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Session 100OF
Cash-Flow Testing in a Low Interest Rate Environment

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Summary: The panelists lead a discussion on the major consequences and potential effects of the current economic environment, including the choices of assumption that actuaries should consider in performing cash-flow testing. Topics for discussion include:

- *Constraints on projected yield curves in declining scenarios.*
- *Impact of contractual interest rate guarantees.*
- *Lessons learned from other countries.*
- *Managing assets to minimize these risks.*
- *Product redesign.*

Mr. Anson J. (Jay) Glacy Jr.: I'm a senior consulting actuary with Ernst & Young based in Hartford. I'm part of E&Y's risk management team focusing on the capital markets risk exposures of life and annuity companies. My partner, Dave Sandberg, is the appointed actuary for LifeUSA based in Minneapolis. He's been active in the Unified Valuation Task Force as well as the C-3 RBC (risk-based capital) subgroup.

This is an open forum. It's meant to be a free-form and interactive discussion of the issues and challenges associated with this year's cash-flow testing event. Dave and I will lead a discussion into various directions, letting you know what we see as the major difficulties that you might encounter this year, but we'll rely on you to provide your views and perspectives as well. The handout you've picked up is meant primarily to stimulate discussion as we go along.

Note: The chart referred to in the text can be found at the end of the manuscript.

First, we'll take a look at where interest rates have been and where they might be going. Then, with audience participation, we'll conduct a "show-of-hands" poll to determine what individual companies may be planning. Finally, we'll finish up with a discussion of modeling issues, assumption setting, and problems and solutions.

I think everybody here has got a sense of where the Treasury curve was on September 30, 1998, especially the benchmark five-year rate of 4.22%. Contrast that with what happened in the fourth quarter of 1994, essentially a pop-up event, where interest rates flirted with 8%. Now we have interest rates at the other end of the spectrum, so we've gone from a situation where we might have worried about policyholder "puts" to one where we are now concerned with policyholder "call" options. The curve as of September 30 is U-shaped with the low point occurring at the five-year point. I think that the Federal Reserve actions of the past few weeks have probably fixed the curve now to make it a more normal shape.

Mr. David K. Sandberg: In 1993 and 1994, Japan's interest rate environment was at a historical all-time low. It was hard to imagine it could get much lower, but it happened. We all have to confront the common reaction of "We've never been this low before. I'm sure rates will bounce back to some higher state." But we need to be thinking about what happened to Japan as a plausible scenario in the U.S. and be sure that management is aware of the risks that the company faces in that type of environment.

Mr. Glacy: What would happen in the U.S. in this situation is what I term a "nightmare scenario." Rates get down to the 1% level, which is where rates are right now in Japan. In this type of situation, capital would come flooding back to insurance companies, renewal premium would accelerate to take advantage of minimum interest guarantees that might be present in the contracts, reinvestments would be made at a much lower level than anticipated, and market-value balance sheets would be under water.

Mr. Sandberg: Another way to look at this difference is in Chart 1, where the 1998 U. S. Treasury curve looks very similar to the 1992 Japanese Treasury curve. After seeing what happened in Japan from 1992–1998, where is the U.S. Treasury curve going in the next six years?

The good news is that, even though changes in the Treasury yield curve have been very dramatic, corporate spreads have offset some of that decline as far as the amount of yield that's actually available. While the Treasury curve itself changed

about 30 or 40 basis points between June and September, the actual yield available on a corporate bond didn't change at all.

Perhaps we can dismiss Japan as a unique environment. Its situation might be due to a different financial structure than exists in the United States. But, it's also important to consider some interesting historical facts. From 1870–1920, over a 44-year period, government bonds fell from 5.4% to 2.9%, and then returned to 5.4%. For 40 years, they were less than 4%. This is what's called a deflationary environment. We've all grown up learning how to plan for and deal with inflation. The deflationary environment was the paradigm from the last half of the 19th century into the 20th century. Triple A corporates 1879 closed at almost 6%, which is similar to the yields we saw this summer. They fell for 23 years to 3.8%, then took another additional 18 years to exceed the 1879 level. Over 20 years, corporate yields were less than 4.5%. So, as we think about the state of the economy, the important question is, "Where are we today?" We have to make some judgments and assessments. We can no longer safely say it just can't happen. The deflationary environment is a plausible economic scenario.

