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## PENSION VALUATION METHODS AND ASSUMPTIONS

Moderator: *BARNET N. BERIN*. Panelists: *THOMAS P. CERNEKA*,  
*YELLOTT F. HARDCASTLE*, *ARVIN L. HEILMAN*, *HARRY S. PURNELL*

1. Assumptions used in generating Social Security benefits.
2. Smaller plans: How to handle actuarial assumptions, funding methods.
3. Early retirement assumptions and the funding of supplementary benefits.
4. Conservatism vs. realism and valuation assumptions.
5. Discussion of the paper, "Another Look at Group Pension Plan Gain and Loss", by Christopher C. Street.

MR. THOMAS CERNEKA: Retirement Income is generated from 2 principal sources - the Social Security program and private pension plans. In designing retirement plans for the private sector, we generally allow for the other source of income as well as the reduced needs of the retired employee. Recognition of the Social Security program is accomplished in a somewhat complex manner since the amount of Social Security retirement benefits varies as a percent of the retiree's final earnings. Recognition of Social Security benefits is attained through a coordination or integration approach and is generally accomplished in one of two manners. Under the first, benefits from the private plan are calculated as the sum of a percentage of salary up to a level related to the maximum taxable wage plus a higher percentage of salary in excess of that level. This type of formula is referred to as step-rate. Under the second approach, benefits are calculated as a percentage of salary less a percentage of the retiree's primary insurance amount. This approach is referred to as "offset".

This discussion treats the valuation problems involved in the latter type of plan, that is, the offset plan. We will not be concerned with step-rate plans nor with the problems involved in plan design, employee understanding, employee benefit statements or actual benefit calculations. We will concentrate only on offset type plans and, with respect to those plans, only on valuation problems, methods for solving those problems and the need for communicating the potential impact of our solution to our clients.

Prior to the 1972 amendments to the Social Security Act, which provided for indexing of taxable wages and benefit tables, it was a common practice not to project Social Security benefits beyond the law in effect for the pension plan year of valuation. A positive, or at least conservative, effect of this approach was that retirement plans generally experienced actuarial gains each time the Social Security Act was amended to improve benefits. On the other hand, the valuation results did not provide the plan sponsor with a reasonable measure of ultimate benefit costs.

With the advent of indexing provisions, coupled with tacit IRS acceptance of actuarial assumptions reflecting inflation and "single best estimate" requirements of ERISA, we generally adopted valuation methods for projecting Social Security benefits beyond the wage base and benefit table currently in effect in the valuation year. There are 3 basic methods in use for projection of Social Security benefits. The first is the wage base/CPI method, which projects the wage base at a given rate of increase per year and the CPI at a somewhat lesser rate in order to predict primary insurance amounts. The second is the replacement ratio (RR) method which calculates Primary Insurance Amounts as a percentage of salary at benefit determination date. For our purpose here, the replacement ratio is defined as the ratio of Primary Insurance Amount to salary at retirement. The third approach is a throwback to pre-1973 days in that it uses no projection whatsoever, but rather accepts the actuarial gains caused by wage base and CPI increases as they occur.

Recognition is generally given to the refinements required in the projection methods to accommodate disability retirement, early retirements, pre-retirement death and vested termination. Actuaries using the wage base/CPI method generally agree that the results of these projections become unreasonable for the younger classes of employees due to the cumulative results of indexing unless the assumptions used for the projection are modified to prevent such result or unless limitations are placed on the resulting Primary Insurance Amounts. Although there appears to be a general agreement that such modifications and limitations are appropriate, not all actuaries are applying these adjustments where the wage base/CPI method is used. Actuaries using replacement ratios generally operate under the philosophy that the Social Security Law will be revised to halt the increase in replacement ratios which results from the operation of the present law under current economic conditions. There are a variety of theories as to when the halt will occur with some actuaries assuming that present replacement ratios are the ultimate ratios and others assuming that replacement ratios will increase for a period of time in the future before reaching their ultimate level.

To illustrate the significance of the method chosen to solve the projection problem, I have prepared a brief table showing the funding requirements for two plans of benefits with three alternative Social Security projection methods and, for purposes of comparison, a similar plan without offset. The method applied was individual entry age normal cost and the funding objective includes normal cost plus a 30 year amortization of accrued liabilities.

The first plan has a benefit formula of  $1\frac{1}{2}\%$  of final average salary less  $1\frac{1}{2}\%$  of the primary insurance amount for each year of benefit service. The second plan uses 2% of final average salary rather than  $1\frac{1}{2}\%$  but is otherwise identical. There are no death or disability benefits nor subsidized early retirement benefits and the vesting provision grants 100% vesting after 10 years of vesting service.

We used a standard mortality table, moderate turnover, 6% interest, a 5% salary scale, and 6 sets of wage base/CPI assumptions. The wage base assumptions were 4% and 5% and the CPI assumptions were alternatively 1%, 2% and 3% below the wage base.

Ratios of Funding Requirements  
to Covered Payroll

	WAGE BASE/CPI METHOD						Replace- ment Ratio Method	No Projection	Ratio of High to Low	Similar Plan with no Offset
	<u>4%/1%</u>	<u>4%/2%</u>	<u>4%/3%</u>	<u>5%/2%</u>	<u>5%/3%</u>	<u>5%/4%</u>				
1-½% Final Average Salary - 1-½% of Primary Insurance Amount										
(a) No Assets	9.0%	8.3%	7.4%	8.2%	7.3%	<u>6.1%</u>	7.7%	<u>9.8%</u>	<u>161%</u>	12.5%
(b) Assets of 50% of the accrued liability under the replacement ratio method	7.4	6.7	5.7	6.6	5.7	<u>4.4</u>	6.1	<u>8.2</u>	<u>186%</u>	10.9
2% Final Average Salary - 1-½% of Primary Insurance Amount										
(a) No Assets	13.2	12.5	11.5	12.4	11.5	<u>10.2</u>	11.9	<u>14.0</u>	<u>137%</u>	16.7
(b) Assets of 50% of the accrued liability under the replace- ment ratio method	10.7	10.0	9.0	10.0	9.0	<u>7.8</u>	9.5	<u>11.5</u>	<u>147%</u>	14.3

- (1) Normal Cost plus 30 year amortization of Unfunded Accrued Liabilities
- (2) Group of Employees
  - (a) All Active
  - (b) Average Age =39, Average Past Service = 7, Average Salary = \$12,000.
- (3) Actuarial Method: Entry Age Normal Cost

We do not claim that any of these sets of assumptions are appropriate; however, the results should be illustrative. The group of employees valued has an average age of 39, average years of past service of 7, and average salary of \$12,000 per year.

The three projection methods include: first - the wage base/CPI method; second - a replacement ratio method under which the replacement ratio is a function of annual earnings in the valuation year and is determined by projecting those earnings and the social security act into the future at constant wage base and CPI changes which ultimately result in stable ratios. The ultimate ratio is then the replacement ratio; the third method assumes no projection and is technically a wage base/CPI method with 0% wage base - 0% CPI assumptions. The fourth set of figures illustrates comparable costs for similar plans without offset features.

If we ignore the "no-offset" plan and assume there are no assets, the results show that, for the  $1\frac{1}{2}\%$  -  $1\frac{1}{2}\%$  plan, the range in funding requirements is from 6.1% to 9.8% of payroll with a ratio of high to low of 1.61% and, for the 2% -  $1\frac{1}{2}\%$  plan, the range is from 10.2% to 14.0% with a ratio of high to low of 1.37%.

