

**1998 VALUATION ACTUARY  
SYMPOSIUM PROCEEDINGS**

**SESSION 37IF**

**DYNAMIC FINANCIAL CONDITION ANALYSIS UPDATE**

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## DYNAMIC FINANCIAL CONDITION ANALYSIS UPDATE

**MR. JAMES F. REISKYTL:** How many of you realize there is a *Dynamic Financial Condition Analysis Handbook*? How many of you have opened it or used it? You're going to have an opportunity to talk to some experts in this area. I'll will begin with an overview to bring you up-to-date.

I find often that if I don't describe Dynamic Financial Condition Analysis (DFCA), then most everyone thinks it involves the results of a thousand scenarios. Their immediate reaction, unless they're running a 1,000 scenarios, is I don't want any part of it unless I have to do it. I want you to know that that is just one of many forms of DFCA. Another form of DFCA is simply sitting at your desk and thinking and making your best estimate. DFCA covers the whole spectrum of analysis from a rather detailed cash-flow analysis to your best guesses. Sometimes you don't know what's likely to happen, and detailed cash-flow analysis is not better than your best guest. Each analysis attempts to provide management with better tools to manage. I'm going to start by briefly describing where we are and what's going on with DFCA (or DFA if you are a property/casualty actuary).

Each word of DFCA was carefully selected—*dynamic*, *financial condition* and *analysis*. We are trying to measure financial condition under various assumptions. Putting it another way, we are trying to measure the ability of surplus to adequately support future operations. It's going to be pretty rare when company management does not want to know whether it has sufficient surplus to meet its future needs. The Academy of Actuaries (AAA) committee concluded after some study that an equally important and perhaps a better description would be to call it vitality analysis report measuring vitality surplus. Getting a little ahead of myself for a moment, if the unified valuation program being developed by Bob Wilcox takes shape, you're going to see a valuation requirement for a vitality analysis report. Vitality simply means that the company has sufficient capital to be viable under most future possible scenarios. Most companies today are not very concerned about going broke, but management wants to know if they will be viable. For example, are we going to maintain our ratings? What's going to happen to our generally accepted accounting principle

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(GAAP) earnings? This type of analysis gets people's attention. So when you talk about vitality, I think you will attract a much broader audience and more interest from senior management.

What is DFCA? Perhaps it will be clearer if I tell you what it isn't. It is *not* a standard practice; it's *not* a cookbook; and, it's *not* the New York 7 or something similar. You're going to have to look at your operations to determine the primary risks, analyze those risks, and prepare a report identifying how well you have covered those risks through either product design, reinsurance, investment hedges, or whatever else you may have done. One thing I want to emphasize is this effort is not going to be a cookbook response. And I guess that takes you to what DFCA is. It is analysis and sensitivity testing and stress testing. Even if you know nothing, it is very likely to affect your vitality significantly. You want to stress test it to determine the largest possible adverse results that might happen. It is extremely important that you take a look at the most adverse risks, even if very unlikely. I'll give you one example from my company, Northwestern Mutual.

If Hillary Clinton had been successful in launching national health insurance, half our doctors would become disabled. That isn't a probabilistic statement. It is an example of stress testing. You can apply your own probability to the result. As another example, suppose all your international investments fell by one-half. You might want to look at Japan, Russia, or Asia separately. The key thing here is that you do two things: you identify the risk and you quantify the risk. With regard to probabilities, in my experience, it seems that people don't believe actuaries that much more than anyone else. Back to my example, what's the probability of national health insurance? Who knows? Everybody has their own opinion. Your CEO probably has his own idea and probably thinks his estimate is better than yours. However, he probably has little idea of what it would do to the company's results if it were to happen. We've done this with our Board of Trustees. They find this to be a very interesting exercise to determine the magnitude of various possible risks and their relative ranking. That's what you're really trying to determine. Then you can apply various probabilities. You might have a very big risk, which in your mind, has a very low probability. The basic point is to use DFCA to quantify risks; do not develop probabilistic statements. This doesn't mean you can't do it. It just means that it is not part of the basic structure/analysis.

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In this handbook, you will find methodology and tools. In a way, you say the handbook covers about everything we do as actuaries to some degree. It's true and I have experts here who will share their knowledge. If you have any questions, we'll be glad to answer them. The intent of the handbook is to provide a broad, outline kind of an alert. If you play bridge, you ask what's your bidding system? In this case, the handbook will alert you to references and other material that will hopefully guide you towards your decision to analyze or stress test a particular risk.

The ultimate goal is to enhance management's understanding of your risks, how you provide for them, and what portion isn't covered. But it doesn't stop there. DFCA is designed for you to also develop an optimal risk/reward response profile. What do you believe should be done about it? This response is where the actuary provides her or his valued service to the company. After analyzing the various stresses, they provide various possibilities of handling them and ideally, the optimal choice. Presumably, DFCA, properly done, will enable management to make better decisions.

Are there actuaries with a property/casualty background here? There is one. I've been told that property/casualty actuaries have been very responsive to dynamic financial analysis (DFA). I was in Boston at a DFA seminar where there were over 300 attendees, which is terrific. We have not had that kind of a response from life, health, or annuity actuaries. Our challenge is to get the same or similar level of interest from the latter group as from the property/casualty group. The property/casualty actuaries tend to focus on one line of business, not the whole company, because their analysis tends to be focused by area. I've been told DFA has been done primarily by the larger companies. I suppose it's true since, in a smaller company, there's so much to do. You'd like to do DFA and are probably doing some aspect of it.

The Academy board received the report on vitality and DFCA, and said actuaries should build this analysis into everything the actuary does, where appropriate. They charged the vice presidents of each major area to look at everything from the Society's education, to research, to the various committees. The goal was to make certain this analysis becomes an integral part of their efforts. In turn, this will be as handy a tool as your PC or anything else that is used effectively. That's to begin this year. As a result, I think you're going to hear more and more about it in the United States.

