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Risk Management for Pension Plans

Track: Pension

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Panelists: Joseph Bellersen†
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Summary: Learn how to improve the manner in which the funding of a plan reacts under adverse economic conditions using asset-liability projections. Investigating the utility of hedge funds and other investment products in the risk management of pension plans is also discussed.

MR. ARTHUR L. CONAT: Our panelists today include Julie Curtis, who's the director of actuarial services for The Boeing Company. She's going to provide a corporate perspective on risk management. Peter Michaels is vice president of Northern Trust, who's going to provide the perspective of an investment consultant. We also have Joseph Bellersen, president of Qualified Annuity Services, providing the perspective of a person who sells annuities.

What we're going to do today is ask a series of questions and have each one of the panelists respond to those questions so that people can compare and contrast the different opinions. We're going to focus on several questions: What is risk in the context of a defined benefit (DB) retirement plan? How do we measure or evaluate risk for those plans? What general approaches or tools do we have for managing risk? Which of these approaches is well-suited in the retirement plan context? We're going to start with Julie. Julie, what do large corporations view as the risk associated with retirement plans?

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MS. JULIE CURTIS: We have what I call the Big Three factors that affect us. By way of background I'm a pension actuary, but I've worked for the past 25 years at The Boeing Company, which is one of the big smokestack industries where approximately 500,000 people are going to be depending on us in the future or depend on us now for regular DB payment annuity-type benefits. The opinions that I'm going to be talking about, though, are mine and what I've seen over my 25 years at Boeing, rather than representing Boeing as an agent here.

Risk is overall an economic uncertainty and an economic cost. Our concern is how that is going to be perceived by the public. Are the future demands in cash that are going to be placed upon us going to somehow adversely affect our ability to make our products and to make them competitive? Is that cash demand going to somehow impinge upon our access to capital resources for expanding our business? These concerns all hinge on what I call long-term economic cost and the Big Three elements for that.

There are plan provisions. What is the plan providing? How do people accrue their benefit? When are they going to start accumulating? I have a standing joke with my internal Boeing audiences: How long are they going to receive it before they go to the retirement plan in the sky?

In terms of participant demographics, if we have a pay-based type of plan (and we have so many plans that we cover almost all the different funds) or if we have spikes in pay, perhaps it's an inflationary environment that's going to have a direct effect on the size of the benefit that's going to come later. If we have an older work force at the moment, their nearness to retirement age is going to affect what the timing of the economic cost is.

Regarding assets, are we going to have the assets available to us through the trust funds to meet the payment obligations at the time that we need them? My co-speaker, Peter, will be addressing some of that.

To explain a little bit about the asset side, we have investment risk. Like everybody else with a DB plan, we promise to pay a certain benefit, a benefit amount that's based on a formula. This is also true of our retiree medical plans because we offer retiree medical benefits. The problem, and I'm talking to pension actuaries here, so I'm stating the obvious, is we have no clue when our benefits are going to commence. We rely on the law of large numbers, but a person's decision on when to retire is individual, and there's a broad span. The later people retire, the less time they'll be drawing and the fewer demands we'll have on our trust fund.

My euphemism is unknown time of expiration. You can take expiration to mean either of the individual or, as I intended here, of the annuity because the primary forms of benefit we pay are lifetime annuities, and I know that's not always true for corporations. We're never sure what the payment amount is going to be in the future. This is in direct contrast to most of the defined contribution (DC) plans, where a set amount is put aside, and the risks in the future, both longevity risk and investment risk, are borne by the participants.

Chart 1 shows our actual population and is a projection of what it looks like in the future for just the benefits right now. We have several scenarios: if people retire as we expect them to, the one with the little bump is if they retire a little bit earlier, and the one that goes way out and high is if we take into account an open population. The scenario with an open population and current-day dollars illustrates a strong, large, cash flow going in the future. The length of this obligation has a long duration.

Those are some of the economic cost risks. We also face some work force risk. What is the point of a corporation's offering a retirement plan in the first place? It's to attract and retain the skilled employees that you need. Over the years, beyond that broad goal where I suspect it's effective for short-term fluctuations of your work force management, it's sometimes difficult to use. An employer wants to keep somebody around a long time. However, sometimes the people that you want most to keep around are the first to take advantage of a generous plan with early retirement provisions.

When economic times are good, people pressure organizations to increase benefits and allow self-directed funds. They basically want to take advantage of upside cycles for investment returns, but in the down cycles that immediately quiets down, and they're content to be sitting there with a DB that's payable in the future with the full good faith of a corporation backing it. Sometimes when concerned people ask, "Are you going to make it? Are those plans adequately funded?" There is a lot of uncertainty that can be a concern for overall employee morale and productivity.

I boil it down to two issues: 1) the economic cost risk including its uncertainty and drag, and 2) work force risk. Are we going to be able to manage our work force? Is this a good tool for doing so? With that, I'll pass it on to Peter.

MR. CONAT: Thanks, Julie. Peter, what do you see as the major risks in the context of a retirement plan?

MR. PETER MICHAELS: First of all, I define risk as the estimated probability and magnitude of an undesirable outcome. Looking at the investment experience of the mid- to late 1990s, we saw the upside volatility of the equity markets, and we didn't see anyone who was too upset about that type of volatility. It's only when you got to 2000 or 2002 that people started to get upset. Basically risk is estimation. It's how probable a poor outcome is going to be and the magnitude of that outcome. Risk is in the eye of the beholder, and what is risky to the different stakeholders for corporate or public pension plans is going to be different. Anyone who's worked with an investment committee in setting asset allocation or investment policy recognizes that risk is also an emotional decision.

As much as you may want to quantify what you think the downside is for example a standard asset/liability study illustrating a probable range of outcomes including a downside of only 85 percent funded rather than your current 100 percent funding, people's reactions to that is not to take that into a quantitative mode. They'll say, "We can live with that. That's no big deal." or they may say, "Oh, my gosh. We can't face that. We can't deal with that." It's especially true in the investment decision of which asset classes people are willing to invest in. Some people will dismiss some asset classes out of hand because they are personally uncomfortable with them, even though those asset classes may have been proven to provide positive economic returns over long periods of time.

Right now, for the DB plan stakeholders, the key risks are different depending on who you are. For the plan participant, certainly the risk is not receiving benefits that you have accrued to date. You certainly can walk away from any position that you're at working for a company that offers a DB plan. You know you're not going to accrue any additional benefits going forward.

However, what you'd like to know is that for the five, 10 or 15 years you spent at that company, part of your compensation was the pension plan, and you'd like to know that you will be receiving all of that money either as an annuity or as a lump sum. The last thing that plan participants want is to see their pension plan be given over to the PBGC because they know that there's a possibility that they're going to see a reduction in their compensation after they've already provided the work to the company.

