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SELECTING AN INTEREST RATE ASSUMPTION

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This session will address the considerations and factors in selecting an interest rate assumption.

- ERISA (best estimate individually)
- FASB
- Current liability
- Effect of IRS audit guidelines and audit programs
- Effect of other assumptions

MR. MITCHELL CHARLES WIENER: I'm with the Washington, D.C. office of Foster Higgins. With me is Bob Byrne, who's a partner at Kwasha Lipton, in New Jersey and a member of the Pension Committee of the Actuarial Standards Board (ASB). Many of you may have seen his recent article in *The Actuary* regarding selecting an interest rate assumption. Also with us today is Dick Daskais, who's an independent consulting actuary. Dick and Joe Brownlee, who's in the audience, wrote an article on a similar topic in the *Pension Section News*.

What I'd like to do first is go through a history of the assumption-setting process and IRS challenges to assumptions to bring us up to date and to put in perspective the current IRS small-plan audit program. I think this is really not a new program, but it an outgrowth of IRS challenges to the assumption-setting process that have occurred over a number of years, dating back to shortly after World War II. Really, the history of the IRS' efforts to both have a full-funding limitation in the code and to regulate the assumptions that are used in determining deductible contributions dates back prior to the 1954 code, to a bulletin which was put out by the Service in 1945, on at that time, Section 23p(1)(a), which is the predecessor to current 404.

At that time, there was nothing in the code that dealt with the assumption-setting process or with the full-funding limitations. The IRS was trying to impose such limitations on the theory that if you had assets greater than a reasonable measure of the full-funding limitation, making a contribution and taking it as a deduction could not be an ordinary and necessary business expense and therefore should be disallowed.

Its efforts to impose a full-funding limitation with this bulletin was not successful in the courts. There were two particular cases, one in 1951 and one in the early 1960s, which dealt with these interpretations; *South Penn Oil vs. the Commissioner* in 1951, where, in accordance with the code as it was written, South Penn Oil took a tax deduction for its normal cost, despite the fact that its assets exceeded a measure of its liabilities. The IRS sought to challenge that, and ultimately lost that case in court. This was followed some time later by *Texas Instruments vs. the United States*, which was another key court decision. Here, Texas Instruments, the plan's sponsor, switched from the entry-age-normal cost method to the aggregate cost method to avoid full-funding limitations that were imposed on the entry-age-normal method by IRS bulletins. Once again, the IRS did not prevail here in the short

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run, but we might say that in the long run it did, because with ERISA, the IRS position was codified. With ERISA, we now had a full-funding limitation in the code, and where you're using a spread-gain method, such as the aggregate-cost method, there still is a full-funding limitation.

Also, in the same Bulletin 23(p)(1), the IRS tried to deal with the assumptions by specifying that they be reasonable in the aggregate, and also by listing the most conservative assumptions that could be used. So you can see, even as far back as World War II, there was an IRS interest in defining and limiting the buildup of assets in qualified pension plans. Once again, the position that the assumptions need to be reasonable in the aggregate was codified with ERISA.

The next interesting ruling that came along (and I find it interesting because when we go back and read it, a lot of the concepts that Dick and Bob are going to talk about are first expressed there), is IRS Revenue Ruling 63-11. It's an interesting mix of concepts that I think we, in part, agree with, and in part substantially disagree with, so it's worth looking at because it was, again, an IRS attempt to specify guidelines for reasonable assumptions.

There were basically four key concepts in there, several of which we feel are being violated, if you will, in the current IRS audit program. The first key concept is that the interest assumption, and your other assumptions, should reflect actual plan provisions, actual demographics, and the actual funding medium. So there was acknowledgement in this Revenue Ruling that when you set an interest assumption, the demographics of the group and the specific provisions of the plan should have an impact on your choice of assumptions. This makes it difficult for me to understand how, for example, an 8% interest rate can be used in all cases, because clearly it should vary with your funding mediums and with your plan provisions.

The second key concept that was embodied in 63-11 was the idea that the assumptions should be consistent with reasonable expectations as to average future experience. So what that's saying is it's the future that counts. And I think both of my copanelists would agree that's the essence of what we're looking at in determining a reasonable interest rate assumption; what can we reasonably expect, starting with the market value of assets today, to be earned in the future? We then use it as a guide when setting our discount rate assumption. The next one, which I think many of you will recognize because it has been carried through as a part of IRS policy since 1963, is the idea that the most reasonable assumption should be consistent with the average yield during a recent past period. So, this was the first time a four- or five-year rule appears – looking at actual past experience and seeing what was earned over some prior period, and using that as a basis for setting assumptions in the future. And you'll also recognize it as a predecessor to the current Worksheet III that's often used to measure the reasonableness of assumptions now. As you'll see when my copanelists speak, we don't believe looking at average past experience over a five-year period is a reasonable way to select an interest rate assumption. Rather, we feel, and Bob and Dick can clarify as they wish, to the extent you've had poor or excellent experience over a prior period of time, that's already reflected in your current asset values. So if you've done really well, then your asset buildup may have been sufficient enough, perhaps, to put you into full-funding, and the way in which past experience is reflected is through that particular asset buildup.

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The last concept which is in Revenue Ruling 63-11, and again, one which we find more palatable, is the idea that there's a floor rate, below which the interest assumption should not go. And it's suggested in this particular Revenue Ruling that it's unreasonable to anticipate the most unfavorable experience likely. So in other words, we're looking out over an extended time period, and it wouldn't be unreasonable to say our expected rate of return is 9%, but we want to leave three standard deviations' worth of room for possible unfavorable experience, and therefore use an interest rate substantially lower than the expected value. This ruling also mentions, for example, the interest rate implicit in single-premium annuity purchase rates could act as a floor rate. And I think you'll see, in some of our other commentary, that that's a position, with some modifications, that we agree with.

The next stage in the process was the delineation of actuarial guidelines in Worksheet III, which occurred in late 1984. And what Worksheet III sought to do was measure the reasonableness of assumptions in the aggregate. And it did so by taking a look at the overall gain and loss as a percentage of the accrued liability. In doing this, the IRS agent is supposed to eliminate any nonrecurring gains or losses in determining what the gain or loss was. Basically if the average gain or loss over a period of three-to-five years exceeded 4% of the accrued liability, that was a situation that deserved additional scrutiny. So one of the questions that could occur, especially in looking at current-day audits from the late 1980s is, when we look at the bull market of the 1980s, are the kind of returns that were achieved in the 1980s, the kind of gains that are expected to recur? And, my own position would be that, to the extent that the returns during the 1980s were well above the average rate of return during the postwar period, there certainly must be an element of nonrecurring gain in there. If you're going to do this type of analysis, those types of gains should be eliminated in determining the reasonableness of the interest assumption.

