A PUBLIC POLICY PRACTICE NOTE

Embedded Value (EV) Reporting

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American Academy of Actuaries
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American Academy of Actuaries

Practice Note on Embedded Value (EV) Reporting

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.

This practice note is not a promulgation of the Actuarial Standards Board, is not an actuarial standard of practice, is not binding upon any actuary and is not a definitive statement as to what constitutes generally accepted practice in the area under discussion. Events occurring subsequent to this publication of the practice note may make the practices described in this practice note irrelevant or obsolete.

The Academy welcomes your comments and suggestions for additional questions to be addressed by this practice note. Please address all communications to Tina Getachew, Senior Risk Management and Financial Reporting Policy Analyst at getachew@actuary.org.

The members of the Embedded Value Work group that are responsible for this practice note are:

Noel Harewood, Co-Chairperson

Kenneth LaSorella, Co-Chairperson

Robert Frasca
James Garvin
Edward Jarrett
Patricia Matson
James Norman
Jack Walton
Darin Zimmerman

Introduction

Embedded value reporting is growing in importance in the US and Canada. Most European insurance groups (and by extension, their North American subsidiaries) are reporting embedded value results publicly. In addition, the concept behind embedded value is similar in nature to trends in financial reporting.

The practices presented here represent observations of actuaries working for life insurance companies involved in calculating and/or reviewing embedded value calculations for life insurance companies in the United States and Canada. The purpose of the practice note is to assist actuaries working for life insurance companies with the calculation of embedded values. The information contained in the practice note is not a definitive statement as to what constitutes generally accepted practice in this area. Actuaries should consider the facts and circumstances specific to their situation, including the views of their independent auditors, in making a determination of appropriate practice.

This practice note has been divided into six sections:

Section A: Introduction to Embedded Value
Section B: Mechanics of Embedded Value
Section C: Assumptions
Section D: Analysis of Movement
Section E: Treatment of Options and Guarantees
Section F Disclosure of Embedded Values

Section A: Introduction to Embedded Value

Q1: **What is embedded value?**

A1: The CFO Forum, a discussion group composed of the CFOs of major European insurance companies, describes the embedded value ("EV") of an insurance company as the "consolidated value of the shareholders' interests" in the company. An alternative description of the embedded value is the present value of all future shareholder cash flows from the covered inforce business and capital and surplus. EV does not include any values attributable to future sales.

In this practice note, the term "best estimate" is used consistently with its use in the CFO Forum documents discussing European Embedded Value ("EEV"). In this context, the term "best estimate" refers to anticipated experience without provisions for adverse deviation.

Q2: What is EV used for?

A2: EV (or more specifically, analysis of EV) is used as a performance measurement metric. Internal uses of EV include justification for stock prices, incentive compensation of senior executives, analysis of product/line of business profitability and capital allocation.

External uses of EV include evaluation of mergers or acquisitions, estimates of available capital and comparison of companies across reporting jurisdictions. External parties such as investment analysts or rating agencies might estimate the EV of a company or a business sector in order to assist in their evaluations of company performance or financial strength.

Q3: What type of business is usually covered by EV?

A3: EV is typically used by life insurance companies. In particular, it is used with long-term business such as life insurance and annuities. As a practical matter, certain short-term business may be excluded because the EV associated with such business may be immaterial.

Q4: How does EV relate to the actuarial appraisal value of a company that is often encountered in mergers and acquisitions?

A4: The actuarial appraisal method of a company is similar to EV and is calculated using similar concepts (e.g., discounted cash flow). However, actuarial appraisals will typically include a value for future sales, while the EV does not. In addition, the actuarial appraisal value will differ from EV to the extent that the assumptions entering the calculations differ. For example, actuarial appraisals are typically performed using discount rates that are higher than those used for EV because they reflect the risk premium that a buyer expects to get in acquiring a company. In addition, EV assumptions typically use company-specific assumptions, whereas actuarial appraisals typically reflect a mixture of industry-wide expectations and company-specific assumptions. For example, EV is typically calculated using a

company's specific expenses, while appraisals may use industry averages or include expected synergies. Guidance on actuarial appraisals is provided in Actuarial Standard of Practice ("ASOP") 19 – Appraisals of Casualty, Health and Life Insurance Business.

Q5: What information is needed in order to calculate EV?

A5: In order to calculate EV, a company must have a complete inventory of its in-force policies as well as a balance sheet on the valuation date identifying assets, liabilities and capital requirements. For assets, the company must have data related to asset market values. The company must also have a complete set of assumptions to calculate EV. The company uses these assumptions to project future cash flows as well as the development and release of reserves and capital. These include economic assumptions (including a discount rate, future interest rates, and variable fund performance), policyholder behavior assumptions (including lapse rates, deposit rates, and election rates), non-elective assumptions (including mortality and morbidity), as well as entity-specific assumptions for expenses and taxes.

Q6: What regulations and guidance govern the calculation of EV?

A6: Unlike U.S. GAAP or International Financial Reporting Standards (IFRS), EV is not a prescribed accounting basis *per se* and, consequently, there is not a formal body of regulation that governs the calculation of EV (however, EV is dependent on the accounting basis under which the company reports its earnings and capital and surplus). Rather, practice has evolved and consolidated over time such that a set of commonly observed practices may be considered as defining elements of EV. In addition, sources of guidance have begun to develop as various industry bodies have promulgated EV principles. These serve as the key sources of practice around EV and are described below:

- Achieved Profits Method (APM). In the UK, the Association of British Insurers (ABI) developed guidelines for the calculation of EV for long term insurance business. These guidelines, which were published in December 2001, cover all of the basic EV concepts such as the setting of assumptions, the determination of discount rates, and the treatment of encumbered capital. While not formally required, it is believed that all UK companies abided by these guidelines prior to the publication of the EEV guidelines as described below.

- European Embedded Value (EEV). The CFO Forum issued a set of *European Embedded Value Principles* in May 2004. The intent of these principles was to improve the allowance for risk in reported financial results, to increase the transparency and consistency of EV reporting in Europe, and to improve disclosures around the degree of risk inherent in the business. In addition to covering some of the same ground as defined in the APM, the EEV principles cover such topics as the application of EV to embedded options and guarantees as well as sensitivity testing and disclosure. The CFO Forum's work on EEV is fully endorsed by the ABI.

Further guidance was published by the CFO Forum for application to year-end 2006 EEV reporting. The CFO Forum issued guidance related to Market-Consistent Embedded Value (MCEV) in June 2008. However, MCEV is beyond the scope of this practice note.

