

RECORD, Volume 29, No. 1*

Washington, D.C. Spring Meeting
May 29- 30, 2003

Session 5PD

Interest Rates Are On The Move: Is Your Company Prepared?

Track: Investment

Moderator: DAVID J. WEINSIER

Panelists: R. ROSS BOWEN
HENRY M. MCMILLAN
DAVID J. WEINSIER

Summary: Interest rate movements can play havoc on a life insurance company's financials. Both sides of the balance sheet will feel the impact of asset values, investment income, premium levels, credited rates, surrenders, dividends, guaranteed minimum death benefit ¼ the list goes on and on. Is your company prepared if interest rates change direction and head upward?

Panelists discuss how changes in interest rates affect the assets and liabilities of a life insurance company and what a company can do to prepare. This session examines historical trends in interest rates and how companies have reacted to both sudden and gradual changes. A case study and "checklist" of what to look out for when interest rates are on the move will conclude the session.

MR. DAVID J. WEINSIER: We've had some confusion on the title of this session along the way. Initially it was proposed as "The Next Wave of High Interest Rates: Is Your Company Prepared?" That concerned us for two reasons. I think it's pretty clear that none of us anticipate high interest rates any time soon, so maybe that wasn't really topical. Also, all three of us had a hard time talking about what happens if interest rates rise without also discussing what happens when interest rates drop. So we've changed the title of the session to "Interest Rates Are On The Move: Is Your Company Prepared?" You could also probably make the argument

* Copyright © 2003, Society of Actuaries

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

that interest rates aren't going anywhere. Nonetheless, we hope that our presentation will be moderately topical, and we'll all learn a few things today. That said, I'd like to introduce the panel. Mr. Hank McMillan is senior vice president, risk and financial management, for the institutional products division of Pacific Life. He joined Pacific Life in 1995 and has over 10 years of experience in asset/liability modeling (ALM) in the insurance industry; served as financial economist with the Office of Economic Analysis of the U.S. Securities & Exchange Commission; and was a professor at the University of California, Irvine, in the Graduate School of Management. Hank has published many articles in leading academic and financial journals and coauthored several policy reports for the SEC.

Mr. Ross Bowen is a vice president within the insurance advisory service unit of Conning Asset Management, where he was recently relocated from Baltimore to Hartford. Prior to joining Conning, Mr. Bowen was an investment actuary and vice president for Fordyce's U.S. operations, specializing in ALM since 1994, and has over 18 years of total experience as an actuary. Ross received his MBA in finance from Carnegie Mellon in 1992 and graduated from the University of VA with a BA in economics. My name is David Weinsier. I'm a consulting actuary for the Atlanta office of Tillinghast, and have been there about three years. I specialize in ALM, product management and embedded value and dabble quite a bit in market conduct when those types of issues come around. That said, I think we're ready to go.

Hank is going to lead off and talk about interest rate trends over time in order to give you a lesson in interest rate economics. Where have interest rates been? Where are they today? We hope he'll tell us where they're headed. I'm going to follow up with a discussion on interest rates' impact on liabilities. Ross is going to finish up with the impact of interest rate changes on the asset side. With that, I'm going to turn the microphone over to Hank.

MR. HENRY M. MCMILLAN: Good morning, everybody. I'm very happy to tell you that interest rates will go up, but they may go down first, and I don't know how long it's going to be before they go up. At any rate, I'm here to talk about where are we, where we have been and where we are going.

Where are we? Chart 1 shows the Treasury yield curve at the beginning of April. Since that time, the long end has come down a little bit. The 10-year rate has dropped about 40 basis points off of that 383. It's down to about 340 right now. The short end is pretty much right where it was.

If you did a real simple calculation of the forward yield curve from what you saw back at the end March, as you see in Chart 2, you'd be looking at a forward curve that would suggest that the one-year forward rates would be rising rather rapidly in the next few years. If you put it all together, we would be going from about 1.25 percent up toward five percent in the next five years as the economy recovers and expands. Those are the rates implied or forecasted by the current yield curve.

However, that's a very short picture, and to talk about where we have been, let's take a little stroll down memory lane. David mentioned that I've been doing ALM for about 10 years. I went back to close to when I started doing this stuff just to see what's happened. In Chart 3, I graphed the 90-day T-bill rate, the 10-year Treasury rate, Moody's Aaa Index of Corporates and Moody's Baa Index of Corporates. Over the last 10 years, these interest rates have fluctuated a little bit, but there actually hasn't been all that much in the way of a trend moving up or down until you get toward the end of the time period. Finally, if you compare this period to some of the other decades, interest rates were in a fairly narrow range.

One other thing that I've always liked to do is to compare the United States to other countries. Chart 4 is a graph of the five-year swap rate in the United States, Germany and Japan. As of yesterday, the five-year swap rate in the United States dropped down to around 2.7 percent. The dark blue line shows that the United States is lagging the Japanese line by about 10 years. Of course, Japanese numbers are very low right now, but they used to be higher than current U.S. interest rates.

Chart 5 moves back about 50 years. Again, this is the 90-day rate, the 10-year Treasury, the Aaa Index and the Baa Index. We're gradually now getting back to 50-year lows. That might in itself suggest—and we hear a lot about mean reversion—that rates are more likely to be going up than they are to be going down. That would also be consistent with the forward curves in Chart 2.

It can be useful to examine some summary statistics. I broke them out by "my decades" in Table 1. I always thought that one of the advantages of Internet is that it allowed us to personalize the world around us, and so instead of a standard decade of the 1990s, the 1980s, etcetera, I put them into decades going back from this point in time. We begin in 1953, and for each of the 10-year periods you can see what we've had.

Table 1
Some Summary Data by "My Decades"

DECADE		AVERAGE			
Begin	End	T-Bill	T-Bond	Aaa	Baa
1953	1962	2.7%	3.5%	3.8%	4.5%
1963	1972	4.9%	6.1%	6.1%	6.9%
1973	1982	8.6%	10.1%	10.1%	11.6%
1983	1992	6.5%	9.7%	9.7%	10.9%
1993	2002	4.2%	7.0%	7.0%	7.8%
Average of year-end values					
T-Bill		90-day Treasury Bill	Aaa		Moody's seasoned corporate
T-Bond		10-year CMT	Baa		Moody's seasoned corporate

You all remember what happened in these various decades. In 1953-1962 the Korean War had just ended, a Eisenhower was in the White House and then Kennedy got elected. In 1963-1972 we had the Beatles. In 1973 we had the first oil price shock. In 1983 Reagan was president, it was the end of the first Reagan recession and the remainder of the Reagan-Bush administration happened. Then 1993-2002 we basically had the Clinton administration, and then the 43rd president, Bush, coming through. You can see that we've roughly seen a growth in the average of all these rates up through the decade of 1973-1982, and then a decline.

The volatility of interest rates is shown in Table 2. These numbers are standard deviations of year-end numbers. Because there are actually only 10 observations for each decade, these are simple estimates of volatility. I want you to note one thing, though. If you took a look at the T-bond volatility, 0.7 percent in 1953-1962, go back and multiply that by two. That's 1.4 percent. Then add it to the average of the T-bond in that previous decade, and that would be 3.5 plus 1.4, and that would be 4.9 percent. If you just use the standard deviation from the 1950s and try to figure out what a range was going to be for the 10-year rate in the coming year, you would be looking at something that would be from 2.1 to 4.9 percent, and you can see that we averaged 5.6 percent in the next 10 years.

Table 2
Some Summary Data by "My Decades"

DECADE		AVERAGE			
Begin	End	T-Bill	T-Bond	Aaa	Baa
1953	1962	0.9%	0.7%	0.6%	0.7%
1963	1972	1.2%	1.1%	1.3%	1.6%
1973	1982	3.4%	2.5%	2.3%	2.8%
1983	1992	1.9%	1.8%	1.6%	1.7%
1993	2002	1.6%	1.0%	0.7%	0.6%
Standard deviation of year-end values					
T-Bill	90-day Treasury Bill	Aaa		Moody's seasoned corporate	
T-Bond	10-year CMT	Baa		Moody's seasoned corporate	

This suggests that a confidence interval for interest rates in the next decade based on the volatility estimate from the previous decade could be very misleading. You would have actually missed the average for the subsequent decade. It missed in that 1963-1972 period, and it missed again in the 1973-1982 period. Fortunately, when you got to the 1973-1982 period, the volatility was so high that you were almost encompassing the entire world, so you didn't miss it going forward from that. However, we've seen that volatility shrink a lot during the 1993-2002 period, and we might ask ourselves if that kind of volatility that we've observed in the last 10 years is going to persist in the next 10 years.

I went back even further. Almost all of this data is from the St. Louis Federal Reserve Bank's database called FRED. You can just go in on the Internet and download stuff. The longest interest rate time series they had in there was this Moody's seasoned corporate index, the Aaa and the Baa indexes. It goes back to 1919, and so I thought I'd just put it up there in Chart 6 to show it to you. Of course, 1919 we ended the war to end all wars, and then this year we've just ended the Iraq war or started it and ended it. Taking a look at it, as I showed you in the last 50 years, you should note that you break that into two halves, the first half and the second half, and, roughly speaking, the interest rates in the last 42 years have been higher than interest rates in the first 42 years, almost without exception. With the Aaa, that's absolutely the case. We're only now finally getting the Aaa down under six percent.

I want to ask the question, then, where might we be going? One of the standard lessons in economics is the Fisher theorem, which says that the nominal interest rate that investors require at a point in time depends upon expected required real interest rates and expected inflation. During the 1960s and the 1970s, people apparently grossly misestimated inflation. They underestimated it throughout that time period. You can make an argument that recently we've been overestimating inflation and consequently have been getting high real rates.

In the last 30 years, market expectations of inflation have been the thing that's been driving interest rates more than anything else. Expectations of inflation have been higher and more volatile than expectations about required real rates. That's a personal opinion. Now as we get down to a period where inflation rates are now also returning to 50- and 60-year lows, it could be that the volatility of and expectations about the real rates are going to be more important in determining the volatility of interest rates in the coming time period.

That's just an issue about the general levels. In the business that I'm in, we also have to worry about slopes and spreads and various other kinds of risk premia. In Table 3 we can see the slope of the yield curve between the 10-year Treasury and the 90-day rates. You can see that it has been increasing gradually over these decades. The spread that I've chosen is the spread between the Baa and the Aaa corporates. It's a spread that's relevant for my business. You know that one of the interesting factors is that it's been over 100 basis points during that 1973-1992 period, and it's dropped down to just 80 basis points in the last 10 years. In my business we have often argued that it's been tougher to make money in the last few years, and since we live off of that spread, that kind of explains part of the problem that we face.

