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Introduction to Embedded Value

Instructors: MATTHEW CLARK
LORI HELGE
STEEVE JEAN

Summary: This session provides a general introduction to embedded value (EV). Topics to be discussed include: What EV? Also discussed will be considerations in calculating embedded value, a basic understanding of the movement in EV and uses and benefits of EV. At the conclusion of this session, attendees gain basic understanding of EV and how it is used by companies.

MR. MATTHEW CLARK: This'll be a good introduction to what EV is and some brief introduction to how it's calculated. I'll speak some on the movement in EV. We're going to end with the application or use of EV in the United States, as well as an introduction to some new EV developments in Europe.

I'm a senior manager at Ernst & Young out of our Dallas office. I've been in the industry for about 11 years, and with Ernst & Young for the last eight. I've worked mostly with EV from an audit perspective. I have reviewed EV approaches, documentation and final numbers. Also on the panel is Lori Helge. Lori has 11 years of experience, seven of which have been with the Tillinghast business of Towers Perrin. She's a consultant that works in EV, primarily in a review capacity but she also has performed EV calculations from scratch. Lori will be our first speaker, and she'll look at the definition of EV, including a discussion of approach, assumptions and key results. The other person on our panel is Steeve Jean. Steeve Jean is a vice president with AEGON direct marketing services. He has 15 years of industry experience in financial reporting and modeling, including five years as a consultant with a large accounting firm. Steeve will discuss the uses and benefits of embedded value and give a brief overview of the new European embedded value (EEV) principles and requirements.

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Note: The chart(s) referred to in the text can be found at http://handouts.soa.org/conted/cearchive/valact05/2005valact_handouts.htm.

MS. LORI HELGE: As Matt mentioned, we're going to talk a little bit about defining EV at a very high level. It's going to be pretty high level today, but hopefully we'll give you a foundation to start thinking about this and thinking about how you could actually start implementing it in your company. We are going to talk a bit about assumptions, approach, again still at a high level, and a few key results.

EV is one way to measure the value of a company. It can be used to answer the question: How are we doing? It has a couple of components. One is the value of inforce business, which does include the cost of capital. We're going to talk a little bit more later on how we're going to define capital. The second component is adjusted net worth. Those of you who are used to actuarial appraisal values will notice that there seems to be value of new business missing. EV is really intended to take the value of the company as it stands today rather than the values of what could be in terms of new business, the value of the production capacity and that sort of thing.

Embedded values are traditionally not stochastic, but that's changing, and I think Steeve's going to talk about that a little bit more in what's going on in the EEV side. That tradition is definitely changing. We'll expect to see a pretty comparable shift in the United States, I think. Discount rates are typically lower than in an appraisal value. The expense allocation may be different, and assumptions may be different also. You're talking from a different perspective, from an ongoing concern basis rather than change in ownership, that sort of thing. Of course, with the appraisal value, you also get the question of whose perspective you're coming from: the buyer's or the seller's. Of course, one'll be more optimistic than the other depending on what it does to the numbers.

So, getting into the components a little bit deeper, the value of inforce equals the present value of statutory earnings on contracts inforce plus interest on release of required capital. The statutory basis is used rather than, say, GAAP because the bottom line is statutory earnings; that's what counts. You need to hold your statutory reserves. You need to meet your capital requirements. You can't release more than that and still be in business. The free surplus and the mark to market and assets backing free surplus is kind of our adjusted net worth component. So, the free surplus would be the capital above and beyond the required capital. That's mark to market and included in a market value basis instead of a book value basis.

There are a number of associated assumptions. First is that they are usually very stable. Also, changes from year to year are transparent. Another assumption on EV is that they're intended to be a realistic best estimate. There are no provisions for adverse deviation (PADs). You might even say it is a best estimate to slightly conservative, but again we're not getting into PADs like you would with other assumptions. Additionally, there's no formal guidance surrounding this, but, again, you still have your actuarial standards of practice that you need to follow as a

practicing actuary if you're signing off on an actuarial opinion. You still need to meet the standards of practice. Those are kind of your guidelines.

The result, though, is that these things are not standardized across companies. So, you can't really lay out companies side by side, look at their EV and say, well, this one's definitely worth more than this one. You really need to drill down into things because they're likely not on a comparable basis. And the final assumption relates to the projection period. Most companies typically use 30 years, but it really depends on your makeup of business. So, a nice, little check is until the material portion of your inforce has run off, and that's pretty comparable to your projection period that you're looking in cash-flow testing. Another way to measure it is about 90 to 95 percent of the present value of margins should be realized.

Now I am going to discuss the risk discount rate. This is one of the key drivers of EV. It certainly looks like it would be an easy lever to tweak up and down as you wanted the number to move, but the intention is that the company defines a formula usually equal to their cost of capital, and that formula kind of keeps management under reins in terms of moving it arbitrarily. There is also a trend starting towards a variation in discount rate by product line, again, reflecting the fact that not all product lines have the same risk factors. So, more customized or riskier product lines will obviously have a higher discount rate than the less risky product lines. Their formula will be defined internally and, again, not redefined every year, although it could be. Matt will talk a little bit more about ways that you would then quantify that impact, but really the intention is that it's defined and not used as a management throttle from year to year to adjust the value.

Now I will discuss the required capital. The intention here is to reflect statutory earnings. We're running using statutory reserves and that sort of thing. So, we're reflecting statutory earnings and what can be taken out of the company. In terms of required capital, most companies go back to their local regulatory requirements. In the United States you're talking about a multiple of risk-based capital (RBC). A multiple such as 200 or 250 percent is commonly used to reflect that normally rating agencies require higher ratios to maintain ratings and that sort of thing versus state insurance departments. We're talking not just what you need to do to avoid being taken over, but to stay in business and continue operating the way that you are.

