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FINANCIAL MANAGEMENT OF A DIVERSE PORTFOLIO OF LIABILITIES

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- What are the significant product portfolios? The criteria for identifying them?
- What are the lessons learned from historical results on the portfolios?
- What are the challenges facing the financial managers of these portfolios in the future?
- What is the state of management information for appropriate product or market segments?
- What should financial managers be doing to improve management information?
- What action plans are appropriate for financial managers to improve financial results using this information and observed trends?

MR. FRANK J. BUCK: I should like to stress that this session is sponsored by the financial reporting section, not by the investment section. We are talking about the financial management of a diverse portfolio of liabilities not of assets.

I am with Deloitte and Touche in New York. I am responsible for the life actuarial consulting practice there. We have three panelists. First is Jan Pollnow who is vice president and actuary in the corporate actuarial area of The Hartford Life Insurance Company where he has worked for 25 years. He has corporate responsibility for valuation, product and pricing review, acquisition analysis and tax planning for The Hartford's North American Life Insurance Companies. He's also treasurer for the Society's financial reporting section. The second speaker will be Craig Likkel who until recently was the vice president and chief actuary of Family Life Insurance Company and Merrill Lynch Life Insurance Company in Washington. There he had management responsibility for the planning, organizing, staffing and controlling of all actuarial functions for both companies, including product development, asset/liability risk analysis, reserve valuation, i.e., all the actuarial functions. Craig was with them for 15 years, and recently left to join Milliman & Robertson in Seattle. The third speaker is Craig Reynolds who is with the Seattle office of Milliman & Robertson. He has been there since 1989. Prior to that he was with a major stock life insurance company and a major mutual company.

Jan is going to take a fairly broad overview of the whole topic, explain the financial portfolios, and talk generally about financial management and analysis. Craig Likkel will be more specific and go into a lot more detail about what was done at Family Life. And Craig Reynolds will take a broader view as a consultant and suggest some of the techniques that can be used in managing a universal life portfolio.

MR. JAN L. POLLNOW: During the 1980s, it seemed like everybody was in sales. Product actuaries were in demand, everyone was rewriting everyone else's business, profit margins were being cut to the bone. Now here we are today, and what are we

doing? We are trying to manage this business, trying to put those profit margins back into the business, trying to make our companies profitable. How we're going to do that for a diverse portfolio is what we're going to talk about.

What are these portfolios? What are we really talking about? Are we talking about property/casualty versus life portfolios? Are we talking about life companies that have universal life portfolios and medical portfolios? Are we talking about GICs versus LTD portfolios? Maybe we're talking about portfolios like corporate bonds versus Government National Mortgage Association (GNMAs) bonds versus Treasuries versus real estate. I think the answer is we're talking about all of these things, and I don't think there's any one correct answer for any particular company on how to break your company down into portfolios. My objective is going to be to just review briefly some of the methods of measuring financial results, then I'm going to define the criteria that you could use to identify portfolios, and very briefly I'm going to discuss monitoring.

The first thing you need to do is recognize that financial management can be carried out at various levels in the company. For instance, the board of directors and the CEO would like to have some type of uniform look across all of their portfolios or lines of business. And then as you get down further into the organization, you're going to want to manage at a more detailed level, and look at specific characteristics of the portfolios, and that's what the other panelists will be talking about. For instance, they may talk about mortality and lapses for one portfolio, and then interest margins for another portfolio. I'm sure you've heard it said that the primary job of management is to manage capital, and one of the ways of measuring how management is doing is through return on equity or return on total capital. Another measure that seems to be gaining popularity today is something called value added, or what I sometimes call change in economic value. Just to emphasize the importance of a satisfactory return, I'd like to read you a quote from Louis Preston, who's chairman of Morgan Guarantee Trust. He said, "Assets have no attraction to us if they don't promise a satisfactory return." In other words, growth in sales or assets are not worthy objectives unless they do produce a satisfactory return. What is a satisfactory return or objective? How do you determine where you want to allocate capital? If you're going to manage capital, the first thing you need to do is decide what your objective is. I think generally companies determine what their cost of capital is or what kind of return their stockholders are looking for, and then try to manage to that level. What you have to do is find some measure that you can use uniformly throughout your entire diverse portfolio.

I'm sure you're all familiar with the various alternative methods of accounting, and of course, our friends at the FASB have given us not just one but two measures for life insurance companies -- I think just so they can confuse things and keep everybody employed. I generally agree that GAAP does do a better job or gives more reasonable results than statutory accounting. But there still isn't a lot of rhyme or reason to the pattern of return on equity that you're going to find, and this is going to make it difficult for management to look at its various units on a consistent basis. Thus you may want to come up with some management financial system of your own in order to measure the performance and perhaps even determine compensation.

Another thing you're going to want to do is make sure that you have consistency between your pricing and your financial management. Now most of us price on a statutory basis, and I think a lot of companies are looking at internal rates of return as a measure of profitability. My former boss, Don Sondergeld, who as I'm sure you know is also President-Elect of the Society, wrote a couple of landmark papers back in the mid-1970s and early 1980s. One was entitled "Profitability as a Return on Total Capital," and the other was on what we called affectionately "IRRMA," the Internal Rate of Return Method of Accounting.

What Don did was take the pricing and show how you could relate it to your return on equity. Specifically, he showed that you could develop an accounting method that would produce a level return, and that level return would be equal to the return that was built into your product. And interestingly enough, in 1988 there was a Society committee that put together a report that indicated that this was the preferable way for mutual companies to measure their financial results. Now since that time, of course, there have been numerous papers, seminars, and sessions on this subject, so probably you've run across them somewhere or other.

Another method that seems to be gaining popularity is generally called value added. Although I still have some reservations, I'm becoming a convert to this approach, and there are several financial people at ITT headquarters, which is our parent, and also in our investment department, who believe that this is the only way to measure the value of the company, and it's the change in economic value that drives the price of the stock for the company.

One of my counterparts in our property/casualty operation has done quite a bit of work in analyzing economic value of property/casualty companies, and he's found that the price of the stock of those companies tracks very well with the change in economic value. He's also done some work with The Hartford and ITT, and even in the price of the ITT stock, the price tracks the economic value of the company plus The Hartford, and The Hartford is ITT's largest subsidiary. What he found was that the price does not go up and down with the earnings per share. It goes up and down with economic value.

As many of you know, the Europeans have used this approach for a number of years, and in fact actually use it to do some of their public reporting, or at least they report value added as one of the measures. And as they've started purchasing companies in the United States, they've brought this system over to the United States, and Wagner from AEGON has talked about how it installed value added. Macabees, now owned by a British company, has also had to install value added. BMA was bought by Generali, so I assume there's a good chance that it will probably have to look at value added. Someone else who has made me a believer is Mike McCane of Salomon Brothers. He has based some of his stock recommendations on what he considers undervalued stocks relative to economic value, and he will actually recommend purchase at the same time that he may be before casting their earnings downward because he feels that they're undervalued relative to their economic value.

Now one advantage of using economic value is that when you put profitable business on the books, there's an immediate impact on the value of the company, i.e., the value added, and this can be particularly helpful to a management that has old

business on the books that may be dragging down its return on equity, and when the company puts the new business on the books, it can show to maybe another level of management or its stockholders that value is actually being added to the company.

