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Research and the Pension Actuary: Prospecting for Gold

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Summary: How do the new turnover tables compare to the ones you're using? Are you up-to-date? Come hear about the hottest new data since the Eisenhower era. Can actuaries build a better mouse trap? Learn about our efforts to model probable outcomes of proposed legislation on the U.S. economy.

Mr. Thomas P. Edwalds: I'm the SOA's research actuary for health and pensions. I'm an FSA, an associate of the casualty actuarial society, and a member of the AAA. I've been with the SOA for two years, prior to that I was with the Blue Cross/Blue Shield of Illinois for six years, and I have been an actuary for 18 years altogether.

I'd like to begin this presentation with a brief overview of the SOA research process, then talk briefly about some of the things that are on our agenda, and finish up with a more thorough explanation of one project that we're working on, the Macro Demographic Model Feasibility Study.

The SOA research process is volunteer driven. There are a couple hundred volunteer actuaries that are involved in our research process. A couple dozen of these volunteers are focused on pension research. The key committee here is the Committee on Retirement Systems Research, which Joe Applebaum chairs.

The SOA provides a variety of resources to support actuarial research related to pensions. One such resource is staff to support the research function; half of my time is devoted to pension research. I have one assistant, and half of her time is also devoted to pension research. Research is not actually done by SOA staff, we simply coordinate and support the projects. We hire outside researchers to do most of the actual research. The SOA provides about $70,000 a year to fund this outside research. The Pension Section is another valuable source of funds for research, and there can be other sources as well. The Macro demographic Model Feasibility Study is a good example of a project funded from a variety of sources.

I also wanted to give you a brief idea of how a project moves through its "life cycle." I would identify four phases. All of them are fuzzy and vague; nothing is really crisp.

It starts with the "definition phase." This begins with a nebulous idea or concept that someone has about an issue or area that merits investigation. The idea can come from anywhere. It can come from the SOA leadership, it can come from the members, or it can come from people completely outside the profession. It then goes to the research committee, which will consider the idea and decide if it has any merit. If so, they try to figure out what the research question is, that is, what question can really get answered by doing some research.

From there the project would move into the "organizing phase." The research committee would appoint a project oversight group (POG) that would then decide how to address that research question. The POG would determine what data to use for the study and who would analyze the data. Some possible ways of obtaining data are to use existing databases, to issue a special call for data, or to conduct a survey. The POG may decide to analyze the data themselves on a volunteer basis, or they may decide to recommend that an outside researcher be hired.

Once the POG has defined the process that will be used for the project, it moves into the "execution phase." This is the phase in which the research is actually done. If a call for data is issued, the data requests are drafted, circulated, and followed up on until enough data have been collected to support the desired analysis. If a contract researcher is to be hired, an request for proposal (RFP) is drafted and circulated, and responses are evaluated. The POG monitors the progress of the research throughout this phase and critiques successive drafts of the final research report until it is ready for publication.

Once the research committee agrees that the final research report is ready for publication, the project enters the "distribution phase." The SOA has a publication department that would handle much of this. Some of our publication options are

the SOA Monograph Series, or *The North American Actuarial Journal*. Other distribution methods include presentations at meetings or symposia.

Those are the four stages in the life cycle of a research project: definition, organizing, execution, and distribution.

Here are some of the projects that we're currently working on. The Safest Annuity Rule Study is a project in the execution stage. For phase one of this project, an outside researcher has been hired to study trends in PBGC standard termination data. For phase two, SOA staff is compiling the results of a survey of active participants in the group annuity market. The survey instrument was designed by the POG. This is one of those rare projects in which SOA staff is actually doing some of the research.

The Turnover and Retirement Rates Study and the Uninsured Pension Plan Mortality Study are both in the execution phase. Joe will discuss these studies.

The Ontario Plan Termination Study was recently completed and is now in the distribution phase. This study looks at the characteristics and causes of defined-benefit plan terminations in the Province of Ontario during the five-year period from 1988 to 1993.

The Canadian Pension Plan Mortality Study was done by Professor Louis Adam at the Universite Laval. He looked at Canada Pension Plan/Quebec Pension Plan data to try to determine whether Canadian mortality is different from U.S. mortality. His basic conclusion was that it is different. The CIA has begun the process of doing a formal mortality study of pension plans in Canada. Because the data he used wasn't from pension plans, the CIA didn't feel comfortable recommending that his tables be used for valuing Canadian pension plan liabilities.

The Public Employee Retirement System project is in the distribution phase. This report is a compendium of data from pension plans of public employees: teachers, policemen, firemen, etc. It shows what assumptions are being used in valuing these plans, and whether the actuary for the plan is recommending any changes in these assumptions. It summarizes the results of experience studies done on these plans by showing the relationship between the experience and the assumption. It doesn't go quite far enough to be able to answer a question such as, “What are the mortality rates for firemen?” At the SOA we are frequently asked this type of question.

There's a project on asset evaluation methods. That is still in the organizing phase. Actually there is an RFP out. The bid hasn't been awarded yet. The two finalists were selected from the firms that responded. They both have been asked to make

some clarifications to their original proposals, they both responded back to that, and the committee will now make a choice. That should be being awarded in the near future. The purpose there is to look at the asset evaluation methods that are in use, how prevalent are the various methods, and what types of things correlate. You know, are there different methods in use for public plans than for private plans? Ultimately, the idea is to get to a point where we can say, this method is more effective for this situation, or what have you.

