

RECORD OF SOCIETY OF ACTUARIES 1994 VOL. 20 NO. 1

DYNAMIC SOLVENCY HANDBOOK

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The Financial and Investment Management Practice Education Committee of the Society of Actuaries is developing a Dynamic Solvency Handbook for actuaries preparing solvency reports. Target completion date is December 31, 1994.

The committee will discuss the handbook and their progress to date.

MR. JAMES F. REISKYTL: Our three-part agenda begins with a discussion by Shane Chalke and Allan Brender on the fundamental issues: Should this report be a required opinion/report? Should it be an internal confidential analysis? What are the actuary's role and responsibilities? Some of you may have been at the International Breakfast earlier and heard the summarized responses from many other countries: Is the role of the actuary to express an opinion on solvency and/or on financial condition? Or is the actuary's role to provide an analysis of the company's financial condition? Is the report to be an alert—an early warning system? Should this report be a report to regulators or is it an internal confidential report to senior management and possibly to the board? Is the actuary to be a team player, a whistle-blower, a cop, a person working for the regulator, or a person working for the policyowner?

Shane will present the views from a U.S. actuary's perspective, Allan from a Canadian actuary's perspective. As many of you are aware the actuary's role in Canada is much more clearly defined than it is in the U.S. at this time.

The second part of our agenda is a brief discussion of the latest updates of the handbook by the asset and pension editors, Steve Reddy and Jay Stiefel, and by one of the life writers, Rick Jackson. Third, time permitting, I will comment on some of the other sections and our research efforts.

MR. SHANE A. CHALKE: I'll start by saying, that the opinions expressed here are solely those of the speaker. I am very proud of the work that's happening right now within the Society of Actuaries in reference to this issue. What we have been calling the handbook, is quite a vast and sophisticated undertaking. But it is representative of the fact that this entire arena, that of modeling financial institutions, has advanced rapidly in a very short period. We're really talking maybe eight or nine years from when folks first attempted to do this in a meaningful way to a point where now it happens regularly in most of our financial institutions.

This development truly makes me proud to be an actuary. I fully support this effort and the research that backs it. I believe that this process will begin to dramatically improve the quality of modeling that takes place. It will create a greater spread of knowledge throughout the industry. I believe it will cause steady and continuing

improvements in our ability to perform corporate modeling and our ability to address this problem. Most important, I believe it will spawn further research and not only research at the level of what scenarios to use or how to model this or that, but also very fundamental research that will begin to question the way we actually model insurers. This would entail taking a step backwards, looking at the problem in the abstract, and starting to bring elements from chaos theory and fractal analysis. We're even starting to see use of neural nets to solve some of the problems in modeling. This is all very exciting to me.

However, I would like to raise two issues that I find disturbing in their trend line and worthy of bringing into the discussion of this topic.

The first issue has to do with the nature of modeling itself and the nature of predictions that come from the modeling process. We as a profession tend to produce, what I call, conditionally predictive models. We've become quite good at this although there's a long way to go in validating the relevance of our conditional predictions. We build models that are granular in the sense that we look at classes of policies piece by piece. We look at assets piece by piece. We look at accounting structure, both statutory, GAAP, and tax. We look at capital structure. We look at risk-based-capital and filter all this up through very powerful modeling approaches.

The fundamental goal of this approach and its prime value, is that of conditional prediction. You stimulate the model with outside environmental information. We have models that predict financial results based upon external conditions, and this is called conditional prediction.

Now, what kind of external conditions do we deal with? Well, there's quite a vast array that is expanding pretty rapidly. When I say modeling, I refer to dynamic modeling versus the static trend line spread sheets that were in place in most companies for the previous 15 years. In the mid-1980s we looked primarily at interest rates—that was the big issue. Many of us remember the 1979–81 period when we had an enormous spike in interest rates, a spike this country hadn't seen since the mid-1860s. The mid-1980s, were an extremely high interest rate environment.

So interest was the prime external environmental variable for our models. We wriggled rates and watched what happened—a very informative type of analysis. Now we're bringing other factors into play, including the economy generally. We look at trend lines, general corporate profitability (GCP) growth, and default models, and we experiment with things like tax law changes, regulatory changes, and demographic changes. We do these things in addition to the traditional actuarial assumptions: morbidity, mortality, lapse rates, and so forth—the ones that fall in the pulse of the behavior categories. That's a vast improvement to move toward a much broader scope of external environmental stimulus with our models.

However, we're still in an environment where we feel at home with conditional prediction. And, I think, many actuaries would feel less at home with unconditional predictions. What's the difference? Well, if we are providing information to management or other interested parties about what is likely to happen to this financial institution if interest rates follow this path, if the economy follows this path, if

DYNAMIC SOLVENCY HANDBOOK

mortality does this, and if these assumptions unfold, the translation of that external environment into financial projections is, I think, comfortable for us. We're fairly good at conditional prediction. As soon as we cross the line to say, and I'll go to the extreme, "This company is healthy or this company is dynamically solvent," we are making predictions about the external conditions themselves. We're making a blanket statement. Here's an analogy. Many days this past winter you wouldn't really know whether you'd make it to work the next day if you lived in the Washington area because you didn't know whether you're going to get three inches or three feet of snow. If someone asked you during that time to predict whether you're going to go to work tomorrow, that's an unconditional prediction. If someone asked you, if it snows eight inches overnight, will you go to work tomorrow? That's a conditional prediction. The conditional prediction mandates knowledge about the mechanics of the process of getting to work when it snows, calling the guy to get the snow plowed, or plowing the snow yourself, picking which car might make it to work, getting through traffic, and hoping the parking lot will be plowed when you get there.

