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## FINANCIAL INTEGRATION OF THE PRICING PROCESS

Moderator: WILLIAM R. BRITTON, JR.

Panelists: ROBERT S. MCCLESTER  
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Recorder: WILLIAM R. BRITTON, JR.

- o Involving financial and investment areas in the pricing process
- o Developing consistency between financial reporting and pricing goals
- o Asset/liability management versus asset/liability matching
- o Tracking systems and repricing

MR. WILLIAM R. BRITTON, JR.: Much has been written about the rapidity of product change during the 1980s. In fact, the 1980s will probably be known as the "Decade of Product Revolution." Largely as a result of the new unbundled products, we saw more structural change in our industry during the 1980s than perhaps any other decade in our working lifetimes.

As fallout from this product revolution, we have seen considerable stress placed on the product development process, as product life cycles have begun being measured in months rather than years, and companies have come under increasing pressure to make pricing adjustments on in-force business. We have also seen large scale replacement of companies' in-force portfolios, where existing traditional products were replaced, either internally or externally, by the new unbundled products. The new products also fostered the emergence and rapid growth into dominant players of a new breed of companies, some of which didn't even exist at the beginning of the decade. The marketing and operating strategies of these new players have caused the rules of the game to be rewritten, sometimes for better, sometimes for worse. We have also seen the bright new profit future seemingly promised by the new products turn into a bleak landscape of unmet profit expectations, as both the statutory and reported profits have been disappointing. Real profits have declined from original expectations because investment margins haven't been met, renewal premiums haven't been paid as predicted, and the expenses of selling and administering these products were higher than we thought. The reported profits, at least for stock companies, have changed because of the changes in the definition of GAAP earnings.

All of these forces have irrevocably changed the keys to success for companies in the 1990s. For a company to be successful today, it is clear that a superior investment result will be needed. First, this will mandate more investment expertise and more integration of the investment function into the manufacturing process than most companies have done to date.

Second, it is likely that we will see a shift in management emphasis from the selling of new business to the management of in-force business. For many companies, the profit payoff from better management of an in-force block of assets and liabilities will be

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higher than an investment of resources into the diminishing returns available from new business.

Finally, the successful company of the 1990s will achieve its results by superior execution of the fundamentals. This will not be through the exciting stuff of product innovation or new market exploration. Rather, it will come through the mundane process of focusing attention, defining clear goals, developing the systems to measure and monitor progress against those goals, and then going about the business of achieving what you set out to do. That's not exactly a blueprint for excitement, but I believe it is a formula for success.

Rich Sega of Phoenix Mutual will look at the role the investment operation will play in achieving the results and establishing the linkages with the manufacturing operation.

Scott McClester of the Prudential will describe his company's process for managing its interest-sensitive products, and Phil Polkinghorn of Tillinghast will discuss ways of resolving the inherent conflicts between a statutory pricing system and GAAP reporting systems.

We will begin with our first panelist Mr. Sega. Mr. Sega is a vice president and corporate portfolio manager in the investment department at Phoenix Mutual. His responsibilities include asset allocation, derivative products and hedging strategies, asset-backed securities, structured portfolios, investment information systems and asset/liability management in the insurance accounts. Before joining Phoenix, he held several positions as pension actuary, portfolio manager and options future trader at the Travelers.

**MR. RICHARD L. SEGA:** About six or seven years ago, quest games became very popular. These quest games usually involve the control of a character through a mythical landscape on a quest for treasure or to save maidens in distress. The attribute panel from my personal favorite of these games asks you to select your attributes for your character. You can select any way you want so long as the total adds to a hundred. There are a number of different attributes that can be beneficial in certain situations. If you allocate all your points to, say, intelligence or intellect, you can outsmart a lot of people, but if you meet a fire-breathing dragon, you'll be burned to a crisp. If you allocate a lot to strength, then you can probably fend off the dragon, but you'll be too dumb to interpret messages from elves. What you have to do is strike a balance among the attributes that give you the right tools to face the kinds of risks you're likely to meet. Of course, you don't know exactly what those risks will be. If you're searching for relevance here, I think that the task of asset allocation is analogous to the task of filling out this attribute panel before you embark on your quest. The asset allocation function prepares you with a distribution of assets of different types, with different characteristics, that perform well or poorly in different kinds of environments. Since we don't know what kind of environment we will face, it's nice to have a tool kit that will prepare us to address almost anything that comes up in the context of what we need.

What we need, I think, is to build surplus and defend surplus against various risks. The risks of decline in assets (C-1), increase in liabilities (C-2), and decrease in surplus due to interest rate changes (C-3) are the ones over which pricing actuaries and portfolio

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managers have at least some direct control and influence. The asset allocation decision gives us tools to address these kinds of risks, and we'll see how we can do that. The pricing actuary and the investment manager need to know what the company is thinking regarding these issues. My personal viewpoint is from the investment side. So I'm most interested in the portfolio management aspects of product design and pricing. Portfolio management can be described as techniques that fall somewhere along the continuum between what is commonly called passive to active. While many think that turnover volume or the number of trades is the hallmark for passivity or activity, that's not really true. When we talk about passive portfolio management, what we really mean is portfolio management techniques that don't take a position and essentially have low expectational input. These techniques are used, for example, when you diversify across asset classes, and you have an asset allocation very much like (1) allocating 10 to each of those 10 categories, a fairly average kind of deployment of resources and a fairly average kind of result; (2) diversifying within asset classes, that is, within bonds, or stocks or real estate, having a wide diversity of instruments without taking a position on one value versus another; (3) indexing to the market if you are a stock manager or, (4) in the particularly interesting case of liability-driven portfolios, indexing to the particular product and liabilities that you have in the portfolio. A cash-matched portfolio may require a lot of trades to continually rebalance and get cash exactly when you need it in a portfolio. Turnover volume might be quite high, but it is not necessarily what you would call, in this context, an active strategy.

Active strategies are those that have high expectational inputs. You expect something to happen, and you act on it in the portfolio. Examples are:

1. Selection between asset classes, i.e., saying that over the next horizon one asset class will perform better than another, and you're willing to stake at least part of the company's surplus on that bet.
2. Selection of individual issues, i.e., where you have an allocation to bonds, and you pick one bond over another.
3. Selection of specific exposures to markets, e.g., to interest rates in particular, the mismatch question which we'll talk about a little bit later.

An active strategy may not involve much trading at all. If you put your whole portfolio in 30-year bonds on the bet that interest rates are going down, and each day you just maintain that position, that's very much an active strategy. That's going out on quite a limb, although it may involve no trading for quite a while. What we need to do, therefore, is come to terms with what our company needs and wants in terms of portfolio management and where on this continuum we need to be. Both the pricing actuary and the investment manager have an interest in this. How do we determine where we need to be?

The first question that investment people would like to know is, what does the corporation want from us? The corporation wants competitive returns to price products competitively. What is a successful result for your company and for your line of business? Is it ROE? Sales growth? Yield? How is the pricing actuary looking at the

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input from the investment department? Historically, I imagine the primary criterion was acquisition yield. What do assets yield when you buy them? How does that translate into a dollar price for a product or a guarantee in terms of an interest-rate-driven product? How does that particular interest rate look compared to the market? How will it affect sales? And, ultimately, what kind of profit stream will result?

The corporation also needs to articulate to the investment manager the kinds of risks it is willing to take in pursuit of these returns. How do you articulate what that risk is? Is it a particular size of maximum loss that can be tolerated by the firm in a particular measurement period? How about earnings volatility? Do we like to keep a nice, steady stream of earnings or do we like a certain average level of earnings but are willing to bounce around a bit? What level of earnings do we need to report?

Other things that have become popular in terms of measurement of risks include ratios, such as surplus to assets, problem loans to surplus, and factors that Moody's and Standard & Poor's might look at in terms of establishing a claims-paying rating that feeds back into the sales process. Some people may be basing their judgments on probabilities of ruin or probabilities of certain loss sizes. In any case, some set of critical factors must be defined so that the investment people can manage them.

