

**1997 VALUATION ACTUARY  
SYMPOSIUM PROCEEDINGS**

**SESSION 20**

**Financial Performance Measurement**

**Hans J. Wagner, Moderator**

**John S. Tillotson**



## FINANCIAL PERFORMANCE MEASUREMENT

**MR. HANS J. WAGNER:** We're going to be talking about performance measurement and management issues. Our panelist is John Tillotson. John is from Transamerica in Los Angeles. He's second vice president, working in corporate actuarial research. For the past two years he has been involved with Transamerica's embedded value implementation project. He also works on analysis and strategic issues and special opportunities that arise.

I'm a senior manager with Ernst & Young's actuarial practice based in Boston. I work on financial performance, capital allocation issues and the like. John's going to be talking about value added and embedded value as it has been implemented at Transamerica. I'll be closing off with a brief discussion of setting hurdle rates and performance targets both at the corporate level and at the line-of-business level. We are not going to try to just come up with a way to redefine profit; rather, we are trying to come up with better ways to improve the company's basic economics.

**MR. JOHN S. TILLOTSON:** My topic is embedded value-added: the new kid on the block. We've been working over the last two years at my company to implement an embedded value-added process. I'll discuss the formulas we use, the interpretation of results, and the broader process we call value-based management. Then I'll briefly discuss the role of embedded value-added alongside GAAP and statutory accounting. It's sort of a third way of looking at the numbers. We think it's one of the better ways, but it's the new kid on the block, and it has to compete for management attention. There's still quite a distance to go before the actuaries in our company will feel that it's getting the attention it deserves.

I will discuss several elements in our embedded value-added formulas. These are embedded value, distributable cash flows, the cost of capital, and embedded value-added. Then I'll talk about the components of the 1997 embedded value-added measurement process that we just completed recently.

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Before I proceed I want to mention that embedded value-added numbers behave a little strangely sometimes, and until you've worked through the formulas and the examples, some of the results might not look right. So if you ever get involved in it, I would suggest becoming familiar with how the numbers behave. Otherwise, it's very difficult to explain to your audience what is really going on.

The core of any embedded value-added system is, of course, the embedded value itself. This represents the shareholder value, the market value, or the economic value of the company or organizational unit. There are a lot of different terms you can use. But the key word is economic as opposed to accounting, even though the process behaves more or less like an accounting system. The primary characteristic that distinguishes embedded value-added from other accounting systems is that you recognize the full value of a policy on the day you sell it, not over the lifetime of the policy.

In theory, you might go even further and recognize the value today of all expected future policy sales. Alternatively, you could argue that value is added when you hire an agent or when you develop a new product. Although there are valid theoretical arguments for these other views, we found that recognition of value at the time the policy is sold is the most practical and conservative approach. These characteristics are important for selling the concept to company management. We did not want a method where the embedded value fluctuated dramatically every time the estimate of future sales growth was adjusted.

As a result of our approach, the embedded value of an operation always consists of the value that's embedded in the in-force business at that time. New policies add value on the day they are sold. These policies then become in-force policies and are not expected to add any additional value later. That is why, in the worksheets, the expected embedded value-added for the coming year from the beginning of the year in-force business is always zero.

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The embedded value, at any time, is the present value of future distributable cash flows. This value should be adjusted for asset/liability risk. My company does not yet have a sophisticated asset/liability risk adjustment in most of its line-of-business embedded value-added models. Most of these models use single-scenario projections, either with a level interest rate or a single best guess path of future interest rates. We realize that this creates rather optimistic embedded values, so we adjust the results by looking at some of our asset adequacy and other cash-flow testing work. Based on these, we estimate how much the single scenario embedded value is overstated relative to the average embedded value over a broad range of interest rate scenarios.

The distributable cash flow for a particular year is defined as the after-tax statutory earnings minus the increase in target surplus. It's the money you earn minus what you need to hold aside in order to satisfy risk-based capital requirements or other surplus needs.

The distributable cash flows that we use to calculate embedded value represent dividends to owners. I use the word represent because most of the calculations are done at the line-of-business level. In addition, we're dealing with the in-force policies only when calculating the embedded value. So what we've really got are the cash flows thrown off by the in-force policies within each block of business. Although these cash flows will fund the dividends to the parent corporation or to the owners, they also must fund future new business. Therefore, the future distributable cash flows used to calculate embedded values will not provide good estimates of future dividends.

