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## 2000 Valuation Actuary Symposium

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### Session 25PD

### Demutualization Issues

**Panelists:** Robert J. Matczak  
Meredith A. Ratajczak  
Barry L. Shemin

*Summary: The background material for Actuarial Standard of Practice No. 33 states, “In the past decade, an increasing number of mutual life insurance companies have converted to stock life insurance companies, sometimes including the formation of a mutual holding company. Demutualizations present important actuarial issues, including the preservation of reasonable policyholder dividend expectations and, in a traditional demutualization, the allocation among eligible policyholders of the compensation due them in exchange for their membership rights (i.e., consideration).”*

*In this session the panelists discuss the issues related to the actuarial aspects associated with the demutualization process. The issues discussed include:*

- *Developing historical and prospective assumptions*
- *Aligning the models used in the company’s philosophy regarding dividend determination and pricing*
- *Creating experience assumptions when less-than-perfect data exist*
- *Determining who gets what*
- *Complying with actuarial and accounting standards*

We’re going to give you some high-level discussion on a couple of items. First, we’re going to give a brief overview of the demutualization process when converting from a mutual to a

stock company. We're going to talk a little bit about the issues that you face during the course of the demutualization process and before you get to the point where you actually convert to a stock company. We'll also spend time talking about some issues after demutualization, specifically making changes to your dividend scale.

We have three speakers. Our first speaker is Bob Matczak. He's going to give a brief overview of the actuarial aspects of conversion from a mutual company to a stock company. Bob is a senior consulting actuary in the Actuarial and Insurance Management Solutions Practice of PricewaterhouseCoopers in the Valley Forge, Pennsylvania office. His expertise lies in the areas of demutualization, development of corporate and actuarial models, merger and acquisition (M&A) work, financial reporting and analysis, analysis of risk transfer under financial reinsurance agreements and group annuities. Bob's most recent demutualization experience is that of Met Life. Bob's also going to be our last speaker and talk about one approach to making changes to the dividend scale after demutualization.

I'm going to be your second speaker. I'm going to give a very high-level overview of the issues that are faced during the demutualization process. I'm a consulting actuary with Milliman and Robertson in the Hartford office, where I've been a member of the firm for 13 years. My areas of expertise include demutualization, statutory and GAAP valuation, mergers and acquisitions, financial modeling, pricing, and product development. Over the last ten years, I've spent some time on demutualization with Equitable, State Mutual, and most recently, John Hancock.

Our third speaker is Barry Shemin who will discuss the issues after demutualization, specifically making changes to the dividend scale. Barry is senior vice president and corporate actuary of John Hancock Life Insurance Company, and he is the appointed actuary for the John Hancock Companies. His responsibilities include reserve and actuarial practices and oversight of pricing and financial reporting activities. Prior to John Hancock's conversion, Barry headed up John Hancock's actuarial efforts related to the demutualization, specifically dealing with closed-block funding and allocation of policyholder consideration. Barry and I have spent some quality time together over the last couple of years. I'll turn the floor over to Bob, and he'll give you an overview of the demutualization process.

**MR. ROBERT J. MATCZAK:** Welcome to Demutualization 101. We thought it was important to give you a little bit of background. The two main areas I'm going to talk about are closed-block funding and actuarial equity shares. Let's discuss what these involve.

First is closed-block funding. A closed block is established to maintain reasonable policyholder dividend expectations for the individual or traditional life policyholder. It's really there to protect those policyholders from the whims of management after conversion to a stock company. In reviewing the work that you're doing, regulators want to make sure that the demutualization isn't adversely affecting the dividend expectations. All other things being equal, the experience underlying the dividends should be about the same. Individual or traditional life policyholders takes in the base policies and the term plans. This is especially true of term plans that are significant, and most importantly, participating. Term riders are attached to those policies, typically for administrative ease. The term riders themselves might be nonparticipating, but just from an administrative accounting standpoint, it might be very difficult to unhook them.

We're talking about premium-paying policies, and policies that have lapsed and elected the reduced paid-up (RPU) nonforfeiture options. The RPU nonforfeiture option policies are typically still dividend-paying. They'd be included with the closed block. Those policies are surrendered like extended term insurance (ETI). I've been involved in demutualizations where ETI is in; and at other times, it's out. Again, the considerations are: Is the policy participating or not, and is it difficult and unduly burdensome and expensive to set up the accounting to perhaps exclude what might be a small block of policies?

Finally, there are paid-up additions (PUAs) or purchases from dividends. You typically get dividends on those PUAs. They typically go in. I've seen dividend accumulations in and out. You think of the credited rate as the dividend or the excess interest over and above a guaranteed rate. They could be considered in part of the closed block.

For other participating lines issued to individual policyholders (like individual annuities, individual health, and supplementary contracts), you typically come up with other protection mechanisms. As an example, for some old individual participating annuities, you might certify

to the state your crediting rate or how you're going to determine the credited interest rate. Basically, assure them that if you're going to make any substitute pricing change, be that a change in margins or whatever, you would inform the state. There might be a need for periodic accounting where you demonstrate to them that you're following the pricing principles that you certify.

There are also participating policyholders issued to institutional contractholders through pension contracts like immediate participation guarantees (IPGDs), Deposit Administration (DAs), and participating group life and health. Typically, a closed block is not established for those policyholders, but the marketplace protects them. It's too easy for the policyholder to switch carriers, or go to alternative investment vehicles, if the crediting rates off in the future aren't priced properly.

Let's discuss the closed block. As it's allocated, the closed block is an amount, which together with expected and future premiums and investment income, are sufficient to pay the current dividend scale. We're assuming that all experience underlying that dividend scale continues into the future. The assets will pay for future benefits as well. If any expenses are allocated to the closed block, there will be federal income taxes. Again, the key is the continuation of the current dividend scale. Basically, you're saying, "Here's my scale. Here's the mortality that underlies that scale, based on our current experience; here's the last experience; here's the investment experience." You're assuming you're going to hold in the future, the amount in assets that would be needed to fund and pay out those dividends and the future benefits and expenses.

In essence, when you do that calculation, your initial assets are less than your initial liabilities. The difference between the assets and liabilities is your present value of after-tax profits on that block of business. In effect, those profits will then accumulate, and at the end of the projection period, and at the end of the block, 100 years out in the future, the assets and liabilities will come together, and there'll be no assets remaining. All of them will have been doled out. Again, assuming current experience holds, all those assets will have been doled out to pay benefits and expenses.

To come up with your funding calculations, in addition to creating your complex liability models for the traditional closed block, you need to start selecting assets and create an asset model. The assets are going to be less than your liabilities. In selecting the closed-block assets, you're selecting a subset of the assets that probably have been backing that block of business all along. One of the criterion you use to determine which of the larger pools you're going to use to back the closed block is continuity. You typically start with the assets that had been backing that business all along to price your dividend interest rates.

Predictability of future cash flows. States might penalize you, in doing a demutualization, for valuing and determining the expected cash flows and the assets that are going to be used to pay the benefits. Say you have something like an exotic collateralized mortgage obligation (CMO) that is subject to substantive swings in what the potential cash flows are going to be. You might want to put in some type of equity investment, be that common stock or real estate. In those types of investments, the cash flows are much less predictable than a corporate bond, a straight mortgage-backed Ginnie Mae, or Treasury bonds. Because the cash flow is unpredictable, regulators in certain states will protect the interest of the policyholders by valuing it conservatively, even more conservatively than one might value assets in the marketplace.

The company that's going through this conversion process needs to make a decision as to whether they really want to put those assets in if they are being forced to value them at such an expensive rate. The potential upside that you're going to get when you actually realize the cash flows from those assets is all of them are going to end up going into dividends. Typically, as you go through that negotiation process with the state, you'll end up saying, I'm going to come up with a pool of assets. I'm taking out whatever common stock I had backing the business. You'll also take out real estate assets. I'm going to end up with a fairly vanilla pool of bonds and mortgages. As you get into mortgages, you'll take all the performing mortgages to high-quality mortgages.