- In Canada, principles used to calculate EV are contained within a paper published in draft by the Canadian Institute of Actuaries in September 2000. Again, while not representing codified rules, these principles are widely observed in the industry.

- In the U.S., some guidance on EV is provided in ASOP 19. However, ASOP 19's primary focus is on actuarial appraisals.

Q7: Who publishes EV?

A7: Companies in the UK were the first to routinely disclose EV beginning in the 1980s. Today, virtually all large life insurance companies domiciled in Europe report EV in their annual reports as do companies in Australia, South Africa and, to a large extent, Japan. Canadian companies started publicly disclosing EV results in 2001 at the encouragement of the Office of the Superintendent of Financial Institutions (the Canadian regulatory body). Several insurance companies in the U.S. calculate EV as well, though there is no disclosure requirement for U.S. companies at this time.

Q8: What is European Embedded Value (EEV)?

A8: EEV is the name given to the EV that follows EEV Principles and that takes into consideration elements of an insurance company's business that are not considered adequately under traditional EV. More specifically, EEV incorporates an explicit cost of options and guarantees and more extensive disclosures.

Q9: What is Market-Consistent Embedded Value (MCEV)?

A9: MCEV is EV calculated in the context of a risk-neutral, market consistent framework. Although some actuaries believe that MCEV is a more theoretically precise performance measure, complexity and methodology issues resulted in MCEV not being covered in the initial CFO Forum guidance. On June 4, 2008, the CFO Forum issued guidance on principles to be applied in determining MCEV. Interest in MCEV as the next step in the natural evolution of EV continues to grow, particularly in connection with the International Accounting Standards Board's possible development of a market value-based accounting standard for insurance contracts. This is part of a broader body of research and debate on techniques and theory in determining fair values of insurance products and is beyond the scope of this practice note.

Section B: Mechanics of Embedded Value

Q10: What are the basic components of EV?

A10: EV is typically determined as the sum of adjusted net worth (ANW) and in-force business value (IBV). In formula form:

$$EV = ANW + IBV$$

Q11: What is Adjusted Net Worth (ANW)?

A11: ANW is the realizable value of capital and surplus. Statutory capital and surplus is adjusted to include certain liabilities that are, in essence, allocations of surplus (e.g., Asset Valuation Reserve in the U.S.) and non-admitted assets that have realizable value. This process automatically excludes the value of intangible assets identified in other accounting bases, such as U.S. GAAP goodwill, because such intangibles typically have no realizable value, i.e., could not be readily converted into a shareholder dividend. ANW includes both required capital and any free surplus.

In one approach, all invested assets supporting ANW are marked to market and tax-effected. In essence, a notional sale of all supporting assets is assumed.

An alternative approach tax-effects and marks to market only those assets supporting free surplus, i.e., surplus in excess of required capital (subsequently discussed). Invested assets supporting required capital remain at book value.

Q12: How is in-force business value (IBV) defined?

A12: IBV is the present value of after-tax statutory book profits (PVBP) less the present value of the cost of capital (PVCoC), both computed with best-estimate assumptions at the date of valuation and discounted to the valuation date at a risk discount rate (RDR). In formula form:

$$IBV = PVBP - PVCoC$$

IBV is also sometimes defined as the present value of distributable earnings. See question 22 for a more detailed comparison of the two definitions.

Q13: What is statutory book profit?

A13: In the U.S., statutory book profit (also called regulatory book profit) for a particular accounting period in the projection is the after-tax net income achieved after resetting invested assets at the beginning of that accounting period exactly equal to the net statutory liabilities (for simplicity, statutory reserves). Items included in statutory book profit are those typically found in statutory income statements. A partial list would include the sum of premiums, investment income, capital gains, and fee income, less the sum of claims, surrenders, maturities, commissions, expenses, dividends, experience refunds, the increase in statutory reserves, and taxes.

In jurisdictions where U.S. statutory accounting does not apply, local regulatory accounting typically defines book profit.

Q14: Can statutory book profits be derived from models that project accumulated surplus?

A14: Yes. Some actuarial models, especially pricing models, do not internally reset assets to equal statutory reserves at the start of each accounting period in the projection. Instead, such models project undistributed (self-generated) assets, allowing surplus to accumulate. However, book profits can be derived by assuming any excess of surplus at the end of an accounting period over surplus at the beginning of the accounting period, accumulated at an after-tax rate of return, has been contributed by the book of business (hence, the term, book profit). One possible formula is:

$$BP_t = Surplus_t - Surplus_{t-1} \times (1 + i_t)$$

The above formula assumes there have been no distributions to shareholders (shareholder dividends) or amounts of paid-in capital during the accounting period. If amounts have been paid to or from surplus during the accounting period, book profits must be adjusted to reflect the timing and amount of such cash flows.

Q15: How is Required Capital (RC) defined?

A15: Required capital means the capital the company has assumed to be allocated to the business. Definitions of required capital are context-specific, and vary across companies and geographies. For Canadian and United States business, one common definition is the minimum capital required to avoid regulator actions, e.g., 200% of NAIC authorized control level risk-based capital (RBC) in the U.S., or 150% of minimum continuing capital and surplus requirement (MCCSR) in Canada. Other percentages or capital levels are also used, e.g., a percentage (varies by company) of risk based capital formulae of rating agencies. The underlying percentages are usually tied to the organization's desired financial strength ratings.

Q16: How is cost of capital defined?

A16: For simplicity, first assume no debt. The cost of capital for a given period assumes investors wish to earn the risk discount rate (RDR) on capital that cannot be distributed. Since assets supporting RC are expected to earn an after-tax investment rate of return, the cost of capital for the period is the RC at the beginning of the period multiplied by the excess of the RDR over the after-tax investment rate of return. In formula form:

$$CostofCapital_t = RC_{t-1} \times (RDR - i_t)$$

The present value of the cost of capital is simply the present value of each period's cost of capital in the projection, discounted to the valuation date at the RDR.

Q17: How is Risk Discount Rate (RDR) defined?

A17: The RDR is one method for reflecting the risk inherent in the business. Most often, RDR is assumed to be a risk discount rate that is consistent with the reporting entity's cost of equity capital. While separate RDRs can be used for each line of business or major product line, the more common practice is to use one RDR for all in-force business or, alternatively, one for general account products and one for variable account products. Sometimes, as subsequently discussed, RDR is defined as a weighted average cost of capital.

Q18: How can a reporting entity's cost of equity capital be estimated?

