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## **Session 70TS Long-Term Disability Valuation Issues**

**Track:** Health Disability Income

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*Summary: The valuation of group long-term disability claims can be very challenging. In addition to the fundamental concerns of expected claim termination rates and interest rates, valuation actuaries must also consider the impact of incurred but not reported (IBNR) claims, known and estimated offsets, unusual benefit provisions and claim expenses.*

**MR. G. NICHOLAS SMITH:** This session is a teaching session on LTD valuation issues and as such is supposed to go a little deeper into the topic. It's also supposed to be a little more interactive, so I'm hoping to get some questions. This session has three speakers: Eric Poirier, Delaine Hare and me. I hope the topics we're going to talk about will be thought provoking and controversial. As such, we have put a disclaimer that the information and views expressed in this presentation do not represent the views of the companies with which the speakers are affiliated.

I am going to review some general LTD valuation issues. Eric is going to demonstrate a new way to look at your financial results. Then I'm going to talk about GAAP LTD margins, and, finally, Delaine is going to take that topic a little farther and say how it impacts pricing.

I'm going to review some LTD valuation issues. Here is a list of papers; documents that exist that have to do with providing guidance in setting LTD reserves.

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- Health Practice Note 1995-6, November 1995, titled Group Long-Term Disability Income Insurance.
- Actuarial Standard of Practice No. 5, titled Incurred Health and Disability Claims
- NAIC Health Reserves Guidance Manual
- New York Regulation 56
- Actuarial Standard of Practice Exposure Draft, titled Determining Health and Liabilities Other Than liabilities for Incurred Claims

If we have a question that arises, you might want to refer to one of those. These papers are in order of relevance to LTD. The first one is completely on topic and has a lot of good stuff. The second one is from the NAIC. You have to pay \$50 to get it, and it has some LTD stuff in it. The new "Actuarial Standards of Practice No. 5" has some LTD and has some non-LTD material in it. New York Regulation 56 has some, and finally there are a couple of points in the other "Actuarial Standards of Practice" on the non-claim reserves. Is anybody aware of any other documents out there that talk about LTD valuation? No.

One of the handouts is a paper that I wrote mostly in 1999, and then it just sat. Part of the reason for this presentation is to try to introduce that paper into the literature. Why the paper was written: I felt there weren't that many LTD guidelines out there. There's been some stuff subsequent, the "Actuarial Standards of Practice," but they still don't cover much of what's in the paper. I was chairman of the LTD Experience Committee for many years and created Table 95A. I wanted to make sure that it's applied correctly. If you take any table and apply it incorrectly, then you're not going to get valid reserves. It sort of defeats the purpose of having a good table. Finally, I've been in this industry for 25 years, and I've noted abuses in valuation. The paper discusses some of those. Basically, the purpose of the paper is to provide more valuation guidelines, to discuss some issues and document these abuses and recommend how to handle them.

What the paper contains is a discussion of major claim liability, some valuation practices, claim administrative practices and product features. Over time I expect to maintain this paper and cover new products, and I want to add a major section to it that analyzes the impact of practices and products. In discussing this paper, I'm not going to go much in-depth into it. I'm going to just touch on some pieces. There isn't time to cover much, so if LTD valuation is pertinent to your job, please read the paper.

I'm going to start with what it takes to have a good valuation. You need a good table. Start with that, and then after that you need to have the proper duration, the proper amount and the proper claims. These three factors are independent of whether you're doing GAAP or STAT. Now, to illustrate that further, I'm going to talk about bad practices.

Missing claims: One of the common ways in valuation you miss claims is the claims department or even sometimes the actuarial department is too promptly closing claims in their systems. If you don't have claims in your valuation file, you're not going to have reserves for them. If they really were valid claims that you should have had reserves for, your reserves will be weak. As an estimate, this practice might result in reserves being up to 3 to 5 percent light.

The most common example is you send out forms that are supposed to be filled out. You don't get a timely response on the form. We need this doctor's form, and you have 30 days to send it in. When it's not in on the 31<sup>st</sup> day, you change the status in your system to closed. Two weeks later the form shows up, and you reopen it. This is a bad practice from a reserving standpoint.

Net monthly indemnities: The most common error here is to be overly optimistic on estimated Social Security. I've seen cases where virtually all claims that did not have Social Security had Social Security estimates, and obviously many of these won't get it. You need a probability associated with the estimate.

The final one I have is wrong durations. The best example I have of this is from 15 years ago or so. A company used a 24-month duration for all claims with durations under 24 months if a policy provision had "own occupation." I did a valuation of that block and came up with 40 million; they were holding 25. They also went bankrupt a few years later.

In the documents that I refer to at the beginning, there is nothing in them that tells you not to do this. The only thing that covers it is the General Actuarial Standards of Practice that say you're supposed to value reserves properly, adequately, but no specific points cover these examples.

I'm going to go through some other examples. We just covered three examples. The number-one example we haven't covered is a practice called "advance paying close." You know the approximate duration. A doctor says that the person should be able to return to work in six weeks. You cut him a six-week check, and you code the claim as closed. The terminations for that claimant are in the table. I'll cover more on advance paying close practice later, but that practice can result in under-reserving.