Table 3
Slopes, Spreads and Risk Premia

Decade		Average			
Begin	End	Slope	Spread	Realized Real Rate	Realized Stock Premium
1953	1962	0.9%	0.7%	1.6%	14.1%
1963	1972	0.6%	0.8%	1.1%	5.5%
1973	1982	0.7%	1.5%	1.0%	-0.1%
1983	1992	2.2%	1.2%	3.5%	9.1%
1993	2002	1.5%	0.8%	2.6%	6.3%
Average of year-end values					
Slope		1-year CMT minus 90-day CMT			
Spread		Moody's Area Corporate minus Moody's Baa Corporate			
Real Rate		CPI Inflation minus minus 1-year Treasury in December of prior year			
Stock Premium		S&P 500 Total Return minus 1-year Treasury in December of prior year			

For the realized real rate, I took the one-year Treasury rate in December of 1953, and I subtracted the inflation of 1954 from it and called that the real rate for that point in time. That's the realized real rate. I did that for every year in there and averaged it, and basically it shows that the one-year Treasury rate has been on average not a bad investment in terms of beating inflation. You've been able to realize about one to three percent by doing that strategy every year during this time period. For the realized stock premium, again I took that one-year Treasury rate, and I subtracted it from what the Standard & Poors (S&P) actually did in the subsequent 12 months. You might have thought that the last 10 years would have the biggest performance in that S&P realized stock premium. If I'd done this three years ago, it probably would have, but what happened in the last three years takes that away. You've got to go back to the 1950s to get the biggest number there. Over this entire time period, the arithmetic average has actually been seven percent, the way I calculated it here.

In Table 4 I show volatilities by decade. The stock premium has been very volatile, while the real rate has not been too volatile but also just about equal to what you've actually earned in each one of those years. The volatility of the spread between the lower- and the higher-grade corporates has been pretty low, and the slope moves around.

Table 4
Slopes, Spreads and Risk Premia

Decade		Volatility			
Begin	Ends	Slope	Spread	Realized Real Rate	Realized Stock Premium
1953	1962	0.5%	0.2%	1.0%	23.4%
1963	1972	0.7%	0.4%	1.7%	12.7%
1973	1982	2.0%	0.6%	4.4%	20.7%
1983	1992	1.2%	0.2%	2.1%	11.9%
1993	2002	1.3%	0.3%	1.6%	20.0%
Standard deviation of year-end values					
Slope	10-year CMT minus 90-day T-Bill				
Spread	Moody's Baa Corporate minis Moody's Aaa Corporate				
Real Rate	1-year Treasury in December of prior year minus CPI inflation				
Stock Premium	S&P 500 Total Return minus 1-year Treasury in December of prior year				

Charts 7, 8 and 9 present some other facts about American business cycles. To create these charts I went back and pulled out the months when we reached the peak and the troughs of all of our business cycles in the last 35 years. These peaks and troughs are identified by the National Bureau of Economic Research. The most recent one they just identified was the peak of March of 2001. Their announcement came out, I think, last November on that. They still haven't decided whether we're out of the recession yet or not and exactly when we came out of it, so I can't throw that in there for you.

While there is some interesting information on growth, unemployment and the stock market, move to Chart 7 about interest rates. If you go through that at your leisure, you will see that those kinds of things do stick out, that the 10-year constant maturity Treasury just went up, and then it came down, and it didn't really matter whether we were in an expansion or a contraction. What happens to the long-term Treasury rates really has to do with people's expectations of inflation as you go through here, and again that's the point that I made. However, you will see that at the short end, the Treasury bills tend to drop during contractions because the Fed responds with expansionary monetary policy. Also, you have a situation that the Treasury curve typically inverts when you get to the peak of a cycle. Right now we're past the peak. We've had the inversion recently. We're now at the bottom. That slope very clearly shows you a nice change between the peak and the contraction, et cetera.

We now have a very wide spread. Typically you find corporates widening against Treasuries during these contractions and narrowing during expansions. About the only oddity relative to what I said was down there at the very bottom right-hand corner, the spread between the BBB Index and the Treasury rate. At the peak in March of 2001, it was wider than it was in the previous trough in 1991, 10 years prior to that. That's the one and only odd one, and, if you had set the peak as March of 2000 when the stock market had peaked, as opposed to March of 2001

when the National Bureau of Economic Research chose to do it, you would have found that that number would have been significantly less than three percent.

In summary to say that interest rates are at historical lows requires you to keep your history short, like about 50 years. It was always one of my pet peeves when I was hearing people say there were historical lows, that they were usually referring to the last 15 or 20 years. I never thought that history should be that short, given that I'm older than that. Nominal rates have declined back toward where we were a long time ago. You go forward, and you probably will see real rates being more important than the volatility, and if they are, you have to remember that they depend on things like taste, taxes and technology. Inflationary expectations do matter a lot, but these expectations also affect risk premiums. With that, as I said, they could go up, but they could go down first, and so I'm going to have the other two speakers tell you what to do about it at that point, and then I'll be back to take questions at the end. Thank you.

MR. WEINSIER: Thank you, Hank. I'm going to talk about the impact of interest rates on the liability side. So, before I start, who is issuing fixed annuities? Of the fixed annuity writers, who's sitting at the guarantee right now? Who's crediting the guaranteed rate? How many are concerned that you're currently crediting the guaranteed rate? How many universal life (UL) folks do I have here? How many are crediting the guarantee? How many are crediting at four percent? I know a company I just worked with is sitting there on their big UL block crediting that four percent. That's a big concern, as well it should be, and that situation can get worse. That's what we're going to talk about.

We're going to start off with a little warm-up—the price behavior curve. On the y-axis we've got economic value or let's call that present value of future cash flows averaged over a scenario set. On the x-axis, we got interest rate. This is what the behavior of assets and liabilities is going to look like. Now, why is that? First, as interest rates decline, what happens to your assets? Your bonds, especially your Treasuries, are going to increase in value. That's good. But your callable corporates are going to get called away. Your mortgage assets are going to get prepaid. That's what's going to flatten out the curve up here.

How about the liability side when interest rates drop? Here you're going to see a decline in surrenders. As your interest rates drop, your credited rate is probably going to lag the market, thus leading to lower surrenders and more unscheduled premium, especially on the UL side, leading to an upward slope liability curve, as interest rates drop. How about the assets when interest rates rise? Your assets decline in value. We all know that. What happens to your callable corporates? They stick with you. What happens to your mortgage assets? They don't get prepaid anymore, increasing the duration of your assets, and giving you a more difficult time, which makes it more difficult to reinvest at the higher rates when all your initial assets stay with you.

Finally, as interest rates rise, you're going to see an increase in surrenders, but that increase is going to flatten out, and on the life insurance side you probably will end up with more or higher mortality experience with that group. While Ross is going to touch on the asset side, I will mention that in the middle here, what we like to call the sweet spot, that's where you want your duration to reside. Any time you get interest rates outside of the breaking points on the end, you're in trouble and can end up with negative surplus. As long as your duration and convexity match enough to stay within the corners here, you should be in reasonable shape.

What variables determine a company's vulnerability to interest rates? The current yield curve certainly does, unless you're a big fan of the random walk, and you think today's yield curve becomes the long-term average and there's an equal chance of it going down as going back up again. But most people think that we're in somewhat extreme situations today. We are so low that a lot of our products are crediting the guarantees. That means if interest rates go even lower, that puts us even closer to negative surplus, but if interest rates shoot back up, that's no picnic either. That can cause a lot of trouble. So the current yield curve is certainly going to be a key factor.

With your existing portfolio, are you reaching for extra yield by investing long on the yield curve, and thus have a mismatched duration? Do you have a lot of callable corporates or a lot of mortgage assets, or are your tranches not preferable so you're going to be susceptible to prepays? Also, are you trying to gain yield by investing on some maybe lower-quality bonds, making you more vulnerable to defaults? All three of those could give you additional trouble as interest rates are bouncing around.

As for your crediting rate methodology, are you portfolio? Are you new money? I'm not sure one is necessarily better than the other, but it's certainly a factor when you're resetting your credited rates. As for company spread requirements, think of annuities here, because that's where a lot of your profits are coming from, and most companies are within a certain range on their spread requirements. I also noticed that those requirements are tied to how much compensation you're paying and your company expenses as well. If you've got higher spread requirements than your competitors, that's going to mean you're certainly more vulnerable to spread compression on the downside.

The same story applies to company expenses. If you've got higher expenses, higher overhead, higher distribution costs than your competitors, you're going to be at higher risk. As for required return to shareholders, are you pricing with a 12% ROI, a 17% ROI, or a nine percent ROI? If you're at 17%, and your competitor's at nine percent, and a lot of companies are at nine and 10 percent on these fixed annuities, then you're going to have a harder time catching up. Competitor rates are obviously an issue, and lapse sensitivity. When I think of this, I think of UL with a captive agency force versus a set of brokers. If you've got a broker distribution system, you're probably going to see more lapse sensitivity than if you've got a captive field force.

Let's focus first on fixed annuities. That's going to be my first product. When you think of what product is most vulnerable to interest rate changes, you think of fixed annuities. It's an investment product, relatively short duration, and the majority of your profits are going to come from the spread. Low rates are going to lead to spread compression. As your asset yields decline, your liability yields could decline at a lower rate due to the good chance that you're going to lag the market when dropping those credited rates, and that you're going to bump up against those guarantees. As your asset yields drop, your liabilities drop, but not quite as fast, leading to spread compression. A rapid rise in rates, as I mentioned, is no fun either. With a steep rise and a portfolio company, you're going to have a hard time keeping up with those new money market rates, and you're going to see a big increase in surrenders while your assets are depressed. A slow rise in rates is probably the best scenario here.

Specifically, when yields drop or interest rates drop, you're going to see the spread compression, lower asset yield, and it's going to bump up against the minimum floor. As your short-duration assets turn over, you're forced to reinvest into these low-yielding assets, thus forcing that yield down even further. You're also going to see higher-than-expected persistency. I've seen UL products with four, 4.5, even five and 5.5 percent guarantees and those are going to look really good in this marketplace. If that's the case, your policyholders are going to stick around longer. What does that do? Well, it increases your liability duration.