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Bob Wilcox's task force, as mentioned earlier, has developed a unified valuation law proposal. We are particularly interested in the required annual vitality analysis report. They deliberately chose not to call it DFCA until the concept itself is more clearly understood. The intent was to redefine it so as to make it clear that the focus is on the company's vitality. We had some discussion at the task force and can give you more details later in the question and answer session.

What's new in Canada? They have had required analysis in Canada for a number of years. It's my understanding that there is a new exposure draft for actuarial standards. Previously they had a set of factors and compulsory scenarios. This led to some reactions that maybe this shouldn't be done. Instead, the requirements should focus on the factors that must be considered. This concept has been built into the current exposure draft that could be finalized in November. In the past, you had to run a scenario such as mortality changes by 3% a year. You had to run these prescribed scenarios that may or may not fit your company.

Another interesting point is that they had a choice of running complex scenarios versus individualistic factor scenarios. It is my understanding that, currently, they change one factor at a time so you see the impact (that's individualistic scenario). Then you put all the factors together to get the combined effect. There was some discussion about whether they would simply do the more complex or more complete scenario. The preference was to continue to change only one variable at a time.

In Canada, the report must go to the Insurer's Board and the Superintendent may see it. They now call it Dynamic Capital Adequacy Testing (DCAT). DCAT is required on demutualization, mergers or acquisitions.

That gives you a very broad overview of DFCA happenings in the U.S. and Canada, in the Academy, and in the UVS task force, etc. We are pleased to have you here. At this point, we're going to hear from the other three panelists. First Mike Eckman, who I'm pleased to report has just been elected to the Financial Reporting Council. Is that officially out yet, Mike?

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**MR. MICHAEL V. ECKMAN:** I've been told it is.

**MR. REISKYTL:** Congratulations! Mike's a second vice president and tax actuary at ReliaStar. He has very actively worked on the handbook for a number of years. He's going to update us on the recent Society research that has been done and some of his own experiences with DFCA.

**MR. ECKMAN:** Thank you, Jim. As Jim mentioned, I work with ReliaStar Financial. I'm in the corporate actuarial area so I deal with all of our business units on just about everything they do; cash-flow testing, pricing, and asset/liability management. As Jim said, just about everybody has his or her own definition of DFCA. I see it as measuring the ability of a company to support future operations. A second part of DFCA is an internal report to management covering major financial issues. It's not something that you're going to release to the public. Working within that definition, let's talk about some of the things that have happened.

Since DFCA is modeling the total operations of a company, it's not surprising that research affecting DFCA covers just about any information the Society provides. There's a significant amount of research having to do with the various assumptions you would use in dynamic solvency testing. There have also been three papers on dynamic solvency testing itself. There's a research project to document the extent and nature of the use of derivatives by insurance companies. Another project will determine the methodology to discount cash-flows that extend beyond 30 years. I have quite a list here from the Society of various things that are going on that could affect DFCA. One point I want to make is you've probably already received quite a bit of information that may get filed on your shelf. I was talking to actuaries in my own company and said, "Did you see the latest Tax Sheltered Annuity (TSA) reports and the numbers for annuity lapses?" "Well, no, that's the green book I received. I put it up on the shelf." So like I say, just about anything the Society is doing will be published in the *North American Actuarial Journal* or on its website. This might in some way affect DFCA. Instead of going through a long laundry list of new items, I will simply remind you to scan these sources for potential changes or improvements.

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As Jim said, I've been active on the handbook as both an author and an editor, and I would like to bring you up-to-date as to what's happening. Our last major revision was in 1996. At last year's annual meeting, we distributed a sample DFCA report. The Academy valuation task force has been actively considering the affect of DFCA on any new valuation law. Just to expand a little bit on what Jim said, the model law as written calls for an annual viability analysis. It says a viability analysis report is a report prepared in accordance with the actuarial standards of practice, that are adopted from time to time, setting forth an actuary's analysis of the insurer's ability to carry out its plans of operation. While you might have to consider contingencies, the important thing is that each insurer doing business in this state shall certify annually to the commissioner that its board of directors has received a viability analysis report. In the proposed possible law, this viability analysis report is an internal report. It goes on to say that if your company fails, the commissioner can ask for this report to see if there was something in there that should have been an indication to management, or the board, that the company was headed for trouble.

The DFCA task force continues its efforts with monthly phone conferences to discuss when and what we're going to update and what we need to include in the handbook. One of the current hot items is the handling of equity-indexed annuities. We have to address how to bring them into the handbook since they are not explicitly covered. The work on the handbook is continuing. You can expect another revision when we have enough to justify one. Otherwise, like the sample report, we will distribute supplements to the handbook.

In my company, I've had some practical experience using a DFCA type of an analysis with asset/liability management. We are concerned with our ability to meet future obligations, particularly with respect to matching assets and liabilities. Admittedly, this is not a full blown DFCA as you'll see when I go through it. However, it does qualify as looking at viability and being an internal report. What we've done is monitor the asset/liability profiles of business units in the enterprise. This is much more than cash-flow testing. Cash-flow testing is a regulatory function done once a year using certain scenarios for certain purposes. This analysis is more wide ranging. We review investment alternatives and strategy. We look at the asset/liability in light of capital requirements. If we can better match assets and liabilities by buying a certain asset that causes us



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to hold more risk-based capital (RBC), we're going to recognize that that may not make a lot of sense. Then we use it to prioritize where we want to do further research. So we're really not modeling the whole company. We're not yet modeling all the risks, but we've got a good start.

The process is to look at our largest business units and to look at their long-term profitability. We're looking at both accumulation and risk-based products (our group life and our reinsurance division) to understand the interest rate environments that most surely will affect their profits. We analyze any hedging strategies, and we analyze the risk and reward of various investment strategies. That is the asset side. On the liability or the product side, we look at how we can affect future profits by product design and packaging. These include: changing our product mix, varying sales levels, changing our crediting rate strategies, and considering internal exchange programs. What can we do on the liability side to better match those assets and liabilities? When we do this, we look at several measures. We look at ROI, we look at the present value of distributable earnings, and then we look at mean and standard deviation over a number of stochastic and deterministic interest rate scenarios. Next, we look at some additional analysis of specific increasing and decreasing scenarios. We also consider the incidence of earnings: Since we have dynamic persistency assumptions, what happens to our lapse rate or our premium persistency rates under various interest rate scenarios? Finally, what is the trade-off of managing the in-force business and obtaining new sales?