Mr. Glacy: Yogi Berra said that forecasting is difficult, especially about the future. I did an Internet search trying to collect some interest rate forecasts, avoiding the usual crackpots and sticking with some of the more reputable sources. The following gives some perspective about where knowledgeable and thoughtful people in the economy think interest rates might be heading:

- IDC: "4% long bond by Dec. 31, 1999."
- Levy Institute: "4% long bond in 1999."
- Gary Shilling: "3% long bond in 1999."
- Major multiline insurer: "3.5% long bond in 1999."

One eye-opening fact is that, from the 1920s to the 1950s, the 30-year bond averaged 2.5%. So, long stretches of very low interest rates have occurred in this country in this century.

Single-premium immediate annuity and structured settlement writers are staring at large reinvestment events. In their pricing, they may have assumed a 6% reinvestment rate, which in this environment is unrealistic. For the companies with high minimum interest guarantees, there is now the policyholder "call" situation, where the policyholder in certain lines can, on a discretionary basis, make additional deposits to the insurance company in order to exploit the interest guarantees. We haven't seen that showing up yet in the statistics, but it is a potential issue that you should watch out for. Now, let's do some audience polling.

Mr. Sandberg: Let me make one comment on the polling. We're looking for your involvement and perspective so that, as a profession, we can discuss some of the alternatives on these issues. You are all supposed to have moderate to substantial experience. Jay and I will give feedback to the Society on how well you met our expectations.

Mr. Glacy: On to question 1. Of the companies represented in the room, who has exposure to interest-sensitive product lines with interest guarantees in the 4–5% range? It looks like about 50%. Above 5%? I see only two hands.

Mr. Sandberg: Okay, we'll move on to question 2, which involves how your company does interest rate forecasts. One option is that your company does not make interest rate forecasts, (you're not trying to play the market, just trying to understand it). Who's in that category? It looks like almost everyone. There are also a few companies in which the asset managers operate as a total-return outfit. They're smart and good at playing the market and come out ahead. For them forecasts become important. Do we have anybody with some really good asset managers here? No one. Then, does anyone in your corporation do an interest rate forecast and what is his or her perspective?

Mr. Lawrence E. Isaacs: We have an investment manager who does a forecast. We're not on a total-return basis anymore because of accounting considerations. As I recollect, it's either neutral to increasing. But that would have been as of our last rate meeting, which was in the middle of September.

Mr. Sandberg: How many of those with forecasts have long yields going down another 10 basis points over the next 6–15 months? None. How many have them staying at about where they are today? Two. And how many have them rebounding 50–150 basis points? Two.

Mr. Glacy: Question 3 is What 'repair work' can be made before December 31st if preliminary (September 30th) indications are favorable? At Ernst & Young, we're seeing the potential for this year's effort to have two rounds. After getting a look at the September 30th numbers, which will probably be quite eye-opening in terms of the New York Seven set of interest rate scenarios, companies will probably conduct an additional run to actually form the actuarial opinion for December 31st. This has nothing to do with "cooking the books" or "window dressing," because the spirit of the actuarial adequacy regulation is intended to motivate potential repair efforts that arise from the results that cash-flow testing can supply. I personally believe that initiating a long position in Treasury futures to protect against further drops in rates is a prudent step, and certainly not window dressing.

Mr. Sandberg: Let's go on to question 4. How many of you are changing your views on interest rate environments? Do you think it a real possibility to have a fairly stable or slightly declining interest rate environment over the next decade? I see a lot of heads nodding and some raised hands. If that's the case, then it might be a good business practice to inform your company of the need to talk to the ACLI about the non-forfeiture issue on the regulatory front. Remember that the non-forfeiture requirements were basically set in the 1980s when interest rates were at an all-time high. For those who were there, I'm sure the thought that you could ever have trouble with a 3% or 4% guarantee just seemed impossible. But today it's a real possibility and may be something to follow up with when you're back at the office. Is there anyone whose companies already have talked about that? No one.

Let's talk about the next favorite place to lobby, the IRS, with Question 5: What is the effect of lower life guarantees on the 7702 requirement? If you have a product with a 2% guarantee, what happens to your corridor? You have to calculate your guideline premium corridor using a 4% interest rate, so you end up essentially with any accumulation product that is being sold as an accumulation product not being able to accumulate very much money before it stops qualifying as a life insurance policy. I am not a tax expert, but perhaps others will want to comment on this.