The conditional prediction mandates certain knowledge that is grounded in experience that is grounded in the mechanics of process. As soon as you flip from that prediction to an unconditional prediction, that is, whether or not you think you're going to make it to work tomorrow, you've moved from someone who is an expert in the mechanics of the process to being a weatherman. I would postulate there's a very large difference between the two.

Now, if we're talking about bringing into play prediction about the external environment, and I'll be the first to admit someone in every business is making predictions about the external environment, the question is, who should make those predictions? Who should assess the risk of what the possible results are according to certain external conditions? I'd say that there's nothing wrong with actuaries making these predictions. As a matter of fact, many of the external conditions that we need to make opinions or predictions about in the day-to-day course of business, we are particularly good at. Some of them I'd put us in the middle. I would probably place us somewhere between Bill Clinton and Allen Greenspan in that regard. It takes on a very different picture if an opinion that I create is dependent upon making implied predictions about politics, the Federal Reserve, or Democratic or Republican results in elections. I feel very uncomfortable moving from conditional predictions to unconditional predictions.

Now, in Canada this problem is addressed in part by providing a framework where external conditions are prescribed or mandated in a sense. In the U.S. that's generally been the trend of things with New York Regulation 126 cash-flow testing. Most folks have interpreted cash-flow testing to be the trial of a series of externally produced, external conditions.

However, I don't gain a lot of comfort from the so-called specified scenario route either. Those scenarios carry further disadvantages in and of themselves. First, company and properties are subject to quite a variety of risks. Since different institutions are vulnerable to different sorts of risks, any standardized set of conditions that stress an institution will become artificial and arbitrary over time. We've certainly found this with Regulation 126.

The second problem I have with predetermined external conditions is that someone somewhere in the day-to-day course of business is making assumptions about the likelihood of certain external events; that's a mandatory component of being a businessperson. In predetermined scenarios there is the presumption of occurrence in any external scenario. Obviously you don't put external scenarios in the back as zero probability, or infinitesimal probability. My main problem is, who's going to decide on the external conditions to be tested? I believe that this is the function of management in financial institutions. The essence of what it is to be in business is the balancing of risk and return, and it cannot be formula driven from the outside.

That's my first problem with this conditional prediction/unconditional prediction issue. The second problem is really what I was supposed to talk about, which is the concept of a required report. You've probably guessed by now that I'm not a fan of this idea. I think that making such a report required in the regulatory scheme of things does three things to actuaries that we may not like.

The first is, I do believe it positions us in the role of quasi-auditors of financial performance. A required report positions us, as it were, as the in-house cop. I think that many actuaries would not be pleased to take on that role, not because of what it is, in and of itself, but because of what ensues once you adopt that role. You tend to become sequestered from the management process instead of participating in the management process. Most senior management in my experience treat regulatory conditions as digital events. We're fine or we have a problem.

Second, it's certainly been my opinion that much of the analysis that has been mandated in the U.S. has been treated as such by company management—simply as a hurdle to cross. If we cross it, that's fine. Let's file the report on the shelf and hope we cross it again next year. As a result the incentive is to compartmentalize this process and compartmentalize the people who are involved in completing it. It essentially becomes a situation of "passing audits."

Third, any requirement that surfaces through the regulatory process tends to become a least common denominator effort. It is just the reality of politics that requirements cannot come into being without a certain degree of consensus. A certain degree of consensus tends to lead toward a trivial kind of analysis. We certainly have seen this in the past, and I see no reason why that won't continue along what I call the Regulation 126 experience.

Well given that, what is the proper role of actuaries? This is very much a matter close to the heart. It depends on what your goals are in your careers. It depends on how you want to shape your career and the role within the institution that you work. For me I find it most satisfying to be an integral part of the corporate decision-making process. I would like to be first and foremost a trusted business advisor participating in the very rich texture of risk analysis. It is not a simple process. I feel very comfortable advising on the consequences of any combination of corporate strategy and external environment. It's from that process that you begin the exploration of jointly assessing with management the probability of external environments unfolding, and a set of strategies and business plans that might be put in place to temper the various risks.

DYNAMIC SOLVENCY HANDBOOK

This whole process, that of strategic planning, business planning, and risk bearing, involves sophistication, depth, and the most intimate and close knowledge of the company's very being.

In this process a lot of the knowledge that's brought into place is what I call tacit knowledge. Managements of companies very often, and rightfully so, cannot fully articulate why they make the decisions that they do or how they arrive at the opinions that they do. Generally they know it when they see it is the process that comes into play. This is not bad management, this is good management. It's not absolutely possible to articulate all the knowledge of human experience and bring it into play on a piece of paper.

We really come down to, I think, two views of the actuary going forward. And these aren't my terms, but I've heard them euphemistically referred to as the in-house cop versus the business advisor. I feel that it is in the best interest of our profession to be the business advisor rather than the in-house cop.

MR. REISKYTL: Now Allan will present his views on the questions from the Canadian perspective. He will also cover recent developments in Canada and touch briefly on what's happening in the U.K.

MR. ALLAN BRENDER: This is the third year that actuaries in Canada are actually doing dynamic solvency testing (DST) studies; some of what I have to say is based on that experience. First of all, I want to say that, although we've been doing DST for a while, I think we still have lots to learn. I look forward to seeing the handbook the Society is producing and a lot of the research that I know is going on, because I think it can be of benefit to both Canadians and Americans.

We in Canada have been doing DST to partially fulfil a requirement in our legislation that the appointed actuary prepare a financial condition report. Our legislation uses two words, which it is important to distinguish in practice: position and condition. Position is a static look at where you are. This is basically what you find in the annual financial statement. Condition is a statement about your financial health, whether you are able to continue doing business. Condition is a dynamic and forward-looking concept; position involves a retrospective and static point of view.