Finally, the discount rate we use to calculate the embedded value is set equal to the cost-of-capital rate. Thus, the cost-of-capital rate serves a dual function. It's used to determine how much the capital required to fund the business will cost as well as to discount future distributable cash flows in the embedded value calculations. If you work through the algebra of embedded value, that will help explain why the expected embedded value-added for the coming year on the in-force business is, by definition, always equal to zero.

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The cost-of-capital rate represents the opportunity cost to the owner of the capital funds needed to run the business. The whole idea is that if your operation can earn a greater return on this capital than the owner can achieve elsewhere, then you have added to the owner's value. This definition implicitly assumes that the owner already has the capital and is looking for some place to invest it. An alternative concept is that the owner has to raise the capital somehow and therefore pay a price (or cost) for it (thus the phrase "cost of capital"). This concept appears more appropriate when the parent company has to raise the necessary capital through the issuance of debt or equities.

Because there are multiple concepts with multiple alternative investments and multiple sources of funding, it should be no surprise that there is no single, universally agreed upon formula for determining the cost-of-capital rate. It can be a blended rate based on the mixture of debt and equity. Or, it can be a minimum or hurdle rate set by the owners. At any rate, the goal is to cover the cost of capital (i.e., add value) by as much as possible. This can be done by writing new business during the year with a return on investment (ROI) exceeding the cost-of-capital rate or by managing the in-force block to earn more profits during the year than were expected at the beginning of the year.

In my company we use a formula for the cost-of-capital rate that our parent company has developed based on the capital-asset pricing model. I won't get into the details except to say it is based on the expected excess returns of the stock market added to a risk-free rate of interest.

Embedded value-added calculations focus on the current year (or coming year, depending on when the calculations are made). Typically, you start out with the beginning-of-year embedded value and then calculate how much value you expect to add during that year. For example, if a line of business has an embedded value of \$100 million at the beginning of the year, then that is viewed as the capital invested in that business. It doesn't matter how much actual historical capital has been put into that line of business. You may have given a particular line of business \$50 million a couple of years ago, and due to good luck and good management, the in-force business is now worth \$100 million. You could have a second line of business that looks identical to the first line today, except that you

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provided it with \$200 million dollars a couple of years ago, and due to bad luck and bad management, the in-force business is now worth only \$100 million.

Now suppose that both lines are expected to earn \$11 million during the coming year (based on a cost-of-capital rate of 11%). Under traditional accounting, the first line would be viewed as performing quite well if it earns \$11 million on \$50 million of capital. The second line would be viewed as providing a poor return on \$200 million of capital.

When using the embedded value-added approach, however, what's past is past. The goals for the coming year for the two lines are identical because the lines at the beginning of the year are identical. This makes a lot more sense than setting goals based on historical capital. The owners in the business (at least in theory) could have sold either line of business for \$100 million at the beginning of the year, so that figure represents the amount of true capital (or economic capital or opportunity capital) invested in each of the lines.

In addition to the embedded value, the embedded value-added is a key concept. It equals the excess of what can be called the *annual value increment* over the cost of capital. The annual value increment is equal to the year's retained earnings plus that year's distributed earnings. For example, suppose the embedded value of the in-force business of a line of business is \$100 million at the beginning of the year. During the year, \$7 million was distributed (i.e., made available to pay dividends or to fund new business). At the end of the year, the remaining in-force business (i.e., without any new business added in) has an embedded value of \$108 million. That means in total you have an annual value increment of \$15 million. That \$15 million, however, is not your embedded value-added. You have to subtract the cost of capital. If your cost-of-capital rate is 11%, then the cost of capital is 11% times \$100 million, which equals \$11 million. Therefore, the embedded value-added on the in-force business for the year is \$4 million.

If you are accustomed to traditional accounting, the resulting embedded value-added figures can appear to be very small. Much of the time, these figures on the in-force business will be negative.

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This is one of the reasons embedded value-added concepts are often resisted. It seems easier to admit that you earned only \$10 million this year instead of the targeted \$11 million than to report that you *destroyed* \$1 million of value. The fact is that if your embedded value-added is positive at all, that means you did a good job. You've earned the cost of capital and then some.