Let's get back to the impact on the other lines of business. The only time that could become an issue is if you've gone down that path where you're negotiating with the state and you want to pick these more vanilla-type assets. You might not have enough. You might have a little bit

more real estate or a little bit more stock than you'd like on your balance sheet. In effect, you might need to take some bonds and mortgages from other lines of business. That's a potential impact on another line of business. You don't want to leave the other lines of business with assets that don't properly do the backing. It's a little bit of a balancing act.

The most recent ones we've done, for most of these companies, show the balance sheets are in great shape. The impact on other lines of business is a nonissue. There are plenty of suitable assets within the pool to back the traditional life line. To do this projection, there are very complex models that are developed for both the assets and liabilities.

The last critical assumption or reinvestment rate is the most critical one. What you're assuming there is that you're starting out with pooled assets. They obviously have some average earned rate backing them, and you're going to project that earned rate going forward. Early on in the closed block, you're going to have a lot more cash to reinvest, as premiums come in, as assets mature, and as coupon payments come in. So the reinvestment rate is critical.

When you set the reinvestment rate, you must ask (if you are currently crediting or basing your dividend interest rate on a portfolio rate of 7.5%), is that average rate backing the assets? That's the starting point for your reinvestment rate. That goes to the concept that you want to project out, your current dividend scale with your current assumptions underlying the dividend scale. That is a critical assumption that has the most sensitivity on the level of funding you're ultimately going to have to put up. The lower the reinvestment rate, the more the assets you're going to need.

Both Barry and I are going to go into a little more depth about the closed block. You'll notice something about the assets themselves that underlie the block. I just described a 7.5% earned rate. By the time you take out certain assets that don't have highly predictable cash flows, and take out the equity investment, they might only have an underlying earned rate of 7.25%. That's okay. You might fail to go down a line and say, I have another pool; if I take some more assets and fill some more of the corporates in there, the earned rate might be 7% in another scenario. All that means is that you're going to need more assets if you look at that pool turning 7% when

you're doing your projections. You're going to need more to fund your dividend scale than you're going to need if you start out with a pool of 7.5% or 7.25%. We'll get into some examples later. Ultimately, the asset earned rate or the existing pool you pick for the reinvestment rate is going to have a key impact on the level of funding.

Let's discuss the objectives of the future dividend policy. The underlying principle is you want to kind of maintain the status quo. You want to use the same principles you've used all along, with maybe a couple of things laid on top. First, you want to continue to place your dividends with a long-term objective (80, 90, or 100 years down the road) in mind. When the liabilities disappear, the assets disappear. In doing so, you want to avoid a disproportionate share of having a build-up of funds. As I said, in another way, avoid a tontine. You want to continue to price and smooth your fluctuations as you go along because you don't want to wait until you get part way through and have to start increasing the dividend scale. The people who are left 40 years down the road would get a disproportionate share of the benefit of that experience, versus the people who were in the block previously and are now long gone.

You really want to maintain equity among classes. Continue to follow the contribution principle before you establish the closed block and demutualize. After Meredith speaks, Barry is going to give you some great points about dividend setting and what you have to think about once you establish a closed block.

Let's discuss actual equity shares. In a demutualization, mutual company policyholders need to be compensated for two things. First, in converting to a stock company, they're going to forfeit their membership or voting rights. Second, mutual policyholders are the owners of the company. They need to be compensated for giving up that ownership to the new stockholders. The distribution is typically in the form of stock, cash, policy credits, or benefit enhancements.

The value of the company is distributed to the policyholders in typically two components: fixed shares and variable shares. The fix shares compensate for forfeiting of the building rights. It's paid to all contractholders who have those said rights. It's all participating policyholders of the company. Basically, each contractholder is going to need the same number of shares or dollars,

for each contract, whether you're a group pension contractholder, with a \$10 million dollar IPG or whether you're an individual term policyholder with a \$10,000 face amount policy. Each is going to get the same number of shares that are allocated, regardless of what those shares translate into. There's a range of how much of the value is doled out in fixed shares, but it's typically 15–25%, which is a small piece.

The bigger piece is the variable shares. This is where the heavy legwork is done. These are the actual equity shares. In order to be eligible for voting shares, you need to have voting rights and be participating. Everybody gets the fixed shares, whether they're participating or not. For the variable piece, everybody is giving up their voting rights, and there might be some small exceptions to that. Typically, most contracts written by a mutual company are eligible for fixed share. In the case of variable shares, you must be a contractholder with voting rights and participating. This is where you're being compensated for your stake in ownership. The number of shares will vary contract by contract, and it will vary in proportion to contributions to statutory surplus.

The definition of an actual equity share is the relative share of a given policy's contribution to surplus, relative to the total contributions of all other eligible policyholders. It's the actual contribution for that policy divided by the actual contributions, added together for all policies. When you do that actual contribution to surplus, it's both your historical contribution, from the time the contracts or blocks of contracts were issued, up until the valuation date, as well as the present value of the expected future contributions.

This is a very simplified example that I gave to a roomful of systems personnel on the Met Life project. They said, "We're being told we're going to be busier in the next two years and now we're talking about this actual share concept. What are you talking about?" Think of it as a gigantic spreadsheet. There might be a company with five policyholders; two individual life policyholders, a group pension policyholder, a group life and health contract, and an individual annuity contract. You typically come up with factors when doing your calculations, and express the contributions for a given cell or a given group of policies. When you're doing remodeling, you say all right, on average, the actual contribution factor is 1.4% of reserves. When you go to a



given policy, you say, “This policy is part of this group of model cells.” Those cells are getting 1.4%. This policy has a statutory reserve of \$1,000, so that policy has an actual contribution of \$14. You do that same type of contribution for each of the contracts and add them up. In fact, \$14 is 14/64 of the total, so that policy would get 29.9% of the common stocks being voted on.

Meredith is going to show how you do this. You’re talking about coming up with a factor for policies that will be allocated to cells. This ultimate spreadsheet is on a seriatim basis. There will be some other system that will drive it. It’s going to do this calculation, and then add them all up and come up with the contribution. If there were systems people here, they would tell you it’s not a true effect, at all.

Determination with historical actuarial contribution. For each model cell, you want to accumulate contributions and statutory surplus from original issue to the valuation date. All of you have done models before, so you should relate to what you’re doing. If you use the same models for cash-flow testing, as you do for corporate modeling purposes, basically you’ll have cells driven by the model plan, average issue age, sex, or policyholders. For each of those cells, you need to go back and get historical data and project the floor. You can think about it. The key word you should take from this is *massive*. It’s a massive historical data-gathering effort.

You need to identify whether the data exist. How far back do my data go? If it’s not readily available on systems, maybe it’s available if you just think about the one key thing that you need to do for a traditional policyholder. You need to go back and get historic dividends. Do you have information on your dividend scale from two years ago, five years ago, or ten years ago? Do you have it from 20, 30, or 40 years ago? It is not readily available. You typically won’t find a systems person eager to give you a file and say, “Sure, here’s the 1947 scale.” Computers weren’t around. So part of your compilation effort might include going to rate books and pulling factors off and having people compile them. It’s a massive effort.

As part of the methodological aspect, you’ll have to come up with (whether it is traditional life, group pension, or individual annuities) the exact methodology that you’d like to accumulate for the historical surplus. The availability of the data might drive you in different directions in terms

of the extent to which you use approximations. To what extent do you extrapolate experience backwards into time? Just think of it as a backwards projection.

AC is no different than any other corporate modeling you've done. You're developing cell-based models for most of your individual policyholders. For the larger blocks, aggregate spreadsheets might be appropriate. You basically want to develop those models. Those models prospectively should dovetail with your historic models. The same cells you'd use to develop your historic calculations should then be, in turn, utilized to develop your prospective. There should be a direct link up there. Data requirements are massive. Meredith's going to get into them. There are product descriptions, experience studies, and all these unit values. Think about traditional life; that's the toughest block to fill. There is a massive amount of data.

