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Session 63PD
Current Trends in Demographic Assumptions

Track: Pension

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Summary: An aging workforce, improving mortality, economic dislocations, immigration, and other forces cause change in the demographic experience actuaries observe in pension and post-retirement benefit valuations. This session discusses various topics including the latest trends in mortality, withdrawal, disability, and retirement rates; sources for these assumptions and the effect of changes in assumptions on funding, accounting, and benefit determination calculations; and actuarial standards governing the selection and monitoring of demographic assumptions.

MR. JOHN KALNBERG: This is session 63PD, "Current Trends in Demographic Assumptions." I'm John Kalnberg. For starters, Marilyn Oliver is going to discuss mortality assumptions, and Bart Prien is going to talk about some interesting issues with turnover assumptions. I'm going to talk about some of the relevant actuarial standards and about doing experience analysis.

MS. MARILYN MILLER OLIVER: My name is Marilyn Oliver, and my background is that I was on the UP-94 Task Force. That's really mortality tables. And I've been on the research committee for the Society of Actuaries. Currently I'm on the pension section council.

My talk will be divided into two pieces. The first part is about the current regulatory environment with respect to mortality tables, and in the second part, we'll be talking about some of the trends that have been observed in recent studies.

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Which tables are relevant? The three tables that seem to be most relevant right now are the 1983 group annuity mortality (GAM) table, the 1994 GAM series of tables, and the RP-2000 table.

How do they compare? First, I'll look at the primary sources of data. The 1983 annuity group annuity mortality table and the 1994 series, as illustrated by their names, are based primarily on group annuity experience, while the RP-2000 is based on experience for private sector retirement plans. So it does not include any public sector experience.

What are the major differences? The time periods represented are different, obviously. From the name of the table, you can tell what year the experience is supposed to represent. So all of these tables are based on some experience study and period of experience, and then a projection scale was used to project from the mid-year of that experience period to some year. For instance, that would be 1983 for the 1983 GAM. A second difference would be in margins. First of all, I think I should go back for a second and talk about the 1994 series of tables. There are actually three: the group annuity tables and then this Uninsured Pension Table, UP-94, that are all sort of in the same series. They all are based on the same basic data, group annuity data, which was then projected to 1994.

But then that table is adjusted in different ways and given different names. The basic 1994 group annuity experience table, without any margins in it at all, would be referred to as the 1994 basic table. Then if you add a margin, it's called the 1994 static table. Then if you add a projection table to it, it's called the 1994 group annuity reserving table. And then if you decide that you want to use it for pension valuations, it's given a different name, which is the UP-94 table. At the time it all seemed very reasonable, but I know it's sort of confusing, all the different names.

So the tables that are going to be used for group annuity reserving all include margins, and these margins are for two purposes. The first is to account for the size of the line of business, so you would expect random fluctuation for size, between small and large. The second reason is for the characteristics of the underlying group.

So, in the 1983 group annuity mortality table, there is a 10 percent margin, meaning that the mortality rates (qs) have decreased by 10 percent. In the 1994 basic experience table and the UP-94 table, there is no margin. In the group annuity static table, the rest of the '94 series, there is a 7 percent margin, and in the RP-2000, there's no margin.

So let's step back for a minute. If you're dealing with pension plans, retirement plans, the theory is that you don't need a margin. The gains and losses — whether you have a 100-life case or a 20,000-life case — will be recognized as gains and losses, which is appropriate. That's like the other assumptions. And if your group has different characteristics — for instance, a large percentage of blue-collar

workers — you will recognize that in your adjustments to the table that you use. So you might do an experience table, or experience study, and adjust those rates.

That's why there are no margins in the tables that are meant or developed for retirement plan valuations. That's not to say that you wouldn't want to use other tables perhaps, but just to say that there are no margins in the ones that are specifically derived for that purpose. So, those are the RP-2000 table and the UP-94 table.

How do they compare? What are some of the notable features of these tables? The 1994 group annuity-reserving table was the first to actually incorporate a projection scale into the table. So when you say, "I'm using the 1994 group annuity-reserving table," you're saying that you are projecting the mortality on a generational basis, as well as using these qs.

So, there is a scale AA, which is a projection scale for that table. That scale is applied on a generational basis, meaning that, the longer between the valuation date and the time that the person attains a given age, the more years of projection will be used. So if I'm 40 now, at the valuation date, I'm going to turn age 65, in 25 years, so there will be 25 years worth of mortality projection on the qs at age 65. If I'm 41 at the valuation date, there will be 24 years of mortality improvement applied to the q, at my age 65.