A18: There are several models and methods available to estimate a company's cost of equity capital. However, the one most often encountered in practice is the capital asset pricing model (CAPM), which can be found in most finance textbooks. CAPM defines the cost of equity capital as the company's expected total rate of return on its equity. This expected rate of return is assumed to be a function of the risk free rate of return, the market equity risk premium (expected return in excess of the risk free rate), and a company's beta (a measure of its volatility relative to that of the market). To illustrate, let:

RF = the pre-tax risk free rate of return (often the 10-year Treasury)
RM = the expected market total rate of return (e.g., S&P500 total return)
(RM-RF) = the market equity risk premium
β= Beta, a measure of relative risk of a company's stock to that of the market (technically defined as the covariance of a stock's total return with that of the market, divided by the variance of market's total return)
e = expected company total rate of return, i.e., its cost of equity capital, defined by CAPM as:

$$e = RF + (RM - RF) \times \beta$$

For illustrative purposes, assume the expected market equity risk premium is 7%, the risk free rate is 5%, and a particular company's beta is 1. Thus the cost of equity capital derived by CAPM is: e = 5% + 7%*1 = 12%. This assumption set would produce an equity cost of capital close to the market's historical total rate of return. Assuming a 3.5% market equity risk premium produces a cost of equity capital of 8.5%. RDRs for real-world EEV publications of North American business were typically in the range of 7.0% to 9.0% over the last few years .

[Note: A beta of less than 1 would generate a lower expected rate of return than the market's, along with less expected volatility. Likewise, a beta of more than 1 would generate a higher expected rate of return than the market's, along with more expected volatility.]

For some insurance companies offering more traditional products, a beta of less than one might be experienced. However, for those insurance companies offering less traditional products, such as variable annuities with guaranteed minimum

accumulation benefits, equity indexed annuities, and no-lapse guarantees, betas can exceed one.

Some other models and methods available to estimate the cost of equity capital include the buildup method, the discounted cash flow method, arbitrage pricing theory (APT) and the Fama-French three-factor model. The latter two include more than one beta, each measuring a specific risk. In addition, some have used CAPM with an adjustment for company size to better reflect the additional riskiness of smaller companies. Further discussion of these other models and methods is beyond the scope of this practice note.

Q19: How can debt be reflected in EV?

A19: One way debt can be reflected in EV is by introducing the cost of debt (debt service) into the cost of capital formula. Assuming RDR to be the cost of equity capital, the excess of the RDR over the after tax return on invested assets is to be applied only to the portion of RC funded with equity (i.e., not funded with debt). Assume the portion of RC funded with debt is D, at an after-tax cost of debt, d. The result is a slightly expanded form of the cost of capital formula:

$$CostofCapital_t = (RC_{t-1} - D_{t-1}) \times (RDR - i_t) + D_{t-1} \times (d_t - i_t)$$

The above approach reflects debt explicitly in the cost of capital formula. Alternatively, debt can be reflected implicitly in the RDR. With this approach the RDR is the weighted average cost of capital (WACC) often encountered in finance theory. For example, if only two sources of capital are considered, debt (D) and equity (E), and the cost of each is d and e, respectively, then RDR can be defined as follows:

$$RDR_{WACC} = e \times \frac{E}{E+D} + d \times \frac{D}{E+D}$$

With RDR so defined, the cost of capital would be computed as if there were no debt, i.e., the entire RC would be multiplied by (RDR-i_t).

The formula for WACC can be expanded to include other sources of capital. For example, to include a third source, preferred stock (P) at a cost, p, the denominators would be expanded to (E+D+P) and a third term, p×P/(E+D+P), would be added.

Q20. Why is the RDR sometimes the cost of equity capital and other times a blended cost of debt and equity, i.e., a WACC?

A20. In the UK, where EV calculations first originated, debt was not typically considered. Furthermore, in some jurisdictions, conventional debt cannot be used to fund capital requirements. In the US, for example, borrowing money creates an offsetting liability resulting in no increase in statutory surplus. Consequently, RDR has typically been based in the UK on the cost of equity capital. This interpretation was adopted by Canadian EV even though certain qualifying debt, subject to limitation, can be used to fund capital requirements (qualified debt can provide up to

25% of Tier 2 capital in MCCSR). In EV reported by Canadian companies, the cost of debt is typically recognized explicitly in IBV via the cost of capital (i.e., the expanded cost of capital formula).

However, even in jurisdictions where conventional debt cannot be used to fund capital requirements, there are debt-like instruments, such as surplus notes, capital notes, or preferred shares that may be combined with common equity to result in a WACC for the RDR. In addition, often money can be borrowed and shares issued at the holding company level to fund capital requirements of an insurance subsidiary. As a result, the method of computing IBV with the RDR equal to a WACC also has its place in EV.

In summary, RDR can be either the cost of equity capital or a WACC. If the former, any debt is reflected explicitly in the cost of capital (see question 19); if the latter, debt is reflected implicitly in the RDR.

Q21: How do results differ when reflecting debt directly versus indirectly in the RDR?

A21: It can be shown mathematically that results are identical using a WACC (indirect method) or the direct method when the following conditions are met:

- The values for E (equity) and D (debt) used in WACC are fair values. This is the common definition provided in finance textbooks. However, often practitioners use the more readily available book values; and

- Debt is maintained at a constant percentage of the present value of distributable earnings (PVDE) throughout the projection period.

As a practical matter, the above conditions would likely not apply exactly; nevertheless, results under either method are typically not too dissimilar.

- Alternatively, WACC can be a series of risk discount rates that vary over the projection period, with $WACC_t$ reflecting the specific debt-equity mix of period t in the projection.

Q22: For valuing in-force business, how does IBV compare with the present value of distributable earnings often encountered in acquisitions?

