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## Session 120IF

### Dynamic Financial Condition Analysis Update

**Track:** Financial Reporting

**Key words:** Financial Reporting

**Moderator:** JAMES F. REISKYTL

**Panelists:** JEFF ALLEN†  
WILLIAM J. BUGG, JR.  
MICHAEL V. ECKMAN  
STEPHEN D. REDDY  
CRAIG W. REYNOLDS

*Summary: This session focuses on:*

- *the latest additions to the Dynamic Financial Condition Analysis Handbook,*
- *recent developments in the U.S. and Canada,*
- *the latest research related to Dynamic Financial Condition Analysis, and*
- *casualty efforts in the area of Dynamic Financial Condition Analysis.*

**Mr. Stephen D. Reddy:** I am with Morgan Stanley and have been the editor/writer of the chapter on asset modeling. Our current efforts are to make revisions that recognize recent investment developments particularly as they relate to modeling, and to promote Handbook usage.

**Mr. Michael V. Eckman:** I am with ReliaStar Financial. I was an author and am now the editor of the chapter on liability modeling. In my job, I work with business units on all the valuations: statutory, GAAP, and tax.

**Mr. William J. Bugg, Jr:** I'm with AFLAC. I am the current editor of the health insurance chapter, dealing with behavior aspects and types of risk. My involvement with this activity started several years ago originally. I was a member of the Health-Financial Issues Committee of the Society, which became an Academy committee that's now part of the State Health Issues Committee. It's been an interesting evolution, but I've continued to represent that group on this effort.

**Mr. Jeff Allen:** I am a staff FSA, work on the Society staff, and provide staff support to the finance practice area committees, including Jim and the DFCA Task Force.

**Mr. James F. Reiskytl:** Now you know who we are. We will update you on new research activities, the new valuation law, a new sample DFCA report, and recent developments by the Academy and Canadian authorities. So this session is designed for you to ask questions and to share your experiences. To get the session started, Mike, why don't you tell them what we did on the new report? Perhaps I should take a quick poll first to find out how many of you have ever read or seen the handbook. About a third. How many practice with us? All but three members.

**Mr. Eckman:** For those who haven't gotten to the report in the Handbook yet, we have copies of the sample DFCA report in the back of the room. As you review it, you will likely appreciate how it could and likely will serve management as it addresses the ability of a company to execute various business alternatives. The tone and content of your actual report should reflect your management's objectives. I think this sample is more frank than most actual reports will be but it does cover the key points. First, it covers the entire company, not just the in force, new business, or a specific block, but the entire company. It also covers every kind of business and considers both the company's resources and its obligations. Second, the report assesses the company and policyholder behaviors, and several plausible changes in assumptions or experience. Its definitely dynamic, not static. Third, the report identifies and analyzes the risks of the company. Fourth, and I think this is very important, the report spells out the criteria that will be used in making judgments—for example, earnings or solvency could be the primary criteria. In this sample, the emphasis is on GAAP earnings and possible rating agency actions. The sample report focuses on the viability, not solvency, of the company, including its ability to attract capital and obtain favorable ratings.

The sample report is very straightforward. Simple background information about the company is given at the beginning. You may or may not include that information in your report. It was needed in the sample to give you a framework for the remainder of the report. Personally, I think the actual report should contain some summarized information so all start with the same understanding. It's frustrating if you present something and then half of your audience believes something different as to the facts. If you put it in the report, it all should be correct information. The characteristics of the company will guide or determine the amount of effort to expend on a particular scenario. If you look at the characteristics of the company, you may know why you looked at a particular risk, and why you expended much effort in this area. Prior data or results may be helpful.

Next, we have a list of the internal and external influences that may create opportunities or threats. The executive summary provides a brief write-up of the conclusions, and will vary depending upon the original objectives. Recall that the purpose, objectives, quotes, and limitations of the report were given in the background section. Then the balance of the report evaluates the risks and provides the basis for the conclusions. You should note, as you review the report, that the risks are very specific, the results are in quantitative terms, and each problem is addressed with specific responses. That's the key to making this report useful—make it as specific and as practical as possible. Separate line of business reports are also given. The appendixes, which are not included in the sample, provide the details of the assumptions and the results. As with the Handbook itself, we're interested in any comments you have about this sample report. Please tell us what you think should be included that isn't, or what is included there that you don't think should be.

**Mr. Reiskytl:** Craig, you said there were some new requirements in Colorado. What are they?

**Mr. Craig W. Reynolds:** Actually, these requirements are new in that I've only recently begun dealing with them. I've been supporting several companies recently that have been trying to get licensed to do business in Colorado. Colorado requires something like New York's requirement of a business plan to get admitted to the state, but in addition, they ask for a surplus adequacy report. While it's not explicitly called a financial condition analysis, if you read the requirements that's essentially what it is. They want a full company projection and specify a period. We typically have used five years, for the few companies we've helped. This report is supposed to demonstrate, under a wide range of adverse conditions, that the surplus of the company is adequate to meet the business needs. For the three companies plans submitted, we found it very easy to work with the department. Unfortunately, because it's still viewed—as it is to a certain extent in Canada—as a regulatory exercise rather than a valuable business management exercise, we're finding that the companies want to do the quickest and dirtiest job possible to get into the state of Colorado. The report is then promptly filed away and never looked at again. But it is still a hoop that needs to be jumped through.

