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REPORT ON DYNAMIC SOLVENCY TESTING RESEARCH (DST)

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Panelists will inform financial reporting actuaries and other interested parties about the Society of Actuaries research activities directly related to dynamic solvency testing (DST).

MR. ALLAN BRENDER: This panel discussion will focus on Society research efforts in support of DST, or dynamic financial condition analysis, as it has been renamed. I am a consultant with William M. Mercer in Toronto. With me are two individuals who are very well known in the Society. Donna Claire is a member of the Board of Governors and president of her own firm, Claire Thinking, Inc. in the New York area. Godfrey Perrott has served as chairperson of many SOA committees, including general chairperson of E&E; he is a consulting actuary with Milliman & Robertson in Boston.

We will discuss several recent and ongoing research projects. I will begin with a brief description of a project that Donna and I jointly completed. Donna will then speak about a project recently completed by Robert Fillingham who, unfortunately, could not be with us. Following Donna, Godfrey will speak about an ongoing project on economic assumptions that was featured in the March 1995 issue of *The Actuary*. If there is time remaining, I will review a few other projects that the Society is planning in support of dynamic financial condition analysis.

Our project was definitional; we were asked to investigate questions in five areas that were identified by the DST Force, which was chaired by Godfrey. The object was to lay out a path of attack and suggest specific areas in which additional technical research is needed. When the requests for proposals appeared, Donna and I made independent submissions; it was the decision of the project oversight group to team us up, and I am grateful that they did. Our report is available from the Society for \$10. I am not going to read it to you now but instead will give a brief summary.

The first question dealt with the time frame for analysis; how far into the future should we look? Basically, we noted that consumers of the actuary's work would probably be most comfortable with a three-to-five year time frame. However, life insurance is a long-term business and the actuary has to study long-term risks. The period of study need not be the same as the period reported on. Some way must be found to incorporate the longer term; we offered a few suggestions on this.

Dynamic financial condition analysis will usually involve projections under a number of scenarios. Our next topic dealt with the interpretation and analysis of results from these scenarios. We considered whether analysis should focus on the company as a whole or on its operating lines. Each scenario gives a large number of numerical results. It is significant to pick a few important results for analysis in order that the projections may be understood. The problem is compounded when many scenarios are projected. We suggest that graphical methods may be best when large numbers of scenarios are involved. The next area we were asked to consider was credibility and reliability of the dynamic financial condition analysis. We concentrated on two areas: the model of the company

used to project future results and the appropriate choice of scenarios to be investigated. It is my belief that model building and cash-flow projections are the actuarial technique of the future. We have a great deal to learn about a systematic approach to constructing and validating models. We also need help in choosing an appropriate variety of scenarios to be tested. This need is behind the project that Godfrey will report on as well as some others I will describe later.

We were asked to discuss the confidence standards that should apply in DST. Our main conclusion is that this is not a statistical exercise; our scenarios are not randomly drawn from a well-understood universe. Most actuarial opinions are at best qualitative and do not offer numerical levels of confidence. However, we suggest that there is a great deal of research to be done in seeing how stochastic models can be applied to this type of analysis and whether there are other mathematical tools that might be of use.

Finally, we were asked to consider the question of reliance by the actuary on the work of others. The actuary may make use of the work of other specialists, such as marketing or investment officers, but retains full responsibility for the quality of his or her analysis. Ultimately, this is more a question of professional standards of practice than an area for technical research.

That's a very brief summary of the kinds of things that we looked at and I think as a result, there will be more detailed technical research projects coming out that some of you might be interested in undertaking. Now I'd like to call upon Donna, who will talk about Bob Fillingham's work.

MS. DONNA R. CLAIRE: I actually have two comments on the work Allan and I did. It was quite enjoyable working with a Canadian on it, other than when I would send a WordPerfect document up, his spelling was always wrong. The second thing is that the best line in our report (which was driving some people crazy), was that we recognize that we're dealing with actuaries, but also that we're dealing with an uncertainty and that we can never get 100% certainty. So in the report, we do say that certain things are not only currently unknown, but may be unknowable. That is something that we must consider. No matter how much research we're going to do, we're not going to be perfect. We are not going to predict the future.

As I commented, I'm actually playing Bob Fillingham. Unfortunately, he couldn't be here, but he did a report at the request of the Society. For those of you who are on CompuServe's Actuaries Online, you can download this for free. In fact, both of these reports are on Actuaries Online.