Saying you are in good financial condition is equivalent to saying you are in a state of good health. It doesn't really offer a guarantee for the future, and there is certainly an element of opinion involved.

As we've done DST, we've begun to wonder whether calling it dynamic solvency testing is appropriate. Are we really testing solvency? What we are really doing is investigating the company's financial condition. The important concept is sensitivity. What we are trying to do is to point out to management and to the company's board of directors those factors to which the company is sensitive, to highlight the risks which pose greater or lesser dangers to the company. We also test possible remedial actions that could be taken by the company and attempt to gauge their effectiveness. Therefore, the thrust of the DST study is to investigate the company's sensitivities.

I agree with a lot that Shane Chalke said about conditionally predictive and totally predictive models. However, I believe the matter of prescribed scenarios has been largely misunderstood, not only in the U.S. and the rest of the world, but also in Canada. It was the intention of the original Canadian Institute of Actuaries committee, which formulated DST, to suggest a minimum set of factors that everyone should consider; these include variations in mortality, interest rates, lapse rates, volume of new business, expenses, and so on. Instead of just listing these factors, we described scenarios involving specific variations in each of them. These are a minimal set of scenarios to test. They are suggested but are not required. And, they are not a sufficient set or a safe harbor. The ultimate responsibility is placed on the actuary to select all necessary scenarios and do all the testing that is required for the particular company. This choice of scenarios should take into account what the actuary knows about the company and what he or she suspects management might or might not do in certain circumstances. It is important to be a skeptic at times with respect to management's actions. For example, management people may say that they will lower participating policyholder dividends whenever a problem arises; however, the actuary may know they don't react very quickly. It is important to show them what that delay costs the company.

Now that we have been doing DST for a while, the CIA committee has conducted a survey of appointed actuaries to learn from their experience. The results show that there is a lot of confusion among Canadian actuaries about the suggested scenarios. There were many suggestions for scenarios that should be removed from the list and others that should be added. These suggestions appear to have been made under the mistaken impression that the listed scenarios are mandatory. This is not the case. Since the listed scenarios are merely suggested, there isn't nearly the need to modify the list as seems to be indicated by the survey results.

Now, let's look at Shane's concerns. I think some of his concerns are valid. However, they really have more to do with the role of the Appointed Actuary than with DST. The question is really, "What should the role of the Appointed Actuary be?"

I think that there's a fundamental difference in culture between the U.S. on one hand and Canada and the U.K. on the other. We have a fundamentally different relationship between the industry and regulators than you do. It's not nearly as confrontational. I think that a lot of the conflict that Shane is concerned about, which I do believe is real in the U.S., does not exist to quite the same degree in Canada. Now, I've noticed that our regulators are becoming more bureaucratic and that changes are taking place in our relationship to them. I also hear some people in the industry beginning to talk as if they were south of the 49th parallel. But I think the cultural difference persists and is the reason why our system has been working and why we and the U.K. have the Appointed Actuary system. I don't discount these differences, and I'm not going to stand up here and say the U.S. should adopt our system, because things really are different.

It is the role of the Appointed Actuary in Canada and the U.K. to warn management and the board when something looks potentially dangerous for the company. This requirement is in our law because the profession asked for it. If management does not react in a reasonable period of time, then there is an obligation for the actuary, if the situation calls for it, to go to the regulator and, effectively, to blow the whistle.

DYNAMIC SOLVENCY HANDBOOK

Interestingly, there is no specification of what is a reasonable period of time. It seems to be left to the actuary to decide whether the company has responded rapidly or sufficiently.

Is there a conflict of interest for the actuary? Yes, you can be between a rock and a hard place. Does the system work? It seems to. Those of you who heard Chris Daykin speaking in the session just before this one, or in many other sessions over the past few years will know that this type of system has worked very well in the U.K. There have been instances of whistle-blowing in the U.K., and the Appointed Actuary system hasn't broken down because of it. Culturally, we in Canada feel we can adapt to it since it's really just an extension of how we've been operating in the past.

I want to turn to the question of the actuary's report. We are required, under a standard of practice of the CIA, to prepare annually a dynamic solvency report or financial condition report. This is intended to provide advice to management and to the board. Under our law, the actuary has free access, independent of management, to the board and is required to report to board members at least annually. The report was originally designed for that purpose.

Now, the regulator in almost any country usually has the authority to ask a company for any information that he or she thinks is relevant to the regulatory work. That certainly is true in Canada. It was always assumed that our regulator, the Office of the Superintendent of Financial Institutions (OSFI) could see this report if the people there asked for it. When DST was introduced in Canada, it was assumed these reports would be available in the company and that the OSFI people would look at them when they came for their on-site examinations every three years.

For the 1993 year-end, OSFI asked for the DST reports to be filed with the annual statement. Why did that happen? I personally regard this development as a success. The fact is that there are a number of companies, and this will not be a surprise, which are in some difficulty and are being closely watched by the regulators. It's not surprising that the regulators are constantly looking for whatever information they can find with respect to companies on the watch list. In some of these cases I know that they were calling the actuary weekly and asking if the DST report had been done.