Finally, Macro Demographic Model Feasibility Study is the one I am going to concentrate on. I'll cover these four areas: who's in, who's participating, what kind of things are going to be in the report, and what models are going to be reviewed. The original idea came from SOA leadership. The idea was there's a lot going on in the public arena about Social Security and about pension policy, and actuaries aren't at the forefront of talking about what the effects of various government actions might be.

Most legislation is made by looking at models and simulation from certain groups in the adult area using the well-established models, and the feeling was that these did not reflect the types of information that actuaries know about. The original idea was, maybe we should go off and build our own model. But as it went from the original idea through the definition phase, it became very clear that would be an enormous undertaking and there was no need for actuaries to reinvent the wheel just because we're actuaries.

So the first step of this process of trying to get actuarial input into this public policy is for us to look at what is available. Our first step is actually called the Feasibility Study. We have hired an outside firm called Capitol Research Associates that is first providing for us a survey of all the models that are out there. What do they do, what don't they do?

The end product of this is going to be recommendation of where is it and how is it that the actuarial profession can make the most effective impact in the area of modeling retirement income. The objective is basically that we want to have actuarial influence in the policy decision. Another thing is, just by putting this together and talking about what modeling is available on retirement income, that's just going to be good information for pension actuaries. Something that should be available to you in your practice.

There are actually five sources of funding for this feasibility study. The American Society of Pension Actuaries and the CCA both agreed to provide funds for it. Obviously, the SOA research funds are a significant portion of this. The pension section is contributing funds, as is the computer science section, saying that the

computer modeling was important enough to the profession as a whole, and to their particular interest, this was one study that they wanted to participate in. The report itself is still under development. We don't have it done yet, but the committee has been working with researchers to define what is going to go into the report. It was discovered that the first thing that was needed was an introduction to modeling terminology. Actuaries are not very familiar with terms like micro-analytic simulation, endogenous variable, and exogenous variable. We found that was necessary because this isn't a part of our training, and just for us to talk to the modelers, most of whom have come from an economics background, we need a new language.

A discussion of the micro-analytic simulation approach, or micro-simulation, is part of the study because that seems to be an important area where we're actually going to get our input in. The micro-simulation is one where you look at individual units, which in most models are families, although it could be firms or government units. You look at what things will affect the behavior of that, and you would take a certain set of inputs and a certain set of outputs as to what you are actually going to model. We'll assume these things, and the things that come in are called the exogenous variables, we just take those as givens. When will somebody be likely to retire, for example, given the government Social Security policy and the employer's benefit plan? What are the things that would affect a person's change of jobs? That's the type of thing that goes into a micro-simulation model, and there's a bunch of them out there.

The main part of the report is going to be information about what models are out there. Once we know the language and know a little bit about what models can do, then the report will get into what the existing models are and how we can affect them. We have five types of information about each model. A background of the model, which is why was this model developed, how long ago was it developed, and how much modification has there been to it is included. A description of the model itself; how it was constructed, what language is it in, how many modules, what do they do. A talk about the application of this model to retirement policy issues, because in some cases they are not immediately obvious. They're not necessarily designed to address retirement policy issues, but they may be relevant—for example, a demographic model that models the aging of the population. Clearly, that has an important impact on your retirement income policy, but it's not designed to do that: it's more just to see how the population can change.

Accessibility is an area that we've discovered. Our purpose is to say, how can we make an impact? In order to have input into this, we need to know whether we get in and work with the developers to develop some new codes, to build a new module that will fit into the system, and how proprietary is their structure. Would

we have to hire them and pay them to make the modifications that we want? Or is this something that we could get on our personal computer and play around with it?

Finally, a critique is included. How good is it? What will this do, what won't it do, and how does this match with the objectives of the actuarial profession? In looking at the application to retirement policy issues there is actually a matrix. The matrix consists of 13 different types of policies that the government could change, and 36 different variables that we might want to see the effects on. For each model we can say, yes it's in this box; no, it's not in this box.

Part of the object there, once we look at all the modules is to see where are the blank boxes. Where are things that nobody's modeling that we think might be important? Possible questions would be, can this system model the effect of change in Social Security retirement age, and on the types of provisions of plans offered by employers? There's two possible outcomes of a change in Social Security policies. Can the system model the effect of a change in pension tax policy on job availability? We want to look at where the economic feedbacks are. We want to see what's being modeled and what's not.

We figure that this feasibility study step is more for us to learn what's already out there. Chris Bone, the chairperson of this committee, is also on the National Academy of Sciences, the panel on retirement modeling. We're not done with the analysis yet, but the general consensus is that there isn't much out there that models employer behavior very well. The feeling is that pension actuaries working with employers all the time probably could help devise a model that would say, in response to a tax policy change you might get these changes in the benefits offered. That's preliminary.

The study is designed so that it includes part of the features of the model, the structure of the model, and where are the data coming from. The data sources and the assumptions are key. There are real data going in, but some are an assumption, or based on a theory of how something might work. Where are the feedbacks in it? What kind of things will be recognized to affect other things that are going to loop around and make the interactions complex.

Joe Applebaum is the chief actuary of the Pension and Welfare Benefits Administration in the U.S. Department of Labor (DOL), and works for the chief economist and director of research. Joe is going to discuss two of the projects that I mentioned on our current agenda: the turnover retirement rates study and the uninsured pension plan mortality studies.