The job that I did with Allan was the first time I was involved in a research project. As Bob acknowledges, many people are involved. We are trying to do this right. We're trying to come up with the professional answer as opposed to our own personal opinions. There's a huge review process that goes into any of these projects. The Project Oversight Group (POG) and the SOA staff, which includes a number of actuaries, also contribute greatly to the final product.

Specifically, what drove this paper was the American Academy of Actuaries' 1992 paper that commented that DST effectively is the way to go. The paper said that it's what has

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to be done to prevent insurance insolvencies. We wanted to substitute facts for appearances.

The source had to be limited to companies that Bob could look at. The source of the information was Best's survey of insurers that failed from 1976 to 1991; this was the original selection criteria. In that period, 290 insurers failed! They specifically wanted to exclude the big guys, Executive Life and Mutual Benefit, because so much had been written on them already. They wanted to examine companies where DST might have made a difference. Looking at 1991 alone, they came up with seven that met the criteria. Two of these companies, Fidelity Bankers and Trust Capitol, were sister companies, so they actually only looked at one of these.

In order to do the job, we first had to define what DST actually meant, and after some work by the committee, we came up with this definition: DST is the measurement of a company's present and future financial condition by the use of modeling. It explores sensitivity to potential future events that may affect the company financially under a variety of plausible scenarios, both for the company in total and by major lines of business, over a period of several calendar years, following the last calendar year-end in which the company had been in business. Basically, DST is looking at the entire business of the company very thoroughly.

The basic evaluation standard as to whether DST would have worked is that they went back to 1986 (five years before the insolvencies). If DST was done in that period, and any subsequent period, would it have signaled major problems? Specifically, in effect, capital ratios or liquidity problems. As an example, one of the companies that they looked at had, I believe, something like 80% of its assets in stocks or real estate. And my basic answer, which is also Bob's conclusion, is that all you have to do is look at that number and, considering it was basically in traditional lines of business, you could have said that it will have problems. We really didn't have to do a thorough analysis on that one.

But—this is important—DST is going to be expensive, in general, to examine the entire company and to examine a number of different paths. So certain things must be considered as to whether it's worth it. Would you have been signaled early enough? For example, if the signal was only a month before it went insolvent, that would be useless. If it was five years before, it would be a useful test.

Some of these companies are small. A question is, could the company have afforded to hire somebody to set up the model? Also, some of these companies were health companies. How good were their actual data? Would DST have shown that there may have been problems with this particular company's underwriting, for example? Access to information was a concern as was credibility and understandability of the results. Some of these companies got into new lines of business in the last five years, and with a brand new line, you probably did not have any credible results. Despite what we're showing in that example, you're not absolutely sure if one year is going to be representative. Also, do you have to do DST if, for example, the risk-based capital formulas would have triggered which companies and which areas were in trouble?

Another concern that has been expressed is, if the regulator had known about these things in 1986 for example, what action would have been taken? As a sidebar on that issue, I've been involved in the last couple of years with four companies, at the request of regulators,

that were on one side or the other of insolvency. I did complete DST for two of these because I thought they were rescuable. Two I gave back to the regulator and said, "These can't be rescued." As an actuary, there was nothing I could have done about one case, so I could not find a way out of the box.

Of the particular companies that were studied, Bob concluded that two of them, Fidelity Bankers and InterAmerican, would have definitely been helped by performing DST. Both of them were relatively large companies. In fact, Fidelity Bankers had over \$1 billion worth of assets. They're both in interest-sensitive lines of business. One had grown its new business ten times in that five-year period. DST would have certainly triggered some problems. Certain companies, he concluded, would have been helped, but it wasn't necessarily the only way to go. In this category, he claims that simpler testing would have revealed things. Specifically, I think most of these were health companies. So he was looking at solvency testing as a full cash-flow analysis, whereas, gross premium calculations, which I actually consider part of DST, probably would have been enough. That last one happened to be the one where the majority of the assets were in real estate and stocks, and it was intuitively obvious. All you had to do was look at the annual statements and see there was trouble. So the bottom-line conclusion was that DST, in certain cases, can be helpful. It is not the only answer. In certain cases, much simpler testing would have also triggered some review by management if they were looking at the numbers.