When you're calculating EV, you want to capture all of the different bits of value that you can. You want to get as complete a picture as you can of the company, and so there may be some non-modeled lines of business and lines that you wouldn't normally model, like Exhibit 11 claim reserves. However, you have investment income running off of reserves like that, and in some cases you have reserves that are going to run off over a time maybe in proportion to your business. Maybe it's something that would likely be level over time. If it's running off over time, you can capture that reserve runoff, plus you can capture the investment income after tax on that reserve. And if it's something that's level, again, that

after-tax investment income is worth capturing and including in the value. And another thing to capture is the overhead not associated with new business production. The overhead associated with new business is captured in a separate component, but you want to make sure basically that all your expenses are accounted for somewhere.

Again, we mentioned the adjusted net worth is normally mark to market. So, that's what's backing free surplus. Some of those assets may already be held at market value, such as common stocks and that sort of thing. In that case you would only recognize the tax effects of those assets. Basically you're reflecting the fact that those assets could be sold off. If you have your statutory reserves and if you're meeting your regulatory capital requirements, then in theory those assets could be sold off, and so those are normally reflected at market value basis. This is consistent with the way that things are done on an actuarial appraisal basis also.

One thing that may or may not be running through your mind is the question: What do I have right now that I can start with? We're already calculating statutory reserves. We're calculating GAAP reserves. Are we just going to be doing more bases here? This comes up very frequently with management that we speak to. They don't want to start from scratch. They don't want to build a whole new accounting system, so to speak. So, the question becomes: Can you piggyback off of your cash-flow testing model? And, yes, you absolutely can, but with some changes. This was the approach we used with one client that I worked with. We had their cash-flow testing model, and for different purposes we calculated both the EV and an actuarial appraisal value that absolutely can piggyback off those models.

Cash-flow testing models, of course, start with your assets and your liabilities set equal. So, you need to add in required capital and get the formulas coded up. Then you need to add in enough assets to top off that capital. You need to reflect your nonmodeled lines, as we already talked about. Again, your Exhibit 11 reserves might not normally be included in your cash-flow testing but would be something to include. Be sure that expenses are on the correct basis. With EVs you want to capture all of your expenses somewhere and not leave anything on the table there.

Create a new business model. Matt's going to talk about this a bit more, but in the reconciliation stage one of the things you do is calculate the value of the prior year's new business. So, for example, if you're doing EV as of year-end 2005, you're comparing it to your year-end 2004 model. Year 2005 issues are considered new business for EV purpose, although if they're in force, they're on the books. For EV purposes, when we talk about new business, we talk about the most recent period issues. And, of course, for cash-flow testing it would be already embedded in your model, but then you'll need to split that out and build a new business model. You may have to be a little bit more precise about modeling it than you were in your cash-flow testing. Asset valuation reserve (AVR) gets removed from the cash-flow testing model, and it's actually included as part of free surplus. Normally interest maintenance reserve (IMR) would be included in a cash-flow testing model,

but that's actually removed, and the value of the runoff is also included with free surplus.

Again, double-check to make sure your assumptions are realistic best estimates. The results are displayed and scrutinized a bit differently. You're kind of focusing on your surplus at the end of each year, and at the end of the model in terms of EV, you're looking at your earnings running off, but then you're also doing extensive analysis in terms of the differences between the prior year and the current year, and so it's a different level of scrutiny. In both cases you should have a fair amount of year-to-year stability in assumptions and methodology. I think with cash-flow testing you have a little bit more wiggle room. I've seen actuaries have a little bit more play in it, and they can use some of those assumptions for a little more throttle. You're supposed to disclose when you change assumptions for cash-flow testing purposes, but it's not nearly as transparent as it is on the EV side where even a minor assumption change gets explicitly accounted for, as Matt's going to talk about a little bit more.

I want to now talk about some of the key results that come out of the EV calculation. The first is, obviously, the EV. What's the company worth? And especially for the first year that this is done this is what everybody is dying to know. Management wants to know what we are worth. But it's also worth looking at, once you're calculating this on a consistent basis, what your EV earnings are. How did your EV change from year to year? Some of the drivers of those changes also should be looked at. The EV return then is calculated as the ratio of EV earnings to opening EV, and ideally you want that to be greater than your hurdle or discount rate. It should create value.

The sources of change are something that Matt's going to go into a little bit further in a few minutes. I found that this is often an iterative process. You'll go through your sources of change, and then you go back and it's not only used to explain the difference between your ending and beginning EV but also kind of a way to check your work. Did you do things the same way? If there's a lot of unaccounted for difference, sometimes that's because the inforce file didn't get built the same way, but that's not what you intended to change. That is the sort of thing you'll see. And then I think another very valuable piece of information is the value added or, in some cases, subtracted by new business. That's the point of looking at the last period's worth of new business, that you'd include all the expenses associated with that new business in that component. The question becomes: Did we create or destroy value? What's the present value of future profits on this business we issued in the last year? And did we create or destroy value? Maybe it's not always the pricing actuary's best friend, but hopefully the answer is that usually value is added.

The final thing that I just wanted to go through was some sensitivities that are commonly done on EVs, and my experience with these sensitivities aren't always reported, but they're good for internal purposes. These include the risk discount

rate, the target surplus level, investment return, morbidity/mortality, lapse rates, expenses and EV at risk (i.e., 1 to 2 percent interest rate shock or 20 to 25 percent equity market drop). I also found things like this useful even just in setting assumptions. Which really are your key assumptions, and which assumptions are less critical? But these are a number of the areas where I've seen assumptions tested.

MR. CLARK: EV by itself really doesn't mean much. The company says, well, what am I worth? You really have to go back and say, well, did you pad any of your assumptions? Were your assumptions well known? Are you guessing? As we all know, we make educated guesses as actuaries every day on assumptions, and we don't always guess right. The real value in EV is the movement. How did I move from last year to this year? What happened? Was the movement because of something I did as an actuary or management? Did the market crash and did I lose half my value? But nobody could have controlled that.

I'm going to resist the urge to go into stochastic processes because that's something that Steeve will touch on and would take us a whole other session to discuss, but there are many techniques people use to try to predict and to polish their assumptions and understand the sensitivities and so forth.