What happened in some of these cases was that the actuary's report expressed the same concerns the regulators had. Regulators are often in the position of going to the board of directors and complaining about what is and is not being done. The board listens but often believes that regulators, as outside people, do not understand the situation. But now, you had an inside person, the actuary, expressing the same concerns. From the point of view of the actuary, who is often in a very lonesome position, there is backing from the regulator who is telling the board members to listen to their own person and pay attention to the report. I think that in a few cases both sides, the actuary and the regulator, found this coming together to be quite agreeable. It's from this perspective that OSFI has begun to read the DST reports annually. I don't see this as an intrusion by the regulators although perhaps some others do. I think it shows the system is working. But one's view on this really depends on your view of the role of regulators and whether you see them as being intrusive or not.

There is a question of whether the actuary should offer a public opinion on the DST study. DST, as I said, was begun three years ago. The CIA felt we would need a few years' experience before actuaries would be required or even be prepared, to make any form of public statement. There is a lot of discussion in Canada about whether the actuary's opinion should deal with DST. The required statutory opinion does not make mention of DST; it only makes reference to policy reserves plus risk-based capital by saying that this combination makes good and sufficient provision for the company's obligations.

With respect to a company's published "glossy" statements, the CIA has put into effect standards of practice as to what should be covered in the actuary's opinion. Basically, this opinion says, "I have examined the liabilities of the company and deem them to be appropriate." But, there is the intention by the CIA that there will be added to the opinion a single sentence that basically says, "I have studied the financial condition of the company and find it to be satisfactory."

The full actual wording is:

I have valued the policy liabilities in the company's balance sheet, and their increase in its statement of income for the year just ended, and I have examined its financial condition, all in accordance with accepted actuarial practice. In my opinion, the valuation is appropriate and the financial statements fairly present its results and the company's financial condition is satisfactory.

This statement generally says the company is in good health. We did not want to make a statement that says the company is solvent and that it is guaranteed to continue. But it is interesting that this same standard of practice does contain examples of what you might say when things are not so rosy.

When things appear to be satisfactory, you don't want to go overboard and offer guarantees that everything is right. Perhaps a statement to the effect, "I've examined the company's financial condition and for now, I'm comfortable" is as far as you might want to go. But, when things are not right, then you are in a position to be explicit and perhaps you ought to be a whistle-blower, even a public whistle-blower. This seems to be the position of the CIA. For financial statements for business years 1995 and later, the following standards of practice will be enforced. In the case the actuary feels a company needs more capital, it is suggested the opinion paragraph be modified to say something like, "The valuation is appropriate and the financial statements fairly present the company's results. However, as explained in a note to these statements, the raising of additional capital is required to restore the company's satisfactory financial condition."

Here is another example: In the case where the company needs more capital and has a credible plan to raise it, you might say, "The valuation is appropriate and the financial statements fairly present the company's results. However, as explained in a note to these statements, the company has made arrangements to increase its capital, which will, in my opinion, restore its financial condition."

DYNAMIC SOLVENCY HANDBOOK

I think you get the idea that we feel that, if there is a real problem, then this requires some disclosure. However, in a more normal situation, we as a profession do not want to offer guarantees. We want to show a company where its future problems might lie, but we don't want to create self-fulfilling prophecies. Our Insurance Companies Act says you have to study the company's financial condition and report on this to the board. The Act says nothing about making a public statement. However, because the financial condition report is required by legislation, it is public knowledge that this job is being done. The CIA feels there is an obligation to acknowledge that, if the report has been prepared and things are generally fine, we should acknowledge the completion of the task required by legislation. But you have to walk a very fine line in deciding exactly what you can say.

I must also add that I believe many actuaries in Canada, who have been doing DST for several years now, have not realized that for the 1995 statement they will have to make a public reference to this in their opinion. Up to now, they have not done so, and are only beginning to realize that the standard of practice, which came into effect in 1992, contains additional sections, which only come into effect in 1995. There is a certain level of discomfort among Canadian actuaries as people begin waking up to the situation.

I just want to mention briefly that, as Chris Daykin was explaining earlier, the U.K. has had an Appointed Actuary system for a long time. It has had a financial condition report as had Australia. But neither of these notions of financial condition is nearly as explicit as what we in Canada have moved to. The U.K. is moving to adopt DST. It has a joint committee of the Faculty of Actuaries and of the Institute of Actuaries working on it, with the strong support of Chris Daykin, the Government Actuary. My understanding is that these groups expect to bring DST into effect for U.K. companies sometime in 1995.

I can tell you of two other countries that have adopted the Appointed Actuary package including DST. These are Singapore and Malaysia, both of which have British roots. Singapore has virtually copied the Canadian law. DST is required in Singapore beginning this year. The Malaysian memorandum does not explicitly mention DST, but does require financial projections; effectively this is the same process. So, this role of the Appointed Actuary, together with DST, is coming into effect in a number of countries.

I can also tell you, having spoken with the regulators involved, that in the U.K. and Australia, which have required financial condition reports intended for company management and directors (but also available to regulators as appropriate), these reports have often been quite blunt. There have been a number of cases where actuaries have effectively said, "Fix this situation or I won't sign next year's statement." These sorts of things have been said to boards; they have been seen by regulators. The world didn't end. The system really can work, but its success depends on the local culture.

MR. B. JOHN MANISTRE: Shane, I agree that this exercise should not degenerate into a compliance exercise. I believe there's a significant danger that it could. In such a case, it just becomes, get it done with a minimum amount of resources, stick it on the shelf, and do it again next year.

Allan, I agree with your point about the professional culture and the relationship between the profession and the regulator—what might work on one side of the border may not well work on the other. I am very concerned about the 1995 issue. Is anyone actually going to give what amounts to a qualified financial condition opinion? A few years ago when I was working in the U.S., I suggested to someone that he should give a qualified opinion. At which point he asked, where do I work next year? I'd like some panel member to speak to this issue.