Now, of course, ERISA has since codified the use of assumptions reasonable in the aggregate and the full-funding limitation. Thus, even though some of the court cases may have gone against IRS, eventually they've prevailed.

The next major attempt by the IRS to audit deductions was a series of technical advice memorandums which were issued in 1985. And in these cases, the IRS tended to focus on newly-created plans. This is its first attempt to really focus on assumptions individually rather than focusing on assumptions in the aggregate. By focusing on new plans, you wouldn't have the three-to-five years' experience that you would have if you were auditing an older plan. As part of this effort, the IRS, especially on some newly created small plans from 1980 or so, focused on the use of Treasury rates as an interest rate floor, and particularly on the use of 30-year Treasury rates, saying that for a new plan, certainly they could have achieved that rate. And this is also the first time IRS stated that it believed that an 8% interest rate was appropriate. This is one of the first instances where we see the 8% interest rate that currently applies in the small-plan audit program appearing in the IRS rulings.

Significantly, in 1987 there was a court case of *Jerome Mers and Associates vs. the United States*, which marks the first instance in which the IRS achieved a court victory in challenging assumptions. This particular case had some particularly egregious elements associated with it. It was for the 1980 plan year. It had a formula which was particularly front-loaded, with an accrual of 30% of pay in the

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first year of participation and 5% per year for the next four years -- that constituting the full accrual. There were only two participants in the plan, one of whom was 43 years old and was expecting to retire at age 55, so the IRS viewed that as a very limited time horizon, and, interestingly enough, did not challenge, in this particular case, the age 55 retirement assumption. The interest rate used was 5%, and in this particular case, Jerome Mers had tried to take a tax deduction for the pure unit credit normal cost on the 30% of pay accrued in the first year, such that they would have been contributing the vast majority of the assets that would have been contributed over the life of the plan in the first year. And the IRS, in this particular case, focused on the rate of return available on 10-year Treasuries, given that they were viewing it as a 12-year time horizon from his current age, 43, to age 55, and were able to prevail in court that the 5% interest rate was unreasonable in light of the facts of the case and the current circumstances.

Now, again, a lot of what the IRS was trying to accomplish with these technical advice memorandums and with the court cases at that time were actually codified with the Omnibus Budget Reconciliation Act (OBRA) 87. OBRA 87 required that assumptions be individually reasonable. In addition, we have a current liability rate in which the interest rate range is very specifically stated, and which limits the buildup of assets. So, again, the IRS accomplished one of its goals, dating back to 1945, of limiting the asset buildup inside pension plans. So, currently, we have the IRS small-plan audit program, which primarily is focused at the 1986, 1987, and 1988 plan years, and is focused on the interest rate and retirement age assumptions more so than other assumptions, and is, in some cases, specifically trying to use an 8% interest rate as a guideline to what is reasonable.

So, it seems to us that this current topic of discussing a reasonable method of setting an interest rate is especially critical right now for two reasons. One is we need to demonstrate the process that we've followed in selecting an interest rate assumption, and that interest rate assumption, since 1988, has to be individually reasonable. So I think it behooves us to come up with a method of selecting an interest rate that can withstand scrutiny. Given the substantial disagreement (at least among our panel) with the process followed in Worksheet III, of looking at the actual gains which have occurred over the last five years and using that as a basis for selecting the interest assumption for the current plan year, it seems to me that if we as a profession feel that that is not an appropriate method to use, then it behooves us to try to develop a method that can be used to determine whether an interest rate is reasonable or not. And in light of ERISA, it seems to us that our job is to select a rate which is reasonable, but our rate should be presumed reasonable unless the Service can prove that it's unreasonable. So in our mind, what we need is a standard that we and the Service can agree on, so that when we set interest rates and we calculate tax deductions for our clients, we can know at the time we do the calculations that those calculations are going to be reasonable and are going to withstand IRS audit. And it seems if we can develop a process for identifying a reasonable interest rate, it should also allow us to develop a process that would allow us to identify rates which are unreasonable. So, in that spirit, I'm going to turn the discussion over to Bob Byrne, and we'll take you through our thoughts on what a reasonable method is to use to select an interest rate assumption.

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MR. ROBERT STEPHEN BYRNE, JR.: I've been on the Pension Committee of the Actuarial Standards Board now for about three years. And during the course of the last two years, we have been discussing the topic that we're presenting at the panel, which is economic assumptions for measuring pension obligations. This is meant to amplify the Actuarial Standard of Practice which was issued by the Academy: Actuarial Standard of Practice Number Four, Recommendation for Measuring Pension Obligations. The standard is meant to provide guidance in most everyday circumstances for actuaries to be able to use. But the Standard does recognize that there are an infinite number of circumstances; that is, you can't write rules that will cover every situation. And also, as is usual in the introduction to a standard whenever it is issued, and it's going to be in draft form later this year, will come the statement that some of the views or opinions or ideas expressed within the standard may have to be modified for either use with the Governmental Accounting Standards Board (GASB), the FASB, or the IRS because they, in fact, may have their own rules.

The economic assumptions that are going to be covered in the standard really are, first of all, the basic three that we're all used to dealing with, which are inflation, the rate of salary increase, and investment return. For other assumptions, which might include rates of increase with respect to government indices, rates of return on short-term yields which might be appropriate for use in cash-balance plans, and other such indices, only general guidance will be given. Initially, in discussing economic assumptions, it was realized, or we realized, that to not talk at the same time as to how one was measuring asset values could lead to inconsistencies. This standard will be issued without reference to asset valuation methods. The assumption, or presumption, will be that the actuary is using something which approximates current market value, or is a market-related value, which over time is expected to closely resemble market value. That is, the asset-valuation method is explicit.

Now, the hoped-for method that Mitch was referring to, if the standard remains in its current draft form, will not be helpful in that regard. That is, actuaries will still be permitted to use a range. It is not to my liking, but the way it currently stands right now, a minimum or a maximum will not be specified that an actuary can feel good about using. In other words, there's no lowest or minimum interest rate assumption that would guarantee that your interest rate assumption is reasonable. The standard will go through the usual considerations. The key one, which Mitch mentioned, is to be able to measure what you think the future trends are going to be with respect to your current investments. In order to establish that, you've got to take into account the plan sponsor's investment philosophy, and the real rates of return that would be expected to be earned on other asset classes. You need to take into account past experience to the extent that you think that that past experience would be duplicated. That is, the past experience is relevant, possibly in establishing real rates of return that could be expected to happen again in the future, because they, in fact, have happened in the past.