With that, I'll let Meredith get into this in a lot more detail and tell you about the fun you can have in calculating actual contributions.

**MS. RATAJCZAK:** Suppose you work for a company that is just getting into the demutualization process, and you determine that your earliest issue cell is 1925. You need to construct an income statement and a balance sheet for somebody going back to 1925. How do you do that? I'm going to cover issues and considerations. I'm going to talk about what's in and what's out, and why that's a concern on the actuarial side. I'll also discuss some of the modeling considerations and assumption development.

As valuation actuaries, you might say, why is demutualization a topic on a valuation actuary program? If you think about it, demutualization is a modeling process. You need to do things like develop models and come up with assumptions. What is going to worry you at night is going to be a little different in this exercise than it is in cash-flow testing.

Now the discussions at the company regarding what's in and what's out probably started long before any modeling or actuarial work is ever done. I would say that it's more of a legal issue than an actuarial issue. As somebody who is building the models, we have to be concerned about what is in those models. Because so much of the work is involved in coming up with models to

do these projections, it's a big concern. We've seen most companies model all the business. At the time when you really need to get down to business and set up those models, you might not necessarily have totally determined what is par and what is nonpar. Is coverage in full force? Should extended term insurance be included? It's a very tedious process, and we found it is much easier to put some logic in system allocation programs to say, include this person or not include this person, than to have to build models halfway through this process. You don't want to do that.

On the modeling side, we deal a lot with how many cells we need to have. You think about that on the valuation side, but here it's more a question of what cells should we model that are going to line up with things like pricing philosophy or dividend philosophy and their logistical constraints. All of the panelists have spent a lot of time looking at those equity-share factors. Figuring out why there are trends and why there are outliers is a doable process if you're looking at 1,000 cells, but it is an almost impossible process when you have 5,000 cells. You will see less full granularity in these models than in your cash-flow testing models because your focus on what's coming out is just a little bit different.

There are some other considerations. How do you handle policies that might have started out as deferred annuities and are now immediate annuities? These are coverage discontinuities. How do you model those? What's available in your administrative systems to give you information about the history of that particular policy is going to drive how you include them in your models.

The models are base policy models, but there are a lot of miscellaneous things that are going to impact surplus that are associated with these base policies. Things like different dividend options, paid-up additions, reinsurance, and riders need to be taken into consideration in some way. We've seen the entire spectrum from explicitly modeling riders and reinsurance to the use of approximate methods for how actuarial surplus should be increased for those particular miscellaneous items. There is no textbook that says, this is how you have to do it. You develop methods that are reasonable based on the information you have available, and sometimes systems considerations also impact that. In my experience, we have been in situations where there are

different models used for closed-block funding or AC calculations. That adds another layer of complexity. You need to make sure that there is consistency among them.

We typically look at assumptions. There are historical assumptions, but they're not really assumptions; they're really history. We look at them in terms of global assumptions, and those are assumptions that impact all lines of business. There are also line-of-business assumptions.

Clearly, the most challenging global assumptions that I've dealt with on all the demutualizations that I've worked on include taxes, expenses, and investment income. Think about our example of an issue going back to 1925. That policy spans four tax eras. They are: 1925 to 1957 when taxes were levied on investment income; 1958 to 1981, when there were the three-phase systems; 1982 to 1983, when you had stop-gap tax laws; and 1984 and later, when tax was levied on gain from operations plus equity tax.

How are you going to model that? The actuarial systems of today can't go back in history and model all those different tax eras. In addition, how do you get to what your company's tax basis is. You spend time on the front-end talking to your tax people; you get a sense for what the philosophy has been over time. You also spend a lot of time with tax returns and work papers coming up with the appropriate treatment for the company. The tax calculations need to consider what is both above-the-line tax and below-the-line tax. You might have some provision below the line for federal income tax, which might reflect the audit adjustment items that are sitting out there. You need to incorporate those into your calculations. You also need to look at the tax position at the end of the historic period to figure out whether any of the adjustments that are made are permanent adjustments that should go out into your prospective period. You might not be able to just calculate taxes as 35% of taxable income. You might need to take into consideration that you have assets that aren't nontaxable. You'll need to track those assets for tax calculations in the future.

You probably think of expenses more as a line-of-business issue. In the last couple of cases that I've dealt with, there are so many corporate issues regarding expenses. One is how to deal with expenses such as Y2K. Have there been allocation shifts over time? Are there specific expenses

that the company has incurred that the policyholder should not be charged for? We've elevated expenses to the global level.

I can assure you that for our policy, going back to 1925, you're probably going to have a very hard time finding unit expense studies. If you have a unit expense study, there might not be good descriptive information, so you can understand what those drivers are that you're talking about. In addition, over time, the drivers have changed. So if you are projecting expenses over that 75-year period on the historic side, you probably want to put expenses on some consistent basis, so you don't have all these driver changes. It's quite a tedious process. Then you want to do something to figure out if somehow these unit expenses that you've come up with reconcile back to some total expense number.

It's probably safe to say that our company, which has policies going back to 1925, probably started off as a portfolio company. There was one portfolio of assets, and investment income was allocated to those lines. Today, companies have multiple segments. You have separate account earnings to deal with. So the investment income situations become very complicated. The primary source of information, at least in the case of John Hancock, were the annual statements and work papers. We looked for the investment income, took the assets, got the policy loans, got the capital gains to come up with the appropriate net investment income assumptions, and put into those projections. It gets a lot more complicated than that because then you have to relate that back to things like, what is assumed in the dividend scale for certain tax eras or certain dividend eras? You also have to look at loaned and unloaned money. So a great deal of data gathering is done to get to the point where you can construct this big spreadsheet that shows, for this line, or dividend block, the investment income assumption that is going to be used.

On the line of business side, we have the most trouble dealing with historic dividends. They're a key component of the determination of surplus. What cost of insurance rates should we charge for mortality costs and policy loan utilization? On the dividend side, as Bob mentioned, I can say with 100% certainty, that for our policies that go back to 1925, there are no electronic copies of dividend scales. You would probably have a hard time actually finding the dividend factors. I

have actually sat down with dividend votes and read through them to actually come up with the formulas to calculate the dividends. Then I have to go back to see if they realistically model what amount of dividends were paid in a year. I know it was a very big issue at John Hancock and Bob mentioned it was difficult getting that information. It's a really difficult thing because a lot of companies didn't keep that information electronically until very recently.

On the mortality side or cost-of-insurance side, because of the dividend work that's done, I've seen a number of mortality studies done. The issue is, is the way in which the mortality studies are done consistent with how mortality was viewed in the course of dividend scale development? Did the mortality studies split up smoker, nonsmoker or preferred and standard, and how should that information be blended in order to determine the appropriate cost-of-insurance deduction? The other issue is, if the mortality studies have a different basis going through time, then you have to go through the exercise of somehow taking them and putting them on a consistent basis to apply in your projections. There are many issues there. We're just making sure that what you are doing is consistent with the company's philosophy of mortality in calculating your dividend scale.

The information we've seen regarding policy loan utilization is pretty good now. However, information obtained before people did a lot of work on computers is sketchy. So what do you have? You have policy loans, maybe allocated by line of business in work papers, but nothing that gets you back to policy loans utilization split premium paying or paid-up, or by dividend block. My experience has been that there is a lot of variability in policy loan utilization for those characteristics. When that information does not exist, think about what you have to work with. You have aggregate numbers of policy loans, split by line of business, or down to the product line. You might have current information that is a true policy loan utilization study. You have to bridge the gap in that information. You come up with methodologies that allow you to take what you have and work backwards to essentially explode that aggregate information into something that is a reasonable reflection of what would have been expected based on what you're seeing in policy utilization. It's important because you are calculating investment income for loaned and unloaned assets separately. The nonloaned investment income has changed a lot over that 75-year historic period and policy loan rates have stayed fairly constant until we see variable loans.