There is another one that I see occasionally. Basically companies reason that this is an accident claim. They never last more than three years, so I'll use a three-year duration instead of a to-age-65 duration. Again, those terminations are in the table. You shouldn't be doing that.

I'll quickly list some other smaller errors, but these all can mount up if you have a bunch of them. I've seen cost-of-living adjustment (COLA) that hasn't been valued as COLA. There are valuation systems that are based on a claim system, and the claim department doesn't fill out the fields until the first COLA adjustment

is made, so you don't know about it. I've seen bad algorithms. The reserve or the COLA is a compounded one, and they're not compounding it. This will result in a small error, maybe 5 percent, but it still mounts up.

I've also seen bad amounts for Social Security estimates. I've seen people look at the last year's averages—an average Social Security of \$1,200; so we use \$1,200 for everybody. I've already mentioned about using 100 percent, but I've seen companies that take a percent, don't monitor it, and they use it for years and years. They may apply Social Security estimates on some teacher groups that don't even have Social Security. As I mentioned before, basically you need a scale. You need to create it and monitor it if you're using estimates.

Another problem is not valuating using the full benefits being paid. Survivor income—the case has survivor income and you don't have a probability of death times the survivor amount that can amount to 3 percent or so for each claim with survivor. Ignoring miscellaneous benefits is another problem. I'll get into that later with a list of them.

Another side topic on missing claims: You don't hold any reserves for claims on ERISA appeals or in legal. It's very common to have the claim system have those as closed. The reserve system doesn't pick it up, so you don't reserve for them.

The final point I have here is that many of these errors exist because they're extracts off of the claim system. The claim people are really worried about making the next payment correctly, and if you pick the data off from that, that may or may not be proper for the next payment. But it's not proper for the long-term string of payments.

The major reserve components are the disabled life reserve, which you all should be familiar with, but there are two adjusting reserves that I call the reopen reserve and the terminated, but not reported, reserve. These two are adjusting reserves to true up the disabled life reserve for administrative practices. I'll give a quick definition of the reopened reserve. That's basically as of the valuation date you didn't know that the claim was closed, but subsequently some payments were made on it. Either it re-opened had further payments, or it is truly closed but there were some remaining payments. It's possible for the claim department to code a claim as closed, but the last payment or two hasn't come through yet.

Terminated, but not reported (TBNR) reserve: You held a reserve for it since you didn't know it was terminated. You didn't really need to hold a reserve. These two adjustments to reserves work in conjunction with your administrative practices. If you promptly code claims as closed in your systems, then you're going to have a big reopen reserve and a small TBNR. If you keep them coded as open a long time after they terminate because maybe they'll reopen, then you're going to have a small reopen reserve and a big TBNR. The net impact of these two adjusting

reserves should be that between differing practices, companies with similar termination rates should result in about the same level of reserves.

Just for completeness I will mention some other reserves, which I won't get into. You should have IBNR and survivor income reserve on known deaths (i.e. this is the situation where the claimant has died and you're making survivor income payments or you know that they have died and you haven't made the lump sum yet). You're supposed to hold an expense reserve, and then some of you may hold a pending claim reserve or that may be including in IBNR or in your regular disabled life reserve.

I'll get into some practices here. You should have start and stop dates for the offsets. Back when I first started this, we didn't do that. This would be 1980 or so. You would have a state disability offset. You knew it only lasted six months, but if you had it as an offset for the full duration of the claim, that results in a fairly gross error.

If you're calculating the net amount from the offsets, including estimated offsets, you need to take into account the minimums. It's fine to do estimated offsets. Make sure you get some good probabilities in there. You can use estimates for offsets other than Social Security. It's quite rare, but if you think there's a good chance that a claimant is going to get workers' comp, then you could put workers' comp estimates in the valuation calculation.

I mentioned durational adjustments already. From 1985-1995, it was really common to reserve AIDS at a lesser duration. I think that's probably proper because it was a new condition that wasn't in any table. The death rates have improved considerably, and I don't believe you should be doing that anymore. Maternity for statutory: it is fine. If any of you are using Table 95A, it has a separate maternity table. For other disabilities—I mentioned accidents previously—don't adjust. I've seen cases where they say this is a terminal cancer patient, expected to live three months, and so they put a year in there. Those terminations are in the tables. You should not do that.

There is a common error in applying minimums with estimated offsets. Most valuation systems can do only one valuation. If you have a minimum and you have a Social Security estimate using 60 percent—I'll just use an example of an error here. You have a \$2,000 gross amount; \$1,000 workers' comp offset; and a \$1,500 expected Social Security with 60 percent chance of receipt. You do the math here: you get \$100. The claim has a \$200 or 10 percent minimum, so your calculation comes out with \$200. The correct way to do this is that there's a 60 percent chance that they're going to have \$2,000 less \$1,000, less the \$1,500—producing a negative number and resulting in paying the minimum. There is a 40 percent chance they're not going to have Social Security. \$2,000 less \$1,000 times 40 percent results in \$400, this added to the \$120 from the 60 percent part and you

end up with \$520. The \$520 is more than double the \$200, so your reserve had a big error in doing it the improper way.