MR. BRENDER: I will be presenting a complete DST study of a real company. It's a real company which, in fact, was barely solvent. In the session, we'll show you results for many scenarios and talk about what we told management and what we told the regulators. I want to assure you that this has all been done with permission of the company. The facts come through even though the numbers have been changed. So you won't know what company it is, because it is still in the marketplace.

MR. GODFREY PERROTT: I want to talk about a specific part of DST, but before I do that, I want to talk about DST in general because I have some fairly strong feelings about it. Walt Rugland recruited me to be the chairperson of the DST force in 1992. He asked me to recruit a task force to outline what the Society had to do to put the materials in place so that actuaries would be qualified to perform DST. I think that was an extremely important function. I think it still is. And I think the work that's been done since then, by many people, proves it. I think the original Academy position was one of the most ridiculous positions that any actuarial body has taken in recent history. If we get so arrogant as to say that we as actuaries believe that all insurance companies should be made to perform DST, we deserve to be encouraged to find another line of work. I strongly support the education part, but I want to distance myself as much as possible from the original Academy position.

One of the problems that we identified on the original task force where we thought research needed to be done, was the problem of coupling assumptions used to make projections or to make actuarial projections with economic assumptions. In the actuarial literature, there are boxes of papers that have been written on the term structure of interest rates, on interest rate generators, and on interest rate models. You would draw the conclusion, if you read through that literature that, as of a couple of years ago, actuaries believed that if you could model the yield curve, you could project anything. And as we talked about this on the task force, we found that all of us felt strongly that there were

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many other economic assumptions that affected actuarial projections or projections of insurance companies that were frequently far more important than what the yield curve was doing, particularly in lines of individual life and annuity.

And so in the original task force, one of the activities we recommended was further research into the coupling of economic variables with the typical assumptions we use to make projections. At that time I thought I was done with this task force. We prepared a report and we did, in fact, have the three meetings (and no more) that I had promised the membership. The board accepted our report and discharged us with thanks. But then Jim Reiskytl called me and said he wanted me to do something more. Somehow I got dragooned into being the chairperson of the task force on economic assumptions. And for some reason I agreed. So we recruited a task force that consisted of, in addition to myself, Jed Frees, Mike Zurcher, Mike Cowell, Dave Carlson, Rich Lambert, and Warren Luckner. We met and tried to decide what we would do about this. We decided we should survey the membership and maybe that would tell us something. So we prepared a survey for the last issue of *The Actuary* and asked everyone to return it by April 10.

How many people have returned the survey to the Society? OK, for all of those negligent people who haven't returned them yet, I strongly encourage you to return them. It is a one-page form that already has a fax number on it. It's very easy to submit. We have actually received about 100 surveys so far. The survey is line-of-business specific, so you can vote more than once, even though this isn't Chicago. And I would strongly encourage each of you to submit at least one survey. It isn't that difficult to fill out. It takes some thought, but we believe the results will be valuable. I have some preliminary results. I had planned to comment on them, but given the fact that no one has yet responded to the survey, and I'm sure that everyone will, I don't want to bias the answers. So I think I'll stop there and give it back to Allan.

MR. BRENDER: I'd like to talk a little bit about the research efforts that are going on in the Society right now. Research efforts have been revitalized and are quite different from anything that I remember a few years ago. For example, there is now a binder called "Research" which contains descriptions of procedures and all the research projects. As you can see, it's nontrivial. There's a fair amount of material in there. The Society has organized it into practice areas and is coordinating research efforts in many areas. In particular, I want to mention a program where it is putting out questions and contracting with researchers to look at these for some pay. The reports that Donna, Bob Fillingham, and I did are of that kind. You're not going to make a living at doing this; it's not that kind of pay. However, there is some recognition for the effort involved. Of course, the idea is not just to go to actuaries, but to also try and get other interested people with the appropriate expertise. This might be university faculty, consultants, industry people, or anybody else who has something to contribute.

There are many new committees now which don't have the status of committees, so if you look in the *Yearbook*, you won't find them. These are the POGs. If the Society identifies a problem and decides that it's something that will be contracted out, then it forms a POG, which then has the responsibility for drawing up the description of the project, seeking out bids, awarding the contract, and ultimately approving the final product. For example, we had several conference calls with the POG for our project as we went through various revisions of our report. They made sure that they were getting the product that they had contracted for.