What does that mean? All of the sudden now your duration is mismatched, adding to the trouble. You've really got risk here, especially on the annuity side. You've got risk at issue. Is the asset that you need to invest in to match your duration, less your required spread, enough to cover your guarantee or your current credited rate, I should say? In today's environment it may not be. You've also got additional risk. Even if you can make that spread at issue, you've got the risk at reinvestment as well, because the policyholder's got a put option. They can bail on you whenever they feel like it. You've got some surrender charges, but not too long on the annuity side. That's going to be a concern as well.

Consider your company. What factors can you use to determine whether your company is vulnerable to spread compression? The type of annuity sold is going to be a key factor here. The one-year annual reset is going to be more at risk to sudden interest rate changes than your fixed-rate five-year product. With the five-year product, you set your liability duration, and you can probably invest in an asset with a similar duration and make that spread. With the one-year product, you're going to constantly have to chase market rates, and with the duration so small it's very difficult to get your yield at issue. Current credited rates are very important, especially in relation to your current guaranteed rates. If you've got a window there right now, you're not at the disaster point just yet. If you don't have a window and you're crediting your guaranteed rate, clearly you don't have much room for air.

On the annuity side, the vast majority of outstanding annuities today were sold with a guarantee of three percent. Many of you probably heard there's a temporary agreement out there among a lot of the states initiated by the NAIC whereby you can issue a product at a guaranteed rate of 1.5 to two percent. I don't think the majority of the states have accepted this; it's maybe about half. You'd have to issue a separate product in these states.

Also, you've got some competitors that are putting their foot down and saying we're not going to issue at 1.5 or two percent. We're going to stick with the three percent guarantee, and if your competitors are selling at three percent, you're going to have trouble selling at 1.5 to two percent. This has not had a huge amount of impact. This has not alleviated a whole lot of the problem.

Your existing assets, your existing portfolio, as we've discussed before, is going to be a factor. What is your duration mismatch? A couple years ago it wouldn't be uncommon for us to see a zero to half of a year of mismatch. Today it's more like zero to one. Companies are reaching out further on the yield curve for that extra yield.

What about higher interest rates? A rise in rates can be an issue as well. It's going to be difficult to raise your credited rates if you're invested further out on the yield curve. For example, you sell the one-year product. The yield curve's steep. You invest longer than your liability duration. You're thinking, you're going to get some extra yield out of this thing. A year from now rates rise. You have to raise your credited rate to keep up with market rates, to keep up with your competition, but what's your asset doing? It's earning the same things it did last year, compressing that spread.

You've also got to balance your ability to maintain current profitability versus your attempt to remain competitive. This has been an issue since the dawn of insurance. As interest rates rise, you're going to have a hard time keeping up your credited rates to the existing market rates. Therefore, you've either got to bump up your credited rates more than you can afford, thus losing spread, or keep them low, and, in effect, you're going to see higher surrenders.

You can alleviate this somewhat if you're hedging using derivatives, a very good idea, caps, swaps, futures, or whatever you have to do. A lot of companies use these derivatives, but the vast majority does not completely hedge. Even in these types of rapid-rise situations, the derivatives are not going to be enough to protect them. Again, what factors determine whether your annuity company is vulnerable to higher interest rates? Same story on the type of annuities sold. Nothing changes here. The one-year product is going to be more vulnerable than the five-year guarantee.

The market value feature on fixed annuities increased 77% in 2002. That's a good sign. What does this feature do? First off, it moves the interest rate risk from the company to the policyholder. That's good news. What else does it do? You've got

lower capital requirements here. That enables you to credit or even earn a rate probably 25 basis points or so higher than without the market value adjustment. I think there's very good reason for this feature escalating in popularity.

Surrender charges, both in length and strength, are important. Is the majority of your portfolio still within the surrender charge window? You're in much better shape than if it's outside. Two-tier annuities are not as popular these days. I know a couple of companies that use them, but, again, similar to the market value adjusted (MVA), they're going to penalize the policyholder for surrendering early.

What are your considerations when it's time to renew your credited rates? You're going to have to reflect not only the current market or the new money rates, but also what you're currently crediting today. I've seen some really complex formulas on this stuff. We recently did an appraisal for a company, and I was checking out their renewal crediting strategy. They had three factors. They had the rate today, the market rate. They had their current credited rate. They had their initial credited rate that they offered their policyholders on their fixed annuities.

Then they had this crazy set of nine different combinations. If A is greater than B or less than C, do this. If B is less than C, but greater than A, do this. I thought it was a little more complex than it needed to be, but you may want to at least take these two factors into account, and also your initial credited rate, to maximize your ability to keep that business. The movement of renewal credited rates is typically asymmetrical, meaning you're going to drop those down faster than you're going to raise them. Also, it's a good idea to set a cap on the amount rates will move in any given year.

Chart 10 is from a Morgan Stanley publication from April of this year. Initially I thought this was going to be a great chart. It shows that that from March 2000 to November 2002, fixed annuity spreads have declined, which makes sense. I would agree with that. What looks a little funny to me is they've declined from 2.8 percent or 280 basis points to just shy of 240 basis points. That seems high to me. Are there any annuity writers who want to disagree with me? If you're currently earning 240 basis points, you're in fine shape. That seems quite a bit higher than what I'm seeing in the industry. Maybe I'm just misreading the chart. I didn't see a whole lot of detail on it, but I thought that was a bit misleading.

I guess several things have led to the decline. First, you've got companies bumping up against the guarantee. Of course you've got the drop in yields, but you've also got defaults, this big drop here between September and the end of 2001. Isn't that around the time that we had the Enron and the World Com situations? Those defaults are really going to impact your bottom line. Why we see the spike back up from June to September 2002 I'm not completely sure. I'm thinking it may be because of the increase in credit spreads on assets. Because you saw the defaults, assets had to correct themselves, and we had to bump up the credit spreads, especially on the border of the non-investment grade, and that's probably what increased spreads at that time.

Speaking of defaults, what happens when defaults occur? You start off with a block of bonds. This leads you to your investment return, which thereby you pass onto the policyholder less a spread through credited interest. Everything is wonderful. Then you get an Enron. You get a World Com. Who knows what else is around the corner. Your bonds—just cut them right off the top. Assets that were there yesterday are not there today. Your investment return's going to drop, and then the question is what do you do with the credited interest? Do you pass the hit onto the policyholders? Do you keep your credited interest, or drop it? Do you keep your spread the same? Probably not. You're going to see a rash of surrenders. What do companies most typically do? They take the hit. They take the current year hit to earnings and then just suck it up. They feel it's more important to stay competitive and to take the hit in the current year.

What about other products? I've been talking about fixed annuities up until now. How about UL? It's going to be less sensitive to rate changes than fixed annuities are. It's not an investment product; it's a life insurance product, although I know quite a few people who would argue that point. You've got longer and stronger surrender charges. You've got initial surrender charges, about 15%. Annuities are going to be about seven percent. You're going to go for 14, 15 or 16 years, and annuities are going to be about half that. There are longer and stronger surrender charges. Also don't forget, if you own a life insurance policy, and you feel like you're getting shafted on the credited rate, you've got to go through underwriting again. People don't like going through underwriting again. You're not going to go for an extra 20 basis points if you know you're going to have to have a blood and urine test against. That's a key aspect of life insurance.

There is par whole life. The good thing about par whole life, you have the non-guaranteed dividend to play with. Rates drop. I imagine you have a chance to lower your dividend to a certain degree. You are still subject to the same disintermediation when the rates rise on this product. With non-par whole life or term, there is straight hit to the bottom line, up or down. You don't have a whole lot of non-guaranteed elements to play with here. These are products that have to be monitored carefully when interest rates and yields are bouncing around. With single premium immediate annuity, the good news is very predictable cash flows. The bad news is extreme vulnerability to changes in interest rates. Your variable UL and variable annuity are going to have minimal direct impact, although I would have said that's more true one or two years ago, when everybody had their money in equities. Today, more and more money going in the fixed account adds to that risk.

If you're going to model these things properly, if you're going to set up your model so it's modeling appropriately, you're going to have to set up for some dynamic assumptions on these products. Let's go back to fixed annuities. We do appraisals all the time, and we help companies set up their dynamic assumptions. We came up with the following formula:

Max { 950% 20-qtr avg of 5-yr T's + 50% 3-qtr avg of 5-yr T's), 3-qtr avg of 5-yr T's] less 50bp

When I say 50 percent of the three -month average, that's the three-month average of the five-year Treasury. So, all of these averages refer to the five-year Treasury. We attempted to come up with a formula that tied to median single premium deferred annuity (SPDA) credited rates. Here, we're defining a competitor rate or a market rate, and this should be the average of your target competitors. We were all proud of ourselves for quite some time that we come up with this formula that tied to the median market SPDA credited rates.

In recent years, our formula has let us down a bit. We're not 100% certain why this has occurred. Are companies pricing with less spread? Are credit spreads increasing? Are they pricing with lower profitability requirements? It could be several things. It has forced us to go rework our trusty formula that worked for so long.

Once you defined your competitor rate, you've got to define your excess lapse formula. If interest rates move more than a given level of tolerance, high end/low end, you want that to impact your lapse rates. What I have here is a sample excess lapse formula that we would use for fixed annuities:

$$[7 * (MR\% - CR\% - .5\%) ^{1.5}] / 100 - 2.5 * SCR$$

MR% = competitor rate

CR% = current credited rate

SCR = surrender charge ratio = 1 - CV/FV

Seven is our multiple here. Our tolerance here is 50 basis points.

Typically, our clients will have some input there, but that means you're not going to do anything unless interest rates move outside of your 50 basis points. So, seven is your multiple, 1.5 is your exponent, and 2.5 times the surrender charge ratio, which takes into account how much surrender charge you've got left. This is a fairly standard formula, although the figures in the middle would vary a bit between companies.

What about the UL? We came up with the formula and the story is the same. For a long time we were feeling pretty good about ourselves. We're falling right in line. Average UL credited rate and our trusty formula staying right in line throughout the years. I'd say starting at about 2001 all of the sudden our formula falls right down. Actually on the UL, I'm more confident of why that is. Companies are now pricing lower spreads on their UL products. That is fact. They lower their spreads, enabling them to offer a higher credited rate, but on UL, unlike annuities, you can take that lost profit from spread, move it over to cost of insurance (COI), and load up the

COIs. Or, you load up the product loads, percent of premium load, per thousand load, per policy load.