For plan sponsors the biggest risk that they face right now, and what we're seeing people react to, is paying too much for benefits, and there has been a little bit of an overreaction in the plan sponsor marketplace. A lot of plan sponsors don't remember the years that they chose to forego contributions either because they felt they could put that money to better use or basically they were getting a free good. If they felt that the DB plan was a benefit and that it kept and retained employees, but they didn't have to put any money into it, they thought, "Isn't that the better for us? It's a freebie for us."

What they don't necessarily consider is a policy of contributing the normal cost (perhaps 2-3 percent per year) each year, and is what their cash flows would look like in that scenario compared to foregoing contributions for a number of years and then suddenly having to dump a lot of money in at a time when they could least afford to do that. The other thing is that they don't compare how much they paid over a 10-15-year period of time versus if they had a DC plan and had a guaranteed match that they had to put in there.

For investors the main risk is the impact that increased contributions have on the free cash flow for the corporation because it is the free cash flow in which a company can either pay dividends or reinvest in the companies that it manages.

There are also impact-on-earnings statements on the balance sheet, but depending upon your investment approach and philosophy, that may have a little less impact.

MR. CONAT: Thanks, Peter. Joe, on which risk do you believe an employer should focus?

MR. JOSEPH BELLERSEN: From a general perspective we take a view or we articulate a view of risk as the assessment of an action in terms of capital, opportunity or function that either increases or decreases a probability for success resulting from that action. We'll get more specific about the applicability to a DB plan, but when employers sponsor a plan the responsibility for the risk is totally on management, and DB plans present unique sets of challenges. Obviously the preference is for ongoing plans and plans to continue in that fashion, but over the past 15-18 years we've seen DB plan activities drop from 140,000 PBGC-insured plans down to about 30,000-31,000. There are some reasons for that. Part of it is the unknown risks of DB plans.

The actions that impose these issues impose them to the financial statements of those reporting and disclosing companies, as well as private companies. Funding the costs over time is a real risk issue for plans. The low-interest-rate markets of today create unusual risk problems for management. We, in our activity, typically work with terminating DB plans that have matured, live populations and need to acquire an annuity, so the process of looking at an annuity is typically only at, let's say, final end game in that transaction. However, it's my belief that an annuity is an embedded option.

Plans that keep or retain a risk are retaining all of the obligations of that plan design and funding assumptions over time. I don't know the specifics on this, but Standard & Poor's and Moody's are beginning to look at, if they've not already started, DB plan liabilities effectively as a debt of the corporation. We've characterized this in another fashion. We say that basically employees have an unlimited lifetime call on the corporation's trust for their benefit payments for as long as they live.

When you have risk, and everybody has this in a personal sense as well as a plan sponsor sense, risk can be discharged or displaced. It can be transferred to third parties, and that's what an insurance company does. Funding the cash-flow retiree obligations is a little different from funding the future economic needs of a future cash flow to a retiree. What we see in particular in this market and the comments that we articulate are oriented toward this being the cash-flow drain the plans are experiencing right now in low-interest-rate markets. While plans are making contributions to catch up, we question and wonder where the cash contributions are going in this low-interest-rate market because cash is going out the door if you have retirees.

If you displace risk or discharge risk, we think that you should focus on cash-flow obligations and to try to use a disciplined approach. Don't go out willy-nilly, but think about it and strategize with it over time. When you look at it in that context, we believe that it's not necessarily the same as managing the plan for the earnings, the balance sheet or the equity premium that's typically associated with the total return concept of managing a DB plan.

As a means of managing DB risk, what happens is you're displacing risk. If you use annuities, you're reducing liabilities. Most plans make contributions and therefore have more money in the kitty. However, if you make contributions and discharge or displace liabilities at the same time by purchasing an annuity, for example, you potentially are increasing the prospects of the plan going forward. From a risk perspective it might even be considered to be some form of a deductible approach similar to the liability and property/casualty business, so we question it. Why not try to apply some of these same principles in a DB plan setting?

MR. CONAT: I'd like to follow up with the panel here. Whom do you see as the stakeholders for the risk? Julie?

MS. CURTIS: As Peter mentioned earlier, there are several stakeholders and different classes of individuals who will bear the risk. As he also mentioned, the retirees and the beneficiaries in many cases are the most immediate and most vocal of those who bear the risk when a situation grows dire, for instance, and there's true concern about meeting that. As a result of that, there's the federal legislation that created the PBGC all those decades ago so that we have the government also as a risk bearer.

In addition to that, on the company side we have many different interested parties, and not all of their best interests necessarily coincide. We have the shareholders and the investors because most corporations are publicly traded, and we're interested in satisfying the requirements of our investors. There's also management, who ultimately is held responsible as the fiduciary in many cases for this because it is the sponsor of the plan.

We also have the employees for whom the plan was created in the first place, and they're the ones who view this DB promise as part of their obligation and part of their decision to work for a company as opposed to some other entity. They, too, are looking forward to their benefits in the future, and then they pass into the class of retiree and beneficiary. In that sense it goes full circle, but, as I said, these stakeholders have different interests in the plan.

MR. CONAT: Peter, any comment?

MR. MICHAELS: No, I think Julie made a good point in saying that the different stakeholders face different perspectives and different risks, and what's good for one is not necessarily good for the other, and that's where you see the conflicts that come into place.

MR. CONAT: Joe?

MR. BELLERSEN: The DB plan basically affects everyone, in particular management's role. We emphasize management's role because, in the end, it's responsible for everything in the enterprise. Management needs to understand and assess these risks, and that's what, as professionals, we all try to do, and the proper balance between the shareholder's stake and the participant's stake is a sensitive issue.

The fiduciary duty of participants obviously is exclusive in their eyes to the extent applicable by ERISA in that you have to think about the participant in the first category, not necessarily the shareholders, but this potentially creates conflicts for management. It has to figure out how to balance these appropriate issues. From the participants' side, they're exposed to successful execution by management in the end. If things don't go right, and the PBGC does have to come in, they're at risk to the extent that the risks exceed the PBGC coverages. There's still risk down to the participant level.

When you think about risk a lot of things approach or attack risk from a number of different perspectives, in particular from an annuity perspective when plans introduce design changes. The plan may be thinking about annuities, or it's probably not, but we see particularly difficult problems from the insurance company's perspective, such as pricing lump-sum provisions that are associated with a cash balance option that's introduced by the plan. We also see problems when a subsidized disability benefit that pays 100 percent of accrued benefit at age 35 has a disability option. These are things that affect both the participants, because they're looking for benefits in a number of different forms, and the eventual plan design and total risk of the plan's obligations going forward.

MR. CONAT: Thank you. Next we're going to move onto the question of how we measure or evaluate risks in a retirement plan. We'll start with Julie again. Julie, what type of evaluation techniques do you think a large corporation should undertake?

