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USE OF VARIABLE ECONOMIC ASSUMPTIONS FOR PENSION PLANS

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MR. RICHARD DASKAIS: Our subject is the use of variable economic assumptions for pension plans. We will focus more on the actual techniques that are used and the reasons for using them than on the choice of specific assumptions. The first speaker will be John Thompson, Vice President and Chief Actuary for Huggins & Company. He will be followed by John Haley, a consulting actuary for the Wyatt Company. I will be the third panelist. I am a consulting actuary in Daskais & Walls, Inc.

MR. JOHN B. THOMPSON: When calculating liabilities under defined benefit pension plans, actuaries traditionally use a level interest assumption. In theory, if all future expected payments are discounted at the actual rates that will be earned in the future, the result would be the same as the result obtained using the assumed level rate.

A couple of years ago, when assumed rates were well below the actual yields on pension funds, some of the actuaries in our firm adopted an alternative to the level interest approach that made it unnecessary to develop a long term average rate of investment return. We have termed this alternative approach "The Year Based Interest Method". This method has been useful in certain instances in communicating the investment return assumption to the employer. In a sense, it is a return to first principles, a concept that is generally easier to understand than some of the actuarial shorthand or averaging techniques that have evolved.

Obviously, as both inflation and interest rates have declined over the past couple of years, there has been less of a movement to the year based approach. Part of the reason for less movement is that those plan

sponsors with the greatest interest had already adopted it. As I indicated, we adopted the term Year Based Interest Rates to indicate an approach using rates varying by calendar year. Most designers, the employer and/or the actuary, would expect the rate to decrease eventually and reach some minimum level. As an example, the following pattern might be adopted:

For the years of discount 1983 through 1987 assume 11%, for the years 1988-1992 assume 9%, for the years 1993-1997 assume 7%, for the years 1998-2007 assume 6% and for years 2008 and later assume 5%.

This particular pattern enables the plan sponsor to see that you are recognizing the current high yields on the funds and also build in some conservatism for possible lower rates in the future. One might well ask, "What is the magic about the year based interest rates since we still do not know what the rate of return will be 20 years from now or even next year"? The answer is that we have approached the problem in an orderly manner rather than trying to make the largely arbitrary decision that the rate of return for many years in the future will average out to be some rate such as 6%, 7%, or 8%. We are attempting to determine rates that will seem reasonable to expect a pension fund portfolio to yield 30, 40 or more years into the future. This obviously is a highly imprecise exercise, but a valuable one. The best approach would be for the pension officer, the investment manager and the actuary to arrive at a consensus as to the rates of return that seem reasonable.

If the retirement plan is large enough, it might pay to use econometric modeling to project interest rates on the basis of various assumptions. If this is not feasible, then some basis such as that outlined by Ibbotson and Sinquefeld in their study in stocks, bonds, and inflation could provide a basis for arriving at the assumed year based rates in an orderly manner. Their approach of treating returns as the sum of one or more of a riskless real rate, a risk premium, a maturity premium, a default premium and inflation at least breaks the rate of return into component parts which may help the pension officer, the investment manager, and the actuary arrive at a consensus.

As indicated earlier, this group must maintain its perspective in attempting to set the year based rates. The problem is not to determine whether the rate 50 years from now will be 3.3% or 3.5% but rather what is a prudent rate to assume that far in the future.

A similar approach could be used in determining salary increase assumptions. Generally an increase in salaries may be thought of as occurring because of one or more of the following factors: promotions, merit, tenure, and inflation. Promotions, merit and tenure tend to follow certain philosophical principles of the management of the employer involved. The effect of inflation on salary increases should be consistent with what is assumed to be the effect of inflation on the interest assumption. Thus, the two assumptions are each broken into component parts and each is determined on consistent principals. Just as the pension manager, the investment officer, and the enrolled actuary jointly discuss and hopefully arrive at a consensus for the interest assumption, so might the pension officer, the personnel officer and the actuary arrive at a consensus as to the salary increase assumption.

Thus, both the interest assumption and the salary increase assumption are year based and explicit in nature. Since many common elements run through all pension valuations, it is wasteful for the actuary to program each valuation from first principles. Thus, virtually every actuarial consulting firm has or has access to a generalized pension valuation system. However, no two valuations are quite identical. Flexibility is required in all the generalized systems. Each actuarial organization must weigh the convenience of a generalized system against the inefficiency that is inherent in such a system.

In the past, many of these generalized systems were relatively inflexible and inefficient. Technological limitations made use of the year based assumption impractical for both the interest assumption and the salary increase assumption. With the development of high speed computers and programming approaches, the heavy computational burden of year based assumptions has now become feasible. While the actuary was almost forced to use a flat interest assumption in the past because of these computational constraints, this is no longer the case.

In the above discussion I have dealt primarily with the mechanics of examining past returns and future expectations to arrive at an interest assumption and a salary increase assumption that can vary year by year. We have the computational ability to reflect such variation in actual valuations. What is the significance of this?

Mere mechanical ability to accomplish this has little significance unless the year based approach enables the actuary to obtain results that provide a better measure of the ultimate cost of the pension plan. In discussing this aspect of year based assumptions, I will concentrate on the interest assumption, although similar comments might apply to other assumptions. The year based interest rate provides an employer, through his actuary, the means to reflect the actual rate he is currently earning without forcing him to commit himself to the same rate far into the future. He is able to value short term liabilities such as those for the present group of pensioners on the basis of today's relatively high rates without using the same high rate to discount those benefit payments expected to be made 40 or 50 years hence. Some actuaries attempt to do this by using one rate for valuing liabilities for pensioners and a lower rate for valuing liabilities for actives. This, however, does not properly reflect the changing nature of the interest assumption, and the constant change in the group of pensioners through death of existing pensioners and the addition of new ones. It involves two averages rather than only one. Using a true year based interest assumption however, enables the employer to reflect current experience without artificially breaking his fund into several parts.

Revising the interest assumption yearly is probably not feasible in most situations. However, with the year based interest approach it is possible to change the interest assumption in part without changing the entire structure. With a flat interest assumption, the rate of return is applicable for the full time frame involved in the valuation. This is not true with the year based approach. There are two dimensions to the interest assumption: the level of the assumed rate and the period of time for which that level would apply. Either or both could be modified. Changing a level interest assumption from 7% to 8% does not seem to be a dramatic change to many. On the other hand, changing the assumed rate

from 10% to 12% in the year 2000 is specific and implies a substantial optimism. An employer or actuary who could make the first decision without a long period of soul searching could have difficulty making the second decision. Nevertheless, the impact of the first decision is obviously greater than the second decision. The averaging process the actuary used in arriving at a level interest assumption often proves confusing to those managers unfamiliar with actuarial techniques. The year based approach allows the employer and the actuary to look at the problem of the interest assumption directly without forcing the final result into a predetermined mold.

