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Session 65PD
Long-Term Disability Buyouts

Track: Health Disability Income

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Panelists: MICHAEL E. GABON
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Summary: Many employers and insurers have blocks of open disability claims which take significant time and money to administer. Disability insurers or reinsurers are often eager to acquire these claim blocks in a "reserve buyout," assuming both the administrative responsibility and the financial risks and rewards of managing the claims.

This session explores a variety of issues connected to long-term disability reserve buyouts, including:
- *Advantages and risks for buyers and sellers*
- *Use of appropriate reserving assumptions*
- *Possible financial structures for a buyout*

Mr. Daniel D. Skwire: My background is in individual, group, and association disability insurance as an actuary with Milliman & Robertson in Portland, Maine. Now, let me introduce my two co-presenters. Mike Gabon is assistant vice president at Scottish Annuity & Life Company, an offshore reinsurer located in Grand Cayman. Mike has 15 years experience in reinsurance, insurance, and consulting. His current responsibilities include reinsurance marketing, treaty drafting, product development, and pricing. He works with the life, annuity, and disability product lines, and he's a Council Member of the International Section of the SOA.

Steve Mitchell is a vice president at UNUMProvident Corporation in Portland, Maine. He is in charge of life and disability pricing, and he has 15 years of experience in long-term disability (LTD) and short-term disability (STD) pricing, valuation, and financial reporting.

Mr. Stephen J. Mitchell: Long-term-disability reserve buyouts relates to closed blocks of claims that are sold. Mike Gabon and I are going to give two different perspectives. From a carrier perspective, we see a lot of employers looking to

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

migrate their claim liabilities. What Mike sees in the reinsurance arena is working more with carriers who are moving blocks.

The items I'm specifically going to talk about are the carrier's advantages and disadvantages of doing disability buyouts, the structure of the deal, and the items that you may want to be attentive to when you are putting the deal together. I'll talk about the analysis and some of the items that you should review and understand with regard to the block you're buying. I'll also explain some considerations in choosing assumptions and what sources might be available to you. I'll close with some practical issues in the execution and implementation of these types of arrangements.

There are many advantages for buyers, if you're a carrier in this market. You can gain experience in managing claims. A lot of the buyout blocks that we see have a lot of volume in the older claims. You can gain some experience in managing that tail of claims and some experience with how recovery patterns and morbidity patterns take place. Buying these blocks presents an opportunity to build the scale of your operation or take advantage of some scale if you have capacity available already. It also lets you build some expertise or attract some expertise in claim management. From a carrier perspective you may have the sales of the associated in-force business. We see that often with employers who come over from a self-insured or TPA environment to an insured environment. They want to migrate all their management to one place for ease of administration and simplicity in dealing with one group. They may be looking to migrate that with the in-force business.

In terms of the disadvantages, there are also some things to consider, like the opportunity cost of resources and other businesses. Buyouts can be resource-intensive from a number of perspectives. They're complex. You'll use claim time and time migrating claim files. You'll use investment people. You really have to invest some resources in this. Those should be resources that won't be invested in other opportunities or areas that your company or business may have.

You may experience some customer service disruption if you're migrating particularly large blocks or deals. It could be for your existing blocks of business or it could be disruptions in the block that you're moving. This creates some difficulties in resource planning. I always call planning for buyouts something like predicting the earthquake. There's a lot of quote activity, and there are a number of things out there, but you never quite know when it's going to close. Trying to plan for these in terms of ramping-up the appropriate staffing or doing your financial planning results is a difficult task.

With regard to financial results, depending on how the results of these are reported from a revenue and an income perspective, particularly if you're a public company and have statements, you want to pay attention to how you present these publicly. They'll create quarter-over-quarter and year-over-year comparisons that you'll want to be sure to explain, whether you want to report these separately or make footnotes in your results. They will create questions if people are looking at the segments and seeing that revenue dropped off a lot.

Again, high-level resource involvement, such as actuarial, legal, and investment people, can be fairly expensive. You may have a new contract. For example, when you take these blocks over, you're usually taking them over under the provisions that other people had in place. Their contract won't match yours. Your claim people will have to become familiar with the management tools and the language in the contract, in the plan that they had previously. Also, if you take these on and assume the liability, you'll assume the litigation risk that comes with these claims. You will also tie up the capital that's associated with having this business on your books.

There are two types of deals that we're talking about. I'm focusing more on carriers working with employers, and Mike will explain more about reinsurance, working with carriers. A number of structures are possible, and Mike will talk more about this in terms of how you move the reinsurance or assumption. There are other structures that I've seen requests for. Occasionally employers want to participate in the experience further out. They may want to be able to look back and see how it panned out relevant to your assumptions. If you do something like that, that can be a complicated deal. There may be a series of payments that gets you in the business of financing. Some of the credit risk requires even more involvement on the investment side.

That brings us to the deal itself and some of the things to be attentive to as you're looking at the block of business and thinking of how you're going to structure the deal between the employer and the carrier. Some seem simple, but they're easy to forget in the heat of the moment. Usually, you have all the time you need as long as it does not take more than three or four hours to figure it out.

When's the first payday? When's the date that we're thinking we're going to be taking over the liability? Who has the incurred but not reported (IBNR) liability? Who's got the run-out risk for the current plan that's underway? That's an important point you have to understand. If there are Social Security approvals later on that that are retroactive, who's entitled to those monies? Is the contract silent on that, or is it something you're counting on as part of your price?

There is a lot to be careful of on the expense side as well, and one is broker cost. The simple ones are those that have commissions with the deal. It's easy to forget at the time you're doing these that a lot of companies may have deals with particular brokers, overrides, special agreements, or that they count these towards some kind of in-force or new sales production bonus programs that they run. Those costs have to be recouped as well.

It's important to think of claim adjudication costs, too, particularly if you have an older block of claims that you look at. The cost for managing the five-year claim that you have on your books now from business that you had in force is different than the cost that this five-year claim's going to be. First, you have to have the cost of bringing it on and setting it up. Second, a lot of people, when they bring these, are trying to bring some further risk management and influence some outcomes there. It'll be different from something that's been through your process from day one. It's important to account for that.