On the fixed annuity I'm not as sure what's going on, but on the UL I'm confident that three or five years ago it was not uncommon to see 200- to 250-basis point spreads. Now companies are a lot closer to 100 basis points. You've got other factors at work here. You've got higher credit spreads and maybe different profitability requirements as well. This is our excess lapse formula on the UL side:

$$[5 * (MR\% - CR\% - 1\%)^{1.0}] / 100 - 1.0 * SCR$$

MR% = competitor rate

CR% = current credited rate

SCR = surrender charge ratio = $1 - CV/FV$

It's going to be less sensitive than the fixed annuities, so our multiple is only five, and our exponent's only one. Our tolerance is one percent, and we've got less of an impact on the surrender charge ratio as well.

How are companies responding to the current environment? They're doing stochastic testing. If you're writing fixed annuities, you need to be doing stochastic testing at issue. Of my fixed annuity writers, who's doing stochastic testing at issue? That seems to be fewer hands than the number of my fixed annuity writers. How many are not doing stochastic testing, but taking a haircut right off your spread? I see a couple in the back there. This is a product for which you need to be doing stochastic testing at issue. You need to determine how vulnerable you are to those big changes in interest rates.

Then there is determining the value of a block of business. We did an appraisal for a company recently with a huge UL portfolio. The majority of their business was UL. They gave us the initial crack on how they value their UL block. They model a level earned rate, say, 7.5 percent, a level spread, which they were currently earning, about 200 basis points. The guarantee was about four percent, so they weren't bumping up against that. They projected it forward, and everything was hunky-dory. They had this nice value of their UL block. We said, "you're missing something here." You've really got to value this block on a stochastic basis. What you're missing out on with level earned rates, level spreads, is on the down interest rate scenarios. On the ones that are significantly down, you're going to bump up against the guarantee. Spread is going to compress and also lower profits.

How about on the high end? How about on the scenarios where interest rates are increasing? There you've got your dynamic lapse formula. You're going to see increased lapses, and at a time when the market value of your assets is depressed. Policyholders can withdraw at book. They can surrender at book. Your assets cannot. Those assets are going to reflect market value, and when interest rates rise they're going to be depressed. You're going to see a cut on the high and the low ends. When we took the average of our scenario sets and compared it to their initial

estimate, it was maybe nine to 10% off. That's a pretty good hit. If you're valuing your block of business, your UL block of business, I strongly recommend doing that on a stochastic basis. I'm confident you'll see quite a bit of difference versus doing your typical deterministic run. Also, stochastic testing is a good method to use for investment strategy optimization.

Conservation is a hot topic, more so a couple years ago. Companies came to us and asked what could they do to maintain their block of business? The lapse rates were through the roof. Policyholders were leaving for 10 basis points. What could they possibly do to keep their block in force, keep their profits stable? Renewal commissions, more so on UL, more common on UL than on fixed annuities, I would guess, suspiciously have a way of keeping policyholders in force longer, don't they?

How about product features? We talked about the MVA. There was a huge increase in sales on MVAs last year. You can credit a higher rate, less capital requirements, and pass the interest rate risk on. How about a persistency bonus? Offer an annuitization bonus if you can. A bonus, when the policyholder turns a certain age, to keep that business in your books instead of moving on, is certainly a good idea.

You can reduce your spreads. On the UL side we talked about reducing the spreads, offering a higher credited rate, but passing on that profitability or loss of profitability, bumping up your COIs or your product loads. On the annuity side, it's more difficult to do, since your profits are coming from the spread. You may end up having to reduce your profitability. I think overall here, if you are able to keep your business on the books longer, it increases the duration of your overall liabilities. That means you're allowed to increase the duration of your assets. What does that mean? That means you're earning a higher rate because you can invest further out on the yield curve. You can either keep those profits or use those to pass onto the policyholder. This stuff is pretty good. This can really add profits to your bottom line.

Finally, what are companies actually doing today? Some companies are pulling the products with their guarantees. Three percent is too high. They can't make their spread, so they pull it off the market. Not too many companies doing that, but certainly some are. A lot more companies are cutting commissions. That's not a term that's used very often. If you go up to your marketing folks, you say, you've got two choices. We're not making profits. We're going to pull the product or you're going to slice commissions by 10%. They're probably going to choose the later. We are seeing commissions cut on these three percent minimum guarantee products. A lot of fixed annuities have first-year bonuses, one to two percent. Those could get cut.

Then you've got the refiling issue. This temporary 1.5 percent provision that I mentioned earlier is an option, although it really doesn't seem to be taking off, because not all companies are using it or not all states are allowing it. The alternative nonforfeiture approach refers to the current nonforfeiture law, which is being reviewed, but with the current one, on the SPDA, you've got to credit, 90% of

your gross premium, at three percent. If your loads are less than 10%, then you're able to credit a net rate of less than three percent because you're still able to, at the 90% and the three percent, get to the same point that you would at, in effect, 95 and 2.75 percent. That's a way that's always been in place, although companies have never used it until now. You're able to effectively credit a lower guarantee than three percent.

There is a new annuity nonforfeiture law out. I know there's a presentation on this later on, and I'm certainly not the expert. The NAIC approved it at the end of December, and I know Texas has approved it, I think effective this summer, and it's going to turn the guaranteed rate into something like a lower of three percent or an index rate less a spread. That aims to alleviate the problem of the fixed, set-in-stone guaranteed rate that we see today.

Finally, where are interest rates headed next? Who knows? That said, I'm going to turn things over to Ross, and he's going to touch on the asset side of things.

MR. R. ROSS BOWEN: Thank you, Dave. Although I'm going to talk about the asset side of things, before I begin, I would like to say that I believe that the real key is product design and management, and the asset side should really come second. For instance, if you develop an MVA product that will protect you against early withdrawals from your products, that's a lot sounder strategy to follow than to come to me, the asset manager, later and ask for an investment strategy that won't be affected by increasing rates. I'm going to talk from my experience base. Our typical client is a \$100 million- to \$1 billion-type life insurance company with annuities, traditional block, and UL. I'm also going to talk about rising rate environment as the example that I'm worried about.

I'm going to cover the following four things: (1) the impact of rates on the balance sheet, (2) how you might actively manage against an expectation of changing rates if you had a specific expectation, (3) how duration matching as an investment strategy would be impacted by fluctuating rates, and (4) efficient frontier analysis and how robust it is through interest rate changes.

On the balance sheet, probably everyone in this room is aware that assets on a statutory basis are held at book value. The asset balance sheet for a life insurance company can be relatively immune to interest rate fluctuations. Interest maintenance reserve (IMR) balances tend to mitigate the impact on balance sheet changes. In fact, I imagine a lot of people have a positive IMR balance on their books now. If we get into an increasing rate environment, the IMR is going to help stabilize your balance sheet.

I've realized that an interesting thing might happen to portfolio book yields if interest rates begin to rise. I think your portfolio book yield could continue to fall, even in an environment of rising rates. That would be because, if 10 years ago you bought an 8 percent bond, and it's going to roll off the books now, and you can only reinvest at 6 percent. Even though you're investing at a higher rate than you were

last year, you're not investing at a higher rate than you were 10 years ago. You could continue to have declining book yields for a while in an increasing rate environment. This could create a problem for companies that use a portfolio-credited method where there's a spread off the asset yield. I'm not sure that your clients or your producers are going to understand why your portfolio yield continues to drop when everyone knows that interest rates are moving higher.

What about active management? What if we had an expectation that rates were going to rise, and we decided to act on it? Rather than buying 10-year bonds or buying long bonds now, we'll sit on the sidelines. We'll invest our money short. We'll wait for rates to rise. Then we'll reinvest. We'll get the higher coupons. There are several problems with this. It's very difficult to predict rates. You've got the opportunity cost. While you're waiting for rates to rise, you've obviously given up yield on your portfolio, which can hurt you, and you have to consider what the breakeven period would be. Even if your strategy is correct, it could take quite long for you to get back ahead.

As an example, I looked through the blue chip economic forecast from last October. This is a consensus of leading economists in the United States. The 10-year Treasury at that time was 3.84 percent. They predicted within six months it will be 4.40 percent, an increase of 56 basis points. You could say, all right, in six months rates are going to be a lot higher. Let's buy a 6-month Treasury. We'll wait. Then we'll buy the 10-year Treasury. At that point the six-month Treasury was at 1.51 percent. Even if you're exactly right, you're not going to break even for three years. It'll be 2005 or 2006 before you make up the lost income that you incurred during this six-month waiting period. Of course the forecast wasn't exactly right, and rates had only risen to 3.97 percent. This means you'd have a nine-year breakeven before you'd get ahead. My point here then is that to sit around and wait for rates to rise is not, I think, a very good strategy.

Possibly you could enter into a derivative contract. There's probably a lot more choices for derivatives that you could invest in. Say you went into a swap. You swap fixed-cash flows for floating. Then when rates rise it'll pay off because floating will pay off if rates increase. You'll begin to receive more income. I think it's very difficult to set up and buy the first derivative. I know New York Regulation 163 has a derivative use plan that can be very difficult to comply with. At my last job we considered investing in derivatives, and after we talked to the various departments, the accounting, there would be all these procedures and controls that would have to be set in place. We abandoned it. To buy one derivative will be difficult; it would obviously be easier after your derivative use plan was in effect, but it didn't seem to make sense to me.

Another way to do your investment strategy would be to use duration matching. Rather than try to anticipate rates now, we're going to invest in a duration-matching portfolio. The advantage here is that you don't have to make a rate forecast, but you need to be aware that the liability duration can move significantly when rates move, and this can require rebalancing over time.

Chart 11 shows what we call the market value curves for an actual client. In the top graph area, the top line represents the value of assets as interest rates change by 50 basis points at a time. Rates were very low, so we could only shift down 50, and then this shows also up 50 and up 100. The bottom line is the liabilities. This company doesn't have an economic surplus problem. Even if rates make these moves, they're still in an economic surplus. I also show numerically the market value and the duration and the convexity of the assets and the liabilities. I want to draw your attention to the duration section, which is slightly darker. The current duration of the assets for this portfolio is 6.3 years, and for the liabilities it is 6.9 years.

