

Panel Discussion: Actuaries and the Academic Community

Mr. Jock Maynard, Chairman  
Dr. Jack D. Kalbfleisch  
Mr. Allan Loney  
Dr. Arnold Shapiro

Mr. Maynard:

I am going to spend a few minutes introducing the panel and the subject and then away we go.

This Spring, I was talking to Cecil Nesbitt about this panel and he provided me with a couple of paragraphs which I believe are a good theme for the discussion today. I am going to read them to you.

There is dichotomy between professional and scientific viewpoints. Actuaries tend to the former and much of academia to the latter. The division has been enlarged by the many changes in practice relating to computer systems, new insurance plans, pension developments and the dynamic economic environment. It has also been enlarged by the knowledge explosion in mathematics probability theory, statistics, computer science and operations research. Each side has been so engrossed in its own developments that communication and mutual recognition have deteriorated.

The theme of the discussion, will be finding ways which will improve the coordination between practicing actuaries, academic actuaries and non-actuarial academics. These three types of persons, you will note, are represented by our panel today. If we think about it, I think we will conclude that in each of these three categories there are capabilities which are not necessarily in the other categories. To get the full effectiveness out of actuarial performance you really need all these three types of capabilities.

As the discussion proceeds, we can certainly think of this conference as one example of communication between these three types of individuals. Of course, there are many other perspectives today in the work of the actuary. So I hope that in this discussion we can keep these other and perhaps broader perspectives in mind.

I am going to turn first to Jack Kalbfleisch and ask him three questions.

- 1) Do you think this conference has been successful in communications?
- 2) Have any ways of improving communications been suggested?
- 3) How can actuaries and non-actuarial academics work together?

Dr. Kalbfleisch:

I should warn you that once I get started I like to talk for an hour and a half at a time.

As Jock outlined, the theme of the session is communication between actuaries and nonactuaries. I hope to give some comments on the questions he raised through the course of my remarks.

I will tend to concentrate mostly on communications between the statistical and actuarial communities. It is widely recognized that the fields of statistics and actuarial science have a very large area of commonality. Both, for example, draw extensive and probability theory for their mathematical bases and both are directly concerned with problems of inference and decision making; that is making use of available data.

In Europe, there has traditionally been a much stronger association between the fields of statistics and actuarial science. In fact, it is probably fair to say that the best known statisticians in Europe, up until relatively recently, were actuaries by profession. On this continent there has been quite a different development -- the two fields have grown relatively independently and separately over the past several decades. If anything, a wider schism has developed with somewhat poor communications over time. There are clearly many ideas and methods that have developed in each of the areas that would be of great use in the other. There is a real problem in how to bridge the communication gap.

Many recent steps have been taken and things are improving greatly. This is a job that requires individual effort. I feel somewhat guilty in that for my own presentation, my original intentions were fairly good. I intended to provide a dictionary of statistical and actuarial terms and lean more toward the actuarial way of looking at things. When push came to shove and time pressures became severe, however, I opted for the statistical notation with which I am more comfortable.

The conference was a very positive step toward improving communications and although I was not able to attend all the presentations, I enjoyed very much those I had heard. The discussions gave me a much clearer idea of the kinds of problems that confront the actuary in dealing with mortality data and some of these problems do have analogues in statistical applications, for example, clinical trials and statistical methods. It should be clearly recognized that statistics is by no means a panacea. There are many problems in actuarial science for which statistical methods are really not, at the moment, available. I think I got a glimpse of some of these.

One thing I really enjoyed in the conference was the number of papers which dealt with applications. I think that is a very good thing.

I think there is a tendency in statistics to view research as the antithesis of applications. It needs to be clearly recognized that good research is motivated and guided by the real needs that arise in applications.