I've mentioned the high-level resource attention. These are fairly expensive resources. If you get very high-level claims people, actuaries, investment people, and legal people, it can mount the cost. You may have costs associated with management, depending on the block of business and the things you're setting up. For example, will there be dedicated phone lines? Are there any kind of requirements in the deal about communications on paper and that kind of stuff?

It's pretty common to run into some data quality issues in these kinds of transactions, no matter what environment they're coming from. Getting claimant-level detail with all the things you'd like to understand about disability dates and causes and occupations can be difficult. Even if you do some internal scrubbing of data you get, you can usually weed out a few anomalies to put questions back to people. If the date of birth is well after the date of disability, that's a red flag, for example.

It also can be difficult to get contract and plan information. You may have some summary plan descriptions, but, again, it's easy to miss things or to misunderstand inside limits of the plan, such as monthly limits, 24-month mental/nervous limitations, definitions of disability that apply, or whether cost of living adjustment (COLA) coverage is applicable and at what point. Those can be things that can change your assessment of the liability you're assuming by a fair amount.

For claim demographics, there are a lot of things that, if you take the time to look at them, are very instructive. Look at the duration since disability, occupations, causes, ages, geographic dispersions, and offsets. This is important in order to identify opportunities to influence the outcomes in a positive direction and to create opportunities for returning people to work. Unless you understand how these demographic things play out, you don't really have a good assessment of your opportunity to influence that. Second, you don't have a good idea of how your assumptions have to reflect the block you're taking over. Taking over a block of 55-year-old people all in one economically depressed area is very different than taking on a block of younger people with highly transferable skills. You need to be able to address that in your assumptions quantitatively, as well as qualitatively.

Often, if you look at these deals, you get the list of people who they want you to consider for the claim listing. I guess I'd caution you that even if you get a claim listing, be sure you shoot back the question about how it was selected. Don't assume because you have the list that it has everybody who was on the plan. Make sure you understand how they selected the ones they asked you to quote on. It could be that they gave you everybody who was over two years on claim that they didn't think would ever recover. That would probably affect your thinking about what your assumptions might be. Be sure you understand how that list came to you.

It's also important to understand the current claim management. If you do some due diligence, understand if the medical assessments have been done and if they are up to date. What are the current practices around the risk management, how often they've touched base to re-certify disability, and what their process is around offsets, Social Security, partial work capacity, that kind of thing.

Again, there are a couple of reasons to understand this. One is that it plays into your assumptions. If you're looking to influence outcomes at all, you need to understand the environment they're coming from to understand what you're going to be able to bring to the transaction. The other thing that's important from a litigation perspective is to understand that if these people, as a group of claimants, have been managed a certain way for a long portion of their disability. When you bring them into a new environment, that change can often result in some great degrees of dissatisfaction and can even result in some increased litigation for you. It's important to understand as you migrate these blocks of claims what you're talking about from an environmental perspective.

Let me touch on some assumptions and some places to look and think about. One is that many claim blocks we see are very heavily weighted towards older claims. We spend a lot of time looking at termination trends in the tail. We spend a great deal of time thinking about mortality. We've seen some disabled mortality shifts. We spend a lot of time modeling that out.

Some other things you'll want to think about are the currency of your understanding of your block dynamics around recovery and mortality, and the granularity of your information. If you have an understanding at a block perspective of what you're seeing in the tail, that's good, but your block could be a much different mix by either age, cause, or occupation than the block you're bringing on. The more granularity you can bring to your understanding of your assumptions, the better understanding you're going to have of the liability that you're bringing on the books.

There are a couple of places to look for industry sources. These are your starting points. There's been a lot of work going on about some updated disability assumptions, both on the individual and group side. There's a task force that came together in the SOA, and there are subgroups that work on the individual and group side. On the individual side, within the last six months, I think they issued their final report. They did a study where they surveyed a number of companies and updated the disability termination assumptions for 1985 Commissioners Individual Disability Table A (CIDA). They coined it 1985 CIDC. There were significant differences from the CIDA table. The report also noted significant differences among companies, based on a lot of factors around underwriting and block mix.

That's one source to look at. However, I caution you, without an understanding of how your experience is stacking up against these things, I wouldn't necessarily say this is appropriate for every transaction. That's an individual-based experience table as well. The other place is Table 95A. There's currently a committee that is looking at 95A and trying to understand how well that's fitting recent experience, and looking at whether to recommend modifications or to go on to build a new table. It's another place that's a starting point. You'll want to understand how your experience fits into that, to be able to draw any conclusions about how to use that in any work you do around valuation.
I also have some final thoughts around mortality. I hit on this for a couple reasons. Particularly for older claims, after two years mortality becomes an increasing portion of the termination rates. After five years it's very significant. I mention that

because, if you're looking at your ability to influence outcomes, clearly you're more focused on the return-to-work and those kinds of issues that are becoming a shrinking part of the total termination rate as you get very older claims. You want to be sure you separate out which parts you're hoping to influence.

In terms of benchmarks I think the task forces are in the midst of trying to figure out where the right bases and standards should be. As that work progresses and more information comes out, those will be good sources, but I would say, too, that there are variations among companies. You really have to understand how your particular company experience impacts what happens to those rates.

Last, a couple of comments in terms of practical issues. There's a great deal of time invested as these are fairly complex transactions, by the time you get through all the legal and investment work, the understanding of the block you're assuming, how all the termination rates are going to play out, and the demographics of the block you're assuming. Data quality is a big issue. You're likely going to find yourself not having all the pieces of information that you'd like to have to be able to do all the analysis. There will be some volatility from the assumptions, either through data, generated by data-quality issues, or just understanding how the tail behaves. You have to consider your ability to influence outcomes and in the context of that consider any kind of risk management actions or things you have in place, as well as the balance between mortality and recovery.

This is a complex transaction. It's easy, I think, to get in over your head before you do a lot of the groundwork. If you do get in the marketplace, it's important to get in and commit the level of resources you need to understand these things. Otherwise I think you can find yourself out ahead of where you'd want to be pretty quickly.