Now, there are many different methodologies for selecting an investment return assumption or an interest rate assumption. And the discussion that I'm going through is in absolute terms. It's not discussing selecting an investment return assumption for FASB. It's not talking about how one would modify it for the IRS. It's from the point of view of what's being developed right now within the Actuarial Standards Board, or the Pension Committee of the Actuarial Standards Board. The two

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methods that I'll be going through briefly are what I'll call the traditional method, which we're all well schooled in through study notes and our upbringing in the Society of Actuaries. Then I'll discuss other methodologies.

The traditional, which we all, or some of us, would call the building-block approach, starts with an assumed, long-term future inflation rate. And that future inflation rate could be composed of select and ultimate. For example, you might be in a time of what you think is temporarily high inflation. But the basic starting building block is the current inflation rate. From there, take a look at both the current assets and the assets expected to be accumulated in the future, and the different asset classes that the plan sponsor is expected to put their money in, real rates of return. All those things are put together, the inflation is added with the real rates of return, and what comes out is an investment rate of return. And that's the traditional way that the investment rate of return has been developed, certainly for IRS valuations in the past. As a comment, not a number that's going to be specified in the Actuarial Standards Board document, I would say generally, most actuaries probably start out with an inflation assumption of 3.5-6.5%, and it is independent of what the current investment climate indicates the expectation for future inflation is.

But, there's another approach. This is one that actuaries, and actually the IRS, are becoming more in tune to, either in promulgations by the IRS or FASB. It involves starting with what current risk-free rates are. Benefits are expected to be paid out over a future period of time. Generally, that period of time ranges 30 years or more, for most plans. Long-term U.S. government bond yields – Mitch mentioned the 30-year U.S. government bond yield – seem to be an appropriate starting point. That doesn't mean that's the ending point, but it may be an appropriate starting point to evaluate what the asset return would be. Then one would, based on the investment philosophy and a host of other considerations, and Dick and I will be getting into some of those other considerations, establish a premium to come up with the total investment return. And, as is noted in FASB's current discussion memorandum on present values, as it is going through a project right now, the expected inflation rate is actually embedded in those long-term U.S. government bond yields.

To compare the approaches without the date, see Table 1. I think this type of example will be appearing in the document, and it's important. This document, unlike other documents that have been released by the Actuarial Standard Board, will have a lot of illustrations. There are illustrations meant to show what an appropriate way to start is, and what an inappropriate way to start trying to evaluate the assumption is. In Table 1 that we've drawn up, and it happens to typify what the investment environment happened to be back on January 1, 1985, just so that you could see it was real, we assumed that our investments were such that, over the long term, we could expect to make a rate of return 4.5% in excess of inflation. However, current or government bond yields for the long term, or the rates of return on government bond yields were expected to be 3.25% in excess of inflation. Now, I dare say the normal way that actuaries would have determined, and still, to a large extent, determine the expected rate of return, is to start with an inflation assumption. That inflation assumption is independent of current market conditions. And, that inflation assumption I just drew up, and I don't think that's too far out of line with what might have happened in January 1985, might have been 4%. No one would care, under the traditional building-block approach, as to what government bond yields were. The

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rate of investment return, or the interest rate that might have been established in this environment, might have been about 8.5%.

TABLE 1
Comparison of Approaches
January 1, 1985

Assume:		
- G-bond yields 3.25% excess of inflation		
- asset return 4.50% excess of inflation		
	Traditional	Alternate
Inflation	4.00%	N/A
G-bond yield	N/A	11.50%
Asset return	8.50	12.75

The alternative philosophy that's talked about within the Standards Board document, and it may be subject to change from the last time that I saw it, which was in late May, is that you would start out with the government bond yield. At that point in time, long-term government bond yields might have been, on the average, somewhere about 11.5%. Since investments were assumed to earn about 1.25% over and above inflation, someone might have established an asset return rate, given the particular investment cited here, of something like 12.75%. And although those two types of examples are shown in the standard, there is no real guidance as to how to resolve the difference between those two rates, which is substantial.

As another example, which I think is going to be pulled from the standard, some of the other considerations that one might talk about are small plans. What makes small plans different? One is a generally conservative investment philosophy as compared with larger plans. And the other thing is the volatility with respect to what the future expected benefit payments might in fact be. I'd like to describe a situation which, in the beginning, you might think does not describe any real situation, but actually is quite close to what a small-plan sponsor, or small-plan sponsor actuary might find.

Let's suppose, for example, that the investment philosophy of the plan sponsor is to invest in 10 separate GICs or CDs or zero-coupon bonds, and let's say that they all are earning 10% as of evaluation day. Forget about the \$10,000. Let's also assume that all of these zero-coupon bonds, or GICs mature for equal amounts. Let's assume that all of the investments from one year to 10 years earn 10% and there's no early redemption penalty. That takes it out of the zero-coupon bond environment and leaves it with something like a GIC environment. Let's make believe we're not invested in Executive Life or some such thing, and assume that there is no risk of default. Finally, let's assume that if, in fact, we're faced with having to reinvest money, we might earn 6%.

Now, let's take the case where the plan covers a 55-year old where the benefit over 10 years has been fully accrued, and that the lump-sum value expected to be paid for that person with 10 years of service, for that 55-year old, is \$100,000. And that \$100,000 would be payable whether the individual retires at 56, 57, going up to age

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65. The responsible plan actuary comes along, and says there's a 0.1% chance that that individual will retire at age 56, 57, 58, etc., and a 100% chance that the individual will retire at 65. The question is, what interest rate assumption should be in back of the actuarial accrued liability so that, depending on the plan's size, the actuary could expect that there'd be a 50% probability of that amount of assets being able to provide all future benefit payments – a 70% chance, or a 90% chance? The results are striking. If you had 1,000 plan participants, and in that situation that I just outlined, no matter what type of probability you wanted for the assets to have in order to be able to provide all future expected benefit payments, the interest rate that you would be using in that situation would be very close to 10%, because the deviations, the standard deviations which Mitch referred to, would be very small.