MS. CURTIS: I was going to digress before we do that in talking about measuring the risk. This is where I started by saying although I work for Boeing, these are my opinions I'm expressing. I think for everybody involved with DB plans, especially recently with all the volatility, the interest rates and the other external circumstances, it's hard to keep in mind the long-term view. First and foremost, the risk that I see is one of economic cost from a corporate perspective, which is to say we're on the hook for a long time for some type of cash payment unless, as Joe was mentioning, we decide to discharge that risk and pass it off to an insurance company. Even then you may get some bad publicity if an insurance company goes under.

Ultimately I think whenever a company makes a promise for a benefit or a benefit increase, it's important to realize that we're making a promise for 40 to 50 years of some type of benefit payment. When we want to measure it, as all the regulatory agencies try to measure it, viewing it through their filter of what their purpose of existence is, we have to keep this in mind.

We always look as a corporation at minimum required contributions to trust funds under ERISA and maximum to maximize our flexibility there. We also look at all associated potential premiums, fees, excise taxes, the legislated cudgels—sticks—to make sure that we stay in line and the financial risks as defined by the FAS, keeping in mind the IAS now because we see a little bit of deviation between the two, and the IAS is starting to exert more influence in the public eye.

As a result of all of these different types of measures, what we do internally at Boeing, because we have a huge population, is every two to three years we go through formal stochastic processes. We go through asset/liability forecast modeling looking at all the different ways of approaching it and the different returns. We start looking at some of the discreet underlying assumptions and potential outcomes. We also use some deterministic modeling because it's nice to see these things with confidence intervals, but in the end we ask, "What do we do now? What are we doing the next six months? To fund or not fund? What's the result going to be for us in the short-term as well as the long term?"

We use lots of different models, and for each of the models we try to pin some of the outcomes and figure out in the short term what our contribution options are. Where do we want to target that money that the company is creating right now? Is DB a wise way to invest those funds? We look at whether we are going to be investing in the right asset classes. I don't do that myself, but I know that we're always looking at that in terms of matching to make sure that's all right. Have we satisfied all of the funding agencies that are out there, such as PBGC, FAS and ERISA? In our case, we must because we're a heavy government contractor and we face contracting issues with the Department of Defense. With that, we have a question.

MR. ERIC FREDEN: I'm glad to hear that you did all of that modeling, and my question is if you were doing all that modeling and those stochastic projections in the late '90s, did all of this work prepare you for what happened?

MS. CURTIS: Can I tell you the story? It's funny. I'm a specialist. I do pensions, and that's it. I spread the word, and it's absorbed in with all of the dozens of other issues required. The person at the time in the late '90s who was on the side of the corporate planning, Dave Sjogren, is brilliant. We were looking at the lower 20 percent probability of what happens if you have -20 percent. What happens if you have -20 percent for two years in cash flow, and you have suppressed interest rates?

We had one that was highlighted in red, and the two of us both said, "Oh, that's giving us a knot in our stomachs." He said, "We'll plan for it in a contingency situation, but let's hope this never happens," but, yes, it was very much there. As a result, we did and do have the cash capacity. When we talk about mitigating risk, what happened is that under those circumstances we knew that for $40 billion we would probably need to put in $4 billion fairly quickly. It happened. That's what we did. The answer is that it worked, and Dave and I still look at each other and wish we hadn't been right.

Dave also was involved when we were plotting possible outcomes compared to historical outcomes just on the equity returns where, for the Great Depression, it was -90 percent equity suppression. During the Vietnam War it was -35 percent. During the OPEC time it was 30 percent. He said, "I'm rooting for a54," where I guess there was a one-time spike in most of the equity markets of on average 50 percent. He's still waiting for that day.

I was going to show Charts 2 and 3. We go through more asset/liability model studies. This is somebody that I contract privately. He’s an actuary, too. He runs different scenarios for me, and these are his outcomes. He’s assuming that, in this particular one, such as a long-term trend toward the mean of long-term asset returns, if those scenarios come to play—this is one way he puts it—for each of those different outcomes, this is how heavily leveraged it is. I s’ale's not very visible here, but the difference between the most advantageous quartile and the least advantageous quartile when he puts everything together is many times. In essence we're pretty close to that big, ugly line. With that, I'll pass this on to Peter.

MR. IAN GENNO: Just before you do, can I ask one question, Julie? You reference quantifying risk, and you mentioned measurement of work force risk, talking about skill retention and attraction. Could you offer a couple of comments on how you look at that from your perspective as a plan sponsor?

MS. CURTIS: We're always looking at who's leaving, what the average retirement age is and when they go. We're a cyclical business, and we rely heavily on our skilled work forces. There are two types of skilled work forces we rely on, which are the rocket scientists and engineers and the skilled hourly work force to get that product out. The most obvious example of that is the skilled tool-and-die makers. We're always interested in retaining those people throughout, so we look at that to see whether they're staying or not.

That is one reason why we are still so into DBs, and, again, this is just me. I am not representing the official Boeing position, but what I have seen is that the DB plans that we offer are key to keeping people around for doing that because these are people who are looking ahead. They're looking into their future. They're skilled.

They're financially savvy. They know that we are offering a valuable benefit in the future for their security in their old age when they can't work any more.

We had an early retirement window back in '95 that at the time we did not expect. We were in an economic downturn, so we wanted to let people go, and when people are laid off there's always the possibility of them being recalled. For those who were eligible to retire, we did offer an incentive. It's was not a big incentive over what we already offer; it was a slight incentive, but we had two-thirds of all eligible people throughout the company retiring, which resulted in the single largest early retirement incentive I think in the history of the United States at that time. We had 13,000 people accept within three months, and that was when I realized that using a tool like a DB plan for short-term work force management if you're going to use a broad-based approach, is a large concern. We had a hemorrhage of skills that was truly startling. I hope I answered your question.

MR. CONAT: Julie, before you go, I have one quick question for you. You mentioned that you do these analyses once every two or three years. Is that something that is more scheduled or more event-driven, such as when we get funding relief? Does that cause you to go back and revisit these, or is it just something you are doing on a periodic basis?

MS. CURTIS: For the big formal one that you just saw the beautiful graphs 'n, that's on a scheduled basis, and it was every three years, but this year we've had a slight change in management, and they've asked us to update it this year. That's fine. It would be every two years. For events such as funding relief we have cruder, more deterministic models that we run fairly continuously as events arise because federal legislation is a big driver. Labor movements are a big driver for us.

MR. CONAT: Peter, how do investment firms look at risk and measure risk?

MR. MICHAELS: Investment firms look at it a little bit differently because typically investment firms are going to see only a small piece of the overall asset allocation or investment policy that a plan sponsor has set up. You're typically hired in one particular asset class, and even within that asset class you may be hired for a particular style. For example, in the U.S. domestic equity market you may be hired for small-cap growth stocks. As far as what the plan sponsor wants to do from an overall standpoint, you don't typically see that, I don't think the plan sponsors are all that clear at communicating what that overall policy is to their investment managers.