If the leveraging effect of assets is considered, the differences become greater. For example, if there are assets for each plan of benefits equal to 1/2 of the accrued liabilities developed under the replacement ratio method, then the range becomes 4.4% to 8.2% for the  $1\frac{1}{2}\%$  -  $1\frac{1}{2}\%$  plan with a high to low ratio of 1.86%, and 7.8% to 11.5% for the 2% -  $1\frac{1}{2}\%$  plan, with a high to low ratio of 1.47%.

We argue, therefore, that the assumptions and methods used to project Social Security benefits are quite significant and cannot be treated lightly.

One of two basic assumptions must be made before selecting a projection method. Either (a) the present Social Security Law will not change, or (b) the present Law will be modified to produce constant replacement ratios at some point in the future. While some of the scare stories that we read in the press would indicate that neither assumption is valid, as reasonable professionals we would have to agree that the Social Security System will remain intact in some form and our job is to select between (a) and (b). If we select (a) - that the law will not change, it is appropriate to use the wage base/CPI projection method without modification of limitation. If our assumption is (b), that the law will be modified to produce constant RR's, then we must either use a wage base/CPI method without modification and/or limitation or we must use a replacement ratio technique resulting in constant ratios at some point in the future.

Having selected a method or a set of assumptions to project Social Security, it is incumbent upon us to attempt to educate our clients as to the significance of our assumptions and methods. We must impress upon them the fact that the funding level stated in our valuation report depends on the course followed by the Social Security System and that they should be prepared to

accept changes in funding requirements which will result if the system is significantly revised. The client should also be made aware of whether we are attempting to anticipate changes in the system or whether we are assuming the System will remain as is. It is his company that is committed to pay the price of benefits and he has a right to be aware of our basic theory for this purpose.

The development of generation of funding requirements for offset type plans is, at best, complicated. We, as actuaries, have the responsibility to project benefits which will be paid under a given retirement plan upon the occurrence of events qualifying employees for benefits and must continue our efforts to refine our methods and increase our level of proficiency.

MR. GERALD RICH: How do you handle an employee whose salary is below the wage base now, but, through operation of the salary scale, will have a wage in excess of the maximum taxable wage base? Do you determine the replacement ratio as a percent of the maximum taxable wage base in the year of retirement?

MR. CERNEKA: That is basically correct. Using the projection method, we project what that maximum would be and then the ratios are developed from that. We then apply those ratios to this year's salary. This is one of a variety of approaches that could be used to get the same result.

MR. JEREMIAH MODEL: In setting up your wage base/CPI assumptions, would you consider taking into account whatever inflation assumption you have built into the salary scale?

MR. CERNEKA: The inflation assumption would be in all three: the salary scale, the wage base, and the CPI.

MR. MODEL: So you would set the wage base, CPI up in conjunction with the salary scale, not necessarily independent of it?

MR. CERNEKA: That is right. They should work together.

MR. BARNET N. BERIN: All three should be consistent, whether you want to call it inflation or consistency.

MR. DON GRUBBS: It appears we will know within the next six weeks, probably, what Congress is going to do in this session; and it would appear likely that they will replace or will stabilize the replacement ratios at 5 to 10% below where they are right now.

The Ways and Means Committee has reported a bill to the House floor, and the Senate Finance Committee has taken tentative action on a Social Security bill.

On the interrelation of the assumptions: the salary scale is composed of at least two elements. One, the increase in average wage and the other the increase in the individual's wage relative to the average. In making projections of social security, we can follow the precise route of projecting the taxable wage base. In doing so, we need to consider that present legislation apparently is going to make some ad hoc adjustments to the wage base quite apart from the automatic adjustments to it.

Another approach that some people have used is to assume that the average monthly wage itself is going up rather than merely projecting the taxable wage base. It may be a cruder, but might be a workable solution.

QUESTION: I see quite a few valuations which use the same scale for both salary projections and Canadian Social Security projections. Is this common in the United States, or do you not presume that your salary scale will be higher than your social security assumption - because of the promotional effect within the salary scale?

MR. CERNEKA: I cannot speak for the whole group, but the common approach would have a differential between the salary scale and the wage base projection for various reasons, including those which you mentioned.

MR. BERIN: Generally in the United States, the salary scale is greater than or equal to the taxable wage base rate of increment. And the taxable wage base assumption is greater than the CPI assumption.

MR. YELLOTT F. HARDCASTLE: In looking at the problems inherent in choosing actuarial assumptions and cost methods for small, defined benefit pension plans I will be focusing on pure pension plans using a deposit administration funding vehicle. These plans generally cover less than 50 lives and are funded through an insurance company. The problems, though, are a function of the size of the plan and would be encountered whether it were trusteed or insurance company funded.

Some of the main problems an actuary for a small defined benefit plan faces come from the client himself. This can probably best be demonstrated by a couple of horror stories. Unfortunately, these stories are true.

The first story involved a plan covering 80 employees. The benefit formula was 40% of final average earnings in excess of covered compensation, where covered compensation was defined at Normal Retirement Date for each employee. Out of the 80 employees, only three had, or would probably ever have, a benefit. Yes, the IRS did qualify this. To make matters worse, the other 77 employees were unable to set up an Individual Retirement Account because they were already covered under a qualified plan - with a zero benefit.

Small plans are often tailor-made for a few key individuals. This poses very specific problems in the choice of both of your cost method and your assumptions. Generally, your actuarial assumptions are made from a long-range point of view. You expect to fund the liability over a twenty-five to thirty year period, and that annuity that you are funding for will run out over 15 to 20 years after that. That may not be the case now. The key individuals, the decision makers around whom the benefit formula is designed, are generally older than the average attained age for the group as a whole. Since most of the liability rests with those few, current economic conditions should probably receive greater weight than for a larger group where the liability is spread more evenly. This impacts ever more directly on the actuarial cost method. There is little justification in amortizing the liability over thirty or forty years if most of it will come home over the next ten. This is especially true under a deposit administration setup where the annuities are purchase at retirement. Your aim now is to get money into the fund quickly to avoid a major fund strain problem.

From the IRS standpoint, there are very specific restrictions on the funding method when more than 50% of your liability rests on three people or less. Hence, the very nature of the beast calls for specialized treatment.

The other horror story came about during a telephone conversation with a client. After several questions that made very little sense to me, I was able to determine that his plan was defined contribution, not defined benefit. He had no idea what that meant.

My point is this . . . . The small client often has very little pension knowledge. He has little professional staff to help him. He probably does not have an accountant or tax lawyer on hand full time. Moreover, the dollars involved are too small for your company's field representative to spend much time with him. Hence, the client calls his friendly actuary whenever he has a question about his plan. Part of your thrust, then, must be to keep things simple, simple from the employer's point of view. This could imply the use of a cost method without supplemental liability, or perhaps using Unit Credit if the benefit formula were appropriate to that. Whatever you can do to cut down on the employer's questions, while keeping things appropriate to the situation, will be a help.

