

**RECORD OF SOCIETY OF ACTUARIES
1990 VOL. 16 NO. 3**

**DOES THE PRICING ACTUARY REALLY SPEAK
TO THE VALUATION ACTUARY?**

Moderator: MARK S. MAHANY
Panelists: SHANE A. CHALKE
DONNA R. CLAIRE
THOMAS M. MARRA
Recorder: ALAN J. ROUTHENSTEIN

- o This session will examine criteria that should be addressed:
 - Scope of the pricing actuary's investment assumptions
 - Scope of the valuation actuary's investment assumptions
 - Actual investment practice
 - How the three relate
 - Ways to coordinate
 - Effect on initial pricing
 - Effect on repricing

MR. MARK S. MAHANY: The format for our panel discussion is that each of our three speakers will give short discussions about topics that are relevant to the subject, and then we will open it up for questions.

Our distinguished panel includes Donna Claire who will be speaking about the role of today's valuation actuary and what she feels the role should be and how it relates to the pricing actuary. Donna is currently the Assistant Vice-President and Actuary at the Equitable, and I guess her official title is the Insurance Investment Liaison with the Asset/Liability Management Department. Our second speaker will be Tom Marra from the Hartford. Tom is currently the Vice President and Actuary in charge of pricing, financial reporting and valuation for individual life products and annuities. He's also in charge of marketing and business development for annuity products at the Hartford. Tom will discuss the relationship between the two, with a pricing emphasis and how it relates at the Hartford to the valuation actuary. The Hartford has a somewhat different structure in that the valuation actuary and pricing actuary fall under the corporate area and are, in this particular case, the same person. Our final speaker will be Shane Chalke. Shane is President of Chalke Incorporated, and Shane will be discussing what he views the roles of the pricing actuary and the valuation actuary in tomorrow's marketplace should be and how those two should coordinate or, in some cases, not coordinate.

MS. DONNA R. CLAIRE: At a speech a few years ago, I came up with my VIP circles -- where I envisioned the Valuation, Investment and Pricing Actuaries working closely together. What has happened in the meantime? In most companies the pricing and investment areas have developed a decent working relationship. However, the valuation actuary, whose role I get to play today, is still out in left field.

There are several reasons for the split between pricing and valuation. One is reporting lines. Many companies have put the pricing, marketing and maybe administrative areas

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together, but have left the valuation actuary in a corporate area. The need for coordination between pricing and investments is recognized, but the need to coordinate with the valuation people is not. The corporate area may be located on a different floor, building, or city, which makes communication hard.

By the nature, the three areas view the process differently. Pricing is proactive -- looking ahead to an idealized portfolio. Investment is active -- making day-to-day decisions as to what should be bought and sold. Valuation looks at where the assets and liabilities are at a point in time and reacts to it.

There are many times when the pricing and investment people look for the best rates in the current interest environment. However, the best rates in a particular environment may not be the best if the interest rates change. For example, in the early 1970s many companies invested long to pick up a little extra yield. This proved to be a poor move when interest rates increased. The valuation actuary tests what would happen in various interest environments and can point out problems.

There are times when the pricing and/or investment people deliberately pursue an aggressive strategy because they think it will pay off in the long run. This is fine, but the fact that the valuation actuary must put up additional reserves to cover the possibility that the strategy does not work out must also be considered. Many times it is ignored.

One possible solution to improve the relationship between pricing, investments and valuation is to bring all the disciplines together -- have an annuity center, and a traditional products center, a pension center, etc. This does require enough staff to split the functions.

Another possible solution is to have the areas use the same computer model for pricing, investment and valuation. The advantages to this are several -- one is that it's less work to split the setup work. A second advantage is that the argument of "my model is better -- more accurate -- than your model" is avoided. It is also easier to answer the question of why the valuation actuary thinks extra reserves are needed, when the pricing actuary thinks the product is a winner and the investment guys are earning what was expected.

The most important solution to the problem of different opinions is to keep the lines of communication open. Valuation actuaries are people too, and can contribute to the understanding of the product.

I'd like to focus on the valuation actuary specifically and why differences in viewpoint may occur for a specific product:

1. The valuation actuary will examine the actual portfolio versus the ideal portfolio. For example, the pricing actuary may assume investments in five-year bonds. The investment people may buy collateralized mortgage obligations (CMOs) which have the same duration as five-year bonds. However, the valuation actuary will examine what these CMOs will do in various interest environments which may point a different picture as to profitability.

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2. The valuation actuary will focus on actual mortality experienced, not the pricing mortality. Due to AIDS or a different smoker/nonsmoker division than what was priced for, the mortality used by the valuation actuary may be different than what was originally priced for.
3. The valuation actuary will examine the actual policy loan experience. This can impact profitability, especially if there are fixed policy loan rates or if wash loans are permitted.
4. The interest rates used by the valuation actuary may be different than those used in pricing. The valuation actuary examines cash flow patterns under different environments rather than using set rates.

I feel the valuation actuary should get involved in pricing (of course, I'm prejudiced, considering I'm playing the role of valuation actuary). Recently at my company, for example, we have been having the valuation actuary (me) do scenario testing when a product change is proposed on certain products to see the effect of this change in various interest scenarios.

