

RECORD, Volume 27, No. 3*

New Orleans Annual Meeting
October 21-24, 2001

Session 132PD Investment Strategies To Maximize Yield

Track: Investment

Moderator: NANCY E. BENNETT

Panelists: NANCY E. BENNETT
MARILYN FROELICH†
JOSEPH E. PAUL

Summary: With the U.S. Treasury curve at its lowest level in years, general account investment yields have been declining, impacting investment and product strategies. This is leading to alternative investment strategies and asset classes, which are designed to increase risk-adjusted yield. This session includes an illustration of developing alternative investment strategies using optimization techniques and shows the risk/return trade offs of alternative investments. trade off

MS. NANCY E. BENNETT: We're going to talk to you about what to do about investment strategies in today's environment, with the yield curve at historically low levels. We're going to discuss revising investment strategies from three different perspectives.

Our first speaker is Joe Paul. Joe Paul is with the Clarica Life Insurance Company. He is their vice president and pricing actuary. Joe is going to discuss some of the ways Clarica has been dealing with the low investment environment from a pricing standpoint. Joe started his career in St. Paul at the Minnesota Mutual Life Insurance Company, now Minnesota Life. He moved up to Fargo to head up the pricing function at Clarica. He's responsible for the pricing and product development of all of their products including universal life, fixed annuities, equity-indexed annuity and their special markets. Joe is an FSA.

* Copyright © 2002, Society of Actuaries

† Ms. Marilyn Froelich, not a member of the sponsoring organizations, is vice president and portfolio manager at Advantus Capital Management in St. Paul, MN.

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

Our second speaker is Marilyn Froelich. Marilyn is with Advantus Capital Management in St. Paul. Marilyn is a vice president and portfolio manager. She is a chartered financial analyst (CFA) and holds an MBA. She's going to share her perspectives on dealing with this low investment environment from the perspective of someone who is actively buying and selling securities in the market. Marilyn's responsibility at Advantus is to manage their business operation where they provide investment management services to life insurance companies. Before joining Advantus Marilyn was at Western States, an insurance company in Fargo, North Dakota, and she was in the investment department.

I'm going to be the third speaker. I'm going to look at investment strategy from a top-down perspective. I will discuss how investment strategies affect the product and overall financial results for the organization. I am a consulting actuary with Milliman USA. My emphasis is primarily on corporate modeling, and financial management. Prior to joining Milliman, I was with Aon Consulting Group for a couple of years, but spent most of my formative years also at Minnesota Mutual. I'm also an FSA.

With that, I will make a few introductory comments to put our comments into the proper perspective. First I will review the current environment in which we are trying to operate. We are in an environment with almost unprecedented historical lows in the treasury curve. We've been in a period of declining yields and spreads on fixed-income investments for a period of time. Now, as compared with the fixed-income markets, we see that in the equity markets there are volatile returns. In the last several months most of those returns have been volatile, but they are also generally on the decline.

Dealing with the volatility in the fixed and the equity markets is certainly not something new for the industry. We're used to dealing with the interest rate and the market risks. Something we have to deal with that is new, at least probably more new for us as actuaries, are the liquidity risks and operational risks. There's a much greater awareness of risks facing insurance companies, in part because of a couple of high-profile insolvencies and other troubles in some large companies.

Another thing influencing the current economic environment is a change in consumer demographics, creating a lot of competition for consumer dollars.

Chart 1 illustrates how much the yield curve has changed over the last two years. I doubt that this is the case, but if anybody is under the misguided assumption that it's business as usual, I hope that this graph helps to change your mind about that notion. The last or the most current yield curve on the graph is for Sept. 17, 2001, and I'm sure things have changed quite a bit since then.

Now, turning to the equity side of the house, chart 2 illustrates how quickly our economic environment has changed over the last two years. This graph represents

the returns on the Standard & Poor's (S&P) 500 index over the last two years. The graph underscores the challenges that life insurers are facing as they try to make investment decisions in the current economic environment.

With that, Joe is going to start with some comments that are more from the product perspective.

MR. JOSEPH E. PAUL: The choice of presenters was made with quite a bit of thought. It is critical if we're going to develop investment strategies to maximize yields, to have the pricing people, the asset/liability modeling (ALM) people, the financial management people, and the investment people all talking to each other. So it is very appropriate to have all the disciplines represented here.

The first question I've got is why does it matter? We recognize that we are in a low interest rate environment, but why is it important for us to have a discussion on the topic? Companies are competing for the consumer's dollar, and so competition is fierce. As a result of the competition being fierce, profit margins get quite a bit thinner.

I was trying to come up with a couple ways to think about the low interest rate environment, and from a product perspective, when agents ask for more commissions or consumers ask for more benefits, I use the expression that there are only 100 pennies in a dollar of premium. That is a true statement, but the actual amount of money that the product people have to spend is the amount of premium plus net investment income. That's the size of our pie that we can allocate for profit, consumer benefits, or agent compensation. If we can increase the size of the net investment income, which is investment yield less all of your default costs and all of your investment costs. If my pie is bigger than the competitor's pie, I've got more money to spend on consumer benefits, agent compensation, and saving money for the company.

Why does it matter in a low interest rate environment? Well, if my investment team is turning a 13.5 percent return and yours is turning 14 percent, I can still compete pretty favorably in the minds of the consumers with a 12 percent annuity when yours is 12.5 percent. If I'm only earning 6.5 and your investment team is able to turn 7, we're still only 50 basis points short, but your 6 percent single premium deferred annuity (SPDA) is going to do a lot better in the market than my 5.5 percent SPDA. So as interest rates come down, the size of the pie shrinks and we have to make sure that we keep that pie as big as possible for our companies.

My topic is how a company responds to declining yields. Actually for me it's from a pricing perspective. What is my response to declining yields? What are the pricing actuary's options for addressing this type of environment? I've got a couple of easy suggestions for you. The first thing you do is you go to an investment team and ask them if they can get an 8 percent yield again. After you have that meeting, you may want to schedule a meeting with the corporate department and see if you can

convince your shareholders to accept a low return. Using a capital asset pricing model (CAPM) analysis, you've got a risk-free rate plus a risk premium. Well, the risk premium for insurance products didn't change, but the risk-free rates come down, so obviously the shareholder is much more willing to accept the lower return. I encourage you to bring that to the analyst's attention at some S&P meeting or at the A.M. Best presentation and see what kind of a response you can get. I wish you luck with those two, but those are the first two steps.