A year based interest assumption might help to settle important differences of opinion among professional groups. Accountants through FASB and AICPA opinions have struggled with the concept of reporting certain liabilities under defined benefit pension plans. The conflict has involved what to report, the basis on which to calculate what is to be reported, and where to report it. A year based interest assumption does not itself answer the many broad and complicated questions involved here, but it could clear up some issues. For instance, a liability is to be calculated based on actuarial assumptions. At least partially offsetting this liability are the assets on hand. The accountants currently seem convinced that market value of these assets rather than the actuarial value should be used. They also seem convinced that the actuarial assumptions used in calculating the liability should involve an interest rate that is consistent with the market value of assets. An explicit year based rate would be consistent with either market value or actuarial value. At least some accountants are of the opinion that the level average rate the actuary has traditionally used in actuarial valuations is not suitable for determining the liabilities accountants reflect in financial statements or notes thereto. With the year based system this problem would disappear.

For multiemployer plans the introduction of a withdrawal liability pits the withdrawing employer against continuing employers, the administrator and union trustees. In selecting the interest rate to be used in calculating a withdrawal liability, the interests of the two sides are obviously not compatible. A year based interest rate might provide the basis for compromise between these groups.

There are other considerations to a year based interest assumption. This approach is philosophically geared to the practice which some already have followed, of dedicating part of the portfolio to a bond immunization program or to group insurance contracts. The pattern of rates assumed for the immediate future, together with the period of time for which they were assumed, would be coordinated with the dedication program. In fact, the dedication program would help to quantify the rates to be assumed in the near future. For that part of the portfolio that is dedicated, the rate to be assumed is determined by the parameters of the dedication program. It merely remains to combine this dedicated rate with the rate expected for the balance of the portfolio.

The current economic uncertainties cause concern about the possibility of investment yields trending downward. While opinions differ as to when and how much rates will trend downward, most experts are of the opinion that they will do so eventually. The year based interest rate provides a somewhat less painful way of recognizing this.

As indicated earlier, the assumed interest rate may be varied from time to time to keep it in line with current experience and current expectations. The pattern of interest rates used will probably show a downward trend after a number of years. If this pattern is permitted to run off, then we move from a current high assumption to a current low assumption. It would not be necessary to make any abrupt change and increase liabilities dramatically in any one year. For example, the first set of illustrative rates that appeared earlier provided for a maximum rate of 11%. If optimism continues, this period could be extended with the assumed rates declining thereafter. If the economic mood is less optimistic the pattern of rates set by calendar year remain fixed. Thus by the ultimate year, the assumed rate would decline to the 5% level.

What are the disadvantages of a year based interest approach? As I indicated earlier, there is an increased computational burden which results in more computer time. An alternative approach is to use a year based approach periodically - say every 5 years as a check on results obtained by more traditional approaches. Also, to implement a year based program, the pension officer, the investment manager and the actuary must be willing to discuss expectations for the future conscientiously and honestly. As is often true, the characteristic which is perhaps the greatest advantage can be turned around in the hands of an employer or actuary who is concerned only with manipulating pension costs. The characteristic that is referred to is the fact that there are two dimensions to the interest assumption. One is the level of the rate, and the other is the period of time that the given level is applicable. Under the average rate approach, if an employer is inclined to force the interest assumption up, it is more obvious. With two dimensions, the employer can be more subtle. It may be acceptable to increase the interest rate by 1/2% and increase the period for which it applies by 5 years. Is it also acceptable to increase the rate 1% and the applicable period by 10 years? The approach must be applied honestly and with judgment. This type of subtle manipulation probably will not occur but all must be on guard against it.

In summary, in considering refinements in actuarial techniques, we must remember that the actuary uses methods which are mathematically precise, but his calculations are based on assumptions that are inherently imprecise. A year based system can add greater precision and flexibility to the assumptions, particularly the interest assumption. Because of the high visibility of the interest assumption and its impact on required contributions, it is prudent for companies to explore this approach.

MR. JOHN J. HALEY: I am going to talk about variable assumptions for all aspects of a pension plan, not just variable economic assumptions. There are the two types of actuarial assumptions that are used in valuing a pension plan.

The first type is the economic assumptions, which consist of the interest rate, the salary scale, increases in the social security wage base and in the CPI. These can all be looked at in really one integrated whole as to what is the relative level of inflation. Once a level of inflation is

assumed for each year in the future, there are a number of different theories which lead to assumptions that are consistent with those of the other theories.

The non-economic assumptions consist of rates of retirement, turnover, mortality, and disability.

One important thing about the economic assumptions is that they're subject to cycles. Everyone has seen that - how the interest rate can move up and down. One of the interesting things is that there's also an interrelationship between economic and non-economic assumptions.

An example of this is disability. When the economy is in difficulty more people are disabled than during good economic times.

Also, the relative level of inflation can have an impact on the number of early retirements. Inflation tends to push retirements off somewhat further.

One of the things that we might see here is that the interrelationship is not just between the economic and the non-economic assumptions, but between the rate of change of the economic assumptions and the non-economic assumptions. People have a tendency to get used to a given level of inflation. If inflation increases from 5% to 30% in a year, many people might postpone retirement. However, if inflation has been at 30% for several years, they adjust for that somehow. Also, in the non-economic assumptions we can identify trends with a little bit more precision than we can with economic assumptions.

An example of this is retirement rates. Even before the recent amendments to Social Security, it was clear to most observers that something had to be done eventually, and that 30 years from now people are probably going to be retiring at a later age than they are today. This might be reflected in the retirement assumption. One way to do that is to use an average retirement age and retirement rates that are somewhere between current experience and expected ultimate experience.

Mortality is another area where actuaries can probably feel comfortable about the long term trend.

What are the long-term implications of this for pension funding? My concern here is: When is the use of an average acceptable for either the economic or the non-economic assumptions? My main focus is: what does this do to the solvency of the pension fund? I want to make sure that when I am using an average I am not likely to run into later losses that are inherent in that assumption when the plan sponsor might not be around to pay for them, or might not be able to afford them. The key question here is the pattern of gains and losses.

As an example, consider interest rates which are gradually declining over time. If the actuary is using an average interest rate, there will be gains in the first few years. These early gains reduce the contributions in the early years, put less money into the fund. There is no surplus available to offset anticipated future losses. In this case an average interest rate is probably unacceptable. The other scenario is that interest rates gradually increase. Here the average produces losses

early. These losses increase contributions somewhat and there is a redundant surplus. That might not be acceptable from the plan sponsor's viewpoint, but from an actuarial viewpoint the solvency of the fund is better protected.

One of the other considerations is what I might call the plan sponsor QX. Not all plan sponsors will be around 20 years from now. If there is a mechanism that builds in late losses, some people might go without pensions.