A22: The key difference is the fact that distributable earnings (DE) are typically calculated using a starting level of capital whereas IBV is calculated without capital (with a separate adjustment for cost of capital). For simplicity, assume no debt, economic capital for the acquisition appraisal equal to RC, and an appraisal discount rate equal to RDR. Distributable earnings can then be defined as after tax net income, which includes the after tax statutory book profit, plus investment income on assets supporting RC, plus any release of RC (positive or negative). In short, distributable earnings for a period represent the maximum dividends that can be

distributed to shareholders while maintaining minimum capital requirements. In formula form:

$$DE_t = BP_t + (i_t \times RC_{t-1}) + (RC_{t-1} - RC_t)$$

Subtracting and adding $RDR \times RC_{t-1}$ to the right side of the equation gives:

$$DE_t = BP_t - (RDR - i_t) \times RC_{t-1} + (1 + RDR) \times RC_{t-1} - RC_t$$

Working with the first line of the DE formula, projecting the terms on the right hand side to the end of the projection period and taking the present value gives the standard definition of IBV, i.e., the present value of book profits less the present value of cost of capital charges, computed at the RDR. Projecting and taking the present value of the terms of the second line gives RC_{t-1}, i.e., starting capital. Dropping subscripts for convenience, in formula form:

$$PVDE = IBV + RC$$

The above formula applies as well where there is WACC reflecting debt. When explicit recognition is given to debt, distributable earnings defined above can be reduced by the cost of debt service and repayments of debt (positive or negative), leading to the following expanded formulas for DE and PVDE:

$$DE_t = BP_t + (i_t \times RC_{t-1}) + (RC_{t-1} - RC_t) - (d_t \times D_{t-1}) - (D_{t-1} - D_t)$$

$$PVDE = IBV + (RC - D)$$

Q23: Is IBV the same as the value of in-force business (VOBA) encountered in purchase GAAP (PGAAP)?

A23: No. VOBA is recorded on a pre-tax basis on the balance sheet, whereas IBV is recorded on a post-tax basis. Although at least one approach to VOBA takes the form of an IBV computation, there are differences in accounting bases, assumptions, and the definition of RDR. For example, if U.S. GAAP reserves were greater than statutory reserves, greater profits would be expected to emerge as such excess reserves release into GAAP income. Consequently, if VOBA is derived from IBV, an adjustment must be made for statutory/GAAP reserve differences. In addition, EV best-estimate assumptions (discussed further in the next section) assume a going concern and are mostly company-specific. Since VOBA is intended to satisfy the fair value requirements of SFAS 141, assumptions are more market-based. For example, a selling company's assumed maintenance expenses of $80 per policy (based on experience and deemed appropriate for EV) might be supplanted with more typical market expenses of $60 per policy, reflecting economies of scale obtained by a potential purchaser. In addition, as discussed above, the RDR used to compute IBV is more often based on the assumed cost of equity capital, allowing a

particular company's capital structure to be reflected in the net cost of capital (e.g., debt equal to 25% of required capital). In contrast, the RDR used in the computation of VOBA is typically a weighted average cost of capital (WACC), reflecting the cost of capital structure typically encountered in the market place.

Q24: How is the value of new business (VNB) defined?

A24: For a block of new business, the basic definition is exactly the same as IBV, i.e., the present value of book profits less the present value of the cost of capital. VNB may be valued at the point of sale. In some disclosures (discussed in a subsequent section), VNB for the reporting period is accumulated at the RDR to the end of the reporting period. VNB is typically reported reflecting all actual acquisition expenses incurred. As with IBV, assumptions underlying VNB are typically best-estimate assumptions.

Q25: How does VNB differ from the value of future new business (or franchise value) valued in actuarial appraisals?

A25: VNB is the value of new business sold in the particular reporting period (e.g., a calendar year for annual reporting). It does not reflect the value of future new business to be sold in future accounting (reporting) periods. The value of future new business capacity valued in actuarial appraisals represents the value of a certain number of years of future new business as opposed to just one period's worth in EV.

Q26: Can EV be compared to an actuarial appraisal?

A26: In general, not directly. As previously mentioned in question 4, EV is <u>not</u> an actuarial appraisal. In addition to ANW and IBV, an actuarial appraisal includes the value of future new business capacity, a critical component of any actuarial appraisal. In addition, VNB only reflects the value of business sold in the recent reporting period; it does not reflect future performance, either with respect to sales volumes, product mix, or profit margins. In addition, an actuarial appraisal might not use exactly the same assumptions used for EV. For example, a prospective buyer's interpretation of risk and uncertainty, and the desire to achieve a fairly high risk adjusted potential return, might lead to selection of an RDR above that used for EV.

While EV analysis does not attempt to deliver an actuarial appraisal or attempt to place a value on the company's stock, a major purpose of EV disclosure is still to provide analysts with additional information that can be used to better value the company's stock. Given ANW, IBV, VNB, and some sensitivity analysis, an analyst can examine historical financial data, make assumptions about future growth, modify IBV and VNB based on independent assumptions and modeling, and finally, select a multiple of modified VNB to be added to modified EV. The result would be a somewhat independent valuation of the company's market value.

Section C Assumptions

Q27: What assumptions are required for EV calculations?

A27: The assumptions can broadly be split into two categories; economic and non-economic assumptions, though these two categories are interrelated and some assumptions cross both categories.

Economic assumptions generally relate to the existing and expected future economic environment. Examples of economic assumptions include future reinvestment rates, future default rates, and inflation.

Non-economic assumptions generally relate to the existing and expected future operating environment. Examples of non-economic assumptions include future mortality and morbidity rates, future expense rates (excluding inflation) and future interest crediting strategies.

While this framework of separating assumptions is often useful, the categories are not necessarily simple. For example, persistency may be either non-economic or economic, depending on the product design under consideration.

Q28: Do assumptions used include Provisions for Adverse Deviation (PADs)?

A28: Assumptions are generally best estimates of future experience, without allowance for any margins or PADs.

Q29: How often are assumptions updated?

A29: The assumptions are generally reviewed each time EV is calculated, but at least on an annual basis. The assumptions are expected to be consistent with best estimate assumptions used in other areas including valuation and pricing. The assumptions usually include allowance for expected future trends in the assumptions (e.g., mortality improvement).

Q30: Who is involved in the setting of the assumptions?

A30: Management is typically responsible for the development of assumptions. In practice, actuaries may play a key role in the development and monitoring of assumptions. However, there are many other key parties involved in assumption development (for example the investment department and accounting as necessary).

Q31: What is typically considered when setting mortality or morbidity assumptions?

A31: The mortality and morbidity assumptions used are expected to reflect a combination of credible company experience and market experience. Companies will often compare actual experience to established mortality and morbidity tables to determine the applicable percentages of the standard tables.

Companies might set their assumptions based on the established tables with adjustments made to reflect their past experience, current pricing experience and underwriting philosophies. The granularity of mortality and morbidity assumptions differs by company. Some might set their mortality at a product and era level while others might use an aggregate table to apply across lines of business.

As part of the analysis of change in EV, the company validates the assumptions against current experience to determine the component of the distributable earnings attributed to experience variances.

Q32: What is typically considered when setting mortality improvements?