Jim also asked about the practical issues. He says he has talked to this board about various issues. What has been the board's or management's reactions? Is it one of those big binders, like Dilbert or Dogbert said—where this information will be put into a large binder and housed in the same building as your CEO? No, this is actually used. I would say the reaction had been favorable as they found the information to be useful. In the past, we have reallocated assets among the lines of business based upon the results of this analysis. We've quantified the cost of interest rate guarantees and we've quantified the cost of subsidies. I want to emphasize "quantified," which means to put a dollar value on them. This way, you may be able to say, for example, if interest rates go up, this is going to happen and if they go down, this is going to happen. At this point you can see the direction you're going. You need to quantify it to find out the dollar amount to see what action, if any, you have to take to offset it. We have done quite a bit of work there. You might guess that

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increasing interest rates have a negative impact on in-force business, stable or moderately declining rates have some positive results, and decreasing rates are positive unless you start to breach the minimum guarantees in the policy.

What's the dollar amount? What change in interest rate do we have to worry about? What steps are appropriate, and how much impact will they have? If you make the general statement that if X happens we'll do Y, is Y really going to solve the problem, or is it just going to mitigate it? Do you have to look beyond it? We have reviewed specific up and down scenarios because not all financial impacts are the same. You could have down scenarios that are negative, but the incidence, when it happens, and what you have to do to prevent it are different from another down scenario. One thing we found is that our risk business (group life and reinsurance) and the in-force business is an offset to accumulation products in the increasing interest rate environment. Another item is that new business is a form of hedge offsetting adverse impact of rising interest rates on the in-force. So there is a balance between in-force management and seeking new business.

Finally, where do we hope to go with this? As a person in corporate actuarial who's working with people on this, I'd like to expand it to all lines. The easiest way to do that would be to start with the cash-flow testing model. Then test even more than these interest rate scenarios; first to mortality, then to morbidity and expense, and eventually build it up to an enterprise model. The strategies will not only be what we invest in, but it will include the product mix, hedging, the current investments and new sales.

So that's an update on the status of where we are with DFCA.

**MR. REISKYTL:** Do you have any questions for Mike either about what he's doing or how he's doing it?

**FROM THE FLOOR:** Just a question on vitality analysis. Will it be in the future law, and is it not in the current requirements?

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**MR. ECKMAN:** Correct, it is not in the current law. The vitality analysis is not in the current law, it's just in the proposed Universal Valuation Law (UVL).

**FROM THE FLOOR:** It's an internal document. I wonder if there's going to be any pressures by the SEC, or NAIC, or others to go further?

**MR. ECKMAN:** That's something to consider. The intent is to limit it to an internal report to management and the board so you would not be tempted to minimize the risks.

**MR. REISKYTL:** This must be addressed because it gets asked so often. If it is discoverable, do you have to provide it because of shareholders? The intent is that it won't have to be done, but that's being looked at by the lawyers. At this point, we don't have an answer other than we know it's an issue that has to be addressed.

Our next speaker is Craig Reynolds, consulting actuary with the Seattle office of M&R. Craig, like Mike, has been a very solid contributor/performer on the DFCA handbook. Craig has been involved since the beginning. He was also part of the day-and-a-half seminar on this subject. He's going to share some of the experience he has had.

**MR. CRAIG W. REYNOLDS:** First, I will reemphasize some of my experience relative to what some of the other speakers have said as to how DFCA is being used. My first answer is that the casualty actuaries appear to be taking it quite seriously. I'm not quite sure why. They focus on it more than life actuaries do, perhaps because they're used to so many more of their risks being real, whereas we tend to focus more on interest rate risks. Many of us may feel that the interest rate risk is adequately measured by cash-flow testing; the other risks are more quantifiable, well understood, and less serious. There's probably some truth to that, but I'd like to think that we have some great value to get out of this process on our side as well. The Canadians have been doing it for a number of years largely because of the regulatory focus. I've worked in Canada, but I'm not a member of the CIA. My Canadian experience is somewhat limited, so don't take this as gospel. The Canadian reports I've seen so far have seemed to do little beyond the required regulatory exercise. The

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Canadian requirements have historically suggested a number of scenarios to test related to in-force mortality, morbidity, various interest rate scenarios, etc. Most of the reports I've seen tested are precisely those scenarios—no more and no less. I think that's unfortunate. Perhaps the Canadians in the audience will raise their hand and say, no, we're an exception, we do a lot more. But that's one of the reasons why I'd like to see this not become a requirement in the U.S. Once you start defining requirements and specifying scenarios, it really limits people's imagination to attack these exercises proactively and to really define the tests that are appropriate for their particular company.

I have not talked to very many actuaries in the United States who actually say they're doing the DFCA analysis or DFA analysis for their companies. However, I have talked to a great number who are doing it, but just don't call it that. Some words being used for DFCA in the United States are: *credited rate strategy analysis*, *asset/liability management*, and *value-at-risk analysis*. I will not talk about value-at-risk analysis because of the old adage about it being better to keep your mouth closed and thought a fool than to open it and remove all doubt. Value-at-risk analysis is not something I know a lot about.

State filings are an area where some form of DFCA has been required. I recently assisted a couple of companies that were trying to gain admission in the state of Colorado. Colorado essentially requires a surplus adequacy test. I believe there may be similar requirements in a couple of other states. I like to think of that requirement as being an exercise in DFCA since it's a multiscenario test of company solvency.

Where else could it be used? An area where it might be used in some way, is in embedded value calculations. Embedded value has been a big issue in Europe for quite some time. It's starting to become an issue in the United States, although relatively few companies are actually managing on that basis. Embedded value is really an exercise that doesn't have a whole lot of meaning unless you attribute some sort of risk measure or quantification of risk to that embedded value. Anybody can generate a huge embedded value by ignoring the risks that are associated with their model and/or their operation. Some sort of DFCA is required to do embedded value appropriately.