I went through the research binder and will tell you about a number of projects, just to show you the kinds of things that are involved. DST within the SOA's structure now falls under the finance area of practice but in fact, it originally began in the life insurance area. So, one or two things are listed in this book that are in the life practice area, particularly two projects called "Actuarial Modeling 1 and 2." For Actuarial Modeling 1, the chairperson of the POG is Bob Johansen. He's talked about it at a number of recent meetings. That project has much in common with what Godfrey is trying to do in his project. They were trying to look at various economic time series and various series of experience rates in insurance in trying to determine if there are any relationships. I think a lot of what you're trying to do, Godfrey, would be in that area; that is, trying to look for relationships. They put out a request for proposal and got basically no response. I think that there is a great deal of overlap and I'm not sure exactly where that project is going now.

Actuarial Modeling 2 is a longer-range project and I happen to be chairperson of the POG. It's directed to saying, are there any other ways to get at descriptions of the economy other than with stochastic models? There's a feeling that the kinds of tests you want to do in DST involve stress testing to some extent and that the existing stochastic models are not going to come up with the extreme cases, the real outliers. It's not very likely that you are. Also, whatever stochastic models do exist are perhaps too simple. As a matter of fact, I would maintain that the interest models that exist now were created mostly by financial people for the pricing of options, futures, derivatives, and so on. The properties that they see as desirable in those models (e.g., no arbitrage, etc.) may not be the properties we want our models to have at all. Just because it's good for pricing doesn't mean that it's going to tell you all the kinds of extreme things that can go on. Nor is an examination of just the yield curve enough. All kinds of other things might impact our models; for example, economic influences. There are other things that we should test that we don't currently have. I don't think we have sufficient models right now. There's the whole question about whether a stochastic approach is really going to be sufficient. Ed Lew, who was a grandfather to much of this, is driving this Actuarial Modeling 2 idea and asking if we have any other approaches. Maybe stochastic isn't the only way. The problem with this, of course, is that it's so open-ended that it's hard to know when this project will ever occur, but there is something going on.

A project called "Boundaries of Risk" has two components: behavior models and alternatives to cash-flow testing." This project was actually put out for requests for proposal. Proposals were received and my understanding is that Donna is about to begin on that. It seems like a very closed community, but you're encouraged to jump in.

There's a project within the life area on option-pricing models as an alternative to cash-flow testing. There's a project on diversification of risk, which is definitely related to the solidity and financial condition of insurance companies. An ongoing project is analyzing insolvencies of health carriers, similar to Bob Fillingham's project. I'm not sure whether it's close to completion.

Finally, I will comment on two other projects. The Committee on Knowledge Extension Research has a generalized project on different modeling techniques. And a project being done right now by Jed Frees is titled "Modeling Life & Health Insurance Operations with Solvency Considerations." Incidentally, for all the projects (or most of them) that I've mentioned, it's suggested that the Society and its committees come up with questions and then put out bids for proposals. There are other avenues. For example, in the academic

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community, the researchers will have interest in certain questions and then will go seek support. Most often, these proposals of this kind come into the Actuarial Education and Research Fund (AERF). The AERF is a body that takes in all the North American actuarial organizations and attempts to fund and organize this kind of research effort. I think Jed's proposal came that route but I'm not sure. The AERF has money of its own, but it also is in contact with all of the actuarial bodies: the Society, the Casualty Actuarial Society (CAS), the CIA, the Conference of Consulting Actuaries (CCA), and the AAA. If it thinks that the project has some merit, but it can't give the 100% support that is requested, then it may put up some of the money and refer the proposal to one of these other bodies for the rest of the support. I think that's why Jed's proposal comes to be in this book.

I want to mention all of this because there is room for all kinds of approaches to research. I'm very encouraged that the SOA, in particular, has embarked on this very extensive program and has decided to devote a great deal of money to it.

Finally, before I throw this open for any questions or discussion, I believe that cash-flow methods are the actuarial technique of the future. All kinds of cash flow work is being done in terms of DST, reserve validation, appraisals, and embedded values of companies. If you want to know what the fair market value of a company's in-force business is, you run that closed block off and see what profit emerges. That's one way to do it. That's how we do appraisals: the value of the in-force business is based on the discounted present value of distributable earnings.

