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Session 91PD
Embedded Value of Life Insurance Product Lines

Track: Financial Reporting

Moderator: BRIAN C. CAMPBELL
Panelists: NANCY E. BENNETT
                    MICHAEL L. KASTER
                    SIMCHA A. SEGAL

*Summary: This session focuses on the methods and assumptions used to perform
embedded value calculations for various life insurance product lines. Discussions
also center on practical examples of how embedded value is used to assist
companies in the strategic decision making process. Comparisons to fair value and
other methods of valuing performance of life insurance product lines are made.
This session provides a learn-by-example format for acquiring knowledge and puts
current theory into practice for more experienced practitioners.*

MR. BRIAN C. CAMPBELL: Our first speaker will be Nancy Bennett, a consulting
actuary with Milliman USA in Chicago. Her consulting practice focuses on integrated
financial management, including asset/liability modeling (ALM), investment strategy
development and risk management issues. Her specific modeling applications have
included cash-flow testing, embedded value analysis, appraisals, demutualizations
and profitability analysis. Her presentation today will focus on an overview of
embedded value, including such elements as internal and external reporting, some
assumption choices and a discussion of the differences between fair value and
embedded value.

Our second speaker is Sim Segal, a senior manager with Deloitte & Touche in New
York. Mr. Segal's areas of expertise include capital and risk management,
embedded value, mergers and acquisitions (M&A) valuations, strategic planning and

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bank insurance convergence. Sim's presentation will focus on the five stages of management usage of embedded value. Actually, it's going to really focus on three of those five, and these applications will vary from the very basic to the very advanced.

Finally, our third speaker is Mike Kaster. Mike is the managing director of actuarial practice areas for the SOA. Mike's main focus is advancing the actuarial profession in the marketplace and helping to develop new areas of application for actuarial skills. His work includes the development of SOA strategic initiatives that will further the skills of actuaries and enhance the profession's future. Mike will discuss a specific case of a company's use of embedded value, including the variance across products, how to use embedded value for determining product mix and internal challenges to the use of embedded value.

With that, our first speaker is Nancy Bennett.

MS. NANCY E. BENNETT: Thank you for the opportunity to speak with you today. I have to admit I'm a bit overwhelmed here by the response to this topic today, but I think that's encouraging because there is a lot of interest in embedded value, and it seems to be growing.

Before I start though, I would like to ask just a general question of the audience. How many people have experience with embedded value or at least some familiarity with it? Okay, that's pretty good. A lot of you have direct experience. When this session was put together by the Society, it was listed for those with little to no experience or no to moderate experience, and in deference to the Society, we did put some basic information in there. But I think given how much experience is in the audience, I'm going to cover some of the basics pretty quickly. I won't cover everything and probably won't cover every slide, but if there's anything that you want to go back and touch on, we can certainly do that.

My piece of the presentation, as Brian mentioned, is to cover the basics of embedded value, in particular embedded value as a financial reporting tool. In my presentation today I'm going to briefly cover some of the factors that have been influencing this increased use of embedded value within the insurance industry. I'll cover the basic embedded value fundamentals and then move quickly into the financial reporting aspect of embedded value.

In the last couple of years in the United States, embedded value has been gaining a lot of popularity. There are certainly many factors that have influenced this positive momentum toward the increased interest and the use of embedded value. For example, in the last couple of years almost all of the major Canadian insurance companies implemented and started reporting embedded value to the analyst community. This actually followed their sister companies over in Europe and the U.K.

I think part of the reason for this is that we're all familiar with the increased sophistication of the products and the fact that the risk profile of insurance companies' balance sheets continues to shift. Demand seems to be increasing for people to be able to evaluate the financial results of insurance companies based more on the underlying economic fundamentals. People are tired of trying to wade through some of the accounting rules and some of the weird things that can happen with the accounting, so there's a lot of interest in getting at the underlying economic fundamentals. In tandem with that, and we'll see more of this, shareholders are becoming louder about their concerns with management compensation, and they want to make sure that the management compensation packages are aligned with shareholder interest.

On another note, also influencing the use of embedded value are the developments in international accounting. Within the international accounting community, there is a lot of interest in developing an international accounting standard that can be used across all financial institutions and industries. Although this is a long way from being final and there's certainly a lot of discussion on it, the International Accounting Standards Board, which is one of the key drivers in this development, is leaning toward an international accounting standard based on what they're calling fair value, which is really an interpretation or really conceptually quite similar to embedded value.

On the flip side, some forces also have been holding back embedded value from being accepted across the industry on a widespread basis, and I think you'll probably find most of the resistance within the United States. Clearly, within the United States almost all of us are required to do U.S. GAAP and U.S. stat. Embedded value becomes a third reporting standard for many companies, and if they're also part of a multinational insurer, there can be even more standards beyond that. So there is some resistance by U.S. company management, partly because the stock analysts in the United States have not really embraced embedded value.
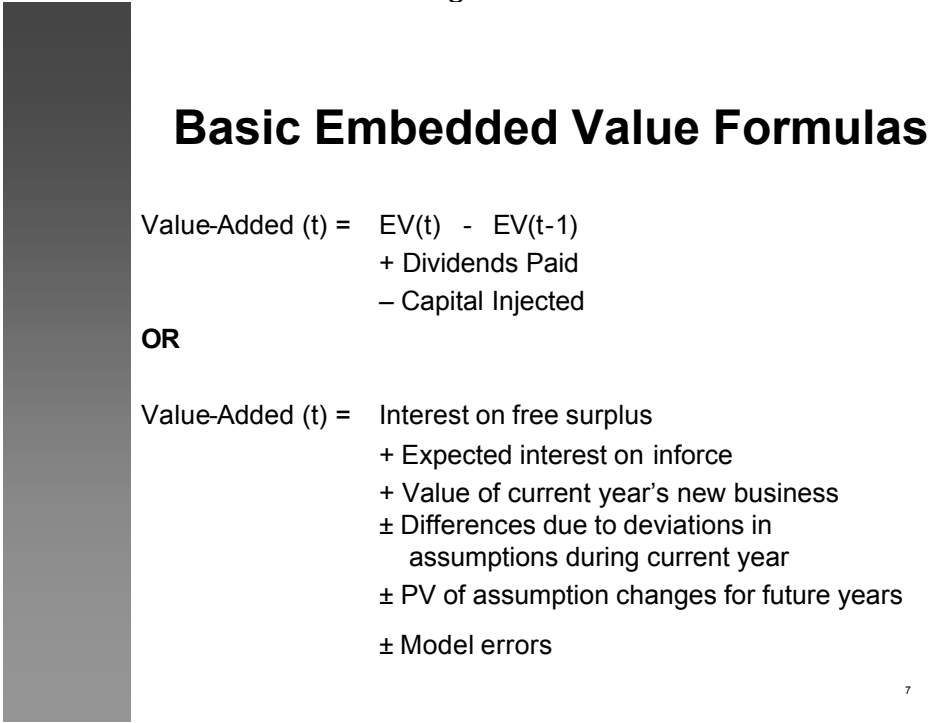
Just to get everybody on the same page here, let's start with some basics. Quite simply, embedded value of a company is equal to the present value of earnings that can be distributed to shareholders, plus the market value of the free surplus. The earnings that can be distributed to shareholders are based on statutory requirements. Earnings can be distributed to shareholders if first; the company has retained sufficient earnings to cover the capital requirements. Anything above that can be distributed to shareholders. On a period-by-period basis then, the embedded value added—or in the U.K. it's called achieved profits—is actually equal to that change in embedded value over time.

You can tell from this definition that the focus of the embedded value is a measure of the creation or the destruction of shareholder value. I guess to put some actuarial jargon in here, embedded value is based on the actuarial appraisal methodology or what's also called the indirect method in the actuarial literature. It's

based on statutory accounting and statutory earnings. It's a little different in that the calculation explicitly reflects the company's cost of capital and retained earnings.

I'll just give you two formulas just to prove I am an actuary here (Figure 1). The first formula is the basic value added formula. The value that is added to a company in any given year is the difference between the embedded value from the beginning to the end of the period, plus any dividends that have been paid upstream, minus any capital that has already been injected by another entity. The second formula is really just an expansion of the basic formula and illustrates the sources of earnings to embedded value.

Figure 1

Basic Embedded Value Formulas

Value-Added (t) =   EV(t) - EV(t-1)

                       + Dividends Paid

                       – Capital Injected

OR

Value-Added (t) =   Interest on free surplus

                       + Expected interest on inforce

                       + Value of current year's new business

                       ± Differences due to deviations in
                           assumptions during current year

                       ± PV of assumption changes for future years

                       ± Model errors

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The next two tables provide a template or a sample of how some companies report embedded value. Figure 2 shows how the basic embedded value is reported and then Figure 3 shows how a company reports how embedded value has changed from one period to the next. It's called the movement analysis, or sometimes it's called the variance analysis, but you can see that this basically shows what caused the change in embedded value from the beginning to the end of the period.

Figure 2

Embedded Value -- SAMPLE TEMPLATE				
No.	**Item**				
	Income Before Adjustments	**Units**			
1	Pre-tax core income	$US 000's			
2	After-tax core income	$US 000's			
				At Q42000	
	Locked-in Capital (LIC)				
3	200% RBC	$US 000's			
4	- Asset valuation reserve	$US 000's			
5	- Dividend liability	$US 000's			
6	= Locked-in capital	$US 000's			
7	After-tax surplus yield	%			
			PV at Q42000 (at Hurdle Rate - 1%)	**PV at Q42000 (at Hurdle Rate)**	**PV at Q42000 (at Hurdle Rate + 1%)**
	Shareholder Distributions				
8	After-tax core income (vector from above)	$US 000's			
9	+ After-tax investment income on LIC	$US 000's			
10	- Cost of surplus note	$US 000's			
11	- Truly corporate expenses	$US 000's			
12	- Change in required shareholder equity	$US 000's			
13	= Shareholder distributions	$US 000's			
				At Q42000	
14	Free surplus	$US 000's			
				At Q42000	
	Control Information				
15	Policy count	No. of policies			
16	Face amount	$US 000's			