You get a much different picture, if you put in different utilization, in terms of accumulated surplus.

Doing a prospective calculation is really no different than the work that you do in cash-flow testing. You start from today and work forward with a model; however, the prospective model should be in sync with your historic model. The key global assumptions are, investment income, miscellaneous prospective adjustments, and expense inflation. As for the investment income, one of the key considerations is what is the reinvestment rate in the future, particularly in terms of what you're going to be assuming in the dividend scale. Regarding prospective adjustments, what transactions or asset sales or other things are going on at the company that will have a financial impact on the company going forward that are expected and anticipated to definitely happen? Somehow you have to get that financial impact into the projections. You might make a one-time adjustment at the start of the projection for the realized value of the real estate that your investment people say are going to sell in the next six months. What are you going to assume is going to happen in the future? Does the company have specific expense reduction programs in mind that it is in the process of implementing that will impact those expenses in the future. Expenses are another key driver in that prospective calculation of accumulated surplus.

On the line-of-business side, the assumptions should be a continuation of current experience, unless there's something that you are anticipating in the future that is going to change experience. Another line of business consideration is, how do you deal with new issues? The AC calculations and the equity share calculations are done based on a model as of a particular day. You need to have an AC factor for new issues after that time. Your company's sales projections might show that you're going to sell (within the next eight months or until you actually demutualize) a great deal of a new product that you might not have had in your model. So you've got to model that and figure out what assumptions are appropriate. Is it pricing assumptions? Is it current assumptions for a similar policy. You also have to consider these new issues and how you're going to treat them for equity share purposes.

Finally, I want to raise some issues. On the demutualization side, I worry about things like what's in, what's out, what my model should look like, and what my assumptions should be. As

an appointed actuary, I worry about those same things. But, what I'm considering in demutualization is, where am I going to get the data; how am I going to get the data; how am I going to interpret the data; and how am I going to use the data? On the valuation side, there should be a lot less questioning of where am I going to get these data and how am I going to use them? So I just wanted to give you a sense of what the issues are and what we face in the course of doing this work over a very long timeframe.

So now that we covered key considerations during the demutualization process, we're going to talk about a couple of approaches in dealing with changing the dividend scale in the future.

**MR. BARRY L. SHEMIN:** As Meredith said, both Bob and I are going to talk about changing dividends in the closed-block environment. Bob is going to focus more on using an update of the funding calculation that he and Meredith talked about earlier. I'm going to discuss the funding calculation also, but my comments will mostly be background. I'm mainly going to focus on using the statutory glide path as the primary metric to come up with revised dividend scales.

Let's start by outlining a theoretical framework. What objective should a company have in developing changes to a dividend scale in the closed-block environment? First, I think we can look at the guidance that comes from Actuarial Standard of Practice (ASOP) Number 33. Here's how the relevant section reads: "the initial assets, together with anticipated revenue from the business, are just enough to pay for all the policy benefits, including dividends, according to the current scale and any other items that are going to be charged to the closed block, assuming that the funding assumptions in the initial funding calculations are realized." That's the wording that governs the funding calculation that Bob and Meredith have talked about. You're discounting the policy cash flow at the reinvestment rate, and you're also discounting the asset cash flows. You have a funding equation that balances as of the date the closed block is established.

Regarding setting dividends after the initial funding, the ASOP claims that dividends need to minimize tontine effects, while at the same time, exhaust the assets in the closed block precisely when the last policy terminates, which might be 100 years from now, by the way. Of course, these two objectives can often go in opposite directions because making sure that you'll have



enough assets left at the end might cause one to defer dividend increases. If you defer them too much, you could end up with too much money left in relation to the number of policies that you have left as the closed block winds down. Of course the ASOP also requires that equity among policy classes also be maintained just as is required before demutualization.

These statements are pretty general, and I think it would be difficult to read them as requiring that the funding calculation be updated at any specific interval. You probably get a sense from what Bob and Meredith had said, that updating the funding calculation is an extremely big deal at most companies, given the state of the art of modeling technology and what is required to replicate what you did for a demutualization. That's why I currently believe that most companies are not planning to update the funding calculations at regular intervals and certainly not on an annual basis. Many of them might not be planning to update it at all, but instead, to use other techniques to revise their dividend scales.

Nonetheless, I think that because the initial funding was based on a funding calculation, it is appropriate to express at least a theoretical objective for dividends in terms of that kind of calculation. Here's the way I would express it: current assets, at a given time after funding, together with the anticipated revenue to the closed block, are reasonably expected to be just sufficient to permit the closed block to pay all policy benefits, including dividends and other items, if the experience assumptions underlying the new current dividend scale are realized.

I think the implication of stating the objective that way is that one should periodically update the dividend scale in such a way that if one were to do a funding calculation at that time, then the funding equation would balance. This is a theoretical objective, but I think it's helpful to have it as a theoretical objective when one considers the measurements that would actually be used to determine the actual dividend changes you're proposing.

So what I'd like to do next is talk about the kinds of changes in dividends that might be associated with changes in experience of various types. We'll keep this theoretical objective in mind, and then we'll see whether some of the practical measurements can get us to the same place without the necessity of going through a funding calculation.

So let me start with some hypothetical changes in investment earnings. I'd like to assume for this purpose that we have looked at the closed-block experience and determined that the investment earnings of the closed-block are higher than what was projected in the initial funding. Let's also assume that those higher earnings are expected to continue. If we were to do a funding calculation of those circumstances, it could be solved for an increase in both the dividend crediting rate and the reinvestment rate that's part of the funding calculation that would exactly meet the dividend objective that I defined earlier. The increases in the reinvestment rate and the dividend crediting rate that could come out of that would be smaller than the increases in the actual earnings rate, because the actual rate is on the base of assets in the closed block, but the dividend crediting rate is on a significantly bigger base, typically the cash values or reserves underlying the policies.

Let's briefly consider how a change in mortality experience might translate into dividend changes using a funding calculation. One of the things a company needs to do, whether it's in the open block or the closed-block environment, is to establish a practice for periodically reviewing its mortality experience and updating the assumptions underlying its dividends.

Companies don't usually radically alter mortality assumptions from year to year, even though mortality experience might fluctuate. It would be more typical to update mortality assumptions periodically, and maybe not even every year. When they are updated, one might use some sort of averaging period, so that the changes don't occur immediately. For example, if mortality is improving, and the company is using a five-year average for dividend purposes, then there will always be a lag between when improvements occur and when they are reflected in dividends. In addition, companies usually choose not to take into account the full effect of certain fluctuations in mortality that might be deemed unusual or nonrecurring.

How would these situations play out in the closed-block environment, if one were to do a funding calculation every year? First, let's assume that there's an adverse fluctuation that is deemed to be nonrecurring. The adverse experience would still reduce the closed-block assets versus the initial funding calculation. It would be necessary to make some change in dividends on account of that nonrecurring fluctuation, even though it wasn't deemed to continue and wasn't even deemed

credible in terms of the actual, underlying mortality experience. If the assets aren't there, then somehow, over the life of the closed block, there needs to be a dividend reduction to make up for that. So using the funding calculation to make that adjustment is tantamount to spreading the mortality fluctuation over the life of the closed block.

What if we had a recurring trend, such as mortality improvement, and we would have used some sort of averaging process to introduce it into the funding calculation? Solving the funding calculation would result in a change in the mortality element of the dividend that would pretty much fully reflect a portion of the mortality improvement that had been included in the new average experience assumption.

Let's discuss lapse experience. I want to go into a little more depth here because we're starting from an earlier point in the learning curve and reflecting lapse experience in dividend changes. In the open-block environment, lapse is not even considered a separate dividend factor, but in the closed-block environment, variances in lapses versus what was assumed in the initial funding calculation can have a significant effect on the amounts that will be available for dividends over time.