About six or seven years ago, the Society did a seminar on solvency. I think it was here in New York, and Jim Tilley was one of the speakers. His opening comment was that the current non-forfeiture framework is the greatest threat to solvency that currently exists in the United States. He was the only one to state this at the seminar and I think most viewed it as a dramatic comment from a very bright individual, which we now hope was not meant prophetically.

Three of our questions are related to the thought process that appointed actuaries need to deal with when determining if additional reserves are needed. Much of the language talks about reserves being able to fund "moderately adverse" events. Therefore, question 6 is, Is our current interest rate environment one that's likely to occur throughout the lifetime of the policy or not? If the interest rate environment that we're in today extends over a five-year period, is that within the range of a moderately adverse environment? The show of hands is about one-half to two-thirds of the audience. The answer to that question is going to affect the level of reserves that might need to be established through additional cash-flow testing.

Question 7 is, At what level do rates become extremely adverse? If they drop another 50 or 100 basis points, is that extremely adverse? Historically it's happened but, again, you need to come to grips with what you judge to be an appropriate boundary based on your understanding of the interest rate environment.

Mr. Glacy: Let's just go back to the early 1980s when the long bond hit 17%. Just with a show of hands, who thinks that would be an "extremely adverse" event? About half of the audience agrees.

Mr. Sandberg: That's a good example because it was temporary in nature. Most companies could handle that type of event for a brief period. But if it runs for five years, what are the implications? That's question 8. There's very strong evidence that the current interest rate environment is very likely to continue over a five-year period. It could even, very plausibly, drop another 50 to 100 basis points, but at what point does the event become extremely adverse? You'll need to deal with that.

Here's some background for the deflationary environment of 100 years ago that occurred through the introduction of technology. You had railroads, transportation, and the opening of world commerce. Shipping created a fall in commodity prices over about a 20-year period. Similarities today suggest that the idea of another deflationary environment over a 10- to 20-year period is not out of the question, and none of us is used to dealing with that. We know how to hedge against inflation, but we haven't gone through the thought process to hedge against a deflationary environment.

Mr. Glacy: Looking at question 9, How many companies have done some "normalization" of the yield curve? Normalization recognizes that the initial yield curve in our cash-flow testing process is unusually shaped and needs to be adjusted to a more typical shape. How many people have used yield curve normalization in the past? How many have used normalization of bond spreads over Treasuries, showing that the spread situation that existed on September 30th may not be representative of the 20 or 30 years of cash-flow testing? Then, why not normalize all assumptions? It's a slippery slope once you go there, so you want to choose your normalization practices judiciously in a way that you can defend. For example, the U-shaped yield curve of September 30th is a potential candidate for normalization because I don't remember having seen a U-shaped curve before.

Mr. Sandberg: That's a good question. How many people would consider doing normalization for the first time based on where we are today? About 10–15 or so would consider it.

Mr. Glacy: In doing so, are you contemplating bringing the low point of the U-shape up, or bringing the other two points down?

Mr. Sandberg: The answer is yes to all the above.

Mr. Michael V. Eckman: You have statistics on average rates and falling rates, but a flat yield curve over a 20-year period would argue against normalization.

Mr. Sandberg: When bonds are trading at 4%, regardless of whether you have a steep or a flat yield curve, you don't have a lot of room to play with it either way. You might be able to normalize the slope a little to get rid of the U shape, but it won't make much difference in the results.

Mr. David M. Ruiz: Mark Tenney has done research indicating that historically inverted or cup-shaped yield curves occur about 15% of the time.

Mr. Sandberg: I think the initial yield curve is more significant for companies that tend to test using parallel shifts. If you run 100 random scenarios, a fair number of different shapes will probably emerge. But, if you take the beginning yield curve, do about 20 deterministic scenarios that go up 50 or a 100 basis points, and then do some seesaws, that initial shape is probably important.

Mr. Glacy: Has any research found that a U-shaped yield curve was predictive of certain future events?

Mr. Sandberg: At last spring's Society meeting, Mark Tenney talked about stylized facts, where you examine historically whether different interest rate environments predicted subsequent changes. For example, yield curves tend to move in quantum leaps. You don't get small, gradual changes; you tend to have an economic event that occurs as a shock to the system. You may see some inversions and other things happening, but the markets eventually adjust and fling you into in a new state and a new environment. Tenney and Dave Becker have put together a summary of their research.

From the Floor: It strikes me that, if we all agree that forecasting interest rates is a futile effort, then this week's yield curve shouldn't have any bearing on the 30-year risk event of an adverse curve. And, therefore, it shouldn't have any bearing on our 30-year projections.