I have one client who once every three to four years will bring all of its investment managers, actuaries and investment consultants together for two or three days and review what its overall policy ; the financial health of the company; and what recent contributions have been, what they're projected to be and what upcoming changes there may be. It's not often the plan sponsor will communicate all of that to all of its vendors for the pension plan at once. I think it's something that plan sponsors should do more often.

Given that an investment manager knows only its own piece of the pie, what its risk is concerned with is how much risk are you taking against the benchmark that you have been given for that small piece. If you're hired for a large-cap growth assignment, typically it's going to be the Russell 1000 Growth Index or the S&P Barra Growth Index. If you're a fixed-income manager, typically it's the Lehman Brothers Aggregate Bond Index. International equity managers use EAFE. The only probable difference is whether you're hired for an active assignment or for a passive assignment.

If you're hired for a passive assignment, your concern is the tracking error or the variation of your performance against the benchmark. For a passive assignment you're concerned with the absolute tracking variance, and that's what the plan sponsor's going to measure you on. If your index fund has a tracking variance of five to six basis points, and other providers have two to three basis points, you're not going to look as good, and you're probably not going to win as many assignments as the other companies. As far as that goes, it's how tightly you track the performance.

For an active manager it's relative tracking variance. In fact, they are paying you and paying you a premium to take variations against that benchmark, whether they are small, such as an enhanced indexing assignment, or whether they are large. You may have some investment managers who hold concentrated stock portfolios of only 20 to 25 names. In that instance it's not how much tracking error from the benchmark you are because it's expected that you're going to have tracking, but the question is how much additional alpha do you provide for that tracking error? That ratio of alpha divided by tracking error is called the information ratio, and the higher the information ratio, the more alpha you're adding for the amount of variance you're taking away from the portfolio.

One of the things—and this is obvious also in doing asset allocation work—is as you have greater variance from the benchmark, you're going to start driving or biasing your information ratio to be smaller simply because you're adding so much more variance, and there's only going to be so much return you can add for each unit of variance. That's why the information ratio of enhanced index managers who are successful are going to have the highest information ratio, and it may be a manager who is aggressive, who is in small-cap growth and perhaps has a concentration in technology and who has a positive information ratio, but because the amount of volatility is so great, there's no way it could have a similar information ratio.

If you're a bond manager, the risks that you face in the portfolio are numerous. Your primary one is your interest rate risk or the duration that you're taking away from your benchmark. The duration of the Lehman Brothers Aggregate Bond Index is anywhere between four and five years, depending on the component made up of mortgage-backed securities. If you want to be spot-on with the duration of the index, that's fine. You're not taking any interest rate risk. A lot of bond managers don't look to add value through their duration bet, but through their sector rotation and their security selection.

Second is your credit risk, and this is important in the corporate bond market. Basically you give $100 to purchase a bond. You want to get the $100 back. The purpose of investing in bonds is that you get your principal back and some certain rate of interest. However, that collapses like a house of cards if for some reason the company that issued the debt goes into default, and you're not going to get your $100 back. Now you're talking about getting $0.75 to $0.80 on the dollar, sometimes even $0.05, $0.10 or $0.15 on the dollar.

You have reinvestment risk if the income that you earn has to be reinvested at a lower interest rate. Bond managers who invest in the overseas markets have currency risk and sovereignty risk because governments issue the majority of fixed-income securities overseas. Companies don't rely on issuance of debt overseas, especially in Europe. They're more reliant on banks for providing credit.

MR. CONAT: Peter, if I could jump in here quickly, something you said caught my ear, and that is that the bond manager are tracking against some type of given benchmark, and that benchmark has a given duration. That duration is not always the duration of the liabilities of the plan. Is that a true statement?

MR. MICHAELS: I would say probably in 95 percent of the case, no, it is not the duration of the liabilities of the plan, whether the liabilities overall or the liabilities for the retirees and terminated vested.

MR. CONAT: Thanks.

MR. MICHAELS: On the equity manager side market risk is measured by beta. You have various risk factors, such as exposures to value securities or growth securities, sector risk, individual security risk and liquidity risk. Can you buy and sell out of a portfolio when you want? Liquidity risk is more of an issue for momentum managers. If you're investing in the overseas market, you have currency risk and sovereignty risk. Again, notice as you get down to the investment management firm aspect, and they're managing their portfolios, that you're slicing these layers of risk finer and finer. What you would hope is that you could add up all those different risks and measure the entire risk of the pension plan, but often that doesn't come about or plan sponsors don't take a look at it from that aspect.

MR. CONAT: Thanks. Joe, what measurements do you think are appropriate for a retirement plan?

MR. BELLERSEN: Fundamentally I think that I would echo the comments of the prior two speakers, namely that the issues on funding are extremely important.

Accounting measurements to determine the allocations to equities are the principles that plan sponsors attempt to use, and in many instances congratulations to Boeing if it does it so well and so predictively.

From our perspective and from an annuity perspective, the insurance companies are concerned with what the liability look like if it's been styled, characterized or managed in one perspective. We see the culmination of all of those activities when we go in to talk to a plan sponsor about annuitization on a plan termination. Going forward, the issue is whether or not it's event-driven, which would be in a plan termination setting versus strategic, which is what we're suggesting that plan sponsors could consider. When you settle or curtail a liability there's no termination necessarily in a nontermination setting. It's still a fiduciary decision.

MR. BELLERSEN: It's a totally different process as far as the functional process or potential utilization of a contract within a DB plan that's ongoing because, as Julie mentioned, if there is a default going forward, and you're still the plan sponsor, more than ever you should have done your homework. Potentially contracts can be held as an asset just like any other plan asset, and when that's done PBGC premiums are still due. The issuer default theoretically would still be covered by the PBGC, which would take over the contract as a plan asset. In that instance the participant or the plan sponsor has not perfected its obligation or discharged its obligation because it has not in that instance required the contract issuer to issue certificates, but it has effectively perfected its hedge, and that hedge would be that it's a bond investment, which also covers the mortality extension risk, but the plan still owns the contract.

MR. CONAT: Are there any additional measurements you think someone should make when considering purchasing annuities?

MR. BELLERSEN: From the perspective of a strategic purchase as opposed to a plan termination purchase I think it's important that plan sponsors look at the possibility that they can reduce their cash-flow risk over time, utilizing an annuity from time to time. What you do is extend the duration of the remaining liability. It's likely to allow an increase in your equity exposure that you potentially might be looking for. You would have to question and analyze whether the plan is going for broke. Is the plan looking for equity payoffs? How are they managing their plan? What's going on underlying? We've had some discussions with some broker-dealers who are using Monte Carlo simulations to show that if an individual's looking at his own future retirement income, the probability of success in retirement is substantially driven by whether or not he can offload or sell off part of that personal risk through an annuitization. We question whether the same principle applies in DB plans.

