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Session 67 PD
A Brave New World: Pension Accounting Standards– Testing, Testing (Does This Thing Work?)

Track: Retirement Systems Practice Area

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Coordinator: Kevin J. Shand

Summary: In session 55PD, A Brave New World: Accounting Standards, a number of proposals and ideas were discussed with regard to pension accounting standards. This session re-examines these proposals using realistic scenarios to understand what might be produced in the real world.

INTRODUCTION: The session coordinator is Kevin Shand from the University of Manitoba in Winnipeg. The panelists include Gerard Mingione with Towers Perrin in Philadelphia, Bruce Cadenhead with Mercer Human Resource Consulting, and Mark Ruloff with Winklevoss Technologies in Greenwich, Connecticut.

MR. GERARD C. MINGIONE: The first thing we do is update the actuarial assumptions each year. We update the discount rate. It's not exactly right all the time; it's not perfect. If we're basing on Moody's, Moody's occasionally has some flaws. I acknowledge that, but it is updated to current conditions. The return on asset assumption is supposed to be updated, as well. I'm not sure it is always done on a rigorous basis, but it's done. The rate does change. For funded status changes,

All charts referred to can be found through the link on the table of contents.

go right to the bottom line, under certain circumstances. However, when they go right to the bottom line, there are a lot of offsets and intangible assets. They're somewhat illogical. It doesn't make a lot of sense the way it's done. It's just bad management if you're counting on that as discipline.

For pension expense, it takes those capital market events, those results, and trickles them and dribbles them into the income statement over a long period of time. Again, the results are sort of illogical. Right now it's more or less being ignored. I don't think pension expense is a number that people are counting on, which is one of the reasons why transparent accounting is obvious in terms of its inevitability. You have to look to pension footnote disclosures today to know what's going on, and you can't count on pension expense.

Under current accounting, we're talking about all the smoothing and deferral, and the recent pension cost isn't working that well. The main reason is because it's got an expected investment return rather than an actual return. Actual return is not something that you could ever apply a multiple to or assess operating earnings based on. Expected return has its flaws, as well. One of the flaws is that we use a smoothed value of assets, so it's not even expected return based on actual assets; it's a theoretical value based on theoretical assets. Once we recognize plan experience, we have this corridor. The stuff that gets over the corridor we recognize over 10 or 15 years, so there are a lot of filters to get through before you get to pension expense. Similarly on the plan amendment side, you make a promise of the plan amendment and dribble in the cost over 15 years or so. A lot of these approaches have been widely criticized as insufficiently reflective of actual results.

Let's look at what's happened as a result of this kind of accounting (see Mingione slide 5, page 3). The blue line that is a little fainter is funded status, red represents pension cost, and green was in those days a lot of us can still remember when we had pension income. These are averages for all Fortune 100 companies, 81 of whom, believe it or not, have DB plans, so this is the average for 81 Fortune 100 companies. Putting these companies in perspective, their average revenues are $44 billion, and their average operating earnings in 2003 were about $4.5 billion. Even when we did start recognizing the $217 million, those pension costs weren't that big in terms of operating earnings of $4.5 billion and revenues of $44 billion, so we have an understandable pension-funding problem. Pension funding status bottomed out at about 78 percent and last year recovered to about 83 percent on average, but we didn't reflect all that much of it.

To give you an example of how little of it we reflected, from the peak at the end of 1999 to the trough at the end of 2002, we developed an unfunded projected benefit obligation (PBO), or reduced our PBO funding status by $4.5 billion. But recognizing that, we picked up only $350 million from the trough to the peak in terms of pension expense, so we picked up $4.5 billion of unfunded. The most we're recognizing of that is about, as I said, $350 million. That's not that much of it, and that's just an example of how all that smoothing works.

The dirty laundry that we're hiding in the closet is that when we have all that smoothing, we pick up deferred pension costs, which are unamortized balances that are going to have to hit the books one of these days. They exist, and we just haven't recognized them yet. They grew from a surplus of $1.7 billion to a deficit of $2.9 billion over the past couple of years. Remember that our companies have average operating earnings of $4.5 billion, and the prior year was only $3 billion, so if we recognize these, the operating earning would pretty much be obliterated for the average Fortune 100 company. That's a lot of laundry stacked up in the closet.

What would transparent accounting do to fix all this? We're quibbling around the edges on some of these issues, but it's pretty obvious. We would use fair value of assets and reflect actual return. We would reflect actual return by recognizing gains and losses immediately. You pick up an unfunded liability, put it on the books and recognize plan amendments immediately. There are some less critical issues that I'm not going to talk about and that I haven't built into any of the models. Those would be moving to accumulated benefit obligation (ABO) versus PBO and the risk-adjusted discount rate. There's a lot of conflict about that one. I think it's going to be difficult to reach agreement that that would be appropriate.

How would we categorize the pension expense so that the books of the company still make some sense, can still be used and can still be an assessment of how the company is operating financially and how it might continue to operate in the future? Basically, this is a fairly educated guess as to what's going to happen. It might not be exactly this way, but under the operating category you'd have things like service cost and liability-related experience, so if you update your mortality table, it's probably going to end up here. Any plan amendment cost would operate here, which you've got control over, of course. If you have a settlement or curtailment cost related to that, it would end up over on the operating side. Those are numbers that would go against operating earnings and that would get a multiple. Considering most of it is under the company's control, that might be appropriate.

All the capital market noise is sent off to the financing side, including interest cost, investment return and the effect of changes in financial assumptions. My argument is that all that stuff is already obvious from the footnotes. Putting it on the balance sheet may not make that much of a difference, whether it's in the footnotes and analysts put it on the balance sheet themselves, or whether you put it on the balance sheet from the start. It might be cleaner to do it from the start, but I don't think the information is that new. As long as you're not messing up the operating earnings, I think accounting could continue almost as it has been for the past couple of years after people woke up to the pension accounting issues.