Once we have determined a uniform measure that you can use across all your portfolios, you need to look at how to define these portfolios. I think quite often, at the higher levels, companies look at the distribution system or the type of market that they're selling in. Craig mentioned one market might even be a regulatory definition. Then as you work down into the organization, you utilize other type of criteria.

Let's just take a look at The Hartford for instance. We have three main divisions. We have an individual life annuity division, which is further broken down into a registered and nonregistered line of business. We have asset management services, which has mainly pension type products, deferred compensation, structured settlements, and all qualified type business. And then we have an employee benefits division, which sells life, health and managed care to employers, and also through associations.

I mentioned that as you go down in the organization, you might want to look at three different criteria for your portfolios. For instance, you might want to look at the type of product or the type of risk that's being taken. You also may want to look at who's at risk. And finally you might want to look at the type of investments that are being made.

Let's just take a little closer look at these, and see how we might break down the business into different portfolios. First, let's take type of risk.

You can look at insurance risk versus asset risk. For insurance risk, we might talk about morbidity or mortality, and then for asset risk, of course, we're talking about call risk or prepayment risk, default risk, disintermediation risk. The kinds of products you might look at when you're thinking of insurance risk would be medical, dental, stop loss credit, one-year term, and group term life insurance. Generally with these contracts, you look at loss ratios, they don't have very much investment. On the other hand, a guaranteed investment contract, a single premium deferred annuity (SPDA), or a period certain annuity are also entirely investment oriented. Universal life, traditional life, life annuities, and long-term disability combine both the insurance and the investment risk.

Another thing we might look at is who's taking the risk. You may want to distinguish your portfolios based on whether the company is taking the risk, or whether the policyholder is taking the risk, or whether the risk is being shared. Maybe just to help a little bit with this definition, we could take a look at where the company is taking a big risk. As you know, historically, insurance companies have in effect given policyholders put options. Companies have given policyholders the ability to take their cash value at any time they choose. Of course, we've generally found that they're going to do it when it's to their advantage and most disadvantageous to the company like in the early 1980s. And as the economy started changing and interest rates started going up and down and changing about as frequently as our weather in New England, some of the companies tried to shift this risk back to the policyholder. Almost everyone has shortened up their bond portfolios, they've lowered the interest rate that they credit to the policyholders, so in effect, they're passing that cost back

to the policyholder. With variable contracts, the policyholders are entirely at risk, except perhaps for some type of expense or limited annuity purchase rate guarantees. And for shared risk we might think of modified guaranteed annuities or GICs that have market value adjustments.

Now both the criteria of who's at risk and what your investment risk or philosophy is may lead to managing your company according to some type of segmented asset portfolios. Again we might just take a quick look at The Hartford. For the individual division, we have two segments and then a universal life segment, a modified guaranteed annuity segment, and then we have separate accounts for the variable contracts. For asset management services, we have a GIC immediate participation guarantee (IPG) segment, a public employed deferred compensation segment, and a structured settlement segment, and then they also have some separate accounts. Finally, for employee benefits, we have only one specific segment, that's for long-term disability. The rest of the assets for that division are combined with all of the other assets in the traditional life insurance business into something we call the all other or remaining segment.

Let's just take a look at a few examples, and see how we could combine or perhaps separate products based on investment strategy. First of all, let's take a look at those two products that are in the group pension segment, IPGs and GICs. I'm sure all of you know that GICs are generally sold with maybe 2-7 year guarantees, and the cash flow on these is very predictable because they almost never withdraw, and if they do, there's almost always a market value adjustment. So the company can fairly easily control disintermediation risk on those contracts. On the other hand, IPG contracts have cash flow that's generally not predictable at all, but the company can pass the cost of this back to the policyholder by just changing the interest rate. The company can even pass the cost of capital gains and losses or default back to the policyholder. So in these contracts, you might want to invest a little bit longer, and as a result, you might think we ought to segment these two separately. On the other hand, you may think that you could combine them because you can buy one long-term bond, and use the cash flows in the short durations to fund your GIC contracts, and use the later cash flows for the IPG contracts. So you have to make that decision in which way you'd like to go.

On the individual side, we can talk about SPDAs. Now here the policy has this put option that we talked about earlier, and it's risky for the company to give a long-term guarantee. Then if you try to match that guarantee with long-term assets, you could find that you're in considerable difficulty. So as a result, you'll probably give out either limited guarantees or no guarantees, and also invest in relatively short assets. On the other hand, if you're using something called a modified guarantee annuity, you could give longer-term guarantees because, if the individual wants to take his money in the short term, he's going to get a market-value adjustment. On these two portfolios, I think you'd probably find that you'd want to segment those and have them as separate segments in the company and manage them separately.

A couple more products that you just might take a quick look at would be long-term disability and structured settlements, and again you have two different types of cash flow here that you could either combine because they might complement each other

or segment separately. In fact we're right in the process now of considering whether we want to bring some of our segments back together again.

As I indicated earlier, the final thing I'd like to just touch on is using management information. I think it's pretty easy to see that there's at least three uses for management information: (1) measuring performance, (2) identifying problem areas, and (3) using information to solve those problems. At The Hartford we use a five-year strategic plan, a three-year operating plan, and a one-year budget as our planning tools in setting objectives and goals. Then we measure our performances against these targets, and generally the budget is what you'll find is the measuring tool that we use the most. Now that's generally set in December, and then each month during the following year, we calculate monthly earnings. Yes, we report monthly, and compare those against the budget. We have each month what we call either operating review meetings or variance meetings. At these meetings senior management gets an opportunity to review a large number of financial reports, and have meetings with all of the senior management people to find out where the variances are and why. I guess basically our objective is no surprises, at least not near year-end, or else maybe what we'll want to consider is at least no unpleasant surprises.

Basically these reports produce all types of information, like sources of earnings, lapses, death claim reports, loss ratios, interest margins and so on for the various types of products. It's just our way of staying on top of all the lines at a higher level. One of the problems we've run into is that we seem to generate an awful lot of information, and periodically we go through this portfolio of reports and we try to weed it out, and then somebody will raise a question at one of the meetings and like magic, the next month there's a new report, and pretty soon you've got this big volume again. Somewhere we've decided that there's got to be a diminishing return. A couple of years ago, I came across a quote from one chief executive. He said that overreporting was the tendency to present so much background that the foreground goes underground. I guess that's sort of like you lose sight of the forest for the trees, and I think this is a very easy situation to get into today with all these computers spewing out all of this information. So you simply need to take a hard look at what's really pertinent for your portfolios, and concentrate on that information.

MR. CRAIG F. LIKKEL: My presentation will consist of five basic segments, including some background on my experience and the product lines at my former company, some specific observations in response to the questions in the program, a brief description of a concept called the product control cycle, some thoughts on statistical monitoring, and an example of earnings variance analysis.

For purposes of background then, my perspective is based on my 12 years of experience with Family Life Insurance Company, and its subsidiary formed in 1986, Merrill Lynch Life Insurance Company. My perspective is that of a member of the insurance company's management team, but also that of an employee of a rather large parent company, Merrill Lynch and Company. During my tenure with the company, there was significant growth and diversification of the insurance business. In 1982-90, we went from just over a $100 million of statutory assets to over $4 billion. We went from three lines of business effectively, with one being dominant, to managing eight separate lines of business. We went from one investment portfolio to five segmented asset portfolios.