The other table that has some notable features is the RP-2000 table. It has rates for employees — there is a table for employees only, a table for healthy annuitants — and then it has a combined table at ages 50 through 70 that includes both active and retired experience on a blended basis.

So, what does it all mean? Is there any difference? Does it matter? If you look at the tables that are designed for retirement plan purposes or currently used for retirement plan purposes — I looked at the 1983 GAM, because a lot of people used that, the UP-94 table, and the RP-2000 table, and compared present value factors for immediate annuities — what you see is that, for men, the present value factors are higher. They go up over the period. So, from the '83 table to the '94 to the RP-2000, you can see increases in present value factors or cost for males, due to male mortality improvement. And for females, you see the reverse; you see actual declines in the present value factors. I looked at immediate annuities at ages 50, 55, 60, and 65, so that's what I'm basing this on. You saw declines in the present value factors between those tables. If you took a 50/50 distribution, male and female, you didn't see too much difference, really, in the present value factors between those tables.

FROM THE FLOOR: Why the decline for the females?

MS. OLIVER: Because mortality rates for females actually increased at some ages. What about early-retirement factors? There was very little difference for the 50/50

unisex population. What about joint survivor factors? For a 50 percent J&S option and 50/50 distribution, there was very little difference. These are at 7 percent. Now remember, I'm using the unloaded tables. If you decide to use the 1994 static table, which has a 7 percent margin, you're going to see a difference.

What tables are currently being used for what purposes from a regulatory view? For lump sum distributions, they're using a 50/50 weighted 1994 GAM basic table projected to the year 2002 by scale AA. Okay, so what does that mean? They're using the 1994 table, without any margins, on a 50/50, male/female basis, and they're using the projection scale that was developed for the 1994 group annuity-reserving table to do their projection. And this scale varies by age. For current liability, the 1983 group annuity mortality table is still being used, and for PBGC, the 1983 group annuity mortality table is being used.

So, for current liability, the Secretary of Treasury may require a new table. It has to be based on pension experience and projected trends in pension mortality. And that's one of the reasons — I guess it probably is the primary reason — why the RP-2000 was developed. It was developed as a guide to supply information to the Service in their decision regarding the basis for current liability.

As far as our cash outs, Revenue Ruling 2001-62 that put forth new rates requested guidance on how often the table should be adjusted for future mortality improvement. So projection scales are starting to become an issue, and I think there's a real trend across the industry to give more attention to them.

Now, what are the trends that they noticed? The big trend, the thing that seems perhaps most interesting, is the change in male versus female mortality rates that we're seeing. To give you an example, if you compare the life expectancies on these same three tables — the 1983 group annuity mortality table, the UP-94 table, and the RP-2000 table — you'll see that in the '83 GAM, the difference in life expectancies between males and females at the ages of 50, 55, 60, and 65 was around five years. If you make the same comparison for the UP-94 table, you'll see that generally the difference has declined to four years. And if you look at the RP-2000 table and make the same comparison, you'll see that generally it has declined to three years. That's interesting, I think, and it's primarily due to the difference in the male/female mortality rates between the ages of 50 and 75. In that age range, the male rates are improving, and the female rates are not improving as much or not improving at all.

It's interesting from a couple of perspectives. Obviously, what will happen in the future? Then, the other interesting thing is, what's an appropriate projection scale to use? If you use a projection scale, like scale AA that's based on experience, during the period in which this trend was evolving, what you'll see is you are then assuming that the gap will narrow even further over time. So, you would see a difference then if you just used a flat 1 percent improvement scale versus if you used AA.

FROM THE FLOOR: Is there any guess as to why male rates are improving but female rates aren't?

MS. OLIVER: There's a very exhaustive study on the subject by Barbara Kalben. I guess the bottom line is it's not known. I mean there are a lot of different reasons it might be happening.

FROM THE FLOOR: Would the working versus the nonworking mortality be part of it, or might that be isolated — you know women are working more, they smoke more?

MS. OLIVER: The same trend is evidenced in social security data and Medicare data, but those are two of the major causes that are hypothesized, I mean those are definite reasons. Women entering the work force are possible explanations that people have given. Smoking is really interesting, because I think that there was a period of time when women did not smoke so much. Then they started smoking more after World War II, and the q_s for smokers are 50 percent higher than the q_s for non-smokers at some ages. So that has to be a factor. Lifestyle would seem to have to be a factor, but I don't have any real good explanations for it. If somebody here does, I'd love to hear thoughts on what it would be. Barbara's study is really lovely; it goes into every aspect, so I'd recommend taking a look at that.