Here's how the results would have looked (see Mingione slide 9, page 5). Again, I'm averaging all of my 81 Fortune 100 companies for the past couple of years. You're probably familiar with those and already graphed them, so I'm not going to spend any time talking about the actual results, which are $218 million in 2003 of cost and $10 million in 2002 of cost. The operating elements would be a lot higher

because plan amendments would be booked immediately and because of curtailments. These were times when companies were still laying people off. If they gave out benefits or got losses because people left early or took lump sums, those all ended up in that operating earning side. The numbers are bigger as a result, but they're not more volatile. They're not volatile at all, and considering that it is under the company's control, companies might have acted differently about giving out benefits, curtailment or plan amendments, so I don't think there's a problem with the operating side. Maybe these years might not be totally represented, but I don't think there's a big problem.

The financing side jumps all over the place mainly because return is jumping all over the place. We had a -8 percent return in 2002, and in the following year we had a 17 percent return, so the financing contribution is moving around. Also, discount rates kept dropping during that whole period, so we got what we might call "amortization/other." That's dominated by changes in discount rates, and there's a little bit of currency noise that gets in there, as well. That last column is noisy.

This shows the same kind of numbers (see Mingione slide 10, page 6), only now we're taking a forward look for a sample company. To the extent it's meaningful, these are expense figures, but the scale is different because this is a sample company that has a payroll of about $550 million, so it's nowhere near the size of our Fortune 100 company. Don't be thrown off by the scale. This indicates that under current accounting we have some volatility, but we're going to have a lot more in the total expense if we go to transparent accounting.

Getting rid of smoothing is the second bar, and we're talking year one, year five and year 10. The story is pretty similar. Getting rid of smoothing adds a little volatility, but not much. Getting rid of the corridor may add a little volatility, but not much. Recognizing all the gains and losses immediately is where all the damage is. Clearly that's the big noise. If that weren't to occur, if we weren't to recognize all the gains and losses immediately, the story would be dramatically different.

If pension costs were made to reflect capital market results on an immediate basis, what would plan sponsors do? I'm not sure if they'd do anything, but if they were to do something, they'd look at their investment policy and think about reducing amounts in equity and raising amounts in matching (presumably long) fixed-income securities. They might change the contribution policy to address unfunded liabilities as they emerge. I'm not sure. Nothing jumped out at me from the numbers we're looking at to say contribution policy would change.

As practicing actuaries, we know these policy changes come at a cost. Pension plans can be expected to be viewed as more costly to maintain. It depends. If you think that the disclosures you've been sending out and the analysts have been digesting were 100 percent recognized in the marketplace, you might say it's more of the same. On the other hand, if you don't feel that way, if you feel that some of

the expense figures or the smooth figures you've been sending out have been recognized and used, you have to consider the new accounting more volatile, so there's a possibility that that would occur.

To the extent you view the plans as more costly to maintain and as being more volatile, that implies that some companies will think about reducing plan benefits or banning defined-benefit (DB) plans in favor of other vehicles. The question that you'd have to ask yourself is, "Is this a bad thing if those companies decide the plans are more risky based on looking at the market values? Is that a bad thing, or were they just wrong in their viewpoint in the past and they're just fixing it?" I don't know.

I'm going to focus a little more on investment policy implications than anything else because that's what jumps out when you look at the accounting and that's what everybody is pointing to, saying, "We're going to go to all matching bonds." Why would we presume there would be an incentive to switch to reduced risk investment strategies and better link assets to liabilities? To some extent, this is easy. We've been making some dumb mistakes in the way we've positioned fixed income in a lot of our investment strategies, because you can increase return expectations and get better matching simply by moving from a core bond Lehman aggregate fixed-income strategy to a long strategy. For a traditional plan, anyway, that's an easy win, a no-brainer. Why haven't we done it? I don't know. That's easy, and some of the stochastic graphs will show that clearly.

To the extent that you replace large quantities of equities with fixed income, dynamics changed dramatically. Return expectations are reduced, while volatility results are diminished. Expected return GAAP accumulates over time. As equity risk premiums become more certain over multiple market cycles than they are over a partial market cycle, this implies that the benefits of highly matched portfolios would be evident only over the short term. If you're a company that might not survive the next market cycle, you'd better be aware of what's going on in the short term. But if the pension plan is of a reasonable size and your company is reasonably secure, you might be able to look beyond two or three years to five and 10 years. The dynamics of equity investments versus fixed-income investments are very different at that point than they are over two or three years.

We have some numbers on this (see Mingione slide 13, page 7). They're not perfect; they're just an illustration, again based on our sample plan. This is annual expense for given years one, five and 10. First, I took the transparent accounting. I didn't change the 60/40 strategy. The 60/40 strategy that we used was dominated by aggregate bonds. It had diversified equities, but the fixed-income 40 percent was mostly Lehman aggregate bonds. That first bar on the left in each segment shows what you get when you do that.

The next bar is the easy win. It says in this case, where 35 percent were Lehman aggregate bonds and 5 percent were in cash, I'm going to replace that with 40

percent long corporate bonds. The cost goes down because the returns go up. The matching is a little better. There's a little suppression in the range of results.

Next I'm going to go 70 percent long corporate bonds instead of 40 percent, and then I'm going to go 100 percent long corporate bonds. Let's focus on that far-right example, because that's a nice one to look at. What happens? I raise expected cost. No one is going to dispute that. Of course, that's what happens. I suppress the range of results, but I didn't suppress it all the way to nothing. That had us scratching our heads. Why didn't I get perfect suppression? Why isn't that a fixed point? I'm still basing on PBO. I've got a service cost and PBO is responding to wage increases, which I cannot immunize against. There's inflation. I'm immunizing against one snapshot view of what the forecast of planned disbursement is going to be. That's not perfect. In this case I still was 85 percent funded, so I was not always 100 percent funded. My conclusion is I could probably do a little better if I start tweaking durations and worrying about convexity, but I don't think it's ever going to go away, so be aware of that. You're never going to get a perfect match. There isn't anything out there that will give you a perfect match to a final pay pension plan.