The line of business reporting structure we adopted was similar to that which Jan described at The Hartford in that it was based on the Sondergeld model, with each line of business fully funded and measured against an ROE objective. Our definition of a line of business is essentially a product or a product group which should be monitored and evaluated on a financial basis separately from the rest of our business. The criteria we use to make this decision were basically those which Jan described in his presentation, with some emphasis I think in our case on the amount of capital that we anticipated investing in a line of business when we're in a growth situation.

In terms of accountability then, the organization chart is fairly simple. We had one senior management team with two operating divisions, and an allocated shared services division. Note that our bottom line accountability stopped at the level of our division director. Within each of these divisions, we had our eight lines of business that I spoke of. On the Family Life side, we had the traditional individual life line, which is mostly mortgage protection and term life insurance. We had individual A&S, disability, some direct mail life, and some direct mail A&S business. Family life was and still is dominated by the individual life line, which now includes some universal life. Over on the Merrill Lynch side was where almost all of this growth took place. We had single premium whole life, single premium deferred annuities, flexible premium variable annuities, and a group modified guaranteed annuity, the last of which is now the leading seller. Note that most of these lines of business contain multiple products or at least multiple generations of product. At the end of this growth phase, we definitely found ourselves facing the challenges of managing a diverse portfolio.

In response to the question then, what are the lessons learned from historical results on these portfolios, I have two observations. The first is that you should always continue to monitor and manage old products even when your staff is heavily involved in the development and implementation of new products. We painfully discovered that experience tends to change if you stop watching it.

A second lesson I can offer you is that we learned to utilize statistical monitoring along with financial reporting as a means to improve product knowledge and thus product management.

My observations on the challenges facing the financial managers in the future include mainly that we need to build effective management information systems for regular product performance evaluation, and we also need to strengthen our communication and coordination between pricing and product development staff, and our financial and investment managers.

How do we meet these challenges? One way I believe is to manage your business and your various product portfolios around the product control cycle. The product control cycle concept is not new and it's not my own. It was described in a 1985 paper by Jeremy Goford, and presented and discussed at a 1987 Society seminar on the product management process. I'm taking time to describe it here because I found it to be a very effective means of building a sense of team work and understanding among the actuarial and financial staff at my company. It starts with basically the end result of a product development process where you have a set of pricing assumptions, a profit study system of some sort, and a set of results that include some measure of profit objective such as profit margin, return on investment, return

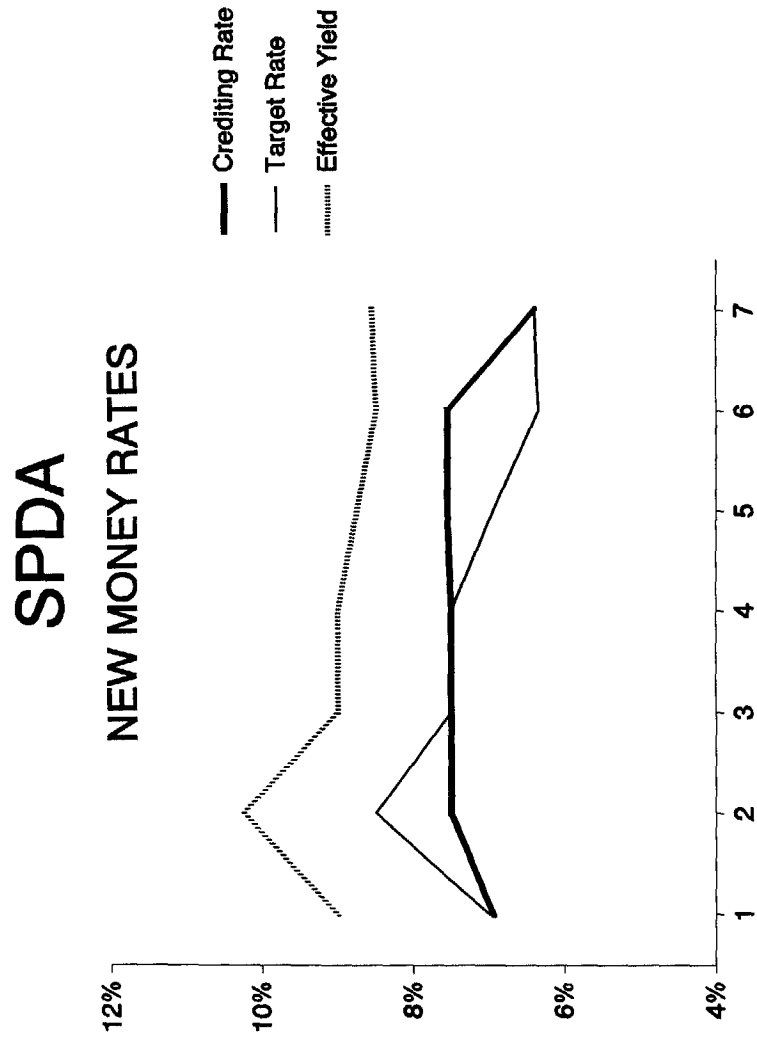
on equity, and I think very importantly an analysis of the sensitivities of your key assumptions in pricing. The profit study feeds a projection model producing pro forma financial projections. These projections provide a basis for interfacing with a budget or planning process wherein the company develops and reconciles a detailed operational plan with the volumes and the allowances built into the pricing of the products. The projection model may also provide sufficient detail to calculate the appraisal values of blocks of business or indeed the entire company. This step is fundamental to the implementation of value added accounting such as Jan described.

The control element really begins with the variance analysis. This is when the results of the financial reporting process are compared with projected results, and the variance analysis is completed to understand the key differences between actual and expected. This leads to a more detailed monitoring or experience studies which then form the basis of an updated set of assumptions that are input to the profit study and the cycle begins again. Note that, at this point, we sometimes have the prerogative of changing our assumptions with respect to nonguaranteed elements, and effectively repricing a block of existing business. One of the things I like best about this model is that it clearly identifies the key areas where actuarial and financial disciplines overlap, and where communication and coordination are critical. These include, of course, the budget process and the financial reporting process, but also the end result of the pricing process which, in my opinion, should take the form of a well-written actuarial report that should be widely distributed to your finance and investment staff.

For the remainder of my presentation, I'm going to focus on the monitoring and variance analysis elements of this cycle. Jan talked about financial monitoring, and I'd like to contrast that with statistical monitoring. Before I do, let me point out that statistical monitoring often takes place before variance analysis, so you could easily change the order of these steps in the cycle. I would define statistical monitoring as the accumulation and review of quantitative management information that has certain common characteristics. First of all it is available more frequently and/or independently of the accounting cycle. It is often based on in-force systems transaction files or inventory files, and most important, it is in some way indicative of key assumption performance relating back to your sensitivity analysis in pricing. Examples of what I'll call traditional statistical monitoring include a number of things. On the sales side, we have submitted an issued policy count, face amount, and premium. For in-force business we have the in-force count, face amount and premium from your insurance exhibit. On the expenses, we often look at actual expense versus budget by cost center, and this takes place sometimes in between the accounting cycle. And for claims, we look at claims paid, submitted and pending by count and amount. These are all things that we've done over the years, but we never did an effective job of integrating them with the financial reporting process until recently.