A32: Future mortality improvements are generally included in products where there is significant mortality risk or where the product is long duration. The improvements reflect published studies and relevant and credible past experience of mortality improvements in a company's own experience. When developing the improvement factors, consideration is usually given to the change in the mix of business over time. Often, this is considered by developing mortality improvements at a granular enough level to allow for emerging business.

Where the business has renewable terms, consideration is typically given to the potential anti-selection occurring from policyholder behavior at the end of the level term period.

Q33: What is typically considered when setting persistency rates?

A33: Persistency rates are generally set based on a combination of credible actual company experience, pricing assumptions, market data, future trends and analysis of customer behavior. The rates typically consider the relationship between customer behavior, the product design and the investment performance of the products. There is likely to be a direct relationship between lapse rates and interest rates for interest sensitive business.

For flexible-premium products, premium persistency rates typically consider both the distribution channel and the economic environment.

Generally rates are set by product type and by duration. For business with renewable terms or surrender periods, allowance for selection can be made by using shock lapse rates at the end of the surrender period.

Q34: What is typically considered when setting expense assumptions?

A34: Generally all expenses are included in an EV calculation. The actuary usually considers the allocation of total actual expenses incurred between acquisition, overhead and maintenance. Considerations are typically given to items which are one-off in nature but likely to occur periodically in the future. Costs of system overhaul, while occurring in the current year, might not be expected to reoccur in *n* years, rather annually. Future expense improvement is typically not reflected beyond productivity gains that have already occurred (i.e., since the last expense study).

Some companies do reflect expected improvements in unit costs where there are specific measures or plans in place to capture productivity gains. Consistency of assumptions with internal business plans is typically considered. The CFO Forum appears to support these approaches, with a specific allowance for improvements for start-up operations.

Q35: What is typically considered when setting investment returns?

A35: Investment returns are typically derived from a combination of the performance of the actual asset portfolios allowing for future reinvestment rates, company investment expenses and expected default and credit risks. The company's reinvestment strategy is typically considered.

Unless assets are perfectly matched to the liabilities, it would be usual for a reinvestment assumption to be part of the investment rates assumption. The reinvestment rate is likely to be adjusted for investment expenses and for expected default risk.

Investment expenses would be expected to reflect the jurisdiction's accounting. They would typically be consistent with any service contracts in place and often reflect the type of asset, e.g., deduct 0.05% from bond returns and 0.15% from equity returns rather than using an average rate.

Care should be taken to ensure that the investment assumption does not capitalize excess return without reflecting any additional risk. For example, increasing the investment return by assuming higher credit spreads are typically offset by making an additional allowance for increased risk, possibly through the cost of capital and the RDR.

Q36: How are the investment returns allocated to the product liabilities?

A36: Assets could be notionally or actually allocated to cover the liabilities by product or segment of business. The excess assets are typically allocated to the ANW.

Q37: Is an expense inflation assumption required?

A37: Generally the inflationary increases on expenses are applied to the business. Inflationary increases typically reflect both general retail inflation, salary inflation, and the weighting of the costs in the business. The inflation is usually consistent with other economic assumptions. Some companies use expenses as a proportion of premiums to implicitly allow for future expense increases.

Q38: What is the RDR?

A38: As described in question 17 above, the risk discount rate (RDR) is a combination of a risk free rate of return to reflect the time value of money plus a risk margin to make prudent allowances for the risk that experience in future years may differ from that assumed. In particular, a risk margin is added to allow for the risk that

expected additional returns on certain asset classes (e.g., equities) are not achieved. And as discussed earlier, it would typically reflect the cost of equity capital and whether explicitly or implicitly allow for the cost of debt. Currently, industry has been adopting one of two approaches in determining the risk discount rates: the top-down and bottom-up approaches.

Using the top-down approach, the RDR could be calculated using a risk margin based upon a group weighted average cost of capital (WACC). The group WACC is calculated using a gross risk free interest rate, an equity risk premium, a market assessed risk factor (a beta), and an allowance for the gearing impact of debt financing on a market value basis. The market assessed risk factor would aim to capture the market's view of the effect of all types of risk of a company's business, including operational and other non-economic risk.

The alternate bottom-up approach is to use a granular approach to reflect differences in risk inherent in each product group. The risk discount rate so derived does not reflect a market beta but instead reflects the expected volatility associated with the product's cash flows in the calculation of the EV for that product. These product specific betas would be calculated to reflect the volatility of product cash flows and determined by considering how the profits for each product are affected by changes in expected returns on various asset classes. Converting this into a relative rate of return, product specific betas are calculated. An additional risk margin for the derived market risk to cover the non-diversifiable non-market risks associated with the business would be added, though this might be calculated either at a product level or more simply at a group level.

Note that for companies with multinational operations, a country-specific RDR is often developed. This RDR incorporates both country-specific risk-free rates and assessments about country risk inherent in a country-specific risk margin.

Q39: What level of tax rate is typically applied?

A39: The tax rate is typically set to be consistent with the relevant accounting regime and reflect the location of the emergence of profits. Taxes would typically reflect all taxes incurred, including federal and local taxes.

Q40: Are there other assumptions that are typically considered?

A40: Generally the actuary is expected to consider all the assumptions used in the calculation of the business that are likely to make a material impact on the overall calculation. The actuary might consider assumptions for its long term care, group risk business, disability business, general insurance lines as well as those mentioned above.

Section D Analysis of Movement

Q41: What is the analysis of movement?

A41: The analysis of movement is reconciliation between the opening and closing embedded values, with the difference between the two allocated to various explanatory categories, broadly defined as elements within management control and elements outside management control. Generally, the analysis of movement answers the question – why did EV change over the reporting period? Many actuaries and investment analysts believe that the analysis of movement provides actionable management information.

Q42: What are the components of analysis of movement?

A42: One method for decomposing the performance of a company in an analysis of movement is as follows:

- Value of New Business (VNB)
- In-force Performance
- Investment Variance
- Economic Assumption Changes
- Capital Movements
- Other

The In-force Performance is in turn comprised of:

- The Expected Return
- The Operating Experience Variances
- The Operating Assumption Changes

The sum of the VNB and In-force Performance is sometimes referred to as the Embedded Value Operating Return, and is viewed by some as a measure of management's performance.

Other methods of decomposing the period's performance also exist.

Q43: How is the VNB reflected in the analysis of movement?

A43: Some companies calculate the VNB using beginning of period or point-of-sale assumptions, and report any variance over the period combined with variances from other in-force business. Other companies calculate the VNB using end-of-period assumptions, and assume there is no variance on new business. The latter method simplifies the analysis of movement.

