



AMERICAN ACADEMY
of ACTUARIES

EXPOSURE DRAFT
Practice Note on FAS 157 & FAS 159

This practice note was prepared by a work group organized by the Life Financial Reporting Committee within the Life Practice Council of the American Academy of Actuaries. The practices presented here represent observations of actuaries working in the life insurance industry.

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FAS 157 & FAS 159 Q&A

FAS 157

Overview:

Q1. What is FAS 157?

A1. Statement of Financial Accounting Standards (FAS) No. 157, promulgated by the Financial Accounting Standards Board (FASB), defines fair value measurement for U.S. generally accepted accounting principles (GAAP) accounting purposes. FAS 157 establishes a framework for GAAP fair value calculations and expands the disclosures required for items measured at fair value. FAS 157 provides concepts and principles for the fair valuation while not specifically providing prescriptive requirements for the calculations.

FAS 157 does not specify when to apply fair value. Guidance for when to apply fair value is provided by other accounting standards and guidance. FAS 157 provides guidance as to how to apply fair value when fair valuation is specified by other accounting standards.

Q2. How does FAS 157 define fair value?

A2. Paragraph 5 of FAS 157 defines fair value as “the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date.” The complete document is available at the time of the issuance of this practice note at <http://www.fasb.org/pdf/fas157.pdf> at Page 2 (FASB September 2006).

So, fair value is an exit price based on a hypothetical transaction between market participants. In other words, it is the price an entity would incur if it “exited” its rights from an asset or to exit its obligations under a liability.

Q3. What are some of the life actuarial items that FAS 157 applies to?

A3. With certain limited exceptions, FAS 157 may apply to any item that is required to be accounted for at fair value by other GAAP literature. FAS 157 itself does not define particular instances when fair value needs to be applied.

Specific instances where FAS 157 may apply to items generally calculated by actuaries include:

- Derivatives and Embedded Derivatives (FAS 133)

- Financial Instrument Fair Value Disclosures (FAS 107)
- Purchase GAAP and Business Combinations (FAS 141)
- Impairment Testing (FAS 142 and FAS 144)
- Fair Value Option (FAS 159)

Derivatives and Embedded Derivatives:

FAS 133 requires that certain derivatives and embedded derivatives be accounted for at fair value. Some common embedded derivatives found on contracts sold by insurance companies include Guaranteed Minimum Accumulation Benefits (GMAB) on variable annuity contracts, Guaranteed Minimum Withdrawal Benefits (GMWB) on variable annuity contracts, and equity index features on equity indexed annuities (EIA). Certain reinsurance features are also considered embedded derivatives under Derivatives Implementation Group Issue B36 (DIG B36). These include certain modified coinsurance (modco) and funds withheld arrangements.

Certain types of reinsurance contracts may also contain embedded derivatives or even be derivatives in their entirety. Many reinsurance contracts covering Guaranteed Minimum Income Benefits (GMIB) are either considered freestanding derivatives or else may contain embedded derivatives. Certain reinsurance contracts covering cost of insurance (COI) charges waived on universal life contracts with secondary guarantees if the account value runs out (as opposed to covering actual death claims) may also be considered freestanding derivatives or else may contain embedded derivatives. If they are considered derivatives under FAS 133, FAS 157 also applies to their valuation.

Financial Instrument Fair Value Disclosures:

FAS 107 requires a footnote disclosing the fair value of many financial instruments. Although insurance contracts are explicitly excluded from this disclosure, many contracts that are sold by insurance companies are classified as investment contracts for GAAP accounting purposes and thus may be included within the scope of FAS 107 disclosures. Such contracts include deferred annuities without significant insurance risk, guaranteed investment contracts, payout annuities without life contingencies, and reinsurance contracts that do not meet the risk transfer requirements of FAS 113. FAS 157 applies to these disclosures (see appendix D of FAS 157).

Purchase GAAP and Business Combinations:

FAS 141 (and the upcoming FAS 141R) requires that financial instruments and certain intangible assets acquired in a business combination be valued on day 1 at fair value (although after the initial acquisition date the value may diverge from fair value). This requirement appears to apply to insurance and investment contracts acquired in a business combination as well as to intangibles such as value of distribution agreements and value of customer relationships acquired in the business combination. FAS 157 applies to the day 1 fair valuation of these items in the business combination. The FASB issued a Staff

Position on FAS 157 that delayed implementation of FAS 157 for non-financial items until 2009, which delays the application of FAS 157 for business combinations.

Impairment Testing:

FAS 142 requires goodwill to be allocated to reporting units and tested for impairment at least annually. The test is passed if the fair value of a reporting unit exceeds its carrying value. FAS 157 applies to the determination of fair value of such reporting units (see appendix D of FAS 157).

FAS 144 requires that certain intangible assets be evaluated for impairment when certain conditions are met. Per paragraph 17 of FAS 142, the test is that the carrying value of the intangible asset be less than the fair value of the asset on the valuation date. Paragraph E22 of FAS 157 states that FAS 157 applies to determining the fair value to be used in this impairment test (see appendix D of FAS 157).

The FASB issued a Staff Position on FAS 157 that delayed implementation of FAS 157 for non-financial items until 2009, which delays the application of FAS 157 for impairment testing for goodwill and other intangible assets.

Fair Value Option:

FAS 157 applies to any financial instrument for which a fair value option election is made under FAS 159.

In addition, FAS 157 appears to apply to calculations of fair value of securities (under FAS 115), pension and post-retirement assets (under FAS 87 and 106).

Principal/Most Advantageous Market:

Q4. What considerations might be taken into account when defining the principal or most advantageous market?

A4. FAS 157 defines the concepts of “principal” and “most advantageous” markets and requires fair value to be based on the principal market. In the event there is not a principal market, FAS 157 provides that the fair value may be based on the most advantageous market as a default.

FAS 157 states the following in Paragraph 8: “The principal market is the market in which the reporting entity would sell the asset or transfer the liability with the greatest volume and level of activity for the asset or liability. The most advantageous market is the market in which the reporting entity would sell the asset or transfer the liability with the price that maximizes the amount that would be received for the asset or minimizes the amount that would be paid to transfer the liability, considering transaction costs in the respective market(s). In either case, the principal (or most advantageous) market (and

thus, market participants) should be considered from the perspective of the reporting entity, thereby allowing for differences between and among entities with different activities. If there is a principal market for the asset or liability, the fair value measurement shall represent the price in that market (whether that price is directly observable or otherwise determined using a valuation technique), even if the price in a different market is potentially more advantageous at the measurement date.”

In addition, the FAS 157 definition of “fair value” is based on a hypothetical transaction between “market participants” and represents the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction (i.e., not a forced liquidation or distress sale). Paragraphs 10 and 11 of FAS 157 state “Market participants are buyers and sellers in the principal (or most advantageous) market for the asset or liability that are:

- a. Independent of the reporting entity; that is, they are not related parties
- b. Knowledgeable, having a reasonable understanding about the asset or liability and the transaction based on all available information ...
- c. Able to transact for the asset or liability
- d. Willing to transact for the asset or liability; that is, they are motivated but not forced or otherwise compelled to do so.

The fair value of the asset or liability shall be determined based on the assumptions that market participants would use in pricing the asset or liability. In developing those assumptions, the reporting entity need not identify specific market participants. Rather, the reporting entity should identify characteristics that distinguish market participants generally, considering factors specific to (a) the asset or liability, (b) the principal (or most advantageous) market for the asset or liability, and (c) market participants with whom the reporting entity would transact in that market.”

Q5. What are some potential markets that could be considered for determining fair values for life insurance products?

A5. Based on the guidance in FAS 157 described in question Q4 above, some examples of principal or most advantageous markets for insurance products that might be used to determine their fair values are as follows:

- The life insurance company market. The fair value would be based on a price that the insurance company would have to pay another insurance company operating in the same insurance market to take on the obligations and associated revenues of the life insurance contracts.

For variable annuities with embedded derivatives, since the embedded derivative alone cannot be transferred to another market participant, the valuation might assume

that the embedded derivative would be transferred in conjunction with the host contract. However, the fair value of the embedded derivative will consider the cash flow associated with the embedded derivative only.

There are limitations to using the insurer market as a basis for fair value. Market prices are not readily observable in this market, due to the low transaction volume, the uniqueness of each company's specific insurance liabilities and the fact that deals may combine a basket of products and intangibles. Prices may cover entire contracts whereas only the embedded derivative portions might be subject to fair value. Also, inputs into the pricing are generally not market observable. Also, transactions in this market might not reflect a full transfer of the liability as required under FAS 157.