MR. BRENDER: I don't minimize that. I feel I've seen reports where people have faced the truth and written difficult reports. But even some actuaries don't always want to face the truth and have avoided studying difficult situations.

One of the things to which the CIA is committed is that, if a company should ever fail, then the actuary will automatically be subject to professional review. Review is not discipline, it is investigation that could lead to professional discipline. It seems to me that in the future the review will look at the actuary's DST or financial condition work. I think that, if it can be shown or it's thought to be the case that the causes of the company's failure were to some extent foreseeable, and that these factors were not sufficiently investigated by the actuary in advance, then there can be a case for professional discipline. This is a very tough position, and people are worried about these questions. However, I believe the CIA is determined to proceed down this path.

We have, in our legislation, a definition of an actuary as a Fellow of the CIA. You cannot sign a statement in Canada unless you are an FCIA. Also, the legislation refers to valuation standards as whatever is generally accepted actuarial practice. This effectively means that one must conform to CIA standards of practice. Therefore, the CIA takes a strong position that it has a strong obligation to the public and to regulators to make sure that its members do quality work, because we effectively have licensing power. There's a strong determination to ensure that members do comply. But, the intention is not to write strict and detailed rules. Rather, the focus is on having members do a good professional job and writing standards of practice to help them do that—always recognizing there are a lot of hard choices to be made.

MR. KENNETH W. STEWART: I'd like to add something to Allan's comments. The regulators have indicated that they will automatically examine the conduct of the actuary, the auditor, the board of directors, and senior management when a company fails to see whether they ought to take legal action on behalf of the Canadian financial institutions and the public. They look for any professional misconduct or failure to follow prudent person rules.

So you have a choice: you can change jobs, go to jail, or carry out your financial responsibilities as a valued business partner. I would suggest, in response to Shane, that this is the highest and best application of the actuary's skills, duties, and moral fiber, as well as experience. Picture yourself as a most trusted business advisor explaining, in plain English, plain French, or whatever your language of work is, what the real risks to your company are and what the real consequences of management's actions are. That's from a man who has seen it, who has watched his partners doing it in Canada, since I don't do it myself. The process of carrying out DST is and can be a compliance exercise, but in my experience it most certainly is not. It's a

DYNAMIC SOLVENCY HANDBOOK

process of learning and growing, where you really find out more and more about the real risks and the real drivers of profitability to the company. Much better business decisions can be made because of this incredible advice you're now able to get from your actuary, who is, in fact, one of your most valued business partners.

So, yes Allan, the process is working very well. It needs to work better. There are going to be some difficulties of conscience and moral fiber in 1995 for some people who will have to point at things that people don't want to see.

But let's step back from this for a moment. What if a few years ago there had been an Appointed Actuary role with dynamic solvency testing for the savings and loan industry? What if there had been an Appointed Actuary role with DST for the commercial banks and other financial institutions that have failed both in Canada and the U.S.? What if there had been a source of advice about the financial consequences of business decisions being taken at the highest levels of a company? Could we not collectively have avoided a lot of these difficulties, which in effect, became massive tax transfers from the general public and from successful institutions to people who managed their business without due regard for what a reasonable and prudent person should do?

The process is imperfect, just as risk-based capital is imperfect. Yet it's a vast improvement on that littered landscape that we have had before.

MR. CHALKE: You just convinced me never to sign one of these. I think a lot of this is like the seat belt argument. As soon as you start arguing that wearing a seat belt shouldn't be the law, people assume that you're against seat belts. And that's certainly not the case with me. This risk return exploration, this very rich texture of what goes on in the risk management companies, happens continually. It happens all the time, and it's happening now. The issue in my mind is, do you now make this subject to the regulatory process or not?

And if you look at the larger model of the world, the theory of regulation tends to be, let's counterbalance shortsighted business people with a farsighted regulatory process. In fact, if you look at the way the world works, it's just the opposite. The regulatory process tends to be very shortsighted and politically driven. And managements of companies tend to be long-term greedy and long-term greedy is very good. I am not opposed to risk analysis. I think it's critical. It's the mainstay of what I do every day. If we make it part of the regulatory process in the U.S., I believe the person writing the report won't be in the strategic planning sessions.

MR. REISKYTL: Unfortunately I'm going to have to move on so as to provide some time to discuss the current draft of the handbook.

I have a few introductory comments about what this handbook is and what it isn't. Our objective is to support the actuary in carrying out his or her responsibilities, whatever they may be whether it's to prepare an internal confidential analysis or a regulatory requirement. We hope this handbook will be useful to you in any case.

This handbook is a work in progress—much has been done and much remains to be done. Unlike Hillary Clinton's health task force, we're exposing everything we do as

RECORD, VOLUME 20

we go along and hope you will comment. You'll notice when you read it that it reads like it's been put together by a lot of people. It has. At this point please focus on the concepts—not on the presentation.

If you have a preference for one style or another, let us know. In some sections you'll see summaries and charts; others have much more detail. Each has merit. Which is the most useful to you? We've included the outlines so you can see what we intended to write in each section.

We appreciate the comments we've received at the various spring sessions, the annual meeting, and we're looking forward to those that you may make.

One of the things we wanted input on was, what if anything are you doing now? What do your managements want? What will make this effort most effective and useful? Some companies will do it only if the regulators require it. In others, management already requires that it be done. We encourage each of you to share what you have been doing and your studies, if possible, with our editors to help them create a better document.

This handbook will be a state-of-the-art document. Someone quipped that, if it were, it could easily become a 12-volume encyclopedia. That's not our intent. It will cover many, many issues—we hope highlighting the key points concisely with reference lists for those who wish to explore or know more. The handbook will outline things to do or consider as one goes through this process. It will not provide all the details.