The RP-2000 has adjustment factors that you can use to adjust for the composition of your group. For instance, if it's blue-collar versus white-collar, there are tables with adjustment factors that you can use for that purpose, and you know there is a difference. At the time that table was constructed, they looked at collar differences and amount differences, and there's overlap in the two sets of data. But the conclusion that they did reach is that amount is important, and collar is also important. So you can use the RP-2000 to give you some idea for that.

FROM THE FLOOR: When you say amount do you mean benefit amount?

MS. OLIVER: Yes, or for employees, I believe it was based on pay. You have to be a little careful with that because they grouped amounts under $6,000 as small, medium was $6,000 to $14,000, and then large was over $14,000. Of course, as you move through time, the benefit amounts in your plan are going to become larger. So if you were to blindly use the RP-2000 adjustment factors, that would not be appropriate.

MS. OLIVER: There are definite differences in mortality rates between married versus single individuals for both men and women. As I said, there is quite a difference in mortality rates between smokers and nonsmokers.

And last, there's a lot more data now at the older ages and a lot more emphasis on analyzing that data. The interesting aspect, I think is, as you know, that the probabilities of death are much higher at the older ages. So, if you have a given

percentage improvement, you'll see a bigger difference at the older ages because the qs are larger.

There was a symposium earlier this year on living to 100 and beyond, if you're interested in that topic.

MR. KALNBERG: Now Bart is going to talk about turnover assumptions.

MR. BARTHUS PRIEN: There are four studies to which I will refer.

Let's take, first of all, a very general idea of what the public concept might be. I just happen to have *Fortune* magazine, published January 12, 1998, and it has an article on the 100 best companies to work for. It just happens to give data about each one, including the voluntary turnover rate. Out of the 100 companies, you'll find that about half of the companies have a turnover rate of 7 percent or less — that's 51 percent — and another 29 percent of the companies were up to about 13 or 14 percent in turnover. You have a few high ones in there.

But these are the good companies. These are what people think are really outstanding. The survey was prepared by an actuarial firm, Hewitt Associates, and was quite extensive. It included 1.4 million people. So I think we got an idea there of the average turnover rate, what we might expect. We have to be careful. It's voluntary turnover, so I don't think that includes deaths firings, or other kinds of separations, but it's a good cross section.

If you buy this magazine, I think they do this analysis about every year. You might be interested to know which is the best company to work for. It's Southwest Airlines. Marriott ranks at number 27, but their turnover rate is 26 percent. *Fortune* gives the percentage that are women and the percentage that are minorities, all kinds of good actuarial data*.*

Fortune shows that women are in the workforce pretty heavily now, at about 44 percent. And what I found interesting was that many of the companies have about 30 or 40 percent women on staff, and very few have less than 10 percent. So it looks like the men almost have to share with the women fully in the workforce. The reason I throw that out is that, of course, I have the data here, but later on, surprisingly, gender is the biggest factor in turnover. The female experience, I'll show, is a roughly 40 percent higher turnover rate than males. I won't explain why.

A study by Roger L. Vaughn was done by an actuary and published in the August 1992 *Pension Forum*. About 150,000 people were included in the study. It was conducted roughly 20 to 30 years ago, and was the only study that had come out since 1950. Way back, we had Harry M. Sarason's *The Actuary's Handbook.* Today, amazingly, many actuaries still use those old Sarason turnover rates. We question why we continue to do that.

With regard to the rates of turnover for the select years, after three years' time, they call it an ultimate. It has an average of 7.8 percent as a turnover. That's a little easier to comprehend. And we compare the Vaughn table to two of the old handbook tables, the T rates, to see what they look like, and experience is very clear. The ultimate table seems to have a different shape than the T tables. This was a concern raised by Mr. Vaughn. We had nothing else to look at.

Now, we get more refined, and we try to show what the rates are like among those with just one year of service or two years or three years, compared to the ultimate table. Of course, the ultimate table is the lower rate. According to the table, people that work less than three years are going to have much, much higher turnover rates, but as they get older, it's lower. So these are just characteristics of turnover.

The Society of Actuaries decided to have a study done. Our committee was made up of about six or seven people. I served as chair, and we employed the University of Iowa to prepare that database. Then we employed Professor Steve Kopp up in Canada to do the study, and we served as an oversight. There were about 41 huge plans in the study. Of course, the big problem of this study was getting the data in good form, because different contributors prepared the data in different ways — nearest age, last age, *et cetera*. So, the preparation of the database by the University of Iowa was very helpful to us. And the study that Mr. Kopp prepared, which recently became available on the Web site — they used to charge us $20 for a copy — is quite detailed in the procedures and methods. So if you want to conduct a study, I would refer you to that to learn the good points and the bad points, what to do and what not to do.