So, first I want to discuss key EV results. First of all, you get your EV number and management says, "Great! We're worth more than we thought." The actuary probably helped make that happen because there were pressures or their approach or assumptions were optimistic. Very seldom do we model with explicit pessimism that's just embedded in our approach and our life. We do sensitivities. We'll shock a different assumption. Maybe it's the market. Maybe it's our lapses. Maybe it's our expenses. Maybe it's all of those. But, again, that still just shows us what maybe the values could be.

Finally, a move in an EV, that really helps us understand that change. What happened from year to year? Was value created? Destroyed? Where was it created? Where was it destroyed? And how does that roll forward? It's really a pure roll-forward in the purist of forms if you do it right. The way I'm going to present things today is from what I would consider a best practice. There are pressures today to do EV more frequently. It used to be quarterly, but many companies are being asked to do it monthly now. The process can take a month or two to do right. So, you can imagine there's a conflict there if it's going to take you longer than you have to produce it. So, the approach I'm going to show is one opinion, one way. It might be best practice in some ways. I might be skipping over a few of the details just in an effort to present this today, but keep that in mind.

So, as I've said, the movement in EV is as important as the EV itself. The EV number's a static point that you move from. The movement says how well I estimated my assumptions. In other words, was my mortality assumption half of what it should have been? Are my expenses off? Did the market perform as I

expected? And you can slice out each of those. You should also look at the change in assumptions. I like to draw a nice parallel to Financial Accounting Standard (FAS) 97 deferred acquisition cost (DAC), particularly your unlocking and true-up process to understand how your DAC moves. I've done my share of audits, and some people do a real nice job. They show how to true-up each piece reflected and then how the assumption changes each impact of the DAC.

You'll also know, and I'll get into this, that there's a synergy. In other words, if I take the impact of each element and I change one at a time and then change them back, the pieces will be larger than the whole after I switch them all at the same time. So, part of the movement is a matter of selecting each element, understanding how they impact my EV and using the traditional approach, introducing them from the most significant to the least significant and letting the synergies go through accordingly. But I've seen companies do them by themselves and not look at the rollup and just take the covariance or the impact on bottom line item as a plug.

There are different ways to do it. There's no right way or wrong way. You just need to understand that there is an impact because there's a covariance happening there. That's something you need to know. If you know that, and you're not really concerned about it, you can look at each piece individually. By doing the movement you can ask if a new business I'm selling is profitable. For us we say, well, of course it's profitable because I have a return. Well, remember, profitability is determined on an EV process. In other words I have a discount rate or hurdle rate which can be in some cases higher than my pricing return. So, there is a chance you can destroy value with new business.

Traditionally the discount rate has been one discount rate for the company. Some companies explored different discount rates per line of business. I wouldn't say that's mainstream, but the hurdle rate would say 10 percent may be set. Some of your business may create value; some may destroy. One thing to keep in mind is that destroying value on an EV basis does not mean that you're destroying value in the company. You've probably heard a lot of talk about economic capital and stochastic processes. The interaction of products, especially in life insurance, can be such that you may lose individually, but collectively you may win. So, you have to be careful how you interpret this. When management gets a hold of EV results and sees new business destroy value, there are a lot of reasons why we sell new business. It might be a strategic move. It might be that that mitigates other risk components.

The analysis I'm going to show can be done both at the product level, as well as at the company level. In other words how did mortality impact us as a company, not just how did it impact our annuities, our universal life (UL) or our term? With this analysis, as you start thinking about it, the different slices of source of earnings and analysis can be quite complex and, more importantly, require a lot of time and a lot of runs. My final point here relates to the impact of economic versus noneconomic

factors. I already touched on the point that management wants to know did we create or destroy value due to something that we had control over, like spreads? Were the spreads really killing our EV? Were we trying to be too competitive? Are we okay with that? Or was it something we couldn't control, like the market crashing or something that occurred that was outside of the control of management? The reasons that management wants to look at this are, first, are we doing things right, and second, are our processes and controls appropriate?

EV is linked to compensation in a lot of companies. Let's say your discount rate changes. Obviously, nobody wants to get credit for having a different discount rate. That would be your biggest move. So, you want to isolate the components that are under control of management and then reward them for the items that are because of their actions and not reward them or penalize them for the ones that are not.

Clark page 2, Slide 2 is a chart that shows an approach that anybody that's seen EV before has probably seen. It begins with your EV at the beginning of the year. I'm going to say year, but it could be quarter or month. At the beginning of the period you have the value of your inforce, discount and statutory earnings on the inforce block of business, and then your surplus or adjusted net worth mark to market. Those two components would be pulled together to encompass your EV. As the year goes on, many things happen from assumptions and experience, and now at the end of the period you have a value of your inforce, which is less. It doesn't have to be less, but let's assume it is, which is true 99 percent of the time. You've added some new business hopefully that's added value.

This box in the middle could be a negative. It could do that. Your adjusted net worth will change, and then you may pass out dividends either to policyholders or shareholders, up to the parent company. Whichever direction or approach is taken, at the end you have a new EV. You'll see that the achieved profits just ask how much we have increased or decreased from last year. The shareholder dividends are no longer in the EV, but you do recognize it for the movement, to say, okay, I lost 10 percent of my value, but that's because I paid the parent a dividend. I had such a great year that they went ahead and took their share of the pie. So, you still credit for the movement because you didn't create or destroy value, but as you enter the next year you'll move back down to the EV at the beginning of that next year without that dividend because obviously now it's gone and not under your control.

So, how do you go about doing this? I've already alluded to the fact that you want to isolate and understand the elements that impacted your EV. I usually like to look at it as a true-up first. In other words, what actually happened? And then look at your unlockings or your change in future assumptions. How do you go about doing this? One approach to do this is to go ahead and run last year's. So, let's say we're looking at December 31, 2004. We have a model. We ran it. If I ran it out to December 31, 2005, I know what my EV should be. If everything acted exactly as I expected, I'll know my EV would be for the inforce only, not from new business

because new business is not put in there, and I'll say, okay, that's where I should be. You can do this many different ways. One is to not know your final answer and then introduce each of the pieces. So, if you think my lapses are my biggest impact, I'll introduce the lapse change. That true-up is worth x dollars or y percent. And you'll introduce each piece. And then you'll say because of our experience I'm going to change my assumptions. So you'll introduce those one at a time.