Mr. Joseph A. Applebaum: The subjects under discussion, the turnover study and the pension mortality study, are works in progress. They have not been completed so this is an interim report. I'll try to fill in a little about where the projects started from, where they are, and try to indicate what we may expect the results to be. Because the pension mortality study was started relatively recently, my remarks for that study will necessarily be sketchy. For the termination study, it may be useful to explore what the next steps might be, and what we need to get there.

BACKGROUND

At the 1993 Enrolled Actuaries meeting, the Task Force on Nonmortality Decrements held a preliminary meeting. The task force consisted of Ed Hustead, Dick Joss, Ho Kuen Ng, Bart Prien, Tom Sloan, and me. The task force had two concerns: getting data for the study, and whether a study of nonmortality decrement should be done. We concluded that it was worth going forward. The first problem, data acquisition, was helped immeasurably by the efforts of the chair Person of the Retirement Systems Research Committee, Mike Sze and Chris Bone, and the current SOA President Bob Berin. They all played major roles in helping persuade pension actuaries to contribute data.

A good deal of time in 1994 was spent contacting actuaries in a large number of consulting firms, and actuaries who, as employees, provided guidance to sponsors on benefit plans. After these consultations, we concluded that the major obstacles to obtaining data for the task force were the need to preserve client confidentiality because of the sensitivity of the data, and the need to make the data requests simple and available from existing sources without any extensive massaging. More than the usual efforts were made to assure that client confidentiality would be preserved.

These considerations led us to make requests for census data that had already been gathered for plans with more than 5,000 participants. The task force believed that comparing end-of-year and beginning-of-year censuses would measure total decrements well. We rejected, after conferring with potential contributors, requesting census data along with records on decrements by cause. We believed it was better to get retrospective data now rather than ask people to collect data prospectively for a future, more detailed study, and detailed records on decrements by cause were not widely available. It was thought that as a first approximation, we would assume any decrement in a cell where participants were over 55 to be a retirement, and if younger than 55 it would be attributed to turnover.

In the end, we were quite fortunate. The task force received contributions for one or more plan years for 43 large plans spanning the years 1989–95. This data yielded about 4.6 million life years of exposure based on about 860,000 lives. The submissions included: beginning- and end-of-year censuses for each plan year

submitted, plan summaries so that retirement eligibility could be determined, and the sponsor's location and industry classification.

We identified sponsors by a two-digit code, an integer indicating the contributing firm and another integer identifier for the plan submitted by the firms. The identities of the sponsors themselves were unknown to the task force. The codes were created so that the task force could make a query to the database creator if a question arose regarding a plan's data. I think that's a good way to get reasonable cut out so the sponsor confidentiality can be preserved.

As to the database, an RFP was published in 1994 and an award was made in 1995 to researchers at the University of Iowa. The database consists of cells with the number of persons in the cell, demographic data (age/sex/years of service), retirement eligibility indicators, sponsor identification, and where available, average salary and accrued benefits. The database work was completed early in 1996.

Another RFP, for analysis of the database, was published and an award was made to researchers at the University of Western Ontario. Much of what I will now go on to describe is from the preliminary report of the researchers at the University of Western Ontario, which was submitted in summer 1996.

The base table can be seen as Table 1 followed by Chart 1 which shows grouped data for attained ages 20–70. These show decrement rates by attained ages curve and follows the curve one would expect. The period studied was from 1989–95, 40% of the exposure was from 1993–94.

If we look at the graph, net rates of termination exceed 10% in the early 20s with a peak in the late 20s of about 14%. Rates trend down to around 6–7% in the 40s. At attained ages in the late 40s and early 50s, rates increase as participants become eligible for retirement. The rates rise as attained age increases. Of particular significance is the quite large difference between rates at ages just below 62 and at age 62, when participants first become eligible for Social Security retirement benefits. Rates rise to nearly 50% at attained ages of 65 and above.

TABLE 1
BASE TABLE OF NET DECREMENT RATIOS
LIFE YEARS EXPOSURE

Age	Net Decrement	Net Exposure	Net Decrement Ratio
15	8.0	8.5	0.9412
16	6.5	165.5	0.0393
17	13.5	324.0	0.0417
18	40.5	719.0	0.0563
19	-59.5	2001.0	-0.0297
20	244.0	4614.5	0.0529
21	407.0	10555.0	0.0386
22	1873.0	18673.0	0.1003
23	3143.5	27521.0	0.1142
24	4964.0	37755.0	0.1315
25	6356.5	46692.0	0.1361
26	7439.5	54519.0	0.1365
27	8488.5	61370.5	0.1383
28	8666.5	66856.0	0.1296
29	8842.5	72260.0	0.1224
30	9561.0	77370.5	0.1236
31	9857.0	81651.0	0.1207
32	9128.5	85035.0	0.1073
33	8867.5	88274.0	0.1005
34	8555.5	91113.5	0.0939
35	8575.5	93289.5	0.0919
36	8048.0	94176.0	0.0855
37	7410.0	94757.0	0.0782
38	7342.0	95593.5	0.0768
39	7083.5	96087.0	0.0737
40	6928.0	96691.0	0.0717
41	6514.5	97244.5	0.0670