Mr. Sandberg: Let's move on to question 10. A standard of practice addresses when to do cash-flow testing in developing a new product. My question is, When pricing of new products, how many of your companies in the last three months have said they needed to do something additional in cash-flow testing for the new product. And, if so, what has it been?

Mr. Andrew D. Rallis: We've been looking at some very long-tailed joint-and-survivor products. They aren't fully developed yet, but I wouldn't say that we're

going to cash-flow test the product any differently. We need to use cash-flow testing techniques in pricing the product because we recognize that there's a risk in using non-interest-sensitive cash flows in the pricing assumption.

Mr. Sandberg: Cash-flow testing just prior to issuing a product may not be sufficient to understand the risks of selling the product in a very different interest rate environment. We've done more extensive cash-flow testing of our current products to make sure we understand the effect of this lower interest rate environment because, when we initially priced them, we were dealing with a different starting point.

Ever since I've been an actuary, I have heard about pricing benchmarks, particularly the magical 15% rate of return pricing benchmark that companies strive for. For those of you who either knew someone or had some exposure to pricing in the 1960s and 1970s, was that same kind of return expected? Would anyone care to comment on that? Someone indicated they priced for a 17% return in 1980. Through the 1960s and 1970s then, does anyone know what pricing benchmarks were used? Will we have to tell the Society that we didn't get audience experience here. It has been pointed out that, prior to universal life, pricing focused on percent-of-premium benchmarks.

Mr. Glacy: Let's do a quick poll here to get a sense of where the companies represented in the room are pricing today. If you're pricing for a 15% internal rate of return or ROE, raise your hand. I see about four or five hands. Is anyone looking for more than 15%? I see one hand. How many are in the range between 12% and 15%? I count 10 or 15 responses. Between 10% and 12%?

Mr. Sandberg: I count another six or seven hands. Of those in the 10–12% range, is that just the target for the last year?

Mr. Glacy: Is anybody pricing below 10% as their pricing objective?

Mr. Sandberg: We have one individual. We assume it's post-tax, right?

Mr. Robert W. A. Howe: We tend to operate a pricing formula over a long number of years that is based on long bond yields and look for after-tax rates of return between 3% and 5% on top of long bond yields. We do tend to follow the market up and down. This makes it about 9.5% currently.

Mr. Sandberg: Thank you. I will also raise the question about what it means to have a pricing benchmark. If we weren't in insurance, a company would prepare a

business plan and plan for a 15% return. When Kmart opens a new store, for example, it expects to get a 15% return from expansions. But one site might get a 3% or 4% return while another gets a 20% or 25% return. How does that translate to insurance if a product is priced for a 15% return? In a cash-flow testing context, some interest rates environments produce a 3% or 4% return and others produce 15% or 20%. How do you think about the range of the return in this case? If it's 9% or 10%, you project that it won't get worse than 6% on the downside, and you could go as high as 12% to 15%. That's very different than saying the expected return is 12% or 15%, but its also possible to lose money on the deal, too.

Those are some of the ideas I hope you think about. If your company has gone through different experiences, I encourage you to share them, because this idea of the low interest rate environment is not just a year-end issue; it affects new business as well.

Mr. Philip J. Bieluch: On your last point, the Boston Consulting Group has a couple of good books on shareholder value that cover return on investment. I have two questions. First, no one has discussed settlement options. Most people price products without converting to settlement options. I can recall some at 4% and some at 3.5%. I'm wondering (1) are they including settlement options in their cash-flow testing, and (2) are they reviewing their settlement options and re-filing those generic forms?

The second question is a bit off the topic. Is this creating a problem with the insurance analysts because, for those companies that have GAAP assets that are market-to-market, the insurance earnings are actually going up at a time when cash-flow testing is projecting problems in the future. I'm just wondering if there is any counter to that in GAAP accounting. Is there something I don't understand? Their earnings are going up because the market values on the assets would be going up as the interest market goes down.

Mr. Glacy: Not if they have prepayments or calls in their assets.

Mr. Bieluch: What if their bonds are Treasury bonds?

Mr. Sandberg: It depends. If you're saying that your GAAP equity is changing due to assets classified as available for sale, it won't change your earnings, just your balance sheet. The earnings aren't going to fall through. My understanding is that most analysts completely discount the Financial Accounting Standard (FAS) 115 adjustment and put it back in. So you probably won't get inconsistent results on a GAAP basis. But your point is very valid. The FASB is aware of that issue and

trying to find a way to keep both sides of the balance sheet in sync. They just don't know how to do it.