Figure 3

Embedded Value Movement Analysis – SAMPLE	
No. **Item**	
1 EV at Q3 2000	
2 Impact of errors discovered	
3 Impact of modelling changes	
4 EV at Q3 2000 - Restated	
Effect of Non-Economic Assumption Changes at Q3 2000	
5 Mortality	
6 Morbidity	
7 Expenses	
8 Withdrawals	
9 Roll-over rates	
10 Asset mix, asset prepayment, etc.	
11 Other (specified in notes below)	
12 Effect of non-economic assumption changes	
13 EV at Q3 2000 - Restated w/ new assumptions	
14 Effect of moving forward	
15 EV at Q4 2000 - Projected	
16 Expected Shareholder Distribution	
17 Effect of new business production	
Effect of Deviation in Non-Economic Assumptions	
18 Mortality	
19 Morbidity	
20 Expenses	
21 Withdrawals	
22 Roll-over rates	
23 Asset mix, asset prepayment, etc.	
24 Other (specified in notes below)	
25 Effect of deviation in non-economic assumptions	
Effect of Economic Assumption Changes at Q4 2000	
26 Risk free rates	
27 Change in spreads, other	
28 Hurdle rate	
29 Other (specified in notes below)	
30 Effect of economic assumption changes	

Effect of Deviation in Economic Assumptions	
31 Risk free rates	
32 Change in spreads, other	
33 Exchange rate	
34 Other (specified in notes below)	
35 Effect of deviation in economic assumptions	
36 Effect of changes in tax rules or legislation	
Untraced	
37 EV at Q4 2000	
38 Actual Shareholder Distribution	
39 = Untraced	
40 Management value add	
41 Operating profits	
42 Achieved profits	
43 Other (specified in notes below)	
44 Achieved profits, including "Other"	

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As you can tell from all this, embedded value is a prospective projection of financial results. As such, the choice of certain assumptions is key and has a big bearing on embedded value. For just a moment, I'm going to touch on some of the major assumptions that influence embedded value. Because it is a projection of a company's cash flows—asset and liability cash flows, obviously—there are many, many assumptions involved in calculating embedded value. In many respects, embedded value is just a natural extension of cash flow testing or other projection work. One of the things that may be different is that a key component in calculating embedded value is distributable earnings. This is based on realistic assumptions, and there is no explicit provision or margin for deviation in those assumptions, unlike what you might find in other projections work.

The cost of capital or the required capital is explicitly modeled in determining the distributed earnings. In the work I've done, it's typically expressed as some percentage of a published risk-based capital formula, such as a percentage of the NAIC's risk-based capital formula. I've worked with a company from the U.K. that based it on the Best's Capital Adequacy Ratio (BCAR). I have seen one company

that uses a proprietary formula, but most of the time I've seen the required capital calculated on a published or standardized formula.

Then, of course, the big calculation is the present value of those distributable earnings. The present value of distributable earnings gives rise to a lot of questions about the discount rate. For the embedded value that is reported today by most companies and in most countries, the present value is based on a deterministic discount rate. Although there's certainly a lot of rationale and logic to calculating the present value of distributable earnings using a stochastic process, at least the companies that I've seen that report externally just use a deterministic discount rate. Theoretically, this rate can vary by product line, but in my experience, most of the time the discount rate is the same for every product line.

As I said, embedded value really can be calculated from your cash flow testing models, and you're going to hear more about implementation in a little bit. But before we move off of the subject of setting assumptions and maintaining assumptions for embedded value, I just wanted to make a couple of comments that may be helpful if you're considering this or are in the middle of implementing it. Some of these comments or suggestions I would give you if you were doing any kind of modeling work, but some of them take on a lot of importance when you're doing embedded value.

Of course, it's always important to document your basis for making assumptions. That is especially important in embedded value because you will be updating these assumptions over time. You want to have a clear idea of when you're going to make changes to those assumptions and who's going to make them—whether the changes will be made by the product areas, the corporate areas or whomever.

Also, I think it's especially important that you understand how the assumptions vary relative to other financial modeling applications. I always preach the use of consistent assumptions in all financial applications, unless you can come up with a good reason not to. I think consistent assumptions are very important. For embedded value, the one I think may surprise you is that you may run into some problems if you use different assumptions that have been used in pricing products versus your in-force products that are probably modeled in your cash-flow testing system. The reason you may run into this consistency headlong is that with embedded value you will be reporting the embedded value created on your in-force business and also your new business. To extent the folks who are calculating embedded value are using assumptions that are different than pricing, you'll end up at a minimum having some pretty interesting discussions about who's using the right assumptions. So, it's good to get that set upfront.

If you're looking to do embedded value, you may wonder if there are any standards of practice. Or if you wonder how you've done it compared to other people, you may wonder if there are a lot of standards of practice. I guess the short answer is no. There aren't a lot of published sources. It's basically developed

from a lot of standard projection practices. I can alert you to three sources that I've listed here (Figure 4). You can look at the Actuarial Standard of Practice 19 on appraisals. The Canadian Institute of Actuaries has published a draft standard on calculating embedded value. And the Association of British Insurers has also published a paper that includes standards for reporting achieved profits, and those are listed there.

Figure 4

Standards of Practice

- Not many published sources
- Developed from typical practices for appraising business and other projections
  – ASOP 19
- Canadian draft standard (CIA)
  – www.actuaries.ca/structure/psc/rava/
    embedded_value-e.pdf
- ABI paper on standards for publishing EV
  – http://www.abi.org.uk/Display/File/88/APM-
    DECEMBER_2001_-_FINAL_VERSION.DOC

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I strongly believe that embedded value is a very valuable tool for helping a company decide what strategic directions it wants to take—how it should be allocating capital and other resources. But you will find that the financial reporting aspect of embedded value will probably be the first and most visible application of embedded value. Once you get comfortable with reporting embedded value, you can move into some of the fun stuff that goes along with embedded value. But given the importance of financial reporting, it's essential that we understand how the financial results are reported in embedded value and, in particular, how those achieved profits or economic value added (EVA) numbers compare to the reported results in other accounting systems.

I'm sure that everybody is probably painfully familiar with U.S. stat and U.S. GAAP requirements. The problems with U.S. stat and GAAP are well-known and documented, and we could probably spend a lot of time talking about that. But I think many of the criticisms of these two accounting systems stem from the users and the purposes of those financial statements. One of the reasons that embedded value came into existence, in many respects, was to respond to some of these criticisms. Though it wasn't developed directly in the United States, the embedded

value reporting system is intended to measure how decisions affect shareholder value. In fact, embedded value is intended to measure economic profits.

So we're really dealing now with three different accounting systems. I don't want to go too far afield here, but I did think it would be useful if I touched on the developments with international accounting regarding recommendations dealing with fair value. As I mentioned before, the issue of fair value is fairly contested right now, and there are a lot of different, fairly strong opinions on both sides as to where international accounting is going to go and, in particular, how that's going to influence reporting within the United States. But the International Accounting Standards Board (IASB) is one of the big forces that are looking to develop a different accounting standard. The purpose of this new accounting standard is to develop a reporting system that can be used for all readers of the financial statements, whether you're a regulator, a shareholder or management.

The IASB has started to go down a pretty solid path of wanting to use market value as their basis for reporting the value of a company. As all of us within the insurance industry know, there isn't always an observed market value, so they are developing what they're calling fair value as the proxy to market value. The IASB has looked at the different ways of calculating fair value. It's not hard to get market value of assets, but the problem, of course, is on the liability side. They've examined both this indirect and the direct method of calculating the value of a company, and they have landed on an approach that calculates fair value using this direct methodology. I'll get into that in a little bit more. One of the reasons they did that is they are fairly convinced that the direct and indirect methods can be equated with the proper choice of assumptions. So what this all means is that the IASB is recommending an approach to use fair value as a proxy to market value that is really a derivation of embedded value, or really a first-cousin.

If I provide a brief background on the IASB developments, I think you will see that the search for an international standard has put even more emphasis on and interest in the embedded value concept. As I said before, this fair value proxy is not quite defined yet. There are still some very important technical issues that are being worked out, but at least the concept of fair value seems to be what is being pushed from the IASB's concept. Fair value would be market value, and where that is not available, they're developing something called entity-specific value. I think it would be similar to what we consider fair value of liabilities or the present value of the liabilities cash flows.

With respect to the fair value, one approach would be used for all insurance contracts, again, based on market value. This would be a direct calculation. In other words, the company would calculate the market value of the assets and the market value of the liabilities. The difference between the two then would give you the value of the company. So that is contrasted to the embedded value approach, which is the present value of just the remaining distributable earnings. The IASB has

taken embedded value one step further, in that the stochastic processes will be a part of valuing the fair value of the liabilities.

Now, there are a lot of strong opinions on IASB and whether or not it will go forward. Clearly, the United States will have a big influence on that. I'm not here to predict the resolution of this issue, but clearly, the fair value movement has seen a lot of activity in the last few years. With the increased market share of multinational insurers, I think it's really important that the actuarial community at least has a basic understanding of this issue because I think it obviously has a direct bearing on our work.

I thought that it would be useful to compare and contrast how earnings can be reported differently, depending on the accounting system. I want to talk about how the timing of profits can change. The timing of profits is going to depend on six key rules that are really no different than those for dealing with statutory and GAAP earnings. I'll just briefly cover them.

One is the type of insurance. As I mentioned, the International Accounting Standard is not looking to have a standard that varies by insurance contract. They don't care if it's short-duration, long-duration, investment or an insurance contract— one standard for all. Some of the accounting requirements, of course, tell you how to calculate benefit reserves. They tell you how to recognize expenses. Once you get the product issues, they tell you how you have to recognize the expense, whether it's upfront. Once you've done that, then they tell you the only thing you do know with insurance is that you're going to be wrong at issue. So, how do you recognize changes in experience over time? Do you just ignore it? Are you locked in at issue, or do you take an immediate hit when the experience changes?

The bottom line when you're looking at the timing of profits is that the rules do determine how the profits will emerge, the timing and the instance of those earnings. What you'll find is that with embedded value or embedded value added it will be more volatile than either statutory or GAAP. I'm sure there are probably some examples where that wouldn't be the case. But I think the primary reason for that is it makes sense because embedded value is not hampered with any of the rules of GAAP that say revenue and expenses have to be matched. There aren't any rules that say when you can or can't recognize changes in experience. So, bottom line, you're going to have much more volatile earnings with embedded value.

I guess to some extent, that's probably not that surprising because you're dealing with insurance cash flows. We all know that insurance cash flows are uncertain. We really don't know what they're going to be. And this very uncertainty is what creates the challenges in preparing and understanding the financial results, regardless of the reporting system, and embedded value is no exception. There are certainly a number of critics who can talk about embedded value and its limitations. But first and foremost, embedded value is a system that focuses on the creation or

destruction of shareholder value. It really isn't concerned with anything else—policyholder value, how company actions affect employees or the communities, other stakeholders in the enterprise. It is solely focused on how actions increase or decrease shareholder value. It takes a long-term view. It's not so concerned with short-term, monthly or quarterly changes in earnings.