TABLE 1—CONTINUED

Age	Net Decrement	Net Exposure	Net Decrement Ratio
42	6557.5	100008.0	0.0656
43	7167.5	99936.0	0.0717
44	6769.5	98325.0	0.0688
45	6532.0	96502.5	0.0677
46	6923.5	95748.0	0.0723
47	7112.5	91128.5	0.0780
48	7723.0	87305.0	0.0885
49	6730.0	82889.0	0.0812
50	5763.0	78525.0	0.0734
51	5803.0	74009.5	0.0784
52	6432.0	69314.5	0.0928
53	6467.5	64997.0	0.0995
54	6160.0	61170.0	0.1007
55	7148.0	57533.5	0.1242
56	7356.0	53101.0	0.1385
57	6762.0	48837.5	0.1385
58	6902.5	45287.5	0.1524
59	7161.0	41725.0	0.1716
60	7674.0	37757.0	0.2032
61	8206.5	33147.0	0.2476
62	8907.0	28162.5	0.3163
63	7377.5	21686.5	0.3402
64	6106.5	16271.5	0.3753
65	5879.5	11944.5	0.4922
66	3693.0	7500.5	0.4924
67	2056.0	4772.0	0.4308
68	1474.0	3445.0	0.4279

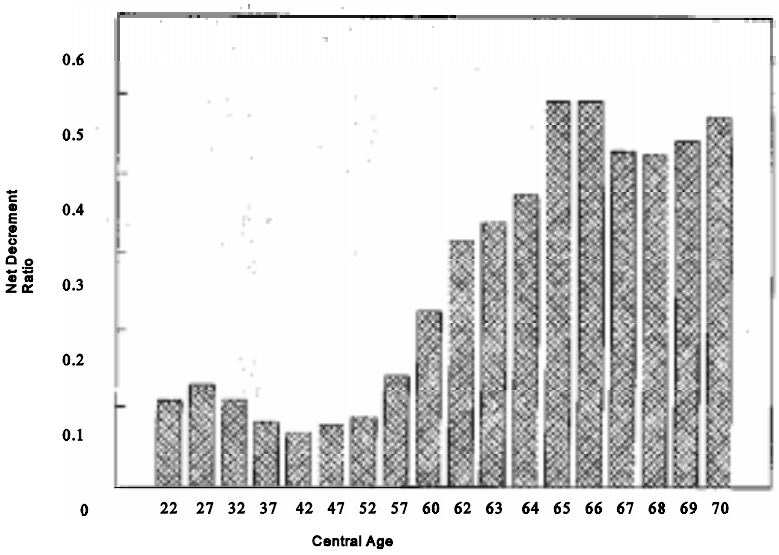
TABLE 1—CONTINUED

Age	Net Decrement	Net Exposure	Net Decrement Ratio
69	1080.0	2434.0	0.4437
70	807.0	1704.5	0.4735
71	695.5	1143.0	0.6085
72	407.0	664.5	0.6125
73	228.5	374.0	0.6110
74	140.0	236.0	0.5932
75	99.0	173.0	0.5723
76	56.0	110.5	0.5068
77	41.0	66.0	0.6212
78	28.0	45.5	0.6154
79	21.0	34.0	0.6176
80	11.5	18.5	0.6216
81	7.0	11.5	0.6087
82	5.5	8.5	0.6471
83	7.5	10.5	0.7143
84	8.0	10.0	0.8000
85	5.5	6.0	0.9167
86	1.5	1.5	1.0000
87	1.0	1.0	1.0000
Total	324800.0	3013398.0	

Looking at Table 1, you'll notice that at some attained ages there are negative decrements. How can this occur? The explanation is rehires. In fact, negative decrements are just the most visible part of the problem. The method of net decrements compares the number of people at the beginning of a year, for example, who are age 40 with 15 years of service, to the number of people at the end of the year who are 41 with 16 years of service. Rehires decrease net decrements. The task force looked carefully for a way to correct for the rehires and we did not see an obvious one. We noted that virtually all plans had some cells with negative decrements. Extensive rehiring appeared to be common within the period the study

covered, and so the task force concluded it would be improper not to include this effect.

CHART 1
NET DECREMENTS FOR CERTAIN AGE GROUPS



From the Floor: You refer to that as rehires, but how do you treat the case of the person who's never been employed by the sponsor?

Mr. Applebaum: That's a good point, but basically what we're talking about is people for whom we have a cell at the beginning of the year. If we didn't have a cell, the comparison doesn't show up. You're never going to have people with negative years of experience at the beginning of the year. So we're really talking about people at the beginning of the year with one year of experience and then at the end with two years of experience. You have to have the corresponding beginning and end-of-the-year cell.

From the Floor: So you're using rehires as an offset to withdrawals?

Mr. Applebaum: In effect, yes. Now, when we started looking at preliminary results, we saw these negative decrements and we said, what's going on? We realized quickly that the anomaly was due to rehires. What we did was ask the researchers to tell us how many plans had negative decrements and found it was most of them. We concluded that there wasn't any obvious way to correct for this, unless we could go back to the data contributors and get data on rehires—that didn't seem to be feasible or likely—and, in any event, you'd have to spread the rehires over the plan's population. There's no obvious way to do this. Further, we viewed that rehires were a rather wide spread phenomenon and that it was important to

reflect them. Also, simply making arbitrary corrections would destroy the credibility of the data. In the end, we concluded that it would be improper not to include the effect of rehires.