Simplicity plays an important role from another angle, that of expenses. The expense of running a pension plan will usually be a greater problem for a small plan than for a large one. A few hundred dollars more of your time could be very significant to a small firm with an annual contribution of \$20,000, where it would be a drop in the bucket to a firm contributing \$200,000 a year. The actuarial cost method you choose needs to reflect this. For instance, you might lean towards a method that automatically spreads gains and losses to cut down on the work you would have to do and charge your customer for.

Expense considerations will also have an effect on your approach to choosing assumptions. A full-blown analysis of experience rates can be expensive. It is probably a luxury that the plan cannot afford. On the other hand, you still have the responsibility to ensure that the plan be adequately funded. Since you often cannot afford to fine tune, you will probably be conservative.

The need for conservatism in assumptions arises from a number of other considerations as well. Small company profitability and cash flow are often at the mercy of the vagaries of the economy, which will drastically affect the client's ability to make a contribution. Pension plans for small firms are often installed during a growth cycle. Unless the plan design on the front end is very good (which is a rare occurrence), a leveling off in the economy or in that growth cycle can cause real problems. Even if money is no object, fine tuning your assumption package is somewhat illusory. ERISA states that the assumptions "in the aggregate, are reasonable (taking into account the experience of the plan and reasonable expectations) and . . . , in combination, offer the actuary's best estimate of anticipated experience under the plan". While you certainly must take prior experience into account in choosing your assumptions, the amount of credibility that you are going to attach to the experience of a twenty life case will not be high. Similarly, your estimate of anticipated experience is simply that it will fluctuate. The death of a highly paid individual or a large salary increase for one person can have a dramatic effect on the experience of a plan.

Acting on behalf of the plan participants, then, you might try to cushion the impact of the fluctuations by being conservative.

One alternative to using conservatism in assumptions is pooling. If you have a large enough block of cases you can pool the experience, thereby protecting the funds needed. With this mechanism available, you certainly are more free to follow the dictates of the specific case.

The actuarial cost method can also play a role in smoothing out the financial impact on the client. If a cost method is used that identifies a supplemental liability, the client can build his own cushion. By paying more than the minimum during the good years he can accumulate a credit balance, a surplus, in his Funding Standard Account, which will allow him to reduce payments during the lean years.

One of the key tools you have to work with in choosing the assumptions and the cost method is the census data each year. Since small plans seldom have professional staff, the actual work of the plan administrator is relegated to a clerk who has little appreciation for the ramifications of the job. On top of that, the turnover in the job is quite high. What sort of credibility can you attach to this data you receive then?

Because of the need for conservatism, because of the importance of expenses, because of the need for simplicity, you may wonder if you should end up with one set of assumptions for all small plans. Where the experience fund is invested only in the general portfolio of the insurance company (using an aggregate rate of return) and where all other experience is pooled, I can understand some degree of uniformity. However, pooling of other experience is seldom total. Moreover, the investment return from the general portfolio of many insurance companies is now calculated on a generation asset basis. Equity separate account participation has become more common, even for small plans.

In any event, none of the problems that you encounter due to the size of the case relieves you of your responsibility as outlined in the Guides to Professional Conduct and in ERISA. "Assumptions must be adequate and appropriate and . . . the methods employed . . . consistent with the sound principles established by precedents or common usage within the profession".

MR. RANDALL LUZADER: You made reference to your selection of the actuarial cost method. I have been questioned recently regarding the participation of the client in the selection of the cost method—within an acceptable range. Should or should not the client participate in something which affects where his dollars are in the operation of his company or in the plan?

MR. HARDCASTLE: I believe that the client should most definitely participate in it. But I also feel that if he wishes to choose one which I feel is inappropriate, then I reserve the right to say no.

MR. BERN: Most of the newly qualified plans in the United States in the last ten years have been small plans, with under 10 lives.

MR. ARVIN HEILMAN: Early retirement is or is fast becoming the norm in this country. This is especially true for major negotiated hourly plans and for

salaried employee plans of associated industry. The 1976 experience of two major auto companies in retirement from their U.A.W. pension plans is an example. In these two plans, 89% and 86%, respectively, of all non-disability retirees were under age 65. Furthermore, 29% and 22% respectively, were under age 55. Admittedly, these are, perhaps, extreme examples of the trend to "early" retirement since early retirement is greatly encouraged by the design of U.A.W. plans, as I will discuss later.

However, more general indicators of the trend may be culled from the 1977 Report on Mandatory Retirement by the Select Committee on Aging of the House of Representatives. In this report it was stated, ". . . there is already a strong trend toward early retirement. In fact, the trend seems to be toward earlier and earlier retirement. . .". The experience of the Social Security System was cited as a basis for this conclusion. For example, in 1962 over half the men awarded initial benefits have received reduced early retirement awards. In 1974, 72% of all new awards were reduced early retirement awards. The 1974 experience, by sex, was 67.3% males and 78.9% females. And the trend indicates that the percentage of early retirees in the total group receiving social security benefits is increasing by 2 to 3% per year.

Personally, this trend toward early retirement is somewhat frightening. It is by all means a trend which should receive significant provision in the financial projection of pension plans. To underestimate the trend in valuing either current or proposed plans which encourage early retirement is a disservice and not consistent with the requirements of ERISA. Early retirement provisions are being utilized by plan participants, and the financial implications of that trend should be realistically communicated.

To complicate the situation even further and make early retirement even more significant financially, many plans, and negotiated hourly plans in particular, are providing temporary supplements payable to age 62 or age 65 in addition to basic lifetime retirement benefits. As I am from Detroit, permit me again to use the U.A.W. pension plans as an example. Oversimplified, these plans provide retirees who have 30 or more years of service with a temporary supplemental allowance to age 62 which often equals or exceeds accrued basic lifetime benefits. For example, the average retiree with 30 years of credited service has accrued a basic lifetime monthly benefit of \$300. But, when combined with a temporary supplement, the total monthly benefit to age 62 is \$650. And from age 62 to 65 the total monthly benefit is \$400 including a reduced temporary supplemental allowance. On the other hand, retirees with less than 30 years of service receive a supplement only prior to age 62 which is equal to a flat dollar amount times service at retirement. The flat dollar amount grades from \$3.50 for retirement at age 55 to \$7.50 for retirement at age 60 or 61.

Obviously, the actual pattern of early retirement is crucial to the value of these supplemental allowances. To begin with, the supplements may only be paid for a short time. Therefore, even a one year difference in retirement age has a very significant impact. Further, the design of the plan provides significantly more encouragement for one group, those with 30 years of service, to retire early. Reflection of the assumed retirement pattern must be sophisticated to produce any significant degree of accuracy in the results.

In fact, whether supplemental allowances are involved or not, I believe we should be using tables of assumed retirement rates, which vary at least by age, as we now do in most cases for death, disability, and employee turnover. This can be done by applying the table directly to a projection of lives (i.e. cash flow valuations) or by developing commutation functions by use of a service table in the same manner as for death, disability, or vested termination probabilities.

Is this added complexity worth the effort? If you believe pre-retirement mortality, disability, and turnover tables are worth the effort, why not retirement? Certainly, in a pension plan with liberalized provisions, the financial impact of early retirement is at least as significant as pre-retirement mortality, and in many cases, at least as significant as disability and turnover. This is not to say that a well established and reasonably accurate assumption as to a simple assumed retirement age will always be extremely inaccurate. In fact, such an assumption works quite well for a plan which provides reasonably level benefit accruals for each year of service (i.e. no maximums on service) and where no temporary supplements are involved.