It is necessary to mention at this point that the embedded value-added is not the increase in the embedded value during the year. I know this has created some confusion at my company. Perhaps there should be a better name for it, because people seem to think right away, "Oh, embedded value-added must mean the increase in embedded value." The fact is, you can usually increase your embedded value even if you earn a low rate of interest -- simply distribute even less than you have earned. To really "add value," however, you've got to earn more than the cost of capital, regardless of how much you retain or distribute.

There were five major elements in the embedded value-added measurement process that we just completed this year at my company. First, we compared the 1996 actual to the expected embedded value-added on the January 1, 1996 in-force business. Second, we compared the actual-to-expected embedded value-added on the new business sold during 1996. Third, we analyzed the change in the embedded value as of January 1, 1997, due to changes in assumptions and changes to the cost-of-capital rate. Fourth, we analyzed the components of the expected embedded value-added during 1997 from the January 1, 1997 in-force business. Fifth, we calculated the expected embedded value-added on the anticipated 1997 new business.

The expected 1996 embedded value-added on the January 1, 1996 in-force business was, by definition, equal to zero. The actual embedded value-added for each block of in-force business was then positive or negative depending on our actual experience during 1996 in terms of mortality, expenses, lapses, etc.

When we calculated the "actual" embedded value-added, however, we did not assume any changes in experience beyond December 31, 1996. That's not literally true, however, because a policy that



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lapses during 1996 is not available to die or lapse or do anything else after 1996. What this really means is that the post-1996 assumptions were not adjusted for what happened during 1996. This appears straightforward, but actually caused some problems when interest rates suddenly reverted to expected levels within the models at midnight on December 31, 1996.

The second element in our process was a comparison of the actual with the expected new business, embedded value-added during 1996. The expected embedded value-added for a particular year's new business will usually be a positive number. Otherwise, you probably shouldn't be selling that business. We ran into some modeling problems here too. For example, our models did not track the actual experience of the 1996 new business during 1996. They could not separate these policies from the older in-force policies. In effect, both our expected and our "actual" new business experience were based on pricing assumptions about mortality, lapses, expenses, etc. The "actual" varied from the expected only in terms of the number of policies sold and the mix of policies by product, issue age, band, etc. Nevertheless, this gave us some valuable information. For example, if a line of business has a 50% drop in sales, this immediately impacts the embedded value-added. If the focus is on GAAP accounting, such a drop in sales may have only a very small impact on current earnings.

We would eventually like to fix our models to correctly handle new business variances between actual and expected. As it is, the variances in mortality, etc., that occurred during 1996 on the 1996 new business got lumped in with the in-force variances.

The third element of our process was an analysis of the January 1, 1997 change in embedded value. At the beginning of each year, we revisit our assumptions and recalculate the cost-of-capital rate, which tends to go up or down with general interest rates. There also may be changes in methodology at this time (e.g., implementing a more sophisticated method for calculating the asset/liability adjustments). The result of all this was a change in the embedded values of each line of business as of January 1, 1997. We reported these changes in increments so that we can see the effect of each different cause of change.

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Even though these calculations result in changes to the embedded values, we do not characterize them as “embedded value-added” or “embedded value destroyed.” This is because those phrases imply a change in the reality of our business, whereas in fact the only thing that has changed is our perception of that reality.

The fourth element of our process was the calculation of the expected 1997 embedded value-added from the January 1, 1997 in-force business. This is, by definition, equal to zero. In our reports we showed its component parts and split these by product groupings within each line of business.

For example, the expected distributable cash flows for 1997 are equal to the statutory earnings minus the increase in the required surplus. The statutory earnings equal the operational cash flows minus the increase in the statutory reserves, with taxes then taken out. The required surplus calculations can be based on the NAIC risk-based capital (RBC) formula with a target ratio or on a formula that attempts to replicate the criteria used by the ratings agencies for the ratings your company would like to maintain.

These breakdowns of the embedded value-added calculations are not only useful for explaining embedded value-added, but can be integrated into or used as validation for statutory capital planning exercises.

The fifth element of our process was the calculation of expected embedded value-added on our anticipated 1997 new business. The new business distributable cash flows are almost always negative in the coming year because of first-year statutory strain and the establishment of required surplus balances. As I mentioned earlier, the funding of these negative cash flows generally comes from the in-force business. Then, whatever is left over is available for distribution as dividends to the parent company or the shareholders.