But note, when we have a very small plan, it has only covered two or three plan participants. Again, if we're just talking about a 50% probability when all the other assumptions are reasonable, again, the rate that one would value is going to be very close to 10%. But is it unreasonable, and I'm not going to try and answer that question. I'm just going to point to it in terms of probability, but is it unreasonable for the amount of assets necessary to back up the accrued liability to have a 70% chance of being sufficient to be able to provide all future benefit payments? Well, then we might be in the 7.75% or 8% interest rate assumption. So, one can see that, due to just the pure volatility, the fact that the deviation, with respect to the small plan sponsor, can be so large, it might in fact speak for, even given the same investment philosophy as a larger plan sponsor, a different interest rate assumption.

The next topic that I'd like to speak just a little bit on is the concept of using variable interest rate assumptions. This was basically outlined in an article which I think appeared a few months ago in *The Actuary*, and it's very similar to a lot of what Dick is going to be talking about so I won't belabor a lot of the points. I'm going to split it into three parts, and the first part is going to be a rehash of what actuaries have done since ERISA.

If you take a look at assumption surveys for plans, the interest rate assumption that actuaries have used has gone up from a little above 5% to what actuaries for large plans are currently using which is something in excess of 8%. The trend has been steadily upwards. At the same time, long-term U.S. government bond yields started out, in the beginning of 1976, at a rate of about 6%, climbed in the early 1980s to rates in excess of 14%, and have since dropped. For the past five or six years they have stayed in a range of 7.5-9.5%.

I would comment that, for a large plan with a diversified portfolio which is fairly well funded, these would be considered to be odd investment return assumptions. That is, one might expect a diversified portfolio to argue for some type of return that was even in excess of current U.S. government bond yields at those particular points in times. Now, obviously there would be modification, not just for the funded status, but for the plan's size, the benefit variability, things we touched on already, the risk of reinvestment expenses, if they are paid from the trust, and the degree of conservatism that is allowed. And again, I'm not speaking at this from an IRS standpoint, but with the degree of conservatism, whether allowable or not, that the actuary wishes to employ within their calculation.

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Four things, I believe, did occur because of our profession not going to market rates. I think the investment bankers were able to sell the idea of immunization. In many cases, immunization was a good investment decision, but I'd say in many more instances, plan sponsors already had a certain amount of assets in fixed-income securities, and it was doing nothing more than to cause the actuary to adjust their interest rate assumption. Because there was really no change in investment philosophy, they came up with a product called immunization to force the actuary to get closer to real market rates.

Annuity purchases were something that insurance companies then fostered with the same idea in mind. One of the reasons that they came up with standards for pension accounting, Statement of Financial Accounting Standard (SFAS) 87 I think, was that interest rates varied from 4.5-14% under the SFAS 36 assumptions that were published in annual reports.

And finally, the current liability restrictions imposed by the IRS, both limited maximum tax deductible contributions with the 150% current liability limit and increased those funding requirements for plans which were underfunded, that is, which had assets less than 100% of the current liability.

As an example, I'm going to go back to the same type of assumptions, but also throw in a pay increase assumption that I alluded to before, and take a look at my recommendation for which of three different methodologies make sense (see Table 2). Again, to review what those assumptions are, we're assuming that government bonds yields are going to be about 3.5% in excess of inflation. The composition of the portfolio is such that we would expect to earn 4.5% in excess of inflation, and we'll assume that future pay increases would be about 1.5% in excess of inflation. Again, going back to this January 1, 1985 date, we've already gone through how the traditional methodology would calculate what the expected rate of return is, or what the investment return or interest rate assumption is. Starting out with an inflation rate of 4%, it would build off that. The pay increase assumption is 1.5% in excess of inflation. We come up with a total asset return 4.5% in excess of inflation, or 8.5%.

TABLE 2
Three Different Methodologies

Method	1	2	3
Inflation	4.00%	N/A	N/A
Pay	5.50	-9.75%	+5.50%
G-bond	N/A	11.50	11.50
Asset	8.50	12.75	12.75/8.50

The second methodology for consideration – and I like methodologies two and three – would be to start with the government bond yields, which are at that time 11.5%, similar to what we talked about before. Taking the point of view that the actuary really has no idea about future inflation or about future interest rates, he would just believe or take a neutral view that those interest rates will hold forever. And then we come up with an investment return assumption of 12.75%. This

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would apply both to amounts currently funded and to all future amounts. I show here the pay increase assumption of minus 9.75%. As many of you know, in high inflationary times, pay increases do lag behind the actual inflation increase. I was assuming here, for simplicity, that it would go in lock step, but obviously there'd be modification. It'd be somewhere between the 5.5-9.75% rate.

A third methodology is to sort of split the investment return assumption. Again, starting with that government bond yield of 11.5%, one would say that for all assets which are currently invested, it is a safe or a best-estimate type of return with respect to those assets already on hand, that 12.75% could be earned. With respect to future investments, it takes a look back towards methodology number one and maybe an 8.5% rate is more reasonable. We're not sure what's going to happen in the future, and that's a more prudent way of looking at things. And finally, somehow, through government policy, inflation will be tamed, so maybe future pay increases will come back down to a more normal 5.5%. And again, similar to showing what was depicted for methodology two, I've shown the 5.5% plus -- you might want to, at this point, employ some type of select ultimate assumption on that pay increase assumption that would again take into account what current conditions are. But I would suggest that methodologies two and three both respond to current market conditions in a responsible way.