The valuation actuary uses actual data, which may differ from pricing (e.g., actual age distributions, actual sizes of policies sold, actual lapse experience). Therefore, the valuation actuary would be in a position to point out any significant deviations from pricing, so that repricing may be done.

When the valuation actuary does his or her work, the result may be that reserves are higher than the absolute minimum reserves in order to be sufficient. The most significant effect of this, from my point of view, is that it makes the valuation actuary very unpopular. These reserves are not tax deductible, and impact the bottom line profitability of a company. However, there are a number of situations where these extra reserves are justified. For example, for an immediate annuity product sold in the early 1980s where the statutory interest rate was over 11%, if none of the assets earning double digits are still around, the reserves may be insufficient. Another example would be where there are significant settlement option guarantees, the minimum reserves on deferred annuities may be inadequate. For single premium whole life with no allowance for a mortality charge, adverse mortality experience may cause a need for additional reserves.

What types of scenario testing should be done by the valuation actuary? The valuation actuary may test more scenarios than the pricing or investment actuaries. One caveat -- the results from the valuation actuary's test under similar interest scenarios should be similar to pricing and investment results. For example, if the pricing and investment actuaries show the product making money in a level scenario, the valuation actuary's test should show the same. If it does not, differences in methodology should be explored to make sure one of the methods is not flawed.

Sometimes the scenarios the valuation actuary must test are recommended by regulation -- such as the New York 7 which appear in New York Regulation 126. These

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scenarios test what happens if rates go up, down, up and down, etc. As you are probably aware, these scenarios are rather benign when compared to real life.

One of the interest rate scenarios that I use is the historical scenario -- using interest rates from 1979-1989 in testing the products. This scenario has the advantage of having actually occurred, so people can't accuse the valuation actuary of being too conservative. It also normally winds up with more negative results than any of the New York 7 scenarios.

The valuation actuary should develop his or her own paths also. I like to stress the test to see the limitations. For example, a sawtooth pattern -- up and down rates -- normally is bad for deferred annuities. This way we know that if we get into this pattern of rates, corrective action in terms of investment strategy or interest crediting strategy may be needed.

There are arguments as to whose assumptions should be used -- the valuation actuary's or the pricing actuary's. As I stated before, my recommendation is to be as consistent as possible between the two areas. Wherever actual data does not exist or is not reliable, as valuation actuary, I use pricing assumptions where possible.

Another question we were asked to answer was should the pricing actuary be bound by the discovery made by the valuation actuary? The question as stated sounds like the answer they were trying to get to was no -- of course, you can ignore the fuddy duddy valuation actuaries. However, I don't think this is always the case. For example, if the valuation actuary finds that the pricing spreads are never achieved an investigation is warranted. It may be that stretch goals are set up by the investment people, but not achieved.

However, the fact that the valuation actuary finds that additional reserves are required does not necessarily mean that something is wrong. It may be that a deliberately aggressive strategy is being followed; for example -- many junk bonds -- which would require extra reserves in case the junk bond defaults increase. As long as management recognizes that extra risk means extra reserves, with potentially higher profit in the future, this would not cause the pricing actuary to change the investment strategy.

To do a gross premium valuation, which is really what a valuation actuary does, a good summary of the method is to start with pricing assumptions, update it for actual results, and add margins for adverse deviations.

There may be differences in risk assessment between pricing and valuation. Pricing is done on a realistic basis -- which means that it has a 50-75% chance of being adequate. Valuation may be more conservative. The figures I have heard recently is that reserves should be adequate to cover 90-95% of the realistic scenarios.

I view pricing and valuation as complementary, not conflicting. Pricing and product development generally designs products to maximize profits. Valuation assesses the actual liabilities and assets to measure risk and to ensure profitability goals are being attained.

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MR. THOMAS M. MARRA: At the onset, let me state that I found the title of this session particularly difficult given the nature of my company's situation. My company is organized on a heavy line of business orientation and for the most part our pricing and valuation functions have been consolidated under each line of business. So in response to the question of whether the pricing actuary and valuation actuary really talk to each other, I guess the answer is yes given that they're generally the same person.

I should probably also note that in our individual product line, over 80% of our assets are either in variable separate accounts or back up our market-value-adjusted annuity line. As a result, we remain relatively immune to the C-3 risk, and therefore I would presume the extent of our interest rate scenario testing is not as great as for many other companies.

Given the above as background, my presentation will provide some detail regarding our company organization and how we feel this allows for strong line management while still retaining strong corporate controls. Given the nature of the intended subject matter of this session, I will focus primarily on how our organization deals with issues regarding product profitability and risk management.

As I mentioned, our company is organized on a line of business or profit center basis. Our ultimate parent is one of the world's largest conglomerates, and all businesses and subbusinesses owned by our parent are also run as separate profit centers. Each center is responsible for its own management of corporate capital, and is expected to provide a return on all corporate capital at or greater than a corporatwide hurdle rate.

Within our life company operation, there are three major lines of business: individual life and annuities, employee benefits, and group pension. Over the past several years, several organizational changes have been made in an effort to bring as many functions and as much control as possible under each line of business head. Among these organizational changes was a consolidation of major actuarial functions (product development, financial reporting, and valuation) into each line of business. My responsibilities include the management of the individual life and annuity actuarial functions.