Another question is liquidity. How much cash needs to be around and when? Do we cast that in terms of minimum liquidity pools, or a maximum short-term borrowing position? However specified, it needs to be clearly articulated and, in turn, must be understood by the pricing people. What does that mean with respect to the strategy that the investment people will pursue? What kinds of cash will be available at what times from this portfolio in support of the liabilities?

What can investment people do in response to this articulation of requirements?

Investment people can provide exposures to some of these risks and, we hope, commensurate returns with the exposure to risk. We can take market risk. We can take credit risk, i.e., we can buy risky bonds, Baa/BBB bonds (at the lowest investment grade level), junk bonds, or commercial mortgages. We can allocate funds to assets appearing on Schedule BA that are typically equity in nature, like oil and gas partnerships or common stock. We can buy high-grade bonds, with cash flows that are well-determined and have high probabilities of occurring as planned. We can take interest rate exposure or C-3 risk. We can mismatch. We can take liquidity risk. By buying illiquid instruments, you typically get more yield since liquidity is something valuable in the marketplace, and people pay for it. If you don't want to pay for it, you can get a little more yield. We can pin ourselves somewhere along the line of taking active or passive strategies.

I believe that you cannot price products assuming that you'll beat the market. We talk a lot about superior returns and superior performance, but we and our competitors are trading in the same capital markets. We have the same kinds of opportunities available to us. Over the long run, our returns will converge.

We can add value in certain ways. One of the ways we can add value is by our asset allocation decisions, which I believe are the most important decisions investment people make. By trading, making relative value judgments, or swapping one bond for another,

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you can add fractions of points to a portfolio. By selecting specific issues, or certain kinds of credit categories, or picking among instruments within an asset class, you can have impact of whole points, maybe several points, on a portfolio in terms of present value over a long period of time. The asset allocation decision, for example, allocating between fixed income and equity or different kinds of equity, could have significant impact, tens of points in present value over a five- or a ten-year measurement horizon. Those kinds of differences in return are important to the result that the pricing actuary will see, as are the attached risks. I believe that constant communication on these points is needed during the process, so that the investment manager will know how to deploy funds.

Two levels need to be decided. First are high level, strategic considerations. One of the most difficult things that we found is to articulate the utility function of the firm. What is the risk reward trade-off? Even if you know what the standard deviation and expected return is of a particular kind of asset, and you know the same thing for another kind of asset, how do you choose between the two? What kinds of results are acceptable to the firm? One thing that helps give clues is to build models that simulate various future environments (economic environments, interest rates, behaviors of certain assets) and calculate critical results, such as return on equity. By looking at the profit distribution that your product, together with a particular investment strategy, develops over the different scenarios, you can get an idea of your return pattern and the likelihood of good and bad returns. You can make adjustments to the portfolio strategies to alter that distribution in order to give the firm and the investment manager an idea of what's acceptable and what isn't. I think the responsibility ultimately for that kind of choice lies with the product manager. Investment managers generally don't really care what the specification is so long as they understand it and can manage it.

Surplus constraints and management comfort are important in specifying these kinds of details. Even if a strategy sometimes makes economic sense and meets all the guidelines, top management isn't comfortable with certain kinds of strategies for historical reasons or because of what it reads in the newspaper.

Once strategies are set, tactical decisions have to be made like day-to-day kinds of decisions on cash flows. If we get cash in today, what do we do with it? Where are we going over the course of the quarter? Six months? A year? These assumptions and projections must be coordinated between the investment portfolio manager and the product manager.

Let me give you examples of the kinds of frequencies that we see when we manage our products. Starting with the most active and what I would call a hot product, GICs, contact between the portfolio manager and the product manager is at least daily, sometimes more than once a day, in terms of what kinds of sales are being made, where interest rates are, and what kinds of guarantees can be developed from those interest rates. A product that's still warm, maybe not quite as hot as GICs, is single premium deferred annuities (SPDAs). Contact with respect to this product is typically biweekly. It could be more often, but rates are set biweekly because of the distribution mechanism. Rates need to be published in certain brochures, distributed to our distribution network, and then sent out to the clients. The rates can't be too stale, so we reserve the right to

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change them if we have big runs in the market. But two weeks seems to be the period where we can get all the numbers settled in and distributed and give people enough time to make a decision on the product.

Contact is somewhat less frequent in slower kinds of markets, like individual products. For individual products, the portfolio managers review cash-flow projections monthly, lay out what they expect to do with the money when it comes in, look at the resulting portfolio after money is spent, look at earnings rates, and feed the information back to the actuaries, who take it from there. The participating nature of the individual line means that there's less of a target in terms of cash flows as there might be in GICs or SPDAs, and it's less critical to time the receipt of cash in the investment to the markets.

The Group line is what I would call cold from an investment standpoint. There is almost never much contact. Since the Group line has a combined ratio of somewhere between 90 and 105 or so, there's not much cash left around for long-term investment, and the investment performance of the funds in that line has a very small impact on results.

What kinds of people are we talking about who are making these kinds of contacts? Investment officers who run portfolios and make trading decisions, right up to the Vice President level, are involved in these kinds of daily discussions with the actuaries in the pricing lines. While it is not yet perfected, we're working on it. I tend not to like formalized meetings, where everyone feels obligated to attend. I like to have contact when it seems to be necessary, i.e., when there's a move in the market or when there's a quote arriving in the shop that needs to be addressed. That seems to work better. People are more enthusiastic about talking and that leads to the array of frequencies of the different products that we have.

With respect to performance measurement, it's critical that we validate the choices of strategies and tactics that we've made through a feedback mechanism. At Phoenix, we're working on that now. It's very important that both sides participate so that not only do we pay people to do the right thing, but also we get the results that the corporation really wants. It's a big effort, and we're in the middle of it now.

Asset/liability matching and mismatching is the second topic that I will address. I'll tell a very brief story as an introduction. My daughter is 10-years-old. A couple of years ago she started to read pretty well. She likes to read just about anything she gets her hands on, and would go through my briefcase to read things, not that the material meant anything to her, but she was proud that she could pronounce the words. One day she asked what asset/liability matching meant. Not wanting to get into a discussion, since I talk about it enough at work, I said that assets are all the stuff where people owe me money, and liabilities are all the stuff where I owe somebody else money, and I just try to keep the two lined up. She thought for a second or two, and she said, "Hey, Daddy, why don't you tell all those people that owe you money to just pay those people that you owe, and you can come home early tomorrow." I thought to myself, if I could just teach her to take a quarter point out of the middle of that, she could get a job at Solomon Brothers, and I could retire. Wouldn't it be nice if everyone had as pristine and clear a picture of what asset/liability matching means?

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Before we talk about mismatched strategies, we need to have a clear idea of what it means to be matched. Do we mean that the cash flows from the liabilities and the assets are exactly or even closely matched? Probably not. While that's certainly appealing from the risk management perspective, cash-flow matching is not a practical approach in most cases for managing insurance portfolios. It has high initial cost and it is inflexible, which usually means that products priced off such a strategy won't be competitive in the marketplace. For a small line or for a closed book of business, it might be a good way to value liabilities and conserve risk-taking capacity for other lines and more promising ventures, but I don't think that cash-flow matching is what we mean when we say assets and liabilities are well-matched.

Maybe we mean duration matching. I think this is closer to what most people mean when they say matched, that is, that the price sensitivity of assets and liabilities are pretty close, but we all know that academic and empirical studies show that duration matching offsets about 70% of the risk of interest rate changes. Yield curve inversions and flattenings cause problems with simple duration matching. We probably want something else, maybe convexity matching, to help us through the strange kinds of things that disturb the parallel yield curve shift theories.

Liquidity management is another consideration. Mathematics says that duration and convexity-matched portfolios ought to be able to provide for all the liability cash flows that are necessary, but locally weak markets and wide bid-offer spreads can cut into profit margins even in tightly run first and second order matched portfolios. Specifying the cash flows is more difficult for some lines of business than others. It's relatively easy for a product line like GICs, but difficult for, say, structured settlements or product liability. I'm continually told it's almost impossible for participating life insurance.