**Mr. Reiskytl:** Has anyone in the audience filed with Colorado, and willing to share their experience? No one. Bill, you mentioned the New York requirements. What's needed?

**Mr. Bugg:** If you are going into New York, you have to file a business plan. I'm not sure of the duration, either a five-year or maybe a ten-year projection. My understanding is you have to have your anticipated sales projection, and the effect

that your sales—whether very high or very low—will have on your surplus position within the projection period. Furthermore, if you have a significant change in your business plan—maybe you decide to drop or add a product line or to change your distribution method significantly—then you are required, at that point, to submit another plan, doing the same sort of projection.

**Mr. Reiskytl:** Craig, do you agree?

**Mr. Reynolds:** That's my loose understanding, but I haven't worked with a New York filing for a long time. There was also one other example that I might mention, Jim, other than Colorado. We worked with another company that I'd characterize as in extreme financial difficulty, which shall remain nameless for that reason, that's under supervision by one of the state insurance departments. In that situation, the state insurance department hasn't taken control of the company yet, but it's definitely reviewing all material management actions. The department has also required, on a fairly regular basis, that the company submit a surplus adequacy report, which, again, is an expansion of the cash-flow testing report done at year-end, but which includes surplus and some additional sensitivities besides just interest rate sensitivities. This company pays a lot of attention to the results because they know they're managing very close to the edge and they have to constantly track their experience.

**Mr. Reiskytl:** Alan, you are an expert on what's going on in Canada. What do you have to add?

**Mr. Alan Brender:** In Canada, as Craig mentioned, you are now asked to submit a dynamic capital adequacy test (DCAT) and projections. This annual report has been submitted to the regulators only recently. When it was originally conceived, it was supposed to be prepared for the management and the board only. That has changed because during the first year we were doing this, several larger companies were in trouble. In a couple of cases, these studies were quite credible, and the regulators found the information in these studies to be extremely valuable as far as we are aware. I hope people aren't that inhibited in preparing the report by the fact that the regulators get the report. The Canadian experience seems to be that there's not that much pulling back or hedging in these reports. In fact, the internal management reports are being submitted. There isn't that much concern about what regulators see versus management.

**Mr. Reiskytl:** Alan, I have a question for you. A couple of years ago, there was a large company failure in Canada, and when we last talked, I think you told me there had been nothing made public about that prior DFCA report. Did anything ever

come out? I've always been curious to know what it said, before the failure. If it's not yet public, I accept that answer.

**Mr. Brender:** Actually, what the actuary did or did not do, or did or did not say, is not public. There's the whole question of professional discipline, and the case has not been dealt with yet. So none of this is public. Unfortunately, having been part of the liquidation team, I know, but I can't say.

**Mr. Reiskytl:** There were two or three others that you said worked in Canada. What kind of report do you prepare? Do you present it to the board, or do you have two internal and external reports?

**Mr. Lawrence A. Seller:** We've been doing dynamic solvency testing for a number of years. The condition of our company, overall, is rolled up into a report of the parent company, as one step in the process following the risk pertinent to our business. In looking at the company as a whole, we consider new business, and various scenarios on new business. Since our companies sell primarily variable annuities, one does not get much information from scenarios like the New York seven. Essentially, we look at the situations that could impair our assets or asset growth, temporarily or permanently, and see what the effect of the impairment would be on our surplus ratios in the end. I'm not sure of the full extent of the U.S. version of this work, but on the Canadian side, we are supposed to go out to the end of the five-year period and then play a little game of pretend and say, "OK, we're here now, do a reserve adequacy test." Modeling that isn't very difficult for us. Under Canadian valuation laws, you have to start putting these special valuation assumptions and do these midstream changes in assumptions after five years. The modeling has been a difficulty, but, overall, I'm very positive about this. I think every U.S. company—every company, period—should be doing this, just for the knowledge of their business. Everybody should use a business plan every year—a one-year plan to see what the risks are, and what can or cannot develop. It's really invaluable, and I recommend all companies get involved in it.

**Mr. Eckman:** There were a couple of others, do you wish to share?

**Mr. Cavanaugh:** I've had a problem with the capital adequacy test back in June, because a significant portion of our business is travel term insurance for about two months. In the travel insurance business, normally it's about two weeks, but for seniors coming down to Florida, it might go for about six months. Making a projection, five years into the future, of what's happening, when we do reprice twice a year, is more just an estimate of management's ability to project claims and reprice. For our company, or the branch of our company, I think that there's a loss of credibility by doing it for five years. Also, for our individual health business, not

travel, the premiums are fully adjustable, and there's no requirement to have approval from any regulator to change the premiums. In this case, again, that's more a test of my estimate of management's ability to manage business. The last block is participating business, where dividends are quite high. I think that we really should fall under that property and casualty type test, which is a lot shorter. However, we are classified as a life company; therefore, we have to make a five-year projection. I keep telling the regulators that it's not as credible as that of some other companies.

**From the Floor:** Regarding the health product that you mentioned that you say you can raise premiums without approval, wouldn't a behavioral type of analysis be needed?

**Mr. Cavanaugh:** Yes.

**From the Floor:** Looking at the past, is there a persistency risk resulting from raising premiums?

**Mr. Cavanaugh:** Yes. There is an additional lapse rate associated with raising the premiums, but our experience has shown that the additional lapses are not that material for their business.