What are the economic conditions now?

Interest - from my observations, the declining pattern is expected. The Wharton economic forecasting model, Data Resources, and Chase Econometrics all have a declining pattern. They all assume that within the next 10 years, which is about as far as they go, that we are going to see gradually lower interest rates. Similarly, PBGC assumptions, although they are backwards, assume a declining pattern. Some of the major national retirement programs like Social Security or the Railroad Retirement system also assume a declining pattern. If these people are right, there is a danger inherent in using an average.

What about the other economic assumptions such as salary scales? Here the declining pattern is also likely because the salary scales tend to be related to the rate of inflation. This means that viewed from the salary assumption alone, I would not have a particular problem with using an average because in this case I am going to generate early losses. However, once the declining interest rate is established as the pattern, it is preferable to put the other economic assumptions on the same footing. This should be done for consistency, and for offsetting an inherent conservatism in the method.

Mortality - I think our expectation is for improving mortality. In this case I prefer not to use an average. For pension funding, the mortality assumption is relatively insignificant. In some areas where the mortality assumption is more significant, ordinary life insurance for instance, the mortality is always done on a select and ultimate basis. People realize that if a company sets dividend scales based on averages, and there is this extraordinarily good mortality in the first few years, the company will be insolvent in the long run.

My conclusion concerning assumptions is that specific calendar year rates and decrements are desirable for interest at the current time, and probably for the other economic assumptions also, for consistency. Concerning non-economic assumptions, I generally prefer to assume those on a specific basis, but they may or may not be important enough to go through the extra work.

Besides being superior for insuring the solvency of the fund, what are some other advantages that you might have from using these rates?

I will focus more on the interest rate because that is the assumption that gets the headlines. One is they do not produce spurious gains which might cause the IRS to question assumptions as unreasonable. A couple of years ago I had this problem. I had a plan that was relatively well funded on an entry age normal basis. We had been using 5% interest and

they had several very good years in the market. The IRS agent came in, looked at this, totaled up the gains that they had over a 5 year period, and divided them by the average accrued liability during that period. Since that was more than 1.5%, he wrote them a letter that he's denying their tax deduction for the last year because the assumptions are unreasonable and have to be adjusted in some manner. I had never heard of this, but when we filed a freedom of information request and received the IRS pension trust training manual, I found that it is something they teach all of their reviewers. They have this 1.5% to 2% test on the gains on the accrued liability. If, instead of using a 5% interest rate, we were using specific calendar year rates which produced the same results as with the 5% interest rate, the gains would be reduced. This is a practical advantage, particularly for some well funded plans.

Another advantage for the well funded plans is that it lessens the chance of hitting the full funding limitation since the accrued liability in the short term moves with the short term interest rates. One advantage that may show up in the next couple of years is when you are doing some of the TEFRA top heavy calculations. In general the key employee group is going to be the group that is closer to retirement age. They are going to have a shorter period over which this discounting is operating. If you are using relatively high interest rates in the short term, by grading down to the longer term you increase the percentage of the PVB of the non-key employees. If you think that is what is really going to happen, it is probably something you ought to be doing.

I think the calendar year specific approach is likely to be more understandable by, and explainable to a variety of the consumers of actuarial reports, especially clients. All clients seem to engage in what they call long term planning which runs out over 3 to 5 years. It is relatively easy to sit down, talk with them, get some feeling about what sort of numbers they are using for their planning and introduce those into your actuarial assumptions. You do not have to follow them exactly, but they can at least see some consistency between the two of them. In general, that will have relatively little impact on the contribution. I think the explainability to the client is certainly improved. You can sit with a client and talk about the fact that the actuarial assumptions apply over an 80 year period, and that the early years really do not matter too much, but it is much simpler to just go ahead and do it.

You can comply with the FASB disclosure requirements by using the valuation assumptions. That is much easier from several points of view, but it is most important that you can tell people these are the assumptions that you are using to fund the plan. You run into problems when you are asked "if these are good enough for disclosure why are they not good enough to fund the plan"?

The Defense Contract Audit Agency has been questioning some plan interest assumptions. I know of one case where they are questioning a 7% interest assumption as being unreasonable in today's market and that it should be moved up to 9%. If you start out with 15% now and grade down to 4% in the ultimate, I do not know how they compare that with anything else. It matches the PBGC rates a little bit closer. You do not end up with the problem of trying to explain to sponsors why, when you measure a liability, it is very different from what they could go out and purchase

an annuity for, or what the PBGC would charge them. These are rates that will be easier to explain to securities analysts because securities analysts have roughly the same time horizon as the typical planning of a corporation. They are looking at 3-5 years and do not really understand that we are talking about very different terms over which our liabilities are calculated.

Another important advantage is that it reduces the pressure for a plan sponsor to switch to lower yielding investments which will reduce the apparent plan contribution requirements. We have all seen people going out selling GIC's, and dedicated bond portfolios by telling them "here is this interest rate that you are going to lock up for this time and your actuary can use this to reduce your contribution requirement". Of course, my general feeling with that is that, if the long term average that you were using before is right, they are probably not going to earn any more money by going into some of these GIC's, and so if anything, their contribution ought to go up. That is something that is very difficult to explain to plan sponsors generally.

The variable assumptions automatically, and rather painlessly, move to a lower interest basis if yields do decline. This is relatively difficult to do otherwise. We have not been faced with the problem yet of yields actually declining and people having to move from, say 9% interest back down to 8%, and maybe back down to 7% soon after that. It is not impossible for that to happen. The experience of our profession during the 1930's was not particularly good, revaluing liabilities at a lower interest base. There was an interesting article which appeared in the Journal of the Institute of Actuaries called "The Flock, the Sheep and Other Essays". If you can get a copy of that I recommend it highly. It is by Frank Reddington. He talks about his perspective on the experiences of the 1930's when in fact actuaries should have been strengthening the basis for reserves but really could not during that time. He regards that in some measure as a failure of the profession. I think he may very well be right. His perspective is that they were saved by World War II. In 1950 we saw that a number of major insurance companies had reserves at 3.5% to 4% and decided to strengthen them to 2.5%. It does not seem like it is the biggest change in the world, but it took them until the mid 1960's until they completed the program, at which time they raised their heads and discovered that they were going in exactly the wrong direction. I prefer something that gets there little by little and rather painlessly.

The pricing of amendments is improved under this scenario. Suppose you are asked for a cost for improving benefits to retirees and you are also asked for a cost for improving benefits to actives. If you do them both on the same basis, what you tend to do is to overstate the cost for retirees and perhaps understate the cost for actives.