However, particularly in the case of temporary supplements, a single average retirement age assumption has significant problems. For example, if we employ a single retirement age assumption of age 62, we have no pre-age 62 supplemental benefit cost. If half of the valuation group actually retire before age 62 and half after age 62, the assumed average retirement age may be accurate. However, there is most certainly a pre-age 62 supplemental benefit cost which was not reflected by this seemingly accurate single age assumption.

Further, we can examine the major factors which influence the choice to retire or not retire early. I believe these factors are:

#### 1. Economics to the Individual

The adequacy of the retirement benefits from all sources combined to provide a reasonable standard of living after retirement is probably the most important factor. Also, economic conditions in general, such as level of inflation and unemployment, will have at least a temporary impact on the choice to retire early or not retire early.

Based on my own discussions with American workers, blue collar and clerical in particular, most seem generally convinced that their maximum life expectancy is to age 70. This is probably due, in part, to newspaper and magazine articles which cite age 70 as the average life expectancy in this country. Attempts at logic, to explain that this magic age of life expectancy is from birth and that it increases with survival to older ages, has been seemingly very hard for them to understand. I recently saw a letter from a reader to Time magazine demonstrating this attitude. This person was very upset with the attempt to change the age requirements for full benefits from the Social Security system to age 70 since this is the age to which most participants could expect to live. Therefore, the change would mean most would get nothing from Social Security! Obviously, with this somewhat fatalistic attitude, many employees will retire as early as possible if they feel that benefits will be financially adequate.

2. Sex

Other than the Social Security experience previously cited, I have not seen a formal study, but my own experience indicates that females are more likely than males to retire early. This is probably due to the fact that a married female's income is often a second income and the wife may wish to retire at the same time as her husband, who is normally older. For unmarried females, or those with established career responsibilities, experience would probably differ.

3. Social

Working conditions including the facilities, character of other workers, and the job itself have an important impact. If an employee is not happy with working conditions, he or she is inclined to retire as early as possible. Belief in the "work ethic" or social upbringing will also have an impact. Within broad job classifications, I believe these social factors are probably best identified by location either geographically or city/suburban/rural.

Given these many factors which influence early retirement, it would seem easier to reflect them selectively if a table of retirement probabilities at least by age, and possibly by other factors, were used as opposed to a single assumed retirement age. And if the level of plan benefits varies, which it almost certainly will for service and may by age or other factors, a select table of retirement probabilities has obvious advantages.

Of course, if the expedient of an average age is still overwhelming in a particular circumstance, some selectivity may easily be introduced by a test based on another factor. For example, the assumed age at retirement could be the earlier of age 60 and 30 years of service, age 62 and 10 years of service, or age 65. But in my opinion, a table of retirement probabilities is almost always the best approach.

The other part of my comments involves the funding of supplemental allowances. I have already discussed my opinion regarding the retirement age assumption to be used in the funding or "costing" of temporary supplemental allowances. I believe the considerations for adopting other actuarial assumptions should be generally the same as for the valuation of any pension plan benefit.

As for the selection of an actuarial method to value temporary supplemental allowances, my opinion relates to the fact that in most cases such benefits are paid for a few years at most. This is apparently becoming increasingly less true for the large auto plans but it remains my own experience with several U.A.W. and other union negotiated plans. Another important factor is that in many plans who have had such supplemental benefits for a while, there is a large group of retirees currently receiving such benefits. And for plans now adopting temporary supplemental benefit provisions, for the first time, there probably will be a sizeable number of participants who will be encouraged to retire in the near future.

It, therefore, seems somewhat naive to me that the actuarial funding method adopted for supplemental allowances would include the establishment of a "past service" or supplemental liability with funding over thirty or forty years. Thirty or forty years is long after most current participants and

retirees will have ceased to receive temporary supplemental benefits.

Personally, I favor the use of an attained age actuarial method for such supplements which does not establish a "past service" or supplemental liability at least for active participants. In fact, by use of an aggregate method, the liability for current retirees can be spread over the average future working lifetime of the active group which is in my opinion a more reasonable period than thirty or forty years.

In practice, most U.A.W. pension agreements require "pay-as-you-go" funding of temporary supplemental benefits as a minimum. I realize that a change to another method such as I have described could significantly increase pension plan funding requirements although for some, due to the large numbers currently receiving benefits, this would not be true. However, I also believe that use of a pre-funded or level cost method provides a more reasonable reflection of the "true cost" of these benefits. And I have already stated that significant understatement of "true cost" is inconsistent with ERISA, and I believe, it is a disservice. And this is especially true in providing financial guidance as to whether a benefit provision should or should not be adopted.

MR. HAROLD BROWNLEE: Is one of the reasons some people retire early the opportunity to receive retirement benefits and get a job somewhere else?

MR. HEILMAN: Theoretically, technically, the plans require you not to work. You do not get the supplemental allowance if you work elsewhere.

MR. BROWNLEE: How do you enforce that?

MR. HEILMAN: In practice, you cannot police that provision.

MR. BROWNLEE: So, that would be a strong incentive to retire early.

MR. RICHARD DASKAIS: With respect to using early retirement rates versus a single assumed retirement age, I think you can solve the problem fairly easily even if your programs do not permit the use of retirement rates, if you use two retirement ages. One would be representative of the age at which employees are expected to retire and not receive a supplemental allowance - typically 62 or perhaps 63; and the other might be the earlier of 30 years of service or age 62. Then weight the results. You can very closely approximate the results that you would get by using a rather complex set of retirement rates.

With respect to the cost method of a supplement, I believe the speaker of course was talking about the auto plans. Once the funding provisions of ERISA are effective, I presume there will no longer be any pay-as-you-go funding of supplemental allowances.

MR. HEILMAN: I am not sure that is necessarily true. I have asked the IRS, and I know of others who have asked the IRS, and they have not made a determination that supplemental allowances need to be pre-funded.

My opinion and the opinion of most actuaries is that they in fact must be pre-funded.

MR. BERIN: I have seen some plans where actuaries use a different normal retirement age, at least in theory, for every single participant. In other words, you set up an elaborate series of rules, then you use the rates appropriate for the normal retirement age, as generated by the rule for each individual participant.

MR. JOSEPH SAPORA: One of my clients has been concerned with the eventuality of the mandatory retirement age being raised. What effect, if any, do you think this will have on your early retirement trend?

MR. HEILMAN: Obviously, if everyone is now retiring early, in pension plans, it will not change significantly. Labor unions keep requiring earlier and earlier retirement with more supplements. Mandatory retirement might have absolutely no impact at all.

MR. BERIN: The steel plans commonly do not have any retirement age. For an employee working in a foundry or on a drill press, if work becomes too difficult for him, he has the right to move into another job. Yet, something like 90% to 95% of the steel union retirements occur before age 65.

MR. SAPORA: I can perfectly understand how that may be true in the industrial or union type plan. Would you extend that feeling also to the white collar worker plan?

MR. BERIN: I think it is too early to know. The Opinion Research Center runs a regular survey of work attitudes. They have been surprised to find out that white collar workers do not seem to like their jobs as much as they used to. It is something most of us have observed. At the first available moment, they go out, depending on benefit adequacy. I think the real problem is timing and what they are going to do after retirement, rather than the exact age.

MR. PETER GOODSELL: Are the U.A.W. plans contributory?