I thought a more interesting view would be cumulative expense (see Mingione slide 14, page 8). Cumulative expense would be a great view if you can afford to take a long-term perspective and not worry about individual years. This is where the results got interesting. I focused on the 10-year cumulative because if you wanted to put on your actuary's hat, it says, "I'm a long-term-oriented investor. I can live through the short term." If you can live through the short term, those 10-year results should give you pause. Basically, those results indicate that I could have reduced my cost over a 10-year period from $473 to $402 simply by taking that long-bond strategy with respect to the fixed income I already had. If I go to all long bonds, I essentially double my expected cost from $402 to $790.

I'm not sure anybody is going to dispute that. You can quibble about what the risk premiums are and how much it is, but on an expected basis, it's going to go up. It's going to go up by a lot. Remember that I started off with $550 million in payroll. It grew to $725 million over the forecast period. Over the whole forecast period that's 6 percent of pay increase in cost going from 40 percent long bonds to 100 percent long bonds. That made me pause. I've shown results like this to clients thinking that they'd be attracted to long-bond strategies, and the ones that can look through the short term essentially aren't for this reason. They can't handle that increase in cost. Before they would handle that increase in cost, they would change plan design or go away from DB plans. That's unfortunately the conventional wisdom.

What are my conclusions from all this? There's a significant reduction in expense volatility with a highly matched strategy. We could refine the strategy and do a little better. I'm sure we could. I didn't do everything perfectly there, I guarantee you that, but no matter what you do, you can expect to pay a heavy price over time for a reduction in expense volatility, and the reduction in expense volatility

was only half. The range of results was cut roughly in half, so if you do something, it's not going to be perfect.

In my example, expected pension expense doubled (it was about 6 percent of payroll higher over the forecast period), and most of the change was seen as a suppression in the probability for highly favorable outcomes. Look again. Of the percentiles I'm showing, not one of them is more favorable. A client who saw this said to me, "Essentially what you're saying to me is that I could make the downside risk a certainty by going to all long bonds." I couldn't argue.

MR. BRUCE CADENHEAD: We did a case study earlier this year for a prospective client. It was a quick analysis of the information that we could gather about its existing plans, what a five-year stochastic forecast would look like for it under existing rules, and what it would look like under transparent accounting. For transparent accounting, we focused on the best example we have of that in an existing standard, which is Financial Reporting Standard (FRS) 17, the U.K. standard.

To some extent you could argue that it is transparent accounting, at least if you look from balance sheet to balance sheet. You've got the change in funded status from beginning of year to end of year being recognized in full on the balance sheet. On the other hand, if you look at the way it breaks it down in components and comes up with the profit and loss (P&L), it may not be quite there. It depends on what you do with the information. FRS 17 has components that are similar to what Gerry mentioned in terms of breaking down the costs into pieces. You've got the operating cost, which is primarily the service cost, plus the prior service cost any time you have a past service amendment that's recognized either in full or to the extent that people are not yet vested. You can spread it over the period to vesting, but there's not much spreading going on. They're recognizing amendments in full.

The financial costs, which are the interest costs and still the expected return on assets, are still similar to a Financial Accounting Standard (FAS) concept, where you come up with an expected return based on your portfolio but using market value rather than a market-related value. There's also something known as the statement of total recognized gains and losses (STRGL), which is everything else, or the things that would normally be amortized under FAS 87 but are recognized in full each year as they occur.

The STRGL is recognized in full, but it's not a component of the P&L, whereas FAS 87, although it's the first recognition of most of the gains and losses spread out over time, does bring it in eventually through P&L. It's directly charged to the balance sheet, but it's a below-the-line item like the additional or comprehensive income under FAS 87. The real question is what are people going to do with this information? How is it going to be viewed? If you focus just on the P&L, you've removed even a lot of the volatility that you had under FAS 87 if that was your focus. We'll see that when we look at the graphs.

I doubt anyone is going to do that, but right now I think you can look at FRS 17 versus FAS 87, which is an issue that Gerry raised. Is this giving us new information? There are some differences and some improvements. The expected return on assets is at least based on market value, so you know where that's coming from. You don't have to try to guess what the fictitious number is. The measurement date is always going to be the end of the fiscal year, so to some extent on a FAS 87, you can have information that's up to three months older. By the time you're looking at this information, it's probably all old anyway. It is a little bit more up to date, but it's largely the same information.

Under FAS 87, you still had obligations and assets. You had plans mixed together. You had to do some work to tease the information out, but Moody's, Standard & Poor's and others are already taking the FAS 87 information and converting it into something that they consider more useful and more meaningful. I don't think people are at the point where, if you ask them how meaningful FAS 87 is, they would tell you that this is a good, solid number that means something. You might ask whether this is new information or just better packaging. Is it just being presented more clearly? Maybe it is. Maybe it is just being presented more clearly.

It seems that that makes a difference. Even so, nobody would tell you that FAS 87 is a truly meaningful number. People still seem to care about the FAS 87 expense right now. Maybe not as much as they did, and maybe they're focusing more on the balance sheet. But there is still some element, the current accounting standards being of a concern, and when we switch to something like FRS 17 or another version of transparent accounting, even if we're not giving a lot of new information, it's still going to affect perceptions. How much? I'm not sure.

The case study was an employer with a mature work force. It had two large, traditional DB plans. One was a U.S. plan. It was roughly fully funded on a PBO basis. The other was a non-U.S. plan that was substantially underfunded, about 60 percent funded on PBO starting off. Under FAS 87, they both had significant, unrecognized losses that were going to come into expense somewhere down the road. Both took advantage of the maximum amount of smoothing permitted under the current rules. They used five-year smoothing under market-related value. For purposes of the analysis and so we wouldn't have to get into the differences between U.S. and non-U.S. funding rules, we just assumed a relatively simple funding policy. Forget about what the rules would require; what we want to focus on here is the effect on your books of going to a new accounting standard. Let's use a simple strategy. Each year you fund the service cost, plus 10 percent of any PBO underfunding or surplus. For that purpose, the interest rate that we used to measure the PBO and the service cost was equal to a funding rate, which is like a FAS expected return on assets.