- The policyholder market. The fair value would be based on a price that the insurance company would charge a policyholder. However, a potentially significant issue with this market is that it is not a market in which the insurer could transfer the liability. The price paid by the policyholder represents an entry price, not an exit price as required under FAS 157.
- The reinsurance market. The principal market would be deemed to be the market in which the insurer could potentially transfer the risks associated with the contract or embedded derivative in a reinsurance transaction. However, a potential issue with the reinsurance market is that reinsurance does not represent a full transfer as required by FAS 157, as there is still counterparty risk. Also, reinsurance deals are generally unique, and therefore it might not be possible to get directly observable market prices.

Information from the reinsurance market might provide some useful market data for determining fair value. For example, reinsurance quotes, if available and reasonable, may provide information as to the fair value of a contract or embedded derivative. However, it may not be appropriate to use information from the reinsurance market without some consideration of these limitations.

- Capital markets. The principal market would be deemed to be the market in which the insurer could potentially transfer certain risks associated with the insurance contracts that contain capital markets risks. However, a potential limitation is that capital markets solutions available for insurance contracts do not represent a full transfer required by FAS 157, as there is still counterparty risk. In addition, these transactions typically do not involve a transfer of all risks – typically, policyholder behavior risk, mortality risk, basis risk, and model risk are not transferred.

Capital markets can provide useful market data for determining fair value. However, it may not be appropriate to be used without some consideration of these limitations.

In light of the drawbacks associated with each of these markets, actuaries would typically consider the reliability of market data and the limitations described above in determining the principal market to be used as a basis for fair value.

Q6. How would the unit of account typically be determined for an insurance contract or embedded derivative being valued under FAS 157?

A6. Paragraph 6 of FAS 157 states: “a fair value measurement is for a particular asset or liability. Therefore, the measurement should consider attributes specific to the asset or liability, for example, the condition and/or location of the asset or liability and restrictions, if any, on the sale or use of the asset at the measurement date. The asset or liability might be a standalone asset or liability (for example, a financial instrument or an operating asset) or a group of assets and/or liabilities (for example, an asset group, a reporting unit, or a business). Whether the asset or liability is a standalone asset or liability or a group of assets and/or liabilities depends on its unit of account. The unit of account determines what is being measured by reference to the level at which the asset or liability is aggregated (or disaggregated) for purposes of applying other accounting pronouncements. The unit of account for the asset or liability should be determined in accordance with the provisions of other accounting pronouncements, except as provided in paragraph 27.”

Typically, accounting for insurance contracts and for GMxB embedded derivatives (e.g., GMWB, GMAB) is done at the contract level. For embedded derivatives, the embedded derivative is bifurcated at contract inception and fair valued. Fair value calculations at the individual contract level or embedded derivative level would then appear appropriate for these items. For other items, such as intangible assets or certain items subject to FAS 107 disclosures, valuation is typically performed on a block basis. Fair value calculations at an aggregate block level would then appear appropriate for these items.

Practically, fair valuations for many life insurance products are performed on a modeling basis and use aggregated data, i.e., model cells. The model cells are designed to produce in aggregate similar results to contract level calculations. For this reason, fair valuations may often be equivalent whether the unit of account is the individual contract level or block level.

Q7. Does the valuation premise need to be considered?

A7. FAS 157 introduces the concept of a valuation premise (“in use” versus “in exchange”) for purposes of valuing assets. Although FAS 157 applies this concept specifically only to asset fair values, some might consider it appropriate to consider the valuation premise to liability fair values under some circumstances.

Under FAS 157, “in exchange” means that the fair value of the asset being measured would be the value of the asset on its own when exchanged to another market participant. “In use” means the fair value of the asset would consider its value when used in conjunction with other assets. For example, the fair value of a machine part under the “in use” premise would take into account the value of the goods produced by that machine part while that machine part is used in conjunction with the rest of the machine. The fair value of that part under the “in exchange” premise would be the price that could be

received if the part were sold on its own. FAS 157 requires use of whichever valuation premise maximizes the asset fair value – i.e., the most favorable valuation premise to the reporting entity.

While not explicitly required by FAS 157, there may be some liability fair valuation situations where it would be helpful to consider a valuation premise. For example, when fair valuing an embedded derivative on an annuity contract, an “in exchange” premise might be analogous to the value of the embedded derivative if it were to be transferred on its own to another market participant. On the other hand, an “in use” premise might be analogous to the value of the embedded derivative in conjunction with the underlying annuity contract. This may affect the expense allocated to the embedded derivative and the risk margins associated with the embedded derivative in the fair value calculation. For example, the risk margins for a standalone embedded derivative might be higher than its allocated share of the entire annuity contract since the standalone embedded derivative loses the benefit of diversification of risks with the host contract.

Another situation where it could be helpful to consider the valuation premise is reinsurance. If the reinsurance contract is valued using an “in use” premise, that may imply valuing the reinsurance contract in conjunction with the underlying direct contracts. That could allow most valuation assumptions, such as expenses and risk margins, to be consistent between the reinsurance contract and the direct contract. On the other hand, if an “in exchange” premise is assumed, these assumptions may need to be developed independently, based on the reinsurance market, and may differ from the direct contract assumptions.

Q8. What valuation techniques may be used to determine fair value?

A8. Paragraph 18 of FAS 157 specifies that valuation techniques are to be consistent with the market approach, income approach, and/or cost approach. Reporting entities appear to have discretion regarding use of a particular valuation technique, except that such discretion should be appropriate to the circumstances and for which sufficient data are available. A brief discussion of these valuation techniques follows:

- Market approach. Per paragraph 18a of FAS 157, the market approach “uses prices and other relevant information generated by market transactions involving identical or comparable assets or liabilities.” Given the uniqueness of many life insurance contracts and the general lack of any direct market for trading these contracts, this approach may not be available for most items valued by life actuaries.
- Income approach. Per paragraph 18b of FAS 157, the income approach “uses valuation techniques to convert future amounts (for example, cash flows or earnings) to a single present amount (discounted).” Such valuation techniques may include present value techniques, option pricing models (such as Black-Scholes or binomial lattice) that incorporate present value techniques, and the

multi-period excess earnings method. This approach would likely be used for many items valued by life actuaries.

- Cost approach. Per paragraph 18c of FAS 157, the cost approach “is based on the amount that currently would be required to replace service capacity of an asset.” This approach may not be available for most items valued by life actuaries.

Q9. Which actuarial techniques may be applied to determine fair value under the income approach?

A9. Several actuarial techniques may be applied as a tool to determine fair value under the income approach. A few examples are as follows:

Actuarial Appraisal Method:

Under an actuarial appraisal method cash flows and capital flows are projected using unbiased actuarial assumptions. Care should be taken to use observable assumptions (see question A10) to the extent available. The actuarial appraisal method may be more appropriate when the exit market is deemed to be other insurance companies that would be expected to price the product using an actuarial appraisal method.

Risk Neutral Valuation:

Risk neutral valuation is one tool for valuing financial instruments. As with most other valuation tools, the key underlying assumption is the absence of arbitrage, that is, the impossibility of risk-free profits.

Risk neutral valuation proceeds under the hypothesis that all asset classes, over short periods of time, have the same expected return as cash deposits. The return on cash deposits is then used as a discount factor. Any financial instrument is valued at the mean of its discounted cash flows. If a risk neutral valuation is performed on an instrument with fixed cash flows, the value according to the risk neutral method is equal to the present value of the fixed cash flows discounted at risk free rates. If cash flows are dependent on interest rates or capital markets performance, stochastic scenarios may need to be generated with an average return over all scenarios consistent with risk free rates. Cash flows would be projected for each scenario. Cash flows would be discounted at risk free rates. Under FAS 157, additional adjustments may be needed for non-performance risk and margins for non-capital market risks.

Risk-neutral scenarios have a number of apparently unrealistic properties. For example, on average, equities are assumed to return the same as cash before investment expenses. Over long time periods it becomes more and more likely that equities will underperform cash. On average, yield curves slope downwards instead of upwards. In real markets, risk premiums earned by investors in equities and long bonds contradict these risk-neutral

patterns. However, in the theory of option pricing, these risk premiums cancel out and do not affect values today. Risk premiums do, of course, affect future projected values. The irrelevance of risk premiums for current pricing means that analysts can take any desired risk premium assumption without changing today's theoretical prices of financial instruments. Risk neutrality corresponds to the assumption that risk premiums are zero. Although that is unrealistic, it is convenient for computation and does not affect the answer to questions of today's value.