If you're not successful with those first two you've got a little bit more work to do. I decided to put together the product development playbook for dealing with a low interest rate environment. The first thing I want to note is that there are no groundbreaking new concepts to be presented here. There are the nuts and bolts of what the pricing product development people need to be working on in this environment. The other comment that I want to make is that this isn't something that pricing or product development people should be working on strictly in a period of low interest rates. It's just more important to be practicing these various aspects in a low interest rate environment.

Without further ado, I'm going to go through the product development playbook. First I'm going to talk about defense. Our defensive strategy is to look at the risks that we've got. As any good pricing actuary, I'm willing to mention that risks must be managed. They're not to be avoided at all costs. One risk is a premium funding risk. For instance, there are universal life contracts sold at an interest rate higher than what we're currently crediting. What are we going to do about it? The first thing we have to do is know how the block of business is performing. It may take a massive effort from the IT department, but one thing that we've done at Clarica is we've periodically gone through a projection process on all our in-force universal life contracts. We classify the policies into groups based on expected premium funding, benefits, and how long the policy will last. Then we take a close look at those contracts that are not going to be performing and are not going to be in force in 15 years, and see what we can do on those blocks of business. Once you have that information, what do you do with that data? The first thing we do is take a look at the profit coming from that block of business. Has mortality or expense experience improved so that we can afford to reduce our expense or mortality margins and increase the crediting rates?

First of all, I'm not a reinsurer and I was not paid to make this comment, but you could take this block of business to a reinsurer. Some reinsurers are willing to do in-force reinsurance agreements. If you can get a better deal than what you were anticipating on the products, you can take that margin and pass it along in terms of a lower spread, but you've got to keep your policies performing even in a low interest rate environment. If all else fails, some type of an early warning system to warn your policy holders a few years in advance that their policies are not performing would be useful.

The next risk I see is guarantee risk. The classic example of this is the supplemental

contract options that you provide on your universal life annuity contracts. Obviously there you've got both mortality working against you and a low interest rate environment. In the classic sense, guarantee risk is any situation in which your current crediting rate is uncomfortably close to your guarantee rate. That is something that you need to monitor, and you need to keep track of your settlement options at the end of your contracts, because they carry guarantees.

Another risk is profit risk. When you're pricing a product, you assume a certain yield on the invested assets and the compounding of the yield. If you've got the majority of your profit or even potentially all of your profit coming off of the spread on the assets and your assets aren't growing as quickly as you had anticipated in pricing, you're not going to make your margins. So you do have to keep track of your profit risk and reprice if necessary.

Product performance risk is really a sales and marketing risk that one carries. For instance, there are universal life contracts or whole life contracts with term riders. If your training process for your agents is to sell at target premium, for example, and target premium carries the policy to maturity at a 7 percent rate, if you're only crediting 6, it's not making it there. So keep an eye on how you're training your agents to sell your products and try to avoid problems up front in the product performance before they become a premium risk problem.

Another risk is certification risk. This is especially near and dear to my heart as the illustration actuary. These are always fun things to look at once a year to see what's changed. Once a year isn't often enough. You need to monitor that on an ongoing basis. Monitor your experience and periodically check your block of business or your new sales throughout the year to make sure there are no surprises come certification time.

The last one is disintermediation risk and I believe that's pretty much self-explanatory. The one additional piece to this that I will fill in is that there is some risk that is borne by companies from their crediting strategies. If my product is crediting on a new money basis and the competitor is crediting on a portfolio basis, in a declining interest rate environment they've got a competitive advantage over me. Even though I'm getting the policy on the books, I may be subject to losing that case because of the crediting strategy. So that's the defensive game plan. Let's move to offense.

I have not seen many carriers that have strategies for competing in the marketplace, and of those that do, I have not seen many that are measurable. One thing I encourage you to do is have a competitive strategy that is measurable. Keeping with the sports theme, they don't take the eight best companies or best products to play in the playoffs; they measure the wins and losses of those companies. They go to a measurable basis in order to determine what are truly the best products in the market. So make sure your competitive advantage basis is measurable. Once you have that done, measure it. Measure it monthly, quarterly,

semi-annually, or as often as you can. It's important to keep track of where the competition is relative to your product's competitive advantage.

The second action I encourage is equally important. In 1997, 1998, 1999, Clarica had a very good capability for building fixed annuities. When the stock market was doing 15, 16, 18, or 20%, the ability to create a fixed annuity was not an innovative concept. So make sure that you have competency to build the products that are selling in the marketplace today. For Clarica, that meant getting into the equity-indexed annuity market. We didn't have variable authority, so we couldn't do variable products, but we got into a market where we could compete in the current environment.

The next one is to add the mythical valuable benefit with no cost. I've seen a lot of these that theoretically had no cost, but that was strictly because the regulatory environment hadn't caught up yet. The classic example is the guaranteed minimum death benefits (GMDB). When they initially came out while the S&P was going to go up 10 percent a year, and the company's stock was going to go up 10 percent a year; there's no risk to that benefit. But, that was really only a function of the period of time, as well as the fact that there wasn't regulatory code behind it. So when you're putting in the "benefit without cost" feature, be careful to make sure that they are actually no-risk, not just unrecognized by regulatory code as having no risk.

The last one, which is a strategy that has proven much easier for Clarica to perform, is tossing anything over the edge of the boat that isn't nailed down. Focus your product on a very specific target and if the feature isn't something that's critical for that particular product focus, get rid of it. That is the offensive strategy.

At the end of the day we've got a product on the street. After the product is on the street, the product actuaries have to be working with the investment team, the ALM team, and the capital management team in order to maximize the investment performance of the company as a whole and make that pie as big as possible. This is important because there should be no one that has a better knowledge of the liability characteristics of the products that are being sold than the product actuary. If the product actuary doesn't know the liability characteristics, there is a bigger problem.

At this point, the investment strategy, the crediting rate strategy, and the capital management strategy are three areas that work together. Reviewing the investment strategy is something that generally happens at the time the product is designed, but that has to be reviewed as the economic environment changes. You can't put a product on the street with a certain investment strategy and hope that it holds true from this day forward. You have to monitor that on a periodic basis.

Crediting rate strategy is something that's set at issue, and you really don't want to be changing that frequently. Although I'd like to switch to a new money rate, or

portfolio rate, depending upon which one is higher, I have not been able to sell that concept yet to my carrier. You pretty much stay with your crediting rate strategy and vary your investment strategy over time. You can never forget the amount of capital that you're using up by the types of assets that you're purchasing. That does wreak havoc with the profitability, because you have a generated return on all the capital that you're consuming, not just that with which you priced.