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Another use is for line-of-business management. You want to be looking at the individual operating lines within the company and understand the risks that they're taking. I think this is very important. One of the speakers in a previous session addressed that issue in the context of transfer pricing.

General strategic planning is another area where it involves DFCA. I think part of the strategic planning process ought to be understanding the risks that are being undertaken by each of your various operations.

Finally, consider rating agency negotiation. I think it's helpful to be able to talk to the rating agencies and talk about some of the risks that your company is taking on.

To indicate the sort of things that can happen, I will briefly mention a couple of companies that I've worked with recently without going into any sort of proprietary details. One situation involves a small-to-medium-sized company with a large portfolio of fairly interest-insensitive liabilities. They've been fairly fortunate in that vein, but it's kind of a classic situation where the liability operation of the company doesn't talk to the asset operation of the company. The entity is a subsidiary of a larger parent company. The parent company made the investment decisions and didn't talk to the subsidiary, largely because of reasons of materiality. The subsidiary felt that they weren't getting all they should from their investment deal. We did a little bit of work as an extension of the cash-flow testing that tested some additional scenarios and sensitivities. It pretty much confirmed what we expected. The investment department had not been investing as long a term as was probably supportable by this block of liabilities. It seems they hadn't ever really stopped to understand these liabilities relative to the liabilities of the rest of the company. They assumed that the same investment strategy should apply without evaluating the risks of the subsidiary. In theory, that should lead to a decision to lengthen the subsidiary's investment strategy. Time will tell if that actually happens.

The second example was a bit more interesting. This company was under the supervision of the state insurance department and was required to undertake a DFCA analysis. Again, that term wasn't used, but it was multiscenario solvency testing. The worst reason to do DFCA is because you've been put

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under state supervision and are required to do it. I'd like to think that had this company started this exercise several years before, perhaps they could have avoided that eventuality. Of course, that's nothing we'll ever be able to prove. In this case, it was literally a case of determining what this company had to do to stay solvent? The company was in serious trouble, and the department wanted to understand what their ability was to work out of the mess they were in. We did a great deal of sensitivity testing and confirmed that if things go right, they'll work things through. If they don't, they won't. Perhaps that's an obvious conclusion, but the department was very interested in understanding what had to go right and what sorts of things could get them into trouble. This analysis enabled them to monitor management decisions going forward. This helped to make sure that the company was on a track towards working their way out of trouble.

What are some of the issues with DFCA that perhaps are more difficult than normal company projections or cash-flow testing exercises? There are a couple of things. One is the addition of new business that generally is not part of the cash-flow testing exercise. You must look at new business to understand to what extent the existing business is subsidizing the new business. It's fairly common these days for new business profitability to be much less than that of the business priced 10 or 20 years ago. How badly is that happening? Is the company going to be in serious trouble in the long-term? That's something that certainly ought to be looked at extensively. I think DFCA is one way to measure the impact for various alternatives.

It's certainly true that when you talk about a company's business plans or strategic plans, one of the key assumptions is the level of sales volume. Most of you who have dealt with marketing managers and agents know that sales volumes tend to continually increase for the following year. I think that makes it particularly important that sales volume be one of the key sensitivities that you test in any dynamic financial condition analysis. Related to that issue is something that I'll talk about later—the issue of expense coverage. Agency operations or any sort of distribution operations tend to be fairly expensive. The unit costs that are allocated to those lines are often very dependent upon sales volume assumptions. You need to understand that if sales volume drops off, your expense coverage changes. You need to know how it does and what the other related affects are on the company.

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Another difficult issue is the issue of initial assets. Many of you probably are dealing with situations in your company in which you're focused on cash-flow testing, and you only need to allocate the assets to the model that are sufficient to cover the reserves. If you're lucky, you can do that without having to consider any of the undesirable assets that the company has. You can focus on bonds, corporate bonds, maybe some mortgages, collateralized mortgage obligations (CMOs), and so on. You just ignore the truly difficult ones to model by allocating them to surplus. With DFCA, you have to deal with those assets. DFCA forces you to look at assets that perhaps you really didn't want to look at.

Investment strategy is another issue that needs a fair amount of thinking. In the companies that I deal with, it's often quite difficult to get the companies to articulate their investment strategy in any level of detail. They don't want to talk to the actuaries. They say, that's not your concern, we'll take care of it. Although it's difficult to get them to articulate their investment strategy, it's even harder to get them to articulate how their investment strategy will change over time, what's going to happen if interest rates shock up, or what's going to happen if lapse rates skyrocket because the credited rates are not aggressive enough? Will they come screaming for more yield? You have to go to those departments and really get them to brainstorm with you to identify how that strategy might change over time.

Expense assumptions, something I alluded to in the context of new business, are particularly important. Most actuaries that I deal with are used to thinking of expense assumptions as being a unit cost factor, e.g. dollars per policy issue, dollars for policy maintenance expense, or percentage of premium maintenance, or percentage of acquisition expenses, and so on. With any sort of sophisticated dynamic financial condition analysis, especially one that involves sensitivities of termination rates or sales volume, the use of a fixed unit cost assumption is almost certainly not appropriate. DFCA forces you to do some thinking about what costs in your company really are variable, semi-variable, or fixed. I think that's a good exercise to go through regardless of what your intent is.

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One of the companies I deal with does what they refer to as, the Berenstain Bears expense analysis method. It's essentially a simple process of dividing up expenses into where we get money versus where we spend money. The aspect of where we get money can be thought of as the allowables that we built into our products. With a target ROI, we can support this many dollars per policy of maintenance and this many dollars of acquisition. When you think about that as being how you get money, that tells you in effect how much expense allowable you have generated by every policy you have in-force and for every policy you issue. Then you go on the flip side and say, where do we spend money? It actually costs us this much to maintain this policy and this much to issue this policy. You can do some crude back of the envelope estimate (hence the Berenstain Bears term), without running any models once you get the numbers quantified. This way, you will understand what your in-force volumes and production volumes have to be to support your expense structure. That's an example of DFCA that can be done without running a model, and it's probably very appropriate for many companies.