MR. CONAT: Thank you. I'd like to go to the question of what tools are out there for managing risk. Again we'll start with Julie.

MS. CURTIS: We haven't found a single magic bullet, and no one has, in terms of how we mitigate, managed or lessened our risk in a way that would make it go away, but it basically comes down to two things: How you determine what the plan design is and what the promise is going to be, and once a promise is made, how are you going to fund it? What is the timing of the funding going to be and what are you going to put the assets in? I think many of you are consultants, and I'm sure you've seen it over and over again: There are more and more plan terminations. When ERISA first started, there must have been 250,000 privately sponsored plans, and we're down to 40,000 now. It's scary what the overall trend is from a pension actuary's standpoint anyway.

I've also seen in the industry an attempt to shift away from traditional, patriarchal, big brother promises of a DB pension and annuity payment for your lifetime no matter what to some type of risk shifting with the investments, and that has upsides in good times, too. I sometimes think that some cash-balance plans are designed to reflect that. In terms of plan design that's where we stand. When we talk to the HR communities, sometimes I discuss the fact that once a promise is made and a benefit is accrued, it's difficult and often impossible under ERISA Section 411(d)(6) to take back any promise that you make. You can always do it prospectively, at least you still can, but sometimes when I look at the proposed legislation, I find a little alarming the concept then in some cases our options to reduce future accruals could be limited when I look at some of those cash-balance proposal. That's a concern of managing risk.

For the asset investments, there are the issues of matching duration and what types of assets you're going to go into. I don't pretend to specialize in those. I know that Peter and Joe are far more experienced in that. There's also the possible annuitization, which leads me to one question I had for Joe, which is whether you're seeing any trend up or down for employers who sponsor DBs to annuitize part of it without a plan termination? Have you seen any change in that?

MR. BELLERSEN: Typically the mindset of plan sponsors is that an annuity is a device that's attractive only when it's economically correct, which means the interest rates available on the annuity have to produce a discount to the liability in the plan. I question that, and part of the reason for this session is to question whether or not annuities can be used in a risk management setting because if you have fresh contributions to your plan makeup and if you contributed $4 billion to the DB plan, you hope you did the right thing in investing. A way to take some of the guesswork out of it in a low-interest-rate market would be to use that to discharge liabilities at the same time. To answer your question specifically, we still haven't seen that pickup because I don't think plan sponsors have viewed annuities as a risk management tool.

MS. CURTIS: I was going to make one other quick point. I think most of you have seen a lot more of this than I have, which is in the plan design side, when you put in options that permit some self-directed types of investments with some investment upside and downside risk-shifting to the participants, there is one thing I always worry about. Because of the long-term view of DBs (presumably employers who offer them are in it for the long term, which is why they're offering it to these people—they want to keep them around), if 10 to 20 years later the investment situation looks awful, and there's a big down cycle like I hope we've come out of, do you see it likely that this group of people will be clamoring for the corporation, the deep-pocketed father that they've had all along, to sit there and make it up somehow to them?

I'm always concerned about that because if ultimately these plans are tools for high morale and high employee retention and if we shift the risk over and it backfires in the long term, maybe we're not meeting the point of that tool at all. On that note, I'm going to pass it to Peter.

MR. MICHAELS: I'm not going to be any more cheerful because I had a couple of thoughts while Julie was talking. One is as a manager or as an owner through a shareholder, when you describe a DB program as a promise to pay something out 40 to 50 years in the future, I have to ask myself why I would want to continue to pay an employee for this year of service that far out into the future? Why not contribute money in either a cash-balance plan or a DC plan and be done with it?

I attended a number of the sessions here at the conference, and the one thing that I think is most important to take away is something that the gentleman from the PBGC said. At the end when someone asked what the values were that companies have for the DB plan, he said that if their employees do not value this benefit, it is not going to be provided.

If employees either don't gain any benefit or don't think they gain any benefit from having a DB plan or if management doesn't believe that it gets any benefit by offering it, it's not going to happen. I think that's the most important thing. We can talk about diversification. We can talk about investments. We can talk about what's happened in the market. Northern Trust has considered this in its compensation program, but if the employees don't appreciate it, why bother offering it?

From an investment consultant perspective, typically when a consultant is involved on the asset side and the plan design has been put into place, you certainly can do asset/liability work where you're switching around plan design at the same time you are switching around the asset allocation. However, that can get to be a little messy, and there are a lot of options that you have to take a look at, and it can be difficult to pin something. Generally when an investment consultant comes and speaks to the investment committee, there are few tools as far as managing the potential volatility of asset returns. The first two are diversification and asset allocation. You don't have to add that many asset classes to get proper diversification.

If you have U.S. fixed income, U.S. equities, international equities and probably private equity to handle the nonpublic markets, you're going to get about as much diversification benefit as you're going to obtain. Trying to slice things down finer and finer doesn't add that much diversification. However, it does seem to make plan sponsors feel more comfortable that they are doing their jobs and that they like to do that and certainly justifies the positions on the asset management side.

The third is indexing. If you don't believe that active management can add value, why add that volatility? Why take on that risk? Some companies have made that decision and have gone with an all-indexing strategy. Some are all active. I'd say probably a fair number are going to use a mixture. They're going to index those asset classes that they think are especially efficient and difficult to add value, large-cap equities in the United States being one of them. The largest index fund you're always going to find is the Standard & Poor's 500. They'll use active managers for small cap, for international equity, for bond and for high yield.

One strategy to minimize risk that plan sponsors can take and don't is either an immunization strategy or a dedication strategy. If you do this, you always have to make a decision on which liabilities. Do you want to duration match or cash match? It does surprise me that more plan sponsors don't try and offload their responsibilities, if not for the retirees, perhaps then for terminated vested, but they typically don't, and, as mentioned before, the duration of their fixed-income assignments usually are going to be close to the benchmark and not to their liabilities.

The last thing is new tools that have come about with regard to risk management and risk budgeting. I haven't included a lot of information. Some of you have heard some of the terms. Value at risk is one, which is basically a stochastic process of saying what two standard deviations away from the expected result is. What would the loss in asset value be for your overall program or for your individual managers? You can use risk factor models such as Barra and other providers as far as how much risk you're taking across a number of different factors and whether you want to take those risks. The final thing is risk budgeting, whereby people make the decision to take a certain amount of risk, but where are they going to take that risk?

You may see people who make the decision to index their fixed-income management, even though it does appear that there are a certain number of fixed-income managers who consistently add value against the benchmark, and they make the decision to say, "We don't want to take that volatility because even if we're rewarded for it, we're not rewarded that much. If we're going to apply volatility, we'd rather apply it in asset classes where the potential alpha is greater."