What we're trying to do is compare what we had to the T tables. So we have a basic table from our experience, and I'll go into in more detail about that. But for the moment, just to give you an idea, it starts out as a rugged line. It has not been smoothed; it simply reflects the actual experience. When you hit about age 50 or 55, retirement begins to be a factor.

But you can compare that now to the different T rates. T nine is a high rate; that's the highest. So, actuaries were presented with this handbook — which one do you use to evaluate a pension plan? How about T five? T three? Perhaps it's not that great a factor, since people will say, "You're going to vest right away anyway or very soon," so it may not have all the impact that it used to have. Back in the old days of the Sarason tables, the 1950s, it took a long time before you could even get in a pension plan, so the turnover rates were much lower then.

Many people think turnover is nothing but duration. However, for years one through eight, the average turnover is about 15 percent; from years nine to 11, it's about 10 percent; and then after that, it's about 4 percent. So it gives you a feeling of what's happening. I'll explain this peculiar thing for duration zero to one later. This is to back up the experience, so you can look at figures all you want on that issue.

In the Vaughn table with a three-year select period, they did their own graduation. You'll find when you study the table that the first differences are almost always the same down the column. So it's a simplistic demonstration, but surprisingly, it's quite consistent. When comparing that table to the one we have from the inter-company study, you will see it's very similar.

Again, this is a 10-year select period for those who like to use a huge computer and feel the detail is merited. But it will show a fairly low turnover rate after 10 years. So, it reveals a lot, but it varies considerably by company.

This is the most important input, I think, in turnover. In a graph of net decrement ratios, termination ages by gender, there is a difference, and it's consistent throughout. Female bounces around more because we have a little less data. This is more on this gender issue. The rates are much higher all throughout for the females.

We thought that turnover would vary considerably whether you were in a recession or in good times, and we were surprised by the results. We had a six-year time period with which to work, and we split it up into two pieces. The first was the first four years, and the other was the last two years. During the last two years, the economy was sluggish and down. But surprisingly enough, they're close together. The rationale was, as stated by Professor Kopp, that in good times, employees shop for jobs; in bad times, they want to stick with them. In bad times, the employer wants to trim down. So the two work against each other, and there hasn't been much difference.

And Mr. Vaughn did a similar kind of thing, breaking up time periods in good times and bad, and he didn't get huge differences in turnover experience. I challenge the audience by asking, what is net decrement ? It's the number of withdrawals, the number of deaths, plus the number of disabilities, minus the number of new entrants in that period.

With this turnover study, we didn't have the actual number of terminations or the actual number of deaths. They provided the data, grouped year by year. This had a built-in error, which was that some companies laid off a lot of people and rehired a number of them, and the rehires are treated like new entrants again. As a result, the termination of these net decrement rates was very low in the first year of service. And that's why we had this low turnover in the first year that we didn't want to see. In later years, it might affect the turnover rate by two or three percent of the total rate.

This is what employers like to see, those who sponsored early-retirement windows. The window is trying to attract people to leave who are 50 or older. The curve, or whatever you want to call it, is a ratio of those who terminated to those who didn't have a window. So, 200 percent or 2.1, twice as many terminated at that age as were expected to terminate.

When we have the gender theme showing by duration of employment, the difference between males and females does show a consistency through many of the years of duration of the gender differential.

We looked at retirement, and we have rates of retirement based on the duration of time in which they were eligible to retire. We split it. Most of these tables take a little time to read, and that's why we suggest you review them, because you'll spend several hours on some of these statistics.

Now we come to a paper by the distinguished speaker, and maybe we can talk about comparing. The key issue is should turnover rates be based on number of lives or on pension credit? Now, I'll make a quiz out of this. How many would raise their hands and say it should be based on pension credit? No hands. Everybody thinks it should be based on lives.

Every one of these studies that I've discussed so far has been based on the number of lives. They did not reflect salary. They did not reflect the reserves released when the person terminated. Is that correct? Should we take into account reserves released when a person quits? If I work for a company for 10 years and quit, my reserves will be a lot more than somebody else's who only worked three years. So the impact on the pension fund would be much greater in my case than in the other guy's case.

Another element is that the people with short service don't have much pension credit anyway and probably are young, defining young as under age 30 or something. So, all of the studies that we've seen so far have been based on number of lives. The speaker is trying to challenge that issue and say that you should take into account the reserves or the amount of credit that the person had at the time he quit. As you know, when you get older, the turnover rate drops, so if you're age 50, it's much less than at age 30. The probability is much smaller, but involves a huge amount of reserves.

We'll discuss a couple of experiences here. I'll just refer to just two numbers. One is 57 percent. So that tells a story, that if you based your turnover study on reserves, you should use a turnover table that's only 57 percent of another table based on number of lives.