Examples of the statistical monitoring we implemented for our interest sensitive products include, first and foremost for SPDAs, the interest spread, including the spread available on both new sales and on old or renewal business (Chart 1). An example is shown where we plotted the effective yield available on new investments from the investment area. The target crediting rate is simply the yield minus the spread objective, and we show the actual crediting rate over a period of time. In this representation you might consider the time periods to be weeks, and note that we've got a declining interest rate environment. We enhance this type of information by

CHART 1


SPDA
NEW MONEY RATES
Crediting Rate
Target Rate
Effective Yield
12%
10%
8%
6%
4%
1
2
3
4
5
6
7

comparing it with the actual sales volumes. The effect on the right-hand side where you see the one particular week with the high volume we came to describe as the fire sale effect. The beginning of week No. 6, we announced a rate reduction, and we had a practice of allowing the brokers a week to get in their business based on the contacts that they'd established, and lo and behold, when we announced a rate reduction, we got a huge increase in volume (Chart 2). One of the lessons we learned there was to change our crediting rates more often, and to give the brokers less notice when doing so.

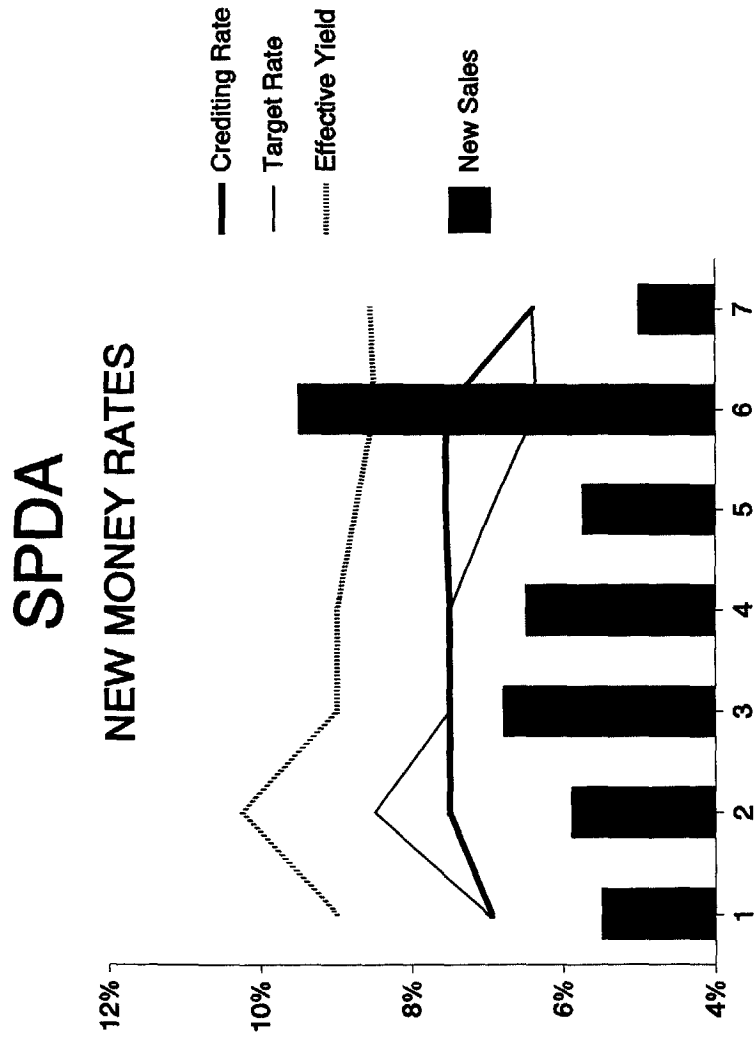
Obviously another key statistic for SPDAs is the surrender and withdrawal experience. You need to look at actual versus expected very closely on these types of products, but another idea is to also, over time, watch your actual SPDA surrender experience in relation to new-money rates. In Chart 3, we can see a simple plot of surrenders in comparison with the five-year Treasury yield. The ultimate lesson to be learned here is a refinement of your interest sensitive lapse function which you used in asset/liability matching analysis.

Finally, for SPDAs, asset quality and duration offers lots of opportunities for statistical monitoring. I'm not going to take much time here to go into the many possibilities. You can talk about take duration and quality and trends and assets. You could spend a whole panel discussion just on that subject, but one that I'll touch on was a source of a painful lesson, and that was when we realized that we had underpriced for the default cost, the C-1 risk. We, in our early experience, found ourselves with very little cost of defaults, but as we accumulated $1, $2, $3 and $4 billion of assets (which by the way at a maximum point we had 8% of our assets in junk bonds or below investment grade, and a good portion of those were downgrades or fallen angels) about two years in, we found ourselves in the position of having significantly under-priced for the default risk, and Chart 4 represents I guess the hope that some day that will turn around. It really has not. With respect to single premium whole life (SPWL), the first point is that it's very similar to the SPDA in terms of the need to monitor spread and withdrawals and asset quality and asset performance. Something else, however, we paid particularly close attention to was our policy loan experience. These products like most in their heyday included very liberal loan provisions, so we watched for over two years the weekly experience of our policy loans, and quickly learned that we had underestimated that by about 25% and made an adjustment in our pricing.

On the other hand, we overestimated the cost of mortality, I suppose because we're dealing with a marketplace that is significantly biased towards high net worth individuals, and these people I think could afford very good health care. As a result, we experienced very favorable select mortality.

To summarize on the subject of statistical monitoring then, the advantages include the speed of the information, the fact that you could get it more often than a line of business earning statement. You could also isolate your key indicators and relate that information again to your sensitivity analysis. This type of information offers a high degree of graphics capability, compatibility, and it enables you to recognize trends I think much more readily than traditional forms of monitoring. The main disadvantage is the possibility of information overload, which Jan also eluded to, or paralysis by analysis. We avoided this by working carefully with our parent company finance staff

CHART 2


SPDA
NEW MONEY RATES
Crediting Rate
Target Rate
Effective Yield
New Sales
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10%
8%
6%
4%
1
2
3
4
5
6
7