Beyond these general observations, the preliminary report, and I would expect the final report, contains extensive analyses of the variables that appear to affect termination rates. I'd like to indicate some of these and highlight some important, although preliminary, results.

For gender, the most important observation, on a preliminary basis, is the similarity of the shapes of the decrement curves for males and females. The actual to expected ratios for females, using the base table to calculate expects, are in the 135–150% range for women under 55, and somewhat lower for those 55 and older. Females represented about 30% of the exposure with much more of it in the prime ages (30–44) than the other working years and particularly less at for those 55 and above.

The preliminary study also looks at variation of experience by plan. Intuitively, one would expect wider variation in plan experience for nonmortality decrements among plans than for purely random events such as mortality. Nonmortality decrements reflect sponsor employment philosophy, including, for example, retirement incentives as well as layoffs and hires that occur differentially among sponsors as a result of their differing economic results within a period. We observed ratios running from 27–170% (a higher ratio was experienced but the data was deleted from the experience study). Importantly, high actual to expected ratios for a firm typically indicated high actual to expected ratios at each age grouping for that plan.

This is consistent with a study on turnover for a smaller group of plans a few years ago, by Roger Vaughn, that appeared in the *Pension Section Forum*, which was in many ways the precursor for this study. One of the things that Mr. Vaughn observed in doing his study was that if you made adjustments upward and downward using the ratio of turnover for vested lives, than you could get quite good fits using his base table. So this is further evidence to support Roger's earlier observation.

The preliminary study also looked at variation by location and industry type. The turnover experience in the Northeast was much higher than any other region—its actual to expected ratio was almost 1.8—the other regions all had actual to expected ratios below 1. It is hard to find any explanation for this other than the obvious one—in the late 1980s and early 1990s the economy in the Northeast was none too robust. It's also worthy of note that only one industry group, financial services, had

actual to expected ratios notably higher than one—once again it's not clear whether this was in line with the usual practices within this sector, was more reflective of the peculiarities of the period, the firms contributing data, or some other factor. It is questions like this I think are particularly important to be able to sort out.

When the study looks at the type of compensation of the workers covered by the pension plan, we see some definite differences—plans covering hourly workers only had lower employee termination rates than plans that covered salaried workers only. Correspondingly, those with mixed populations were somewhere in the middle, although I doubt that simple linear interpolation produces the right results for a mixed group. The preliminary study also produced net decrement rates as a function of years of service. There are very significant negative decrements for zero years of service. This may be due to some definitional problems or the ages of people with zero years of service. This is one of the issues the task force is now attempting to resolve. For one year of service, the termination rate is around 9%, and for years of service between 2–8 termination rates are approximately 15%. For longer service employees rates trend down to the 4% level at around 20 years and stay near this level until retirements begin to show up. Much of the shape of this curve would be more obvious if we had it broken down into attained age/years of service.

Originally, the task force had intended to attribute all decrements under 55 to turnover and all decrements at ages 55 and above to retirement. The task force decided to recognize that a better approach was to attribute some of the decrements at ages near 55, namely those where the participants were eligible to retire, to retirements. This decision will, of course, have no effect in itself on the total decrement, but will spread that total decrement in the late 40s and early 50s into two causes—retirement and turnover.

I'd like to look beyond what remains to be resolved in the current study, which I believe will provide data that will be helpful to practicing actuaries. The current study has an obvious deficiency that will need to be addressed—isolating the effect of rehires and more precisely calculating terminations by cause—and this can only be done if both a census and transactions (exits and re-entrants) by cause as well as age, years of service, gender, and other variables are available.

It should be emphasized we believed it was more important to acquire some information now, in order to go with a better design, and ask for data to be collected prospectively rather than start a planning cycle that would last a number of years. The study might not get done. The nonmortality decrement assumptions pension actuaries make are among the most important—and it would be better if they come from recent empirical evidence. I believe that follow-on studies should

be done and the current study should be regarded as the starting off point. There are some important issues that can, and should, be addressed. First, and most obvious, is how the decrements (and increments) vary over the business cycle and how important those variations are to the financial status of plans. Another area that seems particularly important to me is understanding retirement incidence. What are the important factors? If we can address these better, then we can do our jobs as pension actuaries better.

From the Floor: Financial vendors marketing defined-contribution plans talk of how our economy has changed and people don't stay on the same job as they did years ago. Is that the reality and why are we going to have defined-contribution plans? Have you looked at this? I've heard some anecdotal comments about how that's not the case and that people are staying on their jobs. It would really help if we knew how to handle this.

Mr. Applebaum: I think it's important to understand that many of these things are very subtle. The only study that I've seen to date is one by a couple of economists. Their answer seems to be that the difference in turnover pattern is much smaller between employers who provide a pension, whether a defined-contribution or defined-benefit plan, than between pension offerers and employers who do not offer a plan at all. Much of the difference may have less to do with the pension plans than with other factors of pension offerers and nonpension offerers such as size, profitability, etc. Also, how much of turnover is due to layoffs versus voluntary exits? What are the differences in the nature of the work forces of companies who offer pension plans versus companies who do not offer pension benefits? So it would be very hard to get definitive results because there are so many exogenous variables.

From the Floor: It would be useful if we could make a comparison over time—Even if some of the firms could go back into their old records and look at old experience studies.