Another issue to think about is what scenario to test. Typically, when companies do cash-flow testing these days, they tend to have interest rate blinders on, meaning they're focused on interest rates as if they're the only risk. In many cases, it's probably true that interest rates are the most material risk, or the most material risk that we don't understand. What we tend to understand is the mortality risk, expense risk, etc. The interest rate risk is the scary one, but don't forget about the others as well. I like to think that the issue that will find you is the one that you don't think about. As actuaries, the insurance industry in general tends to be an industry that is always solving last year's problems. Thus, the most important issues to start thinking about are things like management failures, regulatory changes, and maybe things that are totally outside the control of the company, but nevertheless should be quantified and understood. One issue that we might be thinking about now, for example, is the continued convergence in the financial services industry of banking, insurance, and other related entities. What will that mean to your insurance operation? I don't know the answer, but it should be something that you're thinking about and perhaps attempting to quantify and understand.



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I'd also like to point out something about this implausibility. Think back 10 or 15 years to how high interest rates were. If somebody told you at that time that in 1999 the 30-year Treasury bond rate would be at or near 5% and staying at that rate for a while, you might have considered that pretty implausible. Now that it has happened, it's fairly easy to say how much lower can it go? Obviously, it's not going to go down to 0% or negative, but it might be tempting to say, it's not going to go below 4.5%. Certainly there is an absolute limit that it's not going to drop below, but I would encourage you to consider things like what would happen if long Treasury bond yields were to drop to 1% or 2% and stay there for ten years? What would happen if the stock market also dropped by 50%, and there was a commensurate drop in the real estate values and they stayed there for the long-term? Given that most products today have a 3–5% guarantee embedded in them (and in some cases higher), I have a feeling that result would create pretty serious trouble for a lot of companies. Does that matter? Is that a real risk? You might think not, but the Japanese actuaries didn't think so a few years ago either, and they've gone through exactly that. All indications are that rates are going to stay down real low for quite a long time.

Milliman and Robertson, as a firm, and I, to a certain extent, have been doing a lot of work in the last few years helping some of these Japanese companies restructure out of these difficulties. They have long-term policy liabilities with guarantees of 4%, 5% and 6%, and of new money rates that are around 2%. You don't have to be in that environment very long to understand it's not one you want to be in. In their case, perhaps the problem was exacerbated through an inherent mismatch of fixed interest liabilities being backed largely by equities. The regulatory environment in the United States will largely prevent companies from making that sort of bet in that we cannot have very many of our assets invested in equities. I have a feeling that there are similar risks here (perhaps not in equity depreciation, but in interest yield depression) that could cause similar problems for us over the long-term.

The most important, difficult issue is what I'll call the communication of results. A related issue is just getting the authority to do it. In many companies, DFCA is not viewed as a value-added exercise—it doesn't bring in new business. If you're a marketing-focused company doing the dynamic financial condition analysis, it doesn't help you to sell new products. Frankly, many

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companies may not want to know what the answer to this exercise is, perhaps, because of some of the discovery issues you were raising. We're in the business to take risk, and there's always going to be some tail of something that can drive us down. Perhaps we'll just sleep better at night not knowing what those are. I'd like to think that forewarned is forearmed, and at least we should have some idea of where the real risks are. Relating to that, is the kind of "so what" factor. If you do this sort of analysis and show that under such and such scenarios, the company's going to run into serious trouble, you also have to convince people that they can or should care about the results. It might be a challenge to convince yourself and others that they should care about the results.

I guess the last issue related to difficult communication is the fact that I suspect most company managements and certainly the ones I deal with don't like to see 300-page reports. They like to see a single memo that says on one page what's the issue, what's the problem, what's the solution and what's it going to cost? It's exceptionally difficult to summarize the DFCA analysis in anything that resembles one page. We've been testing a large number of scenarios ideally and identifying the solutions to prevent any badness if those scenarios were to come forth. Identifying a single solution, a single cost, or even making a recommendation is exceptionally challenging. It will require good communication skills on your part, and some patience on the part of your management to work through and discuss those issues.

**MR. REISKYTL:** Any questions?

**MR. TERRY KRANTZ:** Under the new valuation law, the report would be confidential and wouldn't be turned over to the commissioner unless the company failed. In the previous regulatory session, I asked the question about "actuarially sound." I said that an HMO wouldn't be actuarially sound if it was needing infusions of capital just to pay claims month-to-month so that the amount that they had available was just enough to get them through the month paying claims. Should there be a point when the appointed actuary, when he sees the way things are going, should tell the commissioner about the failure of the company?

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**MR. REISKYTL:** Actually, the design under the unified valuation system (UVS) requires that once you reach the regulatory action level, this report become available, and that must be long before your company is actually insolvent or about to be taken over. The intent, possibly because it's just an idea, is that it would also be available when the states come in for the triennial exam or on specific request. Why do we prefer to keep it confidential? Why all this concern? It's publicly done in Canada. We hope we'll get better reports, and more useful reports, if it's confidential. The valuation report has become somewhat sterilized because it is a public document. You try to think of words that say it in a positive way, although if you read the words very carefully, you may understand that there are some problems. The intent is to fully and candidly advise management as to the risks it faces. One of the most difficult things that I think we all face today is, what if HR-10 passes in some form and the walls break down between financial institutions? What does that mean for my company? It's pretty difficult to know. In our opinion, if you have to report everything to the SEC or the stockholders, you're going to have a much different kind of report than if you don't have to do so.

It isn't that we don't want the regulators to see this report—we just don't want to make it public. It's designed for management to help them run the company and to make good and effective decisions. It will be available to the regulator as the need arises, particularly, as one approaches financial difficulties.

The second point I'd make is related to the new look at the RBC C-3 factor. One of the issues that Craig raised so strongly on DFCA earlier is should you or should you not take into account new business? I think as you look at what's happening, particularly if new business has significant initial expenses, you have to amortize them over a period of years. In this case, ignoring new business is plain wrong. Also for C-3, can you just use part of your assets to pick out the good ones and put all the interesting stuff into your surplus account or somewhere else? Can the valuation actuary do this for his opinion? The C-3 group has been focusing on interest-sensitive products and interest-sensitive assets wherever they may be.