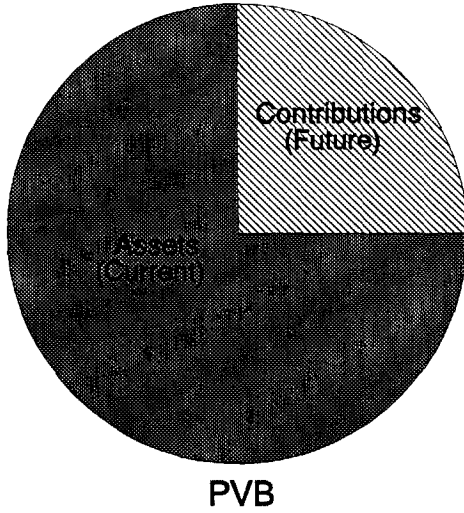
The amplification of that third one (See Chart 1) is to take a look at assets. The egg represents all of the future expected benefit payments, denoted below by PVB. Whether you're calculating that number directly or not, that number is always there, whether it's a unit credit valuation, an entry age-normal valuation, or an aggregate valuation. Assets can be assumed to earn the current rate, in the example depicted just before, 12.75%. Future contributions, which may be reflected in the normal cost and the amortization of the unfunded liability, might be expected to earn that future rate. Finally, these same concepts even apply when one is considering FAS-type assumptions. Regarding FAS assumptions, I don't want to make believe that it's the actuary who's determining them. Naturally, we all know it's the plan sponsor or the corporation who has the final say in those assumptions. Table 3 shows a client of ours who has followed our recommendations consistently over the past five years. And you can see on the bottom line, government bond yields have faithfully been used for the discount rate, but that's not what we're talking about here. We're talking about is the investment return assumption, and that has been consistently determined as 1.1% over and above the discount rate assumption. Amazingly enough, these rates have fluctuated in accordance with where government bond yields were (in case they don't look to you like January 1 rates, the measurement date for this client actually happens to be September 30), but note that with investment return assumptions going up and down like that, and pay increase assumptions and discount rate assumptions going up and down, the fluctuation on a plan sponsor with a plan with over \$250 million in assets and liabilities has been less than a million dollars each of those years for the past five.

So, I think one thing that actuaries have to do is not only get into the spirit, or take a look at what current market conditions are, but also remember that it's not necessarily true that, by reflecting current market conditions, one will be introducing increased volatility. Now, Dick will present, I think, a more general overview and also go into a little different version of fluctuating interest rates.

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CHART 1

Overview



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TABLE 3
Example
FAS 87 NPPC Assumption

	1987	1988	1989	1990	1991
Discount	7.7%	9.8%	9.0%	8.3%	9.0%
Pay	6.3	7.4	7.0	6.6	7.0
Return	8.8	10.9	10.1	9.4	10.1
G-bond yields	7.6%	9.8%	9.0%	8.3%	9.0%

MR. RICHARD DASKAIS: I was fascinated by Mitch's introduction. One way one could have determined an interest assumption prior to ERISA is simply to find the employer's desired contribution and then keep doing repetitive valuations until you had the right interest rate. And if you wanted to earn a very large fee, you could use fluctuating or variable interest rates.

But I think we're dealing, at least at this session, with assumptions that are either best estimate, or work off of something that is related to a best estimate. Let me start with some fundamentals. An actuarial valuation is an appraisal. It is not an historical record of something. It is an appraisal of the assets and an appraisal of the liabilities; the actuary finds the difference between the assets and the liabilities, and that difference is reflected in future contributions or future costs, depending upon which environment we're dealing with. And the actuarial method arbitrarily divides the difference between assets and liabilities into future normal costs and contributions, or costs related to past service, which of course can be negative.

I believe that we have to start out by using the market value for both assets and liabilities. If we are using a value for assets which is different from the fair market value, we should not be using it because we believe that some different value is a better estimate of the fair value of the assets. I think we should be using smoothed assets solely for the obvious reason: we want to smooth costs, and that value of assets is something different from the market value, but is based upon some five-year averaging method.

Well you then get into what I'd consider the impossible situation of saying that two identical portfolios, for different pension plans, will have different values because we got there by using a different path. Let's talk about the market value of liabilities. Contributions for ERISA purposes, for contribution purposes, we have to use a best estimate, and that includes benefits to be earned in the future. For SFAS 87, as we all know, for the discount rate, we are supposed to use something that approximates a settlement rate, the rate at which the benefits could be settled, and it excludes benefits that are earned in the future. For current liability under OBRA 87, we use a weighted 48-month average. My own view is that there's nothing wrong with a 48-month average, except I would weight the last month 100%, and weight the previous 47 months zero. But the general principle is right.

As somebody has pointed out, the regulations are such that we have found a method that is impossible to immunize in the market. Think about it a while. There is no way that you can invest the assets in Treasury zeros or anything else, so if you are in

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balance at the beginning of a period, you will be in balance at the end of a period when you're using a 48-month weighted average, or any other weighted average, for that matter.

One method, of course, of determining a best-estimate interest assumption is to take a survey. This may satisfy some sort of a reasonableness criterion, but there are those of us who believe that if science were based on surveys, the world would still be flat. I'm not going to repeat everything that Bob said; I would just point out that I'm a little older, and so to the extent that we have similar thoughts, I obviously reached them earlier than he did.

I think the first approximation to a best-estimate interest rate is to find a risk-free investment, namely a portfolio of Treasury zeros, that will match the cash flow of benefits implicit in the valuation from the other assumptions. Remember that there are Treasury zeros available for almost every duration at three- and six-month intervals, up to 30 years. So you can match most of the present value of your cash flow explicitly. In most plans, the present value of the benefits to be paid after 30 years, whether you're dealing with a projected benefit obligation (PBO) or the present value of all benefits for the active employees, is a very small number, that is, the present value of the benefits to be paid after 30 years. So you can get a cash-matched portfolio. And you can find the implicit interest rate, or the weighted-average interest rate of that cash-matched portfolio.

The yield curve, whatever it is, will change in such a manner that the change will be the same at each future duration, or if you are willing to make an assumption as to how the yield curve will change (not necessarily become flat), you can find a duration-matched portfolio, which will match the duration of the liabilities. Now, I think it's important to recognize here that the assets need not be equal to the liabilities in order to have the asset duration, the change in dollar value of assets with respect to a change in interest rates, be the same as the change in the value of the liabilities, that is, the duration of the liabilities or the dollar change in value of the liabilities with a specific change in interest rates.

For example, suppose you have a pension plan that has \$500,000 of assets and a \$1 million present value of liabilities. If the duration of the liabilities is about 10, which would not be atypical for a final-pay plan that is reasonably mature, you could go out and invest the \$500,000 of assets at duration 20 and have the same sensitivity of asset value to change in interest rates as the change in liability value to change in interest rates. So, you can dollar duration match the assets. Now, I would say that the interest rate on such a portfolio is the starting point for a best estimate. Then, you have to make adjustments.

If you are operating in an environment where you are permitted to be conservative, in other words, if you do not have to choose a single point as your best estimate, but you want to be one standard deviation or a half a standard deviation away, then you can put your conservatism in. You can also look at the possibility that the pension fund will not be invested entirely in Treasuries. My view is that, to the extent that the pension fund is not invested entirely in Treasuries, it is invested by a fiduciary because he believes that some other form of investment will have an expected return that is greater than that of Treasuries. Presumably, no fiduciary is going to say, "I

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can get 8% on Treasuries, but I'm going to invest in common stocks because I expect them to earn 6.5%. Everyone else is investing in common stocks, and that's why I should." Therefore, any other investment policy, in my view, would lead to a higher expected return than that of Treasuries.