The plans were about 60 percent equity, 40 percent fixed income to start off. To keep it simple, we looked at marked-to-market accounting but did two plans. One was the U.S. plan or roughly the U.S. plan, a plan that starts out fully funded. Then

we looked at the same plan again as if it were to start out 60 percent funded as a proxy for the non-U.S. plan. It was a good proxy, but we didn't get into things like additional risk of currency fluctuation.

The first thing we did was stochastic projection with 1,000 trials (see Cadenhead slide 7, page 4). We varied the economic conditions, returns, interest rates and inflation and graphed the results. To orient you, in each year the median result is indicated by this black dot. The blue bar gives you the range from the 25th to 75th percentiles, and the thin black lines give you from the 95th to the 5th percentiles of the results. We've always oriented so that the good results, lower expense/higher income, are on the bottom of the graph, and the bad results are on the top. The thing that jumped off quickly is that under a transparent standard, we're going to have a lot more volatility in expense. This is not FRS 17 on this first graph. This is fully recognizing everything as it goes through P&L. So this is FRS 17 but including the SRTGL component, the gain/loss component that normally goes straight to the balance sheet, and including that in this expense item because this is the year-to-year change in your position with no smoothing anything, no hiding anything. Obviously things are going to be a lot more volatile.

This is done early in 2004. One of the things that jumps out is that under FAS 87, you already know the expense for the year, whereas under transparent accounting you don't know where you stand until the end of the year. Even for that first year, even for 2004, the year we were already in, we have a wide range of possible outcomes under the current investment policy. Even if you project outward into the future to the end of this five-year forecast, we see we've got some range of results under FAS 87 from the high to the low. We're talking about a $14 million variation, whereas under the transparent accounting, we've got $89 million. Even going out you're not going to have nearly as much volatility. The reason is because we're doing a lot of smoothing in this case. First we're smoothing the investment returns in coming up with our asset value and coming up with our losses, and then we're smoothing the losses in addition to that, so it's going to take a long time for any of that to catch up.

Another thing that you notice going out a couple of years on the graph is that under the marked-to-market accounting, the median result is a better result than under the FAS 87 accounting. The reason for that is that we started off with unrecognized losses in this plan and with some unrecognized losses in addition reflecting in our market-related value. FAS 87 has a lot of momentum to it. You're going to be paying for all that stuff that you carry for many years into the future regardless of what your actual experience is, whereas under the transparent results, the bars don't widen a lot as we go out across the years. We recognize all the bad news at once and then start anew. If we get new bad news we recognize that, but we're not paying for last year's bad news.

In this kind of analysis, we're looking at this from the point of view of pension only. It doesn't say anything about how that fits into the context of the business as a

whole, which can be significant. We were doing analysis for one prospect and looked at just the information that it had in its financial statements and did some projections. It had all this good language in its disclosures about how it has controlled risk, and yet the pension plan (this is a mature company) was huge in relation to the company as a whole. You could see it was invested heavily in equities. It was recording large pension income, and the rest of the business wasn't doing great. It had a surplus at the time we looked at it, and we made the point that where you are right now, you can lock in that surplus and cut down the risk to the enterprise as a whole by doing that.

I'm sure you've cut down on the upside, but you're not able to use a lot of that upside in any case because the plans are already fully funded. Yes, it's doing some paying for retiree medical out of one of its plans, but on its other plan it wasn't going to be able to use that surplus. It didn't seem to make a lot of sense, and the response that we got, which I think was driven by focus on the FAS 87 rules, was that they were giving up too much. They were giving up too much on the P&L and with that focus on the rules, it's not putting any cost at all on the risk of getting there.

The next graph (see Cadenhead slide 8, page 4) shows what happens if, instead of focusing on the full marked-to-market expense, we look at just the operating cost. FAS 87 doesn't separate things out, although you certainly can look up the service cost from the disclosure. If the new thing that people are going to focus on is the operating cost, that's something that becomes less volatile because we're looking at the service cost only, and service cost only is not going to vary a lot from year to year, particularly in these projections. One more background note on these projections is that we're varying the economics; we're not varying the demographics. We're assuming that demographic experience proceeds in accordance with our assumption. There is, in fact, a lot of volatility there, and it's important to note when you present these results that it's to some extent a rosy view of the world.

Things happen. Data change; a company changes its policies, hires a lot of people and terminates a lot of people; the economy is bad and people don't want to leave their jobs. These can all have a big effect on liabilities, and even under FAS 87 liabilities are not smooth as much as assets are. Even though assets tend to be more volatile, when you get this kind of liability experience, and often it happens with a one-year change—you make an acquisition or get rid of a group—results can be a little more volatile than we present here. You don't want to give people a false sense of security in the results that you're presenting.

In looking beyond the operating costs, let's take all of the P&L components of FRS 17 (see Cadenhead slide 9, page 5). It will be the service cost plus interest cost less expected return. I don't have prior service costs in here because we're assuming no plan amendments are made during the projection period. Because you're bringing in the leveraging of interest on liabilities reduced by return on

assets, you've got something that becomes a bit more volatile but still not quite as volatile as FAS 87 expense. You don't have the amortization component, so it's less volatile from that point of view. It's more volatile because we're using market value instead of market-related value, but the net is something that's less volatile, and that's what people focus on. If you think that's what they're going to be concerned about, FRS 17 doesn't change a lot. They already have the information, so what's the new standard going to do? If you ask people in the U.K., a lot of them will blame that standard in particular for what's happened to a lot of the plans over there.

This is background information (see Cadenhead slide 10, page 5). It shows how the contributions proceed under this policy of funding up one-tenth of the PBO underfunding. It starts out low, much lower than the service cost, because on an 8 percent basis, which was our expected return on asset assumption, the plan was in surplus, and we're not worrying about full funding limits or that sort of thing. We've got about a $5 million service cost reduced by an amortization of the unfunded, which gives us about $500,000 starting off and then increases over time.