For the most part, we have been quite pleased with the results of our actuarial consolidation efforts. In particular, we have noted the following benefits of this consolidated approach:

Management Control: I believe that the consolidation of financial reporting functions into the line of business have greatly improved the line manager's management control level. Management reporting capabilities have improved significantly, and there also appears to be a more direct awareness of the financial implications of management decision making.

Resource Flexibility: Under a single organization, we have found it much easier to deploy actuarial resources between the financial reporting and product development functions as business circumstances dictate.

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Personnel Development: Our actuarial students and associates are given significant opportunity for total business as contrasted to the more traditional functional actuarial roles. We believe that this has resulted in a more well-rounded group of actuarial professionals and we feel this will present significant opportunities for nontraditional actuarial roles for these professionals.

At the same time we consolidated the actuarial functions by profit center, we did retain a corporate actuarial function which plays a very key role in the overall management of our life operations. Among other things, the corporate actuarial area is responsible for various interline issues such as capital and investment income allocations, companywide tax planning, and coordination of acquisition activities.

In addition to the corporate actuarial area's interline activities, they also retain a key role in the audit and review of each line's pricing, risk management, and valuation activities. While this audit and review process has several formal aspects that I'll discuss further in a moment, I believe the most valued benefits come from the informal interactions with the corporate actuarial area regarding the line's overall and risk management activities. Our corporate actuary is truly an active member of our line of business management team.

Regarding the formal review functions of the corporate actuary, I would like to discuss a few of the specific responsibilities of the corporate actuarial review process:

1. **Annual Report of Pricing/Valuation Assumptions and New Business Profitability** -- On an annual basis, each line must prepare a report for all currently available products regarding experience assumptions, capital requirements and projected profitability. These results are reviewed in detail with the corporate actuary, and necessary product modifications may arise as a result. We have found this process to be a particularly beneficial discipline, in particular for secondary product lines which may have been priced several years ago.
2. **One- and Five-Year Strategic Business Planning** -- Financial forecasts are prepared by each line twice each year, as well as a verbal presentation of each line's business and marketing strategies. The corporate actuary plays a key role in the review and development of both the financial projections and the verbal statement of line strategies.
3. **GAAP Recoverability/Reserve Adequacy Reviews** -- This analysis is prepared quarterly and again is reviewed by the corporate actuary. GAAP assumptions, methodology and recoverability results are specifically reviewed and if necessary, changes in deferred acquisition cost amortization will follow as a result of this review process.
4. **New Product Pricing** -- All new product pricing must be reviewed by the corporate actuary to ensure adequacy of experience assumptions, profitability and acceptable risk levels. With respect to risk management, we work closely with the corporate actuary in the evaluation of policyholder options, and I will discuss some of these issues in more detail in a moment.

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5. Experience Review -- Our monthly management reporting package includes detailed information of all key experience results (mortality, persistency, investment spreads, expenses) and their relationship to pricing and GAAP valuation assumptions. We have found this monthly discipline particularly helpful in providing timely information on potential areas of vulnerability, and has allowed us to take quick corrective action in areas that need attention.

As I mentioned, new product design is one of the major areas of interaction with our corporate actuarial area, in particular from a risk management perspective. While our product pricing review process obviously includes a review of experience assumptions and anticipated profitability results, I've found that our primary interaction with the corporate actuarial area centers on the more global risk management issues. Some of these specific interactions include the following:

Companywide Risk Profile Consistency -- One of the real dangers of a line of business organizational orientation is that left untended, each line may take on the risk profile of its individual manager, and not that of the overall corporate organization. We see the issue of risk profile consistency as one of the key functions of our corporate actuarial area, and this is probably the area where the corporate actuary becomes most directly involved in line of business management. This requires that the corporate actuary be fully aware of how each line markets its products, and that close analysis take place to ensure that all options and contingencies are properly evaluated.

Benchmark/Required Surplus Determination -- As part and parcel to this risk assessment process, the corporate actuary must approve required surplus levels backing each product line, and again must ensure consistency between lines of business. Rating agency surplus concerns are also coordinated by our corporate actuarial area.

Policy Guarantees -- Policy guarantees are reviewed closely from both a risk and statutory reserve perspective. As we are managed in a return-on-equity environment, obviously there is incentive to keep reserve strain to a minimum. As a result, guarantees are carefully reviewed in our pricing process and we do explicitly recognize the cost of all guarantees in our product pricing.

Policyholder Option -- Policyholder options are carefully reviewed and explicitly recognized in product pricing. If possible, we seek to immunize ourselves against policyholder options. Obvious examples of this include appropriate surrender charge and loan interest spread protection. Probably not as obvious has been our decision to include a market-value-adjustment provision in our fixed interest annuity portfolio. This has effectively removed us from exposure to the C-3 risk on this business, and we believe this has been tremendously advantageous to the profitability of this line of business. In short, we have found that option immunization through product design can lead to very significant pricing advantages.