MR. HEILMAN: No, they are not.

MR. GOODSELL: New York City municipal employees contribute 10% or 12% of their income to their retirement plan. Perhaps the extent to which people retire under a plan like that would depend on how much they have put into the system.

MR. JONATHAN SCHWARTZ: As some of you may know, the city of New York has a very wide range of plans which range from a non-contributory plan for workers before July 1976 to plans which do indeed have contribution rates in the range of 10% or 12%.

However, the 20 year and out plans, which I assume are the plans that are most germane to our discussion, tend to have member rates of contribution that range anywhere from 3 to 6% of payroll depending upon the age of entry.

We notice very different patterns of retirement between our police and firemen even though they both have 20 year and out plans. The policemen are much more prone to retire soon after completing 20 years than the firemen are. The reason appears to be that there has sprung up in the private

sector a multitude of security related occupations for which 20 years of police service is superb training.

Unfortunately, a fireman really has not been trained in anything but putting our fires and there is nothing in the private sector to which that is applicable.

MR. DONALD SEGAL: There are still some plans around which provide for actuarial equivalents upon early retirement. Would you still recommend having early retirement probabilities among those plans, especially where the introduction of such probability would produce lower costs?

MR. HEILMAN: If you have a system that can readily use the introduction of retirement rates, yes. Because even if it has very little impact on the cost, it is going to give you a by-product - namely, the incidence of retirement. As long as you have the system there, you might as well use it.

MR. CHARLES SCHALLER-KELLY: Should you fund the kind of benefit which, in the U.A.W. plans, is called special retirement and, in steel worker plans, the 75 or 80 type retirement? (i.e., Retirement which is either because the company wants to get rid of the individual, because the individual wishes to retire early and the company concurs, or because a plant is closed down.) The most typical case is the plant closing or the massive layoff situation. Do you, or should you, allow for any of these? Or do you think one should take the actuarial losses as they arise, since they are really not predictable from the past experience.

MR. HEILMAN: Since I value U.A.W. plans, let me discuss them. With respect to a U.A.W. plan, what is being described is a company option type of retirement benefit. That is, if the company agrees, the individual gets double the basic benefit until age 62.

There are really two reasons that benefit is given. One is that the company wants to get rid of the individual. The other is because the company has shut down a large plant and wants to soften the impact.

Regarding plant shutdowns and terminations, I do not think you can make any predictions with any kind of degree of accuracy of the timing or frequency of such happenings.

As for company option retirement, I think there is a pattern there. If you look at it, you can establish rates for it - but for plant termination, no.

MR. BERIN: While I agree with Mr. Heilman, I would just add two points. One is that, basically, we are assuming a going concern when we do pension valuations. Some of the situations, but not all, are obviously not going concerns. Second, the IRS takes a dim view of contingency reserves. They simply do not permit them.

MR. BROWNLEE: You have really been talking about single employer or corporate plans. Where such losses occur, you have an employer that has closed down a plant. There is an employer who is responsible for the financial losses. You have to take an entirely different approach, of course, where you have a labor/management plan which is covered by so many cents per hour.

There you may have to be more conservative to take account of the fact that plants may close or people may retire earlier than you thought, because you have no way to go back for more money.

You just have to take into consideration that you are limited as to what would happen if you had unexpected actuarial losses. You might have to shut down the plant. That is not a very good idea from the worker's point of view.

MR. HEILMAN: If you had a large termination, in the cents per hour type plan, then are not all bets off at that point? You have established these benefits assuming on-going contributions. I would think everything has changed at that point.

MR. BROWNLEE: That is one of the things under ERISA that you do not quite know yet because there is no regulation on the definition of multi-employer plan that says which benefit you can take away if an employer leaves. Many plans in the past would only give the employees of any employer who left that which had been paid for by his contributions. Now you are still up in the air because you may have to give them something substantially in excess of that until the question is resolved.

MR. ROBERT KRYVICKY: I would like to point out something that may be a misconception here. Although we are having fantastic utilization of the supplementary benefit at the auto plants and some of the larger suppliers, I think it may be a misconception for people here to believe that it is utilized to such a great extent in some of the smaller plants. We are finding that the extent of utilization is really dependent upon the type of job that people do. If the jobs are easier, the people do not retire as early.

MR. HARRY PURNELL: The battleground of the conflict over conservatism versus realism is almost always the investment return assumption with the salary increase assumption usually tagged on by the more knowledgeable. For that reason, this discussion will focus on these two assumptions and we can safely leave the remainder to a different forum.

Before we dismiss the others, however, I would like to comment on the concept of "the assumptions in the aggregate". This concept is not new but has been given added prominence by its inclusion in the Enrolled Actuary's Statement mandated by ERISA. In certain circumstances it may be necessary for the actuary to simplify or even omit certain assumptions - sometimes balancing off assumption A against assumption B. In such situations the actuary should have little difficulty explaining the reasons for his choices. What concerns me is the tendency of some pension actuaries to wrap a blanket of professional mystery around the choice of actuarial assumptions. We, as a profession, lose credibility because of those who say "Trust me. I know the assumptions do not seem to make sense to you but I, because of my experience and training, am certain that they are proper for your plan." Rarely is there any attempt to explain why the actuary deemed them proper - because that explanation must be made one assumption at a time rather than "in the aggregate."

In an age of increasingly sophisticated plan sponsors and such interested parties as corporate auditors, government regulatory bodies, not to mention

the plan participants themselves, we must not try to persuade through obfuscation. An actuary must be prepared to explain the reasons for each of his choices. Logically, if these reasons are to be acceptable they must be understandable and credible. Does not this imply realism? Unfortunately, this is where we confront the critical problem - definition. I will present a few definitions of realism. No actuary claims "absolute realism" - the foreknowledge of the economic events of the future. On the contrary, the professional actuary's training and experience almost always leads him to a clear understanding and appreciation of the uncertainties of the future. We are struck with Bernard Baruch's certainty - "It will fluctuate."

Another view of realism is what I will call "current realism." By this I mean the extrapolation of recent trends. There seems to be general acceptance from most non-actuaries that actuarial assumptions established in this manner are realistic. Indeed, this has been the accepted manner by which actuaries have traditionally established and justified changes in, for example, the mortality assumption. There are a number of strong attractions to establishing investment return and salary increase assumptions on this basis. First of all, we are naturally better able to relate to assumptions which correspond to our most recent experiences. It may not be easy to recall inflation rates of 2% or so. Yet, if we examine the 55-year period between 1921 and the end of 1975, we find the average annual rate of growth in the CPI Index is less than 2%. This same result, under 2%, is obtained in the 20-year period through 1967. Is everyone aware that our economy has often experienced temporary inflationary bulges? As an example, the CPI advanced at a higher rate in the decade ending in 1950 than in the one ending in 1975. Yet, in between was a fifteen-year period of very low inflation which economists look back on nostalgically. I am not at all suggesting that we should ignore the high inflation levels of the past decade - but we must face the question "Are we now at a permanently high level?" We often deal with corporate financial officers who are currently placing long-term debt at interest rates of  $8\frac{1}{2}$  or 9%. Their perception of a realistic long-term interest rate is very likely  $8\frac{1}{2}$  or 9%. Yet, in my experience, they will understand the prudence of employing a lower investment return assumption in their pension plan. They are well aware that recent rates are at the high end of their historical range. That is why they are careful to place call provisions into their debt instruments which protect their companies against declining interest rates. Their perception can also be modified by the possibility that reinvestment of the coupons in later years may be at lower interest rates.