FROM THE FLOOR: Is that a non-select ultimate basic table that you're comparing it to?

MR. PRIEN: Yes. Only the first year of service has been excluded. I think the gentleman is implying that if you have a select table for three years or five years, this difference, the 57 percent, would be a lot bigger. It might be 90 percent. Many firms I guess practice using a select table.

But by doing the exercise, at least we get to see what it is. This is a group, in San

Francisco incidentally, for which the experience involved 30,000 carpenters. It's an exciting story for actuaries. Firm A said that this plan at that time was worth 37 cents an hour. Firm B, another big firm, said it was 49 cents an hour. How could they be so far apart? That's what caused this study to be conducted. There were two months of struggle between these two huge firms over a client. Now, how do you convince the client that the 49-cent figure is correct and that the 37-cent figure is just an attempt to get the business? It was very exciting.

Let's talk about some other groups — ironworkers and laborers. They were large groups, and the data are then supported that the turnover rates by amount were much lower, in the area of about 60 percent, than what they were by number of lives. I say that if you're doing the study based on number of lives, it is appropriate for valuation of post-retirement medical. But for pensions, you should use a very good select table or base it on amount of reserves.

The figures display something close to the 57 percent. For the laborers, it was the same thing. In preparing these studies, I give some credit to the woman who just spoke to you. We both worked on that. Okay, I could talk longer on it, but the detail, I think, rests as you get the general concept we're talking about.

When you offer a window for those in a retirement phase or early phase, like age 50 and older, what happens to the results? The turnover rate differences didn't look significant as we had discussed before for the other issue, and some companies may feel that isn't enough.

Now, for sources of information on turnover, I highly recommend the Social Security program. It has a couple of excellent tables for rates of disability and rates of retirement. We have the Web site sources on that, which if you're interested I can relay to you.

These disability rates are huge in number, and some judgment, of course, has to be taken if you want to modify these to fit the current client. But where else can you get so much? The standard definition exists, although there is one problem. In some states, it's easier to get a disability Social Security pension than it is in other states. California is the most liberal, and that bothered me a lot. I thought it should be a uniform thing throughout the United States, but it isn't. In past practice, we used disability rates, I think from the railroad retirement board. But it doesn't have any real impact until maybe age 55 or 60 on these pension valuations. At the younger ages, it wasn't that significant.

Regarding retirement probabilities under Social Security, they may not be suitable for your particular client, of course, but at least we have something to go to. It's going to be very interesting, I think, in future years for ages over 65. Are people going to work longer or not? They haven't broken out all of that data. You can get all this information from the Social Security actuary. They're quite helpful.

So we covered 50 years, from the Sarason tables of the 1950s up until now. Currently, the Society of Actuaries — I'm on the committee — is doing a second study of turnover. The first phase (getting the database) is almost complete. This time, we've selected a professor in Wisconsin. We communicate as a committee almost monthly in conference calls, discussing what they provide to us, and the various committee people serve as an oversight to make suggestions. It seems to work very well, and it's not an expensive way to have people all over the country provide input on that critical study.

In summary, I think turnover rates will always be in the judgment department for the actuary, and I think you should go on the conservative side because of the issue of amounts versus lives. And usually, you don't have enough data. When we do these comparisons of the committee, it varies by plan and by client, but there's one good thing. Most of the experience, wherever you get it, seems to follow a similar curve. So, if the experience of this client is triple what you would normally expect, you can easily adjust the curve to fit that situation. It's not all that easy, but I think these studies do reveal a lot of problems in getting the data, preparing it, and observing it, and you don't have that many studies to guide you. There are only three or four studies, but they are worth the time.

FROM THE FLOOR: The question is relating some other firms' observed realities into theory. I've just completed creating a 25-year select and ultimate rates for our system. I'm with Lynchval Systems Worldwide. We chose 25 years because we were under pressure from clients who were doing municipal and public employee plans, and needed 20 years. We thought we'd go out a little bit further. Has anybody studied the termination rate differences between public and private plans at all?

MR. PRIEN: We haven't had any publications. Is anybody here from California PERS?

MR. RONALD SEELING: We do. We have 1.2 million participants. We do our own experience studies. I don't know that we've ever stopped and turned around and compared those. We have compared our own mortality studies to existing tables, and they are similar. But we've never bothered to compare turnover.

I do find the subject of basing some of these tables on liabilities as opposed to lives interesting. In a past life, I had a large medical center for a client that had a diverse population in its plan. There was a core of doctors who were in the plan as well as cafeteria workers. Every time we did a gain/loss analysis, it was telling us to liberalize assumptions, and yet any experience study said to do the opposite. It was this core group of high-liability lives that were behaving so differently, a small group within the plan.