In summary, I believe this is pretty much self-explanatory, but I will leave you with the thought that the pricing actuaries can't sit on the sidelines drinking Gatorade when the special teams are on the field. We've got to be in there participating with the investment people, the corporate actuarial people, and the ALM people, recognizing that the pricing actuary is not the star on the field at that point in time, but they do have to hit their blocks as well. Next up is Marilyn Froelich to discuss investment strategies.

MS. MARILYN FROELICH: I'd like to share with you some of the things that we have found at Advantus that work for us in the environment we've been operating in recently. I manage the general account assets of life insurance companies. My comments will come from the perspective of what we are doing to satisfy the competitive demands of the products.

There are a number of asset classes available that provide excess yield. Some examples are as follows:

- High yield
- CDO
- Private placements
- CMBS
- REITs
- International
- Convertibles
- Common stock
- Private equity
- ABS
- Schedule B mortgages

Now, this list is certainly not all-inclusive, but it does enumerate the majority of the asset classes, which are not derivative-based or synthetic-based. I stayed away from those in my list and addressing those for two primary reasons. First, we really don't work with them at Advantus and I'm going to try to share with you some of the benefits of my experience. The other reason is because most of the companies that we work with are not backing core liabilities with such instruments. I'm really focusing here on those things that are interest-rate sensitive, but do not cause a lot of controversy with your internal management staff or regulators.

Each of the asset classes on my list has plusses and minuses associated with it. As

a whole, I'd like to focus on the benefits of using only alternative asset classes to try to improve your yield. There are a number of such benefits. Notable among these is diversification. Many asset classes complement each other and provide a counter balance and natural hedge to one another. For instance, commercial mortgage-backed securities balance very well with the corporate credit cycle. In the last couple of years, we've enjoyed a number of upgrades in our commercial mortgage backed securities, which have been a very favorable find for us in light of the credit cycle we've been dealing with.

Another benefit is increased supply and opportunities. Public bonds are not only limited in yield, but also in supply. Alternative asset classes provide additional means in the credit market, as well as additional types of risk in the form of structure and/or collateral risk. All of the markets wax and wane, becoming more or less attractive. Having more alternatives and being familiar with more investment vehicles allows you to switch in and out, taking advantage of opportunities, and staying away from the categories that are out of favor.

The risks of the alternative asset classes can be underwritten. Again, I stay away from those particular vehicles that are interest-rate sensitive, in which you really need a crystal ball to determine which way interest rates are going to go. Certainly one of the benefits of all of the classes I've shown you is excess yield. This is the benchmark at Advantus that we really focus on. We look at the high-grade corporate bond that's available today and we feel we have to pick up pretty significantly in terms of yield in order to put on additional risk.

The risk return trade off of the asset classes that I've shown you is evidenced in chart 3. You can see the asset classes vary in yield with the level of inherent risk. On the left side of the chart are those asset classes that are predominantly investment-grade and NAIC1 in many cases. On the right, you'll see classes that are much more variable in cash flow and return, and generally back surplus. Those on the left are usually asset classes that are providing support to your liabilities.

As a whole, the alternative asset classes also have a number of risks in common. First and foremost is illiquidity. Many of the classes are quite illiquid, which is reflective in the price, and that's why in most cases you're picking up on the front-end excess spread. The bid-ask spread on these particular securities is wider. They're very good vehicles for buying whole accounts, which are generally the core accounts backing your liabilities. But they're difficult vehicles to hold if you have to sell, especially in a limited period of time. That is because the prices can be quite volatile and generally they react more to a given market sentiment. For example, since September 11 the airline and the aircraft equipment market has been highly reactive. Those spreads widened out significantly, much more so than their general widening in the corporate market. It may be cumbersome to use some of these vehicles if you're working strictly in a total return profile and if selling is something you're doing on a routine basis.

Generally, positioning these assets involves trading off structure and/or collateral risk for yield. Therefore, you need to be able to underwrite and monitor such risks. This involves having access to the specialized resources, both investment personnel as well as technology, to do such underwriting analysis of the risks. These asset classes dictate higher investment expenses, so not only is your bid-ask spread wider because of the illiquidity, but they're more expensive to have, acquire, and hold. Either you have to have specialized resources in house or you have to tap to them through an external source. The good news is that if the asset classes are underwritten appropriately you can certainly pick up and cover your additional expenses with a nice margin.

In Chart 4 I've plotted the returns versus the risk categories. What we have is the efficient frontier. This particular picture is unconstrained, so there is no reflection here as to the investment policy and statutes that really apply to our industry. It's really a picture of the investing environment that's available to a total return and/or pension account.

In our particular industry the insurance and regulatory environment imposes a number of constraints on us, so we have a different environment than would a strict total return and pension plan. Notably, we deal with such things as statutory accounting, interest maintenance reserves (IMR), and asset valuation reserves (AVR), and our gains and losses are not necessarily offsetting each other in the same accounting period. We really need strong embedded yields. Joe gave a number of examples in that area in his discussion on pricing liabilities. We have to be sure that we've got a consistent income and cash flow coming off this book of assets in order to have an embedded-price competitive edge.

For example, one of the accounts that I'm working with right now, outsources all of its investments and works on total return bogies. They have a very attractive total return to the selected benchmark. It's interesting that when you outsource, you generally find whatever benchmark your manager suggests, your portfolio will perform well to it. So they have an attractive pick up, but the book yield on their actual portfolio of assets is only 639, and that's 100 basis points below their peer group. So they really have very little income coming off that portfolio on a routine basis on which to price their liabilities. Conversely, their tax strategy has had a lot of problems. The only way that they're able to actually turn funds into this attractive total return is to sell in order to have financial flexibility and money to work with. That's caused some havoc with their tax strategies.

Of course, asset liability management has suffered. The total return manager is used to adjusting that duration to match the benchmark as the benchmark floats around in duration. That's one way that they can certainly be sure that they're performing at the benchmark or better, and that's something that's not necessarily available to an insured's company. Your liabilities and your assets have to match in duration and cash flow testing. Of course, risk-based capital (RBC) is an overriding factor and can certainly change the profile of any yield environment.