It's important to keep in mind what we mean by liquidity. When most people talk about liquidity, they really mean marketability. Marketability is being able to get out of a position; liquidity is the ability to get out near par. The fact that a market trades well enough and that it is liquid enough that a market maker does not need a large bid-offer spread to cover his risk (like the long-term Treasury market) doesn't mean that you can get out near your cost and prevent a loss in the portfolio. Liquidity and marketability are, therefore, different things, and the distinction is not lost on investment portfolio managers.

In any case, cash flow, duration and convexity matching are all different ways to look at how assets and liabilities are matched. Even at the point where you're only duration matched, a valuation actuary might opine that the portfolio is well-matched.

Even once you get there, are you matched anyway? You still need to consider things like defaults and calls, since there just is not enough noncallable product to adequately invest a portfolio in all noncallable bonds. Also, liabilities change. Even GICs with market value escape clauses have discontinuances, and portfolios have to be disrupted to meet them. Reinvestment risk is another source of variability in the portfolio.

To give you an idea of what these choices are worth, I took my GIC portfolio, which is about a billion dollars at the Phoenix, and looked at it under several different portfolio

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structures, as shown in Chart 1. The universe of bonds used to do this study were medium to high quality corporate bonds, with no commercial loans. The base is a fully-matched, cash-matched, portfolio that is called 100.

Chart 1

### Effects of Gradual Mismatching

Cash Match	100
Horizon Match	97
Immunization (with convexity)	95
Immunization (no constraint)	92

If we just immunized without convexity constraints and the cost is 92, that corresponds to the duration matching in the previous discussion. Thus, you could save 8% in acquisition costs of the portfolio bonds that would match a particular GIC portfolio by changing from a fully cash-matched to an immunized portfolio without second order constraints, also known as a "return maximizing" immunization. That means, though, you are subject to yield-curve reshaping risk.

If you want to add back in a little safety for an additional cost of about 3%, you can match the second order convexity as well as duration. That gives you immunization with convexity constraints, the so-called "risk minimization" kind of immunization.

If you're also concerned about liquidity risk, you can use a horizon match. This happens to be a six-month horizon match, which means that you have a duration and a convexity-matched portfolio with cash matching for the first six months for every expected liability flow. Buying those particularly well-defined sets of bonds brings your cost back up to 97. By changing your risk tolerance, you can change the acquisition cost and also the expected return of the portfolio quite a bit. Pricing actuaries need to know that, because a spread of eight points in acquisition costs for a particular liability means a lot in terms of return. How much of that return do they want to plow back into the product to create a guarantee or support a dividend scale?

How do you decide what to do from here? All of these things are duration-matched. If we start to depart from a duration match, assets to liabilities, we start getting mismatched.

The interest rate risk is proportional to the amount of difference between the durations of the assets and the liabilities. The expected return, though, depends on your particular beliefs about the shape of the yield curve. The actual return will be whatever it is depending on what happens in the future, but the expected return depends on theory. If we believe in the theory that the expected yield curve tomorrow is the yield curve of today, then the strategy you should employ is to ride the yield curve down. Mismatch long if the yield curve is positive, and you will earn more return than you deserve in this strategy. Because the yield curve of today is the yield curve of tomorrow, you can take this sort of classical or traditional riding-the-yield-curve approach.

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If you don't believe that, if you believe in the so-called pure expectations hypothesis, that is, that the yield curve of tomorrow is based on nonrisk averse investors acting in their own self-interest, then all expected returns are equal. No matter where you are on the yield curve over a particular holding period, you will end up with the same total return. If that is what your particular view of the yield curve is, then you shouldn't mismatch at all. All you're doing is taking additional risk by spreading your durations apart, but you'll never get any additional return in the long run.

If the liquidity preference theory holds, then you want to capture liquidity premiums. So, you'll mismatch long where you are paid those liquidity premiums.

The preferred habitat theory is a generalized liquidity preference theory that says that the only preference in a marketplace is not one for liquidity. People don't only pay up for liquidity. They pay up for all kinds of maturities. Depending on what their liability is and who is in the market at the time determines what is rich and what is cheap. You should mismatch according to those guidelines.

The point of all this is that once you have specified your requirements in terms of return and risk, it is not a simple thing to tell the investment department to go ahead and do it. Both the investment and product sides of the firm must come to terms with what they believe the marketplace looks like and make decisions on that basis.

Finally, what are the implications of taking some mismatches? We talked about some of these as criteria for setting up the risk-reward structure in the first place. What is the level of earnings you require? How stable does it have to be? By mismatching, you are going to affect that. You hope you'll raise the level a little bit, but you're also going to introduce volatility. Additional volatility and additional risk is not lost on corporate actuaries and rating services. You will require more capital for this line of business and, thus, more return on capital. It is also more difficult to certify, should you mismatch, for Regulation 126.

That's a quick run-through of asset/liability mismatching. All I can tell you is that communication, getting through the jargon, is the most important thing in solving the problems. Portfolio managers, of which I am one, view risk like dentists view tooth decay. It's a shame, but it does make for a good business. I love it, and I would like more actuaries to get involved in it.

**MR. BRITTON:** Next is Robert S. McClester, who joined Prudential in 1971. He's been through a variety of assignments, including nine years in the group pension area. Since 1986, he has been with Pruco Life, the Prudential subsidiary that manages its interest-sensitive business. He is currently the product actuary for variable universal life (VUL) and universal-life (UL) type business.

**MR. ROBERT S. MCCLESTER:** I'd like to describe Pruco Life's financial management process and discuss how we use this process to adjust the various pricing components. As an overview, I will describe our financial management process, which is comprised of quarterly analysis of earnings results and projections of those results. We also look at the sources of earnings, and track experience for investment results, expenses, mortality,

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and persistency. Finally, I'll touch on the pricing and financial reporting link that brings this all into balance.

At Pruco Life, a subsidiary of Prudential, we manage the interest-sensitive and variable products, written on both Pruco and Prudential paper. At Pruco Life, we have in-force nonparticipating UL and VUL business, in-force SPDA business, and new sales and in-force single pay life business. Over the past year or two, we've moved most of our new sales of UL, VUL and SPDA business over to Prudential, although we still manage the business.

With that as background, let me describe our financial management process. We produce an income statement on a quarterly basis by analyzing the earnings on a product level and then summing it up. Recently, we have placed more emphasis on results by marketing channel. The difficulty is to try to get all the components of the earnings broken down into channel results.

We measure return on equity using Pru GAAP earnings and the equity that we attribute to the business. Attributed equity is based on the C-type risks that Mr. Segal discussed, plus the difference between statutory and GAAP surplus. Thus, we have a target surplus type of approach to determine the ROE. The target surplus formulas are based on the specific pricing and investment risks for each of the products. Each year we set an earnings plan for the following year, then we constantly measure against that plan during the year and reproject to the end of the year. We also do a number of detailed studies during the year of various products, and look at individual earning sources by comparing actual results with results based on the pricing assumptions.

Regarding the specific earnings sources, I will describe what we look at and the type of pricing adjustments we make in each area. For investment results, we have both variable and fixed funds. Since most of the risk on variable funds is passed to the policyholder, we don't have much risk. The investment results, less the risk charges, are automatically credited to the policyholder. Our risk arises from the SEC limits on the risk charges that we can take. We also have some risk in the size of the management fees, the potential for investment expenses to grow faster than the management fee.

The investment element on the fixed dollar side is critical. Competitive pressures push us to have high crediting rates. At the same time, bottom line pressures push us to have good earnings. At Prudential, we have a separate segment of our general account for the interest-sensitive business, with separate investment strategies for each product. On a more notional-type basis, we have an internal system that allocates the assets and investment results based on the investment strategy that we have for the product. We use these results at the product level to project out the investment income and the earned rates. Obviously, we need very close links among investment areas: the accounting people who have to maintain the records, the financial analysis people, and the product and pricing actuaries.