And I think that that's true of some of the public sector plans as well. The high-paid folks stay on. Even in public plans, you're likely to see a benefit cap. No matter how

long you work, you can't have more than 75 percent of pay, for example. You'll find that the chiefs and the lieutenants and whoever will stay on, whereas the rank and file will move on. But no, we've never done comparisons to private sector tables.

MR. PRIEN: We had a problem getting data from public groups. Hardly any public group contributed.

MS. OLIVER: I think another issue might be the role for profit that exists within public systems. It could lead to some differences in these numbers. Like in California, where it's costing the most.

MR. KALNBERG: I wanted to mention one thing before I get started on the program — the data solicitation that Bart was just talking about. The retirement plans experience committee and the turnover committees are getting together, and they're doing a data collection now, which is largely finished. They're going to start collecting the data every year, with an eye toward getting standardized data so that we can start making some comparisons and doing some trends off of it.

The RP-2000 data collection a couple of years ago and the turnover study collection were the first, or the largest, that have been tried. It was a lot of work, just getting the data out there and trying to get that data comparable. Now, the chief actuaries of a couple of the larger firms have asked, instead of everybody hitting them with these big data requests, that whenever a committee was ready to do something, we try to standardize it. We've gotten together, so we're just going to go after the big firms once a year and say, "Give us a year's worth of data." Then, we're going to track it and try to build on it as we go forward.

The flip side of that is that this is only as good as the cooperation we get from all of the members. Preparing the data is a lot of work and a lot of aggravation. It's the worst part in a mortality table or turnover study. The fun part is doing the interpretations, looking at the graphs, that kind of thing. The ugly part of it is that it's a lot of work getting the data together.

The studies are only as good as the contributions that we get from the membership. The group annuity tables are great because they can go to half-dozen major insurance companies, and they can all dump their data. And that's hard enough to get them to cooperate. For private pension plan studies, we wind up trying to get data from 100 or more different companies. I know there were about 14 million life years of exposure in the RP-2000. Getting data from that many different companies and pulling it together is a lot of work. So the more cooperation we get from you guys, the easier it is.

What I am going to talk about is actuarial standards of practice. Now, if you can do an actuarial valuation, and you never lose your client, and your clients' plans will always be well funded, then you don't have to worry about any of this. Nobody is ever going to raise any questions. Unfortunately, you don't know up front when

that's going to happen. A lot of what's happened in private plans with assumptions in the last few years has been a real sleeper because so many plans have been overfunded. They haven't had to make contributions, so it's hard to get clients real excited about changing an assumption when it doesn't really impact their expense or their contributions.

Well, the world is changing. The stock market is down. Interest rates are down. Many plans may actually have pension contributions this year. We may be back to the old days, where it's very easy to justify an assumption that makes the cost go down. It's very difficult to justify an assumption that makes the cost go up. And as the costs go up — mortality change assumptions especially seem to drive the costs up — there's a good reason for trying to do that on some kind of a regular basis, and trying to reflect some kind of mortality improvement in your assumptions.

MR. RICHARD BARNEY: Even if your plan is overfunded, assumptions can make an extreme difference in your income from the plan versus expense because most public companies are very focused on their GAAP expense.

MR. KALNBERG: That's true.

MR. BARNEY: Whether or not you're overfunded becomes somewhat irrelevant.

MR. KALNBERG: That's very true. In the last few years, though, it's been hard to get people very excited over assumptions, and I think that time is going to be changing now.

Let's talk about some of the actuarial standards of practice that are out there. There are really three that affect assumption: there's ASOP 27, which is economic assumptions; ASOP 35, which they defined as anything that's not ASOP 27, for noneconomic assumptions; and then ASOP 4, which is measuring pension obligations.

ASOP 35 is the one that's really relevant to what we're talking about here. This is the selection of demographic and other non-economic assumptions from measuring pension obligations. It covers the measurement of defined benefit (DB) pension obligations and, as I said, it's what's not covered by ASOP 27.

It's now fully effective, just as of last fall. The gist of this comes down to, when you set assumptions, you should give some thought to it. You should have some documentation about how you set the assumptions. Often enough, the world doesn't work the way we think it's going to work, so you need to have some kind of justification. And when things are questioned, you need to be able to point out that you gave some kind of reasoned thought to it.