Next I'd like to discuss the interpretation of embedded value-added results. There are three parts to this. First, what are the purposes of the embedded value-added exercise? Second, what are some

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of the conceptual issues that we've had to address? Third, what are some of the practical problems in developing and running an embedded value-added process?

There are several reasons for implementing an embedded value-added process in a life insurance company. It enables you to measure the embedded value-added at the company level, the business unit level, and the product grouping level. At my company, the primary focus is on the business unit level. We're trying to determine which of our lines of business are adding value, how much value they are adding, what problems might be preventing them from adding value, and what opportunities for creating additional value might be worth pursuing.

Although we also try to analyze the results at the total company level, there is still a lot of work to be done there. For example, we haven't figured out a practical way to model the corporate segment yet. Analyzing results at the product grouping level is also difficult, largely due to the arbitrariness of any formulas for allocating investment income, overhead expenses, and required surplus.

While the main purpose is to measure economic performance at various levels of the company, there are several secondary purposes. One is to measure management performance. The difficult part here is sorting out the effects of good or bad management from the effects of good or bad luck. Also difficult is deciding which level of the organization is primarily responsible for any particular result.

A second purpose of embedded value-added analysis is to help validate pricing and other assumptions and vice versa. Each type of actuarial exercise -- pricing, embedded value-added, asset/liability management, etc. -- has modeling and assumption issues that are amenable to cross validation.

A third purpose is to use the new business embedded value-added calculations to support the company's capital allocation process. A fourth is to provide analytical support for strategic analyses.

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There are several conceptual issues that we've had to struggle with in setting up our embedded value-added process. As I mentioned earlier, our new business "actual" calculations reflect the mix and volume of actual sales, but not the actual mortality and other experience. This is not viewed as a big problem, however, because the business we sell in a particular year has only been on the books an average of six months by the end of that year. Of course there could, for example, be a major mortality problem as a result of quick claims. In general, however, there will be other mechanisms in place to quickly identify such problems.

A second conceptual issue is how to adjust for riskiness such as the asset/liability risk. Should we calculate weighted scenarios, use value at risk, or adjust the discount rate in some fashion? There always seems to be a large gap between what is theoretically sound and what is practical.

The third conceptual issue is the allocation of various items. For example, how should expenses be allocated between in-force and new business? Should the cost of a large new computer system be expensed or amortized?

The final conceptual issue is the interpretation of variances between actual and expected results. Is bad mortality during a particular year the result of bad luck, bad underwriting or overly optimistic assumptions? This issue has always plagued actuaries and company managers, however, and is certainly not new to embedded value-added.

Thus, although embedded value-added can improve the accuracy of what you are measuring, interpreting the results is still as much art as it is science.

There are also several practical issues that we've had to deal with in establishing our embedded value-added process. The greatest is perhaps the very high level of resources required. In theory, a full embedded value-added process should require the same level of resources as GAAP accounting or statutory accounting. Although this turns out to be false, there is a great deal of work involved. Because embedded value-added is the new kid on the block, we have to compete for actuarial and

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other resources in an expense trimming environment. We're also competing for management attention in a rapidly changing and distracting strategic environment.

The type of quality control that we use on the data, the models, and the assumptions is also a difficult issue. For example, we are trying to develop a generic model for all the various actuarial processes we have (asset/liability analysis, embedded value-added, cash-flow testing, statutory planning, etc.) in order to ensure consistency and comparability. We still have a long way to go on this.

Another practical issue is the allocation of responsibilities between the corporate area and the business units. How much leeway do you give the lines of business in terms of setting assumptions, developing their own special ways of dealing with expenses, etc.? You need some kind of central control and consistency, but you have to recognize the unique products the lines sell and the unique situations they face.

Next, I'll talk about what we call value-based management, which is a broader process. Embedded value-added is an annual accounting process, where we can look at our in-force and new business and see how much value they are adding. Value-based management moves beyond that. It includes value-based decision making and value-driver analysis.

Value-based decision making is the core element of any decision process involving the present value of future cash flows. For a life insurance company, with its long-term products, almost all important financial and strategic decisions are value-based decisions. Examples that I'm sure you are all familiar with are new product pricing, asset/liability management, and the annual asset adequacy exercise. In all of these situations, you will be comparing the present values of future cash flows for various alternatives, base cases, and sensitivity scenarios.