Mr. Applebaum: You've hit on a most crucial thing. It is very hard to get good data. A major part of my efforts on this project in 1994 was trying to persuade people to provide data, as were those of Chris Bone, Mike Sze, and a number of other people. Good data is essential, and without it all we can do is just speculate. If people want to get good studies, they have to spend the time to collect and compile data. This is not cheap, but it's something that you can't do without.

From the Floor: It's almost impossible to ask firms to conduct experience studies now from data that was in the 1950s and 1960s. Surely empirical studies exist somewhere in firms' archives?

Mr. Applebaum: Getting the data so that it can be analyzed is expensive and it's hard. But frankly, if we don't do it, it's very hard to be credible.

Mr. Jack Forstadt: I think there are studies from the Employee Benefit Research Institute to show that people have about the same average tenure now as in the past, but I don't know anything about the underlying data. I also think that people are not necessarily changing jobs as often as they used to.

Mr. Applebaum: There's also a study, I think, by Wyatt.

Mr. Mark W. Campbell: You mentioned age as one way of modeling decrements and service as another. Is there a preference you should give one over the other? Is there an interaction between the two? If you use age and if you use service, is there an unexplained interaction?

Mr. Applebaum: That's one of the things that we're looking at. I think both are important factors, particularly when you look at older workers. There, you're looking at pension incentives that can be more carefully crafted in terms of age, service, or a combination. In a broader context, at entry you start with a rather large population for whom the consequence of a decision to leave an employer carries comparatively small financial consequences as far as the pension plan. For older, longer service workers, the impact of pension provisions on decisions to leave a firm become far more important, so the combination of age and years of service in combination become more apparent.

Mr. Edwalds: Adrien LaBombarde is the research actuary in the benefits research practice of Millman & Robertson (M&R), where he's been for the last ten years. He's an associate at M&R. Before joining M&R he was the research actuary for Johnson & Higgins. Prior to that he was the national associate for Mutual Benefit Life, in his 20-year career. Adrien will talk about the research in the private sector.

Mr. Adrien R. LaBombarde: We have an interesting balance here. Someone from the professional/academic side of research, someone who works in the government with research, and me, I work on the mercenary side of research. How do you use it? What's it all worth? Given that as my background, I want to recognize the interest that was in the previous questions, and note that on the mercenary side of research you go where the money is, you go where the interest is.

I would like to first discuss the parameters and factors of the research. I spend the most time, maybe 50% of my time, simply collecting data and information. After that, I will discuss the development of actually applying that data in development of

models and calculations and the like. The policy research side of things— that is the communication of this with Congress, with the regulatory bodies, with the other bodies that are developing research. Finally, I'll explain what I call the mining or prospecting for gold. That is recognizing that we're not all working in ivory towers, we take this research out and we use it with clients or we use it with the government in ways that make it mean something.

The key point I'd want to emphasize with respect to the information research side is that we all, I think, in the past years have started developing so much of a focus just on the IRS. What's the IRS been issuing, what's the latest regulation, and what's the latest news on this. Certainly, we need to recognize and be aware that it's far more than the IRS. There is an information overload, so to speak, that's going on out there, but I believe it is our job, either as researchers, or as consultants, insurance company practitioners, or whatever else you're doing out there, to stay on top of everything that's going on.

On the international side, even if you're dealing just in the U.S., don't ignore the international. Companies are becoming more international in scope, and if you focus solely on the U.S. you're going to be lost. I would point out, in particular, that there is an international accounting standards committee that's promulgating some Financial Accounting Standard *(FAS)* 87—like promulgations that are going to carry a fair amount of weight they should be effective within, I'd say, the next two years if things continue at the current pace. Be aware of this, be involved, get your comments out there. Be aware of what it's going to mean to any firm that you've got that has any international exposure at all. Of course, we do watch the House and Senate tax and labor committees. Be forewarned and be aware that there is much more than just what comes from Senate finance and Senate labor or the House equivalents of those. We've been seeing more and more legislation that comes from the other committees, as well.

In fact, beyond just the pension simplification, there were several other bills that passed in 1996 that had law in them. Some of them were relatively minor, but there are things that could be of importance to us. Of course, as I said, on the regulatory guidance we're seeing much more information that's been coming out from the DOL, Pension Benefit Guaranty Association, and the Social Security agency. I'd also point to the SEC. There were some insider trading rules that have been moving through recently that have taken effect, that have some implications on 401(k) plans, on the design of 401(k) plans, and on Employee Stock Ownership Plans. Of course, we watch the judicial decisions, and for data and information gathering, we keep an eye on the Social Security, the Bureau of Labor Statistics, the Census Bureau, and other government agencies in terms of data that come out. Unless it's state and local, if you deal with state and local plans, you obviously have

to keep an eye on what's been going on the state and local level, even if you're not dealing with public employers. You need to be cognizant of the fact that there are laws and regulations that are passed at the state and local level that can affect your practice, as well.

From professional sources, we look to the likes of what you've heard talked about here, in terms of the actuarial organizations, as well as the standards board. There are some new standards that are in development right now with respect to valuation of pension plans and selection of assumptions. There are also accounting and other professional standards. Just because *FAS 87, FAS 88,* and *FAS106* were passed some years ago, doesn't mean it's over with. There were some recent promulgations with respect to stock plans. FASB is going through a process where it is reassessing the disclosures that are made under *FAS 87* and *FAS 88*. The process never stops. I think that's one of the things you learn from research, that just because a new law or new promulgation comes out doesn't mean that you stop tracking or following this.