I also would pay relatively little attention to the specific current investment policy. We are dealing with investment earnings to be achieved over the next 20, 30 or 40 years. There is no reason to expect that the investment policy of a particular pension fund will remain stable over that 10-, 20-, 30-, or 40-year period. As a matter of fact, since we know that the pension fund is being invested by fiduciaries, as fiduciaries, they will periodically review their policy. Therefore, I reach the conclusion that the expected investment return is about the same for all funds irrespective of their current investment policy. I would also say, for the reasons I've stated before, that it is irrespective of the past experience of the fund.

Now, some will say that a particular manager or a particular fund has had very poor investment results in the past, and therefore we should use a lower assumed interest rate for this fund, because the manager isn't very good. But I think, again, I have to assume that over the next 30 or 40 years, whoever is responsible for choosing the investment manager will do about as well as those who are responsible for choosing the investment managers of other funds, and I would make very little distinction, or none at all -- based upon the current investment manager.

If the environment in which you're operating permits you to use some conservatism, then of course you would have the anomalous situation that the riskier your investments, and presumably therefore the greater the expected return, the lower the return that you should assume in order to be one, two, or three standard deviations away from your criteria. This would usually be what you'd work out, I think, if you found the safe return, that is, with a 75% or 90% probability of being adequate over a particular horizon.

Both Bob and Mitch talked about the necessity to consider the durations of the liabilities, and I of course have talked about the necessity to consider the duration of the liabilities. It is interesting, if you look at the strip yield curve, which you can see everyday in *The Wall Street Journal* and a lot of other daily newspapers, that once you get out above five years, at least currently, the strip curve is relatively flat. I happened to look at the May 31 issue of *The Wall Street Journal*, which of course shows trading on May 30. The five-year strip was yielding 7.8%, and that's compounded semi-annually, of course. The maximum was about 15 or 20 years where the yield was 8.6%, and then the curve was inverted, or downward sloping, so that a 30-year strip was yielding about 8%. So you are not going to get, under most circumstances, a great deal of variation, if you buy the rest of my arguments, simply because you have different durations on the liabilities. However, I think it's necessary to go through the exercise in order to satisfy oneself that one doesn't have liabilities with durations of 25 or liabilities with durations of three.

I was interested in Bob's comment in which he mentioned that from 1975 or 1976 to 1990, assumed investment returns and assumed interest rates rose uniformly through the period. This was an illustration of one of the thesis of one of my former colleagues at Goldman Sachs, who said that actuaries basically work on a 25-year

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moving average. It was quite anomalous that when interest rates came from between 10% and 15% in the early 1980s to between 7.5% and 9.5% in the late 1980s, we actuaries generally increased our assumed interest rates.

I used to do some work for the defense department, and I remember when certain defense contractors were trying to justify a lower investment return assumption than the Department of Defense thought was reasonable. They, of course, trotted out the fact that the experience had been poor in the early 1980s. In other words, when interest rates were going from 9-13% because the investment return, market to market, was small or negative, they were using this as a justification to go from an 8% assumed return to a 7% assumed return. Rising interest rates should not result in lowering investment return assumptions, and vice versa, in my opinion.

By the way, a great deal, if not most, or if not all of what I've been saying is attributable to Joe Brownlee as well as to me, and probably to a lot of other actuaries who contributed to our paper. When Joe and I presented a similar paper, I guess it was at the EA meeting, we made a list of some of the objections to our crazy thoughts, one of which – and I'd like to go through a couple of them – was that actuaries should generally be conservative. That's fine if the legal environment permits it, but I think we should recognize that sometimes when we use conservatism, we are inadvertently, or perhaps advertently, doing some harm.

For example, suppose we have a client who is considering changing to a defined contribution plan. If we represent the costs of the defined benefit plan using an intentionally conservative assumed investment return, we are biasing that client to choose a defined contribution plan, because we're telling him that he will get more benefit dollars for the same contributions from a defined contribution plan than we expect he will get from a defined benefit plan.

Another argument against doing what we're doing, or what I'm suggesting, is the argument for stable contributions. This, I think, is a valid argument, except I think it's out of place. If we wanted stable contributions, or if the writers of the Internal Revenue Code and the Financial Accounting Standards Board wanted stable contributions and costs, they could have required valuations every five years, instead of more frequently. I think it's incorrect to pretend that we're doing annual valuations and then say that we're implicitly going to give a great deal of weight to the results we got in the previous valuation to determine the results of this valuation.

Larry Deutsch was going to speak about small plans at this panel, but I guess unfortunately he could not make it and Mitch called me a couple weeks ago and asked if I would be able to speak about small plans, which is sort of putting the fox in the henhouse. My view is that the logic, if you will agree that it's logic that I have been stating, is equally applicable to small plans. The expected return of small plans is, for no reason that I can discern, materially different from that of large plans. I would say that the standard deviation of the returns of small plans will be much greater. But except for some economies of scale of investing, for large plans, there's no reason in the world for small plans to expect to earn a materially lower rate than large plans are earning. Any small plan can buy a no-load mutual fund. Most small plans can buy Treasury zeros, they're available in relatively small denominations, with a somewhat greater spread between the bid and the ask.

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MR. WIENER: At this point, we'll just open the floor for questions.

MR. CHARLES L. WALLS: I just wanted to make one comment on something you said, Mitch, about the history of the IRS position. I think the position is still that assumptions which are reasonable in the aggregate can be used instead of assumptions which are individually reasonable. The other comment I had was on Bob's remarks about the SFAS 87, and that was that there's still wide variation in choice of interest rates. My concept of SFAS 87 was that the FASB wanted to get the liabilities onto the balance sheets of corporations, and that it is not concerned about the variations of assumptions.

MR. BYRNE: Just one comment with respect to the assumption variation. I think they are a little surprised or anguished or something about the wide range. Let's talk about the discount rate assumption – a little bit has been alluded to in SFAS 106. I think if it had it to do all over again, it wouldn't be talking about a settlement rate, but would be looking for, in terms of discounting the liabilities, something along the lines that Dick was referring to with respect to risk-free types of investments. But I do agree, there is still a large variation in the assumptions used for SFAS 87.