Mr. Michael E. Gabon: I'm going to cover the insurance carrier and reinsurer marketplace. I will focus on group claims blocks, so there are no active life reserves and there's no IBNR. I'll focus on closed blocks, so there are no new entrants. One brief comment about the employer marketplace versus the insurance/reinsurance carrier marketplace: In the employer marketplace, once the buyout occurs, there's very little interaction afterwards. In the insurance or reinsurance marketplace, aside from a novation, you have an ongoing interaction, to some extent, between the insurer and the reinsurer.

I'm going to be covering the advantages and disadvantages for buyers and sellers, different deal structures, some high-level issues in terms of a transaction, working into some detail, and post-closing issues of the actual buyout.

From the buyer's side, the advantages are similar to what Steve mentioned: gaining experience, profit opportunities from under-managed claims, or technological advances. You can rehabilitate people to return to work or try to negotiate settlements. The disadvantages are the time involved and earmarking of capital. However, if that's the business you're in, it's understood that that's part of the business. You expect to set aside capital.

From the seller's side, though, and this is what I see as a reinsurer, the advantage to the ceding company is disposing of a liability with a potential gain. So far we haven't had anyone wanting to dispose of a block taking a statutory loss. Everybody wants to be paid or to pay less than what their current reserve is. With novation being a total removal of the business, with the name of the direct writer no longer on the contract, there's an immediate gain. On the reinsurance side, whether it's coinsurance, modified coinsurance, or what have you, the gain is taken as the claims come off. At least that's what our auditors told us.

One of the other advantages to the direct writer is freeing up capital. The risk-based capital (RBC) component is 5% of claim reserves on disability products. For long tail or longer duration claims, say, 5–8 years into the claim, that's thought by many to be onerous, since there is probably less volatility the further you go out.

You free up resources as well. I hate to say this because a lot of you are direct writers, but if they're getting out of the business or disposing of a block, there may be staff layoffs involved, since this is a significant change in the direct writer's operations. I'm with an offshore reinsurer, and one of the things that we bring to the table is more attractive pricing through our being offshore. We're a low-cost provider. Statutory accounting of the U.S. doesn't apply, so we're able to hold reserves on a more economic basis.

There are some disadvantages to the seller. You're not totally out of the business as you are in the employer market. This is, again, assuming a reinsurance scenario versus novation. The liability is still on your books.

The type of buyout I have mentioned is novation, which is assumption reinsurance. The reinsurer's name is now in the contract. It's almost like a one-time interaction. In other words, after closing, the deal's done. The other type of reinsurance is indemnity reinsurance, and we're talking about a 100% quota share here. The ceding company's name is still on the contract, and there is interaction over the long term between the reinsurer and the ceding company. Excess reinsurance is not really used in buyouts. There may be some reinsurance of existing LTD coverage out there, which is on an excess basis, but when you're doing a buyout, you're buying out the whole thing. I'm just mentioning it as a point of completeness.

I'm going to focus on indemnity reinsurance, because assumption reinsurance is analogous to the employer marketplace where it's one time, over and done with. In the indemnity marketplace, with LTD you've got investment risk or investment management, termination risk, and expense risk. In terms of structures, it depends on what the ceding company's main objective is. Do they want to be out of the business totally? Do they want to retain the administration but get out of a claim management aspect? Do they want to retain the claim management? A pure buyout, of course, would transfer all of these things to the reinsurer.

Under a coinsurance arrangement, both the assets (which could be cash or the actual assets that the ceding company's holding) and reserves are passed to the reinsurer. Again, I'm assuming 100%, since we're thinking that the ceding company is getting out of the business totally. The other way would be modified coinsurance,

and the ceding company would retain the assets and the reserves would be transferred back, etc. But if we're talking about a pure reserve buyout, where the ceding company wants to get out of it totally, we'd be talking pretty much about coinsurance. The rest of my discussion is about coinsurance.

I'd like to give you an idea of the type of pattern of payout of LTD flows and the liability flow. There's a fairly long tail, but the bulk of it occurs early on and just drags on for a while, and so you have asset/liability issues potentially.

Starting out on the asset side from a high-level viewpoint, what's the form of the transfer of assets? Is it going to be securities, which are typically fixed income, or cash? These are things that you go through when you're doing a buyout and talking to the ceding company. Then there are some other issues at the inception as well. Let's say that cash is provided. From the reinsurers' viewpoint, their concern is, how can we invest the money right away? Depending on the size of the deal, if it's very large, you've got a ramp-up period.

On the liability side, again, there is a high-level aspect. You could have an unpaid liability, such as IBNR, Social Security recovery reserve, reinstatements, and claims that could reopen. I separated reinstatements into two categories: (1) reinstatements from appeals that the claimant is successful on and (2) reopening of claims due to re-injury. We also have expense issues from the liability side, such as broker costs, which often can be very large.

There are also income taxes that you've got to take into account, and in the offshore marketplace, there's an excise tax that's payable. There are also reserves for litigation on existing and future litigated claims. These are things that you would try to take into account in terms of the treaty. Who'd be responsible and to what extent, and how are you going to resolve those issues?

The data quality is probably better in the insurer marketplace than the employer marketplace because insurers have been in the business for a while. Then again, a lot of the detail and the benefits may not be there. We've seen transactions where we're looking for a start point and a stop point for each benefit, and companies have provided us with a column saying somewhere between 2–8 years or 7–15 years. What are you supposed to assume for how long the benefit goes? Would you guess at the mid-point of that range? Your evaluation of the deal could be way off, depending on what you assume.

When looking at demographics of population, duration since the disability is one issue. To the extent that the claims are younger, you have more chance of getting the claimant off claim, if there is a valid reason for doing so, versus longer-term claims that are more likely to be valid claims. It's more like an annuity payout at that point. Is there enough time remaining in the contractual benefit period for the claim manager to do anything? It takes some time to transfer claims over, and there may not be any actual effect that the claim manager can have.