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The third point I wish to emphasize is that when I say the actuary is the be-all-and-end-all in this process, I mean that the actuary is either the quarterback or the mentor, heavily involved in working with many, many other experts needed to do this effectively. One of the more challenging aspects is to get people to articulate to you what they plan to do, for what purpose, and how to put it together to make the report.

Next we turn to the health side and Norm Zwitter. Norm is with United Wisconsin Services, a for-profit portion of Blue Cross-Wisconsin. He's one of the organizers of this meeting, and he has been involved with health insurance valuation and pricing for a number of years.

**MR. NORMAN J. ZWITTER:** How many health actuaries are here? Better than half. They've been waiting for me. I volunteered to try to give a health perspective on this analysis. What I'm going to do is to give you some of my experiences and perspectives from my experience. For your information, we probably have almost all the health actuaries that come to these valuation actuary symposiums in this room. There's about 750 people on average that come to this meeting, and usually about 10% come to the health sessions. To be here, you have to be big enough in health care, or at least heavily involved in health and valuation issues. You will likely find a different mix of health actuaries here than in a more general session. What is changing and the reasons it's important for health actuaries to be aware of this topic is that I think the health actuary will be asked to do more of what is being done on the life side. One of the earlier sessions on the health side was on gross premium valuations. There's some impetus to use this type of valuation as part of the Section 7 opinion, in which a lot of health companies do participate. Some health actuaries are already doing cash-flow testing—there are a lot of changes moving us in that direction. The new risk-based capital formulas for HMOs will require a lot more analysis of where you're going. HMOs probably have generally less capital than insurers. However, 20% of the HMOs would not respond to some type of regulatory action under the new formula, so the database is incomplete. Specifically, health actuaries have to plan a lot more. Their cash-flow doesn't come in as quickly. They have to watch where the HMOs are going, what kind of business is being written, and generally, where the business is going.

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In preparation for this session, I looked at the DFCA manual briefly and was surprised to find that we do a lot of things on the health side that are in there; we just don't think of them as DFCA. I think it's important for health actuaries to start thinking of what they're doing in a broader context. I outlined three areas I'd like to cover. First is cash-flow testing for the health actuary. It's important because our testing has developed differently than that of the life side. That has really impacted how comfortable health actuaries feel about cash-flow testing moving into more dynamic modeling. Second is liability modeling. When I looked at the manual, I concluded that it is something we probably do in the health cycle. We just don't think of it as DFCA. We do a lot on the product side. As to the asset surplus side, we do something, but probably are far from being experts at it. We could learn a lot.

In cash-flow testing, I have two areas I call statutory limitations. Statutory rules and model laws have limited the need for health actuaries to do cash-flow testing. I'll get back to that in a little bit. Corporate structures have also played a part on how health actuaries have undertaken cash-flow testing.

There are a couple of things on the regulatory requirements for cash-flow testing. The HMO blank, and who regulates the HMO, varies a lot by state. In general, the blanks that I've seen usually have a Section 7 type reserve opinion. The clause in the opinion in some of the life blanks is different in that you have to state if you know about any provider groups that are going to fail or are in trouble. This may be kind of difficult to do in some cases. Some HMOs are not regulated. I'm not sure what, if any, opinions they have. In a lot of states, HMOs are not looked at by the state insurance department. One large HMO that I know of is regulated by the Commerce Department. So you have a lot of different regulatory review and standards. There is a lot of the growth on the HMO side. Indemnity plans are fairly stable, and while there may be some growth, a lot of your business is going into the HMO side of your business.

The next area is the property and casualty (P&C) blank. In my last two companies, the majority of our health business was written on a P&C blank, and it has a couple of implications. One, you normally don't do cash-flow testing, or, if you do, you're not doing the formal test that's required

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on the life/health side. Two, you don't even sign the blank. As an FSA, you're not qualified to do so. You can get an exception to do it, but generally you have to have the casualty actuary sign the casualty blank. We had a big workers' compensation reserve and other long tail lines of business, but I was not involved with any cash-flow testing in a formal sense. I mention provider-sponsored organizations (PSOs) because these organizations are more common, and the NAIC is looking for standards for their capital levels. When you have an HMO, you capitate out to these provider groups, and they take the risks. You get the risk back if they go under. Then you're probably stuck with the risks for all intents and purposes. You have kind of a back door financial risk which is being addressed by setting surplus standards for the PSOs.

The other thing that has impacted how health actuaries look at cash-flow testing is corporate structure. Most of my health background, until recently, has been in life and health companies. You do cash-flow testing for health if you have to do it for the life and health company. What tends to happen, or what happened to me, is the life actuaries have all the models. We had lots of GICs and UL products. When they did cash-flow testing, they went to the health actuaries and said, we need this, and so you comply. You asked a few questions to sort of understand what they're doing. You pass the data requested to them and then they do their magic, producing aggregate cash-flow testing for the company. In these companies, you do not get involved in the process in the same sense that you do when you have to do it. Subsequently, I did a Section 8 opinion for my new employer—a standalone health company—that qualified.

The other issue is multiple business identities. Health companies have grown because of acquisitions. Through acquisition, the total premium might get you up to the Section 8 opinion level. It's made up of multiple identities that may continue, and if they do, your opinions really are on each of those small pieces in multiple states. In Wisconsin alone, we had three HMOs that cover different parts of the state. I suspect national carriers may have identities all over the place—companies they have bought over time. While the total premiums are growing, it's not necessarily growing in one entity. The other thing I see happening is that the companies are becoming more specialized. Today it's harder to be a multiline company. The first company I worked for no longer exists. It has been

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acquired and blended into the company. My next company is getting out of the health market. Consolidation is leading to much bigger and much broader health entities that have a lot more coverage. These health entities must do cash-flow testing, scenarios, etc.