Another significant advantage is that multiemployer plan withdrawal liability can be based on the same assumptions as the valuation. It is important to base those two calculations on the same set of assumptions. If you do not, you charge the ongoing employers on a basis which is more stringent than the people who are jumping ship. I had an interesting experience on a large multiemployer plan. We changed the interest rate assumption to 12% grading down to 4%. I received a call from the attorney of a major employer who wanted to withdraw, or at least know

what his withdrawal liability was. I told him what it was. He wanted to know the interest rate assumptions. I told him that we start out at 12% and grade down to 4% after the year 2000. He thought for a minute and says "You guys have been incredibly fair. There are other actuaries out there who are trying to use 6.5% or 6%." I did not tell him that in fact we probably end up with a larger withdrawal liability. The perception is what I think is important here.

What are some disadvantages of this approach? One is that it is harder to link prices for optional forms of benefits to the valuation. That disadvantage may be more apparent than real because I am not convinced that in the typical case the valuation assumptions are really the best basis to be used for option pricing. However, many plan sponsors like to rely on valuation assumptions.

We do have some complications in the valuation and cost estimates. The valuation is not too much of a complication because once the computer programming is done, little in the way of future changes will be necessary. However, there are problems when you are asked for quick results for a cost estimate, and you find that you can not use the standard tables or approximations.

One other disadvantage is more from the purely actuarial standpoint. I have been surprised at how much actuarial intuition is a product of experience. With variable assumptions, it is at first difficult to estimate costs.

One disadvantage that some of my colleagues have claimed, although I do not agree, is that this method appears to have a precision that is not really there. I certainly agree that the precision is not there. What we are attempting to do is make a best guess at what is going on. We see much economic forecasting around now and some precise forecasting. I do not think people really believe them. I think they are just making their best stab and I would hope that actuarial assumptions would be approached in the same way.

I will now briefly describe the mechanics of how we do our calculations. This will contrast with some of the things that Dick Daskais will be telling you a little later on his approach. There are really two ways that we do it.

One method is the cash flow approach where we project the expected benefits each year and discount back to the valuation date to get some present values. This approach tends to be a relatively inexpensive method. In some ways it is easy to check the year by year calculations of the benefits, and it is easy to discount them. When you get the year by year printout of the benefits too, it is easy to do some quick cost estimates on some potential changes.

The other approach that we use is the commutation function approach. We have some programs which are based on the commutation function scheme. We sort our data by age nearest birthday and put in a counter. Each time the counter changes we recalculate all the commutation functions based on the new interest rates. This method is not much more expensive to use.

Either approach is viable. If assumptions are specific to age and service, commutation functions will have to be recalculated each time age or service changes.

One question that comes up is "How do you handle amortization of unfunded liabilities" and in particular "How do you handle it for the funding standard account?" There are a couple of ways to handle it. The approach I prefer is to calculate an annuity based on these exact interest rates. Suppose that the first year's interest rate is 12% and that it grades down by 1% per year. I calculate 1 over 1.12 and then add in 1 over 1.12×1.11 , and so on. I get the annuities for 2 years, 3 years, 4 years etc. and use those to divide into my unfunded liabilities for the appropriate remaining amortization period. The advantage of this is that unfunded past service liabilities are amortized in accordance with the assumed interest rate.

Another question that comes up here is what are next year's assumptions? Suppose again that the first year's interest rate is 12%, and that it grades down by 1% per year. If 1983 is the first year, what is the first year interest rate in 1984, 12% or 11%? You come to 1984; are you starting out at 11% now or are you starting out at 12%? My feeling is that it must be 11% unless there is a change in assumptions. Otherwise, if assumptions are exactly equal to experience, there can be a gain or a loss. That would not appear to qualify under the reasonable funding regulations. However, I have been told that the IRS would actually regard either one of those as reasonable. I have never verified that because it has always seemed easier to slide down the scale. I view it as an advantage to slide down the scale. If nothing is done, the assumptions become more conservative. Some action has to be taken to move to a less conservative basis.

When using the frozen initial liability cost method there is a choice of whether or not to create a new layer of unfunded past service liability for a change in assumptions. I find that it is preferable not to set up a new layer for the change in assumptions. Everything can be spread into the normal cost, and there is no need to worry about the intricacies of entry age normal calculations on this basis.

We are not going to get much into how to select assumptions, but one question in the actual mechanics is: Should a two tier approach be used, for example 10% for 10 years and 7% thereafter, or should the interest rate decline each year? Either one is usable. It is probably easier to get people to use the two tier approach first. It is a little more familiar ground. For myself the advantages that come from using the two tier approach are just magnified by going to the calendar year approach.

Does it matter? A sufficiently clever actuary can constantly monitor the assumptions and their effects, and produce results that give essentially the same answer. Very few of us are that clever. The mean term of the liabilities has quite an effect on what the single interest rate is that equates to the variable assumptions. I have found that most actuaries do not have a good intuition as to what that effect is. If they do not know that I am not sure they are that clever. My inclination is that it is probably better to design a mechanism that will work with a minimum of tinkering, and let that mechanism just run.

MR. DASKAIS: My primary goal in using variable economic assumptions is to comply with the best estimate requirements of ERISA. I would like to expand on this. Right now, I know that any investment manager can invest a pension fund in relatively high quality fixed-income investments to yield 11% for the life of these investments. If I want to use assumptions that are my best estimate for each individual assumption, I must start with an interest rate of 11% today. I then have two choices; I can assume 11% forever or I can assume that the interest rate will be different in the future. If I choose the latter, I have decided that my best estimate assumption is variable. Unless I can find some offsetting assumption I have to use variable economic assumptions.

My other goals in using variable economic assumptions are ancillary to my primary goal of making best estimates. There are several ancillary goals: First, I want to provide the plan sponsor with an unbiased estimate of pension costs and cost of amendments. Second, I do not want to make what appears to be a discretionary change in assumptions simply because what I expected to happen, namely a decline in interest rates, actually did happen. Third, I do not want to use different assumptions for different purposes or different assumptions for Schedule B values of accrued and accumulated benefits than for the ongoing cost valuation. Fourth, I want assumptions that are relatively easy to use and to check the results. Fifth, I want assumptions that are explainable to my clients and others who may use the report. Last, of course, I want to comply with any relevant laws. These goals are not necessarily in order of importance.

In our firm, since 1975, we have been using a particular technique to assume a variable investment return. It was described briefly in Volume 25 of the Conference Proceedings, and in the record of the June, 1981 Society meeting in San Diego. I am going to expand on it further here.

Let us assume that the current long term interest rate is fairly measured by a published bond index such as Moody's AAA Industrials. For the purpose of our discussion today, suppose that that index is now 11%. Suppose further that I want to assume eventually the long term rate, the rate at which long term investments can be made, is 8%. I call the 8% rate the "ultimate" assumed interest rate. I am confident that the 11% is a fair representation of what I should assume the present investments of the pension fund will earn. I am also confident that I want to assume an ultimate rate of 8%. However, I have much less confidence in the pattern by which interest rates will move from 11% to 8%. As a result, in our firm we have chosen a pattern that is extremely convenient to work with.