MR. WIENER: In the current environment, the PBGC immediate rate is at 7%, and on the FAS side you could see everything from seven to, perhaps, a rate on double A utility bonds or something up in the high eights or nines.

MR. DASKAIS: I'd like to add a little bit on the SFAS 87 thing, and that is, although there may be a wide range, as Mitch just said, I think that the auditors would expect a consistent choice within that range. Now, that's overstating it, I'm sure. But as I recall, one of the specific questions on SFAS 87 is, can you just – in the guide or whatever they called it – pick any rate within the range from the PBGC immediate rate to the double A or even single A bonds? And the answer to that question was no. And so, in general, I think the FAS board and the auditors expect – and maybe its disappointed – companies to change their discount rates as interest rates generally change.

MR. BYRNE: Just one more thought on that same topic. With respect to the investment return assumption, I think there has really been two different schools of thought used by different corporations. One is leaving the investment return assumption unchanged from year to year, and the other is moving it, in some way, shape or form, in lock step with the changing interest rate environment. I think you can tell that I'm a proponent of the second one.

MR. WIENER: I find it kind of unusual myself that SFAS 87 seems to require that the discount rate be volatile and move around from year to year. Well, I think it pretty much explicitly states that the expected rate of return is to stay stable, and I find that kind of an interesting way for them to state the whole thing, kind of reversing it from the traditional actuarial valuation role.

MR. BYRNE: I disagree with Mitch a little bit on that one. I think what they say is that it should be a long-term rate, and I think what we've been discussing is that actuaries don't understand what a long-term rate is. The basis from where to start with a long-term rate is the only type of investment which gives an indicator of where

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those future rates might, in fact, lie. And that is, as Dick pointed out, some type of risk-free portfolio. That's the best, and about the only indicator of any economic indices that we have. And I would concur with him that for most large plan sponsors, to think that they would employ an investment philosophy that would say that they would underperform that rate, and therefore that that rate shouldn't move as interest rates move, is in fact a fallacy and makes that assumption not that meaningful.

MR. DASKAIS: Early on, I mean, in the first year or two of SFAS 87, there were some companies that were using a lower expected return on the assets than the settlement discount rate, which was a little anomalous, because they were essentially assuming that their investment managers were earning less than they could get if they settled all the liabilities.

MR. WIENER: In essence, the method that you're suggesting moves the interest rate that's used to discount liabilities from year to year in line with the inflation assumption that's implicit in government bond rates. In other words, presumably the market prices the yield to take account of expected future inflation. So, we'd be moving our interest rates around each year to reflect the current inflationary outlook as measured by the markets. Have you actually performed valuations on that basis, and what kind of results have you found as far as the volatility and the results from year to year?

MR. DASKAIS: First, I think I would disagree a little with your premise, because you can have a change in the real return, and I think many economists would argue that some changes in interest rates are simply changes in the real return, or are largely changes in real return rather than changes in expected inflation. I, and I know a number of other actuaries, have been using an assumed investment return that was partially indexed to a triple A industrial bond yield. Without going into the details of the method, generally it was assumed that the current assets could be invested over a finite period, like 15 or 20 years, to yield the current triple A industrial bond yield. All reinvestment and all new contributions would be invested at a longer term rate, which may be different, and typically, during the period I was using it, was lower than the current rate. And this is basically the method that Bob described in his paper.

MR. BYRNE: I have been using it for both FASB purposes and IRS purposes, and the volatility that one might expect is not there, I think you can do some fairly long-term studies which we also have done, and there's no real volatility difference between going from totally implicit to explicit bases that Dick and I have been referring to.

MR. DASKAIS: One interesting aspect of what we did is that for asset valuation, we used a five-year phase-in, if you will, for the difference between the actual return on the fund and the expected return, taking into consideration the changes in interest rates. Now, this was explicitly asked, or this was specifically addressed, in the SFAS 87 questions and answers, and was rejected because the SFAS 87 approach is essentially to look at assets and liabilities quite separately. They didn't want to mix an asset valuation method with anything having to do with liabilities. I believe they were wrong.

MR. WIENER: Surely there must be some other comments or questions.

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MR. HAROLD J. BROWNLEE: I will always comment. Bob mentioned that the Actuarial Standards Board is going to be coming out with a draft of a standard for selecting assumptions, and it is my understanding that there will be a public hearing on this in Washington in September, and there will probably be something in your hands before then. So I would suggest that, since it will undoubtedly be quite heretical and contrary to what all right-thinking actuaries have been doing for the last 50 years, you should read it carefully and show up at the hearing to make sure that, if and when they ever do issue a standard on this very controversial topic, it does reflect the variety of views.

The other thing that I would say is that he mentioned that there will very likely be a range which would be permitted. Now, a range, a permissible range around some so-called ideal figure, means that if you are within the range, you don't have to explain what you did. That is, if the expected rate of return is 10%, and the range is from nine to 11, then you can use anything between nine and 11 without having to have a specific explanation in your report as to why you chose what you chose. However, to say that the range should be, as has been suggested by some, between six and 14 and that you should be able to go down to six or up to 14 without giving an explanation, really sort of defies what I would consider to be proper actuarial practice. We should be able to explain what we're supposed to do. And, of course, one explanation, which is valid under the guides to professional conduct, is that even though actuarial principles would lead you to 10, if you use seven because you're required to do so by some outside agency which has authority, such as the IRS or FASB, then you simply say, "My actuarial principles told me 10, but I used seven because I had to." And that's an acceptable explanation.

MR. BYRNE: Unfortunately, Joe, I don't think the statement's going to be as heretical as in fact you envision it will be to some.

MR. SHERMAN B. LIEBERMAN: I was wondering if somebody could comment on a recent IRS position that was published in the last 10 days or so regarding variable funding assumptions. I believe they said that in that case, you had to convert a variable or select and ultimate rate into a single rate in order to evaluate the investment experience in a given year. Does anybody have anything on that? And is this the death knell for variable or select/ultimate assumptions?

MR. BYRNE: Well, I know a little bit about that, but I see Mr. Holland here too. I don't know if Jim wants to comment on it or not.

MR. JAMES E. HOLLAND, JR.: I think they're referring to a Technical Advice Memorandum published.

MR. BYRNE: Yes.