Now we'll cover some claim administrative practices: Advance pay and close. You make the payment to when the doctor says the person returned to work. You close it. Your table has those terminations in it already, and by removing the short-duration claims, your table is now off. You could correct it by reducing the terminations during the next month or two. Or the easier way is to keep these claims open until they're past the termination date, and you net out part of the payment that's already been made—the prospective part of these payments.

Settlements have a similar issue. Settlements can go either way. You can have marginally disabled claims that you settle with, and by removing those, you're weakening the table, but then you could also be making payments to totally disabled claimants who are expected to stay on claim to age 65—they're not on their death beds. If you remove those, then your table is too strong, so I don't really have any advice about adjusting tables for settlements, but it is an issue.

We've covered claim closure administration. You should monitor that. It's common for the claim department to change its policies, and, therefore, if you're holding TBNR and reopened reserves, that pattern could change. So you need to monitor what the claim department policies are.

Underpayments and overpayments: They get into the calculation of the payment. They are temporary, usually. If a deduction has been put in there for 12 months or so, you need to pick that 12 months' adjustment only for the period it is applicable to. At times it's very difficult to figure out what the proper duration of adjustments is.

The final point I have is outside the issue of valuation, but I thought since I was talking about payments and valuation, I would mention it. It is fairly common for your underwriters when quoting a case to get experience history and the paid claims to be just the payments made to the claimant and to be missing other items such as FICA payments or ex-spouse split payment. I have had the real payments and then have gotten some data in from another source, and these payments were light. I just thought I'd point that out so you can be aware of that.

Next I'll discuss standard product revisions. It's fine to use a two-year duration for mental and nervous. You should use the shortened duration for self-reported symptoms. However, many "limitation" claims continue past the limitation. You should monitor this; see what the percent continue past the limitation. You should be using a weighted reserve of, let's say, 75 percent of the two-year mental and nervous reserve plus 25 percent of a regular reserve. This is done sometimes in the industry, but it's definitely not universal.

For "own occupation," make sure you use the regular duration. Don't use the 24 months own occupation duration - that's in the table. As for special product provisions, there is COLA. Maybe 5 percent of the LTD policies have COLA. COLA can be 30 percent higher than a regular reserve, so it's fairly material. It's quite difficult though to value it completely properly. COLA has many moving parts—it has a COLA percent, it can be fixed or a percent of CPI, if we compound it or not. The adjustment can be based on gross or net and have 5, 10, unlimited adjustment. It can have yearly caps or aggregate caps. The timing of when the adjustment is made can vary, so it's very messy. It's very difficult to have a valuation system do it. Most claims systems do not have fields to hold all these variables, but do your best to do it properly.

Value additional benefits properly. I should mention some. There is business overhead coverage, Medicare B payments, pension 401(k) payments and FICA payments. A few association policies have hospital indemnity payments. You need to make sure those are in your valuations.

Does anybody know where in writing it says how you apply the interest rate when doing a Commissioner's Group Disability Table (CGDT) valuation? State regs have the single-premium immediate annuity (SPIA) minus 1 percent. If anybody knows, come up and see me afterward. The CGDT should be compounded, and the reason I state that is if you look in the diskette that was created as a companion to the Canadian International Development Agency (CIDA) and CGDT, it is compounded in there. I'm not aware that this is written any place.

Whether you use simple or compounding makes a modest difference. Reserves are 0.5 different at 4.5 percent interest and 0.9 different at a 6.5 percent interest. The basic rule is if you get an interest reported to you to use, you should find out what units they're in and use those units. If your investment department says the rate is semi-annual bond yield, then you should be using  $(i/2+1)^{1/6}$ . That should be the monthly interest rate you're using.

The next topic I have is doing run-outs. I found that they ran out—inadequate or adequate, but when you traced the reason for this it turned out that the valuation assumptions were okay, but the data changed between valuations. This should be something that you watch. The change will vary by claim coding practices. You could have a new product, and they don't put in the right duration until later. Common ones I found were the disability date changing, durations changing, salary changing and ICD9s changing; all of these changes impact your valuation, and they should be monitored.

The final item I have is that there are times when the data you get is not the correct data. The best example I have of this is a valuation system that can't handle Allsource correctly, so they gimmick the salaries in the system so that calculation produces the right net amount, but that's a little disturbing having the

wrong salaries. You probably get the right valuation, but if you're projecting in the future, having offsets come and go, then you may get the wrong answer.

**MR. ERIC POIRIER:** First, let me read the disclaimer statement: the information and views expressed in this presentation do not represent the views of the companies with which the speakers are affiliated.

I'll present a method that consists of essentially reorganizing the standard valuation information to optimize the use of financial results and to analyze the reserves. We will cover five basic objectives: We'll identify the limitation of the traditional income statement, develop alternative views, review its advantages and limitations, learn about data requirements, and finally we'll use the results to review the reserves and their assumptions.