A couple of other things are interesting to look at. One is what happens to the balance sheet, because that's where things change or have the potential to change (see Cadenhead slide 11, page 6). Remember that in FAS 87, we don't have to recognize gains and losses. Although we do disclose them, we don't have to put them on the balance sheet unless we've got an unfunded ABO, in which case we've got to put everything on the balance sheet and, in fact, reverse of prepaid. Because of those unrecognized losses and because the plan is exactly fully funded, it starts out with a large prepaid on the balance sheet. Because the PBO is bigger than the ABO, we show an asset on the balance sheet. Projecting out a few years, we'll see that we expect to continue showing an asset, but now we have a nonzero probability of showing something that is either zero or a charge, and that's if we have an unfunded ABO.

These graphs are a little bit misleading, because there's nothing in this area from zero down to about $50 million. In reality, if this was the case, the sponsor might elect, if it didn't cost too much, to put some extra money in the plan and avoid that situation, but this illustrates the risk that it faces.

Contrast that to where we would be under FRS 17 or any transparent accounting standard, and we see a much more symmetrical distribution. Because this plan started out fully funded, we'd be at zero at the beginning of the first year. Then we have a range that grows over time of whether or not it would have an asset or liability. The asset or liability would represent the plan's funded position.

This is now the same plan, but it started out on a 60 percent funded basis, and there is not too much that's different here (see Cadenhead slide 12, page 6). There are a few things I'd like to point out. We have a similar picture here. It's a slightly less volatile expense for this underfunded plan, particularly on the marked-to-

market basis, because you've got less leveraging. In fact, if you had an unfunded plan, you'd have much less volatility. You'd just have change in liabilities from year to year and not liabilities going one way and assets going another. If you had a severely overfunded plan, you'd have a similar result, but if you're right in the middle, with assets equal to liabilities, that's where you'd end up with the most volatility. It's slightly less volatile, but not obviously so at the first glance at the graphs.

For expense forecast, this is again the same component. The charts are just for the sake of completeness if you want to take a look at them later on. They show the same series of graphs that we saw for the 100 percent funded plan (see Cadenhead slide 13 and 14, page 7).

Regarding contributions (see Cadenhead slide 15, page 8), we note a similar range, but they're higher because the plan starts out underfunded. There's little probability under this particular funding rule of having a zero contribution during the projection period. We look at the FAS balance sheet (see Cadenhead slide 16, page 8). It's not bifurcated like it was for the other plan because this plan is always in the situation of having an unfunded ABO, at least during this five-year projection period. It starts out having 60 percent funding on a PBO, which is about 70 percent funded on the ABO. The funding rule is almost never going to get it to 100 percent, so it's always going to be in effect showing on the balance sheet an amount equal to its unfunded ABO, which is similar to what we're showing under the transparent accounting. It's just the unfunded PBO versus unfunded ABO.

What do we do about it? Again, it probably depends a lot on how the plan fits from the perspective of the company as a whole. In the one case I talked about where the plan was huge relative to the company overall, it's something you probably would want to do something about, but where the plan is relatively small, maybe you're not as concerned.

Let's take a look at what would go into an all-bond, longer-duration portfolio. What would that do to the results that we just saw? The alternative we're going to look at is 100 percent fixed income. To keep it simple, we didn't try to match the liabilities exactly, so we used a 15-year duration bond portfolio. We've got the same funding rule, except now we're going to set our funding rate equal to our new FAS return on asset, which is equal to the discount rate. So we're going to have all three of those rates be the same, and that's where you get the initial increase.

Even under the current rules, if you went to an all-bond portfolio, you would adjust those rates and would, in effect, take the hit up front in exchange for lower volatility down the road. There are other things that you could look at. You could look at funding policy and how you contribute to the plan. You could look at benefit policy. There are ways to make benefits less volatile. I'm going to focus just on the investment here.

Both of these are now under this marked-to-market accounting, recognizing all gains and losses on a year-by-year basis (see Cadenhead slide 18, page 9). Here's where we were. You saw this one before. Here's where we would be under this all-bond portfolio. Right away there's a much narrower range of potential outcomes, both on the high end and the low end, but a higher median result. It doesn't look like it's that much higher, but one thing that we'll see later when we come to the contribution graphs is that it's higher. It doesn't grow substantially, because you're putting in assets more quickly under this new investment approach than you would be doing under the other investment approach. That's part of the story. That's part of why looking at this looks just like a win. If you factored in the cost of those contributions, probably all of these bars would move up a bit.

This is the accrued prepaid that you'd have under FAS 87 (see Cadenhead slide 19, page 10). This is the pattern we saw before where you're likely not to have an unfunded ABO, but if you do, the balance sheet jumps up. We see the same thing here, except the probability of going underfunded on an ABO basis becomes a little less, and this jump-up doesn't occur until a few more years out in the projection. What we want to focus on now is the marked-to-market rules and what the balance sheet is going to look like. Again, we've got a significant narrowing of the range.

Under the current mix, you've got a significant probability of having surplus and of having underfunding. Under the revised rules you have a narrower range of surplus and underfunding and a little more volatility on the positive side than you do on the negative side. Again on the negative side, you're dampening the volatility because you're putting in more assets whenever you become underfunded. Whereas on the positive side, if you're overfunded, you're not taking money out of the plan, so that's why the bar on the bottom is a little bit longer than the bar on the top.

The other thing we see is that our meeting is not the zero line. That's because the projection technology builds in timing of contributions and assumes the current delay of about a year-and-a-half from the valuation date from the time that you put in the money.

Finally, although this session is not focusing on funding, this is another key part of the story. Under the current mix (we saw this graph before), we have a range of contributions going from zero up to about $9 million under this particular funding rule. If we apply that funding rule to the revised portfolio, we drop our interest rate from 8 percent to 6.25 percent. Right off the bat we're going to be putting in more money, and on an expected basis we're going to be putting in more money for a long time. In addition, on the 95th percentile, the worst case result five years out, we're still putting in more money than we are under the current mix. That's a function of the funding rule that we're using, which takes the underfunding and spreads it over 10 years on a simplistic basis. If we carry this out a few more years, the 60/40 graphs would continue to grow significantly, whereas under the 100 percent bond, the growth would be narrower. Down the road, you would see less volatility.