That pattern is to assume that the present pension fund could be invested in a portfolio of fixed income investments which has, in total, the principal and interest payment characteristics of a mortgage for a fixed term such as 20 years which yields 11%. This has about the same effective duration as a bond with an 11% coupon and a maturity of about 12 years. Next, I assume that all future investments of the pension fund will be made at the 8% ultimate rate. The future investments will be made from the net cash flow of the pension fund. The net cash flow consists of contributions, minus benefits and expenses, plus the interest and repayments of principal on the present assumed 20 year mortgage portfolio. I assume this type of pattern regardless of the actual

investment policy of the fund's manager. I know that a long term fixed income portfolio is available to the manager. If the manager has decided to invest the fund differently it is because the manager expects to earn more than the 11% that is currently available.

Now that I have chosen this pattern, how do I mechanically do the valuation? It is really quite simple. First, I calculate all present values using my assumed ultimate interest rate of 8%. If I am using a spread gain method such as frozen initial liability or aggregate cost, all I need to calculate are the present values of future benefits and the present value of future compensation or whatever other temporary annuity that I am using. If I am using an immediate gain method, such as entry age normal or unit credit, I also calculate the normal cost and the accrued liability based upon the 8% interest rate. In either case, spread-gain or immediate gain, I make exactly the same calculations that I would make if I were doing the valuation using only the ultimate 8% interest rate.

Next, I calculate the premium or discount at which a 20 year mortgage at the current interest rate would sell to yield the ultimate rate. For the particular figures we are discussing this morning, 11% and 8%, the premium is about 23%. That is, a mortgage at 11% would sell at a premium of 23% to yield 8%. It takes about 20 or 30 seconds to calculate this on a \$35 calculator with financial functions. I then calculate what we call a "liability adjustment", which is simply the application of the premium or discount to the present assets of the pension fund. For example, if the pension fund is a million dollars and the premium is 23%, the liability adjustment is 23% of a million dollars or \$230,000.

In the case of a spread-gain method, I simply adjust the present value of benefits by the amount of this liability adjustment. The adjustment is a subtraction if there is a premium because the current interest rate is greater than the ultimate interest rate, and the adjustment is an addition if the current interest rate is lower than the ultimate interest rate. The adjusted present value of benefits is used to calculate the normal cost. In the case of an immediate-gain method, the past service liability is adjusted by the amount of the liability adjustment, and the adjusted past service liability is used to calculate the actuarial loss and the amortization amounts.

Let us look at the underlying assumptions a little more carefully. Since I am assuming that all future cash flow will be invested at the ultimate interest rate, I have assumed that the interest rate in all years after the first year will be 8%. If the market interest rate in fact declines to 8%, the hypothetical portfolio will appreciate by the same 23% premium that I used in calculating the liability adjustment. Consequently, the first year's investment earnings rate, if the interest rate goes down to 8%, will be the compounding of the 8% ultimate rate and the 23% premium. This is somewhat over 30%.

What happens if my assumptions are correct and the Moody's AAA Industrials are yielding 8% when I do next year's valuation? Next year the liability adjustment will be 0. If there is to be no gain or loss from investment, the investment return will have to be the compounded sum of the 8% and the 23% premium. If the pension fund was in fact invested in a fixed income portfolio I have described, the appreciation will

exactly balance the increase in liabilities due to the lack of the liability adjustment. If the investment manager on the other hand has invested in short term securities yielding 14%, he will have a loss because he has not earned the compounded 30% rate in the next year. Obviously, a short term investment is not a good investment if interest rates decline sharply.

How does this meet the goals I discussed earlier?

It meets the regulations' requirements for reasonable funding methods; the unamortized past service bases minus the credit balance plus the present value of future normal costs is equal to the excess of the present value of benefits over assets. If all the assumptions are met there will be no gain or loss. Several years ago we had a number of meetings with the IRS in which we explained our assumptions and went through some mathematical demonstrations that the funding standard account entries were being calculated properly and that we met the criteria for reasonable funding methods. This was before the IRS had published its criteria.

There are no special problems in maintaining the funding standard account. Since the unamortized bases minus the credit balance consists of amounts that are not funded rather than amounts that have been funded, the interest rate for all funding standard account calculations is the ultimate rate of 8%.

For disclosure on Schedule B, I show the ultimate rate of 8% with a footnote, and attach a detailed statement of assumptions. For calculating the present values of accumulated benefits for accounting purposes and the present values of accrued benefits for the first page of Schedule B, I divide the 8% present values by 1 plus the premium. This produces present values which are equal to the amounts required to be in the fund to provide the accumulated or accrued benefits.

I believe that the financial officers of our clients have a good understanding of what we're doing. They do not find our interest assumptions totally inconsistent with current bond yields. Institutions that are selling dedicated bond portfolios are somewhat disappointed to find that we are using this method. They do not have any cost reduction to sell because we are already assuming a current interest rate for the present fund assets. We have been quite happy with the results from the use of the method. The clients who had heavily funded pension plans did not experience large increases in pension costs when the values of their pension funds declined but interest rates increased. Similarly, these clients will not experience large decreases in cost when we complete the 1983 valuations. Presumably, the appreciation of their pension funds will be partly offset by the decline in interest rates and the decline in liability adjustments.

MR. GREGG L. SKALINDER: I have one comment and a couple of questions. My comment is about the black box nature of the declining interest rates that has been discussed by Mr. Thompson and Mr. Haley. Mr. Haley brought up this point, and I would like to emphasize that is one problem that I had. Using either an iterative valuation system or a cash flow system,

it really is very difficult to (1) make sure you have done it right in all of the cases and (2) get a good feel for what's going to happen when there are changes.

I have a question for Mr. Thompson and it really relates to what I think is my major problem with the year based interest rate. Take a hypothetical situation where you are assuming some declining scenario of interest rates in the future. Although this is not permitted under ERISA at the present time, you institute a new plan, where there are no assets in this plan, and the plan sponsor doesn't contribute anything for 10 years. Do you not wind up with increasing liabilities, and increasing normal costs not being offset by any assets in the fund? It is a problem that I have always had with the method. I do not understand how it would make any sense under those conditions.

MR. THOMPSON: I have a problem trying to understand the scenario that you have described. You have a new plan that has no assets and the plan sponsor is not going to make any contributions for 10 years. I am not sure year based interest or any other kind of interest would produce a very soundly funded plan under those conditions.