At the beginning of the financial period, the actuary has set assumptions to establish the reserves. At the end of the period, all the assumptions have been tested. They have been right or wrong, yet I'm not seeing this in the traditional view. The success and failure of assumptions have been tested, and the sums of the success and failures are right in the bottom line. Let's try to show that.

The first step is to reorganize information by role. Premiums have a certain role. IBNRs have a certain role. So have tabular and reopen reserves. In this example, I use only three reserve types. These types can vary widely from company to company. It depends on your reserving model. In its most simplistic view, we would only have premiums and all reserves would be aggregated together, which would defeat the purpose of this exercise because each reserve type has very specific roles and are usually based on different model and assumptions. Therefore, it's very important to split the reserve types you want to analyze.

The second step in performing this exercise is definitely a little more complicated. It involves looking at the paid claims. It has one limitation. Let me ask you this: How many of you are absolutely able to reconcile to the penny the paid claim amount in the financial statements? You have a payment database you can access. You run queries by whatever segment you want and paid data perfectly match financial statements. Good, it looks like only one person can. I suspect there's more success than that, - this is a very important exercise. Once you get that, it gets pretty straightforward. Payments that are related to claims incurred in the period are charged to premiums, and payments related to claims incurred prior to the period but reported in the period, get charged to IBNR. Payments related to claims closed at the beginning of the period are charged to reopen.

Let's use the fourth-quarter payment for a given claim and see how it will be charged to different sources in time. If the full period of 12 months ending Dec. 31, 2003 is analyzed, the payment is clearly charged to premiums because the claim was incurred in 2003. It would be charged to IBNR if the first quarter is reviewed.



The claim was closed on Oct. 1, 2003, so the payment in the fourth quarter would be charged to reopen reserves.

To design this expended income statement view, you need to create a database that has payments by status at the beginning of the period you're analyzing. It gets a little tricky, but it's one constraint you have to work with.

From the guidelines I have extracted the following statement: *"Every claim, over the course of being active, should fall at any point in time in one of the reserve types and the transition between reserve types should be smooth and without gaps."* I find interesting the last two words: "without gaps." In this context, a gap would have to be a paid claim, not recognized by any reserve type. Therefore, mapping the payments to reserves becomes the ultimate task for that guideline.

This mapping exercise will definitely lead to the identification of what I call orphan payments. These are payments that you cannot tie to a reserve type. An example is death benefit paid in installments. The claim may be closed, and yet you're making payments for a few months. It could be a negative payment, recovered overpayments for example if you don't hold a reserve credit for that.

Other things you'll find are timing issues. For example, a claim is closed and a payment is performed at the very end of the financial period. Is the payment included in the financial statement or not? If not, the claim should remain open or should have some kind of paid claim debit or pending payment reserve to cover that payment. So this exercise is wonderful to really help you test your reserve definitions.

This process of mapping is the biggest issue in this entire exercise. Once you get that resolved, you're done, so it is very important to make sure you can perform these steps.

Next step: tabular claims. That's pretty straightforward. There should be no issue here.

The next one is IBNR. That should be extremely trivial if IBNRs are split by incurral quarters or years or months. If your IBNRs are based on a percentage of annual premiums, then you're in bad shape—you'd better fix that right away. Other than that, it's pretty straightforward.

As you can see, it starts to take shape. Let's take, for example, the IBNR at the beginning. It converts into some payments, some tabular at the end and some ending IBNR. So the IBNR releasing pattern is shown there.

The reopen reserve is a little trickier. In the guidelines, there is a section about a methodology to set correct reopen reserves. It is highly suggested to use an exposure that is based on closed claims. The status of those closed claims at the

beginning of the period will tell you how to allocate the reopen reserves. If it was a tabular claim, then the reopen reserve needs to be charged to tabular reserves. If it was unreported at the beginning of the period, then it needs to be charged to the IBNR. If the status was closed at the beginning, then it needs to be charged to the reopen reserve.

Let's talk about data limitation with regard to expenses, expense reserve and interest, which were not included in my little financial statements here. I kept it quite straightforward. For expense—it's very unlikely that you would have an expense study allowing you to split the amount between current incurrals and existing claims. One quick fix is to charge to the expense reserve an amount such that it breaks even. If you have more realistic figures, of course, it's better to use them, but what's important is to make sure you charge some expenses to your reserves to keep this expended view as valuable as possible. Interest—that's usually straightforward. Required interest is simply based on the discount rates backing these reserves. Not required interest is usually the actual asset yield in excess of the required interest. Finally, capital and plus—that figure is usually provided by the investment department so this interest split is usually not much work.

This finally leads to the whole thing. In our example, total profit is explained partially by an underwriting gain and run-off gains from different reserve types. For claim expense reserve, an expense amount is charged such that the bottom line is zero. The rest of expenses are charged to premiums. Again, that is just a quick fix.

Let's see some advantages of that view. Tabular gains or losses should tie out pretty well to the resolution metrics. IBNR results should tie to reported incidence metrics. You should link to the incurred reports that are possibly used by the pricing area. This resolves a lot of confusion around reported views and incurred views.