On the investment side, the types of pricing adjustments are to set new-money rates and to set the renewal rates each year. For the UL business, we set the new-money crediting rates on a monthly basis. For annuities, we set the crediting rates weekly. The rates are

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based on the investment strategy that we have for the product, subtracting out our target spread on the product. We get input from the marketing channels on setting the rates and try to maintain a competitive posture, but we also have that pressure to produce a bottom line result. We generally set renewal rates on a calendar year basis. We collapse the new-money rates into blocks of business and try to maintain blocks that have comparable new-money rates, then set the old-money rates from them. Again, we project out future earned rates based on the assets we have supporting that block of business, subtracting out our target spread and producing the renewal rate. Overall, we've been able to keep the renewal rates pretty comparable to the new-money rates. We haven't had any big decreases.

For expenses, we look at two areas:

1. We compare the product loadings with the actual expenses. The margin that we have between the loadings and expenses can be affected by the expense levels and changes in the mix of business. When expense levels are increasing, that margin tends to shrink. We're also concerned that the mix of business may be changing, either between channel or in the types of business that we're selling, which can also affect the margin.
2. We also look at actual incurred expenses versus the expense assumptions that went into the initial pricing of the product. We keep detailed expense records and allocate the expenses by product. We try to allocate as much to the product on a direct basis as we can, but there will still be some allocation of overhead type expenses, which we try to keep under control.

Several things need to be recognized. One is special expenses, such as the expenses on the variable products for prospectus work. We also need to keep the changing mix of business under control. If expenses are changing for a specific portion of the expense, we want to make sure it gets allocated back accurately.

In order to make pricing adjustments, we periodically develop new unit costs. We look at unit costs in detail every two to three years. The critical element is to be aware of changing conditions if any simplifying assumptions are to be used. For example, we price products the same for each of the marketing channels. For each product, we try to hit an ROE target in total, but if we break results down by marketing channel, there may be a different ROE for each channel. If the sales mix starts to change by marketing channel, that can affect the overall ROE.

We do annual studies of lapse rates and persistency by product and by channel. In general, we've done better than we assumed in our initial pricing for the UL/VUL type business. Part of this was due to the large amount of drop-ins in past years that helped to carry the business for a while. The drop-in activity has decreased on variable products since TAMRA and the October 1987 crash. As a result, we can no longer rely on the lower lapse rates that we had been experiencing.

Lapse rates do vary somewhat by channel, primarily on the annuity side where we sell through our agents and through stockbrokers. Stockbrokers have a different culture, and persistency can differ quite a bit depending on their view of things. They are paid to

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manage assets, and they do not have the loyalty to the company that we hope our agents have.

Lapse rates are also very sensitive to the economy in general. Since we started selling UL and VUL in 1984-85, we haven't had any big spikes in interest rates. We need to maintain the interest-sensitive part of the lapse assumptions and not get misled by the relatively low rates experienced in recent years.

The last specific earnings source is mortality. We perform annual company mortality studies, looking at results by product, marketing channel, and underwriting class. Of particular current concern is the AIDS risk and trying to quantify that risk. These data are used to develop new assumptions to the level of actual mortality results and to modify the mortality charges when appropriate.

The relationship of pricing and financial reporting should be on the same basis. For us it's been evolutionary. We make progress on our financial reporting and try to build the same changes into the pricing mechanism, and vice versa. We measure both pricing and financial results on an ROE basis.

To summarize, we make our quarterly earnings process and our studies on investment results, mortality, expenses and persistency an integral part of the pricing process. Experience results have to feed the pricing systems. As results change or evolve, it is critical that the pricing mechanism reflects these changes.

**MR. BRITTON:** That was very interesting. Our final panelist is Phil Polkinghorn, who is a principal with Tillinghast. He's been with Tillinghast for about seven years, mostly in the Jacksonville office, but he recently saw the light, couldn't stand the heat, and moved to Hartford to join us for another cold spring. Phil will talk about the coordination of the pricing and the reporting activity.

**MR. PHILIP K. POLKINGHORN:** The issue of how to coordinate the pricing process and the financial reporting process is one of the most common problems our clients come to us with today. This is particularly true of mutual companies that have recently adopted GAAP. I'm not sure that the stock companies have any better answers, but they may have learned to live with some of the problems a little bit better.

The process starts when management wants some sort of GAAP ROE, 15%, 13%, whatever, and they want it for the whole company. The product managers go away and price their piece of the whole company. They price it to achieve a certain return on equity, and the company misses its goal. This is the stage in some companies where fingers start to point, and excuses are made. It is either "somebody didn't price right," or "my product line got too heavy an allocation," or "at the beginning of the year, I was told my allocation was going to be this, at the end of the year it was different." Perhaps the pricing wasn't done on an ROE basis. Maybe it was done for a profit margin, and the company had a different goal. Perhaps the pricing was done primarily using statutory techniques rather than GAAP techniques, and the goal is expressed in terms of GAAP results. The point is that in a lot of situations you really don't have enough information to tell you why you haven't hit your goal. You don't know whether it's the accounting

## FINANCIAL INTEGRATION OF THE PRICING PROCESS

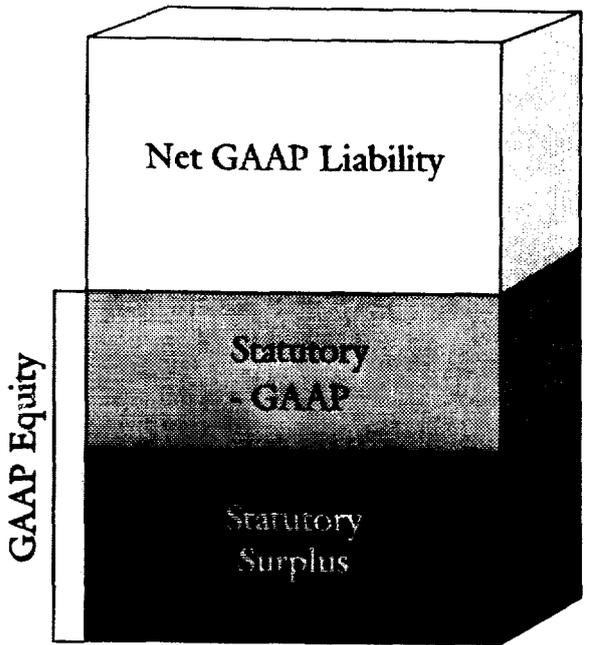
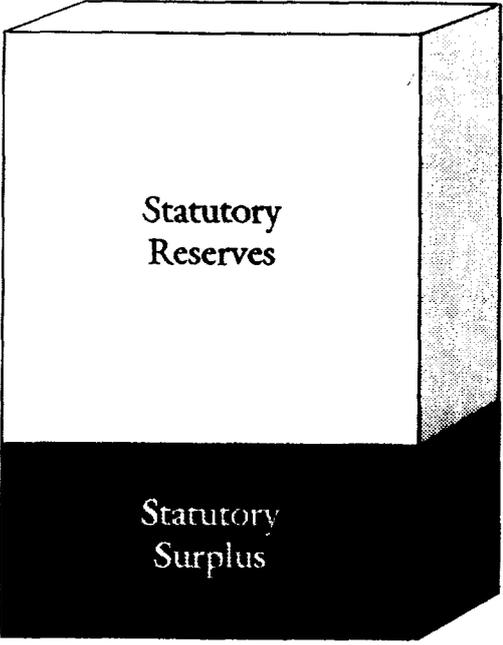
system, whether it's some shortfall in pricing, or whether it's due to differences between actual and expected experience.

So, the next step for many companies is to perform GAAP pricing. This is just very mechanical. You make your earnings adjustments, allocate your GAAP equity amongst the product lines, and project the earnings and equity forward. I'm going to go into a small bit of detail on some definitions of what you might consider to be GAAP equity for a product line (Chart 2). I think this matches up fairly closely with the Prudential's definition, so it must be right. If you look at a company in total, it has statutory reserves and statutory surplus, and presumably it has hard assets, securities, equal to the sum of those two items. If you look at the GAAP equity, there's no doubt that it's equal to the difference between those total assets and the net GAAP liabilities. That, in turn, is equal to the difference between statutory and GAAP liabilities plus statutory surplus.