Most, if not all of the issues discussed earlier with respect to embedded value-added are also present in some form here. The main point is that the economic or value implications of all decisions are

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paramount. Companies that use decision-making methods that ignore economic value do so at grave risk to their ongoing viability.

On the other hand, it can be almost as dangerous to rely solely on value-based calculations for such decisions. You must always consider other factors such as strategic fit, riskiness, employee morale, and short-term GAAP effects. The difficult part of such decision making is determining how much weight to give to each of these different aspects. Also, do you adjust the numbers themselves or just the final decisions?

Value-driver analysis is another value-based management process. Value drivers are those elements in your products that have the most effect on the economic value of your company. Obvious examples include mortality costs, expenses, interest rate spreads, and lapse rates.

There are three major elements involved in deciding where to focus your value driver analyses. The first is the sensitivity of the company's value to that particular driver. Obviously, if the driver has little or no effect on value, then it does not qualify as a value driver.

The second element is the degree of control that the company has over the driver. For example, a company generally has a lot of control over mortality costs on future new business by means of underwriting standards and product features. Once the policy is sold, however, the level of control over mortality is much lower. You still have some control because you can take actions that keep lapses, and therefore, antiselection down. In this case, it is more appropriate to view lapse rates as the relevant driver.

The third element is the potential for improvement. A driver may be very important in terms of sensitivity and degree of control, but if you're already doing the best that can be done with that driver, there's not much point to continually analyzing it. On the other hand, it's always important not to allow your performance to deteriorate through neglect. You also should set up a process for

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benchmarking performance both internally and externally to make sure there really is no room for substantial improvement.

Finally, I'd like to talk briefly about the role of embedded value-added alongside GAAP and statutory analysis. GAAP earnings tend to measure past performance (more than a year ago) as opposed to current or recent decision making. As a result, GAAP earnings tend to be a slow indicator of any developing problems. They are often of more interest to external audiences than to internal analysts. I believe the industry would be doing itself a great favor if it can create a major shift of attention from GAAP to embedded value-added among its various external audiences. Also, GAAP equity is inferior to embedded value as a measure of the market value of the company. Meanwhile, GAAP effects should be viewed as constraints upon decisions, but not as the primary drivers of those decisions.

Statutory accounting, of course, is far too conservative for value-based decisions. Its primary financial importance comes from the constraints that regulatory requirements put on company decisions, such as how much new business can be sold without a capital infusion.

In summary, an embedded value-added process can be very valuable for a life insurance company, but tends to get bashed around and bloody like most new kids on the block.

**MR. WAGNER:** I'm going to spend some time on hurdle rates and performance targets, by actually coming back to John's talk, and discuss some of the ways to figure out what our discount rate should be. Although I'll speak more broadly and not just about the value-added or embedded value concept. I'll also discuss GAAP performance measurement if people are still interested in doing that as well.

I have a couple of definitions for what I'll be talking about. For my purposes, a hurdle rate is the rate at which an investor (and here an investor is company management or potentially an outside investor in some business) is indifferent to making a future or further investment. It's kind of a break-even rate. It's the cost of making the investment, the alternative opportunity cost.

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Performance target, on the other hand, is an investor's or management's desired rate of return for a given project. The two are probably related but not necessarily the same. In the value-added context, the hurdle rate is what we'll use for our embedded value or economic value-added discount rate.

In John's example for Transamerica, they're using the cost of capital. Not everybody would use that. Some might just use cost of equity as opposed to the overall cost of capital. We'll talk a little bit more about that later. You've also seen examples where there's a sense of what the market discount rate is. Actuarial appraisals are often done at 10%, 12% and 15%, so we can pick one of those rates. As John mentioned, at Transamerica right now, the same rate is being used for all lines of business. Clearly, some refinement of that is being considered.

Earning the hurdle rate, however, is like treading water in terms of adding economic value. However, treading water isn't necessarily a bad thing. If we can stay afloat, and the tide carries us somewhere wonderful, that's good. So, as John said, it's a different context. We're not always going to be earning spectacular returns; just breaking even in the value-added context is quite an accomplishment.

Moving from hurdle rates to performance targets can vary somewhat depending on our purpose. For pricing, we might decide that we want a return on investment or a return on the distributable cash flows to attempt to exceed our hurdle rate. We will be adding some value through our new business by not just returning our cost of capital on an expected basis. At the corporate level, in a value-added context, we might have set a growth rate for the embedded value. So we're really focusing on an overall growth in our shareholder value and not so much on a rate of return.