**Mr. Reiskytl:** I'd like to have Mike address his views of internal external reports. Are we just going through the motions of creating a lot of computer output, or does some real practical effect come out of this effort? I think we're hearing that it is more than just an exercise where the actuary makes 10 or 1,000 runs. I'd like to get to the practical aspects. What does it mean to company management?

**Mr. Brender:** I think it's important. There are stories on all sides of this thing. I'm a proponent, so I am an optimist, but what I've seen and heard from other people is that when it works, it works very well. And I'm becoming more and more convinced that it's how the actuary approaches it that's important. You can take the same company, and you might lead the reports, just because of what you say and how adventurous you want to be. The first thing I've learned is that boards of directors of insurance companies generally don't know much about the business of insurance. So the former professor in me says, OK, my job is to teach them, and that's one function of these reports. It's a great opportunity for you to identify the sources of risk in your company, and explain the business. Some companies include pieces about where the industry is today in their written reports. Others discuss today's economy and how it affects their business, and here are their competitors' directions. Then they can understand where the company is in perspective—an opportunity for lots of explanation and education. That's item

number one. I've seen directors really appreciate where that's been done in companies. I think it leads to better management, because they're then in a position to ask better questions of management.

On the other side, we as consultants, sometimes get paid to do peer reviews. An actuary recently, as part of the peer review, reviewed the valuation and dynamic financial condition, but complained that the board didn't appreciate his efforts on the latter. When we heard this, we started thinking, OK, we'll have to educate the board. But then we read his report. There's always a question of what scenarios to test. We have a list of scenarios, but it's neither necessary nor sufficient. He didn't address this issue in his reports. All he said in his report was, "I projected under these scenarios. Here's a one-page table that shows scenario one, and the surplus at the end of five years, and so on. Here's scenario two, and the surplus at the end of five years, and so on. I've done the job that the Canadian authorities requires of me. That's it." If I were on the board, I wouldn't appreciate his dynamic financial condition efforts since he told them nothing useful. He gave them a bunch of numbers, but they had no context to understand those numbers. He certainly didn't explain the possible consequences of anything to anybody. In this case it wasn't the board's fault. It was the actuary's job to educate them, and he failed to do so. That happens. So I think it's going well where actuaries make the effort, but some do a poor job.

**Mr. Brender:** I would like to comment on a few major issues related to this topic from a Canadian perspective. First, we are changing the name we use for this process. We first called it Dynamic Solvency Testing (DST). It is still known as DST in the U.K. and Singapore. In the U.S., it's DFCA if you're in the Society and Dynamic Financial Analysis if you are in the Casualty Actuarial Society (CAS). The CAS, by the way, is doing a lot on this topic. They have a Web site that's devoted to it. They are thinking way beyond what we're talking about because to the CAS members, variability is a more integral part of their everyday experience. In Canada, we have changed the name we use to DCAT.

We are in the middle of rewriting our Standards of Practice, which seems like a never-ending process. As part of this effort, the DCAT standard has been rewritten as well. In doing this, an important issue which has been considered is the choice of scenarios which we test. When DST first was introduced, we had a list of ten specific scenarios. We had proposed that these should be required in any DST study, but in our original Standard of Practice they appeared as suggested scenarios. These were very specific scenarios such as assuming mortality increased by 3% over a five-year period. People thought this last one could not happen and was implausible. They were right—a few years ago a 3% fall in interest didn't happen over five years; it took two months. When we first introduced these scenarios,

people thought they were too explicit. We put them in the Standard as a guide because the process was new and we wanted to give people a list of things that they should test. We also thought it would be an advantage if we saw the results of standard scenarios for all companies and could compare the results. In fact, our Federal regulators require these 10 standard scenarios to be tested. However, just working with the 10 standard scenarios is not a sufficient test. In rewriting our Standard of Practice within the Canadian Institute, we first played with the suggestion that everyone should use a large number of relatively simple scenarios. Instead, we agreed that people should use a small number, three to five, of scenarios, but that each of them should be a complicated integrated scenario in which many related, and some unrelated, factors changed. Interestingly, the CIA's membership said no, that's not useful. They thought that what is more useful is sensitivity tests, where you vary only one or two parameters at a time in order to understand the company's sensitivity to the level of mortality or lapses or expenses, and so on. That's the direction we've taken, except that we have now removed any reference to specific scenarios. Our new Standard of Practice lists a large number of factors which could be tested. We expect the actuary to test those which are relevant for the company.

My second major issue is the public actuarial opinion. We had a proposal, at one point, that we include in the public actuarial opinion in a company's annual statement some reference to the fact that we do DCAT and that the results of the testing are satisfactory. The reasoning for mentioning DCAT is that since everybody knows you have to do this type of testing, if you're silent they will assume everything is OK; if not, they assume you would have said something. So the argument is that it is better to say what we mean than to let others infer a conclusion from our silence. But many CIA members have questioned whether we really wanted to make statements in the public opinion about company solvency. If we did, we would have to deal with the more difficult problem of what to say if one was not completely comforted by the results of the DCAT study. Any expression of discomfort in a public opinion could easily become a self-fulfilling prophecy. We've now come up with a new version of the public opinion which barely mentions that we do DCAT testing. So we've pulled back from offering a public opinion on solvency.