There are all kinds of other uses for cash-flow models as they emerge. These models are not only being developed in the U.S. and in Canada but also in the rest of the world as well. I think that the first models that were really developed and done well came out of Finland by Pentikainen and his people. Their models applied mostly to P&C work. A great deal of work is being done in the U.K. Committees of the Institute of Actuaries (IA) are examining the problems around terminal dividends or bonuses. A company might have a problem there if it pays out too much to people who leave, either because of surrenders or because of death. Paying out too much can threaten its own solvency. So you have to do some kind of projection to see whether your bonus scale is dangerous.

My point is that many people are doing this sort of work, and everyone has their own favorite methods. Some people use interest rate generators that are reasonable. Many interest generators are wrong, by any theoretical sense. Most people aren't paying attention to them; as long as they have a generator, they're happy. We have a lot of data. We don't know how to put them together. And as I was saying before, it's time for some kind of organized approach to cash-flow testing. I don't know the details, but I've been trying for some time to get some kind of movement on this, encouraged partly by Pentikainen. I know that the SOA is willing to supply us with some funds so that we can start having international conferences and organizing this sort of thing. If any of you are into cash-flow modeling that way and are interested in conceptual questions, either about scenario assumptions, building models, analyzing results, or uses of extending the approaches, then look for some announcements. I hope we'll have some sort of conference. I think that this area will be developing and I'm happy that the Society is contributing to it.

MR. FRANK P. DINO: I have a general question on the detail and intricacies of development. From everything that's been said, it sounds like you're really still talking

about projected sales and everything is targeted to the lines of business and the insurance products, along with the yields, the expenses, and whatever else. But what about the other operations of the company for getting insurance projections? If the plan of operation calls for significant growth and new products, does DST incorporate expanding the home office building and facilities? Does it get into holding company expenses and commitments to the owners? Does it get into the board of directors? What if the chairperson of the board is 80 years old with a golden parachute of 50% of surplus upon retirement?

MR. BRENDER: Our view is that it gets into everything. It should get into everything. If you're doing it, and particularly if you're doing it and reporting to the board, the whole idea is to warn them of anything that can go wrong—anything that is a reasonable danger. That means, of course, that you have to have a very sophisticated way of doing your study. But it certainly takes many more products, and it certainly takes in everything about the assets, and it certainly takes in new products as well as old. It should also include all those other things, such as buying subsidiaries—trust companies or S&Ls—and not knowing how to operate them and then losing a substantial amount of money. Those things should be tested.

MS. CLAIRE: You will notice with that question, the actuary's role has to expand far beyond what is in the annual statement under the reserve lines. The actuary would have to have access to all management and to major management actions. For DST to work, the actuary has to be part of the management team.

MR. BRENDER: On that score, and I'm talking from the Canadian experience, which is that you're required to do DST, you're required to report directly to the board. You need all this information and the legislation says you have a right to it—and the board can't deny you it. Legislation also says that if you report to the board, no matter what happens, as long as you're reporting competently (which in legalese means in good faith), no one can sue you. No one can sue anyone who gives you legitimate information.

MR. W. KEITH SLOAN: One of the columns that I have submitted to *Contingencies*, which may or may not get published, is titled "The Good, The Bad, and The Ugly." It's on the general cash-flow situation and I have concluded in it that there is a need, or at least a use, for both scenario testing and dynamic testing, but it depends on which side of the coin you're looking at as to which you use.

MR. BRENDER: What's the difference?

MR. SLOAN: There's a big difference. The stochastic testing is a wonderful tool in pricing. But for the purposes of Frank Dino and myself, when I used to be a regulator, scenario testing is also a matter for management. This is because management can understand it. It is a specific stress test. I, too, have had the experience recently with a company that was actually under supervision at one time. We didn't need to do any kind of dynamic testing to find the problems. It was just doing things it shouldn't do.

It was purchased by some people who pay attention and who have made good use of the scenario test, which is all we give them, to get their ducks in a row, as the old saying is, and it's going to be a very good, healthy company.

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MR. BRENDER: I just think that the distinction of dynamic versus stochastic versus scenarios is what I guess I would call the stochastic-versus-deterministic approach. Yes, there are many debates on that.

MR. PERROTT: I just want to comment that dynamic testing can either be stochastic or deterministic. It means that future assumptions appropriately reflect the scenario and it's not limited to stochastic. I agree with you that scenario testing has many uses—deterministic testing.

