAAP equity. ■

FOOTNOTES:

⁶Hull, J. (2003), Options, Futures and Other Derivatives, p.611-618.

⁷ Available on the FASB Web site at http://www.fasb.org/draft/ITC_Financial_Instruments.pdf

Let Your Voice Be Heard!

THE SOA 2008 ELECTIONS ARE JUST AROUND THE CORNER! POLLS OPEN ON AUGUST 7 AND CLOSE ON SEPTEMBER 10 AT 11:45 A.M. CENTRAL TIME. ONLINE VOTING FOR THE ELECTION WILL BE OPEN 24 HOURS A DAY.

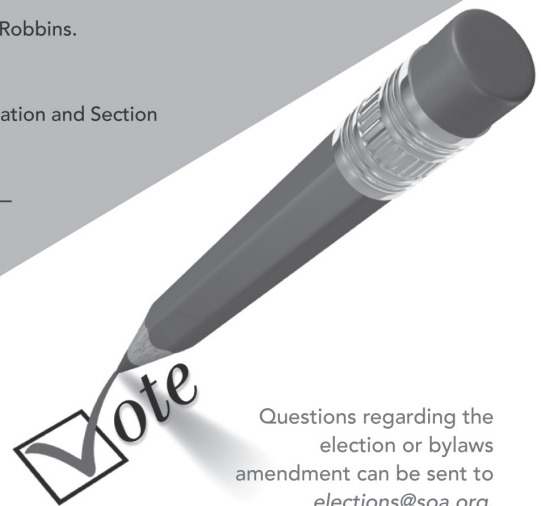
Visit the SOA Web site at <http://www.soa.org/elections> to learn more about the candidates. You'll find:

- Video recorded campaign speeches by President-Elect candidates.
- President-Elect roundtable discussion moderated by Past President Ed Robbins.
- Photographs and biographies of Board Candidates.
- Biographies of Section Council candidates.
- Entire ballots including the Board, Bylaws amendment and proxy information and Section Council candidates.

This election has a SOA Bylaws amendment proxy to allow Associates—who have been members of the Society for five years or more—to vote in elections for President-Elect, Vice Presidents and elected Board of Directors. Remember: all information—including the suggested Bylaws amendment—can be found at <http://www.soa.org/elections>.

Let your voice be heard! Please vote!

Actuaries
Risk is Opportunity.®



Questions regarding the election or bylaws amendment can be sent to elections@soa.org.