Let's move to the GAAP context. Again the hurdle rate is a minimum target. It's consistent with maintaining but not enhancing value. A couple of years ago at the Valuation Actuary Symposium, I gave a talk related to this and it went into more detail. I talked about some of the ties between a statutory return on investment in your pricing and how GAAP returns might emerge from that.



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There are reasons that we do want a performance target set higher than our hurdle rate though. If we have a portfolio of projects, all of which are achieving at or above the hurdle rate, and if we take the average of all of this, the average has to be at least a hurdle rate or better. If we set our target at an aggregate level we might be burying some losers along with the winners. And by setting our performance target a little higher than just the hurdle rate, it helps ensure that each component of the portfolio that we're measuring has to achieve at least a hurdle rate.

There's also an argument that while maintaining value is in many environments a wonderful accomplishment, our goal should be set a little bit higher. It's nice if we can create and not just maintain value. I'll go further to say that in the GAAP context, we don't want to just look at our earnings targets. Earnings growth is also very important, particularly if examining stock market valuations. We'll look at some of the correlations between the analysis of earnings over a target rate and market values in a couple of minutes.

John talked briefly about the weighted average cost of capital. It is a blend of the cost of equity and the cost of debt for a given enterprise. The cost of debt is a pretty thing to measure. For a mutual company you can look at what your surplus notes are being priced at over Treasury; for a stock company issuing debt at the holding company level, it's pretty easy to see what your recent debt cost is. Cost of equity, however, isn't so direct to measure. As John mentioned, at Transamerica and at other places, the capital asset pricing model is a common way to measure the cost of equity.

This brings us to a related topic. As we move from the holding company or the corporate level down into the line of business, do we want to use the weighted average cost of capital or do we want to keep leverage? The weighted average cost of capital is reflecting the mix of debt and equity that the corporate areas choose for the company. Should that leverage be pushed down or should business units be operated as though they were fully funded by equity? The corporate level kind of has the advantage of the leverage because it's their decision.

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In terms of choosing projects which add value or not, if you don't push down the weighted average cost of capital (WACC), you may decide not to pursue some projects that exceed the WACC, but don't exceed the cost of equity. The whole idea of adding leverage and adding debt is to bring the WACC lower than the cost of equity would be.

For those that have gone through the exams before some of the restructures and the inclusion of corporate finance topics, the capital asset pricing model is a way to attempt to measure stock market returns. Essentially, the risk-adjusted return on an equity or really any kind of project is composed of the risk-free rate plus a beta, that's a measure of the risks in a specific business, times the equity risk premium. The equity risk premium is the overall excess of stock market returns over the risk-free rate. We'll talk a little bit more about each of those elements.

### Capital Asset Pricing Model

$$R = R_f + \beta (R_m - R_f)$$

R = Risk-adjusted equity return

$R_f$  = Risk-free rate

$\beta$  = Business-specific risk adjustment

$R_m$  = Return on equity market

$(R_m - R_f)$  = Equity risk premium

The risk-free rate is commonly just Treasury spot rates. In different uses of the capital asset pricing model short-term rates are typically used in stock market portfolio evaluations. They're thinking you can get in and out of positions quickly. In terms of setting a performance target for an insurance company, it might be appropriate to consider a longer term rate consistent with the idea that you're making a longer term investment. You're not typically going to decide to shut down your personal lines operation overnight. You might want to somehow reflect that you're going to be in that business for a while.

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The level of the equity risk premium has been the subject of a lot of academic debate. You'll see numbers ranging from 5% to 7% on a long-term historical measure. There have been a lot of articles indicating that the equity risk premium has narrowed as more people have gotten comfortable with the stock market. Holdings have broadened. Some of the changes between the information available in stocks and bonds and perhaps the equity risk premium has shrunk to 2% or 3%, although most practitioners still use a higher rate.