In conclusion, I hope that although my company's organizational structure does not lend itself particularly well to the pricing actuary/valuation actuary communication issue, my comments may have been somewhat helpful in terms of how risks can be managed or perhaps even avoided. Regardless of each company's organizational structure, I conclude

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that all actuaries should take an active role in these risk management issues, and once this mentality becomes more fully developed, perhaps the issue of pricing versus valuation actuary communication may become a moot issue after all.

MR. SHANE A. CHALKE: This is an awfully strange topic, isn't it? What is it, anyway? Does the pricing actuary really talk to the valuation actuary? It sounds like a yes or no question, doesn't it? I could just say not really. I think the implication here is the question, should the pricing actuary really talk to the valuation actuary? Maybe, as a follow-up to that; if so, what should they talk about? Essentially, what I'm going to address are the roles of the valuation actuary and the pricing actuary from an economic perspective. I would like to go back to economic fundamentals, and talk about the roles of the two actions within a company. Now, why do I want to do that? As time moves forward on the valuation actuary side, and also on the pricing actuary side, we're moving more and more toward economics. I don't think that there are any valuation actuaries here that feel that their roles are specifically to meet regulatory requirements. Their jobs are far more profound than that and far deeper. On the pricing side there have been a lot of moves over the past few years more toward economic reality. Less of our results are being fettered by accounting or regulatory requirements. This is also evidenced by the fact that we have more and more tools at our disposal. If we feel ourselves making decisions that are distorted by accounting or regulation, we can convert to pure economic profit.

What is the fundamental purpose of the two roles? The role of the valuation actuary is to value liability. Perhaps my opinion is a little bit narrower than Donna's, but I'll get back to that later and discuss where the role expands. What's the role of the pricing actuary? Again, the role is to solve a price structure for your product that maximizes anticipated profitability.

Before I can begin to address the implied questions by the title of this session, I'd like to look at the valuation actuary's role and the pricing actuary's role from a number of different perspectives. I'll do that by contrasting a few of the characteristics of each person's job. Given my premise that the role of the valuation actuary is to value liabilities, the outlook is perspective. The only way in which the past actually creeps into this process is the extent to which you can gain some insight as to what might happen in the future from observing the past. Sometimes you can gain insight, sometimes you can't. It depends upon the circumstances under which past experience arose and whether you think those circumstances are going to be repeated. Certainly you look at the past to learn what you can from it. However, I'd wager that you're not tied to the past, and your goal is to anticipate the various scenarios that could unfold in the future.

The pricing actuary's job is to model various price structures, to integrate demand elasticity on the wholesale and retail level, and pick a price that's optimal which maximizes anticipated profitability. Is this a prospective or a retrospective exercise? Clearly, it's prospective. The past is irrelevant, except to the extent that you can gain some insight into what might unfold into the future.

Another characteristic might be the type of measure that's used. Again, I'm looking at things in an economic sense rather than in a regulatory or an accounting sense. What is

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the valuation actuary trying to accomplish? Here's where I find my first difference between the exercise that the valuation actuary would go through and the exercise that the pricing actuary would go through. I bet that very few of you would take issue with the fact that a risk-adjusted measure has desirability. It makes us sound a lot more sophisticated, and it's an excellent buzz word, but what does this really mean? The role of the valuation actuary is to determine for any future cash flow stream of liabilities, the dollar amount that a company would have to pay to absolve itself of the liability. Perhaps an example is in order.

If you have a book of business, a set of liability cash flows, how much would you have to pay to get someone else to take them? That could be the right answer, but maybe it isn't. Maybe the right answer is something bigger than that number or something smaller than that number. Any answer different than that brings into play some enormous distortions into the reporting that you provide. Let's just say, for example, that you have a book of liabilities and you would have to pay someone in the marketplace \$100 million dollars in order to absolve yourself of that liability stream or of that risk. Just suppose that we want to postulate for a moment that maybe the right answer for the valuation actuary is not \$100 million but \$120 million. What kind of incentives does that bring into play? What kind of distortions does that bring into our financial results? Well, obviously, if we provide in an economic statement the answer of \$120 million rather than the \$100 million that we'd have to pay, that gives us an immediate arbitrage possibility. We could go out in the marketplace and sell the liabilities for \$100 million, and up would pop \$20 million of profit. That's obviously a distortion because the \$100 million is, in some sense, an indifferent amount, and there's no real economic profit at play here. What the valuation actuary should attempt to accomplish is to establish the value of the liabilities on a market value basis. He should be able to answer the question, what would you have to pay to get someone else to take over this liability stream?

I mentioned before that the role of the pricing actuary is to select a price structure which optimizes anticipated profits. However, it's not possible to compare anticipated profitability with different price structures or different ventures unless we put everything on the same scale. Some sort of risk-adjusted basis can accomplish this task, but it's necessary to translate everything to certain dollar equivalents in order to compare the effects of different ventures. As a very quick example of this, suppose you're faced with two possibilities as a pricing actuary. You can hand your board of directors a dollar, or you can enter into a game where you flip a coin. If the coin comes up heads, you win a \$1 million and \$2, and if it comes up tails, you pay someone a million dollars. Would you report these as being equivalent to the board of directors? I think not. However, a lot of current actuarial technology would equate the two because we tend to make decisions on expected value, and if I did my math right in my head, the expected value of these two options are equivalent. If we translate each of these to a certain dollar equivalent or risk-adjusted scale, we might find that you might be better off just to pocket the dollar and forget about the coin toss game. Again, we want to put everything on an even keel so that we can measure.