Now you've rolled forward to your final value. You'll want to add in your new business. Hopefully that created value. We're going to go through a little bit of an example here in a minute on how this might look on a simplified basis. When you're all done, you'll have EV beginning of the year, each of your true-up impacts, your expenses, your mortality, your lapses, market impact and so forth. Then you'll have all of your unlocking impacts. I went ahead and unlocked my discount rate or each of those other assumptions that we just discussed. Again, the order is arbitrary. You'll then have your new business. I sold new business. It's worth x dollars. It cost me y in commission or strain for a net position. And then you'll have your final EV you'll start out with for next year. Now you can look at each of the impacts.

The pricing actuary and the modeler have pressure because as you keep trueing up every year, with your mortality, you're always assuming half of what you have. Eventually management's going to say, hey, there's something wrong here. Let's get this on right. There's really a pressure or an emphasis on getting it right, and getting your assumptions right—assumptions that you're comfortable with going into next year—because any difference that you have will be shown quite explicitly in your movement. So if you're consistently wrong, it might not be that you're a bad modeler. It just might mean that the market is going against you, your underwriting maybe isn't going as planned or whatever the element might be. Now I want to discuss some of the sources of movement in EV. New business is one. That includes the cost of acquiring it as well as the profit embedded in it. Other sources are deviations from expected assumptions, change in prospective assumptions, hurdle rate impacts and discount rate changes.

Clark page 4, Slide 1 shows a very simplified example of an illustrative block of business. I took UL because it was there and for no other particular reason. I know it is always dangerous to put numbers up, so I'm going to walk through this very carefully so we understand what I'm trying to do here. I've chosen a hurdle rate of 12 percent. Why? I just picked it; there is no reason. I have two columns, left and right. By the way I did this a few years ago. You'll see the date's quite old. I probably should have updated it. But you have your actual column and projected. Right now they're the same because I started the model out with last year's model. So, basically they're the same model with the same numbers.

At the beginning we have our opening value. I've taken all free surplus out, so there are no surplus issues. There are no complications. I am simplifying it just for discussion. And then we have the existing business. What happened? I have a required return, which is kind of the hurdle rate multiplied by your opening value.

That's how much we're going to get through the interest. I also have my variances, a/k/a true-ups. And then I just went ahead and put assumption changes on a single line so we could get everything on one slide. At the bottom I have new business. I projected that I'll sell a value of 235 million. It's going to cost me 125 million to sell that (using arbitrary numbers) for a net impact of 110 million if everything went as planned.

So, did I sell enough, as I wanted to, and did my expenses and assumptions line up accordingly after it's all said and done? I've assumed that I'm going to pay 5 million to the parent company for a transfer out, and I'm going to come down with 1.785 billion. That's what I said last year, where I would be at the end of the year. I've already assumed that I put in new business and assumed plan for the planned approach because I had the new business in there. However, I already know what my final EV number is here. It's a little different than I mentioned a few minutes ago where you would run through each, but I've cheated. I put the final number down. I happen to know that the value's higher, 1.8 billion, for a difference of 39.5 million.

We're going to go through each slide, and we're going to see the movement reconcile itself. We'll make changes to the actual column and leave the projected where it's at. So, we'll roll forward to Clark page 4, Slide 2 to be able to see that. The first thing I did is I brought the new business in in a capital transfer. So it happened that this year I sold a little bit less business, with a little less cost of acquiring it. My net impact was 90 million instead of 110. I didn't sell as much business. I think the expenses looked about comparable, or maybe a little higher than expected per unit, but we've tried that up.

I now have my new business in there, and it just so happens for one reason or another that the parent company decided to give me money instead of me giving them money. So net, I'm actually further away than I was before. Now I'm 49 million away, but we're going to move on. We're now going to look at the unlocking pieces. By the way the order here is arbitrary. Usually new business will be brought in last, but I did it first just to get it out of the way. By the way, one of the things to note here is that new business created positive value. In other words the business that I sold is going to generate a positive value to the company of \$90 million. If I had priced it less than a 12 percent return, which is very possible, you would see a negative there because the discounted value with the cost of acquiring the business would be a negative value.

It just so happened that I decided that lapses and persistency was the most important piece, as can be seen in Clark page 5, Slide 1. Is that correct for UL? Probably not, but I put it there anyway, and I said we had better-than-expected lapse activity. I've added \$32 million to the value of the line of business. So, the company would say, okay, I've seen that. I'll bring it through. I'm still 17.5 away, but I have other assumptions to look at. I have other true-up aspects. So in Clark page 5, Slide 2, I went ahead and I threw in mortality expenses and spreads. I

would have done this iteratively on a best practice to be able to isolate the impact of each of those. So, it'd be three different runs. It looks like those three aspects decrease value. My spreads were less than ideal. Expenses were higher than expected. Mortality was higher than expected as well. Now I'm 40 million away. And you'll see where I'm going with this in the next slide.

Finally, in Clark page 6, Slide 1 I say, okay, because my mortality was different, and because of lapses and so forth, I've made some adjustments to my future assumptions. The ultimate impact was I increased the value \$40 million. Now I've reconciled to the end. Management can see where they were before on a projected basis before the year started, where they are at the end, and what elements contributed to that. So, they might say their underwriting or mortality expectations were off. They saw that year after year. People want to make some changes and investigate. Persistency was good. You might ask why persistency was good. Was it because the market was down and people didn't want to leave? Are you competitive elsewhere? There are many different reasons possible. Expenses is another area that may need some investigation. Expenses is probably the one area that it seems like everybody always underestimates or expects that they'll sell enough business to decrease the per-unit costs and so forth. Every time I've done EV I get into a discussion on expenses being too optimistic, and I think it's just in the nature of optimism again in the profession, but that seems to be a point of contention.