Despite its many limitations I do believe—and I think you'll see this demonstrated later—embedded value is a very powerful financial management tool, and it can provide a company with a lot of good information to help manage the company. Embedded value can provide companies with information that they probably can't get from any of the other financial systems that they may be trying to use. If embedded value is institutionalized completely, it can be a very effective system for not only reporting and understanding period-to-period financial results, but also to allocate capital to new ventures and to help direct the activities and resources within the company with a singular focus on increasing shareholder value. With that, I'll turn it over to Sim, so he can talk about some of the management applications.

MR. SIMCHA A. SEGAL: I'm pleased to be able to share with you today some of our thinking on embedded value in the context of the larger framework, effective value-based management. The title of the presentation is "Climbing the Ladder to Effective Value-Based Management." We're going to start by discussing selecting the appropriate measure or measures and the different uses for which it's appropriate. Then we're going to move onto the five sequential steps that are critical to getting the most lift out of a value-based management approach, but we only have time for three of those today. Then, I'll touch on some implementation issues because Mike is going to follow with some deep dive and some great discussion on implementation. Finally, I will summarize with keys to success.

There are many measures in value-based management—fair value, embedded value, shareholder value, appraisal value and market value, for example. The only thing that's certain is value. You obviously have to have that if you're managing for value, but which ones and for what purposes? So let's take a look at two that you may be familiar with.

You're familiar with the definition of embedded value, and Nancy did a great job of going over the definitions. These are very similar. In Figure 5, the embedded value on the right equals the value of the surplus, plus the value of the in-force business. Both of those, you'll notice, are distributable. You only give value from distributable. These assumptions are that when something is distributable, it is distributed. So if you have distributable surplus, which is the excess of total surplus over that which is required, or target, surplus, then you distribute it. You don't have it as fallow capital existing as a drag. You just pay it out when it's distributable. In this presentation you have target surpluses, which I think more appropriately belong along with the value of the in force and that, then, is the discounted value of distributable earnings from the in-force business. So that's the embedded value.

Figure 5
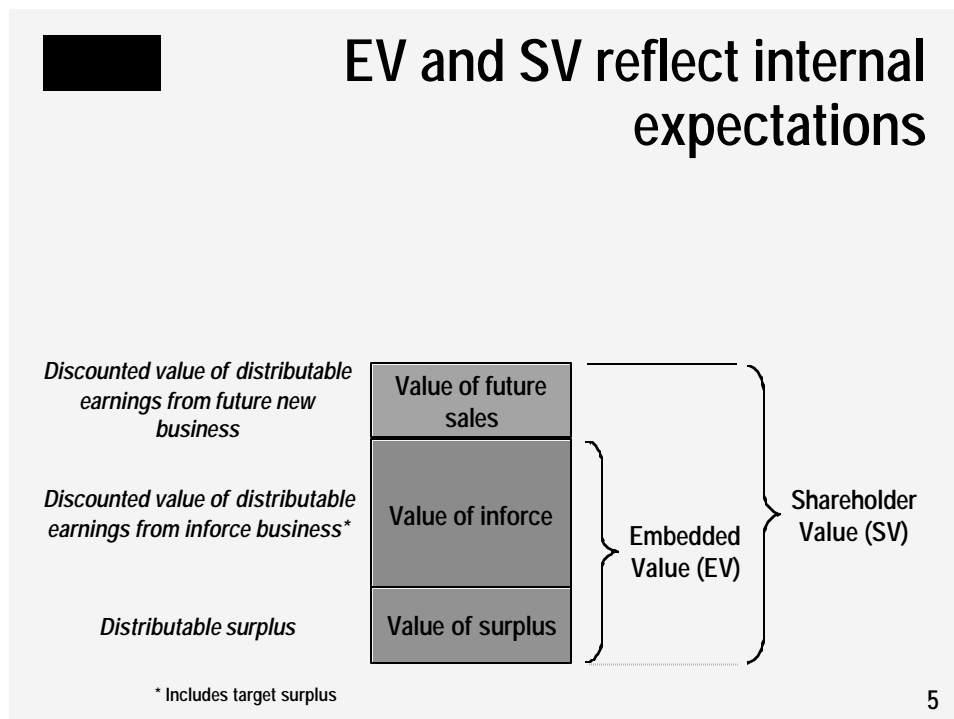
When you add the value of future new business and this discounted value of the distributable earnings from the future new business, you get shareholder value. Now, as it's defined here, some of you may be saying, "Wait a minute, that's appraisal value." This is a bit of a different definition. There's a subtlety that I want to bring out. Shareholder value, as we're using it here, is an internal calculation. It's not an appraisal value that an acquiring company would pay for a business based on market supply and demand, and it's not a calculation of the internal company of what it can sell this for, given the market prices. It's just an internal best estimate of what your management thinks inside the company that actual shareholder value is as a going concern.

Why do you need shareholder value? You have market value; what do you need it for? What one thing does a disreputable stock trader want? They want inside information. They can get inside your company and look at what your managers have, get access to that information. That gives them a much more accurate picture of what the true stock price is and what the market value should approach, over time. Then they can arbitrage the stock price.
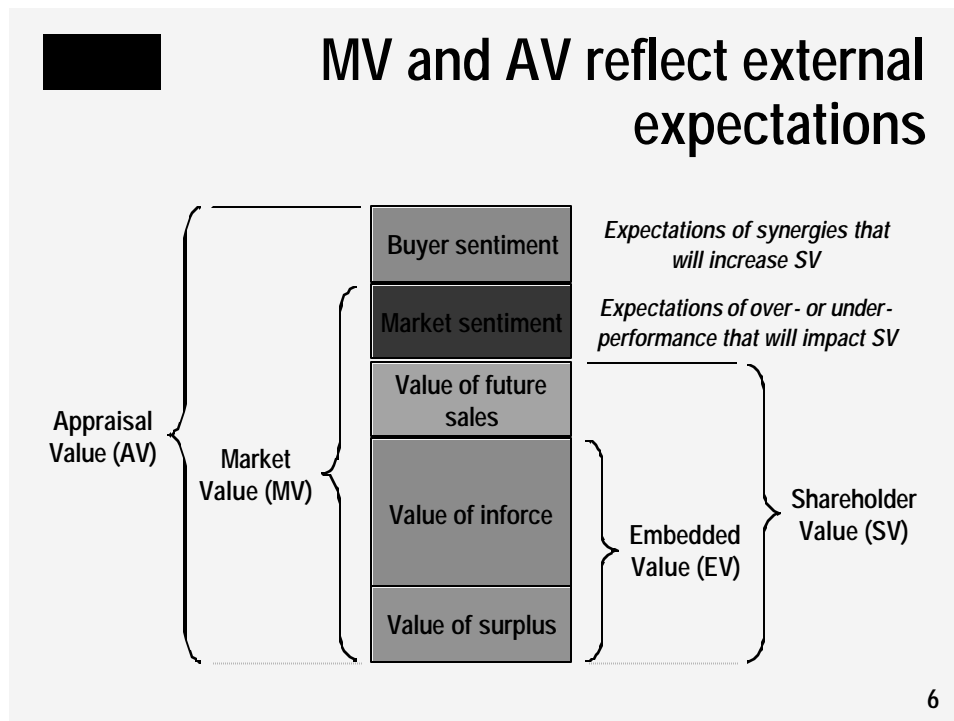
But there's a problem with that. There's management bias in the information you have. Why could somebody come into your company and get that inside information and then use it when they don't have any biases? Often there are biases when you're involving new business projections due to the nature of the

planning process, incentives or the political environment. You don't necessarily get the most credible new business projections. You often get that hockey stick where growth is low, and it's going to take off in the next few years. So the key is to fix it by applying a very disciplined, rigorous process of setting and changing assumptions.

Some top 10 insurer is actually using a credibility-based measure and showing that to the CEO. Because you have a credibility measure, it incents you. If you have credibility measures, it shows your accuracy in projections. If you can instill an incentive for your managers to project accurately—not base comp on over- or underperformance, but also have a measure in there for accuracy—now, you have something. Now, you really have the most accurate potential value for shareholders.

So now let's look at some external measures and the differences (Figure 6). The market value on the left there, is the shareholder value, plus the market sentiment. Now, this is expectation of over- or underperformance. The second block from the top can be plus or minus, and it's often based on transient volatility due to imperfections in the market, inefficiencies. We all know that markets aren't perfect. There is imperfect flow of information. There's better information inside the company than the market actually has, and there are also emotions. Obviously, you have fear. The emotions in the market are adding some volatility. The argument is that over time, the market value and the shareholder value, if calculated correctly with a very credible new business assumption, asymptotically approach each other—where the market value has more volatility, shareholder value has less volatility. If you can establish a way of calculating shareholder value accurately and demonstrating that over time, you can, eventually, influence stock analysts. You will drive the market value toward where the shareholder needs to be because currently, perhaps, you're undervalued.

Figure 6

MV and AV reflect external expectations

Buyer sentiment	*Expectations of synergies that will increase SV*
Market sentiment	*Expectations of over- or under-performance that will impact SV*
Value of future sales	
Value of inforce	
Value of surplus	

Appraisal Value (AV)

Market Value (MV)

Embedded Value (EV)

Shareholder Value (SV)

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The appraisal value is generally higher than market value due to buyer sentiment and sometimes buyer fantasy because most studies show that most acquisitions destroy shareholder value. There have been a lot of studies on this, and I always find them interesting as to what drives it. There are some synergies that are valid—some for the natural monopolies in certain areas or certain entity-specific characteristics that will drive up the value, but by and large, the synergies are not realized and that ends up destroying shareholder value.

As you go up this chain, you increase uncertainty (Figure 7). The value of the distributable surplus (that's your excess or your free surplus) can be distributed right now. That's very certain. You just take it. When you move up to the value of the in force, you know what you have on your books now, but the performance of that in the future—and then, of course, discounted—is uncertain. As you go to the value of the future new business, you don't know exactly how much you will sell in each future year, and then you don't know how each of those new business cohorts will perform and then discount. That's even more uncertainty. Market sentiment, because of the imperfections, has more volatility and, of course, buyer sentiment is the most speculative.