It's down the road, and getting back to Gerry's point, it's a case that will be easier to make with some than with others. The hard part in all of this analysis is to quantify the risk element and make it something that people can appreciate. We can easily put numbers on here. Each year, you're going to report a specific dollar amount or a series of dollar amounts you're going to disclose, and we can project what those dollar amounts are. When you think about it, it's easy to think, "That dollar amount I can handle. That dollar amount is too much, but there's a small probability of that, so I'm not going to worry about it." It's that I'm-not-going-to-worry-about-it piece that we have a tough time quantifying.

There's not much of a probability of your house burning down, but you still buy insurance. How much is it worth to you here? This kind of analysis doesn't get into it. It provides a context, but you have to go a little bit beyond that. I won't spend any more time going through the 60 percent funded plan graphs because they tell a similar story. Hopefully after we hear Mark and have some time for discussion at the end, we'll get a little more into that question of how you put a price on the risk that you're taking.

MR. MARK T. RULOFF: I'm going to talk about going to marked-to-market accounting, a transition period that I think we're in right now. I'll then explain what my beliefs are that I call financial economic beliefs and how I'm implementing those beliefs in the asset allocation studies that I'm doing. I won't take a lot of time to show you some samples of those, but I do want to show you a live presentation on how looking at different things will guide you to different asset allocations. As we go to more fixed income with lower returns, we have the problem of higher contributions. Hopefully I'll have some time to discuss ways that you can deal with that.

You're all probably well aware that we have all sorts of ways of smoothing the volatility and the contributions and expense, but perhaps you didn't realize how severe it is. If you took a plan that had $1 million in assets and $1 million in liabilities, and the person investing those assets grew those assets to $2 million, he might think that he earned $1 million for the company. But when you go through the calculations in FAS 87, you might only report earnings of $20,000. That's an enormous difference. The rest of it goes into a cookie jar, and that's what these accountants do not like.

I show the volatility stochastically generated at the far left using all bonds as an asset allocation, and next to it is the volatility if I were in all stocks, and that's without any of the smoothing options (see Ruloff slide 5, page 3). If we're trying to make an investment decision, you would say, "There's a lot more volatility if I go with stocks, and perhaps I want to not do that." But on the right, I reflect those same figures with the permanent smoothing that we can put into place through our actuarial techniques, and you can see that the volatility disappears. It gets to the point where you say, "What's so bad about going to a large allocation of stocks when there's little difference between it and the all-bond option?" Transparent

accounting is going to get rid of that. What was once a small, volatile accounting expense number under FAS 87 is going to be much more volatile under transparent accounting. The way to address that volatility would be to go to all bonds or at least go to more bonds.

Some analysts can see that volatility now. We do have information in the footnotes that they can take and show the volatility on a marked-to-market basis right now, and we saw from the previous session that that's happening. Maybe it wasn't happening five years ago, but it's happening now. The analysts who are judging your clients are knocking them down, or because they are aggressive in their investments, they're being hit by their analysts because of it. Therefore, you might consider trying to address this before transparent accounting comes. Transparent accounting is coming. I think we should start in a transition right now, and analysts are already reflecting this in the work that they do. I also believe that funding is going to have to go to a more marked-to-market basis to protect the PBGC. In some ways it's already done that with the latest current liability calculations.

I believe the actuarial model should be using bond rates to discount the liabilities similar to what FAS 87 requires, but may be more restrictive than that. I also think that there are tax and risk advantages in going to bonds, but the current actuarial model is biased toward equities, and I believe the full funding of the ABO is best.

How do I take those ideas in setting my asset allocation? First I calculate an efficient frontier, but my efficient frontier is going to consider the liabilities; I'm going to help the client decide what risk level is appropriate; then I'm going to select an asset allocation option within that risk level.

There are problems with the traditional efficient frontier in that liabilities weren't considered, but we now have a new definition of risk that does consider the liabilities. I have graphed two efficient frontiers (see Ruloff slide 14, page 7). On the left is what I call the traditional efficient frontier basis, where on the y-axis I'm graphing nominal return and on the x-axis I have the standard deviation of that return. The dark line on the top is what we consider the traditional efficient frontier options. Down below that are plenty of other options available to us, but we normally don't bother to look at them because we consider them to be inefficient. By recalculating the efficient frontier using an excess return, which compares the asset growth to the liabilities, what was once thought to be inefficient might now on this basis turn out to be efficient.

What's happening between these two different efficient frontiers? This is looking at those two different efficient frontiers in a different way (see Ruloff slide 15, page 8). It's looking at them by looking at the allocation. The different colors represent different asset classes, and in both of them I considered five classes. Red represents cash, green is an intermediate or aggregate bond portfolio with short duration, dark blue is long bonds, yellow is large-cap stocks and pink is small-cap stocks. In both of these graphs, the allocations are going from left to right, and the

risk goes from low to high. The graph on the left is the traditional efficient frontier that maximizes asset return. If we go to the far right of the graph (the high-risk level), draw a vertical line and see what colors it crosses through, it crosses through all pink. In that case, the most aggressive mix is all small-cap stocks. As I reduce my risk and move to the left, I start picking up large-cap stocks and then the bonds, going from long bonds to shorter bonds and eventually to cash. My low-risk option on this basis is a lot of cash.

If I go to the excess efficient frontier, at the far right my high-risk allocation is all pink; it's all small-cap stocks. Again as I move to the left, I pick up large-cap stocks and then bonds and even some short-term bonds and cash. But my low-risk option ends up being a lot of long bonds, because my liabilities and assets would move together if I invested in long bonds. I have to be looking at the PBO here, so as interest rates move up and down, my PBO liability will move up and down. I want to hedge that, and the way to hedge that is with long bonds. It's all something we knew, but this uses a computer model to prove it.

FROM THE FLOOR: Can you redefine excess return/asset return?

MR. RULOFF: The excess return looks at how the assets grow relative to the liabilities. If your assets are earning less than your liabilities, it can produce a negative number.

FROM THE FLOOR: It looks like you have no constraints in the portfolios.

MR. RULOFF: In the efficient frontier, I didn't put any constraints on. For example, I let it go to all 100 percent small-cap stock to the far right.