How do we do this risk adjustment? Well, in order to calculate anything on a risk-adjusted basis we need some sort of a decision model, and the decision model's purpose

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is to map uncertain events into certain events. In our company, we use an exponential utility model which I talk about frequently, but I don't think that it's critical to use that particular model. It is critical, however, to have some method of translating risky events into certain dollar events so it can compare alternatives available to your company.

I mentioned that the way that risk adjustment is done ought to be very different between the valuation actuary and pricing actuary. On the side of the valuation actuary I believe that what ought to be measured is based on some sort of a market value standard. What would be the dollar amount that you'd have to pay to absolve yourself of the risk? Now, in doing this, you're making that risk adjustment and adopting the risk aversion profile that exists as the clearing price to risk in the marketplace. And that sounds kind of obscure, but it's really not that difficult of a concept. When contrasted with the pricing side where you're trying to maximize utility for your particular company, it's necessary when making risk adjustments to adopt the risk aversion profile of your particular company. This is a little bit different concept. The risk profile of your particular company and you, as a particular decision-maker, might be very different than the clearing price for risk in a marketplace. On the valuation actuary side, we're measuring on a by-market standard. On the pricing side, we're measuring according to the utility for a particular decision-maker, so, both are risk-adjusted measures, but the form of the risk adjustment is quite different.

Next, let's discuss solvency concerns. Why isn't solvency a concern for the valuation actuary? According to my tight definition of a valuation actuary, which is that the valuation actuary's role is to value liabilities, solvency as a concern doesn't directly come into play, does it? We're looking at one component of the company, trying to attach a market price to it. Whether the company's in poor financial shape or in great financial shape, it doesn't change the value of that liability stream. For example, if I have a dollar bill in my pocket, it's worth a dollar right now. It's worth a dollar whether I have a positive or negative balance in my checking account. It really doesn't directly come into play. The pricing actuary's goal is to maximize marginal profitability. Why marginal? Well, there is no other kind. If the marginal profit's positive, that's great. If the marginal profit's negative, then it becomes a management decision whether you continue to go ahead with the venture or not. However, many times it's probably not a good idea to go ahead with the venture with anticipated negative marginal profit. If you have something better to do with the money, if all of your alternatives are negative, pick the one that's least negative, I would argue. Furthermore, I don't believe that it's possible to address a solvency concern through the pricing process. You're looking at a microcosm of the company, one product, one cell, within a division or line of business. It's not possible to address overall company solvency concerns, and if you've maximized marginal profit, you've done absolutely the most that can be done to contribute toward the health of the company.

Now, lastly, I'd like to discuss what I think is perhaps the most fundamental difference between these two roles, and that is investments and assets. Are assets any concern to the valuation actuary? No, I don't think so. That's a fairly middle-of-the-road answer compared to absolutely not. If the role of the valuation actuary is to value liabilities, what do assets matter? Let's again go to a third-grade example. If you owe someone \$10, that's a \$10 liability. Does it matter whether you have \$8 in your pocket or \$12 in

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your pocket? I don't think it does. The liability's still \$10. And it would be misleading if you only had \$8 in you pocket to then say, "Well, that liability's really like \$12." To up the liability because you don't think you have the money doesn't make a lot of sense within the context of my definition of valuation actuary. Now, the pricing actuary. I think approaching the asset side of the balance sheet is of crucial value. It's kind of an interesting thing. Donna's had the valuation actuary off to the side and the pricing and investment people shaking hands. I'd do the same, except put a smile on all three faces. I really think that is the proper division. When you're pricing, you are looking at a venture, and the venture is composed of both assets and liabilities. Looking at the venture in a holistic fashion, seeing what kind of value added to your company can be created through this venture is of critical value. The controversial part is the valuation actuary side. What about solvency? Lest I leave you thinking that I really don't care about solvency, let me just say that I firmly believe that it is someone's job to investigate solvency concerns. The question is, whose job is it? I'm not quite sure. It's up to your company's management to identify whose job that is, and the person who properly maintains that job can adopt various titles. We may know this person as the person who's in charge of asset/liability management, in terms of solvency analysis/ solvency concerns; the corporate actuary perhaps, the financial actuary, whatever, but someone's job is to analyze the overall solvency of the company.

And how do you address solvency concerns? Well, it involves setting up a model of the company and projecting across different environments to see what things look like. Oftentimes they call this cash flow testing. Personally, I don't like the term "cash flow testing." I think it's somewhat of a misnomer. As the financial markets become more and more liquid, insurance companies don't have the cash flow problem until they're out of assets. So, cash flow testing is really not precisely the term that I would use. I would prefer to call it value testing. You want to find out how your values pay out. Obviously, in many cases, if you are perfectly cash flow matched, chances are you don't have a value problem, but you can be cash flow mismatched and still not have a value problem. So, I tend not to use that term.