If we impose these constraints on our efficient frontier, you'll get a clearer picture of an efficient frontier and investing environment available to an insurance company. You'll note what's happened in chart 5 is that our environment is a little less efficient than that available to a pension plan and a total return account. We have shifted downward in yield and to the left, so we're focusing on less risky investments.

Given this efficient frontier that's available to us, what I'd like to do is just walk you through some of the things that have worked for us at Advantus. Like any life company, the bulk of our assets are held in fixed income and they back liabilities. So what we tend to do is focus on classes that complement this risk profile, such as private placements, international corporate bonds, structured securities, commercial mortgage-backed securities, REIT securities, and asset-backed securities. These are classes that are inherently more risky and more volatile. We use these particular classes to back our surplus. We represent companies varying in size from \$100 million to \$2 or \$3 billion (as well as our own \$9 billion general account). It's very cost-effective to use the institutional share classes, rather than a stand-alone equity account.

I'll walk through some of the benefits and the reasons why we tend to focus on those particular alternative classes. We emphasize the enhanced yield fixed-income securities and our strategies to maximize yield, because they provide investment-grade risk. Again, that's our focus. We are not a below investment-grade buyer, we are using these particular asset classes to back our liabilities and about 70 percent of what we buy is NAIC1. They also provide stable cash flow, as well as call protection. We like to make sure that our term structure isn't moving around and that we know exactly the cash flow that's coming off of that portfolio. Again, the risks can be underwritten. We're focusing on credit risks, structure risks, and illiquidity risks. These are risks that you can underwrite, and we feel that we have a track record in these particular risks for our accounts. They all provide attractive pick up to plain vanilla corporate debentures, which is our benchmark at Advantus.

Historically at Advantus, our yield-enhancement spreads have provided an attractive pick up to the plain vanilla corporate publics as measured by Solomon Smith Barney. So in Table 1, the column second from the right is showing you the basis point spread to Treasury at the time shown on the left. That is basically the strong high-grade, ten-year debentures that will give you in corporate credit spreads. So you're talking, perhaps, of doing the ten-year debenture in Amoco and Gillette, in high-grade names. To the left is the overall average spread that we've done for the same time period for comparable term and quality in what we call our yield enhancement category. Those are corporate private placements, commercial mortgage-backed securities, and in some cases, public bonds, but they're highly illiquid. On the right side you can see the differential. There are pretty significant numbers there. The overall average for this time period is 61 basis points. That's 61 basis points annually of additional embedded income that you have in your

portfolio. When you overlay the fact that you're dealing with investment-grade risk, the RBC charge coming out of that 61 basis points is very minimal. Generally speaking, the investment charge or asset-management charge varies from 10 to 15 basis points. If you net out your expenses, you're doing pretty well.

Table 1

Yield Enhancement Acquisition Spreads

Average acquisition spreads compared to new issue industrial public spreads, as published by Salomon Smith Barney.

Year	Advantus			Average Acquisition Spread	Salomon Smith Barney Spread 10 Years	Difference
	Average Yield	Average Life	Average Quality			
2001 8-31-YTD	7.59	8.93	BBB+	252	163	+89
2000	8.24	7.61	A+	207	147	+60
1999	7.69	8.65	A-	193	115	+78
1998	6.86	9.48	A-	157	102	+55
1997	7.33	9.66	BBB+	101	68	+33
1996	7.62	9.37	BBB	118	68	+50

11

Now, although we are basically a buy-and-hold, and the investment vehicles I'm showing you today are really focused more on a buy-and-hold strategy, we certainly measure them on a total return basis for our own account at Minnesota Life. We need to do that on most of our accounts as well. Our clients dictate that we do that. What we have found is that on a long-term basis, even though this is a buy-and-hold strategy focusing on up-front embedded excess yield, the total return is very attractive. We're picking up, in most cases, about 100 basis points or more to the credit index component that you put in on the front end. It's a significant advantage in our case to the Lehman Credit. We have about a 50 basis point higher coupon in our portfolio from the Lehman Credit Index, and if you keep that cost-protected and monitor the credit and structure risks so they don't deteriorate, over time that compounds and builds up significantly.

We like to use assets that back our surplus on a tactical basis, and we also need to approach them on a very cost-effective basis, because these are the expensive asset categories. These are really where you have your equity risks, and we view all the particular shares or classes that are more volatile as equity. Even though a number of accounts will focus on them as fixed income, like high-yields, at Advantus we really look at high yield as an equity equivalent and we book it as such. What we have found at Advantus is that we tend to utilize these institutional

share classes to affect the cost efficiencies that we need. Generally, the allocation to these particular classes is small. It may be 2 to 7 percent. If you're looking at a small cap common stock portfolio, it might be 2 percent. Even convertible bonds are seldom more than 7 percent of a particular asset allocation.

It's difficult to really block up to the size that you need to have a stand-alone account and get those cost efficiencies, because you're talking at a minimum of \$20 million dedicated to this, with at least 50 basis points of management fee. Often it's 100 basis points of management fee. What we like to do is get in and get out very quickly. As with the case of using high-yield in an institutional share class, we might only be in that share class for two to four months. We want to get in and out very quickly and that's not only difficult to do, but in many cases impossible if you have a separate stand-alone segregated account. We also find the institutional share classes provide diversification. Because you can step back and go as low as \$1 million into one of these asset classes, you can put together a much more diversified equity-participation bucket and you can participate in a lot of the micro styles that normally would have a higher threshold if you went in on a stand-alone basis. The institutional share classes provide the flexibility and breadth, and you can enjoy a full range of equity alternatives. The institutional share classes certainly provided a much more manageable risk return trade off.

Another asset class that we like to focus on is schedule B mortgages. We consider it a core class as a stand-alone segregated account basis. Like commercial mortgage-backed securities on schedule D, these assets provide diversification and a natural hedge to corporate bonds. We find that the asset classes are quite attractive because they provide stable cash flow. Generally speaking, our benchmark for going into a commercial mortgage that shows on schedule B is to get at least a 50-basis-point income pick up to triple B public bonds for what we consider to be A-rated mortgage. The credit risk is not very high in schedule B mortgages as can be seen in charts 6 and 7.

The foreclosure and delinquency rates in commercial mortgages are basically very low to non-existent. Chart 6 shows our particular foreclosure rate versus the industry. In this graph the industry is not high, and the delinquency rate is very similar. We also have the ability to price our commercial mortgage backs and our commercial holds on a monthly basis. We calculate a total return, so we have comparative numbers for other asset classes and strategies.