Suppose we were to see a lapse variance that was deemed to be a one-time shock or nonrecurring lapse variances. Let's say they are higher lapses, and we did a revised funding calculation. In that case, the result would be that a change in dividends would be required. Because the incrementally lapsed business was no longer going to be there, the margins on that business would no longer be present in the funding calculation or in reality.

The reason these margins are important is because the closed-block assets are less than the closed-block liabilities, so the future premiums on the business in the closed-block contain significant margins that would go towards making up that closed-block deficit over time. If the business, which is supposed to generate those margins, isn't there, then the margins won't be there either. So if the margins aren't there, then solving the funding equation will require a change in future dividends on the remaining policies to restore those margins.

If lapsed variance is felt to be nonrecurring, the financial effect of losing those margins would be spread over the entire future period of the closed block through the reduction in dividends. A nonrecurring lapse change would probably only have a moderate effect on future dividends. If a lapsed variance is deemed permanent, however, then a funding calculation would result in bigger changes in dividends in order to make up for the lost margins if there are higher lapses or additional margins if there are lower lapses. Fortunately, traditional participating life insurance is probably the least sensitive life insurance product that company has issued. What's most likely is the potential of lapse variation will not prove to be anywhere near the level that might cause the need for significant changes in dividends.

Now I'd like to turn to the practical measurements that companies might use instead of redoing the funding calculation every year. Companies mainly adjust dividends using the statutory glide path. The statutory glide path is a series of financial items that come out of the initial funding calculation. Basically, it embodies a projection of the yearly statutory gains from operations, assets, and liabilities of the closed block. As a result, it includes the series of closed-block deficits projected as of the end of each year.

The basic principle behind using these data is that the variances of actual results versus the funding projection are used to determine the changes in dividends, with the objective of trying to restore the financial results of the closed block to the position that it would have been in according to the initial projection. When I say restore, I don't mean they would get restored immediately, but I do mean trying to move towards updating the financial position of the closed block so that it moves towards what was projected as its deficit in the initial funding calculation.

There are some alternatives about what metrics to use among those that are included in the statutory glide path. One I'd like to talk about is whether to use the actual dollar deficit versus its target or whether to use the actual ratio of deficit to liabilities versus its target.

Let's discuss a simple example. Let's assume that the funding projection for year-end of the closed block's existence projected that assets would equal \$1,200, liabilities would equal \$1,500, and the deficit would equal \$300. The resulting deficit-to-liability ratio would be projected at

20%. Let's also assume that the actual results are that the assets would equal \$1,100, liabilities would equal \$1,400, and the actual deficit-to-liability ratio would equal 21.4%.

Now if we were to use the dollar deficit versus its target, our conclusion would be that the deficit is on target and there should be no change in dividends. If we were to use the deficit ratio versus its target, we would observe that the actual ratio is 21.4%. That's higher than what was originally projected; therefore, we should adopt some decrease in dividends, in order to move it towards the 20% target. I prefer the deficit ratio because I think it better reflects the size of the business and the future margins that are present in that business than does using a dollar deficit.

This example might actually be a real rough illustration if you had some additional lapses greater than expected and the cash values and reserves on the lapsed business were equal. In that case, we know that, in the future, the premiums would be less than expected; as a result, the closed block gains would be less than expected. As a result in the future, the dollar deficit going forward would be greater than the initial projection. Using a ratio allows us to react to that knowledge sooner than does using the dollar deficit and waiting for the actual shortfalls and statutory operating gains to emerge. I think it's better to have the information earlier, but it is a matter of taste. Whichever way you go, at some point, the emergence of financial experience is going to need to be reflected. In this simple example, the results of those extra lapses would need to be reflective in dividend changes at some point down the road.

Next, I'd like to go through the process by which experience variations that might be observed in the closed block are converted into specific dividend changes that one might recommend to a board of directors.

The first step is to take a look at the difference between the actual deficit and the target deficit in the aggregate. In the case of our example, we've seen that the target deficit is the 20% deficit ratio times the \$1,400 of liabilities or \$280, and the actual deficit was 21.4%, which was actually \$300. The deficit is \$20 worse than our target. I'm assuming that all this was done on an after-tax basis, so if we gross up this \$20 to account for the fact that dividends are tax deductible, that would mean that in order to eliminate this \$20 difference, we would have to reduce dividends by

\$30.80. I'm not saying that the \$20 would need to be eliminated immediately. Therefore, we don't necessarily need that level of dividend reduction immediately, but we would need that level of dividend reduction over time, in order to eliminate this piece of the deficit variance over time.

So that gives us an aggregate amount we might be starting with. What do we do with that? The next step would be to perform an analysis of variance on the closed-block experience. We should break it down by source so we can try to get down a level or two and see where the variances come from. I'm not saying that this needs to be done on an accounting type basis where everything reconciles to the penny, but we should want to find major sources of variance that are in the same ballpark as the aggregate deficit variance, so that we're not left with big pieces of the aggregate that we don't know what to do with from a dividend perspective.

After this analysis of variance is performed, the next step is to take the variances and start to slice them up. For example, if we have different product lines that essentially have separate dividend scales, we want to try to sort out the variances and figure out how much applies to which groupings. Some companies might have separate dividend scales for industrial versus ordinary or single life versus survivorship. Or there might be more than one predecessor mutual that might have merged, that has its own set of dividend formulas.

We also want to classify the variances into recurring and nonrecurring. In other words, we try to figure out for each variance, whether it means that experience has changed permanently or whether it's simply a one timer. On the one timers, we want to adopt some kind of spreading of those nonrecurring variances. It's up to the company as to how it does that. It might have some prior practices in this regard of how it spread nonrecurring variances in the open-block environment. It might or might not want to modify those practices in the closed-block environment, but it generally would be appropriate to do some kind of spreading of nonrecurring variances. It's more important to do that in the closed-block environment because you can't just lose them in the past the way you can in the open block. Eventually, you're going to have to make up for any positives or negatives, given the objective, or try to use all the closed-block assets at the end of a closed-block's lifetime.

The next step is to take the recurring variances and the current portion of the nonrecurring variances and assign them to the different dividend groupings that might exist. You also should assign dividend factor categories (mortality, interest, and loading). This ought to be fairly self-evident because the variance analysis should have provided the kind of breakdowns that tell you where these variances ought to go in terms of changing the dividend formula. As part of this process, we need to gross up those variances to the fact that dividends are tax deductible. We also need to figure out the amount of change in each of the dividend factors that would match up with the dollar variances that come out of the variance analysis. How many basis points do you need to raise or lower your dividend crediting rate, in order to match up with the dollars of investment variance that you decided it was appropriate to pass on in a dividend scale?

Then a final step might be to apply any offsets between dividend categories or maximum and minimum limitations. Companies would rarely want to change their dividend formulas if the change is small, or they might be willing to take roughly equivalent mortality investment variances and say, "Let's not change the dividend scale this year. Let's wait until we see a need to change in one direction or another before we reflect these offsetting variances." There also might be certain maximum amounts of changes in dividends, which would cause a company to try and spread out any aggregate changes in excess of that amount over a period of years, rather than try to put through an extreme change in the dividend formula that might cause policyholder concerns.

So out of all of this would come some specific changes in the dividend formula that would try to replicate the portion of the closed-block variances that the company believed it's appropriate to pass on in the current year. It would also follow the contribution principle by using the sources of variance to drive the structural changes, as well as the level of changes in the pieces of the dividend formula itself.

So with that process as background, let me quickly run through some of the different kinds of variances, and then we can notionally match up the actions we might take using the glide path against our theoretical objective using a funding calculation that we discussed a little bit earlier.