Mr. Glacy: Phil, your point about settlement options also is a good one. I can recall 3.5–4% settlement options as commonplace contractual guarantees.

Let's talk about modeling issues and obstacles that we might encounter. I talked about normalization of yields and yield spreads. The use of supplemental stochastic scenarios is an interesting topic, for two reasons. One, if you're going to establish additional actuarial reserves this year as a result of cash-flow testing you'll want to do so in a stochastic setting. In other words, you'll need to establish protection at a certain confidence level, typically the 95th or 96th percentile. Assessing exactly which percentile to choose is intimately linked to your definition of "moderately adverse" and "extremely adverse." So this is a perfect year, if you're not already doing it, to contemplate some stochastic work using the platform you're putting together for cash-flow testing.

Regulations allow you to aggregate lines of business in your cash-flow testing, although there is some state-by-state diversity here.

Dave and I had an interesting discussion at lunch about the implications for bond defaults. The yield spreads for corporate bonds have spiked lately in response to what the media describe as the "flight to safety" or the "flight to quality." Table 1 shows what has happened to yield spreads for 10-year A2 industrials in the last year.

TABLE 1
A2 INDUSTRIALS YIELD SPREADS

	9/30/97	12/31/97	9/30/98
5-Year	0.40%	0.52%	1.05%
10-Year	0.55	0.65	1.15
30-Year	0.76	0.84	1.55

Mr. Sandberg: Those changes in spreads occurred in the last three months. As of June 1998, spreads were still about 65 basis points over the 10-year Treasury.

Mr. Glacy: What do increased yield spreads bode for future defaults? And how much of that should you recognize in your modeling? Does it make sense to take some benefit of the increased corporate spreads but also adjust your haircuts and default expectations commensurately?

From the Floor: Were 1997 spreads normal?

Mr. Sandberg: No. Spreads of 55–60 basis points were historically as tight as they had ever been. I think 80–100 basis points have been a more typical range, so they are a little wider than they have been.

From the Floor: What about changes in liquidity and default risk?

Mr. Sandberg: Actuarial judgment and estimation needs to be used for dealing with risk and liquidity, but I think the points are valid. The actuary is required to say what the risks are and, if there is a liquidity risk, then you need to find a way to estimate it and include it in the modeling.

From the Floor: Doesn't the use of historical bond spreads constitute normalization?

Mr. Sandberg: We asked who normalized bond spreads and only got a couple of responses. I do it, so I'll answer the question. Last year, we used the bond spreads available then. They were low, but the spreads did not affect our cash-flow testing conclusions.

Mr. Glacy: Did the vast majority of people who didn't normalize lock in the 55 basis points for the life of the model?

Mr. Ruiz: We always ask our investment professionals to give us an estimate of long-term spreads. We tell them, "Forget about what's happening today. Tell us what's going to happen for the next 20 years because that's how long we need to project." They give us their best guess, but obviously it's a guess.

Mr. Glacy: Do you ask them to do that seven times?

Mr. Ruiz: No.

Mr. Glacy: I think the way to do it is to say: "We're contemplating seven highly unlikely scenarios. Please give me your sense of where bond spreads are going along each."

Mr. Ruiz: Right, that would be the best way to do it, and I consider that a form of normalization as well.

Mr. Glacy: I also recall from the beginning of this session that we didn't put much predictive faith in our asset managers.

Mr. Sandberg: The point is valid because the normalization is over a 20- or 30-year horizon. So, although today is important as a starting point, you need to think through what's happening in the future.

From the Floor: We might be in a situation where almost no future scenario is good. Staying down where we are isn't good because of certain hard-coded guarantees in the policy forms, but we're not going to be too happy if we've just locked in a 5% yield on something and then interest rates go up. Is there a good scenario?

Mr. Sandberg: The present may be the worst scenario to start from if your investment strategy is to lock in for 30 years. But, that's a different issue from taking less yield in the short run. With the flatter yield curve we've had this year, going shorter has not been a bad alternative. It costs less than usual and has less risk on the long end.

From the Floor: What if you're afraid rates will go down some more?

Mr. Sandberg: Then you need to assess the guarantees you have in your contract, too.