The Society is involved in several activities related to actuarial modeling which I want to mention. The first is a research project by Professors Robert Hoyt of the University of Georgia, Mark Browne of the University of Wisconsin at Madison, and James Carson of Illinois State University at Normal. Professor Hoyt spoke on this project at Session 78PD, Actuarial Modeling. They have analyzed relationships between certain economic variables and insurance company performance, with emphasis on failure rates over the last 20 years. They've had access to at least 40



years of NAIC data. This is intended to give actuaries the background to carry out some of the studies we've talked about today. They have prepared a paper on their studies which we hope will be published in the *North American Actuarial Journal*.

Second, there is an effort within the Society to approach the question of model building. Modeling is becoming a fundamental actuarial technique. We held a seminar last December at Georgia State. We published some of the papers presented at the seminar in the *North American Actuarial Journal*. We're planning a second seminar next spring or in early fall; in fact, we intend to have a regular sequence of these seminars. Last year, the Society established, in honor of Ed Lew, a prize for the best paper on modeling; this is worth \$10,000. We hope this will be a regular continuing prize. We also hope that at our next modeling seminar we will be able to present the prize-winning paper as well as those of the runners-up. As you can see, there's lots of work going on in this field which should help those doing DFCA.

**Mr. Reiskytl:** Jeff, as long as Alan has raised some of the issues involving research, why don't you share what's going on in the Society.

**Mr. Allen:** Sure. I want to highlight a couple of other items on the handout starting with item 5, the joint SOA Life Insurance Marketing and Research Association (LIMRA) studies that have been completed or will be published soon. LIMRA has recently made a proposal to the SOA Experience Studies Oversight Subcommittee that these studies be conducted on an ongoing basis, rather than project-by-project, to hopefully increase their timeliness. Items 6 and 7 address the relationship between lapsation and mortality. The Albert, Bragg, and Bragg paper looks at the actual lapsation and mortality experience for 13 different companies and does an analysis of that data. The Bruce Jones paper comes from a more theoretical perspective, and builds a model that incorporates relationships between mortality and lapsation. Item 8 is a joint Foundation and Nationwide study. It's a multipart project. The first part develops an annotated bibliography on behavioral issues for finance and insurance products. The target completion date for this part is February 1998.

On the second page of the handout, item 9, there was a call for papers on a 100-year term structure of interest rates. The response to the initial call for papers was light; so the call has been revised and reissued with a March 31, 1998, deadline. Items 11–13 are related. The Professional Actuarial Specialty Guide (PASG) on currency risk was recently released. Along with that PASG was a call for papers. Two papers were selected, the Mange paper, "On Measuring the Risk of Foreign Exchange" and the Davlin-Tenney paper, "Pricing with Stochastic Foreign Exchange

and Interest Rates.” Alan Brender highlighted items 14 and 15 in the meeting yesterday, so you’re aware of those.

One of the difficulties in putting together a list of other related research like this is that almost any activity that actuaries do can be linked to DFCA. I’m not going to go through these in detail. It’s probably not a complete list, so any other items of activity can be added to this list, and if you have any that you’d like to give to me, we’ll add them so as to have a more complete list. There’s also a list of some of the new projects that have been selected by the Committee on Knowledge Extension Research, those of which have target completion dates later in 1998. I wanted you to be aware of what’s underway in that area. If you would like more information on any of these research projects, Warren Luckner is the Director of Research at the Society. Zain Mohey-Deen is the Research Actuary, and he was extremely helpful in putting together these lists. I am the Staff Fellow for Finance and Investments. I wanted to mention two other sources you should be aware of. One was published this fall from the Research department on Resources From Research. Feel free to call the Society office, and we’ll mail you a copy. The second resource is the CAS Web page, which has access to a number of databases for financial and economic information. You can use a search engine to find the CAS home page or their DFCA page.

**Mr. Reiskytl:** Craig, you mentioned some other data that might be available through the Life Office Management Association or LIMRA.

**Mr. Reynolds:** Yes, I think the one that I was thinking of was what Jeff had already addressed, SOA #5, the persistency study done jointly with LIMRA. Those don’t explicitly address policyholder behavior in the sense of other than those from interest rate shocks. Frankly, there’s not much experience under other external phenomena. There are some really interesting statistics in there particularly about lapses and surrender charges on annuities. The results with independent brokers are scary.

**From the Floor:** Is the value at risk (VAR) addressed in any session?

**Mr. Allen:** Yes, number 2, integrated approaches to risk measurement. There’s a good panel on VAR and other approaches to risks by lines of business.

**Mr. Brender:** We’re all doing the same thing. Sometimes I think we do VAR because we think the banks are doing it. Most of these analyses really come down to the same thing that’s already being done in DFCA. Perhaps VAR is more immediately directed to how much capital you really need at any one moment, whereas we might be saying, given the capital you have, is it adequate and will it let

you ride things out; that that's the only thing that's really different. Also the VAR language makes it sound much more precise, I think, than it actually is.

Many of the differences in the kind of studies we're talking about seem to be more qualitative. You're virtually going to management and saying, here's where we think this company is, what its sensitivities are, and so on. It seems like they're using hard science and coming up with numbers that really mean something. In actuality they are based upon many assumptions, which may not always be that valid. Qualitatively, I think we're going the same way. I think it's easy to get snowed by other types of analyses that look like they are much more technical and accurate. I'm not convinced that VAR or the others are. I think building models and reflecting real behavior of the company is incredibly difficult but ultimately of most value.