Figure 7
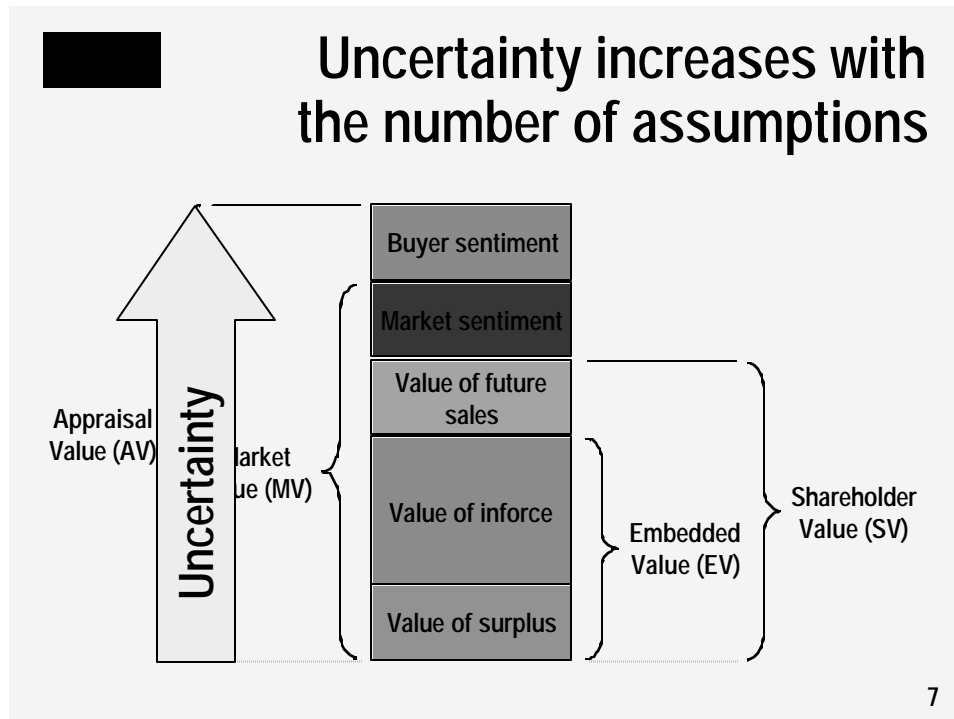
So with all of that, embedded value often is the preferred internal measure used by management. It's more appropriate than appraisal value because it's for a different perspective. You're not purchasing or selling the company in this example. It is less volatile than market value, as we've discussed. It's more certain than shareholder value because it does not include new business assumptions, and it's highly correlated to shareholder value. It depends on your mix of business in terms of long-term versus short-term, but it can be about 90 percent of the total shareholder value.

But you need shareholder value when you're making any decision that involves new business projections. Here are some obvious examples: pricing, underwriting, marketing campaigns and distribution strategies. Shareholder value is a nice blend because, like fair value or the attempt at fair value, it includes the entire company. You're not leaving out new business, which is an important part of your company. But it doesn't have all the market volatility that fair value has, which is often the toughest part of what the IASB is trying to do. So that's the discussion of the different measures.

Let's now talk about five steps that you need for effective value-based management. Based on our global experience in this industry and analysis of best practices, we've identified that it's critical to have these five steps in sequential order. They can overlap a little bit, but when companies jump around, they miss opportunities to get the lift. The first one's internal reporting, and Nancy talked a lot about that. There are basically three reports you get: the embedded value calculation, pushed as low into the organization as you want; the analysis of variance or analysis of movements, as it's called overseas; and sensitivity analyses, saying that if you drive your lapse, expense or mortality down 10 percent, you get a three, four, or five percent lift to your embedded value.

That's really more of a back-window approach. It's really nice. It's important. You gain, over a couple of years, a good, fundamental understanding of value and potential drivers of value based on your decisions now. But there are other tools that help you do that a little bit better. Management decision making is the second step. Moving up the chain, you come to executive decision making. The fourth step is incentive compensation. The fifth step is external reporting.

Some companies jump from step one, internal reporting, right up to incentive comp. When I talk to management at these companies, they say, "We make decisions based on what we think embedded value will do and what we think we'll get paid for, but we're not sure. It's calculated annually; it's a black box; I have this smaller line of business in a different mix; and I'm not sure how the sensitivities and drivers will play out." And that's a little scary because that's missing the management decision making and executive decision making steps, really helping your management and executives understand what will happen, how it works, because it's difficult. It takes time. One of the criticisms of embedded value is that it has a steep learning curve, and it does. It takes a few years for the knowledge to seep into the company.

Some companies jump from step one all the way to step five, surprisingly. They jump from internal reporting to external reporting. For example, a lot of companies in Australia do that. They jump right to external reporting. The stock analysts require it, so they report it. You find that most insurance companies in Australia are owned by banks, and bankers just don't get this measure, so they don't really use it. It's not embedded in the organization in any way, and they miss a lot of that lift in the stock price that you get by approaching this process sequentially. There could be some overlap, but you have to go in order.

I will focus on these three steps: management decision making, executive decision making and incentive comp. Management decision making—value measures are used for strategic decisioning—the emphasis of product portfolio mix, the emphasis of distribution channel, choice of market, and really understanding the fundamental economics of different value propositions. This is possible because, as Nancy touched on, you're not locked in like GAAP and stat into rules. You can construct
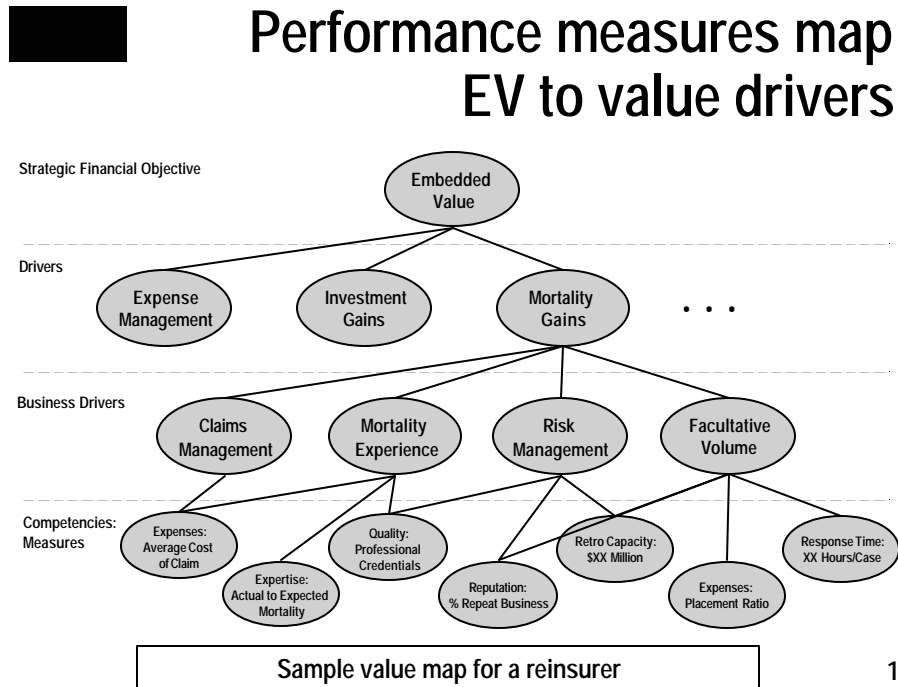
and slice and dice embedded value any way you see fit, any way you want to look at your organization. These are some of the advantages.

It's also used for tactical or transactional decisioning. I've got some examples, all of your major drivers: enhancing your yield, underwriting changes, expense initiatives and retention campaigns. Companies that do this push the embedded value calculation all the way down to the policy level, and then they analyze going forward which of these policies offers the most profit, the most contribution to the stock price and which products they should focus their retention programs on.

Similarly, for cross-selling, it's done down to a policy level, looking at what happens to the stock price. What change in the stock price do you get when you cross-sell one type of product to a customer who already owns the same type of product, for example? So if you sell whole life and second whole life, what are the impacts? Retention may go up a little bit because of multiple relationships with the company, but maybe fewer dollars are pumped into the policy. There are different impacts, and you really have to do the calculation because all the interactions and the dynamics are very complex. There are some pricing decisions, obviously. If you have limited resources and have to choose what to do—should I allocate my resources and try to reduce expenses, or should I improve my mortality studies and improve my underwriting—you can do the calculation to see what the choices should be and see the best impact to the stock price. So you can make choices among, in between, and within these categories. It's also used for identifying problems. One company had a problem with its underwriting that didn't really show up much in the earnings. When they took a look at embedded value—and this helps if you calculate it frequently—there was a big hit. It was about $40 million for the company. It was large, and they took some quick action.

Now, let's talk about creating a performance measures map. This is an example for a reinsurance company (Figure 8). This is important to do because, aside from all the decision makers, everybody in the organization can get value out of a value map because it helps everybody on the staff to understand how they contribute. If I'm in this area, what do I need to do to impact embedded value? I'm important, too. So it motivates everybody. Here, you have classic embedded value driven down to the major drivers. Beneath that mortality gains are split out. And you drive all the way to the drivers and subdrivers, down to the competencies and the measures that you need. That's helpful for motivation. People understand how they connect. It's a basic, easy way to understand everybody's connection to embedded value.
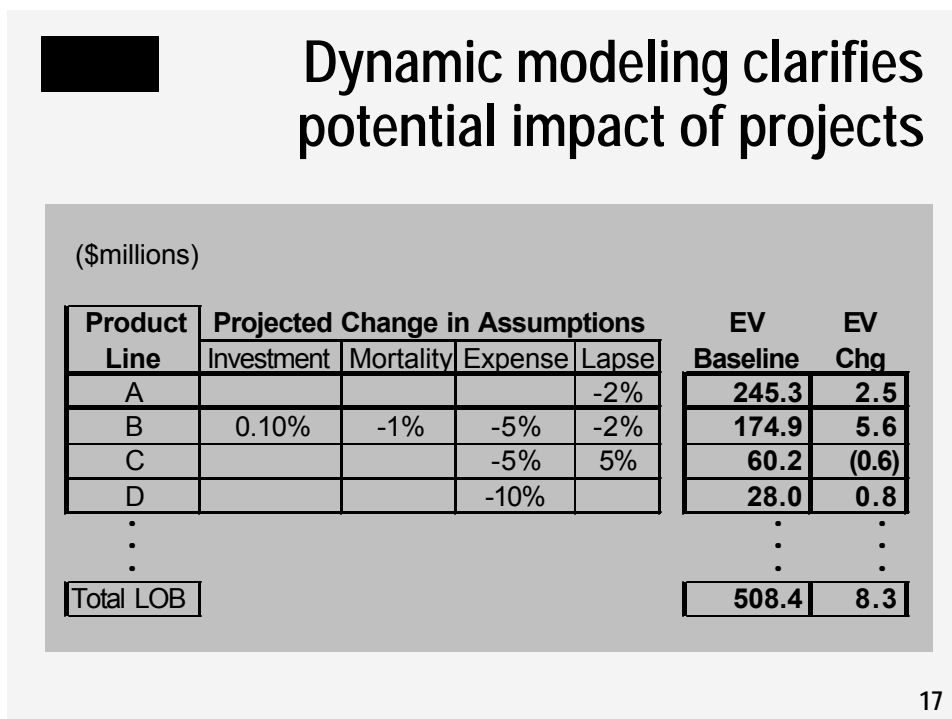
Figure 8

Performance measures map
EV to value drivers

Strategic Financial Objective

Embedded Value

Drivers

Expense Management

Investment Gains

Mortality Gains

. . .