My example doesn't show an exact duration-matched portfolio, unfortunately, but if rates move within this 150 basis point range, the duration of the liabilities changes between 5.9 and 7.4 years, whereas the duration of the assets only changes between 6 and 6.4 years. If you have any kind of an interest rate fluctuation, and you've duration matched, you're going to find yourself out of balance pretty quickly. Now in this case they weren't duration matched in the first place. This company could find itself in duration match if rates rose 100 basis points. The point is there could be a lot of rebalancing. Every year you're going to duration match. The duration is six years. Then next year you're going to recalculate duration. You're going to say, oh, now duration's seven years. A lot of rebalancing can come into play from duration matching.

What I consider to be the best strategy for setting investment strategy, for strategic asset allocation, is efficient frontier analysis. It's a more robust model. Efficient frontier analysis takes into account your operating constraints, taxes, regulation, capital needs and rating agencies and their comments, whereas duration matching doesn't consider any of these things. With efficient frontier analysis, you have to use scenarios. It doesn't require taking a view on which way interest rates are going to move, but it does require a mean reversion target. You have to have realistic scenarios to do efficient frontier analysis.

Chart 12 shows Conning's consensus on our underlying interest rate assumption mean reversion targets. When we generate our interest rate scenarios, we start from where interest rates are now. We have interest rate movements that occur, but they're going to be drawn toward a mean reversion target. These have to be set. The chart shows the building block approach that we use. We look at historical data. We observe how interest rates move. We first set an inflation rate assumption. From there we add on a premium to go into the three-month rate, a term premium. We add on spread to that. We build from inflation to the short rate. Then there's a term premium to go to the long rate. There's also an equity risk premium. This is how we determine our underlying long-term assumptions about where interest rates and equities are going to go.

Chart 13 is an example of an efficient frontier that we calculated a few years ago. Let me explain what this graph represents. Along the y-axis, that's return for the insurance company, for this block of business, the present value of distributable

earnings (PVDE). The x-axis is risk, and that's defined here as the standard deviation of PVDE. What you want is a high return and low risk. Points to the upper left are desirable points, and those points are numbered, as you can see, from 36 to 51. Those points represent a strategy that has the lowest risk for any expected level of return. As an example of these strategies, we take buckets of bonds. These might be various combinations of three- to five-year bonds, five- to seven-year bonds, seven- to 10-year bonds and 10- to 20-year bonds in various increments. Some example strategies that we tested might be 50% in three- to five-year bonds and 50% in five- top seven-year bonds, and we would test that through 100 scenarios and calculate the PVDE and the standard deviation of the PVDE.

I've noticed over time, and found very interesting, that the efficient frontier manages to remain relatively stable as interest rates move, and I'll show you this on Chart 14. This is the same block of business, but now we have an increasing scenario. We've changed scenarios so that interest rates are going to increase more rapidly. What you see is that the absolute level of return has fallen as the points have dropped down, but the same strategies turn out to be efficient. When I go from one year to the next, and I make a recommendation for a strategic asset allocation, and I'll say you should put 50% of your bonds in five-year and 50% in 10-year. Next year I don't really want to come back and say, well, now we want to put 75% in 30-year; we want a stable recommendation over time. What I've seen with efficient frontier analysis is it remains relative stable, and we're able to maintain the same strategic asset allocation from year to year, or with only small changes.

Duration analysis, compared to efficient frontier analysis, is the way to set strategic asset allocation. The pros for duration analysis include, I believe, investment people understand it. It's relatively "easy" to calculate, and the regulators and the rating agencies like duration matching. The cons are, as I've showed you, that it can move quite a bit over time and need frequent rebalancing. It doesn't take into account an insurance company's real world, their operating constraints or their taxes, capital or regulators. It can be very sensitive to the assumptions. Furthermore, there's no real clear definition of what the market value of the liabilities is. I know the SOA is working on it. There's a lot of thought going into that, but it's not clearly defined, and you have to know the change in market value of liabilities to find the duration.

Efficient frontier analysis seems to be more stable when rates fluctuate. It takes into account operating constraints like taxes and capital. You can define risk and reward the way you see it. Here I've defined it as present value distributable earnings, but it can be your own measurements. In the same efficient frontier analysis model will be a platform for you to test crediting strategies or new product mixes; you can have a consistent way to answer questions that are asked to you.

There are several cons to doing efficient frontiers. It's hard to do. It requires more management involvement. Management is going to have to make more decisions about where they want to be and what they think the strategy should be, rather

than say, oh, just duration match. It does require sensitivity testing. Those are my comments about the asset side. Now I believe we're ready to take questions.

FROM THE FLOOR: I work in Thailand where the assets on a statutory basis follow exactly the GAAP rules. They must have copied the GAAP rules. An issue that we have is we're afraid the value of the assets will fall if the interest rates rise. I suggested derivatives, which is the suggestion that you made, and brought it to our management. They said no, because if you can find something in which the price behaves like a short-term asset when you want it to but behaves like a long-term asset when you want it to, you're going to get a lower yield than either one because whoever's going to sell you these derivatives is going to charge you for it. You're not going to end up with a higher return than either one of those. Could you comment on that? Can you really pick up yield and get the benefit of protection?

MR. BOWEN: If you enter into a derivative contract, will it really behave the way you want it as rates rise or as rates move? I think that if you're purely hedging, then it can work out. I agree that the person who supplies you with derivative is going to take a haircut for themselves, and I think it's possible to develop a derivative strategy that will work. My comment was it's just been very difficult to implement it here in the United States, and particularly for my clients that aren't multibillion dollar clients. I don't think it makes sense for us.

MR. MCMILLAN: Let me just comment on that, too. We use derivatives as standard operating procedure at my company, and we feel we have to use them otherwise we would be taking excessive risks to do our business. The way you phrased your question makes me think that perhaps some of the management that you're working with have an errant idea about what derivatives are actually capable of doing. It is the case, for example, that if you use derivatives to help you get a duration-matched situation, then the derivatives will help you about half of the time and hurt you about half of the time. In that sense you will be giving away yield when they hurt you, but that's exactly the point of having these things in place. The point about smaller companies using derivatives and needing a derivatives-use plan is a good one. We have a derivatives-use plan filed with the state of New York, and we just recently completed working with the state of California on derivatives legislation there. We have quite a infrastructure that's dedicated to using them. I think that it is important to have that because if you don't, the mistakes you make can hurt you quite quickly, and quite badly. So I think it is important to have that kind of expertise in-house or else farm it out so that you know that you're getting good help with it.

FROM THE FLOOR: Doesn't that cost quite a bit for that derivatives-use plan, though? You know, when you have expertise it costs money. That comes off the spread somehow.

MR. MCMILLAN: It does cost a lot. In our securities administration group, we used to have one person to do the accounting for derivatives, and now we have many, close to 10, largely because the differences in the United States between the

way you can account for derivatives use on a statutory and a GAAP basis and also on a tax basis keeps people hopping and all that kind of thing.

FROM THE FLOOR: For a small company, should they be in the fixed annuity area, unless they have the expertise to really handle it? You have traditional life insurance, and you don't have to watch once you write it. But with annuities, you really have to stay on the ball and keep watching it all the time in terms of both assets and liabilities. I find that most of the small companies can't keep up with that, and the companies that had fixed annuities and are now writing it tried to cut off that business. Do you have any comments on that in general?

MR. WEINSIER: Small companies do sell fixed annuities, which is probably good for the marketplace to keep up the level of competition. A lot of those small companies will outsource the investment function. With a lot of the stuff that you do have to monitor, there are folks such as Conning who can monitor those types of things for you and can advise you along the way. In terms of product development, that's an area where if you don't have the resources internally, you can latch onto another company's product or you can have a consultant come in and help you out. You don't have to monitor all that stuff in-house.

FROM THE FLOOR: But once you write it, that's not the answer. You have to continually monitor it, and you have to make sure your asset people are keeping in touch with what you're writing and how you're writing. You can divvy the things out, but still management's got to watch what is going on or else you can get killed. A small company hasn't really got the surplus situation to cover it.

MR. WEINSIER: That's a very good point. Small companies have to be particularly watchful, especially because they've a smaller amount of business as well. That's an additional factor.

FROM THE FLOOR: They can get too much business, which is what I see coming out now. They can't handle it.

MR. WEINSIER: Ross, do you have any comments on that, given that you guys manage a lot of those assets?

MR. BOWEN: I haven't seen a lot of my clients get into a lot of trouble. We haven't had the overselling problem. My vision of a small insurance company is regional with a career force where you have annuities that aren't their major line, or are a smaller line. It's an additional product offering to help their agents sell product, and I think that kind of situation is a lot more stable than a bigger company that's selling through brokers. I think you're going to need a lot of attention there. That's why you get the too much business. I'd look at the marketing element of it and see who's selling it.

FROM THE FLOOR: I'm talking about the eastern coast, where the brokerage market is primarily how they distribute the business.

MR. WEINSIER: I think you've got to watch that very closely, and when rates move higher, for instance, I think those brokers are going to take the money right away, and you could really take a hit in that situation. Good point.

FROM THE FLOOR: In the past I've been a manager of mortgage bonds, commercial mortgage bonds, asset-backed securities, and then more recently a manager of corporate bonds for life insurance companies. Now I'm an equity analyst, just analyzing the insurance industry. What I think is really interesting and unique about what's happened to us over the last five years is that, after the Asian crisis, spreads GAAP out massively, then after 9/11, they GAAP out again. In those periods, Treasuries moved inversely to spreads so that the yields never really moved all that much, and the corporate market was to some degree self-immunizing, and the mortgage market, too, because all the mortgage-backed essentially fund off of the swap curve, not off of the Treasury curve. All of the Treasury-backed base models back in 1998 totally mis-tracked. All predicted a huge refinancing wave that never happened.

The unique thing about what's happening now—I'm the one insurance expert in the midst of a bunch of bank experts—is that we're seeing a real crunching down of spreads across the financial industry as mortgages prepay massively because no one ever expected rates to really go this low. No one ever expected that banks would develop ways of making refinance so costless that the models are again mis-tracking even off of the swap. No one ever expected that the Fed would jam so much liquidity into the system that, not only would Treasuries fall to lows, but eventually would overcome the corporate bond market and the mortgage bond market because everybody has fled to the security of fixed income, for now. It's a really unique situation that we're in, and we haven't had a situation really where we've had Treasuries come down to lows. Now, spreads are not at all-time lows, but when you take a look at the yield on corporates, the yield on corporates and the yield on mortgages has not been this low, I would estimate, in at least 30 years, maybe even a little longer. If you're investing in any sort of spread product to make your money, new money rates are a little depressed. It's tough. If you've kept your portfolio as positively convex as possible, you might not be hurting on the block as much, but, boy, this is an ugly environment.