**Mr. Reiskytl:** Alan, because it is related, and not everybody knows what it is, can you give a brief overview of VAR?

**Mr. Brender:** VAR, historically, comes from the banks. Many of the major banks maintain portfolios of assets: bonds, stocks, and others that they trade for their own account and hopefully thereby make a lot of money. Some senior vice president is responsible for all these traders, each of whom is independent. Some people think that these are wild people who gamble hundreds of millions of dollars of the bank's money at a time, and that's probably true. The question then is, from senior management's point of view, what can these people do to me over time? We've seen examples where sometimes it can be a lot. How much is the bank at risk because of the portfolios these people are creating? Sometimes you hear about the so-called 415 report. 415 really means 4:15 in the afternoon—tell me what's going on, given that the market closed at 3:30. What they're really trying to ask is, what can happen over the next couple of days, given my portfolio? The expected value is the closing value at the end of business. The horizon is the number of days it would take me to unload or trade out of my current position. How bad can it get? What is the distribution of the market value of my portfolio; how much it can range over a short time period, which is my trading horizon.

Every day, J.P. Morgan and the Risk Metrics publish volatilities of all major traded securities on their Website. There's software you can download off the Web. Plug these into your spreadsheets and come up with a standard deviation for the value of your portfolio. The analysis assumes everything is normally distributed, and the given correlations and all the data are right. Assuming that everything follows a normal distribution is a big leap. It may be right for stocks, and maybe for some bonds, but probably isn't right for most derivatives; nonetheless, this assumption is made. We plug together all these numbers with the correlations, come up with a

variance, and then say, basically, that once you have the variance then use the magic formulas of normal distribution to tell you that if you want to be 95% sure that it won't get any worse than this, you take 1.96 standard deviations times the value of your portfolio, and you have the answer. And you can do that by 4:15!

**Mr. Reiskytl:** We've discussed the basics, the report, and what's going on in Canada. Now I'd like to bring you up to date on what the American Academy has done for those of you operating in the U.S. I'm going to read a couple things, just so I don't unintentionally misstate the Academy's actions. At the September 25 Academy board meeting, the following resolution was adopted: "Each Academy practice council will consider the financial viability of risk-bearing financial enterprises, including insurers and health provider organizations, and in addressing such variability, discuss and consider the use of DFCA in the actuary's work. The practice council shall report to the board on the result of their reviews by the board's June 1998 meeting. Additionally, the council on professionalism will review issues associated with the adoption of an expanded appointed actuary approach in the U.S., and report to the board by its June 1998 meeting."

There are many words there, but the bottom line from my perspective is that they want DFCA to become ingrained into just about everything the Academy does where appropriate. Just how that will occur will be determined after review by the various committees over the next few months. If you listened carefully, you'll notice the term financial viability, not solvency. This new definition was developed by the task force on insurer solvency. They concluded that, at the moment, insurance solvency is not as big an issue as it once was, fortunately, and that viability has become the ongoing very important issue.

Clearly, you can use this DFCA for many things. You can use it for estimating GAAP earnings or preparing for rating agencies, and, as mentioned earlier, for state filings. You can do it for almost any financially driven report within your company. I prefer to highlight doing stress testing analysis or risk analysis and measures, and avoid making probabilistic statements. They've done more of that in Canada, but I think they're moving away from it and if they do they'll take the bull's eye for the critics off the actuary's chest, moving DFCA more to what we can in fact do and are doing. So the intent is to provide a financial measure of risk, so that others can apply their own probability to the event. I will cite a well-known example of mine—if Clinton's health plan had passed, we considered the financial impact on our disability line of 25% or 50% of our doctors becoming disabled. Anyone can then apply their own probability or likelihood to this measure.

When you stress test the various risks in your company, it may be illuminating to find out the relative absolute measures of risks. Some may be larger, others much

smaller than you may have expected. Applying probabilities may rearrange your thinking. Some may find they have actual solvency issues, as Craig mentioned earlier. That will get senior management's attention. I suspect it's a rare board or senior management that isn't interested in the financial risks of the company. That emphasizes my second point—DFCA is not a cookbook. It's intended that each of you look at the risks of your own company's operations; something you should know better than anyone else. Hopefully the handbook will provide guidance as you do this or have questions.

For example, it has a section on economic assumptions. I think Alan made it clear these go beyond 10 proscribed scenarios or the New York seven. We're moving more toward what is really important to stress test in your particular pricing design, product design, and investment strategy. Another example is Steve's chapter designed to answer questions about challenges you may have on assets. We have these and other tools to help you do a better job. I'm going to read a bit more from this Academy report. "DFCA, in our opinion, is an excellent strategic planning tool to measure a company's ability to compete in a fast-changing environment." They go on to say, that both the CAS and the SOA have supported this analysis.

The CAS, as Alan referred to earlier, has really picked this up and run with it. We're always pleased to see interested people here, but they're getting like 175–200 people at their seminars. Craig, Alan, and I planned to have a session in Albuquerque, but, frankly, there wasn't enough interest among Society members, and it was canceled. At this meeting, a number of people came up and said that they'd like to come to the seminar. I wish they had said that sooner. We will take a fresh look at that, however, and see what we might do next year. We're still interested. This was to be a Harvard case type study seminar in which Alan reviewed a failing Canadian company appropriately disguised to protect it. After using this analysis, the company's still viable today, or at least it was the last time that Alan and I talked. Craig's part of the program combined some actual experiences in various companies all into one "worst case" company. The CAS has gone a different route creating more like a valuation actuary symposium type meeting, where they have a general session and then many alternative sessions at the same time. We will look at that option, and we're interested to know if you would find such a session thought-provoking or useful.