What we do with our own accounts, as well as our clients', is we like to work with them to bring all this together. We like to talk to them and show them on a quantified basis what these various asset classes look like. We also like to overlay the constraints that are put upon our industry with the asset classes, as well as internally to a particular account or to our own account. We constantly seek movement toward a strategy that is improving the return profile given the risk, or to move upward and to the left in the efficient frontier.

Table 2 is a prospect that we’re working with. They came to us and asked us to help them with their asset allocation, because they felt they weren’t getting enough return for their given risk profile. We quantified where they’re at right now and you can see that under point A. That’s the allocation strategy they had in place when they came to talk to us, and you can see the asset classes that they were using down the left side of the chart. They’re a big player in corporate bonds. Down at the bottom you can see their risk-return trade off. The return profile there probably looks pretty low to you, but remember this is a fully adjusted return, so what is netted out of that return is not nominal. We’ve taken out the associated RBC charges and the expenses for their asset classes. You can see they’re into public equity and that’s a more expensive asset class. So that’s adjusting that particular return down and showing up in the risk profile.

Table 2

Asset Allocation Strategy

Asset	Current Allocation (Point A)	Near-Term Strategy (Point B)	(Point C)	(Point D)	(Point E)	(Point F)
High Yield	2%	0%	2%	3%	4%	5%
Corporate Bond	54%	30%	30%	27%	26%	23%
Private Corp Bnd	0%	20%	20%	25%	22%	20%
Commercial Mtg.	18%	15%	10%	10%	10%	10%
CMBS	0%	5%	5%	5%	7%	10%
MBS	13%	10%	17%	10%	9%	10%
ABS	0%	3%	5%	5%	5%	5%
Convertible Bond	0%	0%	2%	3%	4%	5%
Public Equity	12%	10%	4%	5%	6%	5%
Private Equity	0%	0%	0%	1%	2%	3%
Real Estate Sec.	0%	2%	0%	2%	2%	2%
Intermediate Govt	1%	5%	5%	4%	3%	2%
Selected Portfolios Expected Return/Risk						
Return	3.29	3.69	4.77	3.94	3.47	3.35
Risk	6.08	5.54	5.31	5.28	5.39	5.43
Return/Risk	0.54	0.67	0.90	0.75	0.64	0.62

Constrained by RBC, investment policy and expenses

We looked at the asset classes and put together a variety of different portfolios for the company, ranging from point B to point F. We quantified what these particular risk return trade offs could look like. Our initial recommendation was to focus on the core liabilities, or rather, the assets backing the liabilities. That’s defined in point B. That was the near-term strategy that we recommended they implement. You can see the adjustments that we’ve done here, where we have put in additional yield-enhancement-type fixed-income strategies. We’ve decreased the corporate bonds pretty significantly. We put that weight into corporate public bonds, private bonds, and commercial mortgage-backed and asset backed securities. These are fixed-income classes that are high grade and provide stable cash flow and additional yield.

Chart 8 puts this recommended strategy on the efficient frontier and shows what we have accomplished and what we are leading them to on the long-term basis. They started at point A, so you can see they're out on the risk spectrum and they're down low on the yields. Then we move them to point B where they're focusing again on the core assets and the liabilities that they have to back, and we've improved that risk profile pretty significantly, as well as given them additional return. The next step would be to interject the institutional share classes on a mixed batch of equity holdings. Equity participation will improve that yield picture even more, so we could move out to D or we could move out to C using our diversified equity strategy against surplus. Where you move on the efficient frontier depends upon your own particular constraints and needs, as well as the risk profile tolerance in your company.

MS. BENNETT: Joe and Marilyn have shared with you their experiences in dealing not only with their own companies, but in Marilyn's situation she has presented a variety of companies to illustrate the different ways they are helping companies respond to this current economic environment. I think their experiences are a pretty good cross section of what many insurance companies are doing. I think many insurance companies are experiencing many of the same effects, but to a different degree, depending upon, their product mix and the risk profile they already have in place with their existing assets or liabilities.

The current economic environment with low yields and low equity returns has certainly made the recent months very difficult, but in reality, we've been dealing with some of these issues over the last several years. Over the last several years we've certainly seen a shift from general account products to separate account products as the consumers have been fleeing to the variable products for the higher return. That has resulted in slowing growth in your general account assets. At the same time you're seeing declining yields or spreads on those particular asset classes. AM Best recently released a report in which they illustrated the average yields and growth rates on the assets in the life insurance industry. In 1995, the average net yield on invested assets was 7.8 percent and in 2000 that rate dropped to 7.2 percent on a total portfolio basis. That's a fairly significant drop in yield and fairly difficult to make up elsewhere. Also, to exacerbate the situation, we're seeing a decline in yield on a declining block of assets. In 1990, on average, companies' general accounts were growing in excess of 8 percent a year. In 1999 and 2000 the growth in general account asset portfolios slowed to about three percent.

With the shift from the general to the separate account, combined with this reduced performance, we're seeing that insurance companies' earnings are becoming even more dependent on separate account fees. Of course that introduces increased volatility to earnings as the separate account values fluctuate.

Also, in the last few years insurance companies have been evaluating their business strategies and more life insurance companies are positioning themselves as asset

managers, trying to compete in the broader financial services industry. They're now advertising themselves as asset managers. We are seeing a significant shift of the mortality risks and therefore potential mortality margin to reinsurers. I think the numbers vary quite a bit, but according to the last SOA study, approximately 60 percent of the new face amount was reinsured. That's a significant increase from 10 years ago, when the percent of new face amount that was reinsured was probably in the 10 to 15 percent range. So we're seeing a significant shift of the mortality margin. That is putting even greater pressure on company earnings and the investment margin is becoming an even more important source of earnings.

Every company is looking for some way to deal with this particular environment. Some companies are trying to take advantage of it and actually prosper from the environment, but some companies are simply trying to survive. I think one response is taking place in almost every single company. The management is demanding a higher return on their operating income. Of course, as Joe talked about earlier, we can always try to introduce a new product or new features, and hopefully we're not giving up free options in the process.

Switching to a different part of the balance sheet, we can try to change the tactical asset allocation by either altering our risk position or going into different types of assets. We can also go to either the investors or to the corporate house and see if we can try to draw down surplus and thereby retain fewer earnings. In doing so, we're hoping that this economic environment is just a short-term phenomenon. We can weather the storm and draw down on our surplus and see if that works. If all else fails, a lot of companies revisit their strategic plans. Oftentimes they're exiting markets or trying to enter new markets that they think will be more profitable for them. Essentially what insurers are doing is changing their risk profile in some way with the intent to increase yield and, hopefully, decrease their earnings volatility.