FROM THE FLOOR: You're going to have a hard time finding attractive credit rates 200 basis points off and staying investment grade. I mean even in the junk market recently, Flexponents was able to get a deal going, and they're going to be just 2.25 over. So high yield has even compressed far more in this past period.

MR. MCMILLAN: What we've seen happen here in the last few years, especially as we've hit this post-9/11 environment, appears to be an unusual relationship between corporates and Treasury rates and between corporates and the London interbank offered rates (LIBOR). It's created a significant problem for companies; if they're trying to reach yield. If they have a yield target, they've had a tough time. Companies that are looking for spread targets are also having a tough time, at least

in the last few months. Last year the spreads were quite wide. This year they've come in dramatically.

If I could characterize it right now, one of the things you might see is that the spreads on corporates have bifurcated and that you have a lot of quality corporates that are very tight and other corporates with the same rating that are very wide. It might be that the increased volatility in the recent environment has caused rates to move and opinions to move in advance of what rating agencies have been able to do. That's not a criticism of rating agencies, because in fact, the rating agencies have inquired and found that their clientele want their ratings to be relatively stable. Certainly I'm sure all the folks in here who work for insurance companies would prefer that their ratings would be stable, especially if the alternative of that is to have them go down. I think that we've seen a certain amount of that. Again, perhaps back to when I was doing my presentation, there's nothing really new under the sun. It's just that you have to go back a little in history to find the previous environment that was similar to this.

FROM THE FLOOR: I admit I'm a little naïve, but it seems like the idea of pulling products and trying to lower your cash flows in this kind of environment hasn't been followed much, and short of using derivatives to neutralize your exposure, why isn't stopping sales of these kinds of products in this kind of environment followed more? You know, it may impact market share and market producers, but from my naïve perspective it seems a bad time to be selling, or it's not worth the risk.

MR. WEINSIER: That's a very good question, and some companies, as I mentioned, are, but, a lot of folks out there, a lot of the folks we work with, have sales as one of their key goals, and then there's quite a bit of pressure in the insurance organizations to keep sales up. A lot of companies feel that this is a short-term anomaly, and as long as they can, they'll take lower profits. They hope not to achieve negative profits, but they'll take lower profits in the hope that interest rates will pop back up, and those existing sales will then turn into long-term profits.

The decision may not be the best decision, but I believe that's the line of thinking. You'd rather keep the business on the books hoping that it stays on the books, rates pop back up, and then profits pop back up, as opposed to just completely pulling the product and giving the sale to somebody else.

FROM THE FLOOR: I'd like to augment that answer a little bit. I'm not saying that I necessarily believe this. Companies think that the current situation is short term, and if you pull a product completely, you lose sales force, whether it's your own force or a force that you have built up over time through relationships. Getting that force back is expensive. I don't know if anyone has put a cost on that. But I think that may be part of the consideration as well.

MR. WEINSIER: That's a very good point. The point was that if you cut sales off, you risk not only upsetting but actually losing your sales force, and that carries a very high long-term risk and long-term cost.

FROM THE FLOOR: I'd like to add to that, too. You mentioned the commission rates dropping, and gave an example of commission rates dropping by 10%.

MR. WEINSIER: You're also seeing commission levels on fixed annuities dropping 30%, even 60%. That's pretty heavy stuff.

FROM THE FLOOR: Isn't that a way of bringing sales downward?

MR. WEINSIER: Yes. One would think that might depress sales a bit, yes.

FROM THE FLOOR: You mentioned the spread. You had an example about what that spread meant. I agree; I think the spread is too high compared to new bonds out there, but I think you talked about what your experience is in terms of average spread. My question is out of that, what would spreads in terms of overall averages be in today's marketplace?

MR. WEINSIER: I would say that fixed annuity spreads today are around 125 to 175. I think that's about right. And then, the majority of your profits are coming out of that, right? So, on fixed annuities you just don't have as many moving parts. You don't have much to hide. You've got to cover your expenses, your distribution costs, your maintenance costs and your profits have all got to come out of that number.

FROM THE FLOOR: How does the assumption of mean reversion impact efficient frontier and duration analyses?

MR. BOWEN: I think the question is, in an efficient frontier analysis, if the rates that occur don't follow the mean reversion target, then will it be just as out of balance as duration matching? I think with duration matching, you basically have one scenario. Rates follow the forward curve, and then they're disbursed around that. With efficient frontier analysis, although there is a mean reversion target, we also have what we've seen as historically normal yield curve moves. There's a much wider range of scenarios that are realized in the projection, and that's one reason I think it's more robust. Even if it won't exactly follow the mean reversion target, it's more likely to encompass what really occurs, and that's one of the reasons I think it's more robust.

FROM THE FLOOR: I have a question about the efficient frontier. Do you use any secondary management? The thing that always concerned me is the deviation of a present value of distributable earnings over a long period of time. Do you, as a secondary measure, look at your volatility on the earnings or anything like that, and what should we be looking at besides?

MR. BOWEN: We talk a lot about standard deviation as the risk measure. Maybe the management doesn't fully understand what that means. We like to look at what's the fifth percentile worst scenario that we can use as probably our best secondary measure, and we don't really look at it on a year-to-year basis. You should remember that we're trying to come up with a strategic asset allocation, which then goes to the portfolio managers. They invest around it, but they also deviate a little bit around it. We're just trying to set the strategic asset allocation, not give the specific investment strategy that we're exactly going to follow. You can use other reward measures and other risk measures, too. We play with them. I like the fifth percentile and the standard deviation. People understand that. Ninety-five percent of the time you'll do better than this. People can relate to that.

FROM THE FLOOR: Many of the annuities I would call flexible premium annuities have three percent interest rate guarantees, which means that maybe now that the surrender charge has gone away, it might be good to put money into my annuity to get that three percent guarantee. Are you seeing any evidence among the insurance companies you work with that that phenomenon might be occurring?

MR. BOWEN: Dump funds into a flexible premium annuity to get the minimum?

FROM THE FLOOR: The fee is better than what the bank's paying on a one-year CD.

MR. BOWEN: I can't say that I have.

FROM THE FLOOR: I have. My wife's 403(b) went down to three, and she's got a flexible annuity.

MR. BOWEN: I'm in the stable-value fund in my 401(k).

FROM THE FLOOR: Assuming that, you know, insurance companies are paying just the guaranteed minimum.

MR. MCMILLAN: We don't do the standard kinds of the flexible premium that you talked about, but we do have a fixed rate option in our variable annuity product line that we recently pulled because of the kind of market timing phenomenon that people seemed to be following. I just wanted to follow up and defend duration analysis a little because that's what we do. I admire doing efficient frontier work properly. Perhaps we don't need to do it so much because we've already agreed on our strategic portfolio allocation within the company, and so the duration numbers are really what we need to do implementation. You can do duration analysis that will take care of a lot of the weaknesses that Ross mentioned if you take the time to do them right. We do take account of taxes and surplus, etcetera.

When we did a session a year ago, the three of us in Colorado Springs, I talked about the fact that secondary measures are relevant to us as well. What we do is a risk review on an annual basis where we look at the sensitivity of GAAP earnings to

interest rate movements, but because unlocking deferred acquisition cost is a hard thing to do in a modeling context, we only do a handful of representative scenarios to try to give management some sensitivity as to when a change in present value will be reflected on the books of the business.