One suggestion I had arose out of the conference that I attended earlier this year in Muncey, Indiana. It was a conference of biostatisticians working in the pharmaceutical industry. During the course of the meeting, there were several sessions which dealt specifically with data analysis. For one session, the pitch that they used was that two or three months prior to the meeting, three biostatisticians were given a data set usually with some unusual characteristics and they were invited to analyze it and then to present their methods and models as part of this session. At the same time, the data was available to members of the conference. They were all invited to look at it to prepare comments on the presentations. I attended these sessions and found them very interesting. They illustrated very clearly that problems do arise, and suggested many different avenues of exploration that were helpful. I wondered whether an approach like this involving both statisticians and actuaries as analysts, perhaps in pairs, would be a worthwhile session for a conference like this.

Another format for sessions of that type would be statistics sessions at the meetings of the Society of Actuaries and actuarial session at the American Statistical Association meetings. Conferences are an ideal forum in which to improve communica-

tions. This conference has been very useful in that respect.

One thing that needs to really be encouraged is that statisticians talk to actuaries and actuaries to statisticians because there is a tendency to speak to your own kind at a conference. A department such as ours at Waterloo and which is now department of statistics and as you heard, soon to become department of statistics and actuarial science have a very important role to play in improving communications.

One of most promising hopes for a close statistics-actuarial science liaison is through joint research efforts which involves both statisticians and actuaries. There have been many steps in our own department in that direction and there is considerable encouragement for them. The paper we just heard was one example of it. We have had joint study groups and such things and I am very hopeful that a strong association will arise. Such projects evolve through each group trying to involve the other in events of mutual interest. There has been some other instances of effort in this direction at Waterloo and I hope we will continue in that way. Financial sponsoring of team research is one important aspect and this may be a place where the insurance companies and perhaps the Society of Actuaries and the American Statistical Association can help. I am thinking here of awards -- research awards essentially, to support interdisciplinary efforts.

The final thing I would like to remark on is that the actuarial profession has been very outward looking and this is becoming especially more so in later years. The profession has been very receptive to outside influence and this speaks very strongly for its basic health. The recent revisions in the examination curriculum are quite novel on the part of the Society clearly is aimed at improving communications with the areas of statistics, numerical analysis and operations research. So in general, there has been, in recent years, an improvement in communications. I hope this continues and the kinds of things that we have been doing with, for example, this conference, are a great aid.

Mr. Maynard:

Thank you Jack for your very positive report. I would like now to turn to Allan Loney who is a practicing actuary in the heart of a large life insurance company and who has come to Canada from the United Kingdom. He will share not only experience on this side of the water but also on the other side. Allan, I am going to ask you two questions:

- 1) Are there ways in which academic actuaries could be more helpful to practicing actuaries?
- 2) Are there experiences in Europe which might be applied in Canada or U.S.A.?

Mr. Loney:

Thank you Jock. It is a real pleasure to have the opportunity to be here and participate in your conference. You did not mention that I have actually been at the heart of a life insurance company in Canada here for all of 15 months, so my exposure to the academic actuarial situation is relatively limited.

I was asked to comment on the situation in Europe. I can not really say too much about Europe, but I can about the U.K. and Ireland, and I can certainly report to you that the situation that I find over here is far and a way in advanced of anything that exists in the U.K.

There is nothing like the wide variety of degree courses available to students who want to adopt an actuarial career and I

do not believe there is anything like the degree of research papers presented to the profession. So, indeed, I am not sure that there is a tremendous amount that can be learned at the present time from developments in the U.K. Let me just think of why that is the situation. I think maybe one of the reasons is that the profession is tremendously compact -- I mean geographically compact. In the U.K. you have well over half the actuaries within the center of London.

Addressing the other, perhaps more substantive question that Jock asked -- how can academic actuaries be more helpful to practicing actuaries? First of all -- what are the qualities of the academic actuary that are perhaps different from the practicing actuary? I am sure there are many, but a few seem to come to mind. One, I think the academic actuary is certain to have his mathematic facilities in much better working order. He is up-to-date. Indeed, in the short time I was here before this session commenced I heard some expressions and technical terms and so on that stirred very distant and few memories. I am certain that is the situation for most practicing actuaries. They gradually get out of touch with mathematics and certainly pure mathematics. The other thing that I believe the academic actuary will bring to bear in any particular problem, is a very much more general view, a view that isn't buffeted by the immediate demands of a commercial situation.