Next, let's discuss dynamic financial condition analysis. If you look in the book, you'd see that the risks you're supposed to look at are called: operational risk, environmental risks, and risk considerations. So I looked further to see what you're supposed to do with each one.

Operational risks are morbidity, persistency, and expenses. Environmental risks are the marketplace, some legal government actions, and competition. Risk considerations include variability, and underwriting and market distribution systems. While health actuaries typically don't look at it this way, we are doing this analysis all the time. We don't look at it in the context of cash-flow testing and definitely not as DFCA. We study our blocks. We project the model. We consider the risks of government action and where we are going to get rate actions, how much we can sell, where is it going to be, and, if we capitate this type of business, what's going to happen? So we do a lot of this work, but we don't think of it in this context or in the broader context of risk analysis. I think that's going to change.

The other thing is that we don't add it to a broad paper on all the risks and how we manage them in one complete document. We say, "This product is not working because the rates aren't right. This HMO is in trouble because the capitation rate won't work. We didn't get enough business here." We attack each issue on a piecemeal basis. We look at all the issues and quantify them, but usually not in one broad plan or document. It's a plan for each product or each type of coverage level, so it's a somewhat different concept.

On the health side we tend to do this analysis constantly. Because our lines are so short-tailed, every month you get a little more claim data. Each month you look at the trend and the pattern, especially for the medical side. I think the LTD is a little different. I think the long-term disability (LTD) actuaries have addressed their risks and issues much more than other health actuaries have done. The LTD health actuaries address modeling much more than those on the medical side. On the

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health side, other than LTD, we have short run-offs. You keep getting a new picture and must ask yourself, what does this do to our year-end forecast? What about our rate action or our plan? We constantly redo our plan. Each month's reserves change the trend line. If you get a big hit one month, everybody will ask questions like, why do the pricing actuaries have different ideas? You go back and forth to determine who's right, what you have missed and where you are today. So you are reevaluating your model regularly.

**MR. KRANTZ:** I am thinking about regulatory risk for an HMO. If they capitulate with individual providers, they're allowed to take credit. If they do it with a third party, there is a possibility that the third party would be considered a reinsurer. If the reinsurer is not admitted, the credit may be disallowed. Is that one of the things you consider?

**MR. ZWITTER:** I'm not sure. The risk I was thinking of has more to do with the PSOs not being able to provide the coverage. This might be more of a question of risk, rather than one of being able to take credit. PSOs are a big area that's going to get bigger. Evaluating provider groups is very hard. You have some very limited information on how well they're going to do things.

The next area I want to discuss is the asset side. I think health actuaries look at scenarios, but probably not in the same way that life actuaries do. Most of our products, even LTD to some extent, are not as interest sensitive as some annuity products. You don't need to worry about fluctuations in LTD yield. One of the things that the life valuation actuaries always used to ask us on our LTD block was, is this a sensitive interest rate? Generally no, but if interest rates hit 14%, yes. At that point, some people will miraculously become disabled and their benefit won't be sufficient. This is not the type of correlation that you see on the life side, so we spend less time on it. On the other hand, we have talked to health actuaries at these meetings, even those under a Section 7 opinion, and they are looking at their assets. Again, the review is somewhat different than that done on the life side. We look at quality in general terms. Fortunately our record has been pretty good. If you had highly illiquid or high risk assets, most health actuaries would comment. Much is done with liquidity. How much testing is done varies a lot with how liquid they think they have to be. Some health actuaries go through the New York 7 tests on their assets as part of their cash-flow testing to



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see how sensitive they are to changes in rates. Much depends on what kind of assets you have and what businesses you are in. I coordinate and talk to our investment department in very general terms about risks. We have the same general problem that others do. The link is probably not as strong as you would like. We do not look much at what they are buying or selling. Perhaps we need to do more. On the health side, we probably do less than is done on the life side.

Finally, just a few comments on surplus analysis. It's probably the area in which health actuaries have limited involvement. I've been involved very little because of the type of liability we have had. I've looked at the new risk-based capital health formulas, and what the C-3 risk would be, how that component is likely to change, and its impact. Generally, this analysis and GAAP analysis, where I have worked, has been done in the accounting area with input from the actuarial area. They have not been heavily into surplus analysis. While we look at some of the business risks everyday, I'm not sure we look at some of the broader risks that Jim referred to earlier such as national health care. We might consider it, but definitely not as formally as some of the more broad business risks that could happen economically.

Another area I've seen is DFCA documentation. As I said earlier, this is one of the things we probably don't do, or at least I've not seen it. We do not present it formally to our board. We've discussed a lot of specific issues, but not all rolled up in a package. Here's where we're going for all of the business units. We attack one issue at a time as they come up in the product lines.

**MR. JAMES GALASO:** Are you aware of any SOA literature regarding specifics with respect to cash-flow testing for health insurance companies?

**MR. ZWITTER:** No. Like I said, it really varies a lot. There's probably some guidelines, but there are not as many standard tables that you can rely on as a minimum. Many of the discussions we have on the health side are on reserving. Your health analysis and your bottom line are very dependent on where you set that claim reserve on the medical side. On the LTD side, you have problems with where you're going, and it takes more time to know. Because you're so leveraged on reserves, you need to get the reserve level right because it's pointing in the direction you're going. I'm not sure

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that I've seen anything formal on what to look at or test for health cash-flows. When you start moving into a required Section 8 opinion, there's not a lot of guidance.

**MR. REISKYTL:** Now you have the opportunity to ask any one of us questions or express your own view, tell us what you're doing, or what you might like to be doing. I have to give one plug to the Society of Actuaries handbook. For those of you who haven't seen one, it may be purchased from the SOA. They might also be available online. We'd welcome your comments and suggestions for further work to be done or if you think the handbook could be improved.

**MR. ZWITTER:** We also need volunteers.

**MR. REISKYTL:** We always can use volunteers and I'm so pleased with those who volunteered to talk about what's really going on. Maybe you have been doing DFCA or some part of it and never knew it. I think that's often the case. As Norm just said, I think it's a lot closer to what the property/casualty actuaries are doing. If you focus on a line or a particular issue, and are not necessarily able to look at the whole picture, that's fine. At other times, you should look at the whole picture.