Risk neutral valuations have the desirable property of maximizing the use of observable capital market inputs, e.g., market observed implied volatility versus statistically observed historical volatility, or market observed credit spreads versus historical default rates. Risk neutral valuations are commonly performed for guaranteed minimum accumulation benefits (GMABs), guaranteed minimum withdrawal benefits (GMWBs) and other GMxB benefits on variable annuities that are considered embedded derivatives. Risk neutral valuations are also sometimes performed for embedded derivatives in equity indexed annuities. Risk neutral valuation methods may be particularly relevant when the exit market consists of financial institutions other than insurance companies, many of which typically use risk neutral methods to price their products.

Budget Method:

The budget method is a technique that is often used to calculate the fair value of future embedded derivative benefits on equity indexed annuities. Under the budget method a budget is set for future equity guarantees. The budget is often based on the product pricing, such as the target interest spread. Target interest spreads are projected for future renewal periods and these spreads become the budgeted amounts for the embedded derivative costs in those future periods. An assumption is made that parameters of future guarantees (such as caps and participation rates) will be set so the future embedded derivative costs equal the budget. A critical assumption for using the budget method to calculate fair value is that certain future cash flows will always offset each other in the future. For example, future changes in the cost of funding the guarantees (i.e., future changes in the value of the guarantees) will always be offset by future changes in credited rates or other pricing parameters.

The fair value of the embedded derivative beyond any guarantee currently in effect is then equal to the present value of the future budgets for providing those guarantees. The projected budgets are typically updated each reporting period to ensure that they are consistent with the current crediting strategy.

While the budget method is often used to project the cost of future embedded derivative guarantees, the value of the guarantee that is currently in effect is often fair valued separately using a method such as Black-Scholes. So the total fair value of the embedded derivative is typically the sum of the following two components:

- The value of the guarantee currently in effect, measured using Black-Scholes
- The value of future renewal guarantees, equal to the present value of future budget amounts.

When a budget method is used, care should be taken to use observable market assumptions to the extent available.

Black-Scholes:

The Black-Scholes method is a simplified case of risk neutral valuation that is used to fair value market traded put and call options. For such options the risk neutral valuation simplifies to a closed-form expression.

Black-Scholes has some usefulness to actuarial fair value calculations. In particular, the Black-Scholes formula may be useful for fair valuing short term options, such as the current in force guarantee on equity indexed annuities. Black-Scholes may also be useful for fair valuing longer term options if persistency is not an issue. Black-Scholes may also be a useful method for demonstrating immateriality of more complex items so that building a more complex model can be avoided.

Other Methods:

Other methods for calculating fair value distinct from the methods above may also be appropriate. Under some circumstances the income method may reduce to a simple calculation. For example, for a short duration instrument with fixed cash flows the book value may reasonably approximate fair value, without the need for actually projecting the cash flows. Similarly, if a DIG B36 embedded derivative is defined as a total return swap with a floating leg, the income approach often simplifies to the difference between the fair value of the invested assets and the book value of the reinsured liability. Simplified methods may also be appropriate for immaterial items.

Inputs to Valuation Techniques:

Q10. What is the fair value hierarchy?

A10. Paragraphs 21 through 30 of FAS 157 define the fair value hierarchy.

Paragraph 21 of FAS 157 states that valuation techniques should maximize the use of observable inputs, defined as “inputs that reflect the assumptions market participants would use in pricing the asset or liability developed based on market data obtained from sources independent of the reporting entity.” As described above, there may be limited observable inputs from the insurance market. There are, however, observable inputs from capital markets for some of the assumptions required to value embedded derivatives within variable annuity contracts. Use of a risk neutral approach may maximize the use of these observable inputs, since a risk neutral approach necessarily uses observable capital market inputs such as current swap curves and market implied volatilities in valuing the embedded derivative.

Inputs into the valuation are categorized by FAS 157 as follows:

- Level 1 inputs are quoted prices (unadjusted) in active markets for identical assets or liabilities that the reporting entity has the ability to access at the measurement date
- Level 2 inputs are inputs other than quoted prices that are included within level 1 that are observable, either directly or indirectly. They include quoted prices for similar assets or liabilities in active markets, quoted prices for identical or similar assets or liabilities in markets that are not active, and inputs other than quoted prices that are observable for the asset or liability, either directly or indirectly (e.g., observable yield curves, volatilities, and default rates)
- Level 3 inputs are unobservable for the asset or liability

Q11. How would inputs to the valuation of an embedded derivative under FAS 133 typically be classified in the hierarchy?

A11. Examples of some of the inputs to a typical valuation of an embedded derivative in a variable annuity contract, and their potential classification and significance¹, are as follows:

Input	General Observability	Typical Level	Usual Significance
Swap curve	Observable	2	High
Company or instrument specific credit and liquidity adjustment	Non-observable	3	High
Short term Volatility	Observable	2	High
Long term Volatility	Generally not observable, depending on duration	3	High
Short term correlations	Observable	2	High
Long term correlations	Not observable	3	High
Lapse	Not observable	3	High
Withdrawal	Not observable	3	High
Mortality	Generally not observable, but may be limited market for some applications	3	Low
Fund mapping	Not observable	3	Moderate

¹ The typical level and usual significance in the table is based on typical sources and uses of these assumptions at the time this practice note was written. Subsequent developments may cause the level or significance to change.

Expenses	Not observable	3	Low
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As mentioned above, the valuation should maximize the use of observable inputs. Since there is no active market for identical assets or liabilities, there will be no level 1 inputs to the valuation described above.

Some of the valuation inputs (in particular, capital markets assumptions such as swap curves and volatilities) are observable, and the valuation technique will maximize the use of such observable inputs.

Many significant inputs to the valuation will be level 3 inputs, including items such as mortality and policyholder behavior. FAS 157 states that “the reporting entity shall not ignore information about market participant assumptions that is reasonably available without undue cost and effort.” Therefore, any available data (such as from reinsurance transactions, capital markets solutions, etc) that is reasonably available should be considered in determining these inputs. FAS 157 also states that “unobservable inputs shall reflect the reporting entity’s own assumptions about the assumptions that market participants would use in pricing the asset or liability (including assumptions about risk).” Therefore, assumptions should consider both the best estimate assumption that would be used by a market participant as well as an additional margin that market participants would add to the valuation as compensation for the risks associated with that assumption.

If any significant input is level 3, then the fair value estimate is considered a level 3 estimate.

Q12. Is a market-based input always an observable input?

A12. A market based input may not always be observable. For example, a broker quote for the price or interest rate on a thinly traded security may be market based. But it is not observable to market participants other than the entity receiving the quote. Thus, it may not be an observable input as defined in FAS 157 and therefore is a level 3 input.

Q13. What weight might be placed on reinsurance quotes when determining fair value assumptions?

A13. As described above, FAS 157 states that “the reporting entity shall not ignore information about market participant assumptions that is reasonably available without undue cost and effort.” Therefore, any available data from reinsurance transactions and reinsurance quotes that is reasonably available may need to be considered in determining these inputs. However, available data regarding reinsurance transactions and quotes may not be sufficient on their own to serve as representative market prices. The following questions may be helpful to consider in determining how relevant reinsurance quotes and transactions may be in determining a fair value:

- Does the reinsurance transaction represent a full transfer of the liability (or asset), or does some obligation (or right) remain with the ceding company, which would make reinsurance a less-than-complete exit market?
- Reinsurance transactions tend to involve different blocks of business and are for specific points in time, as opposed to current prices. Is the reinsurance transaction truly representative of the specific item being fair valued?
- Does a single (or even a few) price(s) or quote(s) represent an active trading market?

In light of these questions, it is possible that a combination of an actuarial model and consideration of reinsurance quotes and prices could be considered in determining fair value. Actuaries determining fair values may wish to consider differences between modeling results and reinsurance prices/quotes to ensure that the differences are explainable, and to the extent reasonable, may want to consider revisions to actuarial models to account for market participant views that can be observed from reinsurance participant data.

Q14. How does FAS 157 interact with FASB Concepts Statement No. 7?