What we are left with, if we reject absolute realism as impossible and current realism as misleading, is a historical perspective of realism. We have to constantly keep in mind the long 30, 40, or 50-year time span with which we are dealing and temper the impulse to let recent events overwhelm our knowledge of broad economic history. We must be aware of the consequences of both over-optimistic and over-conservative assumptions. This will lead us to the choice of assumptions that we are comfortable with and that we can explain clearly.

We have to be conscious of the need for a larger degree of conservatism under certain circumstances. For instance, in flat benefit plans which are not a function of salary the actuary would be subjecting the plan to more risk by including a large inflation component in the investment return

assumption than he would by using that same inflation recognition in a plan where benefits relate to final pay. The risk in both cases is a decline in inflation which would dictate a change in the inflation recognition in the actuarial assumptions. The result would be higher plan contributions in both cases but the flat benefit plan would be harder hit since there would be no salary increase assumption present to help cushion the financial impact. This illustrates just one of countless reasons why the pension actuary may conclude that more or less conservatism is warranted in a particular circumstance.

In thinking about the investment return assumption in pension plans, history has shaped our views in a powerful way.

Pension plan growth accelerated after World War II and the number of pension actuaries increased geometrically. Contemporaneously, this 30-year period has also seen the unusual situation of rising fixed-income interest rates - with some fluctuations, but almost without pause in the underlying trend. As a result, virtually all pension actuaries have had their entire professional experience in an unusual period of increasing interest rates. We have often used increases in the investment return assumption to help defray the cost of plan improvements. But, we have never had to face the consequences of persistent lowering of the investment return assumption. If the day comes when the interest rate trend reverses direction, we will encounter a new professional experience; what our life insurance brothers call reserve strengthening - also known as future shock.

This brings us back to the focus of our thinking in establishing pension plan assumptions - to prevent a flagrant maldistribution of cost. We know the identity of the parties-at-risk if the choice of assumptions produces such a distortion: the participants, and they can be hurt by over-conservative as well as overly optimistic assumptions, the plan sponsor, the stockholders of the corporate sponsor, the taxpayers who ultimately must support public plans, the PBGC and, not incidentally, the plan actuary himself.

It is often said that the consequences of erring toward conservative assumptions are less unpleasant than the alternative. ERISA has reinforced this dictum. Let us weigh the consequences to all concerned, develop assumptions we are comfortable with, and be ready to explain them convincingly.

MR. THEODORE KOWALCHEK: ERISA would indicate that an actuary is supposed to use his best estimate and is not to incorporate any conservatism at all into his assumptions. However, of course, actuaries might disagree, sometimes by a wide margin, as to what might be their best estimate. Actuary "A", for example, might wear rose colored glasses and feel that a 7 or 8% interest rate is appropriate for a given plan, whereas Actuary "B" might feel something like 5 or 6% is appropriate. Actuary "A" of course would consider Actuary "B" to be unduly conservative.

What do other actuaries feel is an appropriate spread between the interest rate assumption and the salary scale?

My feeling is that the real rate of investment return is around 3%. If you use a 6% or 7% return, you have introduced an inflationary factor.

What is an appropriate salary scale assuming benefits are related to salary? I tend to feel we might have a 2 or 3% inflationary factor and we might have about a 1% or so productivity increase-merit increase in salary scale. I feel that, in general, a difference between interest rate and salary scale of 1 or 2% is appropriate.

MR. PURNELL: There certainly is a wide practice in that regard. There are elaborate justifications along the lines that you suggest as to how one can determine appropriate relationships between the various assumptions that do, or at least, theoretically interrelate. It is interesting that this relationship of adding a constant for inflation seems to be generally accepted. Yet, we did not see that happen in the last ten years during which we have had much higher inflation and which has been recognized to a greater extent in the cost of living and in the salary factors than in the investment return.

I think it is true of my experience that there are very few plans that I am associated with which, if you looked at their investment return of the last 7 or 8 years, have earned the rate of return on a cumulative basis that I am assuming right now. You must take that into account.

MR. BERIN: I would like to respond to what I detected were three issues in the last discussion. The first is the question of best estimate and conservatism. Clearly, ERISA does not say you should be conservative, but rather, lays out an intelligent system on how to define best estimate. It puts the burden where it belongs, right on the actuary. So I find no problem with the absence of the word conservatism or the fact that the actuary chooses to take a particular philosophic approach.

The second point is interesting, but incomplete as stated. Actuary "A" is valuing a pension plan. Actuary "B", called in to audit the procedures of the pension plan, values the pension plan again under a different set of assumptions. The two assumptions are clearly different. The two cost ranges are clearly different. The client says, who am I to believe? How is the actuary supposed to respond?

I think the answer is maybe neither one of them is right. Or maybe one is a little better than the other. Only the emerging experience of the case will decide. The responsibility again is on the actuary to point out to the client that we are not soothsayers; we move slowly, forward in time, one year at a time. We analyze our experience. We make observations; and periodically, all of us change our actuarial assumptions. So it is the actual experience of the case that is going to shape the cost.

The third point, I would point out to the audience is controversial, to say the least. There is a theory that there is an underlying interest return of 3% which varies with inflation and with risk for equities and fixed income investments. The only problem is that it has been thoroughly refuted by economists for about 40 years. A revisionist school has introduced it again within the last 10 years and some actuaries have been taken with the theory.

The problem with the theory is that there does not appear to be any formal or informal substantiation of the underlying 3% rate.

When we attempted some research, we found out that in England this kind of research has been done, which has been picked up in this country. It was done by *Economica* in England and Forbe's here. There is no 3% underlying interest rate. There is a lot of stability, a lot of blips, but there is no 3% underlying interest rate. I simply point out, if you are taken with the theory that the interest rate is divisible into three parts, please realize that it is a theory, and that it is not the prevailing theory in economics.

Interestingly enough, you can test the theory, over time, to see if it has some validity. This year, last year and the year before, it did not work at all.

MR. WILLIAM RUDD - Pension Commission of Ontario: Years ago in the life insurance industry we watched with horror while our portfolio average interest rates were falling, falling, falling and we were strengthening reserves. Now my part-time avocation is regulation of pension plans and dealing with actuaries who are being "realistic" in pension assumptions. The latest one we had was somebody who was keeping a margin half of 1% in earned interest return but 3 or 4% in his salary scale.

The technique that I find is simply not used to any significant degree by the consulting profession but which is used to a very great degree by the life insurance company in setting annuity premiums is that of select and ultimate rates. It does not appear in pension funding. It has always puzzled me as to why this very valid method of recognizing both the current situation as well as the very great uncertainties of the future has not been brought into pension funding techniques. The only place that we do see much of it in Canada is in the Canada Pension Plan ceiling and the integration plans which has a scheduled increase for some years before it is allowed then to revert to the salary scale assumption. One place it is used is to reduce cost rather than inject an element of conservatism.