In terms of beta, for public companies at the corporate level you can look it up. Places like ValueLine and Standard and Poor's make available estimates of beta either derived from historical beta or based on their projections of what the future is likely to look like. The amount of leverage in a company definitely impacts what its beta is. If you're highly leveraged it drives up your beta somewhat, and your stock price is more volatile. For nonpublic companies, or for business units, you can't just look up beta, you need to use comparison companies (peers). My individual insurance unit has these peer companies with a certain beta. My health unit has a different set of peer companies and they have a different average beta. In doing that kind of comparison, you'll want to strip out the effects of debt. That again is something that I talked more about a couple of years ago. So I won't get into it much today.

Lets look at a few illustrative companies and run them through the capital asset pricing model (Table 1). We'll look up betas from ValueLine and then develop a target return on equities or a target cost of capital, which is the hurdle rate. So there's weighted average cost of capital, and this is just looking at an equity cost, but it also includes the leverage of that, and here I assume the risk-free rate of 6%, obviously not using a real short-term rate. These companies did fairly well. Fortunately, I didn't put up any companies that didn't do real well last year.

Then, how did achieving excess returns compare to achieving excess perception in the market, if you will, or having a market to book a price ratio that's favorable? When I did this a couple of years ago, I got a much tighter scatter than we did this year (Chart 1). Obviously there are more dots up there than there had been on the prior slide. This actually is reflecting about 30 different companies. I

just did it in the spreadsheet, and you can plot a regression line. It even does the R squared. I had to pull out my statistics text to remember what an R squared was. It's only 9.4% here. So it's indicating that excess ROE is not a wonderful predictor of a market-to-book ratio being very positive. There are a lot of other things, such as earnings growth, that do impact favorable market value, but there is clearly a correlation.

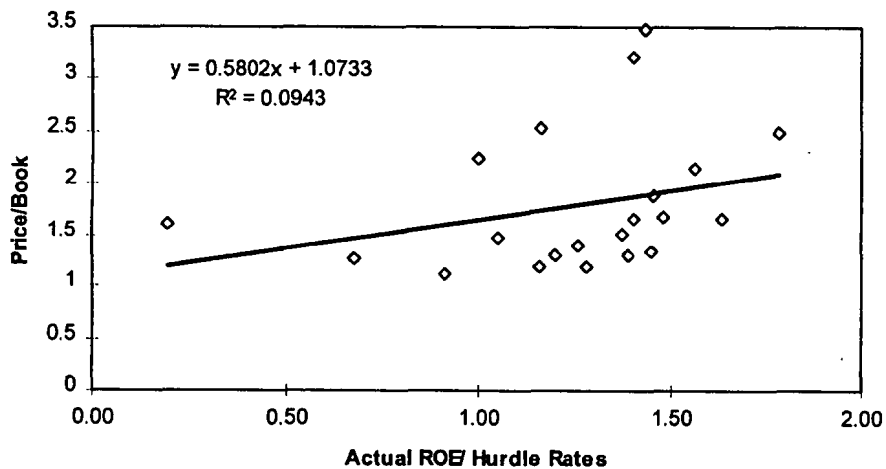
**TABLE 1**  
**Illustrative Companies**

Company	B	Target ROE	1996 ROE	Actual/Target
American General	1.05	11.3%	11.8%	1.05
CIGNA	1.10	11.5%	16.7%	1.45
Lincoln National	1.10	11.5%	13.3%	1.16
SunAmerica	1.50	13.5%	19.0%	1.41
Transamerica	1.00	11.0%	13.9%	1.26

Target ROEs assume  $R_f = 6\%$ ,  $(R_m - R_f) = 5\%$

**CHART 1**  
**ROE and Market Valuation**

**1996 Actual/Target ROE as a Predictor of Price/Book**



## FINANCIAL PERFORMANCE MEASUREMENT

In terms of setting performance targets, there are several ways of deciding how much over our hurdle rate we should go. We can look at peer company/competitor performance and see that they're earning 12% on average. We should earn 12%. We could look at the performance versus the target and assess whether we want to earn the same 1% or 0.5%. You know, are we going for a medium return, or are we going for top quartile performance? Rather than just look at the absolute level of return, let's look at what risks are embedded in their business versus the risks in our business. We'll set a relative return versus the target ROE rather than the absolute. Obviously we need to reflect near-term realities; you can't turn business on a dime. As John mentioned, GAAP results, in particular, tend to be very dependent on prior results. So we're not necessarily going to pick up an awful lot of ROE quickly. In terms of setting compensation targets, we're going to need to reflect that, so we don't just frustrate management. It is possible to get the type of data I hinted at for different types of companies. This can provide some hints as to variances by performance and by business unit rather than just hitting corporate targets.