MR. SKALINDER: What I am trying to point out is that the declining interest rate is not really related to the actual assets, and it does not make much sense to me to assume that kind of interest rate pattern when you do not have any assets because, if you do, you will have increasing liabilities and contributions, and will not produce a level normal cost.

MR. HALEY: I think what those interest rates will tell you is what was the opportunity cost for not having made those contributions. One of the things the plan sponsor could have done with the money was put it in the pension plan when he decided not to, this gives an idea of what the liabilities are. Let us say that we are using 15% for 10 years and then 5% thereafter and the plan sponsor does not make the contributions for those 10 years. All of sudden you are on a 5% interest basis and you have liabilities that are very much higher. If you are really in a 5% interest environment 10 years from now, do you not have the right liabilities?

MR. DASKAIS: I think if you change your example a little bit Gregg, to make it so the plan sponsor does make the minimum required contributions, but assume that you put in a new plan with a quite mature group, and that the contributions are all going to pay benefits so that there is no fund, I think that the result of the calendar year method will be exactly what it should be. There will be a level normal cost because those early payouts of benefits, assuming they were according to the assumptions, would have been properly anticipated.

MR. SKALINDER: I have a question that perhaps mostly relates to Dick but I would be interested to hear the other panelists comments as well. If you are assuming a declining interest rate, does that imply that you ought to be assuming a declining salary scale?

If I could start off the discussion on it, I would like to say that my own reaction is that salary increases are much less volatile, certainly in recent history, than interest rates. At least in the current environment salaries do not seem to respond as directly to inflation as the interest rates do.

MR. DASKAIS: I am not assuming a declining salary scale. I have a preponderance of industrial clients in metal working industries and those that are affected by metal working industries. Many of our clients have had salary freezes or salary reductions, and if I were to use a select salary scale today, it would be an increasing salary scale rather than a decreasing salary scale.

I think at this point it is worth pointing out a significant difference between the 11% and 8% that I am assuming say, and the calendar year calculation that the other panelists would make using the same 11% and 8%. If they were to use those same assumptions, they would get much higher costs than I for a heavily funded plan. Although I am assuming that the interest rate changes immediately to 8%, I am essentially taking into consideration the appreciation that will occur when my hypothetical portfolio of fixed income investments appreciates. For a heavily funded plan, I will have a much lower cost with my 11% and 8% than John Thompson or John Haley would if 11% were the 1983 rate and 8% were the rate for 1984 and later years.

MR. HALEY: I think that Dick's 11% and 8% might be comparable to 11% for 20 years and 8% thereafter under our approach. I think we end up with reasonably close numbers then.

MR. DASKAIS: No. Ours is really a declining rate because we are essentially assuming 11% on the portion of the portfolio that remains each year. It grades down as the unamortized balance of the mortgage grades down.

MR. THOMPSON: I would like to address myself to the question of relating the salary scale to the interest assumption. The approach that I take is to set up a matrix of all of the economic assumptions That would not only include salary increase assumptions and investment return, but would also include the elements that commonly are used in projecting social security benefits such as average increase in wages, and the CPI, and then break down the various elements that can impact on those assumptions such as real rate of return, inflation, productivity, merit, etc. I then fill out the matrix in terms of the impact that element is going to have on this particular assumption. To the extent that inflation may have more or less impact on salaries than it does on investment return does not mean that you can not at least look at it in a disciplined way. Then you are making a conscious choice. Suppose I am assuming that there is a long-term inflation rate of 5%, and that it starts out at 10% or 15%. One of the reasons for the variable interest might be the assumption on what is happening to the inflation. The real rate of return may be assumed to be relatively constant into the future. You can then say what impact this variation is going to have on a salary assumption. It does not have to be the same but I think you should still take it into account.

MR. CHARLES B. H. WATSON: I have several observations to make on the discussion. In particular, I want to comment on the method used by Mr. Daskais to incorporate a variable interest rate into pension plan valuations. I also have some observations on the remarks made by Mr. Skalinder.

With respect to the method used by Mr. Daskais, I would point out that this appears in some respects to be rather similar to the method used almost exclusively up to the present by Dutch insurance companies in order to give credit for "real" rates of return. Under the situation in the Netherlands, as a result of both government legislation and insurance company standardized practice, the premiums for an insured pension plan are calculated using a fixed interest rate of 4.5%, which is rather low given the actual yields being realized. In order to allow for such yields, a discount percentage is applied to the premium which reflects the actual yield on certain Dutch government bonds; the discount is designed to provide for excess yields during the 10 years following premium payment. This therefore has the effect, at least in the Netherlands, of lumping the interest gains into the first year. I am not certain whether Mr. Daskais' method would have the same effect, but, if this is the case, it would certainly be more serious in this country where much closer attention must, under the rules of ERISA, be paid to actuarial gains and losses. I might also add that the Dutch system suffers from a further drawback, in that the insurance companies give no credit whatsoever for excess interest earned after the first 10 years. It is effectively assumed that the premiums are invested in 10 year securities but no credit is applicable to reinvested monies.

I also have some concern about the fact that Mr. Daskais would use what can only be viewed as an artificial portfolio of investments - 20 year mortgages. This could give rise to dangers of manipulation of the results, or at least I think it could be subject to such manipulation. I would certainly be interested in hearing any observations on this which might set my mind at rest.

Turning to Mr. Skalinder's remarks, I would only point out that the example he gave, where in effect no contributions would be required during the first few years except for employee contributions, with a consequent distortion in the results produced by the method of Mr. Daskais, is by no means an unreasonable situation, at least in certain countries. The country which immediately spring to mind is Ireland. For pension plans installed on an insured basis in that country, the actuarial cost method can be and often is selected to produce a result which would give rise to extremely low contribution requirements during the first 10 years. Essentially what is aimed at is to have in the fund at the end of the 10 year period enough money to cover the cost of the accrued benefits. If the workforce is extremely young, then it is entirely possible for the actual contribution requirement, worked out on a unit credit basis, to be less than the employee contributions. In effect, therefore, the company is making no contributions and is actually making use of some of the employee contributions to finance its own activities during the 10 year period. The rationale lying behind this is that a multinational company operating in Ireland has in most cases the advantage of a 10 year tax holiday, and so therefore it is decidedly to the company's advantage to minimize its pension contributions so long as that tax holiday continues, regardless of what this might do to the level

of funding in future years. The multinational companies seem to be attracted by the idea of making contributions only during a period of time when tax deductions can be claimed for them! This is not surprising, but it does have a distorting effect upon the funding arrangements for their pension plans.

Finally, I would stress that what is most important is to adopt a method of providing for variable economic assumptions which is easily explicable to the client, and with which both the actuary and the client will be comfortable. It seems to me that the methods proposed by Mr. Haley and Mr. Thompson have certain advantages in this respect.