Many companies already have methods for allocating this statutory surplus or target surplus to individual product lines. The allocation of the difference between the statutory and GAAP net liabilities on a product line is very easy as well, because it is calculated on a product line basis. So, for the more literal-minded, we would define the GAAP equity for a product line to be equal to the statutory reserve, plus any allocated target surplus less the net GAAP liability. Since federal income tax is important, it is important that the net GAAP liability be more than just a benefit reserve net of the deferred acquisition cost. You also have to include any unearned revenue liabilities and any deferred tax liabilities.

To illustrate what might happen at this point, we took a look at a couple of sample products. Charts 3 through 5 show a case study for a fairly typical SPDA. We projected the GAAP ROE for one year's issues out into the future, and you can see in the first-year that it's slightly less than 5%. It's 3.6%. In years two and later, it starts out under 20% and grades down. So, it's not level by a duration. We have a little bit of a hit in the first-year due to nondeferrable expenses, and just for reference purposes, the statutory rate of return after provision for target surplus and federal income tax was 14.4% for this product.

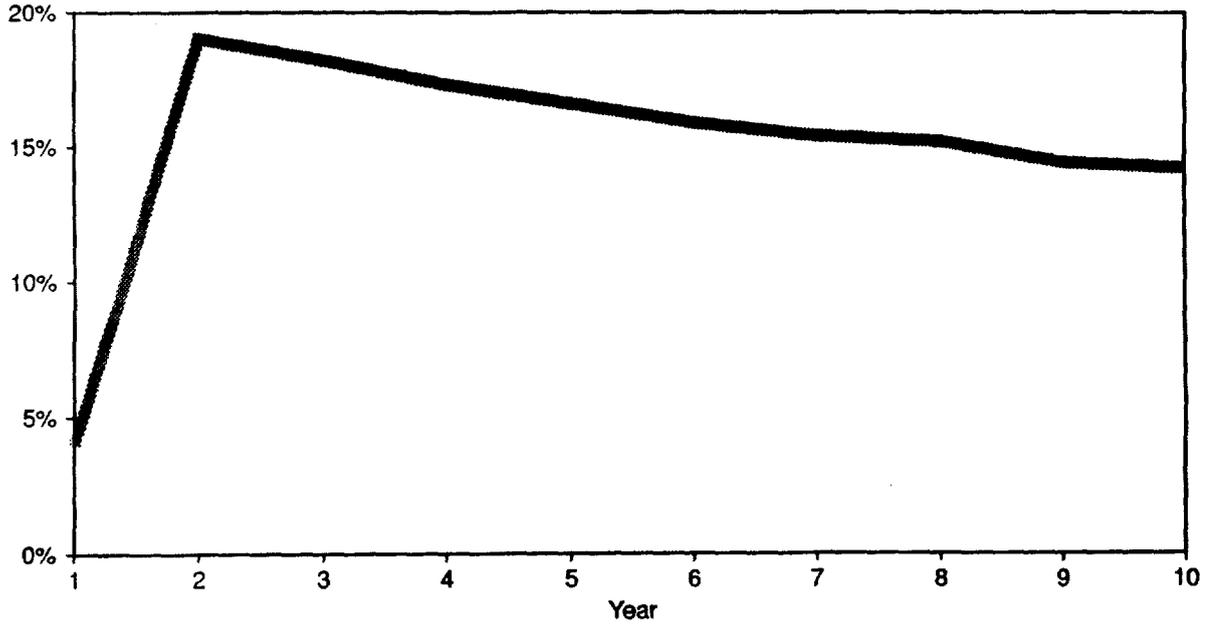
The company sells a companion UL product to the SPDA, and for a small block of business sold, we also projected the GAAP earnings and GAAP equity for this block of business. You can see the GAAP earnings are projected out. The GAAP equity or GAAP return on equity bounces around from year to year. Graphically, you can see that this was a backloaded UL product under FAS 97, and we had particularly heavy earnings during years two through four, when we had some higher surrender rates and some pretty heavy surrender charges. Now, quite apart from how you make a pricing decision when you get these results, I'd like to point out that GAAP results tend to be very heavily influenced by your block of in-force business. If you look at this pattern of GAAP ROEs for this hypothetical product, it starts out quite good in years two through four and then grades gradually down. What can happen with the way some companies are pricing products today is that future managements will have a huge amount of in-force business locked in at 11.9% and 12%. If their goal is 13% or 15%, it is going to be very difficult to achieve that goal. I'd like you to imagine, an FAS 97-style product, where the gross profits are positive in the first 10 years and exactly zero thereafter.



PANEL DISCUSSION  
CHART 2

# GAAP ROE--SPDA

## Case Study



FINANCIAL INTEGRATION OF THE PRICING PROCESS  
CHART 3

PANEL DISCUSSION

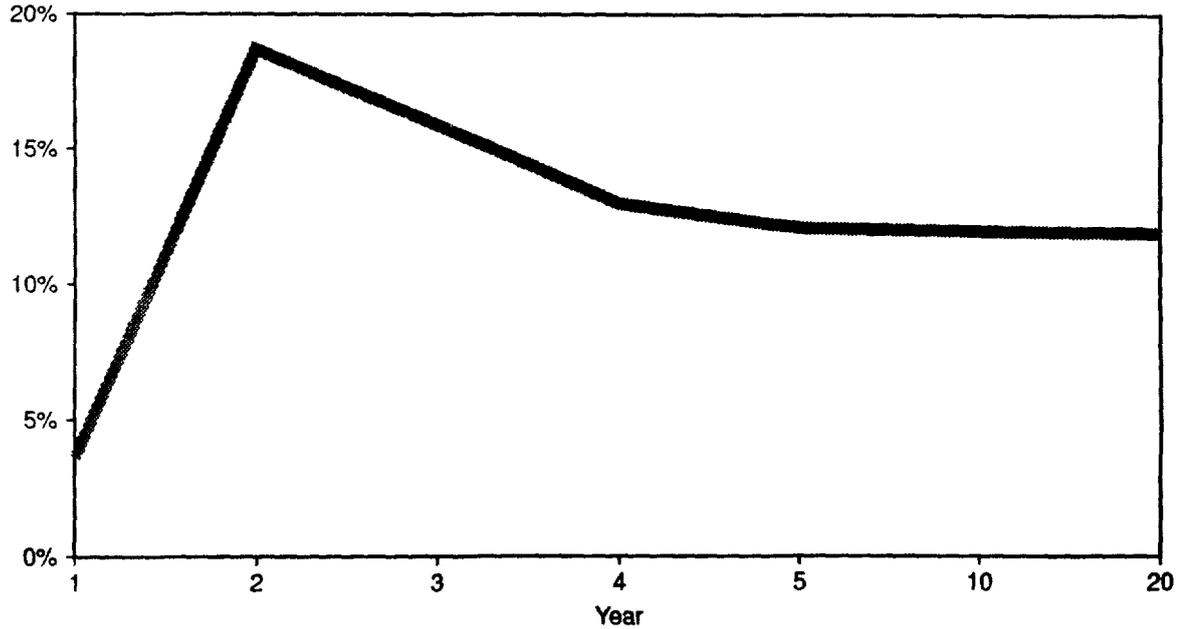
CHART 4

GAAP ROE Case Study -- UL  
\$500,000 Premium Sold

Year	GAAP Earnings	GAAP Equity	GAAP ROE
1	\$ 6,473	\$181,151	3.6%
2	40,828	218,021	18.7
3	38,787	243,225	15.9
4	34,078	262,139	13.0
5	34,303	284,262	12.1
10	30,835	256,024	12.0
20	32,665	275,130	11.9

# *GAAP ROE Case Study--UL*

## *\$500,000 Premium Sold*



FINANCIAL INTEGRATION OF THE PRICING PROCESS  
CHART 5

## PANEL DISCUSSION

Under FAS 97, that product, ignoring any differences between actual experience and expected experience, will report all of its GAAP earnings, other than any sort of return on target surplus, in the first 10 years and nothing thereafter. So, in that extreme example, which is getting to be less and less extreme today, future managements would be looking at rates of return on the in-force business in the neighborhood of 6%, and they would be largely locked in with 10 years' worth of new sales on that product.