So, in summary, what does this take? It takes a lot of runs. It takes knowing your business. I showed one line of business here. You could be doing this across the entire company, as well as by line of business, for the summary of earnings and the roll-forward. You think through how many runs you have there. You have runs that say: Am I comfortable with my assumptions when setting it up? Do I understand my movement? Do I want to change the order of introduction? Other sensitivity tests or runs, as Lori alluded to, are always in your EV runs. So, the number of runs, the model points and number of models, as we all know, can be quite onerous. Getting those all through and quantifying your movements can be quite a task. However, if done right, it brings the whole process of EV together and allows you to understand what's happening in your business. A good example I like to always give is looking at stat, GAAP and EV. If you have a big death in a year, there's a cash flow that comes through, and on a traditional bases you'd say, "Wow! We lost some money to a death. That hurt me this year." If interest rates went way down, let's say cut in half, your impact in the GAAP and stat would be almost nothing. You'd recognize that it drops, but you could also see that it didn't hit me yet. My portfolio hasn't turned over. If you go to EV, those relationships flip-flop. Yeah, having a little bit high mortality for one year also a fluke and really doesn't impact your EV much, but a spread prospectively will kill you. So, it really lets you look at what has happened in the environment as well as actions taken by management. It's really worth the effort to ask where I am creating or destroying value versus looking at traditional accounting bases which really might give you a false positive or false negative.

Before, I mentioned that it allows you to identify the economic versus non-economic pieces that are under control of the company, whether it be from the pricing actuaries to underwriting, expense allocations and/or expectations. Is new business making money? Are we being too optimistic here or there? So, it really allows you to point the finger at who's doing what well and who's doing what poorly. And then you have the sensitivities. The ultimate point that we're getting to in the industry, and the EEV is leading the charge right now, is that economic capital processes and so forth are moving toward stochastic. I won't get into that, but it really is the next stepping stone to say, okay, what are the true value of my business on more of a fair market value versus a static?

MR. STEEVE JEAN: I'm sure you all understand that it takes a tremendous amount of work and effort to produce EV numbers and explain them, and when you go through the movement analysis and understanding the economic and uneconomic factors it's a tremendous amount of work, but once you have all the information available to you and senior management, what do you do with it? What uses and benefits can you get out of those numbers and those analyses? That's going to be the first part of my presentation. The second part is going to cover some of the new EEV requirements and principles that have been rolled out for European companies.

So, we're going to go over how to use EV to measure the value of the company. Lori's already covered that. We're just going to do a brief recap of that. We're going to go over some of the management and business decisions that EV can be used in. How do you use EV to improve your external communications with analysts and rating agencies? A lot of the European companies are required to publish it, so it's not an option, but it is optional for the company to publish it. How can you use that to support your primary financial statement? EV is a major component of incentive compensation for a lot of companies. So, we'll go over that a little bit. How do you incorporate EV in your pricing process and discipline and make sure that the way you price your products is consistent with how you measure value added at the end of the year?

On the EEV side I'll give you a brief overview, talk about the 12 principles that have been published and go over some of the practical implications of those principles.

So, first, EV can be used to measure the value of the company. It provides the value of the in force, which basically represents the present value of future profits on the existing business. You also have the adjusted net worth, which is more your retained earnings and capital contributions and shareholder dividends. And although it is not an appraisal value, sometimes you'll see companies show it as a proxy for appraisal value by adding multiples of value for new business. You might take the EV at the end of one year and add five times or seven times the value of the business sold in the prior year and then kind of use that as a proxy for an appraisal value.

On the business side EV can, and probably should, be used in most of the key business decisions companies make. For investment purposes, you can use EV to look at different investment strategies and different asset mixes. Companies have been struggling over the years with total return strategies, and they're not sure the way to compensate asset managers is consistent with the value they bring to the company. So, we'll go over that a little bit in the incentive comp side. We'll talk about asset managers again. And you can use that to investigate, like I said, different investment and asset/liability modeling (ALM) strategies. You can also use EV to look at new product initiatives and new business pricing. Looking at different products, you need to capture different products so you can capture the capital requirements, such as cost of capital and different profit signatures. There could be some tax implications. And your ROI obviously is going to give you some level of comfort that you're pricing at the right level, but if you monitor your value of the business and compare different products or different strategies you might have in mind, from an EV perspective that definitely gives you additional insight that are very valuable.

In-force management is another area EV can be used. You can re-price your products. You can increase cost of insurance (COI) or premiums. I don't think you decrease them very often, but you'll often have to reset COIs and premiums to a level that's consistent with experience. You'll set your renewal credited rates. If you equity-indexed products, you'll try to manage your option budget by setting spreads and caps, but you can also use those as part of your pricing decision and look at resetting the value of that block of business. So, companies will look at it from an ROI and say, well, can we re-price a product to get back to our target ROI? but you can also look at it and say I'm going to re-price this product to reset the pricing value of that block if you want. So, you can look at it from today and decide you should expect the value of that block to be \$100 million today. Then you can decide to re-price it to get back to that level, and you might also try to recoup some of the prior losses as part of that pricing exercise, but then you're looking at dollars. You're not looking at 12 percent versus 11 percent or 13 percent. You're really looking at a value that has been lost because of poor experience, and now you can recoup or reset that value through the pricing exercise.

The same thing is true with renewal credited rates. Obviously then you get into issues like policyholder behavior and lapse and dynamic lapse assumptions. It's a little more sensitive there on the assumption side, but you might also want to look at your renewal rates and look at your original target new business margin—and we'll go over new business margin later—and try to determine how you can adjust your renewal credited rates to get back to the same either ROI or new business margin level that was originally priced for.

Reinsurance can be part of new business or inforce management. You look at your existing arrangements and deals. Should you try to renegotiate them? Should you consider recapture in some cases? You can also analyze different potential deals on the inforce and, if you have two or three different quotes or opportunities, decide

which one's going to create more value to the company. So, again, EV's a tremendous tool in doing those kinds of analyses.