If I look at the ABO now and do this excess efficient frontier, I see my low-risk option is all bonds (see Ruloff slide 16, page 8). If I do it with an actuarial liability, my low-risk option shows me a lot of cash again, which doesn't make any sense (see Ruloff slide 17, page 9). My liability is a long-duration liability, isn't it? Shouldn't I be investing in bonds to match it? There's a problem with the way the actuarial liability is being calculated here. I'm doing a forecast where my actuarial liability is calculated at 8 percent every year. Interest rates move up, interest rates move down, and I calculate my actuarial liability at 8 percent.

The definition of duration is how much the liability changes with the change in interest rates. In this case, I'm not changing the interest rate. The market rate is changing, but my liability interest rate isn't. The effective duration of that liability is zero, so it's seeking out short duration. Therefore, I stay away from the actuarial liabilities calculated in that manner. I tend to focus on the ABO. I've heard a lot from analysts at conferences that they perhaps focus on the PBO, so I might change my focus to be PBO- rather than ABO-based. I have to decide that yet, but right now I'm focused on the ABO, and I want to reduce the volatility in my ABO-funded status (see Ruloff slide 18, page 9).

What if I put all my money in cash? My cash and my assets might not be that volatile, but my liability is, and therefore my funded status jumps around. If I put it into bonds, I see I have a lot of control on the ABO-funded ratio. As I put more and more in stock, it gets more volatile again. We can conclude from simply looking at this that putting a lot of money in bonds is the way to go to protect your ABO-funded status.

In the past, I used to do stochastic forecasts and not pay much attention to details. I used to focus on the results that are from the 25th percentile or the 75th percentile level because 50 percent of my results are in there. I told clients, "Don't worry so much about those tails. That probably won't happen to you." But I think I've learned a lesson that I need to pay a lot more attention to those tails.

For example, if I looked simply at historical returns for stocks from 1926 to 1999, I would see that large-cap stocks had a mean return of around 13 percent and a standard deviation of around 20 percent. If I entered that information and used that historical data as my future expectation, I might say that the chance of having the actual returns that I experienced in 2000 through 2002 is less than 1 percent. It was an event about which I would have in the past said, "This can't possibly happen to you," but I learned better. I also learned that the question is not whether it might happen to my client. The question is, "When is it going to happen to my client?" If I forecast into the future and take longer periods of time, if I look over 20 years instead, the chance increases from less than 1 percent to over 4 percent, and a 100-year forecast goes up to a 23 percent chance. We are going to have a long bear market. The question is when, and if your client is in the stock market, it's going to get hit by it. It's not going to avoid it.

We also talk about this perfect storm of all sorts of different things coming together at the wrong time, and I no longer believe these things are necessarily independent. If I look at poor economic experience, which I define to be when the stock market drops, I said from 2000 to 2002 it's dropped on average 15 percent a year. Looking back in time, in 1990 I see that we lost 3 percent, and if I go back to 1981, I see that we lost 5 percent. We think about the stock market dropping and somewhat independent of that interest rates come down and liabilities go up, but there is a federal reserve, and the federal reserve recognizes when we get into a poor economy. What does it do? It lowers interest rates. They go hand in hand.

If I look at the growth in long-term bonds, which I'll use as the proxy for my liabilities, I see that from 2000 to 2002 they went up by 14 percent a year. The federal reserve was not as quick back in 1990, so when we had the drop in the stock market in 1990, the next year in 1991 long-term government bonds went up 19 percent. If we go back to 1981 when the stock market lost 5 percent, in 1982 long-term government bonds had the best year they ever had, going up 40 percent. They go hand in hand, and with that contributions and expense jump up, companies file for bankruptcy, and the PBGC runs into problems. They all go together.

We might say that we have the PBGC insurance, too, but I question whether it's really insurance. In insurance, you commonly apply the law of large numbers, where the chance of my house having a fire and someone else's house having a fire are independent from each other. But when we're talking about these pension plans being attacked by a bear market, they're not independent from each other. They're all being attacked at the same time.

In my asset allocation studies, I'm focusing much more on the ABO, and on the tails, and there's a good way for me to lead a client to do that. One of the biggest competitions for asset liability studies is what I call value-at-risk methods. They focus on 95th percentile levels. They look not at long-term horizons but at annual information and focus on surplus, or I'll call it the ABO. I can focus on that with my clients and then balance that against current methodology that might look more at contribution levels.

During these studies, I also find out that clients are too aggressive in their equity return assumptions and therefore suggest that they lower the actuarial assumptions, and they have done so. They also talk about changing their assumptions because we're being more conservative in our mix, so they lower their expected returns accordingly, getting more in line with what I think is the appropriate discount rate anyway. But I ultimately feel that the rate that these liabilities should be discounted at is at a bond rate, and maybe a risk-free bond rate.

Clients are also funding up to the ABO to recover for past losses. They want to avoid jumps in the additional funding charge. They also like to not have any minimum liability issues on the accounting side. The common problem for actuaries is their costs are going to be so much higher. But we need to learn more about financial economics to understand that this approach increases shareholder value.

Once you take the risk out of the pension plan, you can instead take that risk in your core business. If you're an oil company and take the risk out of your pension plan, you can then be more risky in your core business, drilling for oil. Because of that, you might make more money in your core business to be able to afford the higher pension costs. We need to take the blinders off and stop focusing solely on the pension plan and look at the entire corporation. We would also learn that there are tax advantages to having our bonds in a tax-sheltered vehicle and equity-type investments outside of it. This is the argument, I would say, that talks more about going to 100 percent bonds. It's not the risk that wants you to go to 100 percent bonds. It's more that the tax advantages are such that we should be in 100 percent bonds.

I will stop there so we have at least a few minutes for questions.

MR. RICHARD LEMIEUX: I heard the comment that accountants do not like volatility. I work for an accounting firm and don't, by any means, want to defend these firms, but I think we're talking about the regulatory authorities who do not like volatility, probably in reaction to Enron and similar problems in Italy or in France. We're moving to what you're calling more transparent accounting, and it's the authorities and not the accounting because I think the accountants don't like volatility either. It's only now that we're moving from what I would call the income approach to a balance sheet approach.