CHART 3

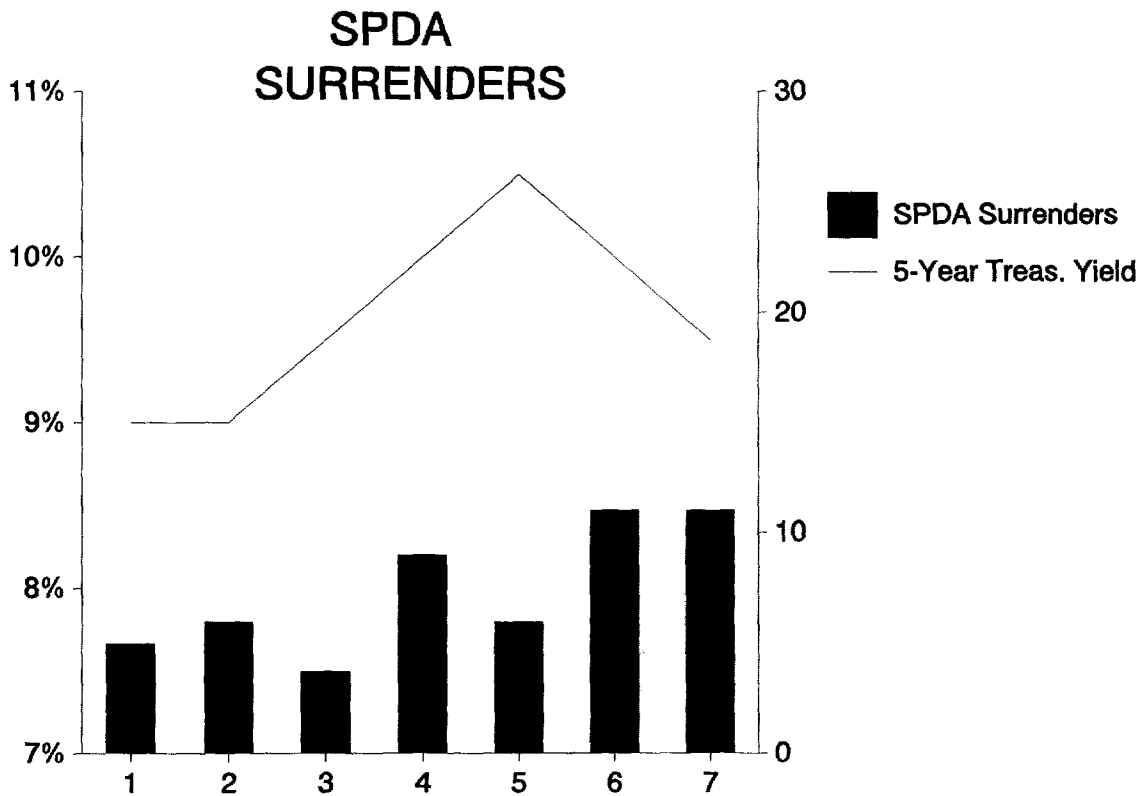
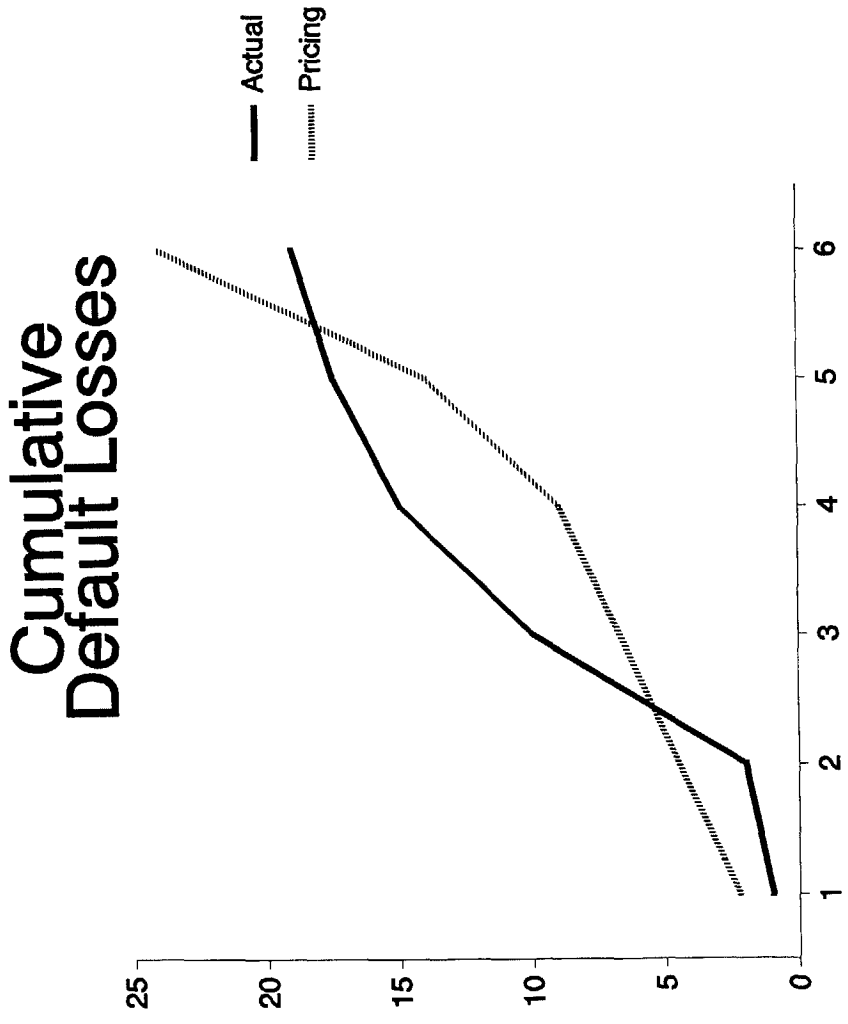

SPDA
SURRENDERS
11%
10%
9%
8%
7%
30
20
10
0
1
2
3
4
5
6
7
SPDA Surrenders
5-Year Treas. Yield

CHART 4


Cumulative
Default Losses
Actual
Pricing
25
20
15
10
5
0
1
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4
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6

to develop an executive level monitoring package that we call the risk report. It included a number of key statistics I've described here, and a significant amount of investment information along with some discussion and analysis. We distributed this information widely on a monthly basis, and it was very well-received. Internally at our company, we constructed and distributed a much more detailed report for our finance and actuarial staff.

The last topic I'd like to discuss is variance analysis. A traditional variance analysis looks something like Table 1 where we show a comparison of an actual versus budget income statement and a difference column that really is the variance in each line item. This is useful when it's done on a line of business basis as it readily identifies the problem areas. It really does not, however, identify and quantify the cause of the variance. That typically takes a little research and work to try to explain each significant variance item to management.

TABLE 1
Traditional Variance Analysis

	Actual	Budget	Variance
Income	X	X	X
Expense	X	X	X
Profit	X	X	X

Another technique that helped us understand and communicate what had happened to our traditional term life insurance business I'll refer to as earnings variance analysis by experience factor (Table 2). And it goes something like this. Here you see a set of actual to pricing ratios for the key experience factors for our term life insurance business over a five-year period. You can see the mortality is generally favorable running in the 90th percentile. The lapse experience however is a key problem running up to 138% of expected and moderating down to 120%. The acquisition and maintenance expenses also look to be a problem running up well over 100% of pricing ratios towards the end of this period. This is a very stable, mature block of business with a limited amount of growth, but the events at our company in terms of increasing overhead, increasing our systems components, and the introduction of universal life in this market, all contributed to the increased expenses.

TABLE 2
Earnings Variance by Experience Factor
Actual/Pricing Ratios

	1	2	3	4	5
Mortality	91%	93%	97%	94%	97%
Lapse	108	120	138	129	120
Acquisition	99	102	110	117	125
Maintenance	104	97	115	120	118
GAAP Profit	101%	93%	63%	67%	68%

As you can probably guess, our profitability was definitely on the decline. We see the ratios of the actual to expected GAAP profits, and they go from 100% essentially down to 63-68%. So we found ourselves dealing with this experience, and trying to explain the problems to and deal with the problems with management.

At a certain point a year or more ago, I was asked to try to summarize a comprehensive analysis of the problems with this business, and quantify the impact of the various deviations, specifically those in the lapse and the expense area. So the analysis that I came up with essentially looks like Table 3. We start with the expected profitability based on our projection model essentially, and we reconcile the differences between our expected profit and our actual profit. Here I've unitized the profit with a base year of expected of $100 just to display the information.