You're in charge of identifying and investigating company solvency, and you notice a problem. What do you do? Well, first, I'd say you alert management that there's a solvency concern. Second, I think it's crucial to set up some sort of mechanism to restrict the scope of the problem. That usually involves saving up for the impending doom in a colloquial sense, and how is saving up for this done? Well, restricting cash flows, restricting dividending, restricting distribution of profits, perhaps restricting riskier uses of capital in the future could be called for. All these tools are at your disposal. However, when there's an impending solvency problem, changing the value of the liability on the books can be argued. This is the one thing that I don't agree should be done. Again, back to my simple example. Raising the values of liability because of solvency concerns is really analogous to having that \$10 debt and realizing that you're not sure if you are going to have the \$10, so you call the \$10, \$12. It doesn't do anything except bring distortions into the balance sheet and it doesn't address the question as directly as it could be. Now, the industry is moving fundamentally in this direction. If there are solvency concerns, restate the liability. Those are my reasons as to why that might not be the appropriate action.

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Let me summarize. Did I answer the question for this session? No, I guess I didn't. So, let me answer it now. Does the pricing actuary really talk to the valuation actuary? Not really. Should the pricing actuary really talk to the valuation actuary? Perhaps. What should they talk about? Well, this I think I did answer. The valuation actuary and the pricing actuary should talk about assumptions. Why should they talk about assumptions? Because it's very valuable for them to explain the contrast in any differences that they have in assumptions, and, of course, the pricing actuary and the valuation actuary are dealing with different blocks of business, different time horizons. One block has yet to have any experience. One block has experienced a certain historical economic pattern. So, there are plenty of reasons why there could be legitimate differences in assumptions, but it's a very valuable exercise to shed more brain power on this to compare assumptions, and if they are different, explain why. Personally, I don't agree with the principle that valuation actuaries should automatically have different assumptions simply because they should be more conservative. That's not a valid way to proceed. The reasons that they should have different assumptions is because of different anticipation and the nature of the future experience of the business. In that respect one of the implications of this topic is, should the valuation actuary and pricing actuary be forced to use the same assumptions? I'd say certainly not.

MR. DAVID C. ZIMMERLI: I guess I'll start off with a question about the valuation actuary not being responsible for assets. How do you handle a situation when you have, say, an interest-sensitive product, and your credited rate on the product may depend on the earned rate that you've put down on your portfolio of assets? In order to value the liability you must have to project future crediting rates, and to do that you have to project future assets. So, don't you have to take assets into account in that respect?

MR. CHALKE: I think that's an excellent point. I do agree with that 100%. To the extent that you have an interest crediting strategy which is at all linked to internal asset performance, it's necessary to model the assets for the sole purpose of developing a model for policyholder behavior so that you can project cash flows on the liability side more accurately. But then when it comes time to actually go through the valuation process I think you would only value those liability cash flows. That's an excellent point. I apologize for not bringing that up.

MR. MICHAEL E. MATEJA: Donna's presentation focused on the idea of interest rate scenarios as that was the only thing that the valuation actuary ought to be considering in doing an analysis of the business. I agree that's pretty important, and that's where we had our origins. We kind of look beyond interest rate scenarios to consider such things as even mortality rates, for instance, when looking at annuity business. It is very revealing when you start projecting out different mortality assumptions for your annuity book. In the individual life business I like looking at lapse rates, too, and seeing what happens as the business plays out.

Shane mentioned something about the valuation actuary ensuring that the profitability is being attained. I don't care whether the profitability that the pricing actuary was expecting is attained. I'm accountable basically to the senior management and to the board, and I go in periodically and tell them that we have a proper liability up and that we can mature our obligations. They take the ability to mature our obligations very

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seriously at the Aetna. I think the worst possible thing that could ever happen in a board meeting is that the valuation actuary would stand up and say that he doesn't think they can mature their obligations because the reserves somehow are inadequate. Tom's description of a valuation actuary in the interaction at the Hartford parallels much of what goes on at the Aetna. I do think it's possible to have the picture that Donna described, the pricing actuary and the investment people talking pretty much on a day-to-day basis and the valuation actuary out there on the sidelines smiling because that's kind of like the way I think about it. I think that we have developed a very highly coordinated role between the pricing and the investment area. In retrospect, I wondered how our company survived because the only time that the pricing actuaries and the investment people used to get together was over lunch, and they'd talk about football or the weather or something like that. We're talking about matters of common interest and vital interest because it really is a partnership. Conceptually, I've always thought of our products as manufacturing the future cash flow stream, and it's kind of helpful to have the investment people out there anticipating the kind of cash that is implicit in the products that were coming together.