MR. PURNELL: I think we rationalize the use of a type of middle ground interest assumption on the basis that it does precisely what Mr. Rudd proposed. We recognize that if we are assuming say  $5\frac{1}{2}\%$  interest, that one can currently earn a higher return than that on fixed income securities. But at the same time, the uncertainties of the future, when melded together with current high yields, brings us to the  $5\frac{1}{2}\%$  or 6% return that we may be using today. Again, it is an elaborate rationale, but I think that would be my judgement as to what is being done in practice. It is not necessarily contradictory to your suggestion.

MR. BERIN: I cannot speak for the Canadian practice, but I can for the United States practice. There are people who use select and ultimate rates. But I do not think that is the end of the process. There are people who make elaborate experience studies periodically. I do not think that is the end of the process. I think the process is an annual measuring of departures from what you assume to find out if, in fact, the select/ultimate is working for you. Is it really depicting the experience that emerges?

MR. CHRISTOPHER STREET (Author of Another Look at Group Pension Gain and Loss): This paper is an attempt to develop a more generalized notation for pension gain and loss than has appeared in the literature. Arthur Anderson, in his paper "A New Look at Gain and Loss Analysis," has already succeeded in reducing gain and loss analysis to a problem in algebra, expressing the

gain/loss in terms of commutation functions. However, Mr. Anderson's approach is limited by the very rigid conditions he imposed (i.e. a simplified plan with no incidental benefits). In addition, it is this author's feeling that not many actuaries could take the time to apply this very painstaking process to an actual case. This paper is an attempt to develop a generalized notation which permits a rigorous development of the formulae from the initial definition of the gain but which can also be applied to virtually all insured and trustee plans, regardless of what assumptions are made or what closed group cost method is used.

This paper makes use of set notation to define the status groups over which summations are to be made. Transitional sets define those who change status during the period. Set notation permits the formulae to be used for any type of covered group. For example, the retired life group for an insured plan where benefits are purchased at retirement would be an empty set, and could then be omitted under the summation signs.

The core of gain and loss analysis is the development of recursion relations connecting beginning and end of year assets, liabilities and statuses. Part of the change in the unfunded liability or normal cost is "expected". By comparing the expected change with the actual change we are able to determine the gains by source.

The covered group will change because of new entrants and new terminations. The recursion relations connecting beginning and end of year assets and liabilities may be simply described. The connecting link for assets is the net cash flow plus investment results. The connecting link for liabilities is the normal cost, required interest, the net expected release less drop-out, and changes in liability due to actual benefits differing from the multiplicity of benefits, status groups, and expected decrements. A notation which permits this diversity to be handled economically is essential. Otherwise, the algebra gets out of hand. The notation, however, must be flexible enough, once the essential formulae have been developed, to permit a detailed analysis which recognizes the particular cost method, plan benefits and assumptions. If my paper makes a contribution to gain and loss analysis, I believe it is in the development of such a notation.

In valuing pension plan assets and liabilities, we make certain assumptions about future events and then compare what has actually happened during the time period to be analyzed with what we expected to happen. The effect of any difference on future cash flow is discounted to the valuation date to give the gain or loss. An essential part of this procedure is to compare the expected accrued liability for each covered life at the end of the period with the actual accrued liability. The accrued liability for each life is the present value of total benefits less the present value of future normal costs where the normal cost rate for aggregate methods is the aggregate rate, not the individual rate. This definition is admittedly artificial for aggregate methods, but it leads to the correct result in total. To preserve the independence of aggregate gains, it is logical to use the rate at the beginning of the period. This is the prevailing practice. Use of the rate at the end of the period leads to a different definition of the spread factor, as Mr. Anderson has shown.

At about the time this paper was completed, Josiah Lynch's "A Practical

Approach to Gain Analysis" appeared. He departs from the traditional approach which defines gains and losses by comparison of actual and expected values, and so he has coined a variety of new functions which appear for the first time in the literature. Consequently, I have included an appendix in my paper which shows how his functions may be translated into their more familiar form. Using this appendix, it is not difficult to prove the equivalence of the formulae in the two papers.

I certainly do not believe that the last word has been said on the subject of gain and loss, and look forward to other papers in the future. Gains and losses have been measured in the past by differences between the actual and the expected unfunded accrued liability or normal cost rate. Other measures may be more appropriate for methods not covered in my paper, in particular where assumptions are made about future new entrants to the plan. Gains and losses for multi-employer plans, where future contributions are assumed to continue at the current level, might be measured by the difference between the actual and the expected remaining amortization periods.

MR. BERIN: I would like to comment on the reference to the multi-employer plan and the effect on the amortization period of gains and losses. We have been handling a rather large multi-employer for the last two years in the following manner which is, coincidentally, close to the concept that Chris just expounded as a possibility.

We set up a table consisting of four steps. The first step is the estimated contributions. The second step is the estimated administrative expenses. The third step is the costs from a section that follows in the reports. There are four costs in step three: the maximum amortization, a 30 year amortization, a 40 year amortization, and the minimum per ERISA funding standard account. Step four is a test criterion which is item one minus item two, minus 3a, 3b, 3c, 3d. For those who can follow all of this in their head, you get a series of negatives. Then, when they break positive, you have reached a safe state, so to speak. The period of amortization corresponding to the safe state is one that you can watch from one valuation report to another to note if it goes down or stays about the same.

MR. DAVID KASS: As Mr. Purnell was speaking, my mind wandered off into that love bit in Dostoevsky's *Brothers Karamazov*, where a lovely woman explained how she loved humanity in general, but as to when it came to loving them individually and nursing their stinking sores, she just could not quite carry it through. I mention that because I loved Mr. Purnell's general endorsement of many things that I go along with. But then when we got down to some of the detail work, I felt I parted company. I felt that he implied that being realistic meant being non-conservative. Now you can call an actuary many dirty words. Calling him non-conservative is probably the worst. Calling him non-realistic, however, is right in there fighting.

For my part, I would like to feel that one could be realistic and can also be conservative. Yet I feel the burden of your remarks is that they were somehow contradictory. Somehow having low salary scales was being conservative because I gather if you have high salary scales, somehow you are forced to have unmaintainably high interest assumptions or else the costs will look a bit awkward.

I think all of us in that context might be of greater service to our clients, for example, in the heading of salary scales if we could hire out to them, as personnel directors and could give them some assurance that the salary scales we are suggesting we use in the valuations would in fact be utilized in that corporation for the next five years.

This is one way of saying that realism does not mean going one-for-one in step with the interest rate with an equal step on the salary scale. It may very well be that to be realistic, we have to jump up several steps (at the same time) in the salary scale because of our view of realism and seeing what interest returns have in fact been.

I wonder whether we are in agreement or disagreement here?

MR. PURNELL: I think we are basically in agreement. I do not want to cast any aspersions on the term realism. I think realism is really what we should strive for. But the definition of it and how we get there is where we have to be careful. I think your very suggestion, in the way you presented it, indicates you have thought about it and thought about it considerably. That is basically the message. I do not think you have ever encountered difficulty explaining the reason for your choices of assumptions.

MR. BERIN: Let me strike a blow against realism because I think the problem is the word. I think we should never forget what it is about. We are projecting costs far into the future. Take the interest rate, for example. If you look at the historical returns of most pension funds in the United States over the last 30 years measured from plan inception at the end of one year to the end of two years, the end of 5 years, to the end of 20 years, the end of 30 years and you plot it, you get a very interesting curve because of the use of market value.