MR. CONAT: Peter, I have one quick follow-up here. I was reading an article in *The Economist* that said 90 percent of corporations are involved in some form of hedging, but we don't see hedging in retirement plan funds at least I haven't. Do you have any comments on that?

MR. MICHAELS: I think there are a couple of things at work there, most of them having to do with human psychology. I'm going to say one of them is that anyone who's worked with investment committees recognizes that a lot of committee members like talking about investments. They like hearing outlook of what's happening out in the area from their investment managers. They use some of the same investment managers I think that's part of the process that's taken place. They like having those managers come in. They like having the consultant come in and talk about this. They find it to be useful.

I think another thing that makes it a little difficult is people's reaction to ERISA and to the prudent-person rule. People think that the prudent-person rule means that you have to do what everyone else is doing, and, again, that's an assessment and measurement of risk. How much different can you be from other plan sponsors and feel comfortable with that? Some people want to be spot-on with what all the other plans are doing and want their asset allocation to not vary that far from the composite that we have for all of our consulting clients.

There are others who are going to make a decision and feel that as long as they can defend and justify it from an investment and reasonableness standpoint, they're going to take that approach. I think that's why you have a few plan sponsors who immunize their fixed-income portfolios to their liabilities. They've made that decision. They feel that that's a reasonable argument. Not enough have done that to get a lot of other plan sponsors comfortable enough to make that move.

MR. CONAT: Thanks. Joe, what are your thoughts on managing risk?

MR. BELLERSEN: I spoke before about annuities being potentially the perfect hedge, and I want to echo that. Typically payout annuities or annuities used in DB plans are a nonpar transaction. Effectively the insurer takes over the liabilities with a single premium one time. In an active, ongoing plan it would be done potentially for retirees and term-vested participants. Again, I focus on the current economic and macroeconomic conditions and say, "At this time, if you used a nonpar annuity to take the cash-flow load or drain off of the plan in its entirety, the risk characteristics of the plan going forward would be materially different from what they are today."

In particular, however, you can't purchase annuities on a nonpar basis for participants who have not yet had their benefit accrued or who are still accruing benefits. Unless it's a participant who's been terminated, has stopped accruing benefits or has fully accrued benefits, the annuity can't be used to purchase for actives. At that point one of the rationales is that retirees are almost a creditors to the plan and its future ability to pay those benefits.

In a par annuity setting things change a little. In a par contract it's common to use separate accounts, but unfortunately at this time within the macroeconomic conditions, the money isn't there to fund most par contract designs. Effectively you have surplus that you've transferred into the insurance company, and the reason that that excess is required is dictated by how you set up the asset allocation within the par contract. The insurance companies have additional reserves they have to hold when you're not buying bonds.

If you allocate away from bonds within the par contract, those excess reserves are required, which creates a surplus condition within the contract. We think that these contracts can be useful. They can be settled out. They can be developed with trigger conditions and conversion provisions, which can be advantageous to the plan sponsor for timing purposes. There are guaranteed conversion rates. It's a contract that probably mirrors or mimics how closely the plan's intended to be managed going forward, but the one exception is that the errors are at the cost of the insurer's surplus, not the plan sponsor, to the extent that there's no additional surplus required or a contribution required through the contract.

MR. CONAT: Joe, do you think we'll ever see a more prevalent option for an annuity purchase for retiree medical?

MR. BELLERSEN: That's a difficult question to try to answer. I think we have not seen enough product development side-wise from the carriers to try to solve some these risk problems for issuers. According to the news, you can't buy combined premium increase (CPI) coverage from insurance companies. That's old news. Insurance companies are providing full CPI protection going forward, although it's a limited number. We just priced up a contract that's swap-based on a guarantee investment contract (GIC) that has CPI crediting attached to it. I think that within the financial markets there are sufficient tools, but they have not been utilized.

One possible way to try to attempt to offload or diminish that risk might be to try to construct a contract, for example, that has several components to the upside, and one such example would be to purchase an annuity contract that has CPI coverage. In addition to CPI, you use it as a Part II, which would be an S&P linkage. The CPI becomes a deducible to a Part II. That way you're getting a combination of CPI coverage and some potential returns linked to an indexation model going forward, and if you do those things within a mortality-based payout annuity setting, I think the dynamics could potentially work to at least diminish risk.

MR. CONAT: Thanks. Julie, one of the questions I had was is there ever a point in time where a corporation would feel compelled to try to manage risk more actively? Every time you undertake something, you have to measure success. How would you go about trying to measure success in the context of managing risk?

MS. CURTIS: I think the first part of your question alone is difficult in the sense that every corporation is always trying to manage every risk element, environmental and financial. Pensions represent an overwhelming financial risk to those that have large DB plans. I mentioned earlier a workforce management risk, too. It's always an ongoing issue. In terms of measurements, ironically, some of the measurements that we see, the most visible, are your disclosures on your financial statement. In essence that's an investor-driven measure that's come out because they get their annual, and now quarterly, report cards on it.

In terms of minimizing and mitigating that risk in the future, as I said, one of the obvious ones on the plan design side is to either eliminate your DBs, which is what's happened in many cases, or introduce some shifting of the risk. In those cases mostly it's the investment risk and ultimately making some or all of the size of the benefit a person will receive dependent on what the asset performance is. That's shifting it back to the employee. That's what I see in terms of how to manage it offhand.

I also think there seems to be a national and international trend in terms of looking at the assets and somehow annuitizing or immunizing what the expected cash requirements are in the future. What I always ask, and maybe you would be able to answer this because from that perspective I'm a total layperson, is what is the capacity of the current financial markets to absorb perhaps $2 trillion just in the U.S. DB plans? What is the capacity of our current financial markets to start annuitizing or even immunizing the expected cash flows that are generated from that? It seems to me that we would see a disruption of our current markets as they exist now, but, as I said, this is just me talking pie-in-the-sky, and it's certainly not answering your direct question of how we measure success.

MR. CONAT: Thank you. Peter?

MR. MICHAELS: It's funny because working both at a firm that offers investment management and consulting services, 90 percent of our employees take lump sums out of our DB plan, and I think I'm probably one of the few people who said, "I think I'm probably going to go the annuity route," and people look at me thinking, "You know how to pick managers. You know all about this. You're financially sophisticated." I think the issue is what are your risks? Where do things come from? One of the risks we've talked about is the longevity risk and outliving your assets, and that's one of the potential hedges for it. I'm fortunate to work for a company that offers both a DB and a DC plan. In addition to that I also have my own savings. I can try and hedge that risk as much as I possibly can.

If I do choose that annuity route, just as I as a participant would prefer for the corporation to absorb that investment risk, my preference would be for the corporation to pass that investment risk onto a firm that handles that. That's its specialty. It has a larger pool to do that because basically if I'm going to take an annuity from the Northern Trust, and it manages the assets, basically I'm asking it to perform like an insurance company, and is that the role that it's there to perform? Corporations are questioning whether they should even be in the DB business in part because it is requiring some skills and some knowledge that aren't useful for the core reason for their being. Wouldn't that be a situation where you would want to see that as well? I'll pass that along to Joe to get his opinion.