Why aren't these GAAP ROEs level? There have been several papers written on this. Brad Smith and Don Sondergeld both wrote papers that addressed some of these issues. The nondeferrable expenses cause a problem. We saw that in the first year. Choice of the discount rate and the impact of tax are important. But the real reason that the GAAP ROEs for a product aren't level is because they weren't designed to be. GAAP was designed to have earnings emerge in relationship to some definition of revenue. For FAS 60 products, it was premium. For universal life and FAS 97 products, the definition of revenue was sources of profit. So, the system was designed to allocate earnings other than to equity. It would not be surprising, and would be merely coincidental, if the earnings did come out as a level ROE.

When you're left with this situation, and you're a product manager, and the company has made it clear that GAAP results are very important to them, and you get the types of results that we have just shown, how do you make a pricing decision? You can stick to statutory pricing and hope for the best, and in general, it will probably work most of the time. Products with a high statutory rate of return after target surplus should produce the better GAAP results, but you will be putting yourself in a very frustrating situation because you won't know. There will be no tie-in between the pricing and the financial reporting. When things do come out differently, you will have very little in terms of tools to help you explain what's going on and very little business information to make decisions that can maximize profits in the future. What you really need is information to help you make a decision, a decision tool. You know that the GAAP ROEs for a single year's issue are going to bounce around. You know that the GAAP results are very insensitive to new business, largely locked in based upon what you already have. One approach would be to develop a total company model on a GAAP basis and develop a business plan and price against that plan. If some past management has left you with a bunch of 6% ROEs on in-force business, all you can really do is say, "How will my pricing decisions today affect the GAAP results for the next couple of years?" Depending on what you use your GAAP reporting or your internal reporting system for, you may want to adjust it to give you more meaningful information. I think this is an area where the stocks, having dealt with GAAP longer, are significantly ahead of the mutuals in terms of the types of adjustments they make to their financial reporting numbers for internal uses.

I'd like to talk a bit about some GAAP indices that we've seen used and that may help you make a decision and solve part of the problem. It's not a complete link but a partial link. The first is useful if you are interested in what a product line might produce as a GAAP ROE, if you sold it for, say, three years or five years. What is the GAAP ROE going to be on this SPDA after you've been selling it for three years? If you assume the production is level, you don't have to run a new business model with three years' worth of production to get that figure. I can prove to you mathematically outside this venue

## FINANCIAL INTEGRATION OF THE PRICING PROCESS

that the GAAP ROE in the third year after sale will be the sum of the projected earnings from a single year's issues over the sum of the projected equity. For our case studies, you will see that for UL the projected GAAP ROE for two years' worth of level issues is higher than for the SPDA. When we priced on a statutory basis with target surplus, the SPDA produced a return on investment, after provision for tax and target surplus, of 14.4% versus 12.9% for UL. So, a capital management process would say that all other things being equal, the SPDA is a better place to put your money (See Chart 6.)

CHART 6

GAAP ROE -- Level Production

Year	SPDA	UL
1	3.6%	3.6%
2	11.1	11.9
3	13.6	13.4
5	15.1	13.0
10	15.0	12.1

However, if GAAP earnings are very important to you, and you have a relatively short horizon, say two years, then you're going to say that the UL is a better product. If your horizon is three years, you will say that they are roughly equivalent.

Our marketing people will point out the flaw that production is never level. It is always increasing. But you can do the same sort of thing. From a single year's issues projection, you can get what the GAAP ROE would be at any particular point in time, if production were to increase at a predetermined growth rate, by just taking the present value of the projected earnings at that growth rate, divided by the present value of projected equity at the same growth rate. For our hypothetical products, the GAAP indices look something like in Chart 7. You can see that for a horizon of three years the UL looks better than or equal to the SPDA. These are two approaches that work if you have a horizon in mind.

CHART 7

GAAP ROE -- Production Grows at 10%

Year	SPDA	UL
1	3.6%	3.6%
2	10.7	11.5
3	13.1	13.1
5	14.6	12.8
10	14.8	12.2

The difficulty is getting a horizon. You might be able to collapse the GAAP results to a single number. For example, for the UL, if you had a horizon of three years, you would

## PANEL DISCUSSION

say that this product alternative gives me a GAAP index of 13.1%. So, it's better than any that gives me a result of less than 13% and worse than any that gives me a result higher than that.

One approach that we've seen used, that I've labeled a hybrid approach because it combines both statutory and GAAP concepts, has two premises. The first is fairly apple pie, hot dogs, and baseball. It says management's goal is to maximize company performance during its tenure. Premise number two is that the performance can be defined in terms of distributable or investable earnings. In other words, this is money you can spend based on statutory earnings after target surplus and the increase in GAAP book value at the end of management's tenure. If this is an accurate statement of the way you think things work at your company, then a GAAP index that might work for you in making pricing decisions would be what we've termed the Management Horizon Index. It says that if you pick a horizon of  $n$  years, the Management Horizon Index for a product is the return on distributable, statutory earnings plus the remaining GAAP equity at the end of the year. So, you would project statutory, distributable earnings after target surplus, and a typical loss in the first-year followed by gains, and at the end of the Management Horizon, you would add in, as a positive return, the GAAP equity for that product line.

For our two hypothetical case study products, you can see that the Management Horizon Index through five years is higher for the UL product than for the SPDA, and by definition, over the life of these contracts the Management Horizon Index will collapse to the statutory rate of return after provision for target surplus (Charts 8 and 9). If we look at a number of these GAAP indices over the long term, they tend to trend back to the statutory rate of return after provision for target surplus, if you set Management's Horizon long enough.

This makes sense because the accounting model that you use over the long term, over the life of all your issues, shouldn't create any earnings. You can't create money through an accounting system. The product either makes money or it doesn't. You can divide it up differently within the accounting system. It is interesting that this sort of system gives you single numbers that, if you pick a horizon that is important to you -- five years or three years would probably be common at many companies.

CHART 8

Management Horizon Index

Year	SPDA	UL
3	12.3%	15.6%
5	13.9	14.2
10	14.4	13.0
Life	14.4	12.9

## FINANCIAL INTEGRATION OF THE PRICING PROCESS

### CHART 9

GAAP Indices -- Long Horizon

	SPDA	UL
Level Production	15.0%	12.4%
Increasing Production (10%)	14.8	12.3
Statutory ROI with Target Surplus	14.4	12.9

You can use this as a decision-making tool to isolate product alternatives that are better from a financial reporting standpoint than others. The problem is that, to many companies, the capital management process is also very important, and you may need to make a decision about which is more important, the capital management process or your reported GAAP earnings because, remember, the UL product in this example had a rate of return from our capital model of 12.9%. The SPDA had a return of 14.4%. But, for all of these GAAP indices over relatively short horizons, the UL looked better than the SPDA. If a company's GAAP reported earnings are very important, it may be willing to sell a product that has a little lower return from the capital management process in order to get better GAAP results.

We said one of the things we can do is adjust the reporting. Up to this point, we have been saying we've got a financial reporting system in place. How can we best adjust pricing to conform with that accounting model? You can come at it from another way, depending upon why you're doing this sort of financial reporting, and say you have a capital management process that you really like for pricing products. Is there a way you can adjust the reporting to be more consistent with that? The answer is, internally, yes, you can. The two most common methods and the two that seem to have the greatest link with the way we price products are typically known as the level ROE method and the value added method.

Before we talk about adjusting the financial reporting system, it is important to note what GAAP does. All GAAP really does is allocate the total earnings that you expect to get on a product over a given base. For FAS 60 products, it's over premiums. For FAS 97 products, it's over gross profits. It's a full release from risk for some products. For the level ROE method, it's just over the equity in the product. The point is, a great deal of negotiation and a little bit of theory went into how earnings should emerge. But basically they are somewhat arbitrary, and depending upon why you are doing GAAP, you need to ask yourself if one of these really is superior to the other for your purposes.