External communications is another area that benefits from EV. EV is not a substitute to your primary financial statements, but it's definitely a strong complement. It can be viewed as an estimate of the economic value. I know that we can get into the old economic capital discussions, and if that is a better answer or better tool, but that's not the scope of this discussion. However, you also have to realize that although EV is a key element, we're seeing more and more activity on the economic capital side also as a way to improve communications with the shareholders and the analysts and the rating agencies.

If they're going to monitor value, they're going to see if you're adding value through new business. They're going to look to see if the change in value came from economic or noneconomic factors. They can then assess if it is really the management that's creating value or deteriorating value, or really if it's the economic factors that are adding most of the value. They will assess the quality of management through that. The disclosures and sensitivities provide insight on realization of value because on the disclosure side they're going to look at movement and explain it. So, you'll see that in most financial statements in the EV report, which is similar to what Matt was explaining.

They're going to show all the different pieces. They're going to show change in economic assumptions. What's the impact of that? What's the impact of change in experience assumptions, such as lapses and mortality? They'll also look at current period variance analysis. So, if you have experienced variance in the current year, and you expected your statutory earnings to be x, and they ended up being y, how do you explain that variance? And they're usually going to split it between an investment variance and an experience variance, and then you can use that to understand the potential sustainability of that EV that's reported.

Also the sensitivities give you an assessment of how sensitive that EV is to different assumptions such as the discount rate, different spreads, different lapse rates and mortality rates. Usually they're fairly common, such as looking at a 10 percent increase in lapses or 25 basis point change in spreads. So, they have some kind of proscribed sensitivities that are reported, and you can also use those to compare different companies and their different discount rates. They show you sensitivities. If you move the discount rate up or down 1 percent, you can see what the impact is on the value of the inforce. It can be a tool to compare two companies and see if one has higher or lower value.

Obviously it's very big in Europe. European companies publish it, and more U.S. and Canadian companies now publish EV. It started like once a year. Way after year-end they would publish their year-end results. Six months later and it was almost becoming part of their regular close process that they want really timely and valuable information to be published and provided to the external world.

It can also benefit incentive compensation. That gets a lot of senior managements' attention. Incentive comp plans usually have an EV component to them. They have expenses obviously, and GAAP and return on equity (ROE). They can have different other components, but EV profits, or sometimes return on EV, which is just EV profits over your beginning of period EV, are components of incentive comp plans. There is also value of new business. I've seen a case where senior management and the executives will not get any incentive comp if they don't have positive value of new business. So, they do a first test. If there's no value of new business for that year, that's the end of it. It's a pretty strong statement to senior management that they need to create value not only in the inforce but on an ongoing basis. They also use different measures and different bases. So for incentive comp purposes, they're going to back out the impact of the change in the discount rate. They might back out the impact of the change in the in the foreign exchange rate if you're consolidating different countries together. They also might also exclude one-time events, and those are usually more negotiated on a case-by-case basis. It could be a change in regulation, a catastrophe or there could be some negotiation to exclude that from the incentive comp basis.

Coming back to asset managers, again, there are a lot of debates and struggles with total return strategy. Asset managers can and probably should be somewhat rewarded on the contribution to EV, and this can be done a couple of different ways. On the new business side, you can have an expected pricing value of the business based off a benchmark, and then you can look at the actual investment performance on that new business segment and share some of that additional value or negative with the asset managers and make sure you're aligning the incentives between what they do and how you're rewarded and compensated.

Also, if you have a very active trading strategy, it's very hard to confirm and support that all that trading strategy is actually bringing value, and EV is definitely a strong way again to capture the real value added through that active trading strategy. It's going to capture the cost of capital. There could be some different asset classes or different RBC requirements and capital requirements, and it's also going to capture any duration change. So, the asset managers are playing duration and trying to stay within tolerance but optimize there on total return strategies. You can capture some of that through your EV work.

Now I'm going to talk about incentive comp for sales and marketing. Sales executives usually are rewarded for top line growth, and that's actually beyond EV because now there's a lot more focus on capital ROE and EV. So, senior sales executives need to have a much better understanding of what it means selling different products. What does it mean from a capital perspective? What does it mean from a GAAP ROE perspective? Different products have different profit signatures, and they may all be within your pricing ROI target, but they have totally different impacts on capital ROE and value of new business. So, a lot of work needs to be done there, and I think there needs to be a lot of communication between pricing, the people responsible for producing EV and the sales and marketing folks.

They need to share that knowledge and make sure everybody's pulling in the same direction.

Now let's talk about benefits of EV on pricing and value of new business. It complements traditional pricing measures, such as return on investment (ROI), internal rate of return (IRR), etc. If you publish it, obviously it gets a lot of scrutiny. It's measured in dollars. So for example, if you roll it forward and you have \$100 million of value to the business at issue, and then if you roll your strain into your adjusted net worth, you get a value of new business at the end of the year. Companies also look at new business margin, and that is the value of new business at issue over an annual premium equivalent (AP). The traditional definition of annual premium equivalent has been an annualized premium on a recurring product and 10 percent of the premium for single premium products. So, you do that ratio and you monitor this, comparing different products and different time periods. Now the definition has changed a little bit under the new EEV principles. For recurring premium you look at the present value of premium as opposed to annualized premium, and then you take the full single premium on single premium products. Obviously it just changes the numbers, but it's still a very strong tool that complements your traditional pricing measures.

As part of the EEV principles under EEV, you need to reflect the value of the options and the guarantees. So, that leads us into the stochastic and modeling process. What it means from pricing perspective is that either they need to do stochastic pricing or they need to understand what the value of the options and the guarantees built into their various products are. And you can use that as a topside adjustment. It could be 2 percent, 3 percent or 6 percent. That's the value of the options and the guarantees without necessarily going through a full stochastic pricing exercise. But if you report the value of new business monthly on the pricing side, and that's going to be rolled up and reported and compared to an actual value of new business, you need to build that into those monthly calculations and that monthly reporting.