There are a lot of ways we can do this, because within an insurance company there are a lot of moving pieces in changing the risk profile. You can do one thing at a time, but everything is linked and very interdependent. The question that I ask is how can we help companies change their risk profiles so that they're doing what they want to do. I think we have to acknowledge that many companies use different quantitative tools to assess a changing risk profile or look at different investment strategies. In many companies, the existing tools that analyze the impact of some of these different strategies are in different parts of the company. We might have some analysis done in the investment area independent of what the pricing folks are doing. I think we can all agree that we probably need some increased communication.

I'm not recommending this, but we can always go in and try to use those pricing asset shares and see if we could get a higher internal rate of return or something. Or, as Marilyn illustrated, we can go to an efficient frontier and see what we can do. Every once in a while they'll bring in a corporate actuary that will try something that they use for a rating agency or what's being used for the planning process to see if

they can find some way to reduce the cost of capital, or maybe to try to figure out some corporate way to do things.

I think the message that all of us are trying to send is that by taking this disjointed view, there are several drawbacks. In particular, from my perspective as an ALM practitioner, I think the overriding drawback with this type of an analytical approach is that the analysis doesn't capture the integrated impact of changing the investment strategy on the company's overall financial picture. How many times are we caught off guard when the investment folks try a different asset class? Or conversely, how many times are the investment folks being drilled as to why the yield declined or why the investment margins are not as high as they were in the past.

The problem that I see with a lot of these stand-alone, independent analytical approaches is that we're not really capturing this integrated impact and therefore the overall financial impact on the entire organization. I think it's absolutely essential for life insurers to develop analytical techniques that take into account the capital position, the risk position, and then the resulting periodic income that will flow out of the strategic changes.

The basic efficient frontier concept Marilyn used earlier shows you the risk return trade off from an asset manager's perspective. But this analysis is incomplete because it looks only at the asset side of the balance sheet.

I propose an alternative, more sophisticated analytical tool, which is an ALM efficient frontier. This is an analytical framework for helping you understand how alternative strategies not only affect your total return or book yield, but how alternative strategies really affect your financial management and the financial picture of your entire company. An ALM efficient frontier is an analytical tool that is developed from your corporate model, or it's an extension of your corporate modeling applications. It's a graphical representation similar to the asset efficient frontier that layers in the effect of the investment strategy by imposing liability constraints.

Chart 9 is a graphical representation of this ALM efficient frontier. In the ALM efficient frontier the return for each strategy is defined according to the company's financial objectives, such as statutory income, GAAP income, or distributable earnings, and risk is defined as the variability in return. The letter "C" indicates the risk return position of the current strategy. I have modeled different strategies in the corporate model where I can project the effect on the company's overall financial position.

We construct this ALM efficient frontier by running a number of investment strategies and seeing what it does to the bottom line over a range of interest rate scenarios. How volatile is that financial return going to be?

Now, I want to discuss how we could use this tool to help evaluate alternative strategies, with particular emphasis on investment strategies because that's really our topic for the day.

Suppose you're evaluating 10 alternative investment strategies. The first thing to do is break the illustration up into four basic quadrants, centering on our current investment strategy. I want to evaluate what is going to be the risk and return trade off relative to my current strategy. I think we can pretty much all agree that quadrant two would be a really good place to be, because quadrant two represents those strategies that have less risk and more return. We can also all agree that we do not want to be in quadrant four, because those strategies have more risk and less return.

This is the first way to filter the investment strategies. For each particular strategy you can quantify the additional return per unit of risk or, the reduction in return per the unit of risk that you're giving up. This is an adaptation of the Sharpe ratio concept. By looking at the difference between the current and expected return, divided by the standard deviation of the return of that portfolio you can determine the additional return per unit of risk. With this adapted Sharpe ratio, you can rank the various strategies at least from a quantitative point of view. You still have to consider some of the other items that Marilyn mentioned, such as the diversification and expenses, but this is at least a starting point for a discussion of alternative strategies.

I am a consultant now, but I spent the majority of my career in a company, so I do have a pretty good foundation in terms of the practical importance of some of these tools. I recognize that you're going to make the most headway if you talk to management about how you could move them away from their current position. I also think it is important that we also make sure that we understand, at least in a theoretically perfect world, how we could invest. We all have competitive constraints, but we can also use this efficient frontier to evaluate alternative strategies relative to an optimal portfolio. In other words, in a perfect world what type of investment strategy would you follow? This is a more advanced or more sophisticated level of analysis, but once you have your tool in place it's really not a difficult extension. What you are really doing is determining the optimal investment strategy, and that is the investment strategy whose risk profile exactly matches the risk profile of the liabilities.

That's not realistic of course, because we all know that you have to take on risk and you can't afford to be perfectly matched in your assets to back your liabilities, but I think it's instructive to understand and to at least have a starting point to know what an optimal portfolio could look like. So, as you take on risk and you at least start to understand how far you're deviating from this strategy on both sides of the balance sheet. This particular concept is an application of transfer pricing, which is well beyond the scope of this particular presentation. But I want to bring the concept up because I think we also want to make sure, that we help move

companies toward more ideal strategies. With the development of an optimal or a perfectly matched investment strategy you can do the same thing. You can evaluate these alternative strategies, including your current strategy, determining the return differential and how much you're picking up in terms of additional return per unit of risk.

There are other analytical techniques, with their own pros and cons, which can add a lot more complexity to your whole ALM analysis. One of the analytical techniques is the price behavior curve, in which you are graphing the interest rate sensitivity of your asset liability cash flows over a range of scenarios. You can look at how those graphs change with different investment scenarios. If you're into stochastic analysis, you can calculate distributable earnings under each different strategy and then project your earnings over multiple interest scenarios, and you can apply all different kinds of fun statistics to this. I'm covering these particular concepts very quickly just to provide you with a flavor for some other applications. Obviously, I think the ALM efficient frontier is probably the most powerful and it presents fairly well to senior management to help them understand how to make choices on different investments.

A final question is if we go to all of this effort, is it really worthwhile? I strongly believe that we need to have some type of analytical foundation for the decisions that we're making. I think, as actuaries, we can add significant value to our company. Although things are changing very quickly, we can easily become complacent. From a practical point of view, we can always find some kind of practical justification for not putting more sophisticated tools in place. But, if we do that, it's almost a speculative form of management and that's quite unwise. Companies sometimes take on risks that they really are not aware of and they're almost betting the company on intuition. I think some of these analytical tools I've described will help provide a much better foundation for making business decisions.