First, let's take an investment variance, when the investment earnings rate has changed. Using this process, the dollars from the investment variance, if it were deemed to be permanent, would translate into a smaller change in the dividend crediting rate than the change in the investment earnings rate itself. So if the investment earnings rate went up by 25 basis points, and you felt that would continue, that might be equivalent to something like a 20-basis-point change in the dividend crediting rate. That's because it's on a larger base than the base of the assets and the closed block. This is consistent with what would happen if the funding calculation were updated for this very same kind of variance. So the glide path technique works very well for investment variances.

As for mortality variances, I think it's fair to say that if a mortality variance is nonrecurring, you would not reflect the entire amount immediately; rather you would typically spread it over a certain number of years, even in the open-block environment. That's what you do here, as far as your variance analysis, and that's what you do with the funding calculation. Even if a mortality variance would deem to be permanent, the normal way of incorporating that into dividends would be over some gradual period of time. You'd see some averaging of mortality experience. Once again, I think the glide path treatment of mortality is also consistent with what would happen if we were to update the funding calculation.

Lapses get to be a little more complicated. Once again, they're usually not a factor in dividend structure, so I guess the good news is we're starting with a clean slate. The first thing to observe is that the lapse variances can come from several sources. The first one is the difference between the reserves released on lapse business and surrender benefits incurred. To the extent that these amounts were different from the same variance that was included in the funding projection. There's a variance from that source in the annual statutory operating gain.

A second variance stems from the difference between the actual premiums received and benefits incurred (including reserve increases) on the business in force and what the funding projection included for those items. If lapse variances occur, these premium and benefit variances would show up in later periods of time. So if one gets some extra lapses in year  $n$ , then starting in year  $n$  plus one, there would be lower premiums and lower benefits and reserve increases. On



balance, there would be lower operating gains that would continue for an extended period of time. If one is using the method of comparing the dollar deficit to its target, then we want to take these lower operating gains into account for the purpose of changing dividend scales.

A third source of variance, which really is a substitute for the second source (if one is using the deficit ratio method), is the difference in the target deficit that arises from the difference in the actual and projected liabilities.

A pertinent observation here is that, if one is using the deficit ratio method, the liability differences need to be expressed as a dollar variance. I think it's important to note here that the present value of margins on the difference in business, which is a result of the liability difference, should be fairly close to the product of the deficit ratio applied to that difference in liabilities, assuming that the difference in liabilities can be considered typical of the business in force. In other words, the deficit represents the future margins on the in-force business. If one assumes that the business that did or didn't incrementally lapse is typical of the in-force business, then applying the deficit ratio to the incremental difference in the liabilities should give us a measure that's not too far away from the present value of the margins gained or lost on the incremental business in-force.

This is telling us that when we convert those differences to dollar variances using this method, we're going to come up with something similar to what our revised funding calculation would come up with, had we updated it for the revised business in force. Then, presuming it's a nonrecurring variance, we'd end up spreading it similarly to how a funding calculation would spread it.

Finally we need to think about where to include lapse differences within the structure of the dividend scale? I think the loading component is a logical choice, given that a good portion of the financial effective lapse variance is due to the premium for expense coverage, which might not be present if the business has lapsed, assuming that expenses are not going to be paid from the closed blocks. So there's a source of gain that was expected in the closed block that isn't going to be there. But one could also make a case for spreading lapse variances over all of the

elements of the dividend structure, on the grounds that it's not explicitly accounted for in the design of dividend formulas.

One final issue I want to elude to very briefly is tax variances. I'm not going to talk about these in any depth, but I do want to point out that, like lapse variances, tax variances are typically not a component of dividend scales and to the extent that there are tax preference investments or other differences in tax rates, it will be necessary to think hard about how to analyze the financial affect of those variances and where to put them and any dividend changes that might be necessary as a result. Remember, if the taxes that you actually incur are different from the taxes assumed in the initial closed-block funding projection, somehow those need to be reflected in dividends at some point over the life of the closed block. That completes my discussion of dividend changes.

**MR. MATCZAK:** To prepare for this presentation, I went back to some of my clients, including MetLife, and said, "Now that you've established this closed block, what else do you need to worry about?" I think Barry hit a point that was right on. On one hand we're saying the whole purpose of this closed block is to keep your dividend philosophy going and maintain the status quo. The key is, it's a closed block. Barry eluded to the fact that, in the past, you could spread some things out. You had the benefit of new business coming in to spread that over. You also had profit for some things like your accidental death benefit (ADB) riders and waiver premium riders. All of that was buried in there.

Now you're talking about a closed block. You set aside the assets. You really need to focus on and account for some of those things. So it might be that the key change in going from a mutual company environment to a stock company environment, within normal dividend pricing, is the additional rigor and discipline you need. You're dealing with a closed block and a fixed set of assets. You need to account for all those individual gains.

One of the key questions is, what is the glide path? In a moment I'm going to talk about what I think glide paths are. How are the glide path or paths used to monitor actuarial expected experience? What are the parameters you need to measure? How does the monitoring of

experience factors differ from what you've done in the past? When should the closed-block model be rerun? Believe it or not, this is one of the rare times you'll hear a consulting actuary actually advocate this position. I don't think we need to run the closed-block model every year. I think there are times when you have to use your own judgment. I think you need to do it periodically. I'll present some examples that show when you need to run the closed-block model.

Let's discuss some guiding principles. When you're analyzing your actual versus expected experience, you're going to want to classify those deviations into random or nonrecurring type fluctuations or recurring systemic fluctuations. There are different implications, and Barry has covered them. You'll want to spread the random ones and for the systemic ones, you need to change a factor in your dividend scale and change an assumption next time you do your funding update.

Continue to utilize the contribution principle. When you've had any substantive change in experience on a going-forward basis, I think you should, if anything, verify that the dividend pricing action you took is allowing you to meet your two dividend objectives in a closed-block. These objectives are that you are going to have zero assets at the end of the day, and you are avoiding a tontine. Each plan of operation under demutualization is different. You typically see a provision in there. The state regulators will require that an independent actuary certify that you're following the principles outlined in the plan of operations and that the long-term funding objectives are still being met.

The closed-block model might need to be updated and run in order to solve for the dividend pricing action. I'll give some examples here. As you go along, you might realize that your mortality is now 102% of your experience. You can change that directly into a factor, and update all of your mortality factors. Eventually, as you get going down the line, you are going to have some random fluctuations. You are going to have some variations in perhaps the expected profit margins in your accidental death benefit and waiver. There are certainly times when you might get to the point, as you're pricing the dividend action, of wanting to verify that the pricing action you're taking in the dividend scale, is in fact, keeping you on track. This is particularly true

when you get to variations in lapse experience. Again, you might want to verify your pricing action in the course of coming up with your actual dividend scale. Or it might be you're highly confident because you followed a lot of Barry's principles. You might want to verify that you're still on track after the fact because your independent actuary is coming in next year. You really want to update that and have that all laid out. It's an easy job for the independent actuary to say your actions are consistent with the philosophy of the closed block.

There's one other point to be made about when to run the model. I think Barry made a good point. I agree whole heartedly with focusing on ratio, as opposed to the dollar differences. That's clearly the way to go. In the example Barry gave, the dollars of deficit were the same (actual versus expected), but the liability had gone from 1,500 on an expected basis to 1,400 on an actual basis. When your liabilities start deviating from that statutory glide path, I think that's a warning sign. First, what's causing that deviation? Have my lapses increased, and has my mortality increased? If you think about that closed block or that deficit as being the present value of the future margin, you'd realize there are blocks within the blocks. There are generations of policies you sold, such as a bunch of nonsmoker policies over the last 15 years. There are also smoker policies. There are 1958 CSO policies that might have had a higher profit margin than the policies you're selling now. There's some old American experience policies that might have an even bigger profit margin.