The level ROE method, like the others, is somewhat arbitrary. The people who developed it felt that earnings should emerge as a percentage of equity. So, they developed an accounting model that does that. Your year-by-year earnings that you actually report may be higher or lower than your target. But under this accounting model, if you're not hitting your target, it's due to real differences in the environment and not due to discontinuities between your pricing methodologies and your financial reporting methodologies. You might price for a 15% ROE and only report a 13% ROE, but it's not due to nondeferrable expenses or to the fact that the earnings model you report under is spreading earnings over premiums rather than equity. It is due to

## PANEL DISCUSSION

something very basic about your business. If experience equals assumed under this model, the rate that you'll report will equal the statutory rate of return with target surplus.

Value added is a very similar technique. Under the level ROE method, the discount rate for each year's worth of issues for a particular product is the ROE rate. If the ROE is projected to be 15%, you'll report 15% per year. Under value added, it is based on appraisal techniques and you pick a hurdle rate. If for our same product that produced a 15% ROE we pick a 13% hurdle rate, then in the first-year the excess produced by the 15% expected return rather than the 13% would come into the value added right away. Then the balance of the in-force business would report 13% a year. With the exception of what happens due to shortfalls and excesses in the first-year, value added and level ROE are very similar. Value added takes the hit for bad things right up front. It takes the benefit or the leverage for good pricing decisions right up front. Whereas the level ROE method would tend to spread it out over the life of the policies. Value added is based upon appraisal techniques. There are standards and generally accepted approaches for appraising blocks of business. Basically, you value the in-force business of a company and try to determine the value of the company and measure the changes in that value over time. This is very consistent with the way people price. People price by discounting distributable earnings at hurdle rates or by calculating rates of return on distributable earnings.

How would the value go from one year to the next? If you look at the value of a company, it is generally comprised of three components. When companies implement value added, they almost always deal with two, and the third is sometimes excluded. The first two components are free surplus and the value of in-force business. The third component is a goodwill value, or the value of business yet to be written, or the ability of the company to sell future new business at a profit. Companies that implement value added look primarily at the first two, unless they are making some very specific investment in an agency plan or a distribution system. The first two components are often referred to as the "embedded value," the sum of free surplus and the value of business in force. Once you have a starting value, you can project it forward for the next year (see Chart 10). Free surplus one year hence will be increased because you will have investment income on the free surplus you had at the beginning of the year. Your in-force business, which has a value at the beginning of the year, will have some distributable earnings which will go out of the value of the in-force business and into free surplus.

The new business you sell will have first-year strain that will reduce free surplus, but you'll have more in-force that has some more present value of future distributable earnings that presumably will increase the value of the in-force business. So, based upon standard assumptions, it is fairly easy to project the value at the end of the next year and then perform variance analysis off of that.

Who uses this type of technique? I mentioned that the level ROE method and value added method are probably only really appropriate for internal financial reporting. You can't publish the information from these methods as you can a GAAP statement. However, there are several external uses for this type of methodology. The first is for reporting of foreign companies not constrained to U.S. GAAP.

# *Change in Shareholder Value Value Added*

Beginning of Year		Free Surplus		Value of In-Force Business
"Interest"	+	Net Investment Income on Free Surplus	+	Hurdle Rate x Value of In-Force Business
In-Force Business	+	Distributable Earnings	-	Distributable Earnings
Current Sales	-	First-Year Strain	+	Present Value of Future Distributable Earnings
End of Year	=	Free Surplus	=	Value of In-Force Business

FINANCIAL INTEGRATION OF THE PRICING PROCESS  
CHART 10

## PANEL DISCUSSION

Steve Taylor-Gooby's article in the *Financial Reporter* talked about a number of companies in other countries that use value added techniques and publish the values in their accounts. Foreign companies often evaluate the performance of their subsidiaries in the U.S. on a value added basis. The financiers of leveraged buyouts tend to look at value added figures or projections of future distributable earnings because these types of earnings can service debt. GAAP earnings really can't do that. The oldest situation is in purchase situations. When a company is for sale or about to be sold, an actuarial appraisal is often performed to help guide the purchaser to what the value might be. Why? The reason is that you can't spend or sell GAAP earnings. I've heard people say they can sell at a multiple of GAAP earnings or a multiple of GAAP book value, and, of course, they can. Every purchase price can be expressed as a multiple of any other number. But that doesn't mean that there is a logical or economic relationship between the two.

There are some advantages to the level ROE and value added technique. Probably the most significant is that it has a long-term focus. It considers the impact of current decisions well into the future. So, instead of something bad happening, you recognize the total impact. Looking at the impact over the long term, as opposed to what's going to happen to next year's GAAP reported income, can be important in making decisions about different alternatives. The second concept is fairly easy to understand. How much are we worth today? How much are we worth tomorrow? The change is how well we've done. It measures true economic value and sends a consistent message as well. When things that are bad for a company happen, a bad message is sent through the value added process. When things that are good for a company happen, a good message, a positive response, comes out of the financial reporting system. I think part of the reason why people have concentrated heavily on looking at things like sources of earnings analysis is that doesn't always happen with statutory or GAAP accounting models. Often when lapses go up, earnings go up in the current year. The source of earnings analysis is a useful way to mathematically explain why that happened. But it's a mathematical explanation and doesn't give you good business information. You can't draw something and say that lapses went up, so earnings went up. What does that tell you as a business manager or a product manager? You're left without much useful information.

Since value added ties into the way we typically price, the variance analysis is quite useful. Variance analysis is also useful because it takes into account all projected future changes in an assumption. Finally, the models that you build for this type of analysis can be useful in tax and surplus planning.

When you are making these types of decisions on what performance measurement system you are going to use internally, you should look at one that satisfies several criteria. The first is that it should produce a common denominator for all lines of business. In other words, you shouldn't have a mix and a match between group A&H, individual life, UL, and term. When companies look at how well they're doing in the pension business, they tend to look at assets under management. On group A&H, they look at loss ratio, and that's a good thing to look at. But when they're trying to evaluate what has happened from a product line, it would be nice to get back to one basis. The value that companies add to the value of the company is a good basis. A performance measurement system should be simple in concept, easy to understand, and should be able to isolate the results

## FINANCIAL INTEGRATION OF THE PRICING PROCESS

controlled by management. In other words, you should be able to take the change in value and look at it piece-by-piece and see which changes were under the control of management, and which were due to economic forces outside the control of management. Finally, the reporting system should have some relationship to the intrinsic value of the company or its share price. GAAP and level ROE, as well as value added, do this. I think that the linkage, though, gets better as you move across that spectrum.

Our last pricing survey indicated that the majority of the companies are pricing primarily using statutory techniques. Companies want results that are expressed in terms of financial reporting systems. When companies price, much like statutory, the results aren't level by year. They bounce around. What solutions are there to the problem? We have some partial links. You could continue pricing on statutory and say that over the long term the products with the best statutory results will produce the best GAAP results. As I mentioned, that's not very satisfactory. If you're really good, you can sort of eyeball the year-by-year GAAP results and say, "I can't define what it is I like, but I'll know it when I see it." Finally, if you're looking at many different product alternatives, you're going to want some sort of decision tool. That's where these GAAP indices come in. You can collapse the results into a reasonable number of alternatives to consider. For example, if both your capital management and your GAAP results are important, you might not look at a product alternative that has a statutory rate of return after provision for target surplus of less than 12%. Amongst those alternatives, pick the one that has the highest three-year Management Horizon Index, and you can start excluding things without having to eyeball every single year.

Finally, one of the reasons why I and others in my firm are such big fans of value added is that it is a total company approach. If you're firmly committed to GAAP, a total company GAAP model will not solve this problem, but at least you can test the impact of pricing decisions on next year's GAAP results. So, I guess what I'm saying is that if your horizon is one year, a total company GAAP model may be appropriate. Then, depending on why you do the GAAP reporting that you do, you may want to make adjustments so that you have a very strong link between the way you price products and the way you report earnings. This link can be very useful for management. I can provide examples of confusion that has been created when product people talk about ROEs in the pricing process. Then we have ROEs in the financial reporting process that mean something totally different. Both the level ROE method and the value added method offer a complete link in that when you don't hit your targets, the differences are due to true differences in the economic environment or business decisions and not due to differences between the way you price and the way you report financials.