We look to data, articles and meetings from employee benefits firms, both from our competitors as well as from organizations that were mentioned: Dallas Salisbury's organization, Employee Benefits Research Institute, and the like. Now, I list professional sources, and I did not list the others, which may be because currently we don't see it as a primary source. In connection with what Joe said, maybe it should be listed as something we'd like to see more of, and that is the consulting firms, the employers, and people who do work with pension plans. We would like to see that become a source of data and a source of information, much more than the closed atmosphere that we've been having in the past.

So much of our research these days is done electronically. Certainly much of the information that we're now getting is on the Internet and it does come to us electronically. I want to at least emphasize that if you were not already aware of this, by all means, become aware of what's out there and start using it more. For our legislation we are continually looking for sources like Thomas; it's the service for the Library of Congress. We can keep track of, get the text of the bill, bills that are moving forward, and actually track the progress of the legislation as it moves through the committees and the like. The IRS, PBGC, the DOL, and the Social Security Administration have their own Web sites. Many of these actually have information on them that can be very critical to you in terms of the pronouncements that give you the information of how to conduct your work. Of course, also the Bureau of Labor Statistics which is where we get combined premium increase data and a fair amount of other data, such as demographic data and the like. FASB came up with a Web site just within the last couple of months. It doesn't have much you cannot get tax information, such as the *FAS 87* or text of the promulgations, but if

you want to track what they're doing, for instance, their current deliberations of looking at reassessing the information that's in the footnote disclosures, you should check out the FASB site.

Of course, a fair number of the other organizations, such as Employee Benefit Research Institute, the Association of Private Pension and Welfare Plans, and the International Foundation all have Web sites. Many have information that's very useful to us. There are some subscription tax news services. There are at least two that I'm aware of, and I'm sure more that are coming up. I'm in my office by about 6:30 or 7:00 and checking up on the news of the previous day. Usually by 8:00 I've already read through the promulgations that many of you may not see for a week, a month, sometimes later, so if you're interested in going into the subscription news services, the Web can get you through to some of the services out there, what's going on literally on a-day-to-day basis. Source text and all.

Many of you, I'm sure, also are already aware of the CD-ROMS that are out there. There are several that are extraordinarily useful in terms of doing research, of what's been done, there's usually a month lag on those in terms of timeliness, but if you want to know anything that's been done in the past it is a good option. An interesting occurrence happened about a year ago when the CD-ROMS were first coming through where I had one of the federal agencies call me up and ask me whether they had ever issued any regulatory guidance with respect to a particular issue. It was kind of hilarious that the agency itself wanted me to tell them whether they had ever issued any regulatory guidance on something, but I think it was a sign of how powerful the electronic media can really be in terms of the sheer volume of material.

When you put the computer to use, it could be very useful. Financial news and data as well. Edgar, the SEC site is an extraordinary source in terms of, not only financial data, but there are things such as filings with respect to plan design of some of the defined-benefit and defined-contribution plans. Actuaries Online is very useful. It has some very useful file downloads. We're starting to see more software available. One of the more useful ones that I've seen is the Social Security agency has put out software on the calculation of the primary insurance amounts. That's extraordinarily useful.

At the enrolled actuaries meeting in 1995, they handed out diskettes that have in electronic form all of the grey books that have been issued with the questions and answers ever since the grey book started coming out. That's an invaluable source even if you wipe out 50% of the questions where the IRS said, “We're thinking about that, or we're looking at that.” The other 50% are absolutely fantastic in terms of many useful questions.

Don't forget the conventional methods particularly your libraries. The libraries that you have shouldn't go by the wayside just because of the electronic media. Employee Benefit Research Institute and International Foundation have excellent libraries, and if you don't have immediate access to them because you're not in the area that they are, still consider them. Most of the people who run them will take questions and provide you with information to the extent that it's available. I found a fair amount of information just from my public library.

Analysis of the data. Locating and creating the appropriate model. I want to point to the fact that we're developing some social policy right now about Social Security. Before you go out there and develop ideas, suggestions, or recommendations, be aware that the Social Security agency itself has a fair number of models. If your model disagrees with theirs, know why and where. This doesn't mean that you have to agree with everything that an agency says, but when you go to locate and create the appropriate model, I think you simply need to have a certain degree of respect for what's already out there. If you're going to differ, at least know why.

Appraisal of missing data. As we've mentioned here, getting data is certainly one of the parasites of the actuary's work. I did have the pleasure of working on a research assignment within the past couple of years that, I think, may have been about the worst. I was working, in terms of data, in connection with assisting the Republic of Albania which had just come out of communism, with setting up a Social Security system. They had virtually no data to speak of. Ten percent of the population left when they were going through the change. You know from anecdotal evidence and you know from simply visiting the country and looking around, that the 10% were not the children and the older people. They were the people who were earning the wages that are supposed to be useful for the Social Security system. Of the remaining 90%, those who are working, it's supposed to be a mandatory system, but many of them are not contributing.

Dealing with those data is an interesting exercise. I think one of the more interesting sides on it that I remembered was when I asked the people in Albania whether they had any data on mortality or on population. They gave me some population census data that the communist regime had put together. I went through these data that the communists had put together on the population, and I came to one year where the women at age 87 was a negative two. This is one place where humor just doesn't make it across the language barriers because I ventured to say that I've known a few negative women in my time, but never so many as to make it a net negative. They didn't really get the point. But dealing with those kind of data and appraising them and coming up with something where you can actually make some sense out of it certainly is something.