What EV also allows you to do that can also be done from an ROI perspective is to compare your expected value of new business on a monthly or quarterly basis to the actual value of new business that was generated and explain the movement do some kind of reconciliation and say that was the investment variance. If your expectation is based off a benchmark, that's the actual investment return we got. That's actual value added or loss to the investment side. It could be an expense variance. It could also be a different product mix. A different sales level obviously is going to be a big impact, but if your product mix was a little different that could have an effect. In some case I've seen age distribution being different within some products, and that difference in distribution was significant enough to affect value of new business. You can go through that reconciliation, and it shows you dollars for each of those variances as opposed to going from a 12 percent target to a 10.5 percent actual ROI. And you can do that from an actual to expected, but you can also do that from period to period say I'll compare value of new business sold last

year to this year, and how do you explain the movement? Then you get into discount rate changes and so on and so forth, but you need to explain actual value of new business from year to year as well.

Before we go to EEV, I want to add a couple of examples of what I've seen. One example that I've done years ago in a prior life was to look at distribution channels. You can look at different distribution channels, look at their EV and monitor it, look at their value of new business and look at different marketing strategies. So, you can actually use it for much more. To look at distribution strategies and marketing strategies can be extremely helpful. In one case we had a captive sales force, and there was a very high producer that was considering moving to another company, and we were debating whether or not to try to retain that individual. So, we were able to look at his value of inforce going back three quarters, and we pulled all his policies, looked at his EV progression and did some analysis, looked at his persistency and his product mix, and he was a very, very high producer. He was above average from a production standpoint. However, he was below average from an EV or a value of new business perspective, and the decision was made not to try to retain that individual. So, that's a very practical application, and then you can do that with different managing general agents (MGAs) if you have a different distribution strategy and look at their value of new business and their contribution to EV on a periodic basis.

Now I want to give an overview of EEV. The Chief Financial Officer (CFO) Forum, a group of European CFOs from the major European insurance companies, developed 12 EEV principles. The purpose of that was to improve the quality, the comparability and the transparency of EV results in the industry. So, they were looking at different companies and noted that they're not very comparable. They have different discount rates and different required capital levels. The cost of capital is not very comparable. The business that's included or excluded is different between companies, and also one of the major flaws that they identified and the analysts were complaining about is that the value of the options and the guarantees were not reflected in the EV results.

So, those principles are not proscribed by law or anything, but they are strongly encouraged to be complied with by the end of 2005. Most of the companies have already implemented them. Many have restated prior periods, such as 2004 results and in some cases it's been implemented as part of the –mid-year 2005 EV results.

Here are the 12 principles:

- Principle #1 - EV is a measure of the consolidated value of shareholder's interests in the covered business.
- Principle #2 - Business covered should be clearly identified and disclosed.
- Principle #3 - EV is the PV of shareholder's interests in the distributable earnings of the covered business.
- Principle #4 - Free surplus is at market value.
- Principle #5 - EV should allow for the cost of holding the required capital.

- Principle #6 - The PV of cash flows from assets backing liabilities is reduced by the value of the financial options and guarantees.
- Principle #7 - The allowance for financial options and guarantees should include the time value of money and be based on stochastic techniques.
- Principle #8 - Value of new business includes the value of expected renewals.
- Principle #9 - Assumptions should be based on past, current and expected future experience and be actively reviewed (best estimate).
- Principle #10 - Economic assumptions should be internally consistent. Smoothing is not allowed.
- Principle #11 - Future profit allocations and bonus rates on participating business should be consistent with the projections assumptions.
- Principle #12 - Deals with disclosures.

Principles 1 and 2 talk about the covered business. So, EV is a measure of the consolidated value of the shareholder's interest in the covered business and the business coverage to be clearly identified and disclosed in your EV report.

The next principle says it's the present value of distributable earnings in a covered business. That's nothing really new here. Lori discussed the idea in Principle 4 of free surplus at market value. Principle 5 states that EV should allow for the cost of holding the required capital, and what's slightly different here, they're trying to convince people to report or at least disclose cost of capital under their regulatory capital requirements, and looking at the level that regulators would have to take action and try to bring everybody a little more into sync from a cost-of-capital perspective.

Principle 6 establishes that the present value of cash flows from assets backing liabilities is reduced by the value of the financial options and the guarantees, and this is where all the stochastic work comes into play. Now when you have to do stochastic EV you're going to have to run a thousand scenarios. You will take the average of those and compare that to your deterministic EV number and the difference between the averages. That deterministic number would be the value of the options and the guarantees. And that's a whole session in itself. No. 7 states that stochastic should include the time value and be based on stochastic techniques. So, that ties into No. 6. No. 8 says you should include the value of expected renewals in the value of new business.

If you have flexible premium products, there have been different practices as to including or not including future premium on flexible premium product and now Principle 8 says you should include them on a best estimate basis.

Principles No. 9, 10 and 11 really address assumptions. They say that assumptions could be best estimate. Economic assumptions should be internally consistent obviously, and your policyholder behavior experience assumption should be consistent with your economic assumptions. So, you should ensure consistency

between dynamic lapse rates and policyholder behavior. When you get to stochastic EV it's especially important to make sure that everything's working together properly.

Principle 12 deals with disclosures. There's a lot more detail on www.cfoforum.nl. You can see the full text of the 12 principles, some background information, why those principles were put in place, how they were developed and some of the announcements that have been made by some of the member companies.

Stochastic modeling's by far obviously the biggest challenge. Generating all the scenarios can be a real task, and you might have scenarios already from economic capital work or some other stochastic work that you've done. So, you might want to piggyback off those, but if you don't have them, you need to make sure you're able to generate a consistent set of scenarios. From period to period how do you ensure that you have some kind of consistency in those scenarios? Correlation among assumptions, including policyholder behavior, is important and we briefly covered that earlier. Runtime, Computational limitations, such as run time can be a challenge. Just doing the deterministic EV work is huge effort, and you have to run a thousand scenarios within very short timeframe. How do you address that? Do you have some kind of a lag? Do you use your prior periods of stochastic work to adjust your current period EV results to reflect the cost of the options and guarantees? There are all kinds of considerations that you need to take into account. And explaining the movement in EV is another challenge.