MR. BELLERSEN: This question's going right down the line, isn't it? I think that this is an issue. First I'll try to respond to Julie's comments about capacity. Certainly the insurance industry has capacity, but I would agree with you, Julie, there is an issue there if all the DB plans came to the market today and said, "Let's book out of this thing." There's going to be a severe problem. In the long haul I don't think that the second leg of the retirement stool's ever going to go away.

The number of participants covered by the PBGC dropped recently in 1999 or 2000 to approximately 32 million instead of 34 million. I think it might have been a blip. One-third of the topic of this conversation is risk management relating to annuitization. Regarding the longevity risk aspect of risk management and discharging it from time to time through a systematic approach that's disciplined potentially can help to manage that risk and keep the longevity intact. That would not be necessarily disruptive to the markets.

One of the things that I'd like to focus on again is this issue because it's germane to the question. When interest rates are higher than your funding rates, we consider it and we say, "No, you take a disciplined look at it." They're filed in different terms than what's typical. For example, if you take each year's retirees that come up and annuitize them over time, you would develop a series of tranches that would effectively construct a cost average into displacing the liability over time. That's one example of a way to approach it from a disciplined perspective.

If you have a mature plan, the annuity purchase right now, we know that it's likely interest rates are going to increase in the future, but if you're also making contributions, the stock market returns don't necessarily bless you for putting that contribution into stocks today. The presence or the theory that interest rates are going up, as well as geopolitical issues, has unsettled the equity’ markets, too. Maybe it's time to avoid some risk in using annuities.

I told you that there's been some Monte Carlo work done on the individual side. Peter, if you're ready to buy that annuity from the plan or take it, I think you might be making a good choice. We've done some modeling on our own. It's off the subject, but we are looking at developing some models that help to graphically represent the upside potential to a payout annuity over time. That's going to be something that we think might be suitable for plan participant communications so that when you're ready to take that annuity, the one issue is what's the return on that annuity over your lifetime? For us to understand it here is fairly simple, but for the participant to understand it is entirely different.

Another way to approach helping participants to understand it is potentially to have a system where you can compare the lump sum that's available from the DB plan but also have access to information that gives you a replacement cost so that if you went to market to replace that income, and you couldn't do it, and you were deficient, maybe you would consider taking the annuity within the plan. On the other hand if your lump sum exceeds or if you can purchase an annuity of equivalent or better value than within a DB plan, perhaps it might pay you to take that lump sum, but nobody looks too closely at that as a participant right now.

MR. CONAT: Thank you.

MS. CURTIS: This is a general question I was going to throw out to anybody brave enough to answer it. We talk about risks and the financial risks I don't know that we've addressed directly, although we've all talked about pieces of it, but in the past 10 years it seems to me on the DB side there has been a market increase in the option for lump-sum payouts for most DB plans, so that people are almost looking at it as a best-of alternative investment so that they can either choose, like Peter was talking about, either taking a liability or, if it's a good time and interest rates are low, taking that lump sum.

I think that profoundly changes the financial risk that sponsors face for that, and I wonder how many of us anticipated that when shifting toward more of the lump-sum options over the past 10 years and how much of that is in many cases driving this debate. I was going to ask the audience members whether they had any anecdotes to share about that from what they've seen on their experience and how some sponsors might be handling that right now. If not, I was going to ask whether you've seen that and whether it's changed the outlook, Peter, on the investment strategies of some of your sponsors because the duration changes a lot.

MR. MICHAELS: Typically, and it depends on how many participants choose the lump-sum option, I think what it does is it drives the investment policy to be a little bit more conservative simply because you don't know when you're going to need that cash. If you know with certainty all the annuity benefits, or at least you have a large enough population where it's a reasonable estimate and you know that, it's easy to say that a certain amount of money needs to be set aside. When you don't know what that amount of money is, you're going to be more conservative.

If you want to talk about investment risk, it's giving someone $100 and knowing that when you need that $100 back, you have it. Because you don't know when you'll need that $100, you want to invest in something where you have a higher probability and we're it's going to come back. It *should* drive it to be more conservative. Whether in practicality it does, whether in ALM when you do make an assumption on how much earned lump sum', whether it truly captures that, I'm not certain.

FROM THE FLOOR: You asked for answers from the audience. In my work helping plan sponsors to establish investment policy, I've certainly seen the availability of lump sums as being an important consideration. Recognizing that I'm working primarily in a Canadian context where availability of lump sums has been in legislation for quite a few years now, it's definitely something that we've been looking at in terms of the impact that it has with respect to the amount of ready cash that should be available so that investment managers are not forced to liquidate at inappropriate times. It's also tying into the basis that's used to determine a lump sum. If the basis is tied to bond yields, it's ensuring that there's also something in the plan's assets that's mirroring that exposure to some extent.

While I have the microphone I wanted to ask the panel another question. A lot of our discussion has been focused on the risks to plan sponsors arising in a DB environment, and clearly that should be the focus of a discussion like this. At the same time we've talked about the possibility of managing that risk through passing off investment risk to employees. You could do that through a capital accumulation vehicle of some type rather than a traditional DB, and you've also talked about how individuals can manage that investment risk when it's passed off to them.

I wonder if you'd like to comment for a few minutes about the risk that employers still bear in a DC environment. In traditional actuarial thinking, when I was writing exams 20 years ago, you could pass your exam easily if you said in a DB plan the employer bears the risk. In a DC plan the plan member bears the risk. Someone would check that off on a grading outline, and you'd pass your exam and proceed onto the next stage of your career.

Yet here we are today, and when I work with plan sponsors on capital accumulation plans, by that I mean 401(k) plans, group registered retirement savings plans (RRSPs) in Canada and DC plans, if I look to the U.K. experience where out of the *Financial Times* 100 the vast majority of those companies have frozen DB plans to new entrants or if I look to experience in Australia where in the early '90s DC was mandated as the normal form of coverage for individuals, I see more of a shift toward DC. When employers drive it, it's being premised on the notion that this is a great way for them to shift risk off their shoulders.

Yet when I apply general enterprise risk management principles of looking at strategic risk, operational risk, financial risk and hazard risk, I can clearly identify risks that plan sponsors still bear within that DC environment. I was wondering whether you could comment a bit about how plan sponsors manage or could manage their own risks if they have shifted to a DC environment.

MS. CURTIS: As you've mentioned, we recognize at Boeing that shifting the investment up and down and the longevity risk to the employee, while it does definitely directly impact the financial risk because you have that shift taking place, there is always what I'd talked about before: the potential for the long-term boomerang, which is to say 15-20 years later, if that risk proves difficult to manage on the part of the individuals, and a lot of individuals are hurting, I'm fairly certain that they would come back. Certainly on a personal appeal level, perhaps, they would even seek a public forum or, in the most extreme case, legislation to ease their particular situation.