Typically, we haven't been given full-fledged data on occupations. Whereas in the employer marketplace, you pretty much know who the employer is, so you have an

idea of the occupation of the people in that group. Also, in the insurance-carrier marketplace, an LTD block could be 50 or 100 groups of not so many claims in each group versus a couple of groups with tons of claims in each category. The degree of heterogeneity or homogeneity is an issue. The employer marketplace is probably more homogeneous than the insurance carrier marketplace. We've got age and cause. The definition of the own-occupation period can have an effect. If the claims are fairly well seasoned, that's not an issue, but to the extent that they're younger, there's a changeover point that gives you the ability to go back to the claimants to see if they actually are disabled or not.

The next point is understanding where the claim came from. Did it come from a STD claim that turned into an LTD claim? Did it arise from the underwriting nature of the direct-writing company, or what? Also, what are the claim management practices, past and expected, future style of management or practice, and how up to date is the information in the file? Are the offsets approved or are they just estimated? These are all things to take a look at in evaluating a deal.

Is there further detail on the benefits? For example, in cost-of-living adjustments, a lot of times data is not full. You're looking for the amount, obviously, when increases take place. Rather than increasing the benefit each year by the CPI or however, some companies adjust the reserve discount rate. It's not directly a one-to-one correspondence. Some of them haven't recorded how long these increases take effect. There's one block that I was looking at where the company didn't have full-fledged COLA, and working through their data, it would have increased the overall reserve of the block by more than 35%. It definitely can have an effect. A lot of companies just aren't reserving for survivor benefits, but it has a cost to it.

In terms of offsets, you've got Social Security. Again, the issue is, is it approved versus pending? You like to know the assumptions behind the direct writer's estimate, and also if they're assuming any collection of past overpayments.

If you have a deal that both sides are mutually agreeable to, the next step would be to draft the treaty. In the reinsurance market, you basically have a reinsurance treaty. It's a long-term contract. There's going to be interaction between the two companies. There's also the establishing of security mechanisms. Do you set up a trust or letter of credit? From the ceding company's viewpoint, you want to make sure that the reinsurer can pay the claims. One mechanism is to have either a trust or a letter of credit set up. That gives you some security that the payments will be funded. Then, again, if the transaction is material to the ceding company, they're going to need regulatory approval. The timeframes can vary, depending on how quickly you can get these things done.

Now, let's say you've got your treaty. You've transferred the funds. The deal's set. Again, this is another difference between the employer marketplace and the reinsurer/insurer marketplace. You've got audits that you can do just to make sure that you're receiving the correct data and claim management practices are working. From the buyer/reinsurance viewpoint, there are reserving issues. If you're offshore, you're allowed to hold things on a more economic basis versus a U.S.

statutory basis. The general method is the same as what you would do for anything else. It's just discounting what you expect the future benefits and expenses to be.

Steve referred to the 1985 CIDA Table and Table 95A. Table 95A had the experience of 10 companies and has a basic level of terminations, but, as Steve was referring to, the experience of each buyer is going to be different. It depends on your book of business. That's really going to depend on how you do your claim management. Table 95A may not reflect the origin of a particular block that's being sold, or its demographics or future claim management activity. Table 95A was based on what you'd call usual or normal or standard or some or other claim management activity.

Mr. Skwire: I'm going to expand a little bit on some of the topics that Mike and Steve have brought up in their presentations. They've mentioned a lot of issues connected to the pricing of LTD reserve buyouts. In talking about the pricing, they focused mostly on the factors that you need to think about in determining the expected level of future claim experience. Those include things like whether your own claims department will be able to improve the experience on a block, what the demographic breakdowns of the block are, and the offset experience. It's very important to have a good grip on that information.

I'd like to introduce the idea of looking at the variability of the future results by using a stochastic model. A lot of times I think stochastic models are seen as being too complicated, too large, and too complex to be able to get practical results, to really be able to provide something that you can get your hands on and use in a real business situation. My goal is to show you some examples of how a stochastic model can be used in a very practical fashion to try to study some of the future volatility inherent in an LTD block. Also to really try to get a handle on the variance involved in the pricing of these blocks of business.

One type of model that we're all familiar with is a deterministic model. A deterministic model is really geared toward identifying the expected outcome. In the case of disability insurance, this might be calculating your claim reserve for a given block of claims and just focusing on that single number of the claim reserve. You can extend a deterministic model by looking at some different scenarios, and by doing that you get a sense of the range of results. That's a very helpful technique, because it can help you figure out how to deal with those situations. What if experience is better than expected or worse than expected? How is that going to impact the business that you're running?

The next step is to move on to a stochastic model. The added advantage of a stochastic model is that it helps you look at the likelihood of the different outcomes. It's not just the range of results, but it's the likelihood that you'll experience results falling into those certain ranges. How could your loss ratios vary? How could your future claims vary in relation to your expected?

There are a couple different types of variation that it's helpful to look at with a stochastic model. First of all, there's fluctuation about a known expected value. This is the case where, for example, you're tossing a coin, and you know it's a 50/50

proposition, but you're going to flip it 1,000 times, and what are the chances you're going to have 550 or 450 heads? That's a simplistic example, because with a coin toss, it's easy enough to calculate the variance without having to go through a stochastic modeling scenario. But when you start to get into some of the financial arrangements that we deal with, reinsurance arrangements and reserve buyouts, that variance gets more difficult to calculate in a closed fashion. Oftentimes, one of the most practical ways of measuring variance is through a stochastic model that will enable you to generate a bunch of outcomes and analyze the spectrum of those results.

A second type of variation that you can look at is the movement of the expected value. This is a little beyond the scope of my presentation, but it's a very important type of variation. This is the situation where either the expected value is unknown or you think that the expected value might change over time. It might drift up and down. Maybe this is the situation where you're going to be making some improvements to the way claims are managed so you'd expect the terminations to improve. It could be that you're anticipating some economic problems, so you would anticipate terminations to deteriorate. You may just want to measure the possibility that the expected is going to move around.