Business Drivers

Claims Management

Mortality Experience

Risk Management

Facultative Volume

Competencies: Measures

Expenses: Average Cost of Claim

Expertise: Actual to Expected Mortality

Quality: Professional Credentials

Reputation: % Repeat Business

Retro Capacity: $XX Million

Expenses: Placement Ratio

Response Time: XX Hours/Case

Sample value map for a reinsurer

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What's best? The best practices are providing a dynamic model, and this model is kind of exciting (Figure 9). Down on the left-hand side are product lines A, B, C and D adding up to the total line of business. Across the horizontal are investment, mortality, expense and lapse. If you have some projects and say, "I can reduce the lapses two percent if I do this project. Or for product line B, maybe I have multiple things I could do at the same time." If you just try to base these decisions on your sensitivity analysis, your analysis of movements, which may be calculated at higher levels, the mix of business is a little bit different. You can't be sure of it. You can get quite different answers. When you run this, you get some surprising results and say, "Gee, I thought it would go the other way."

Figure 9

Dynamic modeling clarifies potential impact of projects

($millions)

Product Line	Projected Change in Assumptions				EV Baseline	EV Chg
	Investment	Mortality	Expense	Lapse		
A				-2%	245.3	2.5
B	0.10%	-1%	-5%	-2%	174.9	5.6
C			-5%	5%	60.2	(0.6)
D			-10%		28.0	0.8
.					.	.
.					.	.
.					.	.
Total LOB					508.4	8.3

17

My rules of thumb of sensitivity told me the direction is even wrong, and it's just too complex.

Everything is in the embedded value. You just have to do the calculations and discount it back. There are too many dynamics to make decisions based on those more primitive tools. I shouldn't say they're primitive. Analysis of movements and analysis of variance and sensitivity can teach you a lot, but it's the first step. The second step is management decisioning. You have to move on. This is the best practice to dynamically model so that before management takes action, they know what they'll get. Now, all they have to do is execute.
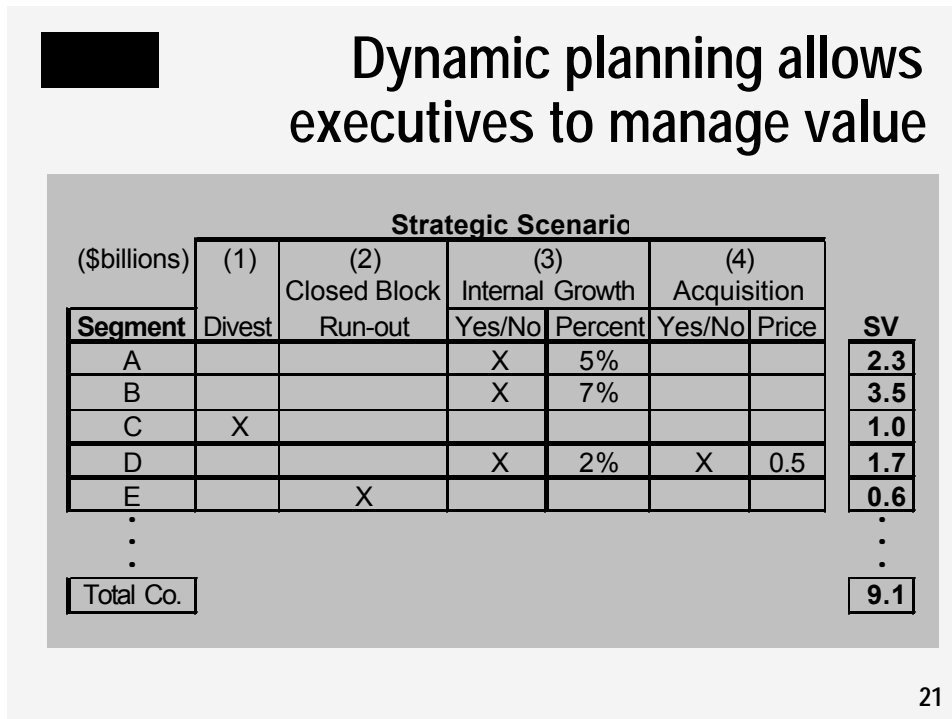
Let's move on quickly to executive decisioning. Strategic decisions employ value measures. The first two are strategic planning. Evaluating growth decisions, whether it's organic growth or acquisitions; market exit, whether it's running off a closed block or a divestiture; analyzing the profitability and dynamics of the value chains, seeing what you may want to outsource and looking at slices of the organization as an executive would look at it; and my favorite, which is arbitraging the stock price. If you have a very credible estimate of the true value of the stock price, and you know what the market value is, this will tell you when you should be issuing stock or when you should be buying back stock.

Let's take a look at the strategic planning process. Throughout you can use embedded value and shareholder value measures in terms of setting the goals. In fact, and this gets a little bit into external reporting, Pru U.K. publicly stated that their goal was to double embedded value in four years. It's a little risky. They had an idea of how they were going to do that. I'm not sure that they're still going to do that, but we'll see. So that's goal setting. Then, it's a matter of evaluating the strategies to see how best to achieve changes in shareholder value to achieve those goals.

Capital allocation, as Nancy mentioned, is critical. You have all the discounted distributable earnings. You have the cash flows and the capital flows all embedded in there, valued down to the one number. You have to use this for capital allocation. Of course, budgeting has to be tied in with all this. Lastly, if you don't measure performance using this, you're not going to make it real. You have to tie it in, and you have to tie it into measuring and then, of course, comp'ing.

In Figure 10, segments are shown on the left-hand side adding up to the total company. Across the top you have: strategies; divestiture and closed block run out; internally grow and at what percent; and/or an acquisition and at what price; and shareholder value, taking a look at your own calculation of what you think the stock price will do. This is pretty exciting because this can do something that executives have been seeking for a long time. It is a tool they can use to manage the value of the company themselves rather than in the strategic planning process, having everyone do a roll up of goals. "They don't really add up, but let's just do more, let's do better." This really vets the plan. You can see if it really makes sense. It turns the strategic planning process from an annual static exercise into a dynamic tool that executives can use to actually manage value.

Figure 10

Dynamic planning allows executives to manage value

($billions)	(1)	(2)	(3)		(4)		SV
		Closed Block	Internal Growth		Acquisition		
Segment	Divest	Run-out	Yes/No	Percent	Yes/No	Price	
A			X	5%			**2.3**
B			X	7%			**3.5**
C	X						**1.0**
D			X	2%	X	0.5	**1.7**
E		X					**0.6**
.							.
.							.
.							.
Total Co.							**9.1**

Strategic Scenario

21

Step four is incentive compensation. Traditional incentive comp plans are often flawed, and embedded value-based plans have several advantages over them. I'll just run through some of these. Embedded value plans versus earnings and a combination of ROE-based plans. Embedded value is more highly correlated with value creation. The next couple of slides will cover that difference in correlation. It rewards more in proportion to the contribution to value. Many comp plans have performance buckets. For example, two top executives are rated in the top tier, and their compensation and bonuses are pretty similar. But when you look at some examples, maybe one executive contributed three times as much value to the shareholder value, to the stock price, as the second executive. That's not fair. With embedded value, you can measure it and reward it to whatever extent you want in proportion to the value creation.

The third one is that it provides incentives to select the highest value-added project. It's often amusing. You find a lot of talk about value added, but you often find it around processes that don't include the value measure. I don't know how you identify the highest value-added project without a value measure. If you're using earnings and ROE and you focus in the short term, two different projects could have the exact same cash flow and capital streams in the short run, so they look almost indifferent. You're indifferent to the choice. But if you project out the full stream, you could have very different future values and, when discounted, your

value measure might show a very different impact to the stock price. So using a value-based measure comp plan, you can identify and incent selection of the best value-added project.

I'll just mention one of those on the right, embedded value plans versus stock option plans. If you have a stock option plan, you're in a large company, and you're an executive in a line of business, and you shoot the lights out one year, but you have your stock options and the rest of the lines of business didn't really perform that well, you don't get paid. Or, if everybody in the company shoots the lights out, but there are factors outside control of management—the sector, the industry, the economy is down—you don't get paid. But with embedded value you can push the calculation down as far as you want to go, down to a local manager. If you so choose, you can reward fully on that basis. You may want a mix. You want to blend. You don't want to pit everyone against each other. You want teamwork. But, to some extent, you can do that if you want to.

There's one other advantage worth mentioning. Embedded value plans discourage overaggressive pricing. As Nancy mentioned, the embedded value calculation is linked to the pricing assumptions. So if you're overaggressive with the pricing and have the assumptions and then the next year it doesn't happen that way and you changed the assumptions and models and embedded value gets lowered, then you don't get paid. So, it really encourages more accurate pricing.

Here's one example of how traditional comp plans can be misaligned because they don't really correlate very well sometimes with value (Figure 11). Across the horizontal, you have agent compensation, which is mostly linked with productivity, and then on the Y axis, you have change in shareholder value. This regression line is drawn through a set of illustrative points that pretty well fit, except for the lower right-hand corner and the upper left-hand corner, where you have these outliers.
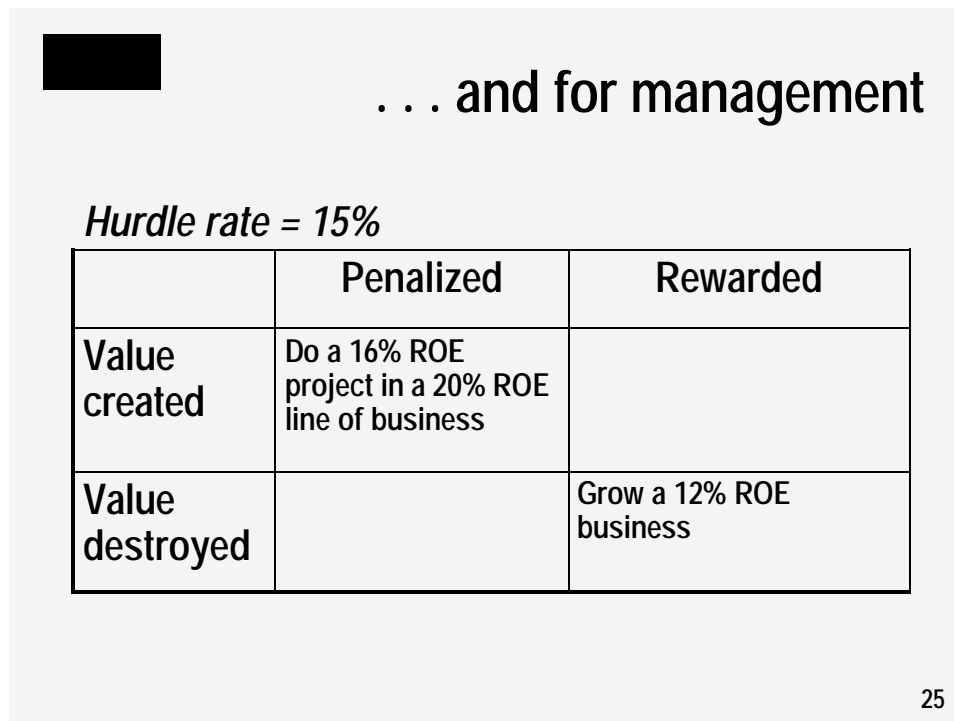
And, for example, the lower right-hand corner is agents who are being compensated very well, but they're really not increasing shareholder value all that much. It's due to the different mix in quality and business and how that plays out in the value calculation. You just don't see it until you calculate it. On the upper left are the agents who are not being compensated very well, but they're contributing quite a bit to shareholder value, based on the quality of their book. So when you change that over to a value-based compensation plan, you better align agents with the value of the company.