If your liability structure has changed, it might mean that, overall, the mortality of your lapse hasn't changed dramatically, but one block might have lapsed off at a faster pace than another; this would mean a more profitable loss. If your liabilities have changed, you would need to investigate this, but your liabilities might, in aggregate, be right on track. If the make up is a little bit different, your future margins are going to be different, even if your experience factors are the same. As part of the independent actuary's review, you need to take a closer look at those liabilities and ask, are the margins still going to be about the same (on a going-forward basis) as what I originally projected? Again, the make up might have changed, resulting in a change in the present value of profits.

Let's cover monitoring of experience. There is the top-level statutory glide path. What are my assets and what are my liabilities? There's only one point I'd make here. I have an example that shows a significant change in an experience factor. For example, you could be three or four years into your closed block. Your earned rates might have slowly gotten to the point where you're now 20–25 basis points below target. Your funding ratio might only be off by 22%. The 22% might look pretty good. If that's all you looked at, you might come to the conclusion that you are doing great. That's why I'm going to go with the premise that you have to look at more than the ratio. That's a great starting point, but you need to dig down further. Barry advocated this as well. You need to look at these other significant glide paths or mini glide paths. What is my glide path that projected earn rates? How am I tracking against those? What is my projected mortality experience? What are my projected death benefits? How am I doing against those? There are lapse studies, expenses, and that sort of thing. I think of all those experience factors as glide paths. When you develop your closed-block funding, you put into place an expectation for all these items going forward. Prior to a demutualization, you might not have looked hard at how your margins are doing from my ADB, my waiver, and my substandard business. You funded for this when you did your closed block and now, given that the block is closed, you have to keep your eye on this.

We talked about random versus systemic changes. Barry covered the spreading of those gains versus an actual change in an experience assumption on a systemic change.

Chart 1 is a mini glide path. It is an example of a closed block that was funded. The divided scale was currently being priced at a 7.5% interest rate. Once the actual assets were selected, and the assets didn't have highly predictable cash flows, and the stocks and the equities were eliminated, we actually came up with a pool of assets that started around 7.10%. This kind of shows that, as those existing assets roll off and are reinvested at the reinvestment rate assumption, your glide path will show that the earned rates are going to gradually increase and ultimately get up to that 7.5% level.

The actual numbers for the first few years are 7.11%, 7.14%, 7.17%, 7.19%, 7.22% and 7.26%. These are now your benchmarks. Prior to demutualization, your dividend scale was at 7.5%.

How are you doing relative to the 7.5%? In a closed block, I put in a bunch of assets. I funded fully for it, so now I'm monitoring against these 7.11–7.26% rates. If, in the first year, you earned 7.13% and your expectation was 7.11%, you're doing great. Even though that's less than 7.5%, it's okay. This rate is what you're monitoring against.

I could have picked a pool of Treasury bonds, or at least assets weighted more towards high-quality assets. I might have had an average earned rate starting out at 6.75%. That's okay. You could throw it in the closed block. I would need many of these assets. I'd have a glide path that started at 6.75% and graded up to 7.50%. Basically, you'd be monitoring how I did against that glide path of interest rates.

Barry covered mortality experience. The only comment I'll make is, do you need to align experience studies? It depends on the make of a particular company. Some companies, when they did their mortality studies, lumped together not only traditional business, but universal life and variable life. If those blocks are significant, you need to guard against the experience of those blocks being considered when looking at the closed block was well. Ultimately, you really need to align those experience studies closely because you want to pass on only the experience of the closed-block policyholders.

Barry explained the reasons why. You have less business on the books, so you have less margins going forward. Ergo, if you begin to look at experience that says you're doing worse than expected, by definition, you're underfunded at a point in time. Conversely, if you're doing better, you're overfunded. Again, aligning the experience studies is one issue I'm dealing with now with a couple of my clients. I'm realigning their experience studies to mesh better with the make-up of the closed block. We covered expenses and taxes. The impact of reinsurance ceded, and miscellaneous liabilities needs to be monitored more closely.

Chart 2 is an example of the original glide path of projected closed-block assets and liabilities. The solid line is your assets, and the dashed line is liabilities. You want them to grade to zero. Remember that my reinvestment rate was 7.5%. What if things had really gone bad? Let's say, for whatever reasons, the level of interest rates went down, and I was only able to invest at

6.20%. Your actual earned rates would start to deviate from expected. Table 1 shows I'm 20 points in the hole by year three. My reinvestment rate shows that I'm actually investing 130 points lower, but some of your existing assets are still there. I'm 20 points in the hole.

**TABLE 1**  
**Comparison of Resultant Total Nonloaned Earned Rates**

<b>Year</b>	<b>Actual</b>	<b>Expected</b>	<b>Deviation</b>
1	7.11%	7.11%	0.00%
2	7.02	7.14	(0.12)
3	6.97	7.17	(0.20)

In this particular example shown in Table 2, after year three, I'm only 0.20% off. So if I was just looking at this glide path, I might not have realized the extent to which I have a dividend pricing problem or a need for an action. If I didn't do anything, I would actually run out of assets in 40 years (see Chart 3). So obviously you need to take some action. You don't need another model to figure that out.

**TABLE 2**  
**Deviation Results in a Relatively Small Change in the Funding Ratio**

	<b>Assets</b>	<b>Liabilities</b>	<b>Ratio</b>
<b><i>Expected</i></b>			
Year 0	\$6,759.8	\$7,706.6	87.7%
Year 1	6,892.2	7,813.7	88.2
Year 2	7,002.1	7,905.6	88.6
Year 3	7,089.0	7,976.8	<b>88.9</b>
<b><i>Actual</i></b>			
Year 0	\$6,759.8	\$7,706.6	87.7%
Year 1	6,892.2	7,813.7	88.2
Year 2	6,998.1	7,905.6	88.5
Year 3	7,077.7	7,976.8	<b>88.7</b>
<b><i>Actual vs. Expected in Year 3</i></b>			
Year 3	(11.3)	0.0	<b>(0.2)%</b>

Again, I whole heartedly agree with Barry that you could, on the back of an envelope, come up with the right pricing action. It's about 20 basis points. At the time it happens, you might realize you are 20 points behind. You'll probably come out with less than a 20-point assumption. The previous table shows I'm 20 points in the hole now, but I was a few basis points off in the first year, and I was 12 basis points off in the second year. I didn't take a dividend action because I'm

not going to change my dividend scale for 3 or 12 points. I'm not sure 20 points is even the right threshold. Assuming it is, I need to reflect the fact that I must change the 20 points going forward. Again, it's a closed block. It was a couple of basis points and then 12 points in the hole. I must make up for that 12 points. In this particular case, I did run the model (Chart 4). I did sell for the similar change in the dividend scale and in the reinvestment rate. It actually said, I need to change it 26 points. That calculation is also affected by the duration of your existing assets. What effect do your opening assets have there, and how much time is left on them? The quicker they're reinvesting, the quicker the impact of the reinvestment rate assumption.

I cut the data-end scale 26 points and reran my model with a 26-point company investment rate. Chart 5 demonstrates that the change in the glide path is inconsequential to the naked eye. In terms of the statutory glide path, you redefine the glide path that was very similar. However, the mini glide path has changed significantly. The dashed line was my original glide path leading up to 7.5%. The solid line is my new glide path. I went in the hole early, so now I have a whole new set of earned rates to monitor against. It doesn't go to 7.5%; it goes to 7.24%. I cut my dividend scale 26 points, and I cut the reinvestment rate 26 points. You can see the two of them side by side. They were my original earned rates that I was targeting in year four and later.

I changed the dividend scale and my reinvestment assumption. I reprojected my model, and now I have an entirely different set of rates that I'm going against. Next year I'll say, "How well am I doing against 6.91%, rather than the 7.19%. In Table 3 the targeted earned rates are down about 28 basis points. If you were to continue to reinvest at that 6.20% rate, what would make sense? After three years, I was 20 points in the hole (Table 4). If I continue to go another three years, I'm going to be 20 points in the hole again. Again, it is clearly important to monitor this.