There are different ways that you can take a look at movement of expecteds. I'll mention just a couple. A random walk is one that I think can be pretty enlightening. The premise behind a random walk is that for each time period the expected value is equal to the actual result from the prior time period, then you generate the actual result. It might be a little bit above or a little bit below the expected. For the succeeding time period, again, you take the actual result, and that becomes the expected, and you get this pattern of drift, the random walk pattern. It can be very interesting to see how the performance of a block can change over time.

That type of pattern can be modified in different ways. One that's fairly common is a mean reversion type of series, where the premise is that there's a long-term known level and that if the experience diverges too much from that level, it's going to have a tendency to work its way back down. Sometimes you'll see this in modeling interest rates, where the assumption will be there's a long-term average of 7% or whatever, and as you generate some random interest rates, if it gets too high, it's going to have a tendency to come back down. If it gets too low, it's going to head back up. That's one type of bound that you can put on these random scenarios.

Another method is a lattice, which essentially builds a grid of future results by assuming that in each successive period, experience will either improve or deteriorate. There's kind of a binomial pattern. You can do it with more than two if you like, and you get a denser lattice. But in future periods you generate a series of patterns, and of builds out a grid as you go forward. These are just a few examples. This can be a very informative analysis.

For the purpose of the simulation that I'm doing, I'm going to focus on modeling fluctuation about a known expected. In this case, that modeling is done through the process of Monte Carlo simulation, which is conducting a series of independent

trials using the same expecteds. For example, the 1,000 coin flips would be 1,000 trials. You conduct those trials. You take a look at the outcomes produced by those trials, and you can arrange them in percentiles. Eventually you end up with a result that gives you a picture of the likelihood of the different outcomes.

What I've done for this model is to construct a hypothetical block of group LTD claims. I put together a block of 1,000 claims to examine. I tried to put in a good mixture of different benefit periods, some fairly short at two years, all the way up to lifetime. I used a variety of different ages at disability and a variety of different dates at disability, which is to say different durations of claim at the time the valuation was done. I ran 10,000 Monte Carlo trials to examine the fluctuation inherent in this claim block.

I used a tool that we've developed at Milliman & Robertson called the Risk Simulator. This is a system that was originally developed in connection with some of the required capital analysis that's been done by the AAA, and that tool can be used for all different types of insurance. It's often used to answer questions connected to reinsurance or to capital management. For instance, what are the chances that a block of business will have a loss ratio exceeding a specific level in a certain year or over a period of years? In this case, I focused on disability insurance and on an open-claim block. Assume that I have a known expected, that I've got a table that represents how I expect this business to perform. Then by doing the random trials, I'll study the volatility around that expected. Chart 1 shows some of the results when I do the projection on a block of 1,000 claims.

The left axis represents the deviation between the actual future claims in the scenario being studied and the expected claims as given in the anticipated claim reserve. If we draw a line at zero going across there, that represents the expected, and you can see that sort of curves around the 50th percentile. Then you've got a certain number of cases at the upper right where experience is worse, and situations on the lower left, in the lower percentiles, where experience is better than expected. This can be a very useful distribution to put together.

CHART 1

Hypothetical Claim Block
1000 Claims

Percentile
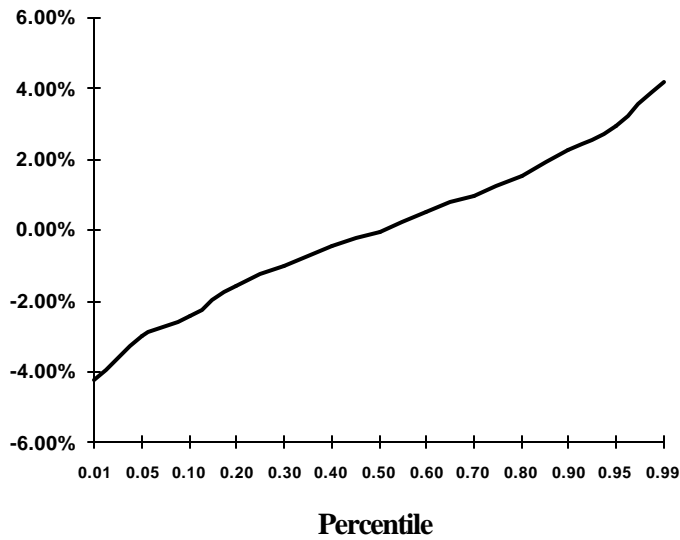
There are a couple of different things that you can do with Chart 2. First, you can determine the likelihood that your claims experience will exceed a certain level. If you want to know what the chances are that actual claims will be more than 2% worse, you start at 2% and draw a line over, and you go down, and you're at 80%, or the 80th percentiles. There's only a 20% chance that it's going to be worse than that.

CHART 2

# Hypothetical Claim Block
1000 Claims

Percentile
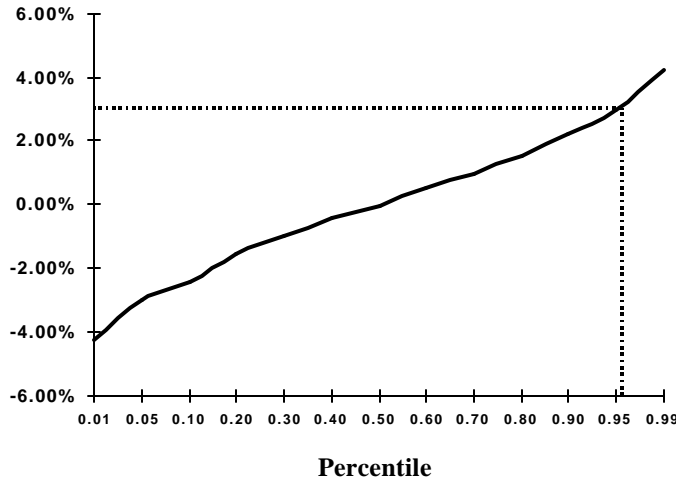
Alternatively, if you want to look at it in the other direction, if you want to have 95% confidence that your claims will not exceed a certain level, you draw the line up from 95 and over. That might lead you to think you need about a 3% additional margin beyond the claim reserve to add that kind of confidence. This can be a very useful pricing tool when you're looking at claim buyouts. It's almost a last stage in the process after you've built an expected level you feel comfortable with. This can help you make sure that your pricing supports that level and that you're going to have more confidence in your experience going forward.