Let's go back to viability replacing solvency for a few minutes. During the Academy Task Force discussion, it soon became apparent that the basis of the discussions was not on short-term insolvency issues, but on longer term issues of viability of the company that could in some cases lead to insolvency. Insurer viability, as defined by the Academy Task Force (which I was a part of) "is the ability of the insurer to deliver value to its customers in terms of competitive products and fulfilling their

expectations, supporting its near-term business plan, and being able to attract investor capital as necessary.” Alternatively, a study on viability might focus on the capacity available to support alternative choices of near-term business plans. “Viability, with emphasis on market viability, depends upon the company’s ability to address the potential threats posed by trends discussed in the report. It links all stakeholders of the insurance community in the foundation of long-term solvency.” I think the emphasis here again is not just on doing the numbers. That’s why I asked Alan and others of you to comment on how we should look at the business plan. It means you have to be an integral part of that business plan, subject it to a financial analysis, and add your comments and recommendations to the process, particularly if there are risks that the company can or should take actions to prevent or minimize their possible adverse effects. The Academy is taking a strong position on the role of DFCA. You might be doing this, but you might not think of it as DFCA. In fact, Craig, I believe you have some comments on things that people are doing that we would call DFCA, but that they may name differently.

**Mr. Reynolds:** Not many companies are doing anything that actually uses that name, but I think it’s true that many companies are doing other things, or they simply go through the process and have a different name for it. An example is a company analyzing interest crediting strategies. Certainly one way to do that is to do it in a macro basis, looking at the company as a whole. That’s probably an appropriate way to do it, in many cases. In a way, that really is DFCA analysis. Another example is, especially in the early years before risk-based capital (RBC) standards came along, many companies were attempting to determine, independently, an adequate level of capital that they required—in effect, the value of risk reward analysis—and that if done right, it is, in fact, a DFCA, or at least one aspect of it.

**Mr. Reiskytl:** Bill, you had some thoughts about why your company’s doing it, and why others might want to do it. Would you share that?

**Mr. Bugg:** Yes, as Craig was saying, companies are doing things that they might not think of as dynamic financial analysis. My company is very interested in what the future holds. We do a detailed plan for some five years into the future. One of the things we’re investigating is a stock repurchase program. What’s the effect of buying back stock or not buying back stock? How many shares of stock are needed to buy back stock? This projection helps us make business decisions on this strategy. Looking at whether we buy the stock at price x or price y, what will the effect be? It helps us to make decisions on our debt program. How’s that going to affect us? Just a couple of things. Also, what’s going to happen to our RBC ratios? It’s all intertwined. If we buy back too much stock, our ratios may get too low. So

we're doing this sort of analysis. We don't think about it as being dynamic financial analysis, but it is.

**Mr. Reiskytl:** I think there's another effort that's underway, which Mike has been part of, and that's taking a look at the valuation law.

**Mr. Eckman:** I've been, and so has Bill, participating in the American Academy Valuation Task Force meetings and discussions. Let me give you an update. The NAIC Life and Health Actuarial Task Force requested that the Academy initiate a thorough study of the current valuation methodology; of methodologies of a wide range—life insurance, annuities, and health insurance—and recommend changes. In order to do this, the Task Force started with a clean sheet of paper without practical constrictions. Ultimately, we didn't want to ignore the current system and the audiences we had to address, practices in other companies, the tools available, or limitations such as tax laws.

A Blue Sky group developed some principles for a new valuation system. They came up with a three-part valuation system. Unfortunately, I missed the last meeting, so I may not have the most recent terms. The three-part valuation system, as I understand and summarize it, is function, summary, and current mechanism. Function includes: (1) measuring a company's financial performance, (2) providing the early-warning trigger, and (3) measuring the long-term viability. We saw those as the three functions of a valuation system.

For measuring financial performance, we measure the change in resources relative to existing obligations. Note the new terms, resources, and obligations; we're more used to seeing assets/liabilities. As part of starting with a clean sheet of paper, we wanted to get rid of words that had excess baggage and to define our own terms, so we decided on resources and obligations. The early-warning trigger evaluates the adequacy of resources relative to existing obligations. Long-term viability reflects the ability of the company to execute various business alternatives, which is essentially DFCA.

The summary column gives some sound bites that provide additional information—so this is the way we try to sell it. Over on the current mechanism side, we show what we can do now. To measure a company's financial performance, we currently have the appointed actuary's opinion, RBC, and statutory reserves. Actually, under the viability part, we don't have anything mandated in the U.S.; that is, again, where implementing DFCA comes in. In approaching it this way and coming up with these ideas, we found that we're not alone.

A review of company practices shows that a process similar to DFCA is sometimes part of the valuation. We also reviewed valuation systems in other countries and found that Australia requires a three-part valuation that's very similar to this. Now, one thing about the Australian system—you find that the actuary is a very powerful person. With that power, of course, comes responsibility. The actuary has the right to any information required to complete this valuation, because it is so important, and the right to attend each board meeting. In fact, Canada requires much of this detail, which replaced the dynamic solvency tests. This effort encompasses cash-flow testing, simulation, and then an analysis of five years of doing business. The fact that other companies have done this encouraged us. I think, more importantly, the fact that other companies have implemented this solution shows that it really could be done, that it's not just a blue-sky effort. I think interest in DFCA should grow and, as Jim pointed out, it has grown because it's been made part of the American Academy's charge. Companies should be interested in this on its own merit, not just because of the compliance issues.