There will be blanks in the document. These are blanks to be filled in when future research is done that will support both U.S. and Canadian actuaries in these efforts.

I have one more comment on research. Some people have said that all this big book is, is a "how to" book on cash-flow testing. I assure you that's not our intent. We are really looking for alternatives—other ways to do this. If you have some ideas, I'd be happy to hear from you.

I'd like to publicly thank Judy Strachan for all her work to date and others who have helped her in the Society office including Warren Luckner from the research side.

I have one other general comment before beginning discussing the update of the chapters. At our most recent meeting we spent about an hour discussing what does management want? As you might guess with a dozen actuaries in the room we probably had a dozen responses, but there was a common core to the responses. There was a focus on the analysis of potential risks and rewards of the current business plan(s) and the tools to do such an analysis. The concern was what could be done now or in the future to reduce the possibility of some adverse impact on earnings, on solvency, or on financial condition? What actions could we take now to mitigate or reduce its impact? What future options do we have? This role is one of a senior team player. The clear agreement was that we should focus on the analytical process, that it would be built on statutory structure, although it could also be used for GAAP, earnings, or surplus analysis.

DYNAMIC SOLVENCY HANDBOOK

Our handbook speakers are: Steve Reddy, editor of the asset chapter, Jay Stiefel, editor of the pension chapter, and Rick Jackson on the analysis of life insurance and annuity company and policyowner behavior.

MR. STEPHEN D. REDDY: As Jim mentioned I'm editing the section on asset modeling or assets. I'll give you a picture of what's there and what we plan on being there.

For those of you who have the handbook, in the table of contents we lay out the various asset classes that we intend to include in this section and how we've organized the section. The asset section starts on page 34.

I'm going to discuss some of the highlights we're hoping to accomplish. In approximately the mid to late 1980s, actuaries were thrust into doing asset/liability modeling and cash-flow testing, and had to come up with models that may not have existed. So projections got done but a lot of the finer points may have been missed. Essentially that's the objective of this handbook, to provide a convenient reference to enable the actuary to do a better job than was done in the past. I think that would hold true whether or not we're talking about a regulatory procedure or an analysis for management purposes. Fortunately, the asset section is somewhat self-contained, and we must do a good job of modeling assets regardless of the ultimate purpose.

One thing I've learned over the years regarding assets is that there's actually no one thing that's difficult about any particular asset class. It's just that there's so many of them, and with derivatives the number is growing. It's almost impossible to fully understand everything that's out there. So one of the objectives is to provide a readily accessible resource, for actuaries to get information that they'd otherwise have to piece together from various sources and documents. We'll also provide references to outside resources for those who wish to get more detailed information.

The chapter begins with general considerations. First, there's the issue of asset grouping. For example, if you've got two or three thousand assets you may not want to model them seriatim because it's too time-consuming or not worth the effort. Yet if you do asset grouping, you don't want to lose valuable information.

There are similar issues regarding projection intervals. The liabilities are generally related to contract years, whereas asset cash flows may be determined monthly or quarterly. If, for example, your prepay function is an educated guess, then it may not make sense to do monthly or quarterly projections. This section will give you some food for thought on exactly how to set up your model and in what detail. Another issue is how to validate the data that you feed into the model, making sure it's reproducing various existing company balance sheet items and yields.

We're breaking this section into various asset classes. We're planning to provide some basic background information for each type and then focus on the key modeling considerations. For example, what are the key considerations for defaults. What is the cost of defaults for any particular asset class?

Prepayments and calls are critical these days with regard to bonds, mortgage-backed securities, and collateralized mortgage obligations. If the model's not addressing the

important parameters, there's a good chance that the model is just going to miss the boat when you run various interest rate scenarios.

We want to provide references to other relevant publications. I think there are a lot more asset-side publications than liability side, because assets, obviously, are not confined to insurance and pension industries. There are a lot of books that were written by non-actuaries that are certainly very good resources.

I want to briefly mention a couple of asset-related issues. As mentioned, prepayment assumptions are critical with regard to mortgage-backed securities and callable bonds. There is a lot of recent historical data available from the recent declining interest rate period, causing a speed up in prepayments and bond calls. There's even evidence that the propensity to prepay is continually evolving. For example, I believe that Ginny Mae just changed its requirements for refinancing in terms of the level. That kind of action can affect the expectation or the propensity of homeowners to prepay and refinance their mortgages.

I know our firm is spending a lot of effort to better understand what drives prepayments. We want to get that kind of information into this document. We want to identify the key parameters that affect the prepayment function.

One common mistake I've noticed in the last couple of years is that I've seen companies key their prepay function off the differential between the mortgage-backed security coupon and the current available coupon. In fact, the key determinant ought to be the mortgage-backed security collateral coupon, not the security coupon. The collateral of underlying mortgages and the rate on those mortgages will determine what homeowners are likely to do. They're going to compare that rate with the current market. The coupon differences between that collateral and the mortgage-backed securities differs by agency type. So your model ought to take into account those differentials and not just base the prepay function off the mortgage-backed security. Those are the things that we want to highlight, the key parameters.

Commercial mortgage loans have been an integral part of the model, but in a lot of cases important data has not been taken into account, such as property type, geography, debt-service-coverage ratio, loan-to-value ratio, the likelihood of restructuring and the ultimate possible cost of restructuring, and making sure that the probability of refinancing is consistent with the actual company experience.