MR. SLOAN: Scenario testing doesn't need to be totally deterministic. It can take interactions into account and should. In fact, I wish that some of the projects would help us identify some of the interactions so that we can bottle them better.

MR. BRENDER: That's what this project is.

MR. DINO: Historically, under the valuation basis and reserving practices, it's simply been tabular formula reserves. Going into the dynamic modeling with cash-flow testing and now DST, I have a question. A position that the Society and Academy have never taken as an issue is the signing of the opinion. All you have to do is give this closure, but independence has never been required. With dynamic solvency and with the closer relationship and the internal assumptions that the actuary may have, is there a problem if he or she is a key owner of the company?

MR. PERROTT: Because all three of us are consultants, we would strongly support the independence concept. However, I think we have a conflict of interest, which we have to disclose before we try to answer your question.

MR. BRENDER: The position of the appointed actuary in Canadian legislation is inherently conflicted, because your obligation is ultimately to the regulator. But you're expected to be senior management or perhaps a consultant. The question is, how has it worked in practice? I know of some cases of companies that have been troubled, and I've been told by regulators that it's a mutual support thing. In fact, some company actuaries were saying things that were warnings. "You, had better do this, you had better do that." It was very similar to the kinds of things that boards of directors sometimes hear from the friendly regulator and then tend to say "What do they know? They're regulators." Then all of a sudden what happened was they were getting similar information from two independent sources that were supporting each other. It worked out quite nicely. But it meant that the actuary had the guts to stand up and say this was wrong. Things are going on here. So the Canadian view is that it's possible to have an employee who has an independent stance. That's a whole philosophical argument and I'm not going to get into it here.

MS. CLAIRE: I will admit that I had been doing cash-flow testing as an employee, and when presenting management with results that they were not exactly thrilled to death with, I did stick to my ground, although I felt I was about to be shot out of the 49th floor window. It's probably much scarier as an employee. It is also helpful at that point, in effect, to get a peer review, even from an internal person, just to make sure that you are on solid ground.

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MR. DINO: What about the future timelines for your projects, reports, standards of practices, and whatever else will come out about dynamic solvency?

MS. CLAIRE: How soon are we going to be doing it? Is it going to be required in the U.S.? Godfrey says never. I think we have a divergence of opinion in the U.S.

MR. JAMES F. REISKYTL: I think that's very true. Frank's obviously raising some good questions. I can put on my optimistic hat and say that if I were part owner of a company, I would like to know whether it was going to make it. I guess I would have a very strong interest in some type of an analysis of the dynamic financial condition. And that's what we've been trying for in our handbook. We have developed a handbook not to try to produce a cookbook, even though you say it can be used like that. Obviously, the intent is that it will be used to get at some of the very issues you raise. And that is, the actuary should be close enough to the company to know the issues. The actuary can't just do a New York Regulation 126 test for six interest rate scenarios and sign a statement and say "I'm done." Unfortunately, it's much more involved than that, either fortunately or unfortunately. I would say fortunately because it gets to the real core of the issue which, of course, is our intent.

Obviously, I admire my Canadian friends who have the freedom from the litigation that the U.S. actuary faces. Hence, we are unfortunately not in the same position and hence, we may go in different directions. The bottom line still is that management is entitled to know what will stress the company, what condition it is in, and however you express that, that's very important. I would hope we would focus on research that is needed so that you as actuaries can do a better job. I support it and clearly there's a lot of work being done on cash-flow testing, but I don't want to make it the exclusive thing. Someone would say, "Well Jim, aren't you all about cash-flow testing?" The answer is no because clearly, there are other techniques.

The economic assumptions clearly consist of much more than just interest rates. Say the interest rate changes; then fine. That doesn't tell me too much; what happens in the rest of the world does, so I can tell you what happens to the stock market, real estate, etc. I think the same thing is true in this instance. You're going to bring to bear many factors and cash-flow testing is just one technique, and we should not get too involved in it. That was part of our original report also. I once had to volunteer to take this on and they then decided it was a great deal of work.

I challenge the people in the audience to discuss other techniques, if you're using them. There are calls for various types of research and calls for papers. That's really the heart of the actuary as far as I'm concerned. Express yourself and then let's see what other people think. And let's see what you're really doing, what's going on in your particular operation. I would hope that if you need more research to be done, you will let it be known. The book's fairly thick but if it isn't meeting your needs, and if the handbook doesn't meet your needs, we're failing to provide you with a critical tool. I believe that the panelists are excellent examples of people who are moving this process forward. It is evolving.