For Shane, I give up. I think the idea of a valuation actuary that is focused solely on the economics of it probably is not realistic in the light of how that's really developing. I think we all need to look at the economics of our business because one of the things that I think has deceived us in the past is not to focus enough attention on that. The valuation actuary and the pricing actuary both focusing on the economics of it should come up with very consistent answers or else something's fundamentally wrong. The impetus for the valuation actuary is kind of really out of the regulatory arena where there's concern about the fact that we can mature our obligations. The fact that those obligations are stated on a book value basis and somehow ignore the values that are associated with the assets -- that's where the problem has its origin I think. I've been very successful in explaining the valuation actuary to my chairman by saying that we have an accounting problem in our business and that when you look at our balance sheet it doesn't necessarily tell you something like the economics that are underlying the business. You can't believe the surplus that has developed by just looking at that balance sheet so one of the solutions to it is to put it all on a market value basis, if that were somehow possible, because then you'd get a better look at what the balance looks like. He said a secondary level or another way of coming at that is through this valuation actuary approach which I conceptually think of as an attempt at doing a market value balance sheet where you restate the liabilities effectively to reflect the economic analysis that is implicit in the liability, in the asset cash flows implicit in a book of business. So, it's not equivalent to your \$8 in the pocket. What was it? A \$10 liability, and you have \$8. You don't need to restate those things because they're basically stated at cash. I mean if you have a current liability, there's no need to kind of restate that. The analogy would somehow be that you have a one-year bullet maturity bond out there that has a present value of \$8 in a \$10 liability. Somehow or other you would need to restate those things back to their current economic values.

MS. CLAIRE: I totally agree with Mike. I have one of my students in the audience who has managed to run six zillion different options such as the different mortality tables, different lapse assumptions, etc. It is important not to just concentrate on the interest scenarios themselves. Also, default assumptions are important, especially if

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you're into the junk-type assets. At our company, we have a certain product that our pricing and a number of consulting actuaries said was very profitable, and our investment people are investing in exactly what the pricing people thought they should, and I come along with my Regulation 126 and say, "We have to set up extra reserves." Because of the dichotomy we are now addressing basically what are the differences? Is the product really profitable? And the thing is you have to go through basically the options you're granting to the policyholders, the options that are in your assets to address whether or not what the pricing people think is likely to happen.

MR. CHALKE: I'd like to clarify one thing, however, lest I be misinterpreted. The first is that my concentration on economic values rather than regulatory values, in a practical sense, is unrealistic because the reality of the matter is that we are bound by regulatory constraints. We are bound by accounting constraints. No doubt about it. But it's very important to recognize what your fundamental purpose is, such that you can continually strive for that within the boundaries of regulatory constraints and accounting constraints. If we lose sight of what our fundamental purpose is, then we do tend to gravitate toward doing nothing more than meeting regulatory constraints. As we move toward the valuation actuary concept we may be in more and more positions where what we guess is the economic value of liabilities that differs from the regulatory answer. To the extent that economic value may exceed the regulatory answer, what methods are we going to use? What is our purpose? How are we going to develop cost for liabilities? With regard to the \$10 current liability, I used an example that had current liabilities because I thought it would be easier. Let me make that example a little bit more analogous to the valuation actuary situation.

Let's say you have a liability of \$10 one year hence. One year hence you're going to have to pay someone \$10. Well, now we have something like insurance. Let's just say further that the market value of that \$10 liability, as I calculate economically, with no regard to what my asset situation is, is maybe \$9. The way I understand it, the way that the valuation actuary concept is heading is that I would do some sort of scenario testing, some sort of asset and liability testing, and maybe discover that all of my assets are tied up in instruments that do not bear any income, ones that are not expected to increase in value at all over a year. In other words, I'm anticipating 0% yield under all scenarios. Well, the next step, if I were to follow, say, a Regulation 126 principle, would be to state the value of that liability not at \$9 but at \$10. This would be the valuation actuary concept. Well, is this appropriate? Should I state the value of this liability at \$10 when, in fact, I can go out and sell it for \$9? I can go pay someone \$9 to absolve it. And certainly if I bring into the accounting mechanism a \$10 valuation on that liability, now I've developed an extreme incentive to go ahead and absolve myself of that liability by paying the \$9, and to me that's just the accounting tail wagging the economic dog.

MS. CLAIRE: Replying to Shane here, I, of course, am on the valuation actuary side. Basically, in the situation he said we've addressed similar things in whether or not we want to reinsure our block of business. For example, a single premium immediate annuity (SPIA) block was x , but the thing is we couldn't just sell that. We had to do something with the assets. We had to either keep them on our books or sell them at that time. If we sold them at that time, which is what we should have done, it would up we would have taken a loss. So, you have to address both sides of the issue. You just

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can't look at the liabilities. What can you sell that for? Because at the same time, you would be doing something with your assets.

MR. MATEJA: I'm going to ask a specific question. In your model does the valuation actuary and the pricing actuary ever come up with a different answer in terms of measuring the liability?

MR. CHALKE: Yes, absolutely. Again, if I could just jump back to a third grade example. The role of the pricing actuary is to optimize utility for your particular decision-maker, your corporation. I think the value of the accounting mechanism is to measure market values. Well, let's take the case of just a choice to purchase two different bonds. Your investment department has a choice of two different bonds. Say the price of each of them is \$10 million, and let's say that you want to help the company decide which bond to purchase. This is a pricing decision, in a sense. You're trying to maximize utility for your particular company. It's obvious that whenever you enter into any economic transaction the value to the decision-maker is more than the market price paid for an instrument. That's just evidenced by the fact that if you buy a car for \$15,000, that tells me that car's worth more than \$15,000 to you. It doesn't tell me it's worth \$15,000 to you. It's just a boundary value. I know that it's worth less than \$15,000 to the person who sold you the car or they wouldn't have traded it for the \$15,000. So, similarly, with the pricing actuary we want to try to measure value to the decision-maker rather than market value, which poses two different questions. So, we might go through a utility model with the two bonds and find out that one of the bonds is worth \$11 million to us, and one of the bonds is worth \$0.5 million to us. As a decision platform we would move toward purchasing the bond with the greater utility to the decision-maker, the one that's worth \$11 million to us. That's a pricing exercise. Now we go over to valuation, to the balance sheet. What would seem to be the appropriate number to put on the balance sheet, in economic terms rather than regulatory terms? I can make a convincing argument that the appropriate number to put on the balance sheet would be the \$10 million rather than the \$11 million, rather than the personal utility value, although I must admit that I'm not entirely swayed by my own arguments here because some days I do wake up and say, "Well, balance sheets as well should be done on a utility basis to better measure profitability to the decision-maker." However, on a balance sheet basis more information can be gleaned from pegging things to market or liquidation value. I'm not sure if that shows what I think the differences are.