Derivatives are a booming area and one that many actuaries need to get up to speed on to model appropriately. So, obviously, we will document what's out there, and of course, the document itself should continue to grow. How should these things be accounted for? What is the statutory accounting? Is it adequate? If a company had a swap that is statutorily off balance sheet, should it really be on balance sheet for these purposes so that management is really aware of where those things stand? Suppose you have a ten-year swap and you do a five-year projection. Should you mark the swap to market after five years so that management knows whether it has something good or bad at that point? And if the swap should be marked to market, how should you do it? It's not obvious. So we will address those kinds of issues in the handbook.

DYNAMIC SOLVENCY HANDBOOK

And the last point I want to make relates to marking assets to market. All assets may need to be marked to market at some point either during the course of projections where assets might be disposed of or assumed to be sold in a certain scenario, or at the end of scenario. One of the outstanding issues, I guess, is whether assets ought to be marked to market at the end of the scenario. Also, are you comparing those values to reserves or to some kind of fair value of liabilities? In any event, in certain circumstances you're going to need market value of assets. And you want your model to be able to calculate market values in a reasonable manner consistent with reality. So that is an issue in putting together a model, can it replicate market values fairly closely? It should also distinguish between liquidation values and market values because in many cases there will be a difference.

We are certainly looking for feedback. We could use additional help on certain sections. We'd love to hear from you if you have a chance to look through the asset section or have an interest in any of these particular asset classes.

MR. JOHN D. STIEFEL III: There are nine results regarding the pension portion of the handbook to report. First, we found two co-editors—myself and Maria Thomson of Thomson Management Solutions. Second, we recruited eight writers. Third and fourth, we identified the need for a new section for the handbook and reorganized our team to accomplish that. Fifth, sixth and seventh, we came up with a basic outline, an expanded outline, and then a revised outline. Eighth, we developed a bibliography, and ninth, we resolved how we fit in with the other chapters and reached agreement on that point with the other editors.

To go into a little more detail about our results, I'd like to make these additional points:

1. Our writers have over 200 years of pension experience. They are Nicki Bair of Transamerica, Gordon Dinsmore of Equitable, Jim Geyer of Aetna, Jeff Robinson of Mass Mutual, Jeff Shuman from Conning & Company, Dick Wenner, recently retired from Aetna, and Henry Winslow of the John Hancock.
2. The new section that we identified the need for is Raising Capital, and this is now Chapter 5. Maria Thomson has moved over to become the editor of that section and Jeff Shuman is going to be working with Maria. Jim Geyer is going to be the new co-editor for the pension section.
3. Our basic outline followed the original format of Company Behavior and Policyholder Behavior. When we expanded that basic outline, however, our team had trouble dealing with that organization. So we came up with a revised outline, originally suggested by Dick Wenner, that consisted of three simple parts: drivers (or forces) that affect group pension lines of business, reactions to those drivers by policyholders (or participants), and protections or tools that the company can use to counter those reactions. A driver, for instance, might be interest rate changes, layoffs, or government actions. Reactions to those drivers would be cash-flow restrictions, contractual protections, and protection against lawsuits.
4. The expanded outline is based on the basic outline; but we've since changed to a revised outline that Jim Geyer suggested. This is, again, a three-part outline. First, what are the basic threats to the solvency or the financial condition of a pension line? Second, what are the methods—the basic techniques—for

evaluating and controlling exposure to those threats? And third, what special issues are raised by the different types of pension products—in particular, immediate participation guarantee (IPG) (experience-rated), single premium (non-experience rated), and GIC (non-experience-rated)? The basic threats to solvency can be primary, or secondary, threats. And we want to get into actual case histories, or company experiences, to illustrate what bad things can happen when the basic techniques are not applied correctly.

5. The bibliography was compiled by Jeff Robinson. He did a lot of work with the Society. This is an area where everybody here can help by suggesting additional sources of reading.
6. One decision we reached, after a lot of discussion, is that the handbook shouldn't be a primer about how to run a group pension line of business. It should, however, get into three things. First, what's different or special about group pensions? Second, what can go wrong and what protections, or tools, are available to protect the company? Third, the financial condition of any pension line of business is a combination of what (if anything) has gone wrong and what protections are already in place.

I would say that there are two major accomplishments. First, I think we have a good logical organization of our chapter that fits well with the rest of the handbook. This should form a good basis for us to make faster progress in the future than we've made so far. Second, I think our team is excellent. We work well together; we each have good ideas; but we can also listen and hear other people's good ideas, too.

There are two concerns. One centers around a comment Dick Wenner made to me at our last telephone meeting. He asked "Jay, we're doing a lot of talking. When are we going to get on to actually writing?" Dick's right. We need to get on with actual writing quickly. Second, we don't have a Canadian on our team. This is an area where maybe you can help.

As I mentioned, I see two areas where someone in the audience, or any pension actuary, can help us. First, we need Canadian representation on our team. And second, we can always use additional suggestions for our bibliography. There's a lot of outstanding work being done in the pension area that we may not be aware of.

MR. FREDERICK W. JACKSON: I appreciate the fact that there are over 100 people here. We apparently have similar interests in this process.

As Jim suggested, my background is primarily with life insurance companies. I've spent 19 years working with companies on this type of process. In 1993 I moved to an investment firm. That move really colors my thinking. When you sit down at lunch with three or four investment people, they're not going to want to talk about actuarial liabilities. They want to talk about investments. They want to talk about assets. Similar to what Allan and Shane were discussing about a very real cultural difference between Canadians and Americans, I've seen a real language difference between investment people and actuaries. The liability people are speaking Greek. The investment people are speaking Spanish. This tool we're discussing really helps us. I believe this asset/liability management process can help us bridge this language gap and get at the issues that really help run insurance companies.