**Mr. Seller:** I just want to echo those remarks and share some of the experience we had. Our company's almost 11 years old. It has grown very rapidly over the years. We've had over \$100 million of capital pumped into the company over those 11 years. First, the parent company had to be comfortable sending this amount of money down into our company, and they were because of the long-range projections that they saw. Along the way, we had an interesting experience. We were doing our modeling and we saw that we had a company with adequate surplus, yet our balance sheets were showing negative assets. It sounds a little crazy, but that was possible because there was one contraliability, a deferred acquisition cost that was showing up as a contraliability, but was really an asset. We looked at all our models, figuring there must be a flaw. There was no flaw. As a strictly variable product company, where all the premiums go with the separate account, we ran out of cash to pay commissions. That's what the negative asset indicated. And it showed that in a couple of years we'd need about \$100 million overall. You just don't walk into a bank and ask, can I have \$100 million? The bank will want to see your business plan to grant a line of credit. Call it dynamic condition analysis if you want, that's really what it is. We present that to the bank as well and get our line of credit so we can keep doing business comfortably without drawing down available assets. So in that case, we found ourselves surplus-adequate but cash poor. If I sound like a cheerleader for this, I am because I really believe in it. The number of uses of this process are limited only by your own creativity. I believe we're derelict in our duties if we don't start picking up the ball and running with it.



**Mr. Eckman:** I've been hearing rumblings about a new type of reserving system set by international regulators, and I wonder if any work has been done to correlate this outside work with the Society's. Perhaps Alan could comment on that effort.

**Mr. Brender:** I think what Mike is referring to is a move by the accounting profession. There's an international accounting body that has never defined GAAP for insurance, which is now trying to do that. Part of the problem is that—this is very biased, because of what I hear from actuarial sources who've tried to talk to these people—one of the accountants who was on that committee has never audited an insurance company, so they don't really know very much about insurance, they don't see why insurance shouldn't just conform to GAAP that you would use for auto manufacturers and so on. There are many problems on the horizon because the question will arise, which countries will adopt whatever they want to do? Right now we're at the stage where the actuaries are incredibly frustrated, but I don't know if anything has happened yet, but there's a threat. A number of countries and people have tried to devise a version of GAAP that applies to insurance companies, which recognizes long-term liabilities and so on. Some people are getting paranoid that that's going to be undone by all this—maybe or maybe not.

Regarding Mike's remarks about the Australian legislation and the powers given to the appointed actuary, I don't want to sound chauvinistic, but much of that, in fact, was taken from the Canadian legislation. We have access to the board, and what not. That comes with a price to pay. If you have access to the board and you give them warning and they don't do anything, then you have an obligation to go to the regulator. That is a difficult position. Whose side are you on?

We recognize the appointed actuary is in part an in-house regulator, and we're moving more and more toward this notion of self-regulation. Our regulators are saying that they rely on the profession to make sure that their members carry out these obligations. Yet, you are placed between a rock and a hard place; there's no doubt about that. But we do get some protection. The same law—and this applies in Australia too—says that as long as you act in good faith, which means as long as you're competent, you're immune from being sued. The board can't turn around and sue you because you went to the regulator and aired dirty laundry that sank the company. As long as what you said was right and you were acting within the bounds of your job, you're safe. I'm not sure if that would be enough in the United States.

**From the Floor:** It isn't necessarily right, it must be within professional standards—

**Mr. Brender:** Within professional standards, yes. As long as you're doing a reasonable job. Two other things, briefly. One is the handbook. One of the things

that I'm pleased to report is that the CIA, all the educational material on DCAT, DFCA, whatever you want to call it, now recognizes the Handbook produced by this group as a primary reference source. I thought you might like to know that. Lastly, Jim mentioned probability. I tend to be academic, and in theory I would like to see us do these things using probability. But I'm a great skeptic because most of the time, we don't have any distributions, we don't know anything about probability, and everything is extremely subjective. On the other hand, and I find this regrettable, what the Committee for Dynamic Capital Accuracy Testing of the CIA is now saying that you should test any scenario that has at least a 1% chance of happening. That would be great, if we could agree on what a 1% chance of happening is.

I'm a skeptic because I can find many people who think that interest rates will never go beyond 12%. In the early 1980s, certainly on our side of the border, interest rates exceeded 20%. Yet, people somehow think it can't happen again. I don't know if you've ever tried to buy a house near a stream and seen the little dotted lines on the local survey, which tells you something about 50- and 100-year flood lines. There are many people, somehow, who seem willing to buy houses within the bounds of those lines, thinking that if it rained last year, it won't happen for another 100 years. It's amazing what people think can or cannot happen. If we're not going to be realistic about what the probabilities are, then we're fooling ourselves by trying to introduce these kinds of statements and requirements in our standards. I think we're finally getting to the stage, with some things, where we can begin to talk about probabilities, but only in very limited cases. But most of this stuff is, in my opinion, nonsense.