I think it may be worth noting what is being considered in the possible new valuation system. This discussion will also summarize much of what we have said thus far. I'm going to go over a few highlights of what is proposed. We welcome your input as to whether it has merit. Let me go over a few of the major changes.

First, you will now have to do a viability analysis once a year for at least five years. Do you have to do cash-flow testing? Yes, most of the time you have to do it for UVS. For vitality analysis, it is not always required. Vitality analysis can be any type of analysis that is appropriate in your opinion. Your analysis must cover the company plan for at least the next five years. You will have to consider all significant risks. We will not tell you what those risks are because you should know that better than we possibly could. As emphasized by Craig earlier, you are going to have to do both: new business and existing business, and you're going to have to include all assets.

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The Unified Valuation System covers both insurance *and* noninsurance operations—a significant change and a very broad approach to valuation. The Wilcox task force draft covers everything. If you own a car rental, a movie theater, a bank, a mutual fund, or whatever, you have to combine all of the cash-flows in this new analysis. Some companies set up their plans for a year or two; others don't. Getting access to the company plans is necessary if you are to reflect the resulting changed cash-flows in your analysis.

Vitality analysis covers changes that may occur such as passing HR-10, implementing codification, or *FAS 133*. What will these changes do to the financial statements? That just touches some of the possibilities you may wish to analyze. This report to senior management and the board, as mentioned earlier, may also help you prepare for the rating agency, respond to stockholders, or improve understanding of GAAP earnings.

The vitality analysis report will identify the impact of your plans and other possible events. The results must be tied to something to give them practical meaning. For example, in Canada, the results typically are expressed in their counterpart to RBC. How has each event changed their ratios? That's one simple, effective way to do it. One could look at the impact on both surplus and risk-based capital, or your own internal measurement. Do you need any additional capital for your plan? What's equally important is will you be able to actually borrow at the time of need? Often valuation actuaries assume they can borrow if needed in their cash-flow analysis. You can't do this in vitality analysis. You must consider whether you can borrow money at the time and whether the price is acceptable.

Vitality analysis must be done once a year. You may choose to do it when you make a major change, such as entering a new line of business or selling a major line of business. Otherwise, you must do it as part of the next annual report.

The report must identify the major risks and what can be done to minimize them. The report must also contain your analysis and your assessments as to its viability. As you project the current or

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planned operation, you'll identify the riskiest assets, the riskiest product lines, and any unique or unusual financial results that could occur.

Another point in question is, are you to be a policeman or a contributing member of senior management? One reaction we've gotten is that some people say my CEO has absolutely no interest in this work. He already knows we're doing something very risky. He doesn't want to be reminded that if he continues as planned, he could lose the company. This report is not needed. The CEO already made the decision, realizing it has possible high risks. If the new UVS were in place, you would have to prepare the report anyway, and present it to him and the board.

You are to estimate the net financial impact of each event after reinsurance, hedges, product design, and so on. Clearly there will be some net risk; they are risk-taking ventures. Then one must rank the results by size. Note these are estimates, without probabilities. You can add probabilistic comments if you choose, but they are not required.

Next, you are to identify the key assumptions that you have made to come to these conclusions, and include a discussion of the appropriateness of each significant choice. You may use industry average, your own experience, or your best judgment for assumptions.

As the Canadians have done, you may/will have to report if you made a run with adverse results. You rerun it with changed assumptions. This gets us back to our discussion about ethics and integrity. If I report to Craig and say, "I ran this thing and the results don't look good," and then I were to change the interest rates by ten basis points, everything would be okay. If I hadn't done the second run, or if Craig asks about adverse results, what do we have to do to look acceptable? You also must report any changes made in assumptions from last year and why those changes were made. If you consistently tie your assumptions to your experience, that's fine. On the other hand, if you abandon your previous basis for mortality rates from your five-year mortality study and begin to use next year's study (which has not been run yet for assumptions), you will have to report the change, and explain why you changed.

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The next requirement begins to bring it all together and makes it potentially very useful. You have to identify the actions that you feel could be most effective in managing the risks. I want to make one point clear. I hope that you will do this in a collective way with others, because you may or may not know what to do in some cases—you are responsible for bringing the experts together and reporting their suggestions/comments.

Next is that of stress testing the key assumptions. What happens to the results if interest rates go up 4% for seven years? Stress test mortality, stress test morbidity, stress test HMO capitation, and stress test to determine your largest possible financial risks. The stressed assumptions don't have to be realistic, but they do have to be possible.

After you're done with such a report, the next year's report would compare what you thought would happen and what did happen. Don't spend a lot of time on analysis other than to help you decide what you should do. Looking out the back window is only useful if it will influence you going forward. To repeat, the analysis emphasis in the report is on what you do as you go forward. You can't do anything about what has happened, although we can all think about where we're going and what we can and should do in the future to improve results.

Of course, the usual caveat applies that all work and the report will be done to actuarial standards that have yet to be identified. Personally, I feel these standards could be developed and applied in a similar way to that used when cash-flow testing was relatively new. That is, you don't have to do it, but if you do, here are the standards. Any other questions?

**MR. KRANTZ:** Regarding the point you made about if you select some assumptions and then change them later—this seems to me that you might not know what a good set of assumptions are, so you play around with various assumptions until you come up with one you like. Then you start from there and build on changes in the assumptions to test for riskiness. That seems to me to be acceptable. Would the actuary need to disclose that his starting point was that of plugging something into the model to see what he got so as to enable him to refine any starting assumptions?

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**MR. REISKYTL:** I think the answer is yes, he would. Unfortunately, it's very difficult to know when you did one and when you did the other. If you identified in advance in your report that you don't really know what your experience is to establish assumption(s), and you are going to try out various ones to determine their results, that might be fine. The key discipline at the moment is disclosure, if you change whatever you started within the analysis as your assumptions. If I was working for Craig, and I had no idea of likely factors, that's what I would say. This is just a draft, a concept, and it needs more work. We'll think about it.