Mr. Glacy: On the impending wave of mortgage refinancing, the *New York Times* article mentioned that prepayment indices for mortgage-backed securities (MBS) have doubled since the spring, and I think they're even at higher levels now. According to what I've read, we've broken through a barrier that is, not unexpectedly, provoking a lot more refinancing activity at these low interest rate levels. For those who are contemplating the prepayment assumptions for your model this year, if you're using the Andrew Davidson model you may want to reset the parameters. If you're using median dealer forecasts, it's time to go back to Bloomberg and take another look at where they've gone. They're probably considerably different from last year.

Dave and I think it makes sense to eliminate unwarranted conservatism in your modeling. Appointed actuaries need realistic depictions to help them assess asset adequacy. We also discussed anticipating future production. A going concern like an insurance company has a reasonable expectation of premium flow from future production that may or may not help you through cash-flow testing.

Finally, take another look at your pass/fail rules. There's a big difference between a small deficiency in a given scenario and a large, threatening loss. In the New York Seven context, most companies view the failure of one scenario as being

acceptable, and feel no need to post additional actuarial reserves. With two failed scenarios, penalty reserves are usually posted and, with three, it's a certainty. How many appointed actuaries would post additional actuarial reserves if you failed two of the New York Seven? I see seven or eight hands. What If you failed three? I see an additional seven or eight hands. I'm wondering what everybody else would do.

Mr. Sandberg: Let's ask it another way: What decision criteria are being used in your company or in other companies? Is it the New York Seven? It looks like about 15 hands. Is it based on some probability distribution, where you run 100 or 200 scenarios and look at the probability distribution of the results? I see about 5 or 6 hands. Does anyone use an additional deterministic set along with the New York Seven? I see about 5 or 6 hands.

From the Floor: What if, one year, you set up penalty reserves and the next year things are all right again. What would you do with the penalty reserves?

Mr. Sandberg: You need to talk to the appointed actuary, who will explain that process. Typically, the reserve is meant to be something that's needed over a period of time. You're not trying to post all the money you need today for the failed scenario in question. You're going to take some estimate that involves discounting and some assessment of the probability that, if this environment persist, it will be funded for over a period of time. This is another way of including the probability. In other words, if it's only going to happen this year, you're right, it would go away; but, if the same environment continues, you're funding for it as the probability of that scenario over time.

From the Floor: Don't you put up the entire amount?

Mr. Sandberg: I'm not aware of any appointed actuary establishing the whole amount of the deficit because of one failed scenario. I expect you to estimate the probability of the economic cost. Jay will discuss how much it costs to protect yourself from insolvency today. You could say, "We'll pay an exact amount and guarantee we don't have an insolvency on the bottom end."

From the Floor: If you put up about 10% or 15% percent this year, what if rates move?

Mr. Sandberg: At our company, reserves are much more than adequate to fund the obligations, so we haven't had to deal with it.

Mr. Glacy: Let me give some perspective from my vantage point about what companies typically do. They usually establish a percentile confidence level, say

the 95% I mentioned before, and then do a ruin analysis to determine how much additional reserves are necessary to supply protection at that level.

Mr. Sandberg: That reminds me of another question I forgot to get back to regarding how to determine whether an event is "moderately adverse." Some actuaries reference a confidence level of 95% to deal with the RBC needed for unusual events. But, the reserve is not meant to handle unusual events. So, if you felt comfortable with a distribution, you could assess what reserves are supposed to cover. We'll go through intervals of 10%. Is 50% adequate? I see no hands. Is 60% adequate? I see one hand from the shy gentleman in the back. Seventy percent? One hand. Eighty percent? About 10 or 12 hands. Ninety percent? Another 10 or 12 people.

Mr. David Huff: I'm thinking about the job we're trying to do and the limitations that we know that are inherent in it. Maybe we don't know what the limitations are, but I'm faced with the decision of what scenarios to use and the reasonableness of those scenarios. It seems reasonable to me to include the following paragraph in rendering an exception opinion: "The current interest rate scenario is deemed to be an adverse situation not likely to continue. This opinion has been reached and computations performed accordingly." That puts the reader and the regulator on notice. They may decide that, if conditions have existed for six months, that's long enough to constitute a likely scenario. But that approach doesn't seem unreasonable to me.

Mr. Sandberg: That's a very good comment. I think it's important that we continue to articulate clearly that we are not certifying a guarantee of solvency or that a defined probability exists. The goal of the appointed actuary has been to communicate better information to regulators and management, though some may question the success of that endeavor. However, to the extent that you can articulate your assumptions and the thought processes behind, them everyone's will be clear about the judgment that's involved in the calculation.