**Mr. Reiskytl:** I'm really pleased to see you are here today. If you do not have a handbook, you can go buy one from the SOA. You don't have to read it from cover to cover. You can read a section of it and get useful information.

Steve hasn't had a chance to say much today. Do you have any questions for him? He edited the chapter on assets, and if you look at it, I think it's an excellent summary. I could also talk about the liability, policyowner behavior, or health chapters. If, for example, you opened up the asset chapter, you would find lots of material there. You don't have to read the whole thing if you just want to focus on collateralized mortgage obligations, for example. You're not going to find the be-all and end-all, but you will find an excellent description. One of the questions you might ask yourself is, do you have any challenges in modeling your assets? If you've dealt with Standard & Poor's recently, you've probably had many challenges, and if you have anything beyond simple traditional assets such as those with any form of replication or collateralization, they may put you through the paces. Some even have their own models to determine reasonable values. We've

done much more talking today than we ever intended. Many of you haven't said anything. Are you just itching to say something? Now's your chance.

**Mr. Robert J. Tiessen:** I don't do DST myself or sign a valuation statement, but I do try to understand what's happening in the business. I think some of the comments that Alan made are very important, that if you find out what the impact of a 1% drop in interest rates is, or a 10% change in mortality, that doesn't really do you much good if you don't know the likelihood of that event happening. Trying to get information on that somehow, in addition to what the impact is, is very important, because you need those two things together to decide whether, for example, this only has a 2% chance of happening, maybe you don't need to take any action, and you look at things that are much more likely to happen, as well. One thing Alan mentioned was the idea of doing scenario testing where a variety of things change, versus scenario testing where only one thing changes. I wonder if you need to do both, because if you do a scenario where you change five things and something bad happens, you need to unbundle those changes and maybe do them one at a time, in combinations of two, to see where things happen, which I know is much more work, but I think its the only way to get information on which you can take action.

**Mr. Reddy:** Jim, one comment on probability as it relates to assets. Certainly there are many more complex assets being bought these days; there are structured notes, equity-linked notes that have some form of equity exposure, or leveraged positions, where you have leverage exposure to high-yield markets, for example, and CBO equity position. Those types of investments require some kind of probability estimate in terms of expected return and standard deviation of those returns because on the surface they're going to have higher nominal expected yields, but the variability of those returns will be much higher than your more typical or traditional investments. So that gets at the issue of having some of this analysis on more than one dimension because companies are now getting greater exposure to equity. In many cases, for varied and structured notes, you can't just do interest rate sensitivities and capture the expected volatility of returns in those instruments. If it becomes larger and larger portions of companies' portfolios, which it is starting to become. For some companies, it potentially will have a material impact on results, especially if some of the worst-case scenarios were to occur.

I think that's something we need to add in the next revisions of the asset section because those are where most of the changes are occurring; these new types of assets that are getting a lot more play than they were three or four years ago. One aspect we need to address is how the rating agencies look at those assets, and how they put ratings on them. We can at least get their insight into what they view the probability of those returns is the risk of not getting the full returns, and the financial

probability of loss. You really need credit-adjusted or default-adjusted returns in the model in one form or another for these investments and not just the nominal yields.

In the worst-case scenarios, liquidity really starts to become important. I think that it is important for people modeling these assets to ask the question, what can these things be sold for, not just today, but in any scenario? and try and factor in these true values in the debt-liquidation scenario. We should try to address these issues in the next revision of the handbook.

**Mr. Reiskytl:** We intend to keep this handbook up to date, and we're always interested in your input. Clearly, as some products move to equity-indexed versions, where your company may or may not be matching the risk, it's almost imperative that you have to do some modeling and stress testing.

**Ms. Joan A. Hentschel:** I don't have a handbook so I don't have one to dust off, and I haven't read it, either. I'm curious whether anybody has looked at, as opposed to scenario testing, fixed scenarios, and their weakest link. Because the risk may be just a timing issue, if you have call options at a certain premium, maybe two years from now is your weakest link, when there's a certain matching up of surrender charges and call premiums. Has anybody looked at that type of analysis?

**Ms. Cathy H. Waldhauser:** One of the primary uses we make of our dynamic testing is to find the weakest link of the point in time where we have the largest risk of a cash flow or an interest rate mismatch. We have been using our testing for a number of years now to reevaluate our investment portfolio, and initiate rebalancing discussions with our investment managers and our board and senior management. It's been very effective that way. Dave Sandberg has coordinated that work for us. That has been its biggest value.

**Mr. Reynolds:** Sometimes there are other things that you test because they're important to your company. One last example, one of my clients does a lot of creditor business, so they do mortgage insurance. What happens if interest rates go up? The housing market dies. That means that people don't refinance, so they don't prepay mortgages. This company does very well, when rates fall you have high prepayment rates. Then the longer people stay in this product, the worse mortality becomes. So now if all of a sudden the interest rates go up, this product has new problems. These policy owners stay, there's no new business, because there are no new private housing purchases or new mortgages. Stop and think about your products and very carefully the consequences for you on various possibilities. Each case is a different case. We don't always have to ask who does what. Each company is different, and the circumstances are different. This tool should be useful in any case to investigate your company and stress test your risks.

**Mr. Reiskytl:** Handbooks are available at the Society offices, and they should be available online. I hope you share your handbook with some of your friends, because we're honestly interested in broader recognition of this process. With the Academy effort and the Canadian effort, I think you will hearing much more about DFCA in the future.