The second point I would like to make is that it seems to me that we're mixing funding and accounting. We actuaries have a lot more control over the funding valuation, and I think we certify the costs of these, and it's up to us to justify the assumptions and so on. When we're dealing with accounting, first of all, we're not choosing the assumptions. Every statement says that it is up to the management to choose the assumptions, and I don't think that a company would decide on the investment based on the accounting results. I think you make the decision based on the funding valuation, so we don't have as much flexibility in terms of choosing the assumption when you say, for instance, based on the long-term investment income and so on, that you think the discount is dictated by the statement itself.

MR. RULOFF:I agree; we do have a choice in our funding assumptions right now. In fact, I think the current rules would prevent me from using the risk-free bond rate as my funding assumption. But I personally believe that using an interest rate that includes an equity risk premium and doesn't factor in the risk of volatility is a mistake that should not be made.

MR. MINGIONE : Even on the accounting side, many clients, maybe not the top Fortune 50 or whatever, need the actuary's advice to implement the accounting and develop their own assumptions. So there's a gray line between when we "set" the assumptions and when we "advise" on the assumptions. I think it gets fuzzy.

MR. CADENHEAD : To add to that, in the past there's been a lot of pointing in the other direction of setting the assumptions. "I thought he was setting the assumptions." I'm seeing a lot more often now where the auditors are asking our opinion of the assumptions whether or not it's our responsibility to set them. Do we sign off on them? We have to take a stand, whereas before we might have said, "It's not my assumption."

FROM THE FLOOR: Like Mark, I like to look at the extremes, and I'd like to consider the possibility that every pension plan in North America decides to adopt this procedure tomorrow. I certainly hope that I'm not long on my stock portfolio when that happens. We live in a dynamic economic environment, and it's going to be a rather nasty, probable recession if DB plans in North America choose to avoid the equity side of the market.

MR. MINGIONE : Let me just say that the Committee on Investment of Employee Benefit Assets (CIEBA) probably did a much better job than actuaries could do in trying to quantify what would happen, so you might want to try to get hold of the document. It's about six months old.

UNIDENTIFIED SPEAKER: You'd get only the executive summary. It just used a lot of Wall Street research.

FROM THE FLOOR: Yes, Jeremy Gold said to read the details. Anyway, Mark, I want to know if DBs were to all go to bonds, won't that essentially erase the risk-bearing advantage that DB plans have over defined-contribution (DC) plans? Aren't we putting another nail into the coffin of what I, like the others, earlier observed to be a useful way of providing benefits in the future?

MR. RULOFF: DB plans have taken on too much risk. The market has caused plan sponsors to suffer because plan sponsors want to get rid of that risk. The answer that they all know and we all know is to go to DC plans, but that doesn't get rid of the risk. It just passes it on to the participants, who are perhaps less capable of handling that risk than shareholders and lenders are.

FROM THE FLOOR: Why would you say "perhaps?"

MR. RULOFF: I believe that those participants are less capable of handling that risk than shareholders and lenders are. The other option we have to present to them is take the risk out of the plan. Don't manage your pension plan the way you have in the past, but instead become an insurer—self-insure your fund—and get the risk out of the fund. The downside to that is you're going to have to make larger contributions. But if we learn more about financial economics and the tax advantages and look beyond the pension plan at how reducing the risk in the pension plan allows the companies to take up more risk in their core business, we can show that it increases shareholder value.

MR, CADENHEAD : To add to that, you said that DB plans have the advantage of being able to earn higher returns for the employer or to provide benefits at a lower cost, perhaps.

FROM THE FLOOR: There was an assumption there, but I just referred to the risk-taking advantage, but there is an assumption that with greater risk there is greater return over the long term if you survive.

MR. CADENHEAD : I think, based on the financial economics argument, that's the wrong place to look for the advantages of the A plan. The A plan has advantages over the C plan, but that's not what I'm trying to sell. I would look at the way benefits are delivered. To provide comparable benefits, you've got comparable true risk invested costs in the benefits of the plan, but the benefit delivery is different, as Mark said. There are advantages to taking the risk away from the participants

and also advantages to being able to direct benefit accruals away from benefit plans as opposed to the DC plans.

MR. ARTHUR TEILER: I want to address the ABO versus the PBO question. We become accustomed to doing what we're doing and start believing in what we're doing. Right now we've been doing PBO for many years. In calculating a PBO, we take turnover assumptions and retirement assumptions, so in our assumptions we know how long people are going to be in the plan. The PBO cost is a higher cost, but a level cost, so as a company matures, or maybe I should say as an industry matures, your costs are going to be more level on a PBO basis than on an ABO basis. On an ABO basis, I think you're in danger of letting a company have a richer plan than it deserves. I'm having difficulty going from that adjustment. I would like to hear from the stock side.

SPEAKER: I would like Jeremy to comment.

MR. TEILER: Yes, I would like Jeremy's comment also.

MR. JEREMY GOLD: When you look at ABO and PBO, first as information, the only difference, of course, is $1+S^n$ x every cash flow during the active working lifetime. That has no information content whatsoever to an economist. It's just a number made up by an actuary and spread out across all the cash flow. In terms of the employer, you said the PBO is higher. The PBO is higher for younger people and lower for older people.

MR. TEILER: It's higher at hire or at date of employment than it is at term of retirement, but that applies to whether you're hired at an older age or at a younger age.

MR. GOLD: That's true, but within a career, the PBO is higher younger and lower older. I'm sorry, the service cost—you did refer to cost. Including the liability is higher. When we do the labor economics on this, what we discovered is employees pay for their own benefits, and in a competitive equilibrium, capital is going to demand that the employees pay what capital is recognizing as the cost. If capital is recognizing a PBO cost, employees are going to pay a PBO cost, which means we're going to overcharge the new employee and undercharge the long-service employee for their benefits. This means we're generally going to make the DB plan relatively unattractive to young people. We won't be able to recruit them, and we're going to have a bunch of malingering old people. That's an ageist remark I've earned the right to say. A well-designed plan attracts, retains, motivates and then pushes out the door, and the PBO works entirely against that. And that's just the opening salvo.