A14. FASB Concepts Statement No. 7 provides guidance for using a present value technique to measure fair value (an application of the income approach), as laid out in Appendix B. The components of a present value fair value measurement according to FASB Concept Statement No. 7 are:

- a) An estimate of future cash flows;
- b) Expectations about possible variations in the amount or timing of the cash flows, representing uncertainty;
- c) The time value of money, represented by the rate on risk-free monetary assets (U.S. Treasury securities are mentioned);
- d) The price for bearing uncertainty (risk premium);
- e) Other case-specific factors that would be considered by market participants; and
- f) Nonperformance risk in the case of a liability, including the reporting entity's own credit risk.

Discounting and Non-performance Risk:

Q15. Does FAS 157 require that non-performance risk be reflected in a liability fair value calculation?

A15. Paragraph 15 of FAS 157 states that “Non-performance risk refers to the risk that the obligation will not be fulfilled and affects the value at which the liability is transferred. Therefore, the fair value of a liability shall reflect the non-performance risk relating to that liability. Non-performance risk includes but may not be limited to the reporting entity's own credit risk.” [Note: This is also confirmed in Appendix B,

clarifying FASB Concepts Statement No. 7. See component “f” of fair value measurement in question Q14 above.

Therefore, non-performance risk almost always needs to be considered in the liability fair value calculation according to FAS 157. In general it would appear that the higher the non-performance risk, the lower the fair value of the liability.

Q16. Can an increase in the non-performance risk result in an increase in GAAP equity?

A16. Absent any other changes, an increase in the non-performance risk reflected in a calculation of the fair value of liabilities will generally increase the GAAP equity of the company because liability cash flows would either be reduced or be discounted at a higher rate. This increase would occur whether the increased non-performance risk is due to a downgrade of the company’s credit standing or an increase in observable market credit spreads given the same credit standing. This impact may or may not be offset by changes to asset values or changes to other liability assumptions or risk margins that may be related to the increased non-performance risk.

One possible exception to the increase in GAAP equity for an increase in non-performance risk may occur when discounting the fee leg of an embedded derivative. Some actuaries believe that only the benefit payments should be adjusted to reflect nonperformance risk, but others believe that both the benefit payments and the fees collected from the policyholder should be adjusted. If non-performance risk is reflected for a GMxB liability by increasing the discount rate used for determining the present value of both the future attributed fees and the future benefits as opposed to increasing the discount rate for the future benefits only (see question Q26), then depending on the relationship (amount and timing) between attributed fees and benefits, the increased discount rate may reduce the present value of fees more than it reduces the present value of benefits. In this case the reflection of non-performance risk could reduce GAAP equity.

Q17. Some actuaries find this counter-intuitive. Did the FASB consider this potential implication when issuing FAS 157?

A17. The FASB was well aware of the fact that a decline in a company’s own credit standing could increase GAAP equity to the extent it is reflected in the non-performance risk. Paragraph C46 of FAS 157 acknowledges that:

“respondents’ concerns (with the exposure draft of FAS 157) focused on the counterintuitive and potentially confusing reporting that could result from including the effect of changes in the reporting entity’s credit standing in liability remeasurements at fair value (“gains” for credit deterioration and “losses” for credit improvements).”

Paragraphs C47 to C49 of FAS 157 go on to support the reflection of a company's own credit risk and non-performance risk despite these concerns, pointing to previous GAAP accounting pronouncements (such as Concepts Statement 7) and IFRS (IAS 39) as well as other justifications to support the conclusion.

There are at least two consequences to the inclusion of non-performance risk. One is the counter-intuitive result of a change in credit quality of the insurer being an earnings event. This is the issue that concerns most actuaries who object to the inclusion of non-performance risk in the measurement of liabilities.

However, the impact of changes in credit spreads in the market is more common. If credit spreads in the market widen then assets will decline in value. If liabilities don't decline as well then a company's financial statements may give an erroneous perception as to the degree assets and liabilities are matched. To the extent that assets are marked to market it is reasonable for liabilities to also be affected by changes in the credit spreads. By including non-performance risk, assets and liabilities are treated consistently when there has not been a change in the credit quality of the firm issuing the liabilities.

There may still be differences in the amount the liabilities and assets change as a result of changes in credit spreads, since the asset credit spread and liability credit spread may not change by identical amounts. But including the liability credit spread will generally result in a closer match with the asset performance than excluding the liability credit spread.

Q18. How might non-performance risk be reflected in the fair value of a liability?

A18. FAS 157 does not prescribe methods for reflecting non-performance risk in the fair value of a liability. In practice, many different approaches are emerging. Several methods currently observed reflect non-performance risk as an adjustment to the discount rate applied against projected cash flows in calculating fair values. Other methods involve adjusting cash flows to reflect non-performance risks. The cost of capital method for setting risk margins, which is evolving in Europe, reflects non-performance risk and credit risk in the cost of capital rate assumed to be demanded by investors.

The following is a non-exhaustive list of methods observed in practice as well as some considerations both supporting, and contradicting, the points of view presented:

- A. Discount all projected cash flows using risk free rates (i.e., treasury rates), effectively reflecting that there is no risk on non-performance for that particular liability.

One rationale presented to support this view is that, given the primacy of policyholder benefit obligations in the event of insolvency, and the protection afforded by guaranty funds and other regulatory safeguards, the risk of default on

such obligations is *de minimis*. In order to support this view, the guarantee fund needs to be considered an attribute of the liability.

Due consideration needs to be given to the possibility that, guaranty funds and other safeguards notwithstanding: (a) policyholders may not receive the full value owed them from their contracts; (b) policyholders may not receive the values owed them in a timely fashion, and (c) that the insurance company will not make good on its obligations.

B. Discount all projected cash flows using the interest rate swap curve.

Rationales supporting this view include recognition that: (a) the swap curve has some nonperformance risk embedded within it, reflective of the credit quality of the AA-rated banks that are active in the swap market and that this reasonably approximates the nonperformance risk associated with policyholder obligations of many insurance companies; and (b) the swap curve is widely used as the basis for determining the fair value of most derivative instruments that are actively traded in the market.

Perhaps the most common objection to this view is that the swap curve does not reflect the credit quality of the company that has the obligation to perform and, consequently, there is no reflection in the movement in the credit quality of a company, either in absolute terms or in relation to its peers.

C. Discount all projected cash flows (or just projected cash flows related to claims; see question Q26 below) using either the interest rate swap curve or risk free rates as a base and adjusting for company-specific credit spreads over the base as evidenced by company-specific information such as yields on corporate debt, the price of credit default swaps on the company's bonds, observable prices of institutional products (e.g., guaranteed investment contracts or term notes) offered by the company, or the company's claims-paying rating.

This approach produces results consistent with the credit standing of the company. However, the discount rates derived in this manner may still not perfectly reflect the credit standing of the specific liability being measured. For example, credit default swap rates may reflect the credit standing with respect to debt, rather than claims liabilities. Also, information on credit default swap prices or prices on institutional products may not always be available.

D. Adjust cash flows to reflect possibility of non-performance. Under this approach the cash flows are adjusted to certainty-equivalent cash flows that can be discounted at a risk free rate.

The rationale most commonly used to support this view is that it maximizes the use of observable information and generates a fair value that reflects the company's own credit as uniquely associated with that particular company.

On the other hand, critics of these methods argue that no one observable measure is entirely relevant for policyholder obligations because of their unique standing in the priority chain of obligations within a company and the existence of various safeguards to protect policyholders. Adjustments for elements like liquidity or the timing of payment of claims may require adjustments that some would argue are arbitrary and may lend undesirable subjectivity to the valuation.

Within the non-exhaustive list of methods outlined above, there may be differences in application that lead to materially different results from company to company.

Q19. What elements are considered in determining non-performance risk?

A19. Elements of non-performance risk include credit risk (i.e., the risk of default) and liquidity risk (risk of the asset holder being unable to quickly access its funds in an orderly transaction).

When analyzing credit risk, paragraph 15 of FAS 157 states that the impact of credit enhancements should be considered. Examples of credit enhancements include collateral, netting agreements, and funds withheld arrangements on reinsurance contracts. For example, under a funds withheld reinsurance treaty the ceding company holds the invested assets. So, even if the assuming company were to default the ceding company has recourse to the underlying assets, potentially minimizing or eliminating its loss upon the default.

Some actuaries also consider state guarantee funds to be a credit enhancement on insurance liabilities. These actuaries consider the guarantee funds to be attributes of the liability, since the policyholder would get paid even if the insurance company defaults. This reduces the credit spread or cash flow adjustment needed in the interest rate used for discounting cash flows.