In addition, some companies calculate VNB by running a separate model containing only new issues. Other companies calculate the VNB using a "differencing" approach, where the value is calculated for all business, and all business excluding

the most recent period's issues. The VNB is then calculated as the difference between the two.

Q44: What does the expected return represent, and how is it calculated?

A44: The expected return represents the expected increase in EV, excluding new business, if experience unfolds exactly as assumed in the beginning EV. For simplicity, assume there is no debt, or that the cost of debt is implicitly reflected in the RDR (a WACC). Then, as has been established, EV is the sum of IBV and ANW. However, cost of capital charge in IBV implies that investors expect to earn the RDR on RC. Consequently, ANW can be partitioned into RC and Free Surplus (FS). With this split, both IBV and RC can be expected to earn the RDR with FS expected to earn the after tax rate of return on its backing assets. Since it has been shown that the sum of IBV and RC is equal to PVDE, EV can also be considered as two separate interest-bearing assets; the Free Surplus (FS) and the PVDE. While FS is expected to earn the after-tax earned rate on its backing assets, PVDE can be assumed to earn the risk discount rate (which is true if experience matched the EV assumptions exactly). The concepts discussed above lead to the following formulae for expected return:

$$Exp\,\mathrm{Re}\,turn_t = (IBV_{t-1} + RC_{t-1}) \times (RDR) + (FS_{t-1}) \times (i_t)$$

Alternatively,

$$Exp\,\mathrm{Re}\,turn_t = (PVDE_{t-1}) \times (RDR) + (FS_{t-1}) \times (i_t)$$

Where: (FS_t) is the free surplus at time t

(i_t) is the after-tax earned rate on assets backing free surplus

$(PVDE_t)$ is the value of in-force business (including RC) at time t

RDR is the risk discount rate in effect at the beginning of the period

Q45: What are the operating experience variances, and how are they calculated?

A45: The operating variances reflect differences in the ending value due to the deviation of actual experience from expected experience for operating assumptions over the reporting period. Operating assumptions are intended to include items which are ostensibly under management control. Assumptions typically classified as operating assumptions are:

- Mortality
- Morbidity
- Persistency
- Maintenance expenses

Some actuaries further decompose operating variances into current year and present value components. Current year variances reflect the difference in the end-of-period EV due to the difference in the distributable earnings of the period caused by the deviation in the relevant experience. Present value variances reflect the difference in the EV due to effects of current experience on future projected values. For example, for a deferred annuity in early durations, higher surrenders will cause a positive current year variance (due to higher than expected surrender charge revenue in the year) but a negative present value variance (due to lower future spread income).

Mechanically, one way of calculating the operating experience variances is by running a model with the beginning of year in-force data and assumed operating experience, and then replacing the assumed experience in the first year with the actual experience, the differences representing operating experience variances.

Q46: How are the operating assumption changes calculated?

A46: The operating assumption changes represent changes in the EV due to changes in the operating assumptions (as defined above). The assumptions are reevaluated as described in Section D. Changes are made to an end-of-period model.

Q47: What is the investment variance?

A47: The investment variance reflects the deviation between actual investment returns and expected investment returns over the period. This is conceptually similar to the operating experience variance as described in Question 45, and is calculated similarly. However, this is reported separately as it is felt that changes in value due to changes in economic conditions are beyond the control of management. Some actuaries believe that this may not be true, as a well-hedged portfolio would show smaller variances due to changes in investment returns.

Q48: What are the Economic Assumption Changes?

A48: The economic assumption changes represent changes to the projected economic assumptions used to calculate the end-of-period EV. Typically, companies will project economic elements based on the yield curve in effect at the valuation date. As the curves are often fairly fluid, this results in changes in various economic parameters (e.g., the risk discount rate) from period to period.

Section E Treatment of Options and Guarantees

Q49: What is Time Value of Financial Options and Guarantees (TVFOG)?

A49: Financial options and guarantees are reflected in EV in two ways: intrinsic value and time value. Time value is generally given much more attention in EV calculations as it generally requires additional complexity and assumptions, while intrinsic value is not explicitly determined.

Intrinsic value is the value of the financial options and guarantees at the time of the valuation date. As a practical definition for EV, the intrinsic value of financial options and guarantees is the value of the financial options and guarantees assuming the current in-force projected over the best estimate assumptions.

For example, let's assume we have a variable annuity contract with a guaranteed minimum death benefit (GMDB). Let's also assume that the benefit is currently in-the-money, i.e., the GMDB is greater than account value at the valuation date. The intrinsic value is then the present value of the future death benefits paid in excess of account value due to the GMDB under the deterministic best estimate assumptions.

For EV reporting, the intrinsic value is not explicitly calculated, but is included as part of the value of business in force before the time value of financial options and guarantees.

The time value of financial options and guarantees (TVFOG) is the value of the financial options and guarantees given the potential changes in financial markets to increase or decrease the value of the options and guarantees before their expiry. In instances where a robust calculation is performed, TVFOG is generally calculated as the difference between the mean of a set of stochastic runs and a single best estimate deterministic scenario. This best estimate assumption would already include the intrinsic value of the financial options and guarantees.

It is worthwhile to note that while the term TVFOG is gaining popularity primarily due to its reference in the CFO Forum's EEV Principles, TVFOG is often reported under a different name. For instance, it may be entitled time value of options and guarantees (TVOG), future options and guarantees (FOG), cost of future options and guarantees (CFOG), or another similar name.

Q50: How is TVFOG calculated?

A50: TVFOG is typically calculated as the mean of the present value of distributable earnings for a set of stochastic scenarios minus the present value of distributable earnings for a single deterministic scenario. All of these scenarios would generally be constructed using the same best estimate assumptions and methodology. The set of stochastic scenarios varies only in the projected asset return projections, while the deterministic scenario uses an average asset return projection that is typically consistent with the return assumption used in the overall EV calculation.

As stated above, it is very important to note that, to the extent applicable, TVFOG is typically calculated using assumptions, methodologies, and models consistent with those used in other calculations for EV.

Many of the models that companies utilize in the EV calculations are ill-suited to calculate large numbers of stochastic scenarios, and discrepancies between the models used to calculate the base value and an adjustment for TVFOG can exist. These discrepancies are technically errors and would typically be addressed to the degree possible.