In addition to that, as you said with the strategic risk, we talk about this a bit, and the operational risk, which is to say that in return for a long-term promise where we have quite a bit of flexibility in terms of when we apply our cash to the trust funds to mitigate or discharge the obligation for the payments in a DB, those payments will be occurring over that 40-year period. The funding presumably will be occurring in the next five to 10 years with discretion on the company's part. With a DC it's fairly fixed. When you make that promise you are committing to writing a check to the hard cash being committed right now, which I think is why in the prosperous '90s so many people were not all that concerned about their DB promise, and perhaps some were reluctant to increase or establish DC plans.

I was going to mention something else on the side when you noted Canada, the U.K. and Australia. I have noticed the same thing because those are our four primary areas where we operate, besides United States. What those countries have in common, which is a little bit different from the United States, are some expectations in terms of the social network. What happens is all three of those other countries are more heavily regulated. They pay tremendously higher taxes, both payroll taxes and income taxes. When things don't look so good for the DCs, which tend to be more regulated and looked at more closely from what I've seen to almost a guaranteed annuity, an insurance payment, what happens is they still have their health care and the old-age benefit. There's a little bit more protection.

I also know that there has been some disruption in the U.K., because for some people who did switch to a more DC approach under Margaret Thatcher, now that the baby boomers are retiring, some of them are hurting from what I've heard. I don't have first-hand view of that, and that isn't what your question was. Your question was how do the corporations handle the risk of the DC? I think it's increased the understanding that it is not a free ride. You still have that hard cash that is going to impact our operational and strategic risk. In the long term you may or may not be alleviating that employee pressure to make good.

MR. MICHAELS: I think you pointed out from an operational risk standpoint there are more increases in a DC plan than there are in a DB plan. If you think about the past six to nine months and the scandals with regard to late trading and rapid trading and mutual funds, in a DB plan because it's the company that's promising to pay that money, as long as the money gets paid to the participants, that's all the participants care about. However, when you start offering a DC plan, and you start saying, "Here are your investment–options," in a DB plan, you've done a poor job of picking managers, it's up to the company to make up for any difference because of that poor management, whether it's inability to add alpha or outright fraud or incompetence.

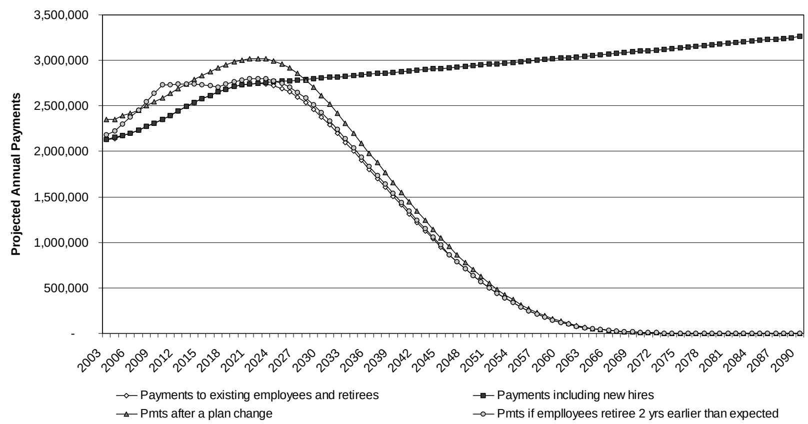
In a DC plan you've opened yourself up to a huge exposure. I brought this topic up in another session where I said suppose you have a plan like my sister's that says it'll pay $0.25 on the dollar for the first $4 that you pay into the plan. If my sister puts in $4, the company will match one, and that's it. In addition to that, because it's a small company, it's not getting the types of management fee breaks that a large company like Boeing would get. It's potentially possible that costs are chewing all of the contribution therefore the company is taking. Therefore, the company's not even helping to contribute.

I brought up the question of a change in law or someone coming up, and one of the panelists said no and that the documents are pretty well-drafted to prevent that. The companies are not promising you a retirement. They're saying they're going to help you with the retirement. As society changes, so does the law and so does the legislation. By having a DB plan, as long as you're meeting the benefit payments to the participants, and you're minimizing some of those liabilities, to some extent that may be a better way to go than a DC plan where you've opened yourself up to a lot more liability and to participant suits.

Chart 1

What is risk?

Future Benefit Payments

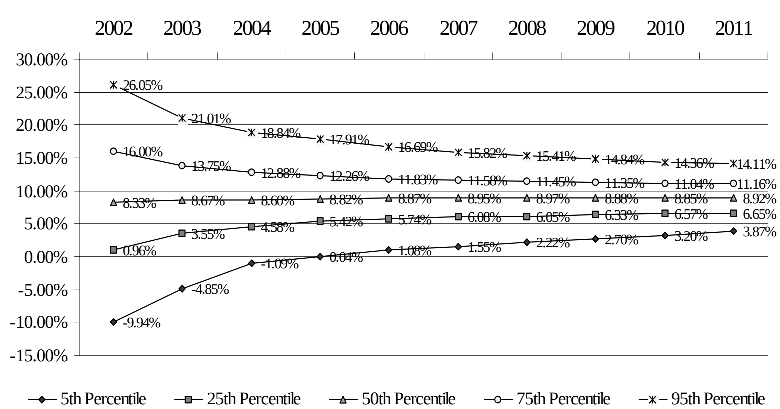


Corporate Perspective

Chart 2

Measuring risks in retirement plans

Cumulative Asset Return (MVA)

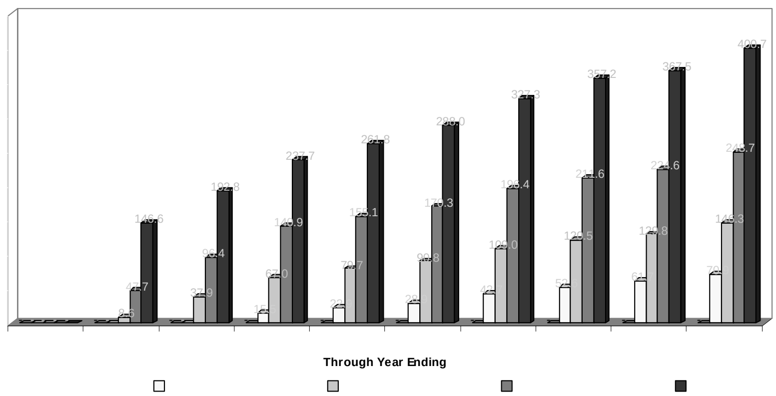


Corporate Perspective

Chart 3

Measuring risks in retirement plans

Present Value of Future Contributions



Corporate Perspective