I do have a couple of cautions in interpreting these results. First, as I mentioned up front, this is assuming the expected is known, which is not always the case. Things do change in real life, and that's a very important pricing consideration to factor in. This is just the statistical fluctuation about the expected, and you'll want to make sure those other factors are getting considered as well. Second, this is just a hypothetical claim block that I've put together. Each block is going to have a very different kind of distribution. As you look at some of your own blocks the size, the demographics, etc., are going to change the shape of this curve, sometimes fairly dramatically.

What I'd like to do now is take a look at some of the factors that do change the shape of the curve and show you some of the things that the stochastic analysis suggests can be pretty important (Chart 3).

CHART 3

Hypothetical Claim Block
Fluctuations by Size of Block
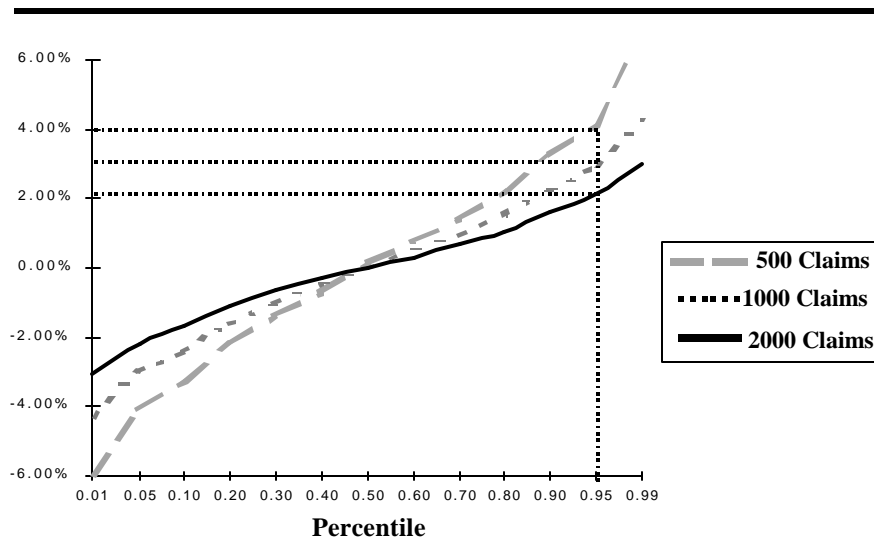
One of the most important is the size of the claim block, and you won't be surprised to see that the smaller the block, the greater the volatility that's inherent in it. The light dashed line represents a block of 500 claims, and the solid line is a block of 2,000 claims. The lighter one has a much broader sweep on the curve, representing a much broader range of results. If you translate that into pricing margin, I've just drawn a line upward from 95% and then over to the other axis, this can illustrate the types of margins that might arise if you were looking for a 95% level of confidence: 2%, 3%, and 4% for these different sizes. These percentages might seem a little bit small at first. Again, they are going to vary based on the specific claim block, but when you're talking about claim blocks, there can be some real large amounts of money involved. A percent or two can add up to some pretty significant sums of money on this business.

We'll look at a couple of other types of variation here. Chart 4 is fluctuation by age, and technically I think this is age at the valuation date, and this has some degree of variation, not excessively high. You see a little more volatility in the under-age-45 block, which is kind of interesting, probably because there are higher expected recoveries at those ages, as well as a somewhat longer tail, so a little more room for up and down movement.

CHART 4

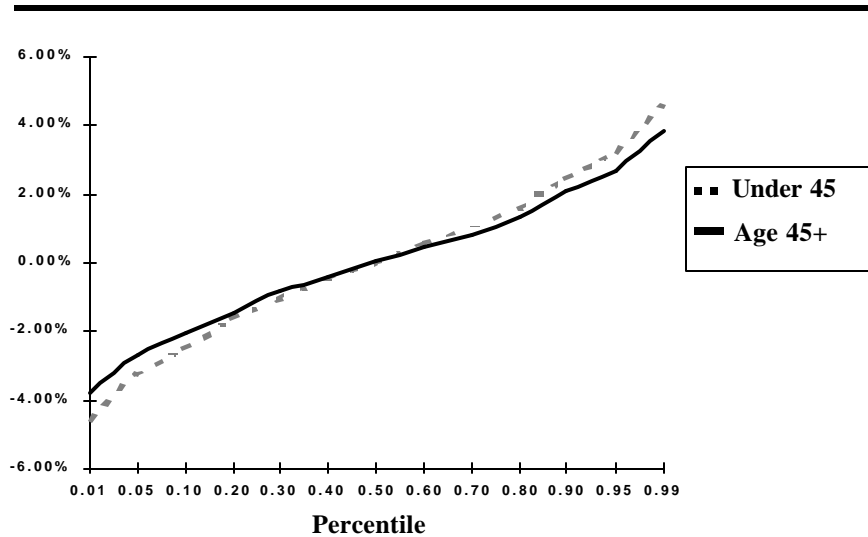## Hypothetical Claim Block
Fluctuations by Age

Chart 5 shows the result that I found the most surprising when I was putting this together. When comparing short benefit periods and long benefit periods, there where almost no differences between modeling. I think the short benefit periods represent two- and five-year, and the longer benefit periods to age-65 and lifetime. I think what happen is that we have a couple of offsetting factors that end up putting the results fairly close together. The short-term claims have greater expected termination rates during the period of the claim. For the first two years or so of the claim, you have might higher expected recoveries and, therefore, higher variance in the actual termination rate experience. However, even though there's a lot of variance in the termination rates, there's a very limited period of time that those claims are going to be around. The variance is whether it lasts 12–24 months, and, either way, it's not an extraordinary period of time.