MR. DONALD P. MINASSIAN: I work part-time for Indianapolis Life Insurance Company—so I have a foot in both camps. I have a question for Ms. Claire. You said 290 companies went belly-up in the period of, what was it, one year?

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MS. CLAIRE: No, from 1976 to 1991; 15 years.

MR. MINASSIAN: Alright, 290 companies went belly-up in 15 years. That's better than what I had interpreted, but it still seems like an awful lot of companies. I read the newspapers carefully. Are these all little companies?

MS. CLAIRE: Many are little. Many were health insurers. The number may have included P&C. It definitely included pure health insurers, such as HMOs, etc. For pure life insurers, the number is a lot smaller. In 1991 there were ten companies that you could consider to be life insurance companies that went belly-up.

MR. MINASSIAN: Is this an increase over the historic rate, and is that what triggered all this study?

MS. CLAIRE: The little companies in any market go in and out. What happened was major companies were failing in 1991 and making headlines all over. This is what triggered a major concern.

MR. MINASSIAN: I suppose the little companies do come and go but as far as you know, this is no increase? It's always been like this?

MS. CLAIRE: It's probably increased a bit, but again, it's not as dramatic as the fact that large insurance companies started failing.

MR. SLOAN: Having some time to spare after I "retired" six years ago, I went through some of Best's records and compiled mortality rates of insurance companies. It was almost a constant 4% up until the time period that we're talking about, and then it skyrocketed!

FROM THE FLOOR: Listening to everything that's been said, it looks like your thrust is to try to get to a situation like the DST has in Canada. However, could another possible scenario here be that it comes about in stages? One example would be, and it is excluding to begin with, items such as noninsurance operations within the family. You don't get the actuary in there, especially given this particular kind of legal environment. It just seems that the U.S. environment isn't oriented toward this. Is that an alternate scenario type of thing, where you have creeping dynamic solvency?

MR. PERROTT: I think there would be some sense to that, although I think the noninsurance operations tend to be relatively small with most companies. The biggest issue is just projecting the insurance operations of the company as a whole, including all of the overhead and some sales interactions.

MR. STEPHEN A. J. SEDLAK: I chose that example because those were things that were mentioned. But if you thought about it a little bit, you could probably come up with other areas where the actuary is not necessarily ready to jump in and expose himself or herself to litigation. Or even, it just doesn't feel comfortable and you exclude it. For example, another area would be that new business would be included, but you don't really make any representations as to future marketing plans. And as you know, there are things that are possibly predictable but awfully unknowable.

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MR. BRENDER: You don't want to test for the sole purpose of testing predictions. One of the things you want to test is new business going up some, going up astronomically, not going up at all, or even going down. You want to test alternatives and examine sensitivities. We haven't used this word, but this whole area is an exercise in sensitivity testing. That's what it's all about—giving people warning about sensitivity. So you want to test different levels of the same kind of thing. But you're never predicting and you don't want to let anyone call them your predictions; that's not what it's about.

One last thing is that I want to give you a scenario about a noninsurance operation. An insurance company owns another financial institution that issues mortgages and loans, which in turn go bad. The subsidiary financial institution has a similar name; it's identifiable and can be linked to the insurance company. For the sake of image, the insurance company thinks that it has to rescue its subsidiary and therefore gives the subsidiary good money for some of these bad loans. Parent corporations sometimes do these kinds of things. The insurance company, all of a sudden, has a lot of impaired assets on its hands. It can happen; as a matter of fact, it has happened and the insurance company is now broke. You can't ignore some of these factors.

MR. SEDLAK: I'm not saying that it's good that you would ignore these things. I'm just saying that one way to approach this thing might be to try and implement it in stages. The actuary can still provide some valuable information with the specifics that you have excluded.

MR. BRENDER: There's no doubt that it's a learning process. The first time you do it, it isn't going to be as good as the second, third, and fourth time you do it. That's been true in Canada, too. The fact is that the later reports are better than the first report from the same company. The sophistication and number of scenarios, the quality of the model—all of those things improve and no one is saying that you're going to have perfection right away. You will do it gradually, but all I'm worried about is that you don't convince yourself that you're doing it, or that it's so gradual that you never get around to improving.