Also, due to the added complexity of building large stochastic models, short cuts and approximations are common, especially for smaller blocks. As with any other type of financial reporting, the impacts of any approximations are typically carefully reviewed and their materiality considered. This is especially true for stochastic processes where intuitive judgment is often extremely difficult.

Q51: What type of business is TVFOG important for?

A51: TVFOGs are important for the following combinations of U.S. products and features:

- Variable annuities and variable universal life policies with secondary guarantees, such as GMDBs, GMIBs, GMABs, and GMWBs
- Universal life policies and deferred annuities with fixed interest options that guarantee minimum crediting rates, including periodic guaranteed rates and long-term floors
- Options and crediting floors found in equity indexed and other fixed annuities
- Universal life policies with no lapse guarantees

While those listed above are the most common products and benefits that have TVFOGs, each product is generally reviewed and any options and guarantees are captured.

Also, preparers of EV calculations typically quantify any options and guarantees inherent in the assets held in support of a block of business, e.g., CMOs.

Q52: What information is needed to calculate TVFOG?

A52: Please see "Section C – Assumptions" for more information on the assumptions required for EV. The general assumptions required to calculate TVFOG is usually consistent with the assumptions used in other EV calculations, e.g., mortality, lapses, etc. Also, methodologies and the approach to modeling would typically be consistent with the rest of EV, e.g., the risk discount rate approach would typically remain consistent across stochastic and deterministic runs.

A few assumptions and modeling issues are of particular interest in the stochastic scenarios commonly utilized in the calculation of TVFOG. The first of these are the stochastic asset return simulations themselves. A set of stochastic simulations dictate asset returns and discount rates for the set of stochastic scenarios. These simulations often include expected returns for various asset classes and currencies as necessary.

Other major assumptions utilized during stochastic runs are policyholder behavior algorithms. For example, the utilization of GMWB provisions in variable annuities typically vary depending upon how far contracts are in-the-money. A policyholder with a significant benefit is much more likely to access those benefits than one with little to gain.

Finally, management actions are typically given consideration in developing the stochastic models utilized to generate TVFOG. EV is designed to generate realistic results and management's propensity for modifying contract features are therefore usually taken into account whenever appropriate. For instance, during times of low interest rates and where contract provisions allow, fixed interest options may be limited within variable annuities to reduce a company's exposure to guaranteed minimum crediting floors. These types of management actions are typically modeled, especially in cases where action plans are documented or historically demonstrable.

Q53: Does TVFOG capture the risk of non-economic variance?

A53: No. TVFOG represents only financial options and guarantees. Risks in non-economic assumptions are typically covered using other mechanisms, such as adding an additional risk premium to the discount rate or applying a direct cost.

Q54: Does TVFOG capture non-economic options, e.g., conversion options in term life?

A54: No. The value of these options are typically reflected in EV where applicable, but are typically not explicitly included in TVFOG.

Q55: How do I create policyholder behavior algorithms?

A55: Policyholder behavior algorithms are not unique to EV and a robust discussion of the methodologies used to generate them is beyond the scope of this document.

Where companies perform cash flow testing or stochastic reserving such as that seen in VA CARVM, FAS133, and/or SOP03-1, policyholder behavior algorithms likely already exist. Pricing may also already contain a developed algorithm. EV calculations can likely utilize the same or similar algorithms. Also, any guidance used in setting a policyholder behavior algorithm for one of the models discussed above would likely provide insight for generating one for EV.

Q56: Is stochastic analysis always required to calculate TVFOG?

A56: No. For some risks, TVFOG can be accurately calculated theoretically using a closed form solution such as Black-Scholes for simple options (e.g., a GMAB rider on a variable annuity). This requires a reliable estimate of dynamic policyholder behavior. For more complex life insurance policies or annuities, stochastic modeling is typically used.

While not as theoretically precise, approximations based on other stochastic runs or shortcuts are common in TVFOG valuations. As with other financial reporting methodologies, the accuracy and materiality of any such estimations are usually carefully considered.

Q57: Should projections for TVFOG use real world or risk neutral assumptions?

A57: Projections are typically consistent with the other elements of the EV calculations. The CFO Forum's publication of the EEV Principles provides guidelines that call for a risk premium to be added to the risk free rate when creating the risk discount rate, reference the desire for market consistency and discuss the need to "allow" for credit risk. More specifically, the EEV Principles document indicates that techniques to value options should incorporate an allowance for stochastic variation in future economic conditions that is consistent with the projection assumptions applied under Principles 9 and 10, which make reference to best-estimate assumptions. The EEV Basis for Conclusions document states "the approach eventually adopted…incorporates the time value of future options and guarantees by taking the expected value from a range of possible stochastic 'real world' outcomes…" The document also appears to reject both a pure risk neutral approach for EV as well as a hybrid approach in which the base EV uses real world scenarios and TVFOG uses risk neutral scenarios. Therefore, some companies have elected to follow a real world approach for consistency with the CFO Forum documents.

However, with the evolution of MCEV, some companies calculate the entire EV, not just TVFOG, on a market consistent (i.e., risk neutral) basis. In such situations, TVFOG is also calculated on a market consistent basis, which is consistent with the general consistency objective of the EEV Principles.

Although the CFO Forum appears to have rejected a hybrid approach whereby basic EV is computed on best-estimate assumptions and TVFOG on a risk neutral basis, some use the hybrid approach. Those embedded options that are typically hedged are often valued in actuarial appraisals on a market consistent basis. The reasoning is that the cost of hedging impacts distributable earnings. Since a primary objective of EV is to value distributable earnings, valuing TVFOG on a risk neutral basis would appear to be consistent with that overriding objective. Consequently, some companies believe that, regardless of how basic EV is computed, TVFOG should be valued on a risk neutral basis.

Other considerations are whether a hedging program is in place, which may impact the choice of method, and the treatment of options and guarantees in cost of capital and RDR. When valuing TVFOG on a market consistent basis, caution should be exercised to properly reflect the interactivity of the valuation method and the method for capturing guarantees in the cost of capital and RDR.

In summary, although the original EEV Principles document does not appear to support valuing TVFOG on a risk neutral basis, practice appears to be towards such a valuation. And for those reporting MCEV, the entire EV, including TVFOG, is valued on a market consistent basis.

Q58: Does hedging impact TVFOG?

A58: EV would typically reflect all material elements of the company's actual investment strategy. Therefore, the cost and effect of any applicable hedging strategies would typically be modeled.

Section F Disclosure of Embedded Values

Q59: In addition to EV and its composite elements (ANW, PVBP and PVCoC), what information should be disclosed when presenting EV?