**MR. RICHARD F. LAMBERT:** I have a question for John about how you deal with timing issues. You talked about how you revised your assumptions for embedded value once a year. If you were to reprice an in-force product and change your nonguaranteed elements in the middle of the year, would you treat that as creating or destroying value? Or would you recalculate your embedded values?

**MR. TILLOTSON:** We currently leave the modeling decisions with respect to particular products up to the lines of business. This is mostly a question related to value-based decision making as opposed to embedded value-added accounting. Decisions such as repricing or changing the nonguaranteed elements should be primarily based on the effects on economic value and only secondarily on the short-term GAAP earnings effects. The effect of such decisions on the annual embedded value-added calculations would occur after the year was over when we compare actual results to those expected. Such decisions could also result in assumption changes going forward. At this time different lines of business might handle similar situations in differing manners. We eventually hope to establish greater consistency in this area.

## 1997 VALUATION ACTUARY SYMPOSIUM

**FROM THE FLOOR:** A great session guys. John, would you want to go one step further and talk about profitability analysis? The step beyond that many of us go to, but none of us talk about business evaluation. If you take a very simplistic model, you know that the value of the business is future distributable cash. If you're a stock company, you capitalize on stock market value. You take away from that the embedded value of your inventory policies, putting in a plan and equipment. What you're left with is the residual value for the human factor.

What piqued my curiosity was when you said there were problems assigning value or profit to the executive core. Have you put a value on the human entity? Have you taken out residual value and said, "Our sales force is worth this, our home office staff is worth that?" What formulas do you use? Do you use the aging -- I've seen formulas where they value a person by some factor or some coefficient applied to their salary, but age adjust it if it is sales.

**MR. TILLOTSON:** We don't do that as part of our annual process. If we were looking at an acquisition or selling off a unit, then we would want to make those determinations. With respect to our embedded value-added accounting process, however, trying to include such calculations would add too much variability and undisciplined judgment to the process.

**FROM THE FLOOR:** I understand but tell us anyway.

**MR. TILLOTSON:** One reason we don't do it is because we couldn't sell the whole embedded value-added process to our management team if we did do it. They know that line-of-business leaders could easily manipulate the results. They could always decide they were better leaders than they were a year ago. Assigning embedded value to people, however, might be useful if we are worried about whether or not our competitors are beating us because they have better people. Or we could focus on assigning embedded values to our customers. These ideas could be examined as separate projects but then tied back into the embedded value-added accounting process. If you try to integrate all of that into one big annual project, you'd be going too far too soon. Does that answer your question?

## FINANCIAL PERFORMANCE MEASUREMENT

**FROM THE FLOOR:** Yes, I understand.

**MR. THOMAS J. HRUSKA:** First, on required surplus -- are you using what your target surplus would be as a going concern or are you using something less? The second question is, is this process perceived as being very manipulative?

**MR. TILLOTSON:** At any given time, our required surplus depends on several calculations, and which one of these calculations gives us the highest figure. Currently, trying to maintain our Standard & Poor's (S&P) rating produces the highest figure, although the formulas used by our lines of business are actually based on a roughly equivalent percentage of the NAIC RBC formula. What was the second part of your question?

**MR. HRUSKA:** Manipulation.

**MR. TILLOTSON:** Manipulation is definitely a concern. It's partly self-correcting, however. For example, a line of business can produce an initially high embedded value using optimistic assumptions. Going forward, however, they will then have a very tough set of hurdles to jump. This is because the cost-of-capital rate is applied to that high embedded value which makes it more difficult to add value in the future.

Similarly, a line of business could do the opposite. They could start with a very low embedded value based on pessimistic assumptions in order to make it easy to add value later on. Hopefully, these opposite motivations will tend to offset one another leaving the primary incentive to be as accurate and realistic as possible.

The most likely situation for manipulation is when a new line-of-business leader decides to recalculate his embedded value as low as possible, blaming its low level on his predecessor and making it easier for himself to add value going forward. In such situations, it should be the task of the corporate area to monitor the situation and keep the players relatively honest.

## 1997 VALUATION ACTUARY SYMPOSIUM

**MR. WAGNER:** I should probably make some kind of plug about how you can have your auditors take a look at it too.