While they do fluctuate widely, the returns do give you an interesting graph. You can plot the valuation rate against it. What you find is that pension plans in the country have not earned the valuation rates that we are assuming today. Now that should give you a moment to pause. Yet, I think the valuation rates, by and large, are between 5½% and 6¼%. And I think that is about right where they should be.

The problem is that, to a mild extent, actuaries are saying the future is going to be different than the past. If you are using very high interest rates and combining it appropriately with other assumptions, you are saying the future is going to be a lot different than the past. Either school is right, but we each have the obligation to monitor the experience and make periodic changes in the assumptions.

MR. DAVID BELLWICK: We consulting actuaries have to deal with businessmen who have to make decisions every day about how to run their businesses; inventory levels, payroll problems, expansion, etc. Many of these businessmen can afford conservatism when they are running their businesses and some of them cannot. I really do not think it is appropriate for us, consulting actuaries, to impose conservatism on them when they really cannot afford it and are not using it in the other areas of their business.

MR. PURNELL: Do you think it would be appropriate for a consulting actuary

to advise a businessman that he may be taking on more than he can adequately finance, if that indeed is the fact?

MR. BELLWICK: Yes, absolutely. I would like to suggest that maybe we have two services to perform for our clients; one, as enrolled actuaries, we have to give them the Schedule B costs. I do not have any problem on a realistic basis even though I feel there is some need for conservatism in the funding of the program.

The second part is in the funding of the program where you should tell the client, that perhaps we should have a little bit of conservatism and 40-year funding is not appropriate. This gives the client the added advantage of having some credits in his Schedule B funding standard account which he can carry over, allows him some flexibility in future years and gives him a little bit more lee-way in running his business. We actuaries are supposed to be acting on behalf of the plan participants. In a way, we may be allowing this client to cut back a little bit on his contributions in one year, but I think the important part of funding is that the plan sponsor's business be strong and we should allow him to make the business decisions he need to make in keeping that business strong. I think we should give him as much flexibility as we possibly can, within the guidelines of ERISA, of course.

MR. JOSEPH MOSKOWITZ: In Mr. Purnell's example, about the flat dollar benefit plan, I believe that he recommended that a lower interest assumption be used for that plan than for a final salary plan. I just wonder how you explain that to a sponsor who has both; the salary and hourly type plan especially if there is a union involved. Saying that your best estimate is higher means you expect to have better results in your salary plan than your hourly plan.

MR. PURNELL: First of all, I was not necessarily suggesting that you employ the lower assumption, but that you recognize the different risk involved in the assumptions. You might very well conclude that you want to use a different assumption. I think you have to explain it in that context. You do not have the same type of cushion available where there is no salary increase assumption present in the flat benefit plan.

I do not think that is so obscure a point that your client could not understand it.

MR. MOSKOWITZ: I wonder if the Union would understand that. That is a more important concern of mine.

MR. BERIN: I think many times these funds are invested differently. Many Union plans are insured plans. The distinction between the salaried benefit formula and the hourly benefit formula made sense 20 or 30 years ago; it no longer makes sense. The two are coming together. Clearly, if they are invested together in the same pool, with the same asset mix, you would be hard pressed to explain a difference in the assumed valuation interest rate.

I agree with Mr. Purnell. We should never forget that there are actuarial assumptions that we never attack: the survival of a company, the permanency of tax rules, the permanency of accounting practice and that the benefit

formula really is invariable over time. We could write the benefit formula in our equations - Capital B, sub t, with good conscience, because they change every 3 to 5 years.

I think what Harry is saying, in an hourly plan it is very clear that the benefit is a step rate over time.

MR. ROBERT STEINER: I agree with Mr. Purnell, that if you go back more than 10 or 15 years, certainly you can justify using a small amount of inflation. If I understand the academy opinion which came out a while ago, if you are using an implicit recognition of inflation or if you are not recognizing it at all, you are supposed to give a number of explanations in your reports. This can lead to quite a few difficulties in explaining things to clients. They think you are doing something which is against your professional requirements.

MR. PURNELL: I structured my discussion to omit the terms explicit and implicit and also best estimate. It is really unavoidable to discuss them. I was not suggesting at all that you should not have an explicit inflation assumption. There is nothing wrong with an explicit assumption of 7% inflation.

In a very real sense that is not an issue. You always have an explicit inflation assumption. Or you can always construe your assumptions to implicitly have that explicit.

MR. BERIN: I would like to suggest that Explicit vs. Implicit is not all that uniformly adopted or agreed upon. If explicit means every item that could significantly effect the cost must be explained, I do not have any problem. I think it is correct. But if explicit means that I should make a specific assumption as to inflation, I have quite a few problems. Because I am projecting costs 30 or 40 years into the future, if I project a rather high rate of inflation, this whole nation will be changed: high rates of inflation (higher than investment returns) will wreck economics, cause ERISA to go bankrupt. I am comfortable if explicit means explaining your assumption carefully and accurately to the client. If it means that we have to impose an inflation assumption, I find it uncomfortable.

MR. JOHN MAYNARD: A previous speaker asked if it was common practice in making assumptions for valuation of pension plans to use any difference between the assumed rate of interest and the rate of salary increase. I think that a tabulation of assumptions used in the United States would be particularly interesting. Has this been done/

MR. BERIN: Stability of the difference in interest rate and the salary scale is something that some actuaries believe in and some actuaries have trouble with. The concept is clear if you make an array and vary your interest rate and your salary scale and examine constant differences between the interest rate and the salary scale. They do not produce constant costs. They produce costs which decrease as the interest rate increases, because the salary scale stops at normal retirement age and the interest rate continues into post-retirement years.

If you introduce a post-retirement cost of living increase approximately

equal to the salary scale, then you get the stability that would make the examination of a constant difference worthwhile. Otherwise, the constant difference in costs produces cost decreases as the interest rate rises.

There are two schools of thought. The first school of thought says the theory is that if you are using a 7% interest rate and a 5% salary scale, you are going to produce the cost of a plan with a great deal of comfort because the important thing is that differential of 2%. You could be using 7% and 5%, or 8% and 6%, but it is the differential that is important.

The other school of thought says not really so, because you take a complicated plan, one with a percentage of final pay that will be improved over time and with a social security offset, determined independently, but consistently with it, you are going to get a scattering of results. Each of the basic assumptions, interest and salary scale, will have experience differences, in any year and over time, which need not be related.

I think, in summation, the jury is out. There are some people who are comfortable with the difference in rate as stabilizing the cost of the plan. Some people feel the concept is not all that tenable.

MR. MAYNARD: I hope we are not getting carried away with the technicalities of the situation. Frankly, I find the word conservatism in the discussion notes a little bit misleading. It seems to me that in any period of inflation, any attempt at conservatism is likely to get swept away in the need for increases in benefits.

Just to pull a thought out of another context, I was talking to a European actuary last year. They have had much higher rates of inflation than we have had on this continent. He cited instances of companies with final salary type plans that were putting in between 30 and 40% of payroll just to keep up to date because they had fallen behind in their funding.

MR. BERIN: Currently, they are going back to pay-as-you-go. Not going back, but dropping down to pay-as-you-go, because they could not support the intolerable level of contributions. I think in the United States, we are obviously blessed. Our period of double digit inflation was brief. We had severe inflation. Most of the pension actuaries in the United States are well aware that the benefit formula is variable over time and try to build some conservatism into the valuation process. I am personally not uncomfortable with the word 'conservative'.