The process that's defined in this ASOP is to identify the types of assumptions. Consider the relative assumption universe. What kind of mortality tables are out

there? Some of the turnover studies that Bart referred to can be very helpful. Other published articles, such as articles from the *North American Actuarial Journal*, can also help. Consider the assumption format. Are you just going to make an assumption, such as 80 percent of the men are married? Or are you going to do an age-related kind of assumption?

A few years ago, a German actuary from our firm was looking at our software. In Germany, they don't have the trust accounting that we do, so they don't project things such as salary increases. But they make up for it by their age-difference assumptions, and the percent-married assumptions are a lot more detailed than I've seen in most U.S. valuations. That's just what's customary over there.

So you need to look at what kind of assumption format? What kind of valuation, are you doing? What you care about for a pension valuation might be much different than if you're doing an LTD valuation. For example, the disability assumption is not terribly important for a pension valuation. However, the disability assumption in an LTD valuation is very important.

You need to select specific assumptions, look at the reasonableness, and then keep reviewing them. Experience studies in the private sector probably don't happen nearly as often as they should. You need to do some kind of review with every year's valuation, just make sure that your assumptions are still as reasonable as they used to be. You need to look at each individual assumption; each needs to be reasonable by itself. You need to be careful about being too conservative, because the risk is somewhat one-sided. You shouldn't have an assumption that's going to be anticipated to produce a significant gain or a significant loss. You want to be right there, so being conservative is somewhat hard.

You need to look at what kinds of assumptions you are measuring: turnover, mortality, or disability. The characteristics of the benefit: how volatile is it? The characteristics of the covered group: is this a mature workforce? Are you getting new entrants? Is it a very young workforce? Is this a startup company? Is this a company that's been around for 60 years? Things like that can be really important.

Materiality is extremely important. One of the things we tend to do as actuaries is get very hung up on the theoretical part of it. You go to the seventh decimal accuracy of an assumption.

You don't necessarily need to make an assumption for every contingency, or each contingency doesn't have to have its own separate assumption. If you have a period where the benefit is the same, whether you go out on a termination, disability, or retirement, you don't necessarily have to have separate assumptions for each of them. If the benefit is different, you probably want to, but if the benefits are all the same, you can group assumptions together.

You want to look at the relevant assumption universe. You want to look at relevant

plan experience, specific events. Say you're looking at the experience of a plan and things like early retirement windows. You're trying to get retirement experience. Early retirement windows tend to mess up an individual plan for the year before and a couple of years after. The year before, if it leaks out that there's going to be a window, lots of people aren't going to leave. There are people that haven't left some companies for probably 10 years, because they know in six months there's going to be a window. But many times if there's a rumor or if a company has had a pattern of windows, sometimes people are going to hang around, and that's going to depress your retirement experience. Then you have the window, and lots of people leave. In the year after the window, your retirement experience is going to be really depressed again because there won't be anybody left to leave. You're going to have to wait a couple of years before you have people who are ready to retire. So you need to look at things like that that have happened.

Have there been major acquisitions? You look at a five-year experience study. If two similar-sized companies merged two years ago and, because of all the synergies there are a lot of layoffs, you need to reflect that when you're thinking about setting your assumptions. You know that's not the way the world is going to continue to work for them. You need to look at general trends. We are in a much different economy now than we were in five years ago.

I talked before about the table and the point estimate. You need to figure out where you want to make the distinction. Are you splitting by sex, by age, by service, by calendar year? And depending on the assumption and the period you're looking at, there are reasons for each of them. Is this something that you want to make select and ultimate? If it is disability, probably not. If it's withdrawal, you probably do.

It was always interesting that in the old system I grew up on, they had room for doing things like gender-distinct salary scales, and that was always kind of a fun one. In reality, there probably are gender-distinct differences in salary scales. I'm not sure that any of your clients would ever want to reflect that in the projection that they're publishing.

One of the most important things is that so much of how we tend to think as actuaries is influenced by the actuarial valuation software that we use now. The world has changed. When I first started, my old boss grew up on back-of-the-envelope assumptions. I remember he would say to me things like, "Well go cost this out. It should make a 10 percent change in the normal rate." So I'd go and spend a week and a half costing the thing out, and it would be a 9.9 percent change, and I thought, "Why did I have to do that?"

Unfortunately, most of us have grown up a lot more dependent on computers. And that's a very good thing, but you have to be careful. With any tool, you have to know how it's designed to be used. When you set assumptions, you need to make sure that you're applying the assumptions the way that your software asks for

them. Do you want to use a rate-based table or a probability-based table? That's a very big one. In theory, there's no difference, but if you have a probability-based table, and the assumption is using it as if it were a rate-based table, you will get different results.