Mr. Glacy: I had a discussion with my friendly regulator just last week about the coverage discussion and the definitions of "moderately adverse" and "extremely adverse." I tried to pin him down as best I could. In his viewpoint, statutory reserves should cover the range between 70% and 90%, and that risk capital was responsible for supplying the additional layer. That's a pretty common belief among the regulatory ranks.

Mr. Sandberg: That's been my experience, too. I'll return to communication quality again. When we say we pass 95%, 90%, or 80% of scenarios, it provides

some information, but if you describe the 20% of the scenarios that failed and why, that's a better disclosure of the risk.

Mr. Peter G. Sawtelle: One of my pet peeves is this 70%, 80%, or 90%. Some of the cash-flow testing we do uses entirely different stochastic scenarios that depend on the product. If one product, for example, passes all of these scenarios, what are the bad scenarios? Well, I'll shock it to produce scenarios that fail 5%-10% of the time to see where the problems are. I think that cash-flow testing is done primarily to identify such troubles. That can make it necessary to generate different sets of stochastic scenarios.

From the Floor: You mentioned policyholder call options. I'd like to know if anybody is considering, in their down scenarios, the prospect for additional deposits coming in.

Mr. Sandberg: Policyholders aren't doing it yet, so we don't know if anyone is using it yet, but it's important to reflect the use of additional deposits. Does anyone have any particular experience to share?

Mr. Glacy: You might see it for certain types of products, such as nonqualified, flexible-premium deferred annuities, where the policyholder has an unlimited discretionary right to supply more funds. You'll see it less often with life insurance because of Internal Revenue Code Section 7702 considerations. Annuities are the product line where you should be looking for that phenomenon. It's a hot topic under discussion now. However, no statistics indicate that policyholders are recognizing their guaranteed right in the contract and starting to exploit it. Of course, the *USA Today* effect helps to make something like that well known. Once it makes it to the headlines of *USA Today*, the cat might be out of the bag. But in cash-flow testing, if you have product lines that might be subject to this new type of policyholder behavior—moving from policyholder "put" activity to policyholder "call" activity—then you want to think about it.

From the Floor: We have a small block of old flexible premium annuity with a 5.5% guarantee. It's not the block I'm most proud of, but then we all make mistakes. We had set up extra reserves some years ago for these annuities, anticipating that persistency would be very good. It turned out that persistency has been considerably worse then anybody anticipated, probably because people thought they could get 20% guaranteed in the market by switching to variable annuities.

Mr. Glacy: Are these annuities nonqualified?

From the Floor: Yes. As far as when to set up additional reserves, my own feeling has been that I would rather be a little bit wrong frequently than monstrously wrong too late. I've had the luxury of being able to set up additional reserves. If things work out and I don't need them, I can take them down. But if interest rates stay low and things get worse and, I can add them and avoid having to go to my company's senior management for a big hit.

Mr. Joel Steven Salomon: I used to work at Moody's, a rating agency, and found that the criteria for putting up additional reserves depended on how conservative and well-capitalized the company was. A company with adequate capital would be much more willing to put up additional reserves than would a company that's tight. The latter might fail three or four scenarios and still not put up additional reserves.

Mr. Sandberg: It does seem inconsistent. Whether you have enough capital is a separate issue and, in theory, the reserves should not be dependent on where other capital is coming from. But there is a lot of gray area here and that's why we need more clarity on what constitutes additional reserves.

Mr. Glacy: Let's move along and talk about protective measures. Any realistic scenario that appears to threaten solvency demands immediate management attention. So I asked some of our friendly derivatives dealers what a 10-year floor contract would cost. A floor is a long-term contract that pays off if interest rates fall below a certain strike level. On September 23rd, such a contract with a strike of 5% floor cost 352 basis points. This means that over 10 years, every time the 10-year Treasury rate went below 5% you would receive a payoff. This is an obvious protective tool to use in situations of low interest rates. Now the 352 basis points, under certain accounting conventions, can be straight-lined into earnings at 35 basis points a year. I took that 35 basis points and subtracted if from the enhanced yield spread of 115 basis points that we talked about earlier. That nets out to 80 basis points. Therefore, if you enter into a floor contract in conjunction with locking in the yield spread, it looks pretty attractive.