Figure 11

Compensation can be misaligned for agency . . .

Change in Shareholder Value (SV)

Agent Compensation

24
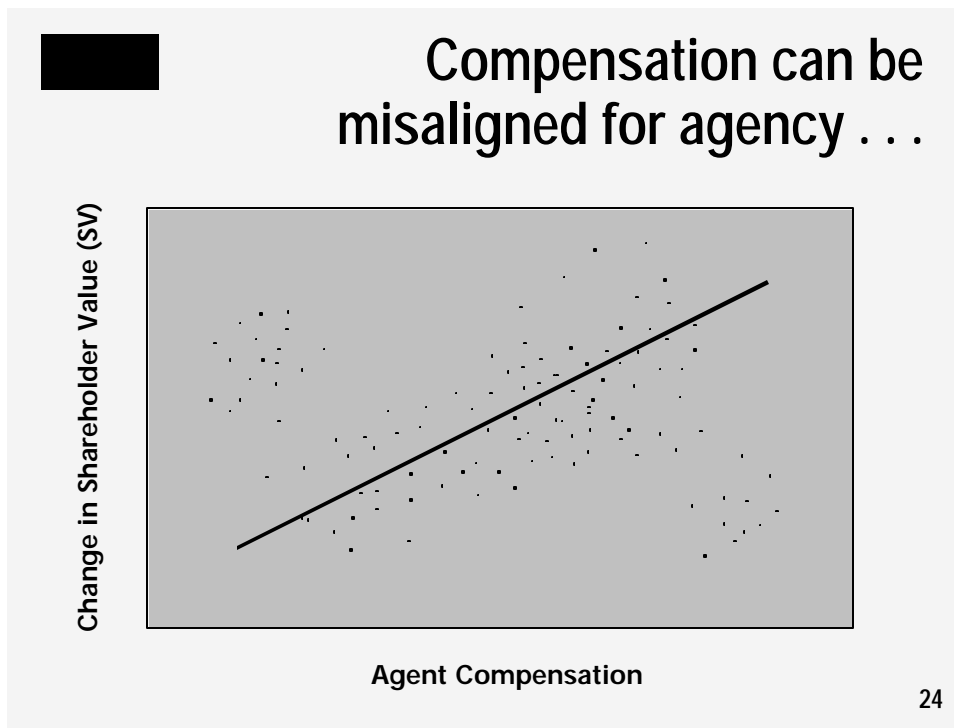
Here's an example for management (Figure 12). There are two disconnects. In this example, the hurdle rate is 15 percent, and assume that any ROE over that will increase shareholder value. In the upper-left quadrant you have a manager who is penalized for creating value. When a manager is in a 20 percent ROE line of business and selects a 16 percent ROE project, which adds value to the stock price, it's over the hurdle rate, but it lowers the weighted average ROE of that line of business. The way their formula worked in this case, with the earnings and ROE combination, these managers were paid less comp. That's not aligned. Similarly, in the lower right-hand corner, if you grow a 12 percent ROE business in proportion—12 percent is less than 15 percent—you're destroying value very year. Well, congratulations. You just scaled it up. Now you're destroying more value every year, and many plans would reward this type of behavior.

Figure 12

. . . and for management

Hurdle rate = 15%

	Penalized	Rewarded
Value created	Do a 16% ROE project in a 20% ROE line of business	
Value destroyed		Grow a 12% ROE business

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I just want to touch quickly on implementation, management and executive decisioning. Measuring with shareholder when it's appropriate, projecting multiple scenarios. One of the criticisms of embedded value is that it's just deterministic, so the more assumptions you can run the better. Obviously, if you provide a dynamic, robust model, then you have a large number of assumptions quickly at the hands of managers and executives who can make good decisions. Enabling a line of sight through a performance map will connect everybody in the organization to understanding their contribution to value. Lastly, providing training and education is important. One of the qualms with embedded value is that it has a very steep learning curve. You cannot train and communicate enough. You have to keep at it, repeat it for a number of years, until it really seeps in because it's a difficult concept.

For executive comp don't use this as a sole measure or, if you do, you have to have a rigorous process. There's a story about a company that was being acquired and the acquiring company had a plan where the sole measure was value. There wasn't really a great eye on other measures, and they gamed it, got paid very well, left and afterward, the acquiring company figured out what went wrong. Secondly, you have got to provide tools to project the impact. Again, you have to give people the ability. You have to take those steps. The second and third steps are critical before you comp on it or externally report it. You have to give people the tools to measure and understand what they're doing to value and to their own pocket. When that's aligned with value everybody can win.

And I'd like to add just a minor point. Separately, you have to adjust for model enhancements. Especially in their first few years, you will perfect your model and make changes that are just model enhancements versus actual management changes to the assumptions that they should be rewarded on. You have to separate those and change the number of shares in such a way that it doesn't really affect the comp when it's not appropriate. Making decisions about what is a change in model and what is a real change in assumptions is often a little tricky.

Just to summarize the keys to success, one is appropriate selection of the measures. You have to pick embedded value and shareholder value where it's appropriate. I can't stress enough that you have to have a disciplined process for setting and changing the assumptions. That's critical. One of the criticisms is there are just too many assumptions in embedded value. Dynamic modeling and a commitment to making it real. You have to get to the step of executive comp or external reporting, or you'll never get the motivation and the drive throughout the organization to get the full lift to the stock price that you want. So, those are my comments and now Mike. Thank you.

MR. MICHAEL L. KASTER: I'm going to talk about embedded value from a product line management perspective, give you a company perspective, and if I have time, I will talk a little bit about the in-force management issues that both Nancy and Sim have talked a little bit about. And we'll talk a bit about the embedded value implementation process.

Why would an SOA staff member be talking to you about this? That's probably a good question. Prior to joining the SOA 10 months ago, I was the corporate actuary for a U.S.-based insurance holding company with domestic operations in three different locations. We did report to an Irish parent, so we used embedded value reporting for many, many years. I was not with the organization for a great deal of time, but they have been pretty well entrenched in the embedded value process. We were working toward the process of using the embedded value techniques to help us in our product pricing. We were not using fair value. We weren't using the concept of shareholder value that Sim mentioned. We weren't using appraisal value. We were strictly based on embedded value.

One of the key jobs of the senior level actuary as a part of the senior management team is to follow the KIS principle, keep it simple. You need to keep in mind that you have to communicate this information to the senior management team, who are probably mostly not actuaries. That was my main job. As both Nancy and Sim have commented, the embedded value approach tends to be very actuarial black box driven, and people know that. Our CEO used to like to refer to it as the dark art of actuarial science. So, it's real important that you find a way to take these complex models and processes and make them easily understood. I'm going to take that approach with you, too, and hopefully you'll be able to pick up a couple of things.

The value of new business is the piece of the puzzle in the embedded value calculations in which you're adding to value based on stuff that has recently been sold. It's different than the appraisal value. Appraisal value takes into account all future prospective sales, but EV does not. It takes the value at this point in time. Value of new business is, over the last reporting period, how much value have you added to your organization based on the new sales? I like to think that the assumptions are real important to establish. They're locked in. At that point in time in time, whatever assumptions are in the block of business that you just acquired are locked in. You have to be careful, because if things deviate from that it's going to result in variances in the future. With our process we had no recognition of investment matching. We weren't trying to match actual assets to the actual blocks of businesses as we acquired them. We used more of a portfolio approach in our investment side.

What are the uses of value of new business (VNB)? Our executives and management team got very used to using the phrase VNB. It is a measure of the growth in total value. If you think about it from a pure economic perspective, the organization is taking its existing surplus or distributable earnings as they're earned and are reinvesting them in the business. This isn't anything new to anybody, but EV gives you an approach to communicate this to people, and we'll talk a little bit more about that. If you follow the approach the right way, you can use it in your new-product management. Which products should you be selling; which ones should you not be selling? Again, it's pretty basic stuff, but it gives you a tool to communicate with people in a consistent manner. And, as Sim indicated, you can create some sales incentives around this that are now value-based as opposed to sales-based.

How do you look at this new business growth and effect on total value of new business? One advantage of being on SOA staff is you can steal shamelessly and ruthlessly from people, so I stole this chart from Sim from a prior presentation (Figure 13). This descriptively shows you the growth in value and all the pieces and parts. I'm not going to go into all the pieces and parts. I want you to focus on the far right-hand side, where the new business is a piece of the growth in total value. We're going to talk a little bit more about this value of new business.