When a firm changes its software, it's a little bit easier because you're going to have a couple of people do all this analysis and tell you what you have to do. When a client moves from one firm to another, it's a little trickier because you're figuring it out. You have to be careful about just blindly picking up all the old assumptions and moving them from one software program to the other. You need to give a little bit of thought about how they were made to be used.

You need to look at things like availability of data. That was one of the things that was a problem on the RP-2000 table and actually on the turnover table in getting all the detail. On the RP-2000 table, we did some analysis on the differences by collar and by annuity size, but at the end of the day, it turned out that there wasn't enough detail in the data to really be able to figure out what caused the mortality rates to be different. So there was only so far that you can go. You need to be careful about going too far past the data that you have.

FROM THE FLOOR: Being split by calendar year, when would you use that? Would that be like reflecting existing bargaining changes or new law changes, something like that?

MR. KALNBERG: Actually, an existing bargaining change could be a very big one. If there was a significant change two years from now, if there's a new piece of benefit coming into effect next year, you might want to do a calendar-year-based kind of table. Or if there's an economic trend that happens to be going on that you don't think can last, you might want to have some kind of calendar-year-based table.

When FAS 106 valuations first were popular, the medical inflation tended to be a calendar-year table. The assumption was that if medical inflation kept going forward the way it was, we'd all be working for the medical firms, and there would be nobody left to get sick because there'd be no room in the economy. So you'd have to do some kind of aging thing like that.

When you look to select specific assumptions, you need to think of the purpose, and again, materiality, materiality, materiality. Consider plan-design changes, for example. If you're looking at retirement rates and there's a big jump at age 62, and the plan was just amended to put in unreduced early retirement at age 60 with a supplement, you might want to take that into account when you're setting your retirement assumption. That jump at 62 might now become a jump at age 60.

Again, don't give undue weight to past experience. That's kind of all we know for sure, but we need to look at all the other things that are going on with the client

and with the economy. You need to look at their reasonableness. You need to look at the decrement being measured, that the assumptions are not expected to produce significant gains and losses, and that they're individually reasonable.

Tuning into what Bart was talking about, you need to look at the effect on both liabilities and number count. You need to look at both of them. You know at the end of the day, a lot of the studies are going to be about numbers because that's what you can analyze. And as you apply turnover rates, you're going to be looking at the numbers. But at the end of the day, if you're off by 1 percent of your retirement rate at age 60 or 50 percent of your termination rate at age 20, it's the 1 percent at age 60 that's probably going to have more bang for your buck.

And at the end of the day, we're doing this to figure out things like pension expense and cost. We're doing this for liabilities, so you need to take both of those into account. You need to look and make sure that the curve is modeling what you need, but you need to focus especially on the places where you're going to be paying money. The idea is, if we're doing our job for the clients, they're going to be able to predict their costs somewhat from one year to the next. They need to predict their expenses, so we need to be able to help them do that.

Again, this is the lecture for being practical. We need to balance refining our methodology versus our cost. You can spend hours and hours and hours and hours developing really sophisticated assumptions, and they'll look really cool. But at the end of the day, if they don't make a whole lot of difference in cost, was it really worth it? It's a fun exercise, but you have to stay realistic with it.

We need to look at the combined effect of the assumptions, make sure that we're considering things consistently from one year to the next. For example, we're doing a valuation as of 1-1-2002, and now it's June. We know something happened in March, and we're setting the assumptions going forward, we'd probably want to reflect that now, going forward. And we can use the advice of other experts, such as topographers, economists, people like that.

You need to keep looking. Our friends in the public sector tend to be very disciplined about it. Most public plans have rules that every three years or every five years, a full experience study has to be done. With private plans, we tend not to be so religious about doing them. But at least as part of every year, you need to do some kind of experience analysis with your valuation. It's not just the liabilities that are cranked through your model. You need to look at it every year and make sure that you're not producing any kind of bad gains or losses. Or if you're doing small-plan work, look at the economy in general and look at some outside sources to help get some kind of a reality check on your numbers. The argument that you used these numbers last year just isn't going to cut it. This is especially important for things like mortality. We've always had this, you don't change mortality assumptions until you absolutely have to because you have this huge hit when you do.

But at the end of the day, over the last 10 years and even through the current mortality tables, we're still showing mortality improvement. So it's still increasing costs, and you need to be thinking about reflecting some kind of mortality improvement. It doesn't have to be the generational tables, but use even some kind of static improvement so that when you do change, it's not so much of a hit. The reason it's a hit is because you're going from '83 GAM to a 2000 rate. That's a hit, right? You need to reflect some kind of improvement along the way.

Just think about doing an experience study and what you can get out of it. You need to step back from the numbers and just ask, "Does this make sense?" Remember what you're trying to do here.