Other actuaries do not consider state guarantee funds to be a credit enhancement to reduce the credit spread under FAS 157. These actuaries consider the guarantee fund payment to be an obligation of a third party (the state) rather than an obligation of the insurance company. These actuaries do not believe that the exit price that would need to be paid to another market participant to assume the obligation would reflect the impact of the guarantee fund since, again, the guarantee fund payment would not be an obligation of the transferee.

If guarantee funds are considered to be credit enhancements under FAS 157, care should be taken when adjusting the credit spread or cash flows. Guarantee funds may not cover all benefits and may be subject to limits. These exclusions and limits may vary by state. Also, even when a guarantee fund makes payments, the policyholder may suffer delays in receiving the payment. This delay may be considered a component of credit risk.

Q20. Should guarantee fund assessments be included in the fair value calculations under FAS 157?

A20. The question of whether guarantee fund assessments should be included in cash flows used to calculate fair value under FAS 157 is a separate decision from whether the presence of a guarantee fund should be considered in determining the credit spread. The decision as to whether guarantee fund assessments should be included in the cash flows is similar to any other decision as to whether an element of cash flows should be included – would another market participant include those cash flows in pricing the liability if the liability were being transferred to it. The decision on whether to include guarantee fund assessment cash flows in the calculation may be different from the decision on whether the presence of guarantee funds affects the discount rate used to discount cash flows.

Q21. What sources may be used to determine company-specific credit spreads?

A21. If it is decided to use company-specific credit spreads to reflect non-performance risk (i.e., option C in question Q18 above), several sources may be available to determine the appropriate spreads. All have advantages and disadvantages. In determining which source to use, the principal market that the instrument being fair valued would be transferred to should be considered. Some options are:

Company Debt – Company debt may be traded in active markets, providing an observable source for credit spreads. However, trades may be less active than credit default swaps. And the unadjusted credit spread on company debt may not be appropriate for claims liabilities, since claims have higher priority (and therefore possibly a lower credit spread) than debt. Also the particular liability being valued may have credit enhancements that may need to be considered in determining the appropriate credit spread for that liability. And if the debt is issued by a holding company, the unadjusted credit spread on that debt may not be appropriate for liabilities of an insurance subsidiary, which may have a different credit standing from the holding company.

Credit Default Swaps – Credit default swaps may be traded in active markets, providing an observable source for credit spreads. These may be traded more actively than debt, providing a more reliable measure of credit spreads than debt. However, credit default swaps are typically more liquid than debt, and more liquid than other company liabilities, so that the liquidity premium inherent in credit default swap rates may be lower than that appropriate for valuing claims liabilities. And the unadjusted credit spread on credit default swaps, which is typically related to company debt, may not be appropriate for claims liabilities, since claims have higher priority (and therefore possibly a lower credit spread) than debt. Also the particular liability being valued may have credit enhancements that may need to be considered in determining the appropriate credit spread for that liability. And if the credit default swap related to debt is issued by a holding company, the unadjusted credit spread may not be appropriate for liabilities of an

insurance subsidiary, which may have a different credit standing than the holding company.

Institutional Products – Some institutional products, such as GICs, retail notes and term notes, are traded in secondary markets and thus have observable prices. These products may be more similar to the liabilities being fair valued than debt or credit default swaps in terms of being claims liabilities of an insurance company with limited liquidity, making the resulting credit spreads more relevant. However, while these products may have observable secondary market prices, trading in such products is often limited, reducing the reliability and availability of associated credit spreads. And the particular liability being valued may have credit enhancements that may need to be considered in determining the appropriate credit spread for that liability. There may also be issues with the term of the available institutional products, since such products generally are sold with maturities up to 10 years, and the liabilities being fair valued may have cash flows beyond 10 years.

If credit spreads from company debt, credit default swaps or institutional products are not available or deemed not to be appropriate, it may be possible to estimate credit spreads from other market sources. For example, a company could base a credit spread estimate on credit default swaps or debt of similar companies or industry averages.

Another potential method is to base credit spreads on historical data on rates of claim payment default for similarly rated companies. An advantage of this approach is that it reflects the risk of default on policyholder claim payments associated with the entity issuing the policy, whereas the other methods described above typically reflect the risk of default on debt, which has a lower priority of payment and may reflect default risk at a holding company level. A disadvantage of this approach is that it may not appropriately reflect current market prices.

Q22. How may reinsurance be considered in determining the credit assumption for the direct contract?

A22. Reinsurance is a legal contract between two insurers (referred to here as the "insurer" and "reinsurer"). Under GAAP, in general, business is valued gross of reinsurance with a separate credit determined for reinsurance recoverables. In general, reinsurance ceded would then be ignored in fair valuing the business gross of reinsurance and considered in fair valuing the reinsurance credit.

The presence of reinsurance could change the nature of credit protection for the underlying policyholders by, for example, providing an extra layer of protection from the reinsurer in the event of insolvency of the insurer. In valuing the direct business, however, the insurer would look to its own credit rating as noted above and generally not consider the additional protection offered by reinsurance. An exception might be where the business was issued with the requirement it be reinsured; for example, this might be required in assumption reinsurance where the buyer needs its parent's backing as a

condition of sale. Also, the presence of reinsurance could be a factor in determining the insurer's own credit rating, for example, if an insurer had a large portion of its business reinsured with a low rated or impaired reinsurer.

Reinsurance assumed would reflect the credit rating of the reinsurer in regard to its likelihood of paying benefits to the insurer. A key consideration is the extent to which assets held for the assumed business are protected, for example, by modco or funds withheld, bank letter of credit, parent guarantee or assets held in trust. Note that the insurer would likely not have any guaranty fund protection that might be available to the underlying policyholders.

Finally, a reinsurance deal or current quote might be a consideration for determining the fair value of a block. A consideration, however, would be the extent to which an adjustment might be needed to account for the difference in credit protection provided by the insurer to policyholders versus the protection provided by the reinsurer to the insurer. A reinsurer might, as a practical matter, want to use fair value results provided by the insurer (and vice versa depending on who administers the business); in many cases, a reinsurer might use the insurer's values unadjusted where the reinsurer and insurer are about equally rated, and where the likelihood of a credit loss from either party is very small.

Q23. How might counterparty non-performance risk be considered for a reinsurance receivable asset to the ceding company?

A23. It is recommended that the non-performance risk for the reinsurance receivable asset be based on the credit standing of the assuming reinsurance company rather than on the direct company's own credit standing. The credit standing of the assuming company may be different from that of the ceding company. However, if the credit standing of the two companies is similar it may be appropriate to use the ceding company's own non-performance adjustment as an estimate of the assuming company's non-performance adjustment.

Q24. How might non-performance risk be reflected in a risk neutral valuation?

A24. A risk neutral valuation is generally performed by discounting cash flows at the risk free rate. Therefore, incorporating an element of non-performance risk into the discount rate may appear to be a violation of risk neutral principles. However, incorporating a non-performance element into the valuation does not violate risk neutral principles as long as the non-performance risk incorporated is the risk neutral assumption.

The risk neutral assumption for non-performance risk is actually simply reflected by the credit spread on the instrument being valued relative to risk free rates. Therefore, one approach to incorporating non-performance risk in the risk neutral valuation is to simply

discount at the risk free rate plus the appropriate credit spread, rather than discounting at the risk free rate. The credit spread being reflected in the discounting is actually representing the risk neutral market-consistent non-performance assumption.

To see this, assume the following:

Risk free rate = 5%

Rate including non-performance risk/credit spread = 6%

Potential investment = \$100

If one invests at the risk free rate, one is guaranteed to receive \$105 on the investment after one year. If one invests in the risky security, one could receive \$106 on the investment after one year, assuming the contract performs (i.e., does not default). But under the risk neutral valuation paradigm there is no compensation for bearing risk, so the extra \$1 of potential return for investing in the risky security must exactly offset the market perception of the non-performance probability of the security.

The non-performance probability can be reflected in the risk neutral valuation through an adjustment to cash flows as well. Assume no recovery on default and:

r = the risk free rate of a T-year risk free zero coupon bond

y = the yield on a T-year instrument including the risk neutral credit spread

Q = the probability of default between time zero and time T

Then the cumulative risk neutral default probability between time zero and time T is equal to:

$$Q = 1 - (1+r)^T / (1+y)^T$$

Risk neutral default probabilities for each period can then be determined from the cumulative probabilities. The cash flows can then be reduced by the appropriate risk neutral default probabilities in each period, and those cash flows can be discounted at risk free rates.

Q25. How might discounting be handled on path dependent scenarios?