DYNAMIC SOLVENCY HANDBOOK

There are a few items in this process that struck me since volunteering to be an author a few months ago. They don't really lend themselves to any particular order, so I'll default to a chronological approach.

I've spoken with 50–100 people at different insurance companies about what they feel about this process. Contrary to what Shane says, I don't think that this process is widely accepted across the country. I've had several people, maybe 5–10%, who were openly hostile about this process. That surprised me at first. I thought about it for a while and tried to figure out why they were so negative. What I found in looking more closely was that the companies I was talking to seemed to break along the lines of size. Who is required by regulators to do Regulation 126 or cash-flow testing? It is those people who have not bought the commercial software and had to perform this process that were negative. They have not invested the time. These are generally small shops—insurance companies with \$20–100 million of reserves. They have not had the time or the resources to devote to the process. Initially, that threw me, but I guess I can accept the fact that this isn't going to be an easy process for some of the smallest companies. It's more the group that's in the "somewhat useful" to the "good tool" category that are probably sitting here in this room.

The "somewhat useful," I'd have to categorize as people who have spent the money on the commercial software and done Regulation 126 and asset adequacy testing work. They're finished with that. The effort has taken an enormous amount of resource. They are done with the process. What did they get back for their effort? They get a checkmark from regulators.

Now these people turn around and ask, "What are we going to do with this tool for internal management purposes?" I think that is the group that we are talking about in the "somewhat useful" to "good tool" range. If I run into someone who believes this process to be the "end all," I think I'd turn the other way and run. It is too imprecise a tool to put absolute faith in. The process can be very rigorous in the setting up of assets. It can be very rigorous in setting up liabilities. However, it has to fit into the overall management process to be very useful. I'd like to thank the regulators for instilling the discipline that now prepares us to use this tool for internal management purposes. I, like Shane, would like the regulators to step back now and let us do some real stress testing of companies, to show where the risks really lie in our companies. The process can help manage the risks and assist senior management in taking some action and making changes.

I guess the one thing I want to say before moving on is that a quotation like the following from a recent Standard and Poor's (S&P) *Focus* article leads me to believe this process will continue to move up on a continuum of importance:

From a claims-paying perspective, S&P believes the ratings outlook for most major providers of individual annuities is stable. Still, S&P views asset liability management today as potentially the most important component in maintaining a company's claims-paying ability rating.

That's a generally powerful phrase—"the most important component." I think that kind of perspective is going to bring companies along and make us become more involved in this type of process.

In looking at the initial draft of the handbook, my first perception was that there was a mismatch of text on assets and liabilities. Steve Reddy's section seems like it is going to be quite large. I questioned him on this. It seemed inappropriate to me. So, I got on the phone with him after the meeting we had in Boston and discussed the issue with him. The conversation went like this. I said, "Steve, there's a lot of text in the asset section." His response was, "OK. So, what's your point?" I said, "It's unbalanced. There is a lack of parallel treatment in the liability section and the asset section." He said, "Right."

At this point I didn't know whether our conversation was over or not. We continued talking, though, for a bit longer. Our conversation brought me to this position. The asset section is the asset section. There is a separate liability section, too, but there is also a pension section, a health section, and a life section, which Steve impressed upon me, were really written from a liability point of view. The other thing that he impressed upon me is that the handbook is a document for actuaries. Most of us in this room, myself included I believe, would say we're more comfortable with liabilities than with assets. Given that somebody is going to be using this tool, in most cases, it is not an investment person who will be at the helm. It is the actuary who is most likely to be running this modeling tool.

It is the actuary who provides liability support, generally, but there has to be investment expertise brought in as well. Ideally, an actuary should get significant help from the asset people, his investment people, in setting up the model. Ultimately, though, it is likely to be the actuary running the model and presenting the results to senior management.

The individual insurance section plans include finishing up the three missing sections. We're also planning to merge the sections on renewal pricing, dividends, and interest crediting into one section. It is all part of the same process of repricing products.

We're also going to add a bibliography. In mid-May 1994 a conference call is scheduled to discuss how the language of the individual insurance section hangs together as a document. We'd like to improve the consistency of language throughout. We would welcome any comments addressed to me, Jim, or any of the other participants in this process.

This handbook we are putting together is not a cookbook. It was never intended to be. I'm now going to break my own rule about sticking to chronological order.

I'm going to refer back some 20 years to my college days when I was an American Literature major. I read a book by a poet, Conrad Aiken. The name of the book was *Ushant*. What he was trying to do in that book was to gain an understanding of a very complex process—his own life. He used a metaphor in that book he termed "the flung net of symbol." He was using language to throw a net over the issues in his life, trying to pull them in like fish, attempting to capture their meaning. He was trying to use the fishing process as a metaphor. It was a fascinating book.

I would contend that what we are working with here is a parallel process of throwing a net over liabilities. We are throwing a net over the embedded options and the risk profile of those liabilities. Similarly, on the asset side, we're throwing a net over some

DYNAMIC SOLVENCY HANDBOOK

complex assets with embedded options and a somewhat different risk profile. The set-up modeling for assets and liabilities is done separately. The overall process we're discussing is the bringing together of these two different risk profiles. We take a look at a company's surplus position, its capitalization position, and its financial strength. Using this model as an integral part of the process of strategically managing the business going forward is what this effort is all about.

I'll close with just one more example. One of the CEOs I recently spoke with put it this way about the modeling process. He didn't need to know the number of angels dancing on the head of a pin. He did, however, need to know what the impact of certain management alternatives would be. What general directions might profits move in? He asked me if we had a modeling process that was sufficiently rigorous, "granular," as Shane said, to project this kind of information. I could respond, honestly, that yes we did. I think that this is the goal we are reaching for.