Figure 13
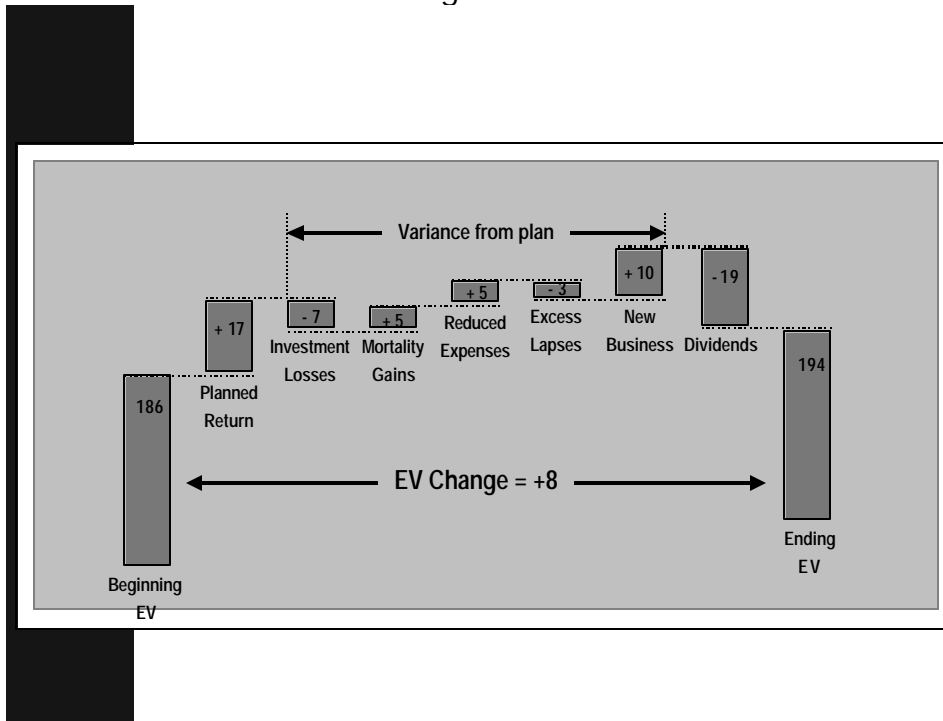
So how does EV and value of new business have an impact on new product pricing? Everybody knows what internal rate of return (IRR) is. It's the rate of return of the present value of distributable earnings, where they will be zero at that point in time. Value of new business is calculated based on a static, fixed interest rate. So just in real simple terms, people got used to telling people, "Our discount rate is eight percent. We have to price for an IRR that's, certainly, greater than eight percent, or we're adding no value." It was, again, an easy way for people to communicate.

You have to take a look at expenses very closely—real expenses versus your pricing expenses. If you have a deviation in your pricing expenses versus what your real expenses are, that's going to show up the first day you start selling. So, it's very important that management understands what the expense assumptions are.

Your distribution and agency compensation will now have a direct bearing today on the earnings results. If you have a variance or a special incentive plan in place—the head of sales has convinced your senior team that we need a special sales incentive for the next quarter—having embedded value as a management tool allows you to communicate to management the effect of that. Five percent of target in actuary compensation this quarter will reduce your added value by five percent of that premium. It's a real, direct correlation to the value and the drivers of the business. It makes it really easy.

I'm going to talk a little bit more about using VNB as a sales performance measure. Sim indicated that that's something you can do, and we were very much based on

that principle in our organization. The sales of the wrong product will result in worse VNB, worse earnings and worse value growth to your organization. I want to go through a quick, very simple example. We used to have a measure we called our VNB factor. Basically, the actuaries would calculate, based on a pricing model, the present value of those distributable earnings at our discount rate divided by the total target premium of that product. So, we got used to talking about these factors.

I have three or four examples of universal life (UL) products, and they did range, depending on when the product was priced, the generation of the product line, et cetera (Figure 14). There were a number of factors that would have a bearing on this VNB factor. Well, then instead of just looking at sales goals, we would line up these sales goals with those VNB factors (Figure 15). You can see in this illustrative example that we tried to have the products with a little higher VNB factor be the ones that we had higher sales goals on. We were a smaller company—$32 million was the goal of target premium on UL products, and our targeted VNB factor was 31 percent. We had a strong tool to make sure that everybody lived up to their expectations and their promises. In this case, we have $10 million of VNB that we were planning for, that we expect, and we can add $10 million of value to our organization because of our sales (Figure 16).
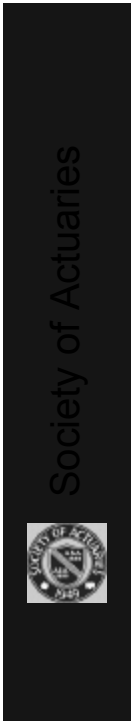
Figure 14

Examples of VNB's by product

	VNB factor: PVDE @ 8% / Target
UL product #1	33%
UL product #2	28%
UL product #3	20%
UL product #4	40%
	31%

Society of Actuaries

Figure 15

Examples of VNB's by product

|	VNB factor:	
	PVDE @ 8%	Sales
	/ Target	Goal
UL product #1	33%	$10
UL product #2	28%	$7
UL product #3	20%	$6
UL product #4	40%	$9
	31%	$32

Society of Actuaries

Figure 16

Examples of VNB's by product

Society of Actuaries
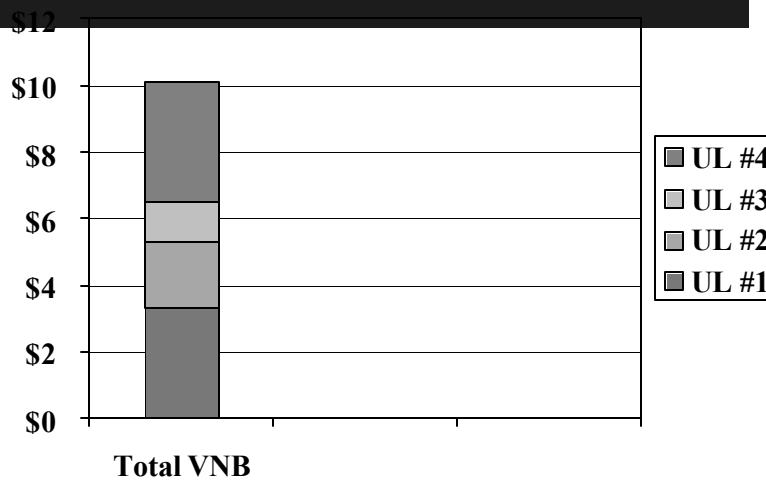
If the sales results come in differently, quite simply, the results aren't going to be as good (Figure 17). People in the sales organization like to say that we hit our sales goals, $32 million. We did a good job. However, you were $1 million short on your VNB goals. So we used VNB as our way of incenting people, and it was really powerful. It made the actuary's job a lot easier. It made the product line manager's job a lot easier. It is true product marketing when you get to this basis. Product marketing is about the profitability of a line of business, not just sales. All of you know that, but embedded value gives you a tool to be able to communicate this. So we've talked about what happens if you don't have the right sales mix in your product line, and building incentives around this is really, really important. Sim mentioned it. We were living it as a real company, and it really can make a difference in the management of your organization. And I talked a little bit about having sales contests, that they can cause variances as well.

Figure 17
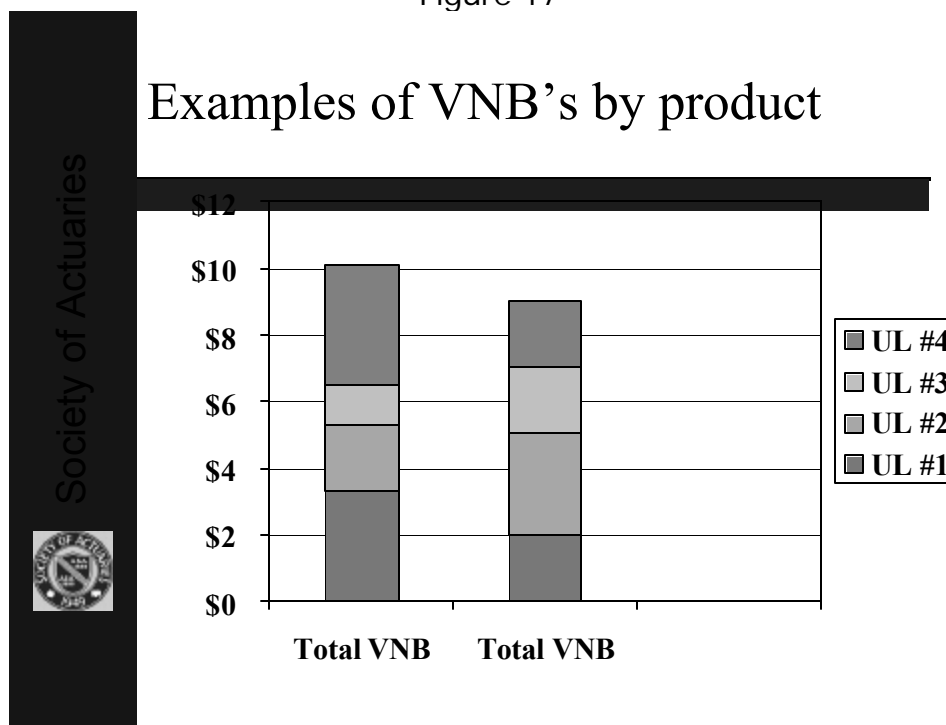
I'll talk briefly about the value of the in force and the impact on in-force management. This is mostly where variance analysis comes into play and analyzing changes that come into play when you're looking at new blocks of businesses. It's important to review your assumptions regularly. If you don't do that, variances from period to period are hard to explain. You don't really understand why those variances come up. You'll run your real in-force values through the black box and, all of a sudden, you have variances that are unexplainable. It is really important to perform this variance analysis to understand where they come from. I'm going to talk a little bit more about that on the implementation side.

I'll give you a couple of examples. With our annuity business, we used the value of our in-force block to help us make crediting rate decisions. We were looking very closely at the assumptions. Remember, when you project out the future earnings, you assume you're going to earn those spreads every period. So, having the value of in force for every block of business and knowing what spread was assumed in that value made it very easy for us to communicate to people that if we're not hitting these spreads, we have to do something. If we don't manage to these spreads, next period we're just going to be spacing another negative deviation. So, we did a lot to compare actual spreads to expected spreads. The interest credit rate decision making process was a little bit easier because it was all based on value growth.

I'll talk about another example. Having embedded value as your basis of reporting and your basis of management of the organization makes it very simple to talk in terms of a conservation program. We faced a time when our block of annuity business was running off pretty quickly, and we considered a lot of different things to help that. Well, should we consider a conservation program in which we would have some sort of incentive in place to keep the customer? Having embedded value and the value of that block of business well-known to people made that discussion very easy. It will cost us X amount of dollars to have a conservation program. Will it result in that much retained value of that block of business? It made the decision making very economic-based and very logic-based. Again, it provides a very powerful way to communicate with people.

On the universal life business, it's much the same as the annuity line. When you're talking about interest crediting of your in force, you're going to want to know what the spread is in your embedded value model. You do not want to have large deviations in your assumptions of your spread in your universal life versus what you're pricing your products. If you do, as soon as you start selling and then implement this into the embedded value process, you will have to make changes to your interest crediting. That was never any fun.

We used it for our term business as well. Talking in terms of converting a block of term business, should we offer a term conversion program? This was all embedded value-based. What's the value of that block of term business today? Then, look at it after we go through the conversion process. Is its value any greater, minus the cost of doing the conversion program? It makes the decision making process really simple. When you get down it, it really isn't when you talk to management sometimes.