On this line here, I have collapsed the underwriting gain and run-off gains on one line called "before tax insurance operation" (Chart 1). Then you have the gain from the investment operations and finally the interest on capital and surplus. The before-tax operating earnings are the grand total. You can then allocate your capital based on your capital formula to see if each of these reserve types is producing the targeted return on capital.

Like any new report, it's not so interesting the first time you look at it. It's only good on a history total view, so you have to line up a bunch of reports before being able to really reach reliable conclusions.

The expanded financial report is the one page that can be reported to management (Chart 2). It's not much bigger than the first one. There are a few additional columns and that's it. It better shows the principle of emergence of profit by measuring the return on the capital allocated to each reserve. From the guidelines I've borrowed this other statement: *"Margins should be consistent for each reserve*

*type so that a claimant's reserve flows smoothly from reserve type to type."*

On the next pages of the expanded financial statement, we look at each of these reserve components. Charts 3 and 4 show IBNR—the total line has a 0.5 percent loss, but now it is split by incurred quarter. This exercise is very simple because you already have the information split. You have all the payments, all the reserves allocated to IBNR, so it's only a matter of looking at results by disability quarters. We can see that the first quarter produced a loss and the last one a small gain. Is the IBNR pattern in this example incorrect? It is possible.

Let's position ourselves at the beginning of the financial period when IBNR was set. IBNR should be looked at as the present value of future tabular reserves. The sum of all these amounts is equal to the IBNR at the beginning. I'm suggesting here that the IBNR should not be defined as a string of future cash flows; it should be defined as a string of reported costs at the end of the quarter where claims are reported. Let's look at the lag 0 Q. Expected cost is \$220 for the next quarter, and the expected ending IBNR is the sum of 170 to 12 which is \$280. If I go back to my previous slide, the IBNR held was 500; this represents the sum of all these numbers. At the end of the period, the tabular reserve was 230, reopen was 8 and paid claims were 70. So 308 was the reported cost in the quarter, plus I now have a revised ending IBNR of 270. We can do this for every single row. Then this slide can be repeated for all reserve types, so you can identify where the run-off gains or losses come from.

When setting the IBNR pattern, again, we need to look at the IBNR as a string of reported costs in time. This represents the number of expected claims multiplied by the average claim reserve in every quarter. When setting the average reserve factor per reported claim, you have to make sure that the average amount respects the dynamic of reporting. That is for the lag 0, we should expect the average factor to be higher due to inflation. It has more recently incurred claims. Therefore, salary should be higher. That puts upward pressure on the factor. Conversely, claims that have been incurred many quarters ago will be reserved at high duration when reported; therefore, the reserve will be higher. So that puts upward pressure on the factor.

I'll summarize what we've done. We took the very same information; we only stored it in a different way to make sure that we could at any point in time choose a start period and end period and make sure we could allocate gains and losses by reserve types and premiums. Make sure you understand your paid claims database. The reserves, once they get into the accounting system, may get allocated between different ledgers, and it can get a little difficult sometimes to reconcile them. What I am suggesting here is that you shouldn't try to perform expanded financial statements from the accounting system for obvious reasons. The accounting system will not have reserves by incurred quarters, for example. Therefore, you have to create your own database and make sure that, at the end, you can reconcile with the actual accounting system.

There are run-off gains and losses in all financial statements. It's much better to take time to study them. Traditionally, it is being done in part once a year in Schedule H and Schedule O on the STAT basis. On the GAAP side, there is the confusing Note 7. But there's no need to wait a year to perform gain and loss analysis. Most companies look at financial results on a regular basis, so each experience statement is an experience period that provides statistical information. It's worthwhile to take time and make an effort to analyze the success and failures of reserving assumptions. At the end, it should lead to a more dynamic management of assumptions. Because it precisely ties with the financials, the expanded view is a lot easier to explain to management.

**MR. SMITH:** I'll start with a quick story. Back 15 years ago in another life doing GAAP valuation, I would have said that the proper GAAP reserve had slight conservatism, such as if two out of three years it ran out adequate and one year inadequate, then that was a good reserve. I have taken another position here because I don't believe that anymore. I'm going to be sticking my neck out here. I want to start a debate. Based on the fact that most companies, especially the public companies, state what their financial objectives are, I will claim that the margins embedded in the GAAP reserves are inadequate to produce their stated financial objectives.

Simply stated, the return-on-capital objectives plus the risk-based capital (RBC) requirements determine your GAAP reserve margins. Just having adequate GAAP reserves is not sufficient.

Why can't the current operations cover this? They could, but you're introducing an anomaly into your source of profits. If you're growing at a certain rate and that slows up or stops, then you would have to raise the profit on your current block to cover the inadequate returns on your reserves. It would be even worse if you went out of business. Your reserves would not be returning your stated financial objectives. Or, if you went to sell the reserves, the buyer probably would ask for profits sufficient to produce an adequate return on them, and you're not holding those margins in your reserves.