A25. Some actuaries develop different scenarios with consistent cash flows, discounting them with the applicable yield curve relative to each scenario and weighting the results to determine the mean.

Other actuaries weight the cash flows in each scenario by their probabilities and then apply a single current yield curve to the average cash flows. Care is needed to ensure that aggregate market-consistent yield rates are used. Some actuaries believe that this approach is only appropriate if the derivative cash flows for each scenario are dependent only on equity returns with no material interest sensitivity.

Regardless of the approach used, it is important to calibrate to assets in the market that are actively traded, such as Treasury bonds, options and futures.

In the application of certain accounting standards, mean-reversion models have sometimes been used, although they are generally not considered to be market-consistent.

Q26. How could the discount rate adjustment be applied to the “fee leg” of a variable annuity GMxB rider?

A26. Many actuaries consider GMxB embedded derivatives within variable annuities to be similar to a swap contract comprised of a “pay leg” (e.g., the claims payments to the policyholders) and a “fee leg” (e.g., the ascribed fees collected from the policyholders). The liability is then calculated as the present value of the fee leg less the present value of the pay leg. FAS 157 states, in paragraph 15, that “the fair value of the liability shall reflect the nonperformance risk relating to that liability.” There is no specific mention of nonperformance risk in the discussion of fair valuation of assets. Based on the lack of specific guidance related to nonperformance risk on assets, and the fact that the fee leg is a payment from the policyholder, not the insurer (and therefore not subject to the claims paying ability of the insurer), some actuaries believe that the adjustment for nonperformance risk would be applied to the claim leg of the embedded derivative only. Other actuaries believe that the discount rate adjustment should be applied to both the claim leg and the fee leg, but only if the resulting embedded derivative is in a liability position. Finally, there are some actuaries who believe in applying the adjustment to both the claim leg and fee leg regardless of whether the embedded derivative is an asset or a liability, based on the premise that policyholders would no longer pay fees if the insurer were to default on the claim payments.

Risk Margins:

Q27. Should increasing the present value of expected liability cash flows by a risk margin be considered when determining the fair value?

A27. Paragraph B2 of FAS 157 notes that one element of a fair value calculation using present value techniques is “the price for bearing the uncertainty inherent in the cash flows (risk premium).” Thus, if there is significant uncertainty in the cash flows a risk premium should be considered. This risk premium would not just be a “provision for adverse deviation” to introduce conservatism into the fair value calculation, but would represent the best estimate of the price a market participant would require for bearing such risk.

Q28. Should a risk premium be considered for observable capital market inputs, such as market implied volatilities?

A28. Many actuaries believe that observable capital market inputs, such as risk-free interest rates, observable credit spreads and short term implied volatilities would not require a separate risk margin. They believe that the observable inputs already reflect the market price for bearing the risk inherent in those values. For example, implied volatilities typically are higher than historical volatilities and credit spreads typically are higher than actual default rates on similar instruments. Since the observable market inputs already reflect the market price for bearing the risk associated with those inputs, no additional risk margin should be necessary.

One capital market input for which a separate risk margin may be appropriate is long term stock price volatility. Equity volatilities up to about five to 10 years are generally available² and considered reliable as they are based on substantial volumes of trades of options that extend for such periods. But trades in options longer than five or 10 years tend to be very thin, and thus the resulting volatilities can be unreliable or even unavailable.

Different approaches can be used to estimate the long term volatilities. In determining the approach to use, the approach that a market participant would use should be taken into account. If the entity for which the valuation is being performed is a market participant, its own approach may be appropriate.

One approach would be to use actual historical long term volatilities to estimate the projected long term volatilities for the fair value calculations. If the average historical volatility is used, there may be a need for a separate risk margin since the observed average historical volatility would not include any risk margin.

Another approach would be to extrapolate the long term volatilities from the observable volatilities at shorter durations. Since the observable short duration volatilities would incorporate the market's risk margin already, it may not be necessary to add a separate risk margin to the extrapolated values, depending on how the extrapolation is performed.

Q29. Should a risk premium be considered for actuarial inputs, such as mortality, morbidity and lapse assumptions?

A29. Since most actuarial inputs cannot be calibrated to observable market prices, a risk margin should be considered for these items if they could significantly affect the present value of cash flows.

Q30. What methods can be used to calculate the risk margin?

A30. FAS 157 states that “unobservable inputs shall reflect the reporting entity’s own assumptions about the assumptions that market participants would use in pricing the asset

² Volatilities up to five to 10 years were generally available at the time this practice note was written. Subsequent events may cause additional or fewer durations to become available.

or liability (including assumptions about risk).” Beyond this, FAS 157 provides very little specific guidance on how a risk margin should be determined.

The application of risk margin to insurance contract fair value has generated considerable interest, research and discussion. The International Actuarial Association (IAA) Risk Margin Working Group (RMWG) has done extensive research resulting in multiple drafts of the document, *Measurement of Liabilities for Insurance Contracts: Current Estimates and Risk Margins*³. Besides discussing objectives of risk margins and desirable characteristics, the latest March re-exposure draft discusses a number of risk margin approaches which include: quantile approaches, methods which use confidence limits, including the conditional tail expectation, CTE (e.g., if a reserve is derived for each stochastic scenario, the CTE60 reserve is the average of the highest 40% of the resulting reserves, the CTE99, the average of the highest 1%); cost of capital method; discount-related risk margins, which include risk-adjusted returns and deflators; and explicit assumptions, similar to margin for adverse deviations (MfAD) and provisions for adverse deviation (PADs).

In addition, to the extent observable market data exists (for example, data regarding reinsurance prices/quotes or prices/quotes associated with capital markets risk transfer), such prices might also be taken into account in the overall fair value. Therefore, it may be appropriate to consider these market prices/quotes in determining the level of risk margin.

Q31. What are some techniques available to apply the Cost of Capital method for calculating risk margins?

A31. Generally speaking, the cost of capital method involves determining the required capital associated with the product being fair valued by projecting future capital needs and determining the cost associated with holding that future capital, rather than being able to invest that capital back into the business at a higher return. This requires determination of those future capital needs at multiple future points in time within the fair value projection period (typically annual timesteps) as well as determination of the cost of capital rate (i.e., the difference between the rate that could be earned from investing the capital in the business and the rate that will be earned on capital held to cover possible future losses).

Determination of future capital needs may be based on regulatory capital requirements, ratings capital (i.e., the amount needed to maintain a specified rating) or economic capital (or, in some cases, the greater of two or all three). Methods for determining current and projected future economic and/or regulatory capital vary, and a discussion of these methods is outside the scope of this practice note. According to FAS 157, the method used should be consistent with what a market participant would use.

³ International Actuarial Association ad hoc Risk Margin Working Group (2008) *Measurement of Liabilities for Insurance Contracts: Current Estimate and Risk Margins, March 24, 2008 Re-Exposure Draft*

The cost of capital rate is a key assumption that is challenging to determine. Some representative rates provided in the IAA risk margin paper are 4-6% before tax, but actual rates will vary depending on the individual company's rating, internal risk tolerance, return targets, and the current market environment.

It is important to note that if a risk neutral valuation is used, the underlying cost of capital calculation would only consider capital requirements associated with non-hedgeable risks, since risk margins associated with hedgeable risks will already be incorporated in the fair valuation through the use of observable inputs. For example, if the risk neutral valuation uses observed market implied volatility through duration x, those implied volatility inputs already incorporate the market's price for risk, so no additional risk margin associated with implied volatility through duration x should be included through a cost of capital approach.

There are different ways of applying the cost of capital method for calculating risk margins. One possibility is to directly calculate the cost at the time the valuation is performed based on the methodology described in the prior paragraphs. The resulting cost of capital value could then be used as the risk margin. The challenge of this method is the complexity of the calculation and the computing time required for most cost of capital approaches.

Another method is to associate a point in time cost of capital method with a specific metric or ratio, and use that metric or ratio to determine the risk margin at the financial reporting date. Under this approach, care must be taken to ensure that: (1) the underlying cost of capital calculations have been updated recently enough that the metric or ratio continues to be appropriate; and (2) that the metric or ratio used will adequately represent the underlying changes in the market's view of risk from period to period.

Examples of ratios or metrics that might be used as a proxy for the underlying cost of capital include the Wang Transform or Sharpe Ratio (described in detail in the December 2007 issue of the *Financial Reporter*⁴); Conditional Tail Expectations (CTE) or percentiles of real world distributions; factors applied to key risk metrics such as in the money-ness, account value, and/or level of guarantee; and provisions for adverse deviation applied to key valuation assumptions.