Chart 1

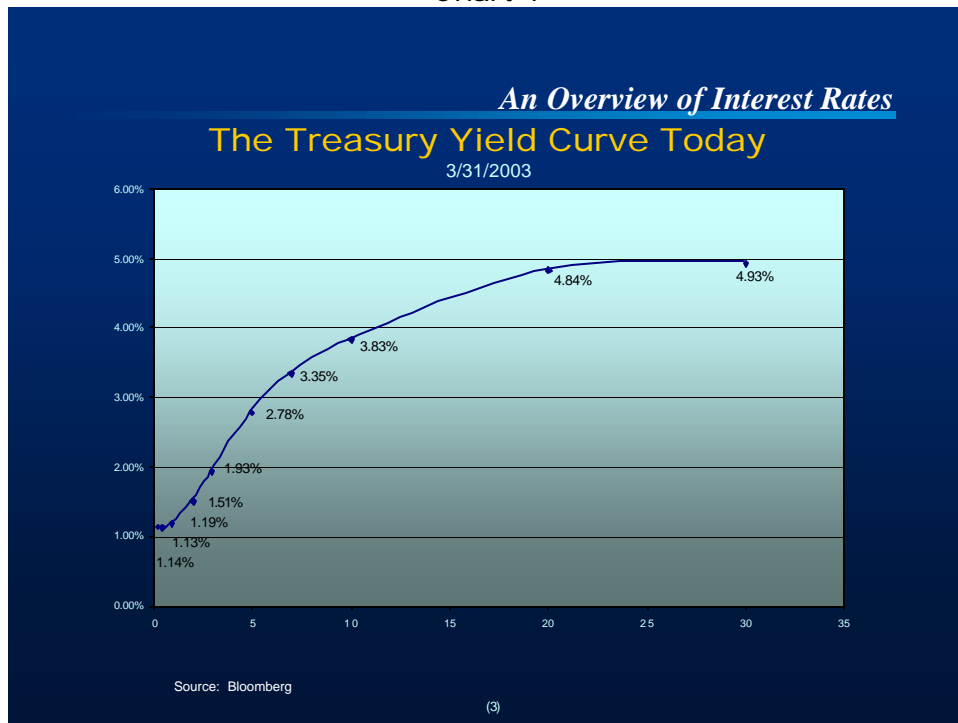


Chart 2

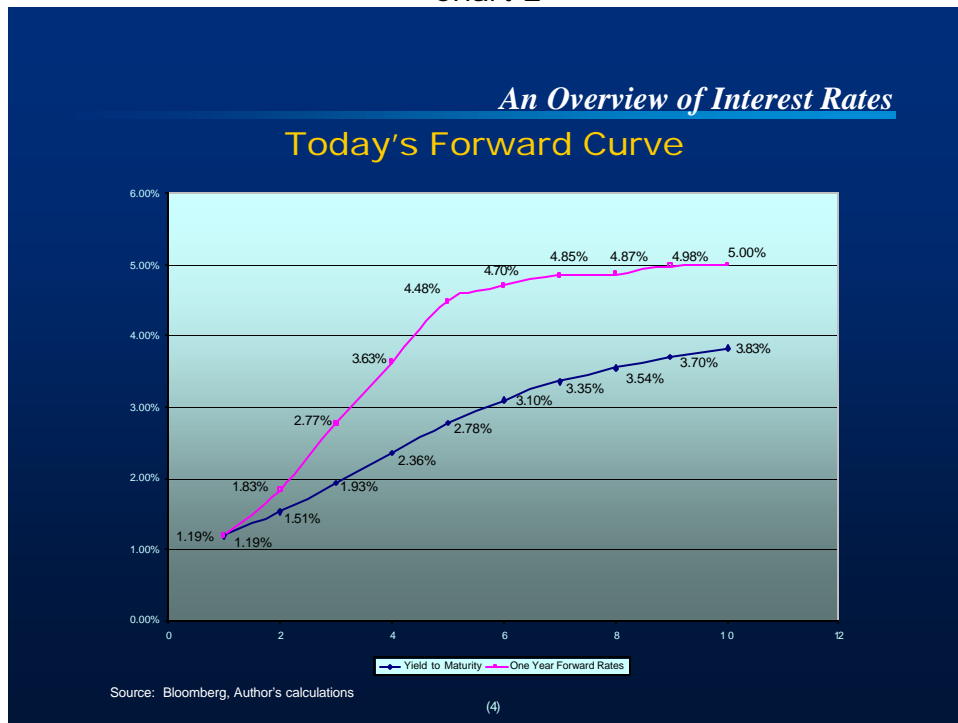


Chart 3

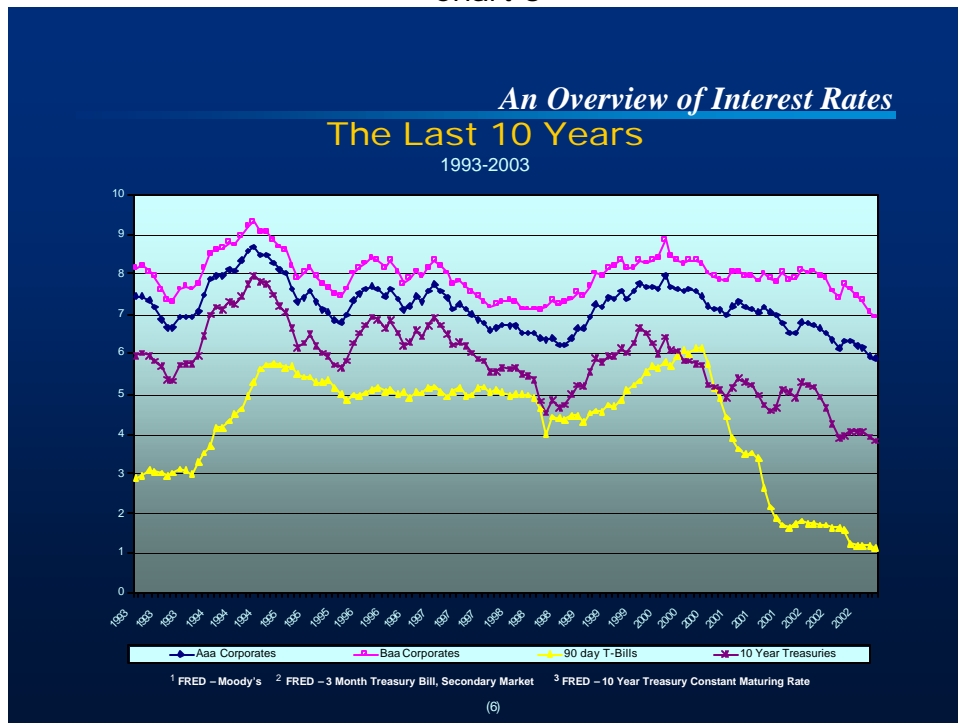


Chart 4

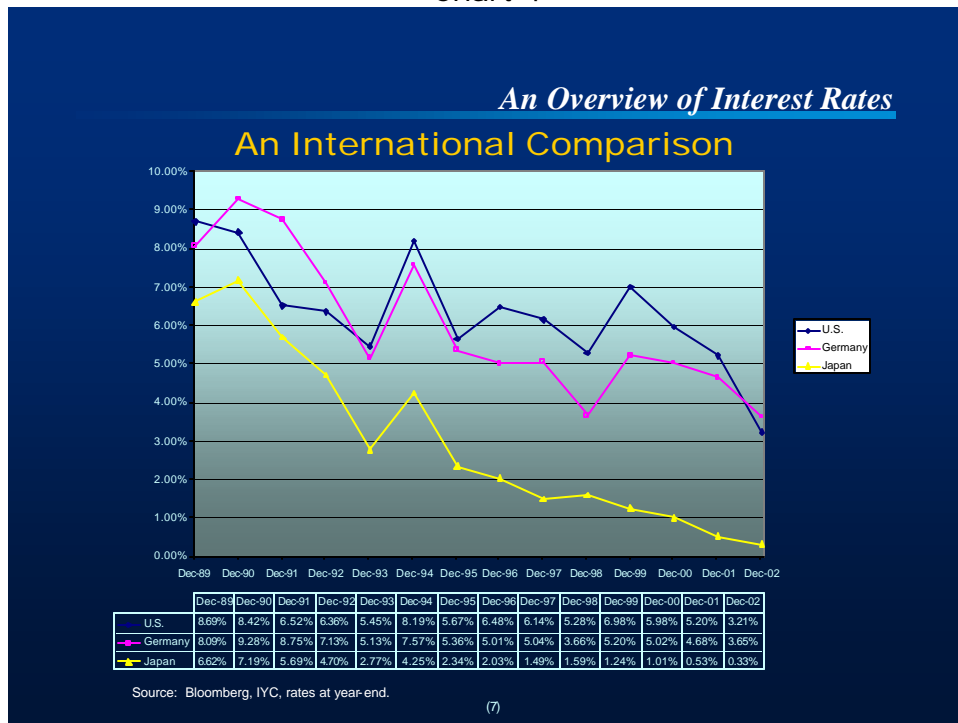


Chart 5

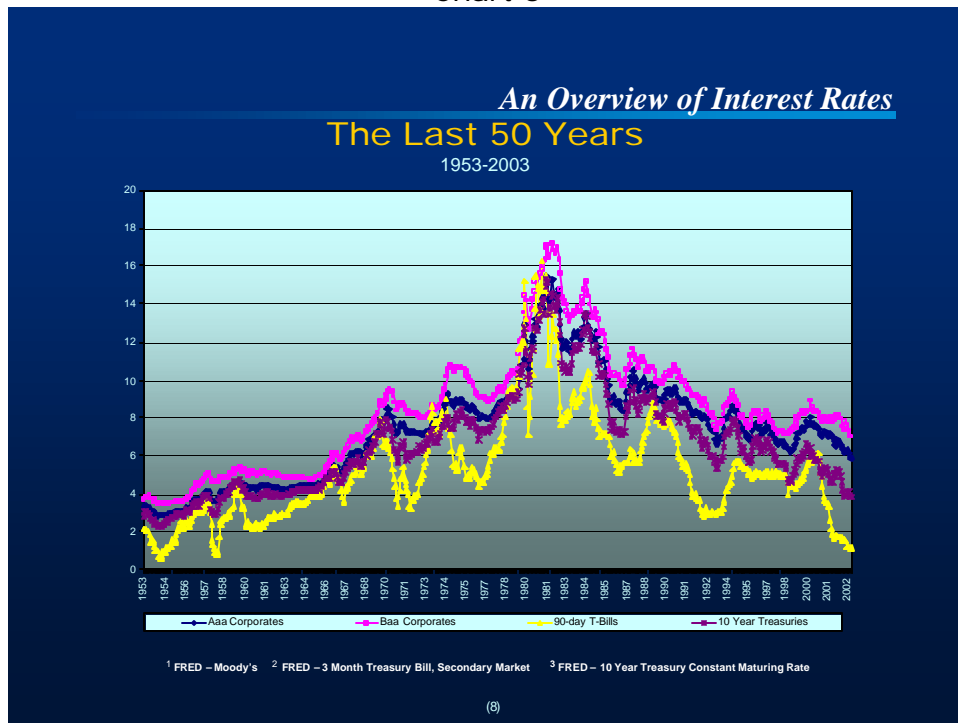


Chart 6

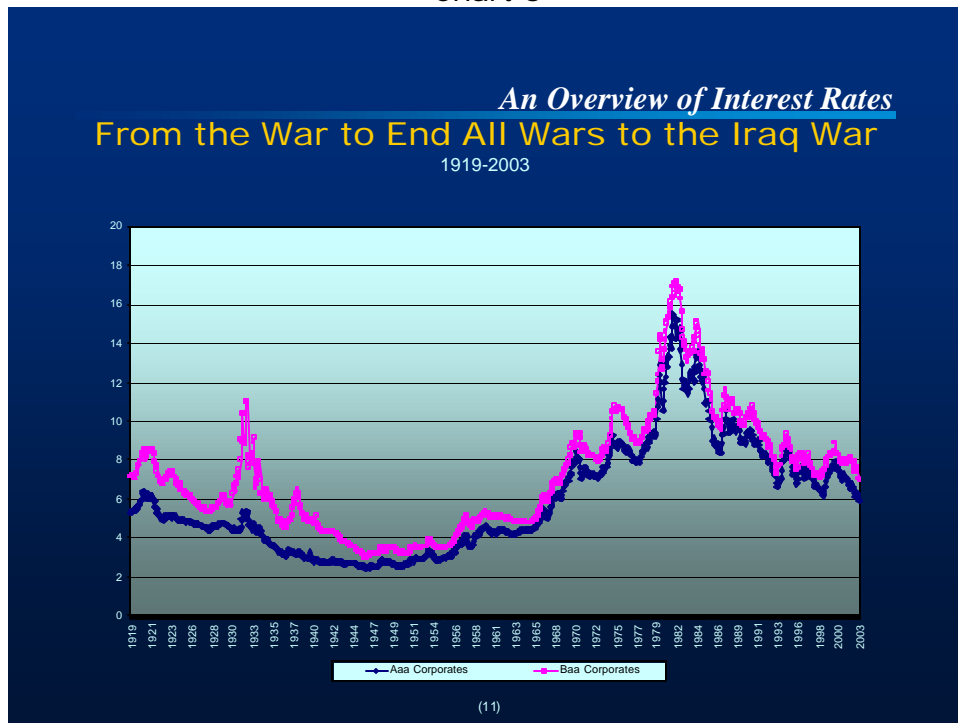


Chart 7

Characteristics of Recent American Business Cycles
Output, Inflation, Unemployment