Current yield spreads appear to buy a lot of protection. In other words, the excess yield spreads that we're talking about can be deployed to purchase an interest rate floor contract. And, if you have 5% guarantees in your contract and a lot of MBS on the books, you might think seriously about getting some protection in down-interest scenarios. Just to refresh your memories of the yield curve from September 30th, the five-year bond rate was 4.22%, which means that, under the New York Seven, there would be sustained periods in your testing with five-year Treasury rates at 2.11%. So an interest rate floor contract will help you in this situation at an approximate cost of 35 basis points a year.

From the Floor: Who pays off on that contract? Is it the investors in long-term capital management? In a catastrophic scenario, when you are really counting on that capital to bail you out? Isn't that exactly when it won't be there?

Mr. Glacy: I've often wondered about that myself. If you talk to the derivatives dealers, they maintain that they're hedging it out "on the other side."

From the Floor: What's the payoff?

Mr. Glacy: The payoff is 5% minus whatever the interest rate drops down to times your "notional" amount. If your notional amount were $1,000, you would multiple it by the difference between interest rates. If the 10-year Treasury rate went to 2%, the payoff would be 3% of $1,000 dollars, which is $30.

Mr. Sandberg: You're saying that the cost for a $10-million block of business would be $350,000 for the whole hedge. To hedge only half of the business would cost $175,000.

Mr. Glacy: My final point concerns a fourth-quarter reallocation from MBS into corporates. While cash-flow testing results might indicate the prudence of shifting out of mortgages, I'm not sure that this is the time to do that. If you have a heavy proportion of MBS, collateralized mortgage obligation or even interest-only in your asset portfolio, there's not too much you can do without realizing losses.

Mr. Sandberg: I take one exception with that. Unless we have people here that are also in senior management, it may not be a dumb thing to do. In other words, it might cost you today, but if your senior management believes that it's a very likely event that rates are going even lower, switching over might be the smartest thing to do. The role of the actuary is to quantify the results of different decisions and let management determine the risk it is willing to take.

Mr. Glacy: When Dave says "switch over," remember that translates into capital losses.

Mr. Sandberg: I'd like to make one last comment. It's my observation that we may be going through a transformation of investment expectations. The Internet reference for much of the data we found is *www.globalfindata.com*. It has a series of data pages you can access. The company is also marketing its services and further empirical research, but everything we've referenced is public information. One of the interesting points I found in a research summary is that the 10-year period of the 1980s saw the highest stock returns for the United States and the U.K. of the entire 200 or 300 years that there have been stock returns in those countries.

In addition, the 1980s and 1990s have been exceptionally profitable for bond investors. So people who invested money in the stock or bond market over the last 20 years have been paid very handsomely. As Bill Koenig mentioned earlier, people are expecting 20% returns, so they are quick to get their money into the market and to keep it there long-term. We're all curious about how that's going to play out. But consider the idea that stock and bond returns will not remain where they have been. Then we would enter a completely different economic environment. How would that affect policyholder behavior?

From the Floor: I have a comment and a question. The reference to the low interest rate environment was referred to as a deflationary period. Maybe it's ignorance on my part, but I'm surprised because, when I look back at the late 1940s, long-term bonds were 2.5% and mortgage loans were 4%. I don't know if that was a deflationary period or a period of no growth, but it followed a significant reduction in government spending and laid the basis for one of the longest periods of growth that we've experienced. So, are we really in a deflationary period, or could we see something more severe than the 2.5% and 4% rates that I've mentioned?

Mr. Sandberg: If you assume there is 2–3% risk return in a bond no matter what you're in, then a 2% return on a bond reflects a return in excess of the Consumer Price Index. A negative Consumer Price Index or some other inflation index is an indicator of a deflationary environment. You'll have bonds that will yield some return in the future that will be at 2% or 3% or 4% return, it just depends on how severe the deflationary environment might be.

Your other point is interesting too. Economic transformations are a way that society builds either future success or failure. The volatility we went through in the 1980s set the stage for the growth we've seen in the 1990s. But you have to have new periods of volatility, which are costly, in order to set the stage for new growth.

Mr. Glacy: One deflation indicator that I look at is the oil futures contract. The November futures contract just traded yesterday below $13 a barrel, which is a stunning number if you think about where we were 20 years ago. When analyzing the prospects for deflation, that's one item to keep an eye on.

Ms. Helen Galt: Just a cautionary note about aggregation. I believe that the State of New York still has restrictions on aggregation across major lines of business.

Mr. Glacy: That's true, as do some other states.

CHART 1
US/JAPAN TREASURY CURVES