TABLE 3
Earnings Variance by Experience Factor

	1	2	3	4	5
Expected Profit	$100	$101	$103	$106	$110
Mortality	10	8	4	7	4
Lapse	(7)	(1)	(31)	(27)	(20)
Acquisition	0	0	(2)	(4)	(8)
Maintenance	(2)	2	(9)	(11)	(11)
Actual Profit	$101	$94	$65	$71	$75

Many of you have by now probably identified this as a type of sources of profit analysis. I deliberately did not use the term sources of profit because we were able to essentially complete this analysis without doing a full sources of profit type of financial report. We simply took the individual experience ratios and, using a combination of our projection model and our understanding of the relationships in the financials, we constructed the individual variances shown for mortality, lapse, acquisition and maintenance expenses, and really just brought the two sets of numbers together without doing a full blown sources of profit analysis. Management basically found this explanation and format very easy to understand and was appreciative of our efforts.

I'll just mention the additional line items if you're dealing with other than term insurance. Obviously if you have interest sensitive business, you would add perhaps a spread component, and, in our situation with SPDAs and SPWL business, you certainly would consider adding a default loss component in this type of variance analysis.

In conclusion then, my hope is that you've gained some useful information to assist your efforts in meeting the challenges of managing diverse product portfolios.

MR. CRAIG W. REYNOLDS: My presentation is going to be a little bit more specific than those presented by Jan and Craig, and in particular I'm going to focus on universal life as one significant portfolio at many companies, and some of the techniques that can be used for financial management of that portfolio.

Now for many companies, including many of our clients, universal life was essentially the product of the 1980s, definitely the dominant seller and becoming a dominant part of their existing business. Even for those for which that is not true, for almost all companies it's a significant portion of their in-force business. So to the extent that we can develop some techniques for effectively managing universal life, I think it's going to be an important thing to be able to do.

Along the way, we're going to attempt to answer some of the questions that were outlined in the description of this talk as they relate to universal life, and we can look at these three questions and get a quick answer right away. What are the lessons learned from historical results on the portfolio? Potentially there's a lot of information of this sort that Craig was able to present there, but for many companies, because of a dearth of information related to universal life, they're not getting access to that information or those lessons. What is the state of management information for appropriate market or product segments? Well, we found that for universal life, again the state of management information tends to be pretty poor. And as far as what financial managers should be doing, I'm going to be outlining some things that managers can be doing to improve their management information as it relates to universal life.

There are a lot of problems with the financial management of universal life, but one of the most significant problems is that it is not really one product. Because of the flexibility that is inherent in the product as it relates to face amount and premium and anything like that, it's really a multitude of products, and some of the sample forms that the product can take are ART, level term, whole life, SPWL (there are obviously a multitude of variations that could actually be taken on that), or we can get decreasing and increasing face amounts, and so on and so forth like that. So managing a universal life portfolio really is like managing a portfolio of different combinations of traditional business in many ways. Unfortunately, many companies have tended to treat it as just one line of business or one product, and as such I think they're seeing some difficulties in managing that line of business. Furthermore, we found that universal life was essentially a new product in the 1970s and 1980s. Few administrative systems were set up to handle it initially, and many or most companies purchased additional software or developed additional software in-house for managing their universal life business, developing illustrations, doing policy month anniversary processing, etc.

As a consequence of that initial administrative lack of support, we found that, in general, universal life is not well-integrated into the company's experience analysis system for analyzing things like mortality and lapse experience. And furthermore, there are new questions that have to be asked like premium persistency, rates of face amount changes, decreases, increases, partial surrenders, etc., that never even had to be asked before so that, even if you did have universal life integrated into your old system, that information would not have been available.

I've outlined three phases of financial management. Now from Jan and Craig's presentation, you actually saw that there are many more phases than three in financial management, and essentially we could look at this and a better title might perhaps be three phases of financial measurement. What we can look at is analysis of past experiences being kind of the crux of what drives the financial management or

measurement of your portfolio. Unfortunately, because of poor information, many companies can't get beyond the first step. And that's unfortunate because the next two steps are what really give you the meaningful results. They are projection of future experience based on the results that you're currently achieving, together with the final step, which few, if any, companies are doing, which would involve maintaining a record by plan and issue-year basis of actually what results you've gotten historically over the years. Then you must put that together with future projections of earnings, to be able to say to management, well, we've priced this product for a 15% return on equity or what have you, and here's what we're actually achieving on this block of business, and what we expect to achieve on this block of business over its life. It's very easy sometimes to say, well, our expenses are showing 110% of expected, or our lapses are 95% of expected, but it's very hard for management in most cases to obtain a reasonable idea, okay, does that matter, does that mean our ROE has dropped from 15-14.5%, or has it dropped from 15-6? I think that this is a very important question that has to be answered to be able to effectively manage your existing business in terms of setting credited rate strategies, but also in terms of pricing future products.

Now experience analysis, which is largely what I'm going to focus on, is particularly difficult for universal life for the reasons that I was outlining earlier that it really is a blend of different products together. Financial projections are often based on results, for what we can call for purposes of discussion here, Mr. Average. When we're doing financial projections or developing GAAP factors, or what have you, it would not be uncommon for a given plan and issue age risk class to speculate that essentially everybody has an average face amount, an average billed premium, average premium persistency, and average lapse rates.

As we talked about earlier though, that doesn't work very well. The people who are going to have term insurance type coverages, the annual renewable term, the people who are paying just barely enough to keep their policy in force, are going to tend to have a very different experience with lapse rates than are the people who make large pour in premiums and work from there. We've done some work at M&R to try to analyze this and see what kind of experience you can reasonably expect for those different types of coverages, and how to isolate out and analyze your in-force business and say which ones are likely to achieve which type of experience.

Furthermore, we found that by pursuing this Mr. Average approach, we assume that everybody is average, we think that, in the short term, that will tend to produce fairly reasonable results, and that your model results will tend to closely match your projected or your actual results. Over the long term, we think the problem is going to get much worse for reasons that I'll explain. The only way that we have seen that it tends to show up in the short term, assuming that you have a reasonably defined model based on this Mr. Average, relates to surrender charge income. We find that the model surrender charge income tends to overstate fairly significantly the actual surrender charge income that is received.

Essentially, we find that a fairly reasonable alternative for managing company's portfolio is to split the business up. We've developed a technique where we can take two successive in-force files of a company similar to what might be generated at a year-end processing. We split the business up into three strata or sample groups

essentially for each plan, issue age, and duration in force, and we compute an average account value per unit for that block of in-force business. Then for each individual policy within that cell, we can split the policies up into three groups: those whose account values are somewhere near the average, and this case I've assumed between 50% and 150% as the middle group, those which are significantly below, in this case 50% of average or less, and those which are significantly above. And just for purposes of discussion, we can tentatively assume that the people who are in the low account value range are those who are purchasing term-type coverage. They're keeping their account value low, paying just enough premium to keep in force. The people in the higher range have the investment-oriented products, the single premium life or the endowment-type products, and those in the middle might be purchasing something oriented towards whole life insurance coverage.

Now once this is done and we split up the business like this using the in-force file, we find that there are a lot of interesting things that you can look at for the individual experience by account value range. One of the things that is helpful to measure and develop some meaningful assumptions for is policy surrender rates, and again this is by account value range so we can look at lapse rates for the low account value people versus the high account value people. We might expect that the low account value people would experience lapse rates that are somewhat akin to the rates you might see with term insurance, whereas the high account value lapse rates would be somewhat lower. We'll see if that's true at least in the samples we've looked at.