Cycle ¹	Year	Duration (months)	Real GDP	GDP Growth Rate ²	Inflation ^{2, 3}	Unemployment Rate	Change in Unemployment Rate
Peak	Dec 1969		3,571			3.5%	
Trough	Nov 1970	11	3,567	-0.1%	5.5%	5.9%	2.4%
Peak	Nov 1973	36	4,151	5.2%	5.4%	4.8%	-1.1%
Trough	Mar 1975	16	4,010	-2.6%	9.6%	8.6%	3.8%
Peak	Jan 1980	58	4,959	4.5%	7.4%	6.3%	-2.3%
Trough	Jul 1980	6	4,850	-4.3%	9.2%	7.8%	1.5%
Peak	Jul 1981	12	4,997	3.0%	7.2%	7.2%	-0.6%
Trough	Nov 1982	16	4,916	-1.2%	6.8%	10.8%	3.6%
Peak	Jul 1990	92	6,719	4.2%	3.4%	5.5%	-5.3%
Trough	Mar 1991	8	6,631	-2.0%	3.1%	6.8%	1.3%
Peak	Mar 2001	89	9,230	3.4%	2.0%	4.2%	-2.6%

¹ Beginning and ending of business cycles as defined by National Bureau of Economic Research
² Annual percentage rate
³ Percentage change in GDP price deflator

(19)

Chart 8

Characteristics of Recent American Business Cycles
Stock Market

Cycle	Year	S&P500	Growth Rate of S&P500	S&P Total Return	Implied S&P Dividend Yield	Bull / Bear Market	
						Hi/Lo	Date
Peak	Dec 1969	92				108	12/03/1968
Trough	Nov 1970	87	-6%	-2%	4%	69	05/26/1970
Peak	Nov 1973	96	3%	6%	3%	120	01/11/1973
Trough	Mar 1975	83	-10%	-6%	4%	65	12/06/1974
Peak	Jan 1980	114	7%	12%	5%	111	10/05/1979
Trough	Jul 1980	122	14%	20%	6%	100	04/21/1980
Peak	Jul 1981	131	8%	13%	5%	135	04/27/1981
Trough	Nov 1982	139	4%	10%	6%	102	08/12/1982
Peak	Jul 1990	356	13%	17%	4%	369	07/16/1990
Trough	Mar 1991	375	8%	12%	4%	295	10/11/1990
Peak	Mar 2001	1160	12%	14%	2%	1527	03/24/2000

(20)

Chart 9

Characteristics of Recent American Business Cycles

Interest Rates

Cycle	Year	10-Year CMT	Change in 10-Year CMT	90-Day Treasury	Change in 90-Day Treasury	Slope: 10CMT-90TB	Moody's Baa Index	Spread: Baa-10CMT
Peak	Dec 1969	7.7%		7.8%		-0.1%	8.7%	1.0%
Trough	Nov 1970	6.8%	-0.9%	5.3%	-2.5%	1.5%	9.4%	2.6%
Peak	Nov 1973	6.7%	-0.1%	7.8%	2.5%	-1.1%	8.4%	1.7%
Trough	Mar 1975	7.7%	1.0%	5.5%	-2.3%	2.2%	10.5%	2.8%
Peak	Jan 1980	10.8%	3.1%	12.0%	6.5%	-1.2%	12.4%	1.6%
Trough	Jul 1980	10.3%	-0.5%	8.1%	-3.9%	2.2%	12.7%	2.4%
Peak	Jul 1981	14.3%	4.0%	15.0%	6.9%	-0.7%	16.2%	1.9%
Trough	Nov 1982	10.6%	-3.7%	8.1%	-6.9%	2.5%	14.3%	3.8%
Peak	Jul 1990	8.5%	-2.1%	7.6%	-0.5%	0.9%	10.2%	1.7%
Trough	Mar 1991	8.1%	-0.4%	5.9%	-1.7%	2.2%	10.1%	2.0%
Peak	Mar 2001	4.9%	-3.2%	4.4%	-1.5%	0.5%	7.8%	3.0%

(21)

Chart 10

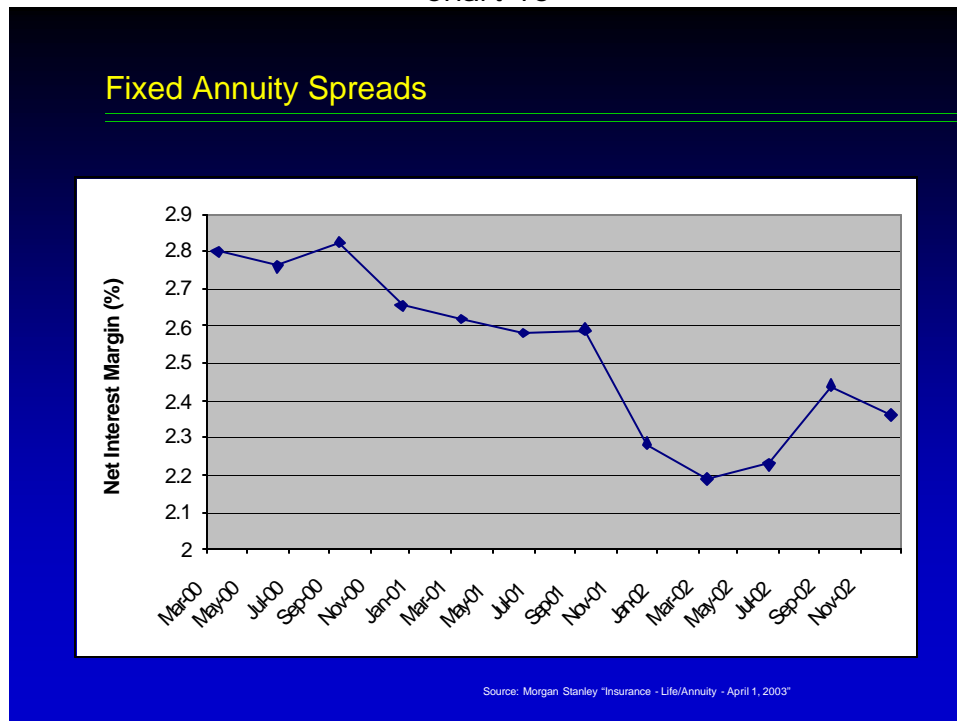
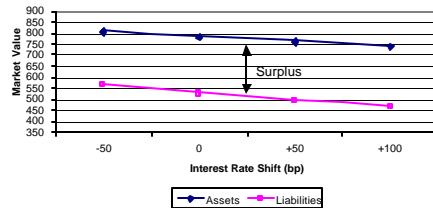


Chart 11

Economic Impact



	Interest Rate Shift (b.p.)			
	-50	0	+50	+100
Market value:				
Assets	805	782	759	737
Liabilities	565	524	492	464
Duration:				
Assets	6.4	6.3	6.2	6.0
Liabilities	7.4	6.9	6.4	5.9
Convexity:				
Assets	0.9	0.8	0.6	0.5
Liabilities	1.6	1.6	1.5	1.4



Chart 12

Efficient Frontier - Base Case

	12/31/02	Conning Consensus	----- Historical -----			
			1961-2002	1961-1981	1981-2002	1991-2002
Price Inflation (CPI)	N/A	2.50%	4.43%	5.69%	3.43%	2.55%
+ Real Returns (3-month)	N/A	1.75%	1.68%	0.86%	2.49%	1.68%
Short-Rate (3-month)	1.22%	4.25%	6.11%	6.55%	5.92%	4.23%
+ Term-Premium (10 yr - 3 mth)	2.61%	1.50%	1.06%	0.42%	1.74%	1.65%
Long-Rate (10-year)	3.83%	5.75%	7.17%	6.97%	7.66%	5.88%
+ Equity Risk Premium*	N/A	3.25%	2.92%	5.07%	0.50%	2.11%
Equity Return*	N/A	9.00%	10.09%	12.04%	8.16%	7.99%

*Valuation Adjusted



Chart 13

Efficient Frontier - Base Case

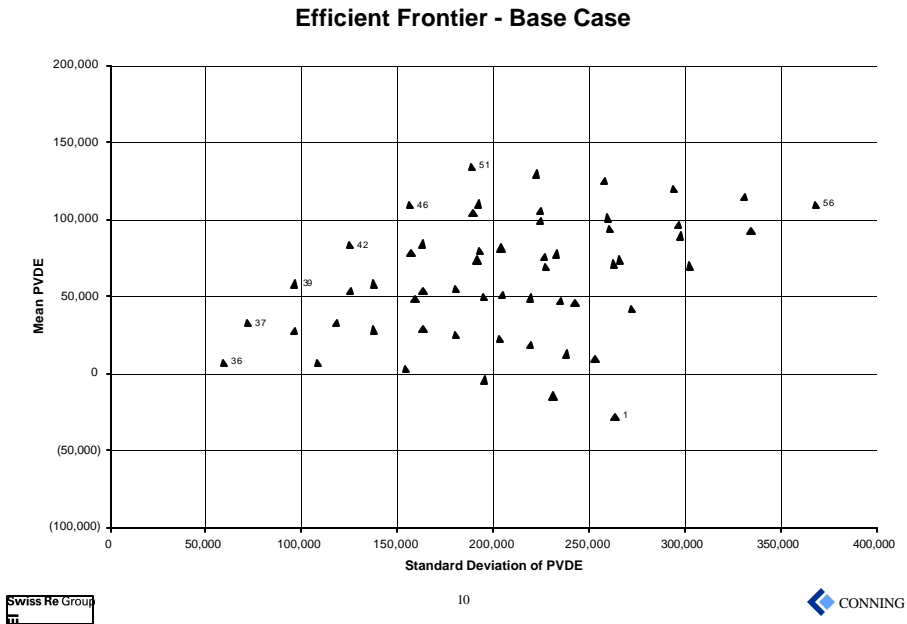


Chart 14

Efficient Frontier - Increasing Scenarios