**TABLE 3**  
**Revised Earned Rate Glide Path Compared to the**  
**Original for Years 4 Through 8**

<b>Year</b>	<b>Original</b>	<b>Revised</b>	<b>Deviation</b>
4	7.19%	6.91%	(0.28)%
5	7.22	6.94	(0.28)
6	7.26	6.98	(0.28)
7	7.27	6.99	(0.28)
8	7.28	7.01	(0.27)



TABLE 4

Year	Revised Expected	Actual	Deviation
4	6.91%	6.91%	0.00%
5	6.94	6.83	(0.11)
6	6.98	6.78	(0.20)

There is a second, real example shown in Table 5. The loss is the same as in my first example. I'm about \$11 million in the hole, but this time, my loss wasn't caused by the fact that I'd been reinvesting and now my earned rate is lower. I had a one-time capital loss and a bond default. I went in the hole. I'm still 0.20% in the hole. Now I'm going to spread this over future dividend scale or over some future period. I look at what I did historically and find that I spread this loss over five or ten years. I'm going to do that again in the future.

TABLE 5  
Deviation Results in a Relatively Small Change in the Funding Ratio

	Assets	Liabilities	Ratio
<i>Expected</i>			
Year 0	\$6,759.8	\$7,706.6	87.7%
Year 1	6,892.2	7,813.7	88.2
Year 2	7,002.1	7,905.6	88.6
Year 3	7,089.0	7,976.8	<b>88.9</b>
<i>Actual</i>			
Year 0	\$6,759.8	\$7,706.8	87.7%
Year 1	6,892.2	7,813.7	88.2
Year 2	7,002.1	7,905.6	88.5
Year 3	7,077.7	7,976.8	<b>88.7</b>
<i>Actual vs. Expected in Year 3</i>			
Year 3	(11.3)	0.0	<b>(0.2)%</b>

In my example, I tried to solve for what would be the change in the dividend scale over the next five years that would account for this loss. In essence, I passed it along to the dividend holders. I'd have to adjust the interest 6%. In real life, might I do that then? I might not, but I need to think of it as a scorecard. I have one random deviation that translates into six basis points. I might have others over the next couple of years that ultimately will add up to a point. I'll have a bunch of things that have added up. They aren't systemic. I don't need to change my mortality assumption or my lapse assumption. I have a pool of things going along that together, with the other interest rate change, must be factored into my dividend scale change. Again, you don't

want them to go too long and start building a tontine or a reverse tontine that moves in the opposite direction.

Think about the site change and mindset you have to have with a closed block, versus what you've done historically.

**MR. WILLIAM C. KOENIG:** I work for a pretty simple company. I am in awe and appreciate the amount of work that must go into to one of those historical recreations. There's so many assumptions over so long a period of time that it would be a massive job even if you had perfect information. What you're really doing is second-guessing 75 years of dividend distribution and dividend allocation. If the contribution principle had been followed perfectly over that period of time, wouldn't all the policies be, in some sense, equally profitable? By finding these variations in the profitability of the business, aren't you sort of exposing violations of the contribution principle over that period of time.

My question is, rather than search for all these historical dividends and historical experience, has consideration ever been given just to searching for historical evidence with variances in the application of the contribution principle and just modify and sort of create an equally profitable model office for those known variances? It might be a lot simpler job. I guess I'm wondering whether we can really do a better job of judging the quality of a dividend scale, in the sense of the application of the contribution principle that was done 50 or 75 years ago than the actuaries at the time did.

**MR. SHEMIN:** I think that's a very good question that actually came up a number of times. I think you're right, in theory, and not quite as right in practice. I think the contribution principle is a flexible principle, and there is company discretion about how fastidiously to apply it. There are differences in how fastidiously companies apply it, including whether they try to get the same contribution to surplus over generations, as opposed to just between classes of policies. There are also differences between classes of policies and how companies view the contribution to surplus that different policy classes might be expected to make. This is a massive one-time event, and you're kind of doing things that can't be undone. There's a higher bar applied to the

rigor with which one gets the contribution to surplus. You second-guess things that might have been done in the past that might not get over that higher bar. There are some differences, and you basically have to explain them on the grounds that you didn't follow the contribution principle perfectly. There were compromises made. We actually did have one line of business where we did pretty much what you said because that line had really followed the contribution principle for pension participating business. As a result, we were just able to take the risk charges for that line and use that as a contribution to surplus, without trying to reconstruct dividends. That line had all the data one could ever want however.

For other lines, it would have been difficult to say that we were confident enough in the rigor with which the contribution principle had been previously applied to be able to just use a smoother approach and that same aggregate contribution applies to all policy classes within the in force.

What you're trying to do here with an actual equity share is focus on the equity. Is everyone being treated fairly relative to everyone else? What I have found, in the demutualizations I worked on, is, for example, Cummings changed its profit margins or dividend margins over generations. Say your policy was issued just before a break point where a margin went up. You might have, relatively speaking, a higher equity share than someone who was issued long ago who had a long period of thinner margins.

Due to marketing pressures, competitive pressures didn't precisely follow the contribution principle in a good way. They played out more in dividends than perhaps the contribution principle would have said they should have for competitive reasons. The calculations you're doing are going to reflect that. Certain generations might have been affected by that more than other generations. That's where the equity comes in. If, as a result, they got better pricing action, that could, in turn, adversely affect their equity share.

I would have loved to do it that way because I heard from all of those policyholders. The fact that they got a good deal did not satisfy them, but that's the way it was.

**MR. STEPHEN L. WHITE:** I have a question that perhaps will affect the answer to Bill's question. It's about the historical equity share calculation. I didn't hear anything in the presentation that indicated that it was on an asset-share basis or just for the continuing policies. Let's say we had 200 policies of a given type issued at one point, of which only 20 are in force now. Are we looking now for the contribution to surplus from just those 20, or does each one of those 20 have one tenth of the contributions from the original 200 that it was a part of?

**MS. RATAJCZAK:** In terms of the equity share models that we have built, you'd look at the current in force as of today and developed the models based on a selection of cells that appropriately represent the business. For those ten policies, we might have one cell or two cells that we use to calculate the accumulated equity share. Through interpolation, we take their contribution factors, and apply that to those other 18 policyholders to get what their total contribution is on a seriatim basis. So we use cells to calculate the equity share attributable to that cell with particular characteristics.

**MR. WHITE:** But you don't look at other policies that, if they had persisted, would have stayed in that cell?

**MR. SHEMIN:** No, you have orphan surplus from the policyholders that have since surrendered, lapsed or died.

**MR. WHITE:** Your dividend procedures might have treated those orphan policyholders quite differently. For instance, if you had a block that had high lapses, you might have tried to recover some of those acquisition costs against the remaining people in that block. In this calculation, you would not do that.

**MR. JOHN B. DINIUS:** You may have covered this, but I don't think I heard it. What happens at the very end? Obviously when there are just a few policyholders left, your mortality experience isn't going to be anywhere close to what the mortality table would call for. Therefore, something has to be transferred in or left over. Does it go to the state or end up in surplus? How do you close the books at the very end?

**MR. MATZAK:** That's a man that's worried about the year 3000. I don't think a closed block will make it to 3000. I think what would happen is the mortality would get reinsured or something like that, once the numbers start going down. I think what's likely to happen is closed block would terminate short of that time. Remember, for a large company, it takes close to 80 before it really does get down to those very small numbers. Long before that, our grandchildren's company will go into the regulators and apply for the closed block to be terminated. I don't know on what basis that might be done. There are a number of bases that would be fair. If it isn't, I think you'd really be forced to reinsure the mortality experience so as to avoid that.

Essentially the closed block would pay reinsurance premiums instead of death claims and those reinsurance premiums would reflect pooling. Either an outside reinsurer or another part of the company would take care of the fluctuation. But I'm not worried about that. I have enough other things to worry about.