A59: For external disclosure, any information required by any body that regulates the publication of EV should be disclosed as required. For U.S. and Canadian companies, there is currently no regulatory body that requires publication of EV. For subsidiaries of European companies, this would include guidance from the CFO Forum related to sensitivities and disclosure (see Question 63). External users often pay particular attention to the reported VNB.

For internal disclosure, discussion of the EV methodology and the key assumptions included within it can provide useful information to help the reader understand the meaning of the EV.

Q60: What items are typically disclosed (i.e., which items will prove most useful to the readers of the EV numbers)?

A60: Different observers will find different disclosure items more or less valuable in understanding the EV figures. In part, the issue is one of personal preference. However, as a general rule, it is the Work Group's view that those items that have the most impact on the level of the EV are those that are most important to disclose. These could include any key methodologies or assumptions that enter into the EV calculations. Items where there is substantial subjectivity on the part of the company or where company practice differs from commonly observed industry practice are particularly important to disclose. That is because an understanding of the sources of these items and how sensitive the company's results are to them can help the reader who is trying to compare EV across companies on a consistent basis.

The CFO Forum provides a list of required disclosures for EEV reporting applicable to European insurance companies. This is discussed further in Question 63.

Q61: What are some specific things that might be disclosed?

A61: Many companies may disclose the levels of key assumptions used in their EV calculations. These could include discount rates, policyholder behavior assumptions and non-elective assumptions (e.g., mortality). Where an assumption is particularly critical, companies may also provide sensitivity tests to show by how much the EV would change were the assumptions different. This enables the reader to come to his or her own conclusion regarding how critical it is to the valuation. Companies may also disclose the rollforward of the EV by source, in order to enable the reader to understand the causes of the change in EV over the reporting period.

Q62. What specific requirements are provided by regulatory authorities outside the United States related to EV disclosures?

A62. There are three main jurisdictions where specific guidance related to EV disclosures exist: the UK (related to the achieved profits method), Canada, and Europe (through the CFO Forum).

Q63: What requirements related to disclosure exist for reporting EV in conformity with the principles established by the CFO Forum?

A63: The disclosure items recommended by the CFO Forum are not technically "requirements," insofar as the EEV principles laid down by the CFO Forum are not mandated by any regulatory body. However, they are routinely provided by the large European insurance companies that comprise the CFO Forum and by other companies disclosing EV as well. A company cannot be deemed to be presenting EV in compliance with the CFO Forum guidance without them.

Specific disclosure items are included within the core EEV paper, *European Embedded Value Principles*. The required disclosures include:

- Key assumptions
- How key assumptions were determined
- Methodologies
- Reconciliation of opening to closing EV by source
- An analysis of the change in free surplus
- Sensitivities to key assumptions

Many of these disclosure items are defined in considerable detail within the EEV guidance.

Subsequently, additional guidance was provided related to the sensitivities to be disclosed. These disclosure items are contained in a paper entitled *Additional Guidance on European Embedded Value Disclosures* published in 2006. The prescribed sensitivities to be disclosed include the effect of the following:

- 100 basis point increase in the risk discount rate
- 100 basis point reduction in the interest rate environment
- 10% decrease in equity or property values
- 100 basis point increase in yield on equities or property
- 10% decrease in maintenance expenses
- 10% decrease in lapse rates
- 5% decrease in mortality and morbidity rates

In addition, companies generally disclose the following:

- The basis for determining required capital (for the cost of capital calculations)

- The movement in EV broken down between ANW and IBV (discussed further in Section E)
- The derivation of risk margins
- The pattern of reinvestment yields.

Other disclosure items are defined in this paper as well.

Q64: How are disclosures provided in practice? Is there consistency in practice across companies and does practice generally follow the CFO Forum guidance?

A64: In practice, there is variability in the level of disclosure provided around various key assumptions and methodologies even as companies comply with the disclosure guidelines published by the CFO Forum. Many observers believe that the level of disclosure provided by many companies is not sufficient to render a complete understanding of the meaning of the EV numbers provided. Consequently, comparability of results across companies is impossible to assess with any certainty. A common sentiment among observers is that many companies appear to provide enough information to be able to claim technical compliance with the CFO Forum guidelines while holding back on details that are necessary for a full understanding of their methods and assumptions. The fear that fuller disclosure would result in providing competitors with privileged information about the company may hinder companies from improving the quality of the information disclosed.

Q65: Are there specific disclosure requirements for companies in Canada that report EV in their annual reports?

A65: While the Office of the Superintendent of Financial Institutions ("OSFI") recognizes that the practice of reporting EV is gaining popularity in Canada, it does not provide any guidance on how such calculations should be performed, or the information related to the calculations that needs to be disclosed. The only guidance related to EV disclosure in Canada is contained in a draft paper prepared by the Canadian Institute of Actuaries titled *Interim Draft Paper on the Considerations in the Determination of Embedded Value for Public Disclosure in Canada*. The paper was published in August 2000. It suggests that standard components of EV be disclosed (IBV, "free capital," "locked-in capital") and recommends that an analysis of the changes in EV from period to period be disclosed as well. It also suggests that key assumptions be reported. It encompasses the same elements of disclosure as suggested by the CFO Forum, though at a much less detailed level. A review of disclosure practices in Canada reflects little consistency across the few companies that publish EV and less detail than would typically be provided by a European company.

Q66: What practices related to EV disclosure are prescribed or suggested in the U.S.?

A66: Neither the FASB nor the SEC, nor any other regulatory body to our knowledge in the United States provides any formal guidance with respect to the

disclosure of information related to EV. Because EV is a valuation concept without regulations, some believe that reporting EV within public financial statements is not appropriate. This would not seem to prevent companies from disclosing EV within the section of the financial statements devoted to management's discussion and analysis ("MD&A"), though the practice is certainly not yet widespread in the U.S.

Q67. Where can one go to find a summary of the information disclosed by companies related to their EV calculations and assumptions?

A67. EV information related to an individual company can typically be found in the company annual report, if the company calculates EV and chooses to disclose the results. Additionally, information may be disclosed in investment analysts' reports or investor presentations. Virtually every large European company discloses EV information in these reports as do a number of large Canadian insurers. In addition, a small, but growing number of U.S. companies are providing EV information. As noted earlier, the disclosure of assumptions within these reports varies by company with some companies providing much fuller sets of information than others. In addition, the International Section of the Society of Actuaries typically publishes a compendium of disclosed financial assumptions used for EV in the fall issue of the *International News*.