In terms of the effort, I really believe that a lot of the existing tools that you have in place can be leveraged and expanded. Many companies have corporate models in place that are extensions of their cash flow testing and their strategic planning efforts. This ALM efficient frontier is another application of all that work. You've done a lot of the hard work to get to this point and some of these analytical techniques are building on a lot of the, frankly, less interesting work that you've already done.

In summary, while we're all looking for that 14 percent investment that has no risk, we're probably not going to find it. Although we'd probably like to find that product option that everybody's going to buy that doesn't have a cost, we're probably not going to find it. We all have to recognize that with additional return comes risk. That's a sound fundamental principal. We always know that the return can be increased, but we have to know at what cost. As actuaries, we have a real opportunity to strengthen our financial management processes by building more robust tools and thus helping to institutionalize this evaluation of risk and return

trade offs.

MR. ANTHONY ZEPPELELLA: All of you seem to take into account yields net of capital costs, and I was wondering how you do that, if you have a type of bond that requires 1 percent, like required capital? Is it simply a subtraction of 1 percent from the yield, because I think that might be in some cases overstating the capital costs. Take, for example, a company that has only corporate bonds. Especially with the coming changes in the NAIC formula if that's what's used, equity risk is separated out from credit risk in the square root, so a company like that could add, for instance, a small amount of stocks with barely negligible extra required capital. I'm wondering if you have any method for accounting for that.

MS. FROELICH: Yes, it's a much finer cut. Efficient frontier modeling is an asset-based system, but it's a step in the right direction. It allows you to, at least, interject and superimpose those things that are unique to our industry, as well as your own internal management constraints, rather than just ignoring them and focusing on the nominal yield. We're taking an asset model and we're trying to put in the other side of the balance sheet. You get noise with that, such as what you've just described. It gives you a little better definition of the ballpark. It shows you where you're at a little better, but it is not as precise and as fine as what you'd like. I think Nancy's analysis really takes that concept and moves it further so that the two sides of the balance sheet are much more interactive, because as you recombine them, you get additional synergisms and changes in the pattern that relate it to the bottom line. In our asset modeling, we're making the assumption that if you beat the Lehman Index by such and such an amount, you're automatically getting good GAAP earnings. That may or may not be true, and her analysis really is focusing and fine tuning that particular element.

MR. PAUL: I'm an independent consultant now, but I formerly headed the corporate portfolio management group at Phoenix. The approach we took was, basically, as long as you're in a comfortable range for your RBC and you're well above your corporate target, we kind of acted independently of your RBC. So there's a constraint that the RBC ratio would be above a certain percentage, but then we kind of adjusted our investment strategy for maximum yield and low volatility of returns. I think that approach works well with the ALM efficient frontier method.

MR. JOHN I. DUTEMPLE: My question is for Marilyn Froelich. What percentage of the success that you're seeing in your enhanced-yield fixed-income securities is attributable to your allocations and your subclasses, which is something that all of us could do, and how much of it is successful underwriting of specific issues, which is a little bit harder to replicate?

MS. FROELICH: Well, we have had a strong track record in those particular classes and we approach them on a different basis. The main drivers of those classes are corporate private placement bonds as well as commercial mortgage-backed

securities and asset-backed securities. We've been dedicated to those classes for a long time. We've been underwriting corporate private placement bonds and they've been the mainstay of our own portfolio since the early 50s. We kept our liquidity somewhere else in high-grade, stable risks. Then, we'd go heavier into the equity classes. That, in addition to the way we approach the commercial mortgage-backed securities, as well as the fact that we have geared our shop to underwrite those and have a strong underwriting record that I can demonstrate in our credit selection, does reflect a heavy weight.

Something again that's unique in our shop, our commercial mortgage risks are unique in our shop, no matter how you take it (and we take it in a variety of ways), because we really like that asset class. It has performed well, it's a stable driver over time, and it offsets credit risks, because we're taking a lot of corporate credit risks. Again, that's unique to our philosophy. So we have a dedicated staff that is certainly commercial mortgage trained, as well as real estate trained. The people and the analysts in this particular sector have master's degrees from the real estate school at Wisconsin. A number of them are undergrad architects and they're all CFAs. That's what's very unique to our shop. Our real estate people have to have bond and securities training because they will underwrite the risks no matter where we show it on our schedules, whether it's schedule B, schedule D, or real estate securities. We love real estate securities and we have an active equity basket in our real estate securities, as well as just having them on fixed income. That's a little unique to our particular shop. It's intensive underwriting. You have to be able to analyze and position on the front end and then monitor it over the life of the holding, because it can change.