We talked briefly about the projection of future plans, not just looking at the turnover, for instance, but projecting future trends.

Identifying and understanding key factors such as time constraints. Frequently you find in the projects that you're working on— I would note the Albania project that I worked on, and I was working on the development of Omnibus Budget Reconciliation Act (OBRA) 87, that there is absolutely just too much to do and too little time. You have to very quickly get to the point of identifying what it is that you need to get done. So it's like a classic consulting exercise.

Analysis of practical applications. 415E repealed this year. I would identify as one of the key things that helped to get the 415E repeal moving along was when they identified the fact that 415E was very closely related, in terms of the practical effect in an ongoing basis, to the imposition of the 401A17 compensation cap. That it's a compensation cap that made it so that in the future ongoing sense 415E had less effect than what Congress was worried about it having. Once we identified those practical implications, Congress was much more willing to undergo what they saw as a potential revenue loss from 415E repeal. So that's one thing where the analysis of the practical implications, I think, had a strong, positive policy impact.

Effective communication of results. I know actuaries love numbers, but when you can put anything that you're doing in an effective chart, whether it's with a Congressional staffer or a client or anything, it goes further. I'd like to make a pitch for the organizations to come together and present more normalized groups. By normalized groups I mean something such as what the economy put out 10–12 years ago with respect to the study of *FAS 87*. They came out with a study that I found to be very useful in communicating the over 87 results during the development of OBRA 87. We had some normalized groups; the Academy had ten groups, A through J in terms of how costs were calculated under these groups. Communication of these normalized groups was standard, as opposed to saying Bethlehem Steel is going to be like this, or my client is going to be like this. Use of normalized groups, I found, was a very effective communication approach.

I want to discuss dealing with the governmental process. I interface with the government frequently, and how do you deal with that? How do you interact with them? At the top of my list is maintain respect. We all disagree. I disagree vehemently with the IRS every single day. I disagree with FASB and what they did on *FAS 87,* but in my experience, and I don't say this in any self-serving way, the people who work at these agencies such as the people who work at FASB, know what they are doing. Dealing with them on a level of respect, I think, is a more effective way of getting your own point across as opposed to believing that just

because you both have different positions that maybe they don't know what's going on.

Be impartial. We went far further in getting certain things that we wanted. I know many of us never got what we wanted, with respect to asset reversions, but we got something that was, at least, workable if we were impartial with respect to our results.

Be pragmatic. We saw this again with respect to the general nondiscrimination tests, in doing research on methodologies and in working with the IRS regarding the test. Many of us didn't like the test in fact, many of us disagreed with the test. But if the test was going to be there, being pragmatic about its existence and determining what we needed to do to develop methodologies that would at least make it workable in practice was helpful. Many of us, with respect to *FAS 87,* disagreed, but taking a pragmatic approach once the accountants had determined what it was they wanted to say, was far better in terms of deriving conclusions.

Be persistent, don't give up. We started in 1984 and 1985 searching for the repeal of Section 415E. If we'd given up I think we'd still have 415E with us. Many of us were persistent through the last 10–12 years in working towards the repeal of that. Work with the process. There are many different goals, different agendas, and different things that are out there, but if you work with it and keep an open mind then it is possible to get some things done.

Mr. Abraham Hazelcorn: Will your study make some comment on adjusting toward portability of benefits which might affect some industries?

Mr. Applebaum: I don't think so. I just don't think the data are there.

Mr. Ralph J. Braskett: Will your study tell us whether we have to select an alternate table in your evaluation should the select portion be an addition to ultimate by years of service, or should it be a multiplier of the ultimate rate? Where the rates are by age.

Mr. Applebaum: We haven't made any final decisions on the form of the table, but I think that it probably will come close to a fairly classic select and ultimate table, rather than just trying to get one variable from the other. One of the things that I would like us to do is to see whether simple multipliers, for example, or additions can be made to the base table and get it to fit well with other plans' experience. I believe I mentioned before that in Roger Vaughn's study, at least for the groups he was looking at, he found he had quite good fits using multipliers. So we'd like to look at that approach.

Mr. Peter S. Kreuter: The volatility of termination is not surprising, and I'm just wondering how the table you developed would be expected to be applied to any particular plan. I also wonder whether we're in danger of it being adopted by the IRS or the PBGC or somebody else as a so-called standard table.

Mr. Applebaum: Well, I can't speak to what kinds of decisions government agencies would make with respect to a table of this sort. I think that with the kinds of disclosure of the variation that will be presented in the study, that it would be hard to say that it was a model where one size fits all. The volatility issue, in general, from period to period is also an important one. I don't know, but I suspect that the period that we have just gone through may have been extraordinary in certain kinds of ways for turnover experience for certain segments of the population.

From the Floor: Will there be, in the study, any efforts to measure variability and standard deviations around your mean results in the interest of the next generation of actuarial mathematics that we keep moving toward?

Mr. Applebaum: I don't know that calculations of standard deviations is perhaps as useful in describing turnover experience as it is for mortality. Precisely because these are not random events. So I believe that doing studies over time that tell you how things have changed may be a more useful exercise than trying to see whether, for example, one firm's experience falls within, let's say, a 90% confidence level.