CHART 5

Hypothetical Claim Block
Fluctuations by Benefit Period
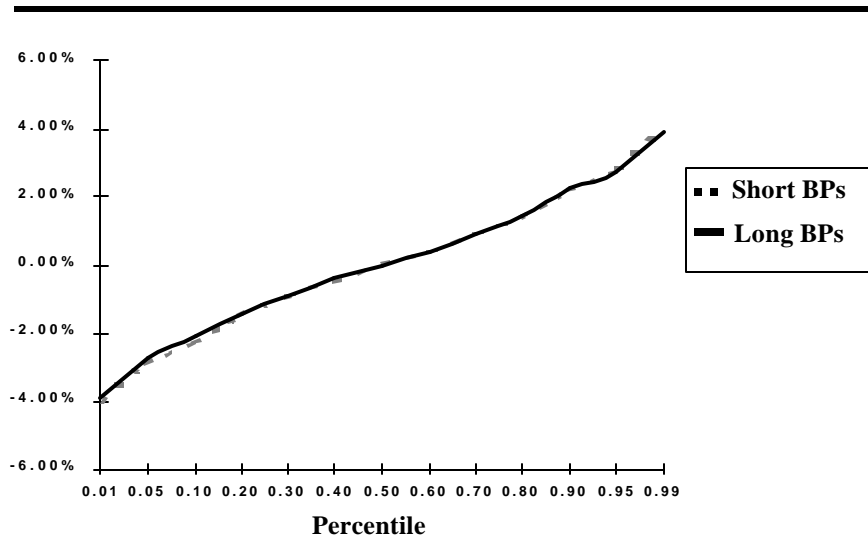
On the longer benefit periods, once you get out into the tail, as Mike explained, the expected recoveries or expected claim terminations are much lower, but the amount of time for which those claims can be paid, is much longer. You're dealing with the difference of paying someone for six years or 36 years. I think those two factors combine with each other, and it's very interesting that the pattern of volatility comes out so close for the different benefit periods.

One of the very important issues, and I think both Mike and Steve mentioned this, is the duration of the claim at the time the valuation is performed. Chart 6 shows that new claims, i.e., claims with a short duration, recent disabilities, have a much greater degree of volatility because of those high recoveries and terminations that are expected in the first few months. If you're dealing with claims in a long duration, open five years or more, you get a much lower degree of volatility. It's a more predictable pattern of payments and future experience. You can see where this type of experience is going to have a real impact on how you price the block. This is very useful information, both for a direct writer and for a reinsurer or other acquirer of a claim block. This is good information to have to be able to do your pricing.

CHART 6

Hypothetical Claim Block
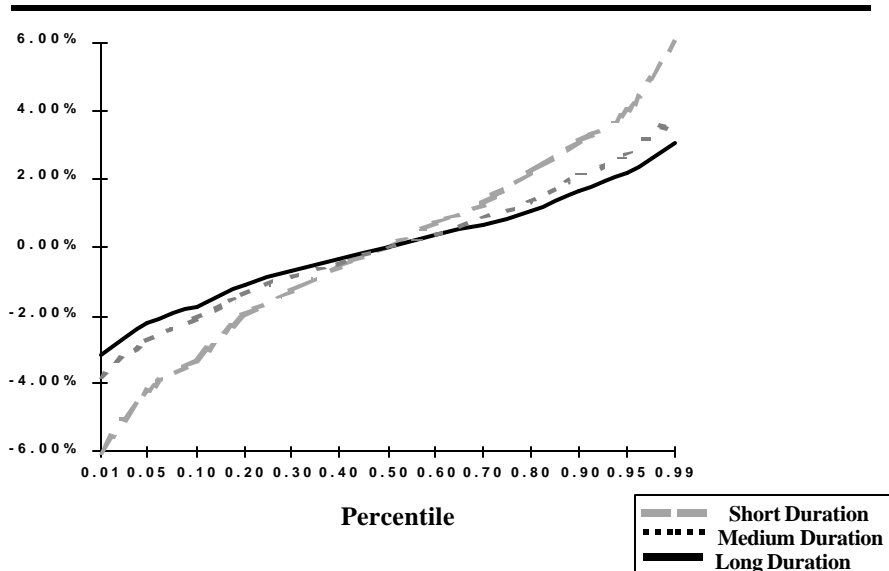# **Fluctuations by Claim Duration**

Chart 6 also, I think, supports what Mike was talking about with the volatility in the tail of claims and the fact that the RBC requirements don't really make a distinction regarding the duration of the claim. This analysis suggests that volatility is much less in older claims. I think that's been one motivating factor for a number of direct-writing companies to seek out reserve buyout situations, especially focusing on the older segment of claims, claims two years or older or five years or older, since it helps them get around some of those capital requirements. I would caution you not to take these specific numbers as being directly related to required capital, although there are some similar types of modeling. The required capital modeling factors in other issues as well, so don't try to tie 3% volatility to a 5% RBC requirement. It's really measuring some different types of things.

Chart 7 is the difference between claims with a COLA benefit and without a COLA benefit. As expected, the COLA adds a little bit of volatility through the changes in the benefit amounts. One reason I included this example is because it also serves to illustrate the importance of considering different expected values for different types of claims. A lot of times COLA claims will have a different pattern of underlying terminations than claims without COLA benefits. That's not reflected in Chart 7. I'm assuming everything's working off the same expected. If you factored in the different expected pattern for the COLA claims, you might get a different result and maybe even some increased volatility.