Q32. Do risk margins need to be explicit?

A32. There is no requirement in FAS 157 for risk margins to be explicit. Both explicit and implicit risk margins are currently used in practice.

⁴ Zinkovsky, "Risk margins to the Non-Market Risks under FAS 157: Suggested Approach", *Financial Reporter* (December 2007), pp. 11-16

Q33. Does a separate risk margin need to be included for each assumption or is one aggregate risk margin acceptable?

A33. There is no requirement in FAS 157 to include a separate risk margin for each assumption. Some actuaries believe it is more appropriate to include a separate risk margin for each assumption and other actuaries believe one aggregate risk margin is acceptable.

Q34. How can risk margins be incorporated into a fair value calculation using the budget method for equity indexed annuities (EIAs)?

A34. The budget method is a common approach under US GAAP for valuing future options embedded in EIA contracts. Some actuaries believe that this approach continues to be appropriate within the guidance of FAS 157.

The budget approach generally involves a deterministic projection to calculate an option “budget,” or the amount to be allocated to a budget account to cover the cost of future option purchases. At contract inception, the initial premium is allocated between the host contract and the embedded derivative, which is comprised of the market value of the current option (often valued using a Black-Scholes type approach) and the budget account for future option purchases.

If the budget approach continues to be used under FAS 157, a risk margin would be added to the budget account valuation to reflect the risks associated with non-hedgeable risks. Such risks would include policyholder behavior risks as well as market volatility (since observable market volatility is typically not an input to the budget method).

The cost of capital approach as described above is one approach to incorporating risk margin into the budget method. Another approach would be to use a range of scenarios for the budget method, as opposed to a single deterministic approach, and set the budget account based on a conservative result from this range that is representative of the market’s price for the inherent risk. Yet another approach is to apply explicit provisions for adverse deviation to non-observable valuation inputs (for example, lapse and mortality) to take into account the market’s view of risk.

Q35. How might taxes impact risk margins?

A35. Most accounting standards, such as US GAAP, US Statutory, and International (IAS), require actuarial liabilities to be pre-tax. Separate liabilities are recognized for amounts owed to tax authorities (a true current tax liability) and deferred tax liabilities on assets and liabilities (per SFAS 109 and its international counterpart, IAS 12). Based on the current positions of the FASB and IASB, it is unlikely that risk margins will be allowed to reflect taxes. In valuing a liability, there is a difference in valuing the elements that are intrinsic to the liability and those that are intrinsic to the company. The

tax attributes are not intrinsic to the liability as they differ based on jurisdiction and not based on the cash flow characteristics of the contract. GAAP and IFRS do not ignore differences due to taxes, rather they separate them out as deferred tax assets and deferred tax liabilities, which are liabilities based on company characteristics (where the company is domiciled) and not based on contractual cash flow characteristics.

Nevertheless, a number of actuarial papers discuss methods that incorporate taxes to determine fair value, such as the actuarial appraisal method (AAM), which is based on the present value of after-tax distributable earnings. Cost of capital risk margins that are linked to the AAM and derived from assumed cost of equity capital demanded by investors, which is an after-tax rate of return from the reporting entity's perspective, typically have a deferred tax component. For example, the required profit (a type of risk margin) defined by Girard (2000 and 2002) and used by Duran and others can take the form:

$$RP_t = \left[\frac{k}{(1-T)} - i_t \right] \times (FVA_{t-1} - FVL_{t-1}) - \frac{k \times T}{(1-T)} \times [(FVA_{t-1} - TVA_{t-1}) - (FVL_{t-1} - TVL_{t-1})]$$

Where k is the cost of capital, i is the assumed rate of return on invested assets backing required capital, T is the tax rate, FVA and FVL represent fair values of assets and liabilities, respectively, and TVA and TVL are their respective tax values. Hence, the last term is the net deferred tax liability (DTL) multiplied by a pre-tax k. Assuming a positive net DTL, the last term is a reduction in required profit.

An alternative form that is more common can be derived by combining FVA-FVL terms, leading to:

$$RP_t = (k - i_t) \times (FVA_{t-1} - FVL_{t-1}) + \frac{k \times T}{(1-T)} \times (TVA_{t-1} - TVL_{t-1})$$

In this form, the last term, which is likely to be positive, is an increase in required profit.

In summary, while the above formulae may be theoretically correct, the current positions of the FASB and IASB would likely require risk margins to be devoid of tax effects. Consequently, this might lead to the use of a more concise form of risk margin, such as the above formulae (with the last terms, which include tax effects, simply dropped).

Q36. How frequently might risk margins be updated under FAS 157?

A36. As described above, paragraph 5 of FAS 157 defines fair value as “the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date.” This appears to indicate that the risk margins be updated every time measurement is performed to reflect the then-current margin that a market participant would require if selling an asset or transferring a liability.

Practically speaking, review of market data and market participant assumptions may indicate that no update to the risk margin is required. However, FAS 157 appears to require that market information be reviewed on every measurement date, and if no update is made to risk margins that position should be supportable.

In particular, changes in observable market data related to non-hedgeable risks since the last measurement date (such as acquisitions of blocks of insurance, reinsurance transactions or quotes, and capital markets transactions, quotes, and related market implied data) should be considered every time risk margins are updated.

Gain or Loss at Issue:

Q37. Could application of FAS 157 result in a gain or loss at issue of a contract accounted for at fair value?

A37. Paragraph 17 of FAS 157 recognizes that under some circumstances the exit price used as the fair value of a contract at issue may not be equal to the transaction price. Under those circumstances a gain or loss at issue could result. Examples listed in FAS 157 include:

1. Transactions between related parties.
2. Transactions occurring under duress.
3. The unit of account represented by the transaction price is different than the unit of account for the asset or liability being measured under fair value. For example, the transaction may include other elements that are measured separately, or it may include transaction costs.
4. The market in which the transaction occurs is different than the market in which the reporting entity would sell the asset or transfer the liability.

However, for contracts traded in an active market or for products offered in a competitive market, the expectation is that a significant gain or loss at issue is unlikely given the FAS 157 directive of maximizing the use of observable inputs.

Q38. Could application of FAS 157 result in a gain or loss being recognized at issue of a hybrid instrument?

A38. FAS 157 is applicable to items that are recorded at fair value. It does not affect the accounting for items not recorded at fair value. Furthermore, FAS 157 does not explicitly alter FAS 133 Implementation Issue B6 (DIG B6). Consequently, it would appear that a gain or loss on a hybrid contract (as that term is used in FAS 133) could be recognized at issue if both the embedded derivative and the host contract are recorded at fair value with the changes in fair value recognized in earnings or other comprehensive income. However, if the host contract is not recognized at fair value (which is commonly the case

for fixed-index annuities, variable annuities and other hybrid contracts commonly offered by insurance companies) DIG B6 would appear to preclude recognition of a gain or loss at contract issue. Rather, the host contract would be recorded at issue at a value that forces the hybrid contract to “break even” at issue. The following text from DIG B6 appears to support this conclusion.

“The allocation method that records the embedded derivative at fair value and determines the initial carrying value assigned to the host contract as the difference between the basis of the hybrid instrument and the fair value of the embedded derivative ... should be used to determine the carrying values of the host contract component and the embedded derivative component of a hybrid instrument when separate accounting for the embedded derivative is required by Statement 133.”

Disclosures:

Q39. What disclosures appear to be required by FAS 157?

A39. FAS 157 splits the disclosure requirements between those for recurring fair value measurements (e.g., fair valued every reporting period) and new fair value measurements. For recurring fair value measurements the following items must be disclosed as required by paragraph 32 of FAS 157:

- Fair value measurements
- Classification level
- For level 3 items, a rollforward including:
 - Gains and losses; which hit earnings and where; and split out of portion for assets/liabilities still held at valuation date
 - Purchases, sales, issuances, settlements
 - Transfers in/out of level 3
- Valuation techniques used/changes (disclosed annually)

FAS 157 includes sample disclosure tables in Appendix A, including the required rollforward for level 3 measurements. An item that may present particular challenges for embedded derivatives is determining the value of "settlements" during the reporting period, since many companies do not perform a fair valuation of contracts on the day they are settled (or lapsed). In practice, it may be necessary to use approximate values (for example, nearest month end) for the impact of settlements during the accounting period.