What margins are we talking about here? I have three models—they all really do the same thing. The first numbers are based on a reserve model. You start with some reserves. From the reserves you derive the claim payments. From those claim payments you build up the tax, STAT and GAAP reserves. In the next model the numbers all look about identical. In this one you start with a claim payment and from the claim payments build up the reserves. I have done these multiple models because I had different sources of data, and to see if I got comparable results.

The final model I have here, I call the complex one. This model actually starts with a real monthly claim payment pattern and builds all the reserves up from that. It's considerably more sophisticated than the other ones, but it gets the same results. The other models are on a spreadsheet where you can do what-if testing and that

sort of stuff. The complex model is a lengthy one to produce the results, and it's static once you have produced it.

To translate this into proper GAAP margins based on the statement I made previously, you should embed the proper returns into your GAAP. Proper margins are, if you have no termination margin, you need about 250 basis points in interest conservatism. If you have 10 percent conservatism in your termination rates, you need about 150 basis points interest margin. And if you have 20 percent termination rate conservatism, you need about 100 basis points interest margin. That gets back to my statement—I don't believe that most LTD insurers have this kind of margin in their GAAP reserves.

These models are intended for you to use and play around with. There's the variable model on the [Smithgroupre.com](http://Smithgroupre.com) Web site that you can download.

Chart 5 is a visual example of the results. If we really knew what the actual was, I believe the current GAAPs are down around the actual, maybe 4 or 5 percent higher. Statutory may be 17 or 18 percent higher. If you use the two-year statutory adjustment, the statutory drops 2 percent or so. The GAAP definition that I gave you to embed your financial objectives in your reserves, puts a margin of around 13 percent—shifts it from one end of the scale to the other end. I didn't mention this, but the examples you have have a 212 percent multiple times the RBC. Obviously you would have to embed a lot more if you have a three-year or 350 percent multiple times RBC. As I stated at the start, this is supposed to be thought provoking and controversial. I welcome having people e-mail me and discuss it. I guess it just disturbs me that the companies are stating their financial objectives, but I don't see those objectives in their reserves. That concludes this topic.

**MR. DELAINE B. HARE:** Before I start, there's one thing that wasn't in my presentation. It's not a valuation issue per se, but it's one that could potentially become a valuation issue for some companies. It came from comments made by Allen Greenspan a few weeks or months ago about the Social Security problem and the potential insolvency that may be down the road from Social Security. It got me thinking: We have a lot of contracts out there that pay benefits out to the Social Security normal retirement age. If I have a claim out there now that's an open claim that's being reserved to age 67 because that's the person's normal retirement age currently, and that age later changes to 68 or 69 because of changes in the laws, how will we handle that as a company? I went back and asked my claims department and thankfully they told me that our contract is worded in such a way that that claim is limited to the current law, the 1983, I think, revisions of the Social Security Act. So we won't have a problem there, but in reviewing some other contracts, I think some carriers may not have this clear of a contract on that and potentially could be held liable for a longer duration than they intended when they opened the claim. It might be something that you'd want to look at in your contract to see if that might be an issue for you.

What I wanted to cover here is a little bit of a discussion about how the level of margin that you hold in your GAAP reserves will affect your GAAP earnings. I think we're in a fairly complex business, and I know certainly some of the nonfinancial colleagues that we may have have a little bit of difficulty understanding where the earnings are coming from. I think Eric's presentation does a very good job of bucketing where your earnings are coming from. It may help your companies understand where the gaps are and where the sufficiencies are and so forth, but a lot of that is created by the margin issues.

The margins may not be even over the entire period of a claim, and so it depends on how fast you're growing; it depends on how much margin you have and where your margin is. All that affects your reported earnings, but it doesn't necessarily affect your ultimate earnings. Then again, I have an example toward the end of my presentation on doing reserve run-out testing. It's very similar to a presentation that Luce Giroux did last year at the SOA meeting in Vancouver in doing run-out studies, so I won't go into a lot of detail when we get to that point in the interest of time.

Why do we hold reserves? The main point I want you to take from here is that GAAP margins aren't explicitly defined in any type of regulation or anything. There's just kind of a general need to margin, and that opens up a little bit of fuzziness in the financials that we report. GAAP reserves are a non-cash accounting entry, which means they aren't real money. They're an estimate of what we think the money will be at some time in the future. Since they're not real money, they don't really affect what your ultimate earnings are. They do affect the timing of earnings because the amount of margin that you have tends to delay the reporting of earnings over time.

Your GAAP reserves don't affect what your real earnings are. The reason is because when you look at the income statement, you have premium plus interest, minus your paid claims, minus your change in reserve, minus your expenses—a very simple income statement view. Your change in reserve over the long haul, over a piece of business, is going to be zero because before you write the business you're holding no reserve, you have no liability and eventually all the payments of that business will run out. At that point, you'll have no liability, so over a long enough period, you have no change in reserve. It becomes just the interest, paid claims and the expenses versus your premium.

The assets that you're holding are your STAT reserves, plus your statutory surplus. Because the GAAP reserves aren't in that equation, they have no impact on what your earnings are going to be.