MR. MATEJA: I understand where you're coming from. That was a useful example.

MR. CHALKE: I'm a practical person, and I think that you always have to work within the bounds of all the constraints that you operate under. For me it's important to know what my fundamental goal is. Then I'll modify the fundamental goal by the constraints within my work as a businessman. If I lose sight of my fundamental goal, I really don't know what I'm doing other than satisfying regulatory requirements.

MR. MAHANY: I guess I'd like Tom and Donna to respond to a couple of measures of risk. Tom, it sounds like you don't really have to worry about the reinvestment risk because you market to the market, and you don't have to worry about that type of thing. How do you handle disintermediation risk? Maybe your policy loan spread or your

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policyholders are taking advantage of certain options in the contract. Do you price for those? And would your assumptions differ than your valuation actuary's? And I guess, Donna, I'd like you to respond to the reinvestment risk as well as to the disintermediation risk.

MR. MARRA: I mentioned that over 80% of our individual assets are directly tied to market. Our variable annuity assets are obviously directly tied to market. Our market value adjusted annuity product combined with its close asset/liability matching also ties this product very closely to market values. So, we do remain somewhat immune to the interest rate swing risk.

There is, however, another type of disintermediation risk laden in these products, in particular the market value adjusted annuity. This product provides guarantee periods of three, five, on up to ten years, and at the end of each guarantee period, account values can be accessed without surrender charges or the market value adjustment. As such, we do run a pricing risk of not being able to recover acquisition costs in the event of heavy surrenders at the guarantee periods. We don't have a great answer to that one other than we view this realistically and, therefore, assume in product pricing that a healthy percentage of these policyholders will be moving onward at the end of the guarantee periods.

In any event, I think I should reiterate that for the most part we have chosen to avoid the C-3 risk in our asset accumulation products. I've heard a lot of discussion over the past three days regarding active management of the C-3 risk. These discussions seem to have assumed that it is a requirement for these products to provide a book value cash-out option. I'd like to suggest as an alternative to all of this scenario testing and the costly hedging techniques, that we first consider whether we want or need to provide this policyholder option. My personal opinion is that attractive consumer products can be designed that do not automatically provide a book value cash-out option.

MS. CLAIRE: I agree with Tom that you have to, in the pricing process, look at what your options are and whether or not you really want them. When we currently do pricing, that is one of the things that we are examining. I think the real question was pricing versus valuation in terms of these option risks. As I said, we try to be as consistent as possible. The base lapse formula that I use in my test is the exact same as the pricing. The difference is a dynamic lapse formula depending on interest rates, interest crediting strategies, etcetera. That is reviewed by the pricing people to see whether or not it's consistent, and at this point they are seeing whether or not it should be incorporated in their pricing. In terms of reinvestment and disintermediation, especially on the vanilla-type single premium deferred annuities (SPDAs), and slightly less but still there on universal-life-type products it's a major concern, and even if you're not subject to regulation, it's one that someone should measure. I don't care at this point whether or not you call it the pricing actuary, valuation actuary or the asset/liability management person, but someone should be measuring it and basically examining how much -- put it in the pricing if you're going to grab the option.

MR. MARRA: I guess I wasn't incognito enough. I did want to mention Shane's comment about adding to the liability. It doesn't seem to make a lot of sense. It's like

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the accounting tail wagging the economic dog, and that relates to what Mike said at the Aetna, that he has trouble like explaining the statutory balance sheet to his chairman. I think all we're trying to do here is force something into a system that we have, and the regulators are having that problem of saying, "Gee, maybe you don't have as much margin in your company as you might think you do, and so we'd like to make you recognize that." We could say, "Well, why don't you cut your assets because maybe they aren't worth as much as you think?" So, instead they can do it with the reserve side, and that's what they've done at this point, and if we continue to work on this problem, it's going to evolve. For instance, on Regulation 128 there they do look at the asset side and say "Maybe these assets are a little too risky for the kinds of liabilities you have, and so we're going to make you take some haircuts on that side so that you do have more margin built into your products or safety margin." It's a good point on Regulation 128; changing the liability not the assets.

MS. CLAIRE: Remember Shane's point -- should you change the liability side? The problem -- again we're stuck with certain regulatory constraints, and the only thing we can operate on is the liability side right now, and I think it's a quick fix, but it does work, it gets to the same point as changing, in effect, the asset values.