For new fair value measurements, the following items must be disclosed per paragraph 33 of FAS 157:

- Fair value measurements and the reason the item is now being fair valued
- Classification level
- For level 3, description of inputs used and information used to develop inputs
- Valuation techniques used/changes (disclosed annually)

Transaction Costs:

Q40. How are transaction costs treated under FAS 157?

A40. Paragraph 9 of FAS 157 states that “the price...used to measure the fair value of the asset or liability shall not be adjusted for transaction costs.” Therefore, transaction costs incurred to acquire an asset or liability measured at fair value would be expensed immediately. There would be no deferred acquisition cost (DAC) asset relating to a liability held at fair value.

This does not necessarily mean that there would be a loss upon issue of a liability measured at fair value. Assuming that the fair value is measured using the income method, to the extent that there are future margins in the product to recover acquisition costs those margins would reduce the liability fair value amount. To the extent that the present value of these margins equates to the amount of acquisition costs expensed there would not be a gain or loss at issue.

Q41. How are deferred acquisition costs or loads reflected in a fair value calculation under FAS 157?

A41. Deferred acquisition costs or loads represent expenses or revenues that have been incurred in the past. An exit value would typically only look to future expected cash flows and the expected variability in those future cash flows. Therefore, deferred acquisition costs and loads would typically not be included directly in the fair value calculation.

However, in some instances it may be appropriate to use those items as proxies for elements of projected cash flows. For example, in some circumstances it may be possible to demonstrate that previously incurred acquisition costs are a good approximation for future loads expected to be collected. In that case it may be appropriate to use such historical information as a proxy for future expected loads collected within the fair value calculation.

Q42. Is there a DAC offset to valuation changes upon initial implementation of FAS 157?

A42. Generally, fair value changes resulting from initial implementation of FAS 157 to items reported in the financial statements will affect net income or other comprehensive income. If these net income changes affect FAS 97 or FAS 120 products that have DAC, the resulting fair value changes would typically affect the estimated gross profits (EGPs) or estimated gross margins (EGMs) used to amortize the DAC. This will produce a DAC offset.

If fair value changes resulting from FAS 157 affect other comprehensive income of FAS 97 or FAS 120 products there would typically be a shadow DAC offset to the change in fair value. This will most likely occur if implementation of FAS 157 causes changes to the fair value reported for available-for-sale securities.

Other:

Q43. Are there other implementation issues related to initial adoption of FAS 157?

A43. Most fair value changes resulting from initial adoption of FAS 157 are reported through net income (or other comprehensive income in the case of available-for-sale securities). Paragraph 37 of FAS 157 provides for three exceptions under which the change of fair value is accounted for retrospectively as a change in accounting principle but these items would typically not be actuarial in nature.

FAS 159

Q44. What is FAS 159?

A44. FAS 159, The Fair Value Option for Financial Assets and Financial Liabilities, creates a fair value option under which a company may irrevocably elect fair value as the initial and subsequent measurement attribute for certain financial assets and financial liabilities on a contract-by-contract basis, with changes in fair value reported in earnings. The objective is to improve financial reporting by giving entities an opportunity to mitigate volatility in reported earnings caused by measuring related assets and liabilities differently without having to apply complex hedge accounting provisions.

Q45. When can the fair value option be elected under FAS 159?

A45. FAS 159 was effective for most companies as of the beginning of the first fiscal year after November 15, 2007. For contracts that are in force as of the effective date of FAS 159, any fair value election must be made on the effective date of FAS 159. For most contracts that are acquired subsequent to the effective date of FAS 159 any election must be made as of the date the entity first recognizes the eligible item.

Paragraph 9 of FAS 159 describes some other situations upon which a fair value election may be made, but these situations do not appear to affect the liabilities actuaries are typically responsible for valuing except in rare circumstances.

Q46. What contracts may the fair value option be elected for under FAS 159?

A46. Paragraph 7 of FAS 159 describes the contracts for which fair value option may be elected, and paragraph 8 describes certain exceptions. Fair value option is available for many insurance contracts, whether or not regarded as financial instruments, as well as many investment contracts issued by insurance companies.

Q47. If fair value option is elected for one contract, must it also be elected for another similar contract?

A47. Paragraph 12 states that the fair value option may be elected for a single eligible item without electing it for other identical items. There are some exceptions, for example paragraph 12 c, dealing with reinsurance:

If the fair value option is applied to an eligible insurance or reinsurance contract, it shall be applied to all claims and obligations under the contract.

In addition, according to paragraph 13, the fair value option need not be applied to all instruments issued or acquired in a single transaction.

If fair value option is elected for a single eligible item but not for other identical items paragraph 18b requires a disclosure of the reason for partial election.

Q48. Can the fair value option be elected for a rider on a contract but not for the underlying base contract itself or vice versa?

A48. No. Paragraph 12d of FAS 159 requires the election to be made contract by contract, but does not allow the election to be made for part of a contract, such as for a particular benefit feature.

If it were allowed, companies hedging a contractual benefit might have benefited by an election to value the benefit at fair value to match hedging assets (derivatives held at fair value).

Q49. If fair value option is elected for a contract and the reporting entity later changes its mind, can the fair value option election be revoked?

A49. No. The fair value option election is irrevocable. But for sales of similar contracts at a later date the reporting entity could elect not to apply the fair value option.

Q50. When might a fair value option election under FAS 159 be considered “non-substantive”?

A50. FAS 159 was issued, according to FASB, because FASB wanted to expand the use of fair value and to provide an opportunity to mitigate earnings volatility in situations where related assets and liabilities would otherwise be accounted for under inconsistent standards. But because FAS 159 presents an option as to how to account for certain items, the possibility of abuse exists. The Securities Exchange Commission (SEC) has indicated that it will strongly scrutinize “non-substantive” FAS 159 elections.

An example of a “non-substantive” election that has occurred and that was invalidated by the SEC is as follows. An investment bank was holding securities whose market value was below book value. It elected fair value option on those securities so that the unrealized capital loss would flow through equity, without ever affecting earnings. The securities were immediately sold, and the fair value option was not applied to the securities that were purchased to replace the securities that were sold. Since this FAS 159 election did not increase the use of fair value and since it did not mitigate an accounting mismatch, the SEC deemed this election to be “non-substantive.” The SEC has indicated that restatements may be required if non-substantive FAS 159 elections are made. So an actuary should be careful when recommending a FAS 159 election that the election is substantive.

Q51. Does FAS 159 require specific documentation to support a fair value option election?

A51. FAS 159 does not mandate any documentation requirements to support a fair value election. Paragraph A22 of FAS 159 recognizes that the documentation to support a fair value election is a matter of internal control and should not be prescribed by the Statement.

A company may establish a policy of automatically applying fair value option to certain newly issued or acquired contracts without making an explicit specific election for each individual contract. In that case, the company would generally document the election criteria with sufficient detail to identify the items for which the fair value election is to be automatically elected in order to support such election upon subsequent audit or review.

It would also be beneficial to document the reasons for fair value election for all contracts or groups of contracts for which a fair value election is made.

Q52. What disclosures are required by FAS 159?

A52. Paragraphs 18 through 22 describe the disclosure requirements for items for which a fair value election is made under FAS 159. The required disclosures include, but are not limited to:

- Management’s reasons for electing a fair value option

- A description of the reasons for electing fair value option for certain items but not other similar items, if applicable
- Additional information on each line item in the balance sheet that includes an item for which a fair value election was made
- The amount of gains and losses from fair value changes and in which income statement line those gains and losses are reflected for each line item in the balance sheet that includes an item for which a fair value election was made
- For liabilities with fair value changes that have been significantly affected by changes in instrument-specific credit risk during the reporting period:
 - The estimated amount of gains and losses attributable to instrument-specific credit risk
 - Qualitative information about the reasons for those changes
 - How those gains and losses were determined

In annual periods only, the methods and significant assumptions used to estimate fair value of items for which fair value option has been elected must be disclosed.

In addition, any disclosures required by FAS 157 would apply to items for which a fair value election has been made.

Q53. Are there implementation issues related to initial adoption of FAS 159?

A53. Upon initial implementation of FAS 159, the fair value option election is available for any eligible in force contract. Paragraphs 26 and 27 describe the reporting implications of such elections. The valuation change resulting from a fair value option election under FAS 159 does not flow through net income but is considered a cumulative-effect adjustment. The valuation change would include any write off of DAC or unearned revenue or similar accruals related to the item for which the fair value option is elected. Disclosures are required to support the election, including many of the items noted above, as well as the impact of the fair value election on deferred tax assets and liabilities and any valuation allowances that were removed upon the election.