The discount rate methodology should be reviewed. Usually it's a spread over the risk-free rate (e.g., 10-year Treasury). Companies have all different spreads, but if you go to stochastic EV, you might want to go back to a bottom-up approach and say, well, now my options and my guarantees are reflected in my EV. Some of the risks are already reflected. Should I adjust my discount rate for that? And then what's not covered? What's still in that risk premium that I should take into account? And there are also other issues, like should the discount rate vary between scenarios? Do you use a single discount rate or do you use scenario-specific discount rate? Coming back to new pricing, after you've done all this, how do you incorporate that into your pricing process so they also reflect the cost of financial options and guarantees? Use the full required capital level as opposed to maybe a different basis that's been used for pricing until now and synchronize all the pricing and the reporting of EV results.

FROM THE FLOOR: I just wanted to ask a very elemental question. I never work in EV, but I'm curious. Is it true that if, for example, all my assumptions materialize when I do EV last year and then after one year see all the assumption materialize that EV remains the same? Or will they change?

MR. CLARK: So, your question is if your assumptions materialize as planned?

FROM THE FLOOR: Yes.

MR. CLARK: No, there are other elements. First of all, there's new business. I showed that your new business was actually part of your expectation. You also have the movement and discount rate, which will have an impact on your EV.

FROM THE FLOOR: Excluding the new business assumption. That's because you use a different discount rate from the investment return rate when you calculate EV. You use another discount rate, not really the investment return. So, I think it will automatically change the EV year by year. You are creating some value or losing some value without even all of your assumptions materializing.

MR. CLARK: One of the assumptions that I did not change but I had up there was that cost of capital. So, the cost of holding your EV for a year was that discount rate multiplied by your beginning EV. Your EV will change because of the required return, the hurdle rate, discount rate or whatever you want to call it, that you've used. So, your EV won't stay the same. It's the difference between your expected and actual EV that we're looking at. Your EV will not stay the same from one period to the next once you're at 0 percent discount rate.

FROM THE FLOOR: So people should look at the change in the expected and the actual value rather than look at one value from last year compared with this period?

MR. CLARK: Yes. The only difference between the expected and the beginning pieces really is that hurdle rate impact to the cost of capital. I showed it in one of the charts I presented. It was 12 percent times the beginning I estimated. So, your point's a good one.

MR. ROBERT HONKOMP: I've played with EV and value added and that sort of thing in the past, but one thing that always seems to come back to haunt me is the model itself. When I compare the model results for the prior year to what really occurred it always seems like there's so much noise in the model that it just kind of gets lost. I'm just wondering from a practical standpoint how fine of a model do you really need to make EV meaningful?

MR. CLARK: There's a certain point where you try to capture your impact of the true-up with last year's model. There's also a point where you leap and say, okay, I have a new inforce. I don't want to make changes to last year's roll-forward. You never explain all the pieces. There's always an unexplained piece because of that noise and the complexity of trying to roll it forward. You have a compressed model. You don't have seriatim. When you get to stochastic you need it even more compressed to be able to run it. It's a big challenge. In fact that's probably where a lot of time is spent. I can't tell you how long that time spent is because I haven't done it personally for a company, but it can be quite significant.

MR. JEAN: It's definitely a big challenge, and few examples that I found that I ran into include premium tracks on UL. So, you split your block into low or different premium tracks, and policies jump from one track to the other from time to time, and then you get a lot of movement. So, if I look at that block that has the high premium and the low premium, and I look at it six months later, I can see that the value switched, and a lot of it is just explained by policies moving from one bucket to another. At one point you almost give up, but you'll say, well, on a total basis do these two buckets totaled make sense? Does it seem consistent? Then you cannot move on. I think modeling refinements really depend on the product line. If you have an annuity block, obviously you could probably have different modeling refinements, and you have term life or UL blocks to analyze. Then you also get into the runtime issues. Well, how much value do I get by having twice as many cells? In my model maybe it makes my explanation a little easier, and I get less noise, but it's going to take one more week before I get a number. So, it's a big issue.

MR. HONKOMP: It seems like if we ever get to principle-based valuation we'll definitely have to have very good, fine models, and that would just dovetail with EV.

MR. JEAN: By the time we get there, hopefully computers will allow us to run seriatim anyway.

FROM THE FLOOR: Modeling is very complex. How can you be assured that you don't have modeling errors in the model itself? It's very hard, even if you are going to peer review it, to actually validate that the model's working correctly.

MR. JEAN: One way I've done it personally is to monitor the EV on very small pieces. It could be a plan code or it could be a group of plan codes or products. I just look at their EV from time to time. And I found errors just through that process. Ninety percent of them are going to trend in the same consistent direction for that line of business, and then they'll have a couple of plans or a couple of products that are going to go all over the place. We usually resolve many of the modeling issues through that analysis.

MR. CLARK: The whole point on modeling and leveraging common models and assumption sets becomes even more important with GAAP, cash-flow testing and EV. They don't have to be the same, but they should be very close or explainable why they aren't from an assumption standpoint. Hitting the stochastic processes, and that's coming around the corner, will exaggerate some of your errors. We think that's the easy part, but it becomes more and more scrutinized. The prior question and yours together will definitely exhibit that. I think UL, the example that Steeve gave, is where we as actuaries fail as far as getting granular enough models on premium and funding. Almost every company I look at is getting caught by that inconsistency. So that's probably the one area that's easiest to understand.

MS. HELGE: I think the last two questions are kind of getting into the transparency of the whole thing. With cash-flow testing there's a lot that's going on around in the background, but with EV you're kind of laying all your cards on the table, and that transparency becomes very apparent, and Matt I think mentioned the unexplained modeling error. The one company I worked really closely with for years on that had standards as to what that unexplained had to be or how small it had to be, but I have to say with a lot of work most years we got it there. There was occasionally a time when we wouldn't, but it would involve model refinements, such as refining your age grouping so that you were better recognizing the mortality differences at some of the upper ages, for example, in a traditional block. It just all becomes more transparent, but I think that's a good thing because, as Matt pointed out, the stochastic is going to point out more issues with your modeling, but bringing those issues to light and addressing those issues will give you a better result at the end. It's most definitely a challenge, though.