MR. DASKAIS: I would like to respond to a couple of these comments. First, there was a comment about the portfolio that we're assuming is highly hypothetical. When we started thinking about this method many years ago, we thought of the approach that the other panelists are using. Aside from some mechanical considerations which made us not want to use it, we thought it was theoretically incorrect because the portfolio that they are essentially assuming if they are right about interest rates is one year term paper. They are ignoring the appreciation that will occur in the pension fund, whether it's bonds or stocks or real estate, that should be associated with a decline in the interest rate from 11% to 8%. That is the principal reason that with the same 11% and 8% we discussed before, we would get a much lower cost than the other panelists.

As to the possibility for manipulation or catering to the clients financial needs rather than the best estimate requirements of ERISA by using the method that I have described, I find it very easy to use virtually the same economic assumptions for the vast majority of my clients. There is very little variation because I do not have to consider the degree to which the plan is funded.

This also works out well where you have a company with several plans, one of which is relatively new with virtually no assets and another one that is heavily funded. I can state the same 11% and 8% interest assumption. The financial officers understand that for the plan that has no fund, my interest assumption is exactly 8%. With a plan that is heavily funded with a mature age distribution my interest assumption is much closer to the 11%.

MR. HALEY: I would like to respond to the point about the appreciation in the fund. I did not get into how we set the assumptions. In my prior remarks, I followed the typical actuarial jargon of interchanging interest and investment return. We certainly do look at the composition of the current portfolio and the plan sponsor's investment policy. Our interest rate assumptions are not based just on what are some interest yields available on bonds, but what we expect to be happening along the range of their investments. On one plan we use a 25% interest assumption for the first year because they are heavily invested in equities and it looks like this could be a good year for the equity market. I think that sort of approach eliminates the question of the theoretical problem at least as to how that works. On the question of the manipulation - one of the advantages of the approach where you are frontloading the assumptions is that any manipulation tends to have costs that appear earlier. I regard it as perhaps less subject to manipulation.

MR. THOMPSON: I would like to make a comment on another point that Mr. Watson made. It is relevant to this discussion that whatever method you use, you have to be comfortable with the method. I have had associates that would say "my client would never go for this type of thing", and I am sure that it comes as no great shock to anybody in this room that you will find that the plan sponsors tend to have a comfort level that is directly proportional of the comfort level of the consultant providing advice to them. If you are against some particular approach, chances are your plan sponsor is going to be adopting whatever approach you are unless he independently comes up with something that he thinks is superior, and in that case he will probably change consultants.

MR. YELLOTT F. HARDCASTLE III: Have any of you run into the problem that I have experienced with the IRS in shifting from a single interest assumption to a select and ultimate where the IRS views this as a change in method that requires prior approval as opposed to simply a change in assumptions?

MR. DASKAIS: Speaking from our experience we had no trouble, although there was no question that this was clearly a choice of assumptions, not a change in method. We have had some long discussions with the IRS on several points. Going back to what John Haley said - one of the things that disturbed the IRS people when we talked to them was that we were assuming substantially the same interest rate or series of interest rates, depending on how you look at it, for all plan sponsors irrespective of their experience. We thought that this was absolutely correct. Over the course of the next 30 years we see no reason to expect that one large plan or medium size plan will earn more than another, since they all have available to them the same range of investment managers. I was wondering about John Haley's comment which would indicate that he was choosing his assumptions on the basis of the investment policy of the fund. This would indicate that the actuary knows more than the investment manager about what investments will be preferable. John, do you want to respond to that, and also, will both panelists respond to Mr. Hardcastle's question?

MR. HALEY: I have one client that likes to invest in relatively low yielding mortgages. They are a construction industry plan and feel that it is important for them to support the construction industry. These mortgages do not return nearly as much as they could get in some other investments, and they are aware of that. There is a large amount of economic theory that supports the notion that different classes of assets have different expected mean returns. It is a reasonable notion to expect that the mean return on equities is probably higher than some other investments. I would be inclined to use a different interest assumption for a plan sponsor that plans to invest solely in equities as opposed to a plan sponsor who invests solely in what is perceived to be lower yielding, but perhaps more attractive investments for other reasons.

Responding to Mr. Hardcastle's question, I have not had any problem with the IRS. Were you dealing with the national office or a local office?

MR. HARDCASTLE: This was with the national office. I had heard a comment about this at the Enrolled Actuaries Meeting. I called the national office to see if this really was the position they were taking. They

said that there was nothing in writing but internally this was the way they were viewing it. They did have some requests from various plan sponsors requesting approval for a change of method when going from a single interest rate to select and ultimate rates.

MR. HALEY: I regard that as nonsense.

MR. HARDCASTLE: I agree with you. I feel that there may be some argument if the only change were taking the retirees and using a dedicated bond portfolio approach. Other than that, I totally agree with you that it has no logic behind it.

MR. DASKAIS: They would presumably similarly regard a change from a retirement age of 63 to retirement rates as a change in method.

MR. HALEY: That is a good point. The IRS might consider it impacting in some way on what they might consider as the asset valuation method. They might slip it under that door but aside from that I do not see how they could come up with it. I have not had any problem yet, and we have used that on a number of cases. Perhaps they have not realized it yet.

MR. THOMPSON: We have not had any problem in that regard.

I would like to comment on something that John Haley mentioned earlier. I think there is no question that if you have a grading scale that starts in 1982 and you maintain the same scale starting in 1983 that that is a change in assumptions from one year to the next because you are moving everything forward a year. You actually have to slide down the scale in order to keep the same assumption.

I would like to make one comment about using say the same assumption across the board which is fairly close to what Dick's firm does. In terms of best estimate assumptions, I have practically zero confidence that any single set of assumptions I have is correct. I have what I would characterize as a comfort range. I have a fairly high degree of comfort or confidence in a best estimate over a range of results. I do not have any problem coming up with results within that range that are directed toward a particular plan sponsor's objectives or maybe investment philosophy. I do not feel that by doing that, I am necessarily trying to outguess the investment managers. It may be more in tune with trying to accommodate a plan sponsor's desired funding pattern.

MR. DASKAIS: I would like to make one comment in response to what John Haley said. The exception to the uniformity that I suggested earlier has been primarily in the same situation that John mentioned, namely the multiemployer construction industry plan where the investment policy does not appear to be the same as we are accustomed to in single employer plans. There we have typically used a shorter period for the calculation of what we call our liability adjustment.

MR. RUSSELL L. MILLMAN: I have a series of related questions for Mr. Thompson and Mr. Haley. On final pay plans where you use a year based interest rate, do you always use a year based salary scale? Do you use a year based cost of living and average wage increase method for your

social security calculations? Five or six years ago, when interest rates were lower than salary scales, did you use a salary scale which was higher than the interest rate?