MR. HOLLAND: You have to look at everything in context. What we had was a situation where you had a plan that was using a single interest rate that was experiencing investment return much greater than assumed. We were challenging the assumptions. I don't remember if it was 5.5% or 6%. It's irrelevant for purposes of what came after. In attempting to justify the deduction, or the assumptions that were used, the plan actuary used select and ultimate assumptions. The select period

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was very short and the rates were coincident with the rates of return realized, so the gains were eliminated. The ultimate rate was magically below what was assumed to begin with, let's say, perhaps chosen to give you the same number as far as the deduction is concerned, as opposed to being what the long-term rate was expected to be. They went down to five, so that's why I say five and a half to six didn't matter. In considering the reasonableness of this, let's see what the equivalent rate is like on a single rate and maybe go from discussions to there. In other words, you could have just as well gotten to the same place we did in not accepting that argument in that context by just saying, "Wait a second, you're giving us a short period to eliminate the gains, and you've come down with a lower long-term rate which we don't think is reasonable either." And we've gotten to the same place. I think it's sort of gotten blown out of context a little bit. It doesn't say that select/ultimate rates, per se, are bad.

MR. WIENER: Jim, if you wouldn't mind, I'd like to ask a couple of follow-up questions, not on that particular point. What I was interested in knowing, and I'll even get other opinions from people in the audience on the subject, is the best estimate requirement for each individual assumption. Do you believe that precludes any margin for conservatism whatsoever? Does it require that you indeed use the expected value, and that no half a deviation or one standard deviation is reasonable? I'd be interested in the opinions of people in the audience on that subject.

FROM THE FLOOR: Our opinions don't matter. Yes.

MR. DEAN A. NANCE*: You discussed the methodologies, under SFAS 87, for the interest rate assumption in evaluating those liabilities. Under SFAS 106, for valuing the retiree medical liabilities, would the methodologies for determining the discount rate be similar?

MR. BYRNE: Certainly for determining the discount rate it is. The discount rate, I think, is spelled out, as I mentioned before, even more explicitly than it was in SFAS 87, and out of necessity gets away from a settlement rate, just because these are types of liabilities that can't be settled. But I think again, if FASB had to write SFAS 87 all over again, and you can see this in its discussion memorandum where right now they're going through a project talking about present values, they'd eliminate any reference to settlement rates also, because that has given a larger range than they, in fact, envisioned. And we'd get back to just some type of risk-free rates.

MR. WIENER: I've realized the language of SFAS 106 is quite explicit. But talking about the variable interest rate methodology that you presented, Bob, in most situations, we'd have an unfunded plan. In general, it would seem to suggest a more conservative interest assumption rather than a market interest assumption simply because there aren't assets standing behind the liabilities.

MR. BYRNE: Well, again, referring to the FASB, the liability determination is independent of the asset determination. They don't care whether a plan is funded or unfunded, and made that clear on both pronouncements. So, I mean, we're following

* Mr. Nance, not a member of the sponsoring organizations, is Senior Associate of Management Compensation Group in New York, New York.

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its guidelines. I think Joe just pointed it out. I think that's standard language that went with the Academy's Standard of Practices – how to deal with SFAS 87. These results are to be used for SFAS 87 purposes only, and certain changes from normal actuarial practices have been made to comply with that standard.

MR. JEFFREY JAMES CSIMA: This is getting back to the step rate or variable interest assumptions, or select and ultimate. I'm just wondering, if you have, for example, a 10% interest assumption for the first three years dropping down to seven, how would that work with the funding standard account? For example, amortizing some of those bases, I could see how, if you come up with a level payment, some of the outstanding balances might increase. Is there a way that the IRS has prescribed to deal with that situation, or how does that work with regard to calculating the minimum contribution requirements?

MR. BYRNE: Well, I'm not sure if we're going to get Jim up here again, but I'll make one comment. I think both the method that Dick and I were referring to is not a select-and-ultimate environment in that aspect. In other words, you don't go 10%, 9%, 8%, 7%. The idea is one of two, which are very closely related. It's 10% forever, for example, because that's what the current interest rate environment is, in which case none of those problems result. Or in the example that I showed, where it was a 12.75% followed by an 8.5%, it's the assets currently on hand that are assumed to be earning 12.75%. The remaining unfunded piece, and the normal cost determination are all at 8.5%. Again, the problem does not result; everything's done at 8.5%. There was a Society of Actuaries group that wrote about the select-and-ultimate assumptions that you're talking about and some of the problems that can result from it. Those are the assumptions where it is a step rate, it goes ten, nine, eight, seven. And I don't know, Jim, if you care to comment on that or not, it's up to you.

MR. HOLLAND: I think the answer is right, and we have a select and ultimate. The outstanding balance will go up, and that's just a consequence of it. And it doesn't necessarily mean that it's bad, except how do you explain it to a client, perhaps?

MR. DASKAIS: You can get some interesting results using select-and-ultimate discount rates under FASB. Let's say that your weighted average rate is 8%, and your select and ultimate rates go from 10% to 6%. If you use the 8% as the expected return, let's assume expected return and discount rate are the same for this purpose, and then you calculate your liabilities using the variable rates, and then you calculate your first year interest cost using the 10% rate, you get some acceleration of cost, which may be desirable if you're a public utility, government contractor, or other regulated company.

MR. DAVID L. DRISCOLL: Just a follow-up comment on the methodology used in amortizing bases in the funding standard account, under select-and-ultimate interest assumptions. There is a study note on one of the Society's exams; it's the P461 exam that deals with this topic. I think the author provides three different methods under which you could do such an amortization. It's been over a year since I took the exam, so my memory on this is probably not entirely trustworthy, but if memory serves me correctly, he indicates, I think, that one of the methods is the one sanctioned by the IRS. The author, of course, was not an IRS actuary, so you'll have to

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take that from whence it comes, but that particular study note, I think it's simply titled "Selection of Interest Rate Assumptions," might be worth pursuing if you're interested in following up on the topic.

MR. BYRNE: I think that study note was adapted from an article in the *Transactions* of the Society of Actuaries, if you want to go back to it. And I would believe that the IRS requirement is that you must have level annual amortization payments, so I guess of the three methods, the one that resulted in level annual amortization payments would have to be the one that meets the IRS requirements.

MR. MERVYN KOPINSKY: I've just taken 461U, so I think my memory should serve me a bit better. The study note says there can be one of three possible methods, and it does say that the IRS has informally indicated that the method that could result in the amortization basis increasing is actually the one that should be used. That conforms with what Jim Holland said earlier.

MR. BYRNE: That's the one in which select ultimate assumptions are decreasing in nature. That's in fact the one that gets a level annual amortization payment, as each year pays. So, I think we're all in agreement.