Similarly, we can measure billed premium in relation to target premium and premium collection in relation to billed premium, which is essentially a measure of your premium persistency. A pattern of face amount changes, in that most universal life allows face amount increases and decreases, and furthermore there's another quantity we can measure, which is that portion of the business with account values that are declining with time. Now that's particularly important for universal life in that, for all intents and purposes, a policy surrender may occur before the policy actually goes off the books. Once the business starts showing declining account values, essentially what we're seeing is a lapse to extended term insurance, which an ordinary experience analysis system would show as a lapse, but most universal life insurance experience systems that exist now probably would not identify as such.

Now we've applied these techniques for a client of ours which is fairly large writer of universal life, although it doesn't have a lot of years of experience in the business so we can't extend this out as far as we might, but it still has some fairly interesting numbers. Overall our client is experiencing fairly good lapse performance for a UL product, 12% in the first year, 9% in year two. I think many companies would probably be happy with that. But the more significant numbers occur when you break the lapse rates down by account value range. The low account value business is experiencing high lapse rates relative to the average lapse rates like you might expect with term insurance although they're still relatively favorable. The high account value business on the other hand is experiencing lapse rates that would probably be the envy of almost all companies at 3%. Now one of the reasons that this is particularly important to know is that if you were pricing this product or developing assumptions for purposes of GAAP and SFAS 97 or what have you, you would probably in most cases be looking at the overall lapse rates and saying, well, 12% in year one, 9% in year two and apply some actuarial gut instinct and say, well,

we might project those numbers will grade down over a few years to an ultimate level lapse rate of say 7%, some people might say 5%, some say 8%, but somewhere in that range.

However, if you do this separately by stratum, you might say that the low account value might be heading towards an ultimate lapse rate of 10-12%, and the medium and high account on the order of 3%. Over time, in the initial few years, if you use the overall assumptions, you're going to get pretty good results at actually matching what your lapse rate performance is. But as we project further out, what we'll see is that the low account value business is going to go away much faster than the high and medium account value business, so that, whereas now the average is being pulled up by the large portion of business which is in the low account value range, the ultimate lapse rate that you might see might actually be a lot closer to 4% or 5% than the 7% or 8% that you might otherwise have predicted. Now that's a difference of only a few percentage points and might not be very significant in this case, but in a case of a company that was experiencing higher lapse rates, we might see a much greater difference in the lapse rate that we might expect. To the extent that we can more accurately predict what the future lapse rate assumption is, we're going to get a more accurate projection of earnings, and perhaps more important from the convenience point of view, we might reduce our odds of having to do any unlocking of assumptions related to SFAS 97.

We can also measure quantities like premium lapse rate or premium suspension. Here we don't see any blatant surprises in that the high account value business is stopping its premium payments at a rate that is somewhat higher than the low account value business, but not too dramatically so. There are a lot of possible reasons for that, but I speculate the main reason the high account value business is lapsing faster in terms of premium persistency is that it essentially is paying premiums that are more discretionary than the low account value. The low account values have to continue paying premiums to keep their policies in force for very long.

We can also measure billed premium in relation to account value, and we see again that the high account value business is higher. Not entirely surprising, high premiums mean high account values, but it is encouraging in one respect. We had speculated initially that the high account value business might be almost entirely business with large pour-in premiums. However, there's more to it than that, the ongoing premium is also a fair amount larger.

The distribution of business by account value range, in this case over half the business, has account values that are less than 50% of the average. That, to a certain extent indicates a great deal of vulnerability in that, if premium persistency drops off very rapidly, we're going to see a high degree of future lapse rates. I think that's something important to know. It also shows why the overall lapse rates tended to be high and close to what the low account value business was seeing. However over time, we're going to see a shift of business when the group of low account value policies will go away faster. Then we might end up with a more equitable distribution between those three strata.

What I've done here is essentially assumed, taking not this company's product but just a plausible, made up universal life sort of product, and said what effect does this

really have on plan profitability? I've done a profit study two ways. First, I do it in the original, fairly primitive single cell approach, where I take a 35-year-old male, nonsmoker, and use the assumptions that you might derive from that data based on a Mr. Average. Then I derive the profit margin and an ROI for that product on an after-tax and after deferred acquisition cost (DAC) tax basis. Then in the second case, we do the same thing but instead derive three separate profit studies for the low, medium and high account value ranges, and then composite those together based on the year one distribution of business. And we see that by doing that in this case, we end up with a fair amount higher profitability, and the ROI is not particularly significant but it's meaningful. In the profit margin, we're seeing almost a 50% increase in profitability. That's a nice thing to know, and I think it's significant. But we're not confident that will always occur with all companies. Essentially it's going to depend on how profit sensitive your product is to premium level.

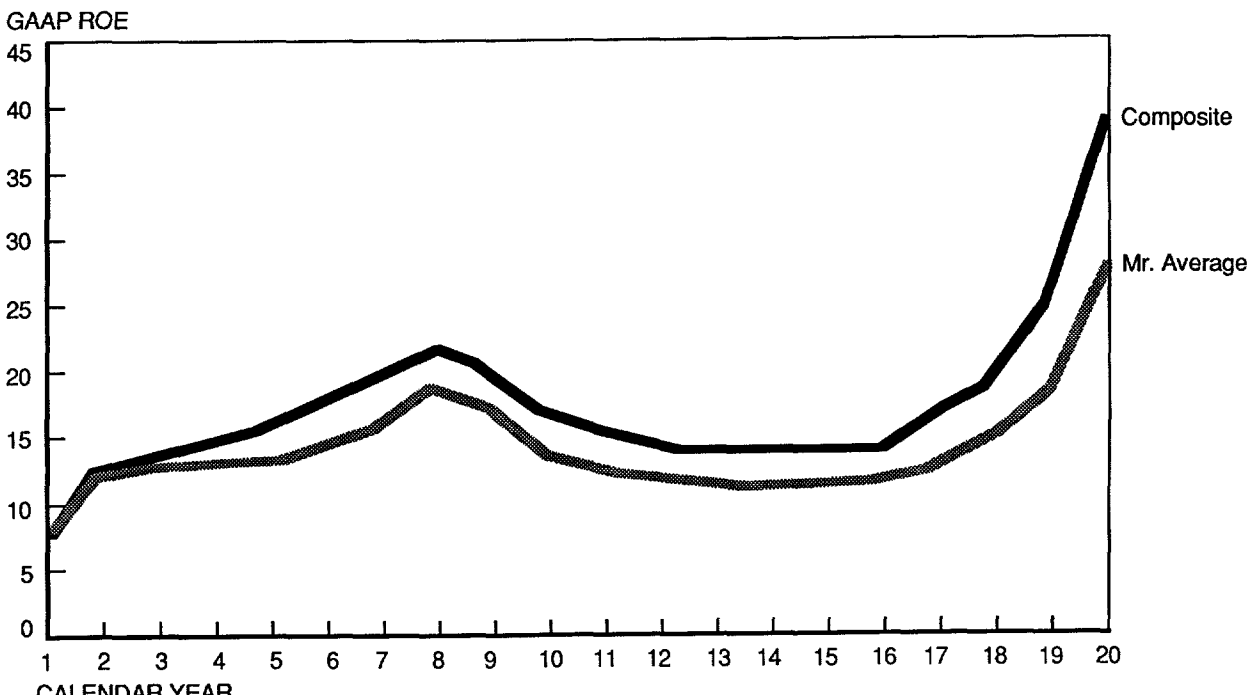
If you have a product where the high premium level is particularly unprofitable, which can occur if you have very high commission rates, we may not see this same sort of result. Similarly, it can depend on the extent to which your product is lapse-supported by high surrender charges. If that's the case, then we may also see a reverse. But our instinct is that in general by pursuing a Mr. Average based approach, we're probably understating plan profitability.