Let's talk about implementation of embedded value a little bit more. I'll try to give it to you from the basis of a company that went through it so you can take it back with you. But everybody will consider it their own way. It's important that you determine your methodology. How are you going to do these calculations? You need to establish all the assumptions. Sim said that, and determining those

assumptions is very critical. Having dialogue on a management team basis of what those assumptions are is also important. You're going to have to build the models. Maybe you use existing models. I'll talk a little bit more about that in a second, but you will have to build some models to do this. You must build this variance analysis that Sim and Nancy talked about. It's not an easy process, and you're going to have to build the internal and external reports.

This was our statement of our balance sheet. The statement of values, showing all the different components of the embedded value at any period in time—the value of the in force, the surplus elements and total capital at the end—was the report that our whole management team was used to reviewing. You have to develop this and make it right for your management; otherwise, they'll never look at it. This was a very interactive process with them.

This was our earnings statement. Nancy and Sim both referred to it as variance analysis. We called it our earnings statement because any change in value was the earnings for the period. Our goal was 15 percent growth in embedded value, so everybody would talk in terms of that being our earnings goal for the year. This was our embedded value earnings statement, and people became very used to it. We would actually plan some variances sometimes. Invariably, our variances would end up being a lot different, and we'd have some surprises. This year, 2000, was really a tough year in this organization, so we had to explain lots of variances to people.

What are some concerns when you're trying to implement embedded value? Within our organization we had multiple operations, so the consistency of the systems being used for the embedded value calculation was a large concern. We didn't want one organization using a spreadsheet approach and another using a very complex modeling system. That made it very difficult for us to even consider, at some point in time, the full integration of these systems. You need to set up your process so that you can have regular updates to your model. One challenge we had was that we only ran our models twice a year. A lot can happen in six months. If you don't set up your model in such a way that you can run it on a regular basis, you'll face quite a few surprises every six months. That's what we faced, so we went about a process to redo our models, and I'll talk a little bit about that as well.

It's important to have good quality data. This garbage in/garbage out philosophy is an important tenet for embedded value. If you don't have good data going into your models, you won't have good results coming out. You must have good information coming in to explain those variances and to explain deviations.

I can't stress this one enough. Minimize the number of outside adjustments. One of our operations would run its models, but then it would take two weeks to run it through all the outside adjustments, and they could never explain them. Each time they'd find a new problem, they'd add a new outside adjustment. Over time this model became so unwieldy and so unmanageable that it was just unbelievable. So

you really must try very hard to minimize the number of things you use and adjust outside of your models for embedded value.

What are some more concerns the first time you go through this? You must get agreement on the methodology. I think Sim mentioned that. How will the discount rate be determined? I can't tell you how important that one is because changes in the discount rate can change your value. Then you have a very difficult job in explaining it to your rudimentary staff. They don't understand. You start to talk about the earnings of the organization being based on the growth in value and then say, "Oh, we had to change our discount rate this year, so we have $20 million less value growth." They don't understand this. It's important that the methodology that's used is consistent and communicated to people because it may change, and it's not understandable to most people.

Nancy talked a little bit about the fact that you don't build pads into your assumptions. You want to use very realistic assumptions in your embedded value. So the question of whether you want stat, GAAP, pricing assumptions, EV assumptions, our goal was always to make them very consistent. If they were totally disjointed, it just created problems all the time in communicating to people. Everybody knows about the GAAP and stat assumptions, but it's real important that those pricing assumptions flow into your embedded value assumptions. If you did both— we did three bases of reporting: EV, GAAP and stat—it is important that those assumptions are consistent. If we changed one and had a deferred acquisition cost (DAC) unlocking, but we didn't change our embedded value, nobody would understand that. You may have to do that if your assumptions are inconsistent, so make your assumptions consistent.

As for the level of target and required capital, I believe Nancy already mentioned that a percent of RBC is one way. Which model should you use: the cash-flow testing models, pricing models or valuation models? I'm not going to tell you which are the right ones. It will be different for every organization. We used our cash-flow testing models as the basis of doing embedded value at the start.

What level of granularity do you want in your model? This is a tough one. The more model points, the better the results, right? Maybe. But maybe it's more difficult to handle. However, the more model plans you have built, the easier it is to deal with a variance analysis. Again, that's a level of complexity that you add, but when you're starting to analyze the differences and do your variance analysis, you can drill down deeper with more model points. A more detailed level of granularity will require more assumptions by product. Again, as you build your models over time that will become easier and easier.

When should you refine your models? It's a continuous process. You're always looking for improvements each time you run it. It's important to have a very good modeling person or a very good actuary involved in this process, somebody who

really understands your models and drives toward continuous process improvement.

When do you want to consider redoing your models? In our case, I mentioned the organization that had built on outside adjustment after outside adjustment. It became obvious in that case that we had to do something. We didn't want to get to the point where we had to make a serious model change, but it was to that point. One of the things that you have to prepare for if you're going to redo your models is to prepare your management. Make them understand that things will change, things will move. Sim mentioned that when you do your model changes, you should plan for some changes in embedded value. We underestimated that, and it was a very difficult thing to explain to people.

You have to make sure you have enough resources available to do a revamp, a redo of your models. I can't stress that enough. Your staffs will be used to running the models and will still be expected to continue to do that, in addition to all their other reporting requirements. If you add on top of that the need to redo their models, they probably won't do it justice, and it will take much longer than they had anticipated. So I can only stress to not underestimate the implementation process and the revamping process. So those are my comments, and I think at this point we're going to open it up for questions.

MR. ARMAND M. DEPALO: I think the presentations were very, very good, and I think it was a good baseline presentation. But I have some observations I think will help the audience. When you do economic value added, most people are first not aware that if your assumptions come through, your economic value increases each year by the hurdle rate. When you look at what's called the increase in economic values, or the difference between the beginning and the end, that's the increase. But the real item that's called economic value added is really the gain and loss over the hurdle rate for the year. That's an important issue. Sim, your comments touched on it, but you didn't show an example of it. If you started the year at $10 and you had a hurdle rate of 10 percent, you'd expect $11 at the end of the year. In effect, you end up with no gain or loss in the year if you had an increase of $1. That takes a lot of time for some people to come to grips with.

If any of you ever worked pensions, you work backwards from a gain and loss. You do your gain and loss, and then you have to separate it into the sources. That's really where the real information starts coming into this system. What was the gain and loss on new business? What was the gain and loss on in force? If you do nothing more, do those steps.

Then you get into an interesting perplexity for anyone who's done gain and loss, and you don't learn this until you've done it a few times. The order in which you do the source of change affects the answer. You have to choose the order correctly and then impose that same order on each of your profit centers. You have to make sure that one person doesn't do change in persistency first and someone else does

investment changes first. But the most important thing you have to do is make sure your numbers tie in with your blue book at the end of every year. This is not a random exercise. It has to be forced back to the books, and when you do it, you get a lot of useful information.

Guardian's been doing this since 1998. It goes all the way into executive compensation. Some of the executives say, "Yeah, yeah, Armand, thank you for showing it to me," but at least they look at it. There's a lot more to this than was presented today. I started it because I thought the unified valuation system was coming down the road, and I needed a better modeling system. Maybe what it will end up happening is that fair value will come down the road, but you need a model that's not tabular to drive this thing. You'll find out that the way the valuation system's going in the future, tabular valuations may be a minimum floor, but you're going to be moving to some other valuation system that sits on top of that. These are just some observations, but I think more time should be spent on the gain and loss for the audience to understand that that's where the real value is. Thank you.

MR. CAMPBELL: Comment?

MR. SEGAL: If I can just comment on that, yes, I think that we struggled with what was a more basic presentation. Going through the details of analysis of variance we thought it was kind of done a little before, but you bring out a very good point, Armand. When the value increases, and let's say the hurdle rate is eight percent, people say, "Hurray, we grew at eight percent." Well, you just returned the value that your shareholders expected, given the risk in the organization.

Regarding the order of the calculation—that's another reason I think that the analysis of variance in the sensitivity analyses can be misleading. If you do it in a certain order, you get a certain result. If you try to extrapolate that to certain decisions with different mixes of business, you could get very different results. I'm just curious what the panelists' thoughts are, and Armand, what your thoughts are on the fact that the very common hurdle rates seem a little bit low. They shouldn't really be below the cost of capital. I wonder what are your thoughts about eight percent being common in the U.K. and Europe and whether that really reflected the cost of capital that they have.

MR. DEPALO: Cost of capital is unique to each company. One of the things you will find is that a mutual company and a stock company will have different answers, and you have to wrestle with the question of what you're measuring as earnings. Are you looking at pretax earnings, discounted at a 15 percent hurdle rate, or are you looking at after-tax earnings, discounted at an after-tax rate? They don't differ by as much as you think, but if you're a mutual company, you're dealing with a different dynamic. You're dealing with the question of the cost of inside capital versus a stock company that's looking at the question of outside capital.

This is one of the reasons a mutual company, when it demutualizes, normally goes out at about 80 percent of book value. The reason that's true is a fundamental dynamic of the company, that a mutual company may price its products—let's just choose eight percent after-tax ROI, whatever you want to call it. When they go from a mutual company to a stock, their outside world was asking for a higher cost of capital. The after-tax value of a 15 percent hurdle rate may be 10 percent, after tax. That whole differential can be explained by taking the same economic value, but running it on the cost of outside capital versus inside capital. You understand immediately what really happens on a demutualization. But a stock company distributes money to stockholders; a mutual company distributes money to policyholders. If you basically looked at the gain or the profit of the product before distribution of dividends—you can do the analysis differently, but you have to then split your dividend into what's return of capital versus what are just the profits from the product. That gets too hard to do. So the default is that mutual companies use their internal cost of capital, which is lower than the same hurdle rate used by a stock company. But eight percent is not an unreasonable after-tax rate, if you're doing it on an after-tax basis.

MR. THOMAS X. LONERGAN: I'd just like to present another possible way of going about this that gets around the black box way of looking at this whole thing. If you do develop a fairly sophisticated model on a present valuation calculation, the tendency is that management won't understand it, and they'll view it as a black box, as an actuarial creation, and not give it much value.

The other thing that's important with embedded value is the comparison between the cost of writing new business versus basically milking the existing business. I work in the health care field, where you oftentimes have to decide whether to raise rates a lot and therefore make a lot of money in the short run or keep them more reasonable, write new business and therefore add value that way. Unfortunately, my company is not to the point of doing those calculations. But one of the things that helps to make it simple for people to evaluate is to have a value of a member.

So let's suppose in the case of health care, the value of the member is $500. That's the present value of the earnings you expect to get from that member over the course of that membership's persistency, if you will. If you write more members, obviously, you get $500 more per member. If you have to give up some price increases to attract those additional members, you're obviously giving up some short-term earnings. So, it makes it easier to make those comparisons. If you keep it on a unit value basis—and I think the concept of unit value can be applied to life insurance, dental insurance and just about anything—it's easier for management to understand.