Your investment income is your assets times your yield rate, and again your assets are defined by your statutory accounting. As such, they aren't going to be affected by your GAAP reserving method. What will be affected is your GAAP equity, because obviously, that's going to be the difference between your assets and your GAAP

reserves, so depending on how much margin you're holding in your reserves, your GAAP equity is going to be affected and as a result your GAAP return on equity (ROE) will be affected as well. The net change in reserve over the life of a block is zero.

Next I'm doing to discuss how it affects the timing of your reserves. I'm assuming that you've written a piece of business and you have an insurance coverage for one year. Then you have run-out over the next three years, but you aren't continuing the insurance. I'm just looking at a one-year and then an ultimate run-out of that business.

I'm bringing in \$1,000 of premium. I've lumped all my expenses into the first period, so I have \$260 in expenses. My total claim payments here are going to be \$710, and I have that spread out in a decreasing pattern over the four-year period. For the GAAP reserves, I assumed all of my claim payments were being made at the end of the period, so in the first period there my GAAP reserve is 415, that is the net present value of the 215 payment in period two; 145 in period three and 100 in period four.

This has no margin in it, so I've just taken those payments that I'm expecting to be my actual payments. I don't know that at the time I'm holding the reserve, but if that does play out, that's my assumption and if I discounted it, for the required interest in the calculation I get 415.

The next point just shows what the increase in the reserve is in each year. My asset line is my statutory assets. In the model that I did, I got that by increasing the GAAP reserves by some percentage for a morbidity margin. I changed the interest rate and put a capital multiplier on there—it's a very simple model. It doesn't necessarily tie exactly to reality, but I think it's illustrative.

My investment income is my actual earnings, which I think in this case was 6 percent. It was on the assets being held during the year. I assumed all my assets appeared at the end of the year, which is probably a flawed assumption, but I did that to simplify things, so for that reason they didn't have any investment income in the first year.

If you do the income statement map on this, you get a GAAP net income in total over the entire period of \$82 million (Chart 6). You see some numbers in here shaded in blue. Those are the numbers that are going to change when I flip to the next slide (Chart 7). Anything that's not in blue isn't going to change. You can see that the \$82 million in total earnings here isn't going to change when I change my GAAP reserve assumption, so over the entire period this is what I'm going to be earning irrespective of what I hold as a GAAP reserve. What you'll notice is that by holding no margin in my GAAP reserves in the bottom line here, my GAAP net income by year, I have a very front-end loaded earnings recognition. I'm reporting 74 of profit in period one, and then I just have very small profits in periods two,

three and four, and those are relating to the differences between STAT and GAAP accounting because I'm earning interest on my statutory surplus and the excess of STAT reserves over GAAP.

If I go back and forth from margin into my GAAP reserves here, my GAAP reserves go up a little bit because I've introduced some margin, so the reserve increase each period also changes. Again, as I pointed out earlier, my total net income is still going to be 82, but it's the pattern that's changed. Now, by introducing this margin, instead of earning 74 in the first period, I'm only earning 25, but then I get to recognize that difference over the remaining period. So I get 27 in the second period, 17 in the third period and 11 in the fourth period. This is kind of what Nick was talking about in this last presentation here.

This is an example of where your GAAP reserves are going to be providing some level of return. Since you have no margin in your GAAP reserves, obviously they're providing no return. All of your returns are being funded by the business that you're writing, the premium that you're collecting this year. If you plug that into Eric's model, then you're going to see very good numbers coming out of the premium—your IBNR, your tabular and your reopen reserve should be coming out somewhere around zero.

Since margin is somewhat subjective, how much margin do you want to hold? It's kind of a personal decision; it's kind of a judgment decision. There are pluses and minuses to holding more margin and also some positives to holding less margin. Reasons you might want to hold less margin is that it lets you recognize your profits earlier. Some companies may want to do that, although it may create some pitfalls. By doing so, if you analyze your business on a net present value basis, you are evaluating the total value of your business and asking what your future cash flows are going to be that you could return to your shareholders. If you take the net present value of that, by holding less GAAP margin and recognizing your profits earlier, the time value adjustment isn't going to be quite as great on that, and your net present value will be greater. That will be satisfying, I think, to short-term investors who are mostly interested in, "What have you done for me this quarter?" I'm sure we're all aware that we have investors that are that way.

The positive for holding more margin is that it's another source of earnings. Again, if you have that levelized profit stream, by not recognizing all of the 82, I think it was, in profit in the first year, I get some of that next year, and I get some of that in year three and year four. It provides me a little bit more earnings stability, so it makes me a little bit less dependent on writing new business. If you're recognizing all of your profits upfront, you're very dependent on writing new business. And if you want to grow profits, you have to grow new business. You have to grow new business at the same prices in order to maintain the level of profits that is in there.



For the long-term investors, I think holding more margin is going to be ultimately more satisfying because it is going to provide more stability. And if there's anything that stock analysts like, it is stability. They don't like surprises.

If you have margin in your reserves, you may at some point be tempted to say, "Do I have too much margin? Can I release some of that margin and can I recognize that in earnings now?" That may be a temptation. If you just have some normal volatility in your results and you don't want to have to explain it to analysts, then it may be tempting to say, "I'm going to squeeze a little bit out of my reserves to cover that and when the volatility swings the other way, I'll build it back in."