MR. HALEY: The answer to the first series of questions is that we always use year based assumptions for all of the economic assumptions. That is not to say that we reflect them all to the same degree. For example, in the last couple of years it has looked like we're in a period where perhaps the market has been catching up with some bad returns in the 70's. The excess appreciation that you are getting there is not necessarily something that you see reflected to the same degree in the other economic assumptions. We do not always keep the same spread between the various assumptions. In fact only rarely are they ever the same. However, we do have some variation each year in each of the assumptions. It does follow some consistent pattern. Six years ago I was working in an insurance company and did not know exactly what a pension was at that time, so I will have to beg off on the second part of the question.

MR. THOMPSON: When we use year based assumptions, we use them for all of the economic assumptions. We set up a matrix and have a disciplined way of looking at it. We do not value all of our plans using year based rates, but for some of the ones that have the more traditional average rate approach, the salary scale exceeded the investment return. When you are looking 40 and 50 years out into the future, I have a problem with the economic implication of salaries exceeding the investment return over a long period of time, but we do value some plans like that.

MR. DAVID M. LIPKIN: Dick Daskais mentioned that he does not believe actual investments should influence the assumptions. I know that is what is written in some study notes that I read in the last few years, but working in an insurance company, many of my plans have their assets in general accounts of life insurance companies. That rate does not fluctuate very much and it does seem appropriate to use this approach for that kind of investment. However, one client came and said "What if I take out all of this money and put it in a 10 year GIC at 15%?" I said I would certainly recognize that rate and use select and ultimate assumptions. Do you agree that particular investment choice would be an example where the investment should influence the assumption?

My other question is: when inflation is at a low point such as the 3% or 4% we are now experiencing, does it seem realistic to expect or to use an assumption of declining interest rates. If you are an advocate of this technique would you use increasing interest rates?

MR. DASKAIS: When we have clients who have money in an insurance company general account we do not use the account stated value. We adjust it to what we consider a fair market value. Often the insurance company will provide that market value. Because of this, we do not have to adjust the interest rate assumption.

Concerning the second question, if I observe that today's interest rate on long term investments is 11%, but I believe that 20 or 30 or 40 years from now 8% is more likely to be the long-term rate or the ultimate rate as I have defined it, then I have to use a declining interest rate. There is not a one to one correspondence between inflation and interest

rate but theoretically interest rates reflect the expected inflation, not over the next year, but over the indefinite future, or at least the term of the security that is paying the interest.

MR. CHARLES E. CHITTENDEN: I want to ask John Thompson and John Haley about the ultimate interest rates that they are assuming of 5% and 4%. How did you arrive at these rates? If Moody's Average is the same next year as this year, or if it goes back to the 14% that it was in December, 1982, would you use different assumptions with a new plan from those you would use with one that you are going down the line on?

MR. THOMPSON: In our shop we have an unusual mix of clients. We range all the way from 2 life cases to well over 100,000 life cases. We have a mix of industrial, non-profit, financial, municipal and other types of plans. We do not have a narrow range of practice that we would be employing in funding these plans or in selecting assumptions.

MR. CHITTENDEN: What does the selection of the interest rate assumption depend upon? Does it depend upon how the assets are invested?

MR. THOMPSON: That might enter into it. The investment return assumption is essentially made up of a number of components that I mentioned earlier; the real rate of return, inflation, risk premium, etc. I use a reasonable mix of these things to select an interest assumption that I feel comfortable with.

MR. CHITTENDEN: You might feel uncomfortable next year with assumptions which are the second step of this year's assumptions. If so, would you change assumptions for all of your plans that you have or wait a few years and then change?

MR. THOMPSON: I take the approach that you should not be changing assumptions every year; you monitor them. You may actually make a formal change every 3, 4 or 5 years after you build up enough experience to warrant change.

MR. CHITTENDEN: Suppose 10 years from now you have made two changes and both times you've gone back to starting off with 11%. Would that argue that there is something wrong with your declining interest theory or would you stick with it?

MR. THOMPSON: That does not show there is anything inherently wrong with the theory.

MR. CHITTENDEN: Suppose you look at the long term bond market. Looking at the difference between 20 and 30 year bonds, you see that the market is guessing that long term interest rates or interest far in the future will be about 10% per year. I admit that you should use some actuarial judgment and not just use 10%, but it seems a large amount of actuarial judgment to go from 10% to 4% or 5%.

MR. HALEY: I will briefly mention how we get down to yields like 5%. It is a matter of taking a somewhat conservative approach to the yield setting. You can look at what the market is discounting bonds at, but when you actually get to it, there are very few of them. Even the ones

that do exist have some characteristics that perhaps do not make them the best. For instance they have call features, and to get an interest rate number from them might give you a lower number than you might have at first expected. Social Security is one agency that has to look out in the relatively long term at some of these things and they have some numbers concerning what they expect the CPI to be at those times. The other thing we did is to look back in history at the periods where the interest rate was greater than 5%. Prior to the early 1960's there were not many periods where the rate was greater than 5% over a 5 or 10 year period. Taking this 5% approach is something that we can live with if things return to historical norms. If we are wrong, there may be a little more money in the pension fund than we needed, and we can adjust that from time to time. I do not regard that as necessarily a failure of the select and ultimate approach because I do not really expect them to work exactly that way. What I am doing is protecting myself in case things do not work out as favorably as they could.

MR. THOMAS D. LEVY: I would like to make two points. The first relates to whether the IRS considers the change to year based interest rates a change in funding method. What we have done on other issues is to recognize that IRS has a procedure for giving a class approval. We have gone in and demonstrated to the IRS how this works on a hypothetical case and convince them that it's appropriate. They then gave us a letter that we attach to the Schedule B any time we use that on any of our cases. We do not have to go through the same procedure with every single client. If you go through that procedure with the interest rate question, then you know the client is not going to have a problem with Schedule B. Maybe it really was a change in assumptions and not a change in method, but if you have that letter from the IRS, the client does not have to consider that issue. You have the approval, staple it to the Schedule B and you're done with it.

The second point concerns Dick's example of two identical plans where one is a new plan and the other is a mature plan. The data is identical, which means that a cash flow projection of future payout is exactly the same for the two plans. Why is the value of the stream of benefits different for the two plans, just because one is well funded and the other has no assets?

MR. DASKAIS: Consider this example. Suppose the stream of benefits is a million dollars per year for 20 years. If I expect interest rates to drop to 8% and I have no money in the fund now, the actuarial present value of benefits is a 20 year annuity at 8%, multiplied by the million dollars. On the other hand, if I have 5 million dollars in the fund which could be invested to yield 11%, then it is not correct to take the market value of that 5 million dollars and subtract it from the million dollars multiplied by the 20 year annuity at 8% and say that we need to supplement the fund by that difference. The unfunded value in that example will be greatly overstated by this method.