We can look at this in a little bit more detail. Chart 5 is showing projected GAAP ROE on the two different bases. The bottom line shows the emerging profit or GAAP ROE that we might project for this line of business if we derive assumptions based on the averages for the block of business. The top line, the one that is labeled composite shows what we would project if we developed assumptions separately for the three strata and then projected them forward. What you see is in the first few years, they essentially produced identical results, and that's because we've derived data for the average that actually reflects the average. Composite the three strata together and you get the average.

Where you start to see some more significant deviations is in the projections going forward as the average lapse rates start to differ from what you might project for the three strata composited together. While the earnings in the early years, as measured by ROE, tend to look fairly similar, the actual by line and by source profits will tend to look somewhat different, and one of the ways that will show up is in terms of surrender charges. That's where we first started noticing this problem in that for a typical back-loaded UL product, the surrender charge income is not fully realized in most cases in the early durations in that the cash surrender value is often not positive for several years because the surrender charge is greater than the account value. When you do a model based on a projection of an average scenario, you may start to see a positive cash value in year three or year five or year four, somewhere in there, and that's the year where you first start to see full realization of surrender charges. In reality though, most of your surrenders are coming from the business that is in the low account value range both because it has higher lapse rates and because most of the business is in the low account value range. The low account value business may not have positive cash values for many years out, if ever, depending on the nature of the surrender charges. Consequently, when that business lapses, you don't see full realization of surrender charges.

CHART 5

COMPARISON OF GAAP AFTER TAX ROE



This is essentially our explanation that we've seen or that we've adopted for what we're seeing in many cases for a typical actual to expected comparison by source of revenue or profit from many different companies.

Now we think this technique has a lot of promise for management of a UL portfolio. A couple of ways that it could be used that we haven't done yet but show some promise are, first, it might be more helpful to deal with a company that had a larger block or more long-term block of universal life business in force, so we can actually see on a year-by-year basis how the experience develops to compare it to what we might project using this technique. Second, we could do something relevant I think for cash-flow testing as companies start to do that for the upcoming standards, and essentially that is, in the development of assumptions, in particular as they regard disintermediation lapse rates, many people have often speculated that the high account value business is going to tend to represent the smart money; the people who have a lot of money to invest are going to be the more sophisticated investors. As such when we start to see a notable difference between market and credited rates and it becomes to people's advantage to leave, we would certainly expect if the hypothesis is true that the high account value business would experience higher lapse rates. What we saw here was that the high account value business had a much lower lapse rate, and, in that case, it's probably because the business is in the early durations with large surrender charges. Interest rates are relatively level, so the smart thing to do is to keep your policy in force. I think it would be helpful to examine a study like this over a period in which interest rates are changing relatively rapidly, and see if the assumptions really do reverse or the results reverse, and we start seeing high lapses for the high account value business. To the extent that that's true, I think it's going to be a critical influence on the results that you're going to get in any sort of a cash-flow testing approach.

MR. ROGER EUGENE FROST: My question's for Mr. Reynolds. When you're tracking persistency by the different categories of UL, below average, the whole life and the high cash value accounts, how did you account for the possibility that products might move from one group to another? Were they locked into one group at one point, or if not, how did you account for the movement between groups?

MR. REYNOLDS: Essentially we're dealing with two separate in-force files. One in this case that's December 31, 1989, and one is a December 31, 1990. Our in-force file is structured in such a way that we have policies separately identified by policy number. What we do then is break up the business of a December 31, 1989 on a separate stratum, and then essentially it's just a matter of okay, within each stratum, look at the policy number's that in there and check to see if it's anywhere in the December 31, 1990 file regardless of which stratum it's in. If it's there, it's not a lapse. If it is, it's actually a combination of lapse and mortality that's driving the policies out. The first approximation will consider them to be lapses. Over the long term, what we're really going to be seeing is the average account value will actually shift, and we'll still be continuing lapse rates directly to all that we'll be counting. But some people are going to shift from the low account to the medium account to the high account or back and forth depending on the actual pattern. It's going to be kind of interesting, I think what will really evolve is some sort of a triangle of lapse rates by duration and issue year. We're going to need some experience with a company that has a few more years of experience before that starts to be meaningful.

MR. POLLNOW: I just had one comment and a question. Craig Likkel's presentation talked about a fire sale, and just made me think of one of the things you really want to look at when you're pricing. Some people say the actuary shouldn't do the pricing, the salesman should. What you really want to look at is what you might think of as marginal pricing where you have to decide what kind of volume you can sell at various levels of interest credited rates or various prices. You may find it is more profitable by lowering or actually crediting higher interest rates taking a lower margin, but having a larger production. My question is to Craig also. You talked about variances which really weren't sources, and it seemed pretty straightforward I guess for expenses and mortality, but what about lapses? How did you measure the impact of the lapses?

MR. LIKKEL: Essentially on the example I discussed, it was predominantly term insurance, and the lapse factors directly influence the bottom line based on the increased amortization of deferred acquisition costs. So we basically obtained from our three strata model, a relationship between an increased lapse rate of 10% say, and an increase direct cost of amortization. I did this on a spreadsheet and computed that aspect of the increase in lapse cost, and combined that with the loss of the marginal profitability on the premium that was no longer collected as a result of the higher lapses over that period of time. So those two things were calculated on a spreadsheet and then aggregated on the display showing the lapse cost.

FROM THE FLOOR: I was curious about the management control system that you were describing. It sounds like a very effective tool.

MR. LIKKEL: It was definitely a mix. I think when we found ourselves with expense problems, we basically attempted to put forth our best effort to control expenses, and this was often either a result of persistency being less than expected or sales volume not meeting our annual plan objectives. With respect to some of the other factors such as policy loans on SPWL, I mentioned mortality, some of the other elements, we definitely changed our pricing model and made a decision to change our spread objective. I'll use hypothetical numbers; we went from a spread objective of 250 basis points and found ourselves with some analysis that told us that to achieve the same average ROE objection we would have to increase the spread objective by say 25 basis points. We made a management decision to change that objective from 250-275 basis points, and implemented that decision over time. In other words, we did not, on any particular renewal date, simply bump somebody's rate by a full 25 basis points. We, in effect, documented for the record our principles of the management of nonguaranteed elements in our products, and we basically described it as a process of grading into a new spread objective over time. Basically we felt a three-to-five year period was sufficient when you're dealing with an annual renewal of a declared rate. It's a sufficient period to grade into a different objective.

MR. BUCK: Any more questions? I have one very detailed question for Craig Reynolds. One of the areas that you were measuring were increases and decreases in face amounts on universal life. Are you seeing much of that in practice? I haven't in the consulting I have done.

MR. REYNOLDS: In this particular company since the business was fairly young, there definitely was not much. Three percent of the base amount was the average increase, so it is definitely not very material at this point.