MR. BRITTON: Let me pose a two-part question to Mr. McClester. Do you measure premium persistency, or is that not a problem with your products because they're fixed premium products? And, second, have you measured changes in persistency as a result of changes in some of the other components like the mortality charge or expense charge in the products?

MR. MCCLESTER: We look at persistency primarily on an in-force basis. We haven't been able to measure premium persistency as well as the marketing areas would like. We have concerns about drop-in activity and the subsequent decrease in drop-ins.

## PANEL DISCUSSION

**MR. BRITTON:** A question for Mr. Sega. How do your portfolio managers react to what may be described as the new rules, i.e., a lot more constraints, a lot more help in doing your job, or a lot more restrictions on what you do in your job? And, second, how do you resolve conflicts between the need for a competitive return and also the need to live within the corporation's risk tolerances?

**MR. SEGA:** To date, we've been driven primarily by yield, and we are only now getting good definitions for risk. We have made some decisions on risk profiles and have decided that some of the markets we had been in for a long time and have gotten very good returns on (for instance, commercial loans and high yield bonds) are not as attractive, so we've scaled back quite a bit in some of these markets. The problem is what do you do to replace the yield you used to get from asset classes that you used to think were cheap? We've worked on some derivative strategies and looked at some equity link kinds of products. I think one of the things you have to do to be competitive in terms of yield is to keep in front of the marketplace, to look at what is emerging now and try to get some handle on what asset classes do appear undervalued.

One of the things that we've recently done is to look at the return on BAAs. Spread compression in the corporate bond market has continued for two or three years. It doesn't look like taking the additional credit risk for downgrading credit pays very well, although it used to pay pretty well. We think one way to add value is to trade better quality assets and raise the average quality of the portfolio a little bit, but be more active in terms of swapping on relative value. The problem, in terms of the picture that I sketched, is that it's very nice to talk about risk and return, but when you put pencil to paper, how do you quantify the risk in a change in strategy like that? A lot more work has to be done on volatilities of returns from those kinds of strategies.

Some work has been done on C-1 risk, i.e., the credit risk. Several people have published papers recently on the risk level, standard deviations of returns, etc. from credit, but I don't think anyone has really done a lot of work on an actively traded portfolio. Certainly, there are historical return series that you can look at for bond portfolios or stock portfolios. The problem with most of these is that they are totally return oriented in the sense that their relative performance is what's being measured. If you're in a total return mode, so long as you outperform most of your competitors, you're doing well, and your competitors float up and down pretty much with you. Liabilities are not nearly so generous. If markets go up and down, liabilities tend to stay there. I think the answer, therefore, is we haven't totally reconciled how you cope with those kinds of constraints. The fact that we're in the business of absorbing risk on the liability side and have those targets to meet drives us to look for yield. When markets don't give it to you, I think you have to have a strong enough surplus position and confidence enough in the abilities of your staff to add the value to ride it out.

**MR. MICHAEL E. DUBOIS:** This is for Mr. McClester. When you review the expense results, what do you feel is the more important comparison, the actual expenses versus the pricing assumptions or the expenses versus the loading? Since the product loading may cover more than expenses, how do you compare the loading with the expenses?

## FINANCIAL INTEGRATION OF THE PRICING PROCESS

MR. MCCLESTER: We are going through a unit cost study now, comparing back to the unit costs that were developed about two years ago and seeing some increases. We will have to cover those in the future. With respect to loadings, the main thing is to recognize how much there is to cover specific expenses. If you have a target spread of a loading over the expense levels, then I think you can judge where you are.

MR. BRITTON: Question for Mr. Polkinghorn. You described two methods as complete links in integrating your pricing process with your reporting process. One is the level ROE method. The other is the value added method. For companies considering one of these methods, what would you see as the primary advantages or disadvantages, merits or demerits, of each?

MR. POLKINGHORN: The level ROE method may have some slight advantage cosmetically over the value added method in that, like regular GAAP, you cannot be hitting your targets but still reporting positive GAAP earnings. What I mean by that is suppose your target is a 15% ROE, and you're only hitting 10%. Even though you're falling a third short of your target, you can say you made \$30 million worth of GAAP earnings last year. It may be more attractive, because under value added, if your discount rate is 13%, and you're only hitting 10%, then you will report a decrease in value for the year. Cosmetically, people like to see positive numbers that don't hit goals more than they like to see negative numbers.

In terms of making management decisions, value added may have a bit of an advantage in terms of variance analysis in the way things are reported. If you have some adverse action, the level ROE method will bring it in bit by bit over each future accounting period, whereas value added will recognize it all today. When that happens, it can make things more meaningful because it may force management to address the problem. On the flip side, level ROE will report the extra gain you get bit by bit each year. The value added methodology will bring it in all at once. One of the problems with regular GAAP is that the results are largely insensitive to what happens with new business, since GAAP earnings are largely driven by your in-force business. For the level ROE method, this would be true as well. If you go out and do something truly wonderful today and you're under GAAP with a level ROE, you're sending those earnings down to future managements, whereas under value added you're taking credit for earnings today.

MR. KARL D. ANDERSON: Mr. Polkinghorn, in the value added calculation of the present value of profits, the assumptions play a key role. What assumptions do you use and how often do you change them? At one point you talked about using pricing assumptions; if they change, then what happens?

MR. POLKINGHORN: Much like FAS 97 GAAP, but unlike FAS 60, you would use best estimate assumptions, and they would change as frequently as your best estimate changed with no lock-in. One of the nice things about value added is that it's fairly easy to do, sort of a dual run based upon a change in assumptions. For example, if you have an incentive compensation scheme tied to value added, but you think that a number of the product managers or people in underwriting really have nothing to do with the investment results, you can look at the results independently of the investment results and see how much value would have been added under a given scenario. You can then

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go ahead and say that those other people were able to increase yield substantially above what was expected, so the excess of that goes to them.

Another thing that comes up with value added is the discount rate. What happens if you ever change discount rates? It's probably appropriate to change the discount rate if you believe that the rates of return demanded in the capital markets have changed enough for it to be worth your while. If this happens, you would do two values and restate last year's value using the new discount rate, so you have a consistent basis from year to year.

**MR. THOMAS F. EASON:** I have a question that goes to the financial area and really deals with the expectations in terms of the pricing process. I've taken it on faith for a long time that with interest-sensitive products in particular, my favorite universal life product, the company that wins the game in the long run is the one that does the best job of investing. Consumers spend a great deal of time looking for the best mutual fund or set of mutual funds, or for the best investment advisor, et cetera. Yet, insurance companies seem to spend precious little time evaluating whether their own investment people really do a decent job. The question is, once you have an investment strategy selected and you know within what limits you're suppose to buy for a particular product line, are there techniques available for the actuaries, particularly, to analyze the investment performance of the investment department, to determine whether the job done is average so that average results related to market conditions are all you can expect, or better than average so you have the luxury of actually assuming you may get an extra 10, 20 or 50 basis points of additional margin?

**MR. SEGA:** The answer to your question is no. There are no good techniques in place for doing that, although there is a lot of work going on to develop them. If you look at the distribution of returns by managers in the pension area, they tend to fit a binomial distribution. Some people will do well for a long time, for whatever reason. Out of a million managers, some will be good forever and some will do less well. The problem with the average is that the ineffective ones don't stay in the business very long. The distribution gets truncated, and the average moves up. It's hard to say what you really mean by averages. No matter how good you are at picking real estate, Texas is going to happen. No matter how good you are at picking stock, October 1987 is going to happen. So, you shouldn't bank on outperforming the market in the investment game overall. Rather, you design products that hold up and produce profits in their own right with average investment performance. If you do get excess performance, all the better. You certainly pursue strategies that you feel have a good chance of providing excess performance. You're in a dangerous game if you price products assuming that you will achieve better-than-average performance, because everybody out there thinks they're better than average or they wouldn't be in the game.