Having thought about that, what practical steps can be taken? It seems to me that one is selection of the issues to be addressed in research. I think this is absolutely critical. Academic actuaries should be leading the way and bringing scientific treatment to the new problems that are facing us. It seems to me (I think this is a comment about the actuarial professions as a whole actually, but clearly it must equally apply to academic actuaries), that we sometimes are solving yesterday's problems. I have been involved a tremendous amount lately in matters of the relationship of assets to liabilities in insurance companies. Now this problem has actually been around or some 150 years, but when addresses in the textbooks, practical transactions of actuarial societies and so on, one finds few references. I put this forward as one topic. Surely there is some tremendously central problem that has to be addressed.

Another question involves the surplus levels a company should be holding. This problem really is at the heart of business. There are some papers on this; but not very many of them give very much in the way of numerical guidance. When you get down to it, numbers are our game. This is an answer one should be trying to get at, and where, perhaps, academic actuaries can play a tremendous leading role. I am not suggesting that none of these problems have been addressed, but perhaps they can be concentrated on to a greater degree.

There is a second thing I wanted to touch on. It seems to me that academics are spending some time working in industry and solving problems jointly. I had not heard -- this may be something that escaped me -- of very much in the way of facilities for people in industries to have, what you might call, post-graduate training. Here, people who intend to continue the majority of their actual career in the insurance industry or consulting would have an opportunity to refresh their skills and to polish them up. This seems to be something that really could bare tremendous fruit, and I am not sure that there are a tremendous number of practical financial problems that need to be addressed to make this a practical possibility.

So, those are two things I would put forward for your consideration. First, make sure that things that are being researched are really very central and relevant and, second, a possibility of people within industry having this opportunity to refresh and develop their skills.

On a very positive note, I might comment on the research and one of the other prime functions of the academic actuarial world, the training of students who wish to graduate to an actuarial career. In my relatively short observation of the products of the courses available in certain universities in Canada, you are doing a really tremendous job. People, certainly in our company and other actuaries in other companies that I talk to, have made the same comments.

Mr. Maynard:

Thank you Allan for another positive report. Turning now to Arnold Shapiro who I hope will agree to be the anchorman in this:

- 1) What role should an academic actuary place in relation to his university, his colleagues, practicing actuaries and actuarial bodies?
- 2) What help does he need from other actuaries?

Dr. Shapiro:

I always am somewhat troubled by the term "academic actuary," because it implies a dichotomy between the practicing actuary and his academic counterpart. I am not sure there is such a dichotomy. The frontiers of actuarial science are continually being expanded, as are job descriptions. In consequence, the academic is compelled to monitor trends in the industry and the practicing actuary is compelled to keep abreast of relevant theory. The net result is a crosspollination which tends to mitigate against a dichotomy between practitioners and academicians.

Having said that, I will speak to the topics raised. My format will be simple, I will make some observations and ask some questions. By and large, the observations will not be new, and most questions will be posed without providing answers.

The role of the academic actuary at universities varies considerably. At some universities, the emphasis is on the preparation of students for the Society's examinations. At others, while passing professional examinations is stressed, the primary thrust is broader than that. In general, the academic actuary has a job description which, in varying degrees, includes teaching, researching, consulting, and service to professional organizations.

The teaching function of a program often is dictated by its environment. This has led to a continuing debate as to where the actuarial program should be housed, and which are the most appropriate colleagues. Possibilities include the mathematics department, statistics department, insurance department, and so on, and their related colleges. As with any organization, affiliation has an impact on strengths and weaknesses. Quantitative departments, for example, tend to stress quantitative subjects. One consequence of this is that many actuarial science professors have never taught a qualitative course in insurance. In some instances, a more relevant consequence is that their students may not be exposed to such courses.

Traditionally, the emphasis of major universities is on research. Research is not restricted to universities, of course, there are many fine R&D departments in industry. A primary dif-

ference between research at universities and research in industry, however, is that the justification for the research at the university often is guided by the whims of the individuals doing the research. Thus, while the research may be currently applicable, it need not be. Similarly, while there may be substantial interest in the research, there need not be.