Chart 1



4

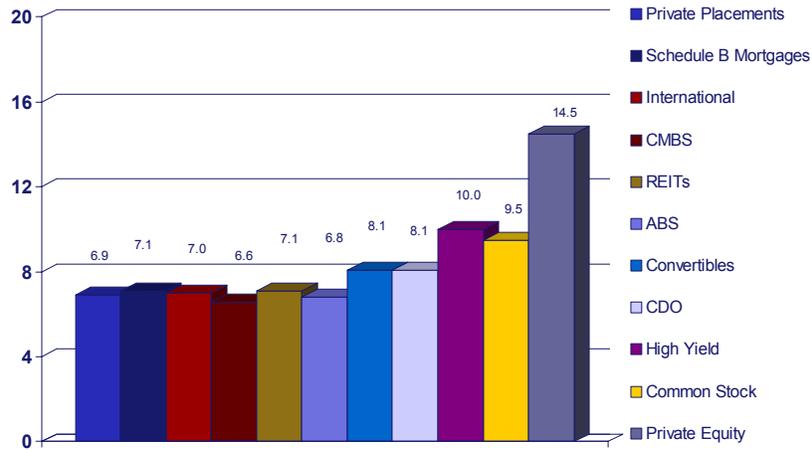
Chart 2



6

Chart 3

Expected Yield*



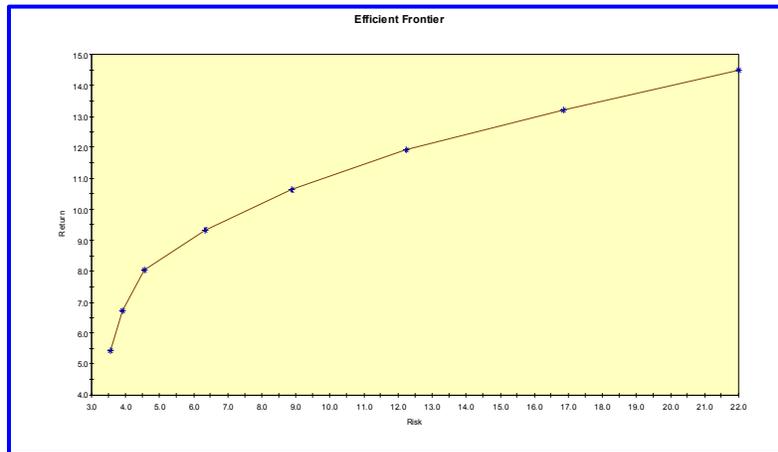
*08/31/01 Market Levels

4

Chart 4

Efficient Frontier - Expected Returns

Efficient Frontier Portfolios (Unconstrained)

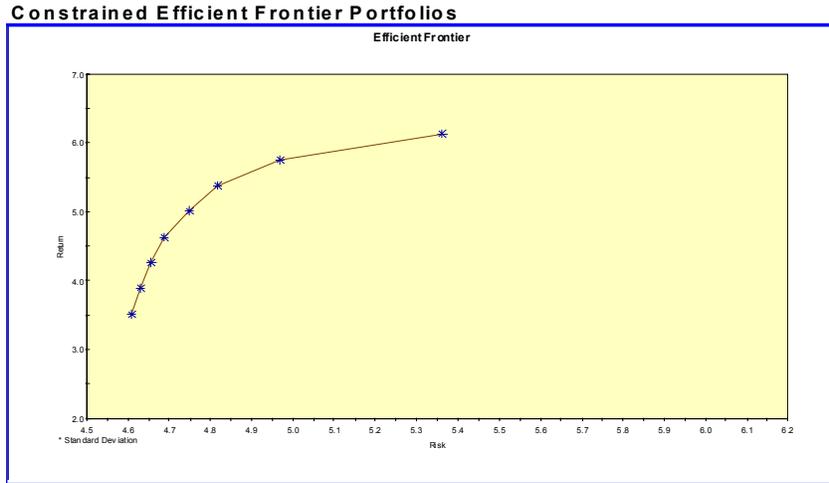


8/31/01 Market Levels

6

Chart 5

Efficient Frontier - Insurance Industry*



*Generic Life RBC, investment guidelines, and investment expenses

8

Chart 6

MORTGAGE QUALITY FORECLOSURE HISTORY* Commercial Mortgage Loan Foreclosure Rates



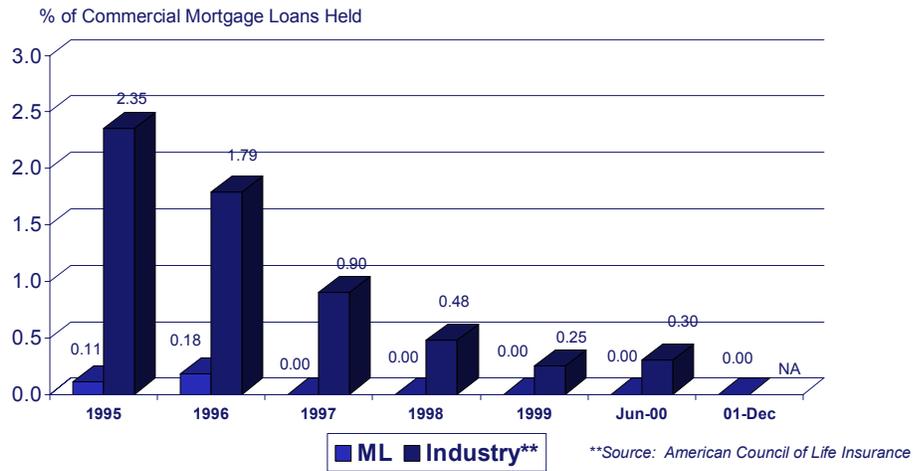
**Source: American Council of Life Insurance

* Foreclosure History - Commercial Mortgage Loan Foreclosure Rates by Amount - (In Process of Foreclosure). This represents the foreclosure history of commercial mortgage loans for Minnesota Life Insurance Company. It should not be assumed that performance in the future will equal this history.

15

Chart 7

**MORTGAGE QUALITY
DELINQUENCY HISTORY***
Commercial Mortgage Loan Delinquency Rates

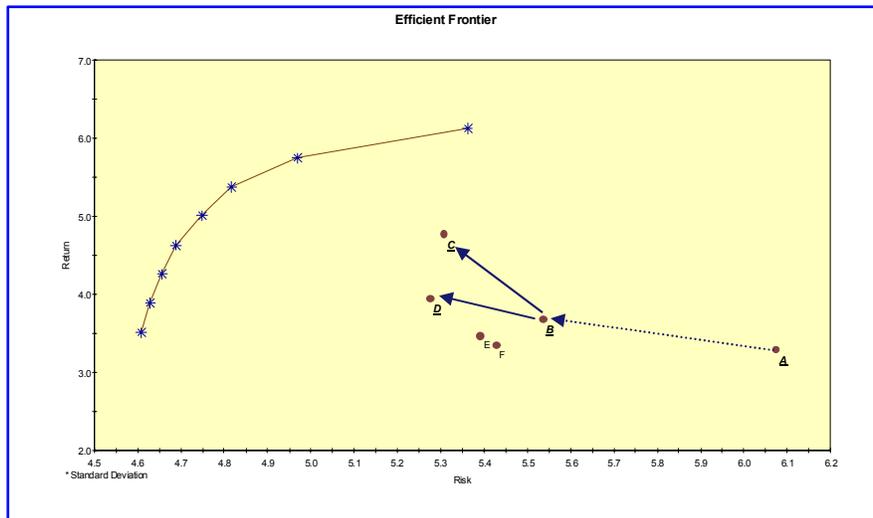


* Delinquency History - Commercial Mortgage Loan Delinquency Rates by Amount - Greater Than 60 Days Delinquent (Includes In Process Of Foreclosure). This represents the delinquency history of commercial mortgage loans for Minnesota Life Insurance Company. It should not be assumed that performance in the future will equal this history.

16

Chart 8

Asset Allocation Strategy



Constrained by RBC, investment policy and expenses

18

Chart 9