CHART 7

Hypothetical Claim Block
Fluctuations by COLA
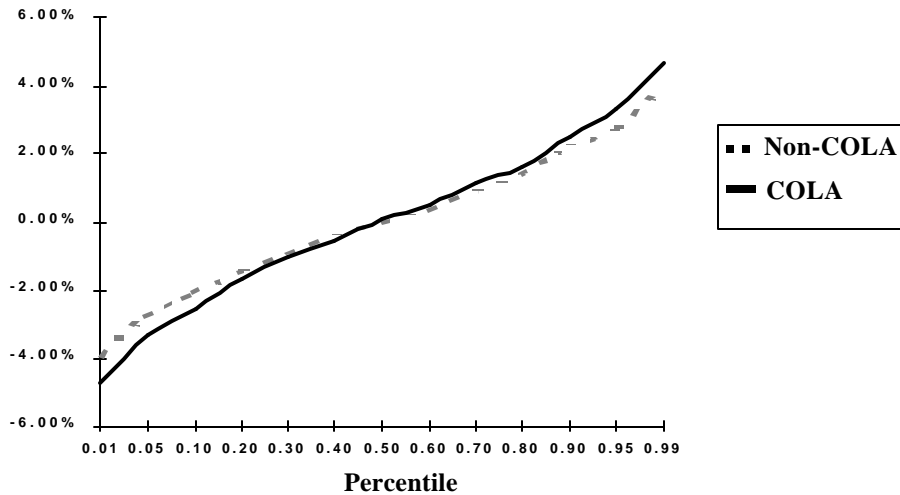
You can probably see where there are opportunities to extend this type of stochastic modeling when you're looking either at claim blocks or at other types of modeling. You could look at different points of time. You could project the block into the future and develop different distributions: today, five, or 10 years down the road, and get a little more understanding of how the experience might develop. You could address some of these issues about how the expected values might change over time. You could use this type of model to address some of your capital needs, to look specifically at your own company's situation in relation to some of the industry formulas for capital. You could get into some of the asset/liability issues that Mike was talking about. You could introduce incidence rates or loss ratios into the model. All this makes it more complex, but it certainly provides useful information along all those lines.

There are a lot of advantages to be gained through stochastic modeling. The modeling of LTD claim blocks is really a very practical way to use a stochastic model. It's a fairly limited kind of situation. There are not too many different things that you're trying to model at once, and it provides a lot of useful information. It is probably not as difficult as it sounds sometimes.

Mr. Daniel L. Wolak: You have shown many items on factors to look at when purchasing a block. One other item I would add, is to know the economic status of the claims examiners of the seller. In other words, will the claims examiners get new jobs at their current company? Will they be phased out? How long have they known about this particular buyout? That may determine what status the files are in and how well the claims have been managed.

One item that you didn't mention that is intriguing to me is the investment climate at the time of the transfer. We're talking about a single premium deposit. The buyer is taking on a large sum of cash at a given point in time. Let's say the seller is either earning or has a reserve basis of a 7% interest rate throughout. Say at the time of the transfer, the buyer is seeing an investment climate that is 6.5%, then there is a little discontinuity there. Technically, when the seller makes the transfer, there would be a gain on the assets, because the assets could be cashed out at a higher rate. I would think that many times the sellers are not that sophisticated in how they're going to realize the capital gain back to the division that is making the transfer. That creates an issue.

Mr. Gabon: The situation has occurred. This is an issue when you're discussing the transaction with a ceding company, whether they want to transfer assets or cash equivalents, up front. This is something that they've got to recognize. What can you really do about it? They can reallocate some assets and maybe sell some of the gain, some of the loss, if they're not totally earmarked to that line of business. It depends on how they're structured, how they've segmented things at the direct-writing company. Oftentimes, from the reinsurer/buyer viewpoint, you don't know. That's something that you just have to alert them to.

Mr. Wolak: As an offer is prepared, do you include a 30-day guarantee, or a period to decide, so you can reevaluate based on the investment climate? Would that be a common proceeding in that regard?

Mr. Gabon: There is typical procedure. You'd have, say, a proposal at one point that might take you into a second phase, where the seller short-lists the buyers. Then, at the final stage, they're deciding upon who they choose to go with, or a group of companies that they choose to sell to. If there's a buying document signed, it depends what the contents of that buying document state. Certainly if you don't want to be taking the risk, you can put a phrase in there. You don't want to be making a forward rate commitment, which is what it's boiling down to. But there are ways, when you quote, to take that into account.

Mr. Skwire: Couldn't you accomplish that through using a derivative instrument?

Mr. Gabon: Yes, you could do that. You could base it off of a Treasury note, and however the Treasury note floats, that's how it floats. There are different alternatives.

Mr. Jean-Francois Poulin: I just want to make a point about this same subject. I think what we do in our quotes is make an interest-rate adjustment from the time you quote to the time you're actually getting the money. You adjust it based on either a Treasury curve or whatever curve you're happy with.

Mr. Gabon: Yes. You specify that in your final bid or binder, so it's known.

Ms. Cheryl A. Thomas: You commented upon the claimants expectations of the change from when they go from being under the employer or under the direct writer to the new claims manager. There can be differences of opinion between the

employer and the direct writer or the direct writer and the reinsurer as to how we manage these claims and what is considered appropriate and the potential for litigation. I was wondering if you could comment upon some scenarios that you've experienced and how those are resolved.

Mr. Mitchell: We haven't run into a lot of bad situations, largely because we're trying to set the expectations up front, through the diligence process and through looking at what the current management is and looking at what the current contracts are. We've avoided a lot of it through some preparation and groundwork. Any time you have a change, you have a possibility that people are going to have a much different perception. People who haven't had a lot of communication with the carrier or the employer for a long time will suddenly think, What are these forms? Why am I going to another doctor? These things create a lot of unrest. Whether it's the TPA or the employer you were dealing with, if you set expectations up front, it goes a lot better. In a lot of circumstances where you have the employer, you also have the in-force case, and in that case, I think it helps somewhat, too, since they're familiar through their other experiences with the claim management process and how we manage claims.

Mr. Gabon: In terms of setting expectations, you can formalize them in a document between the seller and the buyer, stating how you plan to administer and manage the claims. You can try to address as many situations as you can in such a document so that, as Steve was saying, your expectations are outlined.

Mr. Raymond B. Biondi: Dan, in your model, you're measuring volatility. What I wanted to know is volatility in what? Is it a claim count a year after the valuation date? Is it discounted values?

Mr. Skwire: It's in the duration of the claim, in the claim termination rates. From the table of expected claim termination rates, we build the distribution of claim durations. Here are the chances it'll last one, two, or three months. Then we generate a random number and figure out how long that claim will last, and, therefore, what the benefits are. We conduct a bunch of independent trials along those lines.

Mr. Biondi: Can you give us any sense of the standard deviation you used in the termination rates?

Mr. Skwire: I guess it would just be whatever is inherent in the expected table itself. The standard deviation can be measured from the map of the outcomes that we've generated.