One of the constraints, insofar as research of academics is concerned, has to do with the way productivity is measured. "Practical" research, for example, may be inconsistent with promotion and tenure policies in some departments in some universities. This may be particularly important for young faculty members. Thus, there may be difficulties developing research which is both academically rewarding and "practical."

The rationale for this notion is the commonly heard bias within academia for pure, rather than applied, research. This characterization of research as either pure or applied has been counterproductive, in the sense that it lends credence to the dichotomy hypothesis. Here again, however, the dichotomy may be one of degree rather than substance, since the pure research of one individual is the applied research of another. Mathematicians, for example, tend to regard actuarial science, like engineering, as an applied area.

This bias is not one-sided. Practitioners tend to stress the professional and applied nature of their vocation, and to play down its academic aspects. The irony is that the man in the street continues to regard all actuarial work as somewhat academic and esoteric.

One form of research for university faculty is consulting, and it is not uncommon for faculty members to devote up to twenty percent of their time to this function. This tends to have two advantages. One advantage is that it helps the faculty member stay in tune with changing trends in the industry. A second advantage is that it adds to the income of the faculty member, and thus reduces the burden on the university to otherwise compensate a highly marketable individual.

This burden of funding an actuarial program continues to be an important consideration, and the approach varies considerably by university. Where the thrust is towards the passing of examinations, it is common to find significant industry sponsorship. This is not the only factor, of course, such things as proximity to industry, status of alumni and organization plan of the program also have a major effect on funding. While industry funding continues to be an important thrust of many programs, there are concerns that such funding may erode academic autonomy. To the extent that this is a real, rather than a perceived problem, it has to be resolved.

Insofar as the relationship between the academic actuary and the practicing actuary, a major problem is the communication gap. What is unclear is whether it originates within the industry or within the universities. There seems to be barriers to communications from both sources.

It often is observed, for example, that academic research will not be appreciated by the profession unless the researcher does an adequate job of communicating the results of his research. Many researchers, however, regard communicating research results to practitioners as discretionary, and feel that communication need not be an integral part of research. Furthermore, it has been argued that communication, per se, is not the problem, but, rather, the level of communication, which often is far too low to be of interest to many researchers.

This brings up the question of the extent to which researchers are motivated to communicate the results of their research to the profession. A major complication is that considerable industry research is of a proprietary nature, so that much of the sharing is in only one direction. With this in mind, motivation becomes a very important issue.

One solution to the motivation issue is funded research. It has been argued that there is an obligation on the part of the profession to fund research if it is sincerely interested in promoting a dialogue between academicians and practitioners. This raises an interesting economic question. Perhaps one of the reasons there is limited funding of research by the industry is that the industry does not view most academic research as particularly important.

Turning, finally, to the help that the academic actuary needs of other actuaries, perhaps the single most important need is to interact and to share insights and ideas. On the surface, this would seem to be a natural phenomenon. In fact, however, for those academicians who do limited or no consulting, interaction often is minimal or nonexistent.

One way for academics to promote interaction is through participation in services to professional organizations. Indeed, academics have traditionally regarded such service as part of their job description. In recent years, however, it has become increasingly difficult for many academics to participate in the affairs of professional societies because of the tight money policy at universities.

To some extent, this problem is resolved. As long as the services provided are related to the educational process, professional organizations tend to reimburse the academician for his expenses. This is the case, for example, with service on Education and Examination Committees. Expenses associated with services on other committees or attendance at society meetings, however, generally are not reimbursed, so there is much less involvement in these areas. If some way could be found to resolve this problem, it might do much to promote more interaction between practitioners and academicians.

In summary, there are a number of fundamental issues that face academic actuaries. Many of these are perennial, so it is not surprising that their resolution is not trivial. Meetings, such as this, are helpful in that they bring many types of actuaries to a common forum, give us an opportunity for discourse, and, in the final analysis, may prove to be the vehicle for the ultimate resolution of some of the major issues.