Another situation where it may be tempting to do that is if you have some poor fundamentals in your business. If you haven't been pricing your business particularly well or if your underwriting has been giving some of it away, it may be creating some negative fundamentals in your business that are starting to show up in your income statement. The margin release is one way you could control that if you choose to, but really I think you need to ask whether you should be doing things like that, because it has its problems. What you're doing is borrowing from your future earnings. Instead of recognizing that levelized profit over the life of the business, you're taking it all now. If you do that, then you really have to step back and think about where your future earnings are coming from, especially if it's something that you're trying to mask, like your poor pricing fundamentals. By borrowing from the future, you're setting the expectation to the analyst that you're earning an acceptable profit. You're setting the expectation that you're going to do it next quarter as well and the quarter after. If you don't have the fundamentals there, eventually your margin runs out, and it's going to be very difficult to continue to meet those expectations.

This is where the pricing actuary in me comes in. I'm not a valuation actuary and never have been. I try to focus more on the fundamentals and the pricing. The health of the business is really not so much dependent on your reserving basis, but it's dependent on how much premium you collect relative to the expenses that you're going to pay out, relative to the claim payments that you're going to have to make and relative to the investment income that you're going to be able to earning on the assets that you're holding.

These are all things that you can control. It's not always fun to control them. There's often a lot of pain involved in controlling them, but you do have control of your premium. Underwriting and sales definitely have control over the prices that they put on the street, and I would argue that we as actuaries should also have control over that. We need to make sure we're maintaining adequate controls on the pricing metrics to make sure that they're doing the things that we're expecting them to do when we set our rates. Expenses are certainly under the company's control. Financials are going to have a big impact on that, working with cost center managers and identifying acceptable expense levels.

Your claims payments are definitely under your control. There has been a lot espoused lately about the importance of tightly managing your claims and appropriately managing your claims, but you don't pay out benefits that you're not contractually obligated to pay. I think underwriting also has some control over that as well—just through the risk-selection process. There are often temptations to relax some of the underwriting guidelines. That's going to flow through into the claim payments that you ultimately see if the underwriters are doing that. Investment income is obviously under our control in the financial area.

The point that I would really like for you to take out of this session at least from my end is to know your margins and that you need to decide how much margin you want to have in your reserves. It's a company-by-company decision. There really isn't a right answer. It's all a matter of what earnings pattern you want to report. Like Nick suggested, market valuing your liabilities is appropriate in such a way that if you ultimately wanted to reinsure all of your business, feed it off to somebody else, you could just hand them their reserve and they'd be happy to take it.

One approach that we've looked at is looking at a confidence-interval approach, which is taking more of a statistical method view. Look at your run-out patterns over multiple periods. There's obviously going to be some natural volatility in them. Your actual results are never going to come out exactly as you expected them to, but you're trying to do something kind of like Nick suggested earlier so that every two out of three times or every three out of four or five out of six or whatever percentage you decide is acceptable, but you're looking at that approach and saying that I want my reserve to be adequate X out of 100 times.

Once you decide how much margin you want, then you need to hold that level of margin. That sounds fairly straightforward, but as Nick has pointed through the valuation paper, there are a lot of moving parts in this; there are a lot of places where you can make a mistake without even knowing it.

How we like to test the run-out is by looking at it by duration. You start in the tail of the reserve and then work your way backward. I have an example. I'm looking at a one-year run-out of a block of reserves that I'm holding, so my reserves are all split out by four durational buckets. In total I am holding 247 in reserve. During the year, I made 121 in payments. At the end of the period, I am holding 120.8 in reserves. For simplicity sake I ignored interest in this example, but as you can see, if you take the ending reserve of 120.8, add in 121.5, based on what happened this year, that's the reserve that I should have held at the beginning of the year and that's what I call the restated reserve—242.4. By holding 247 versus 242.4, actually you have an observed margin based on what's happened in the past year of 4.6.

However, if you look at it by each of the durational buckets, my original beginning reserve was eight. I made \$10 in payment, so ignoring the interest, I needed to hold the reserve of 10 in order for that durational bucket to be adequate. I'm

restating my beginning reserve for duration four to be equal to my ending reserve of zero, plus the payments that I ultimately made. I set that back to 10, and that puts my duration four into a position where I have no margin in it.

The beginning of duration four reserve is actually the end of my duration three reserve. I was holding 8.8 in reserves, but if my duration four reserve is inadequate, this 8.8 is essentially going to be my beginning duration four reserve, and it's also going to be inadequate if this period was indeed reflective of what my actual experience is going to be. You need to test it over multiple periods to make sure that's the case and that you're not just picking up some volatility things here like Eric had mentioned earlier. But if you accept that this is indicative of what my expected experience is going to be, then my 8.8 reserve is inadequate. And if I gross it up by the same percentage of 10/8, the net reserve is going to end up being 11. If I plug that one back in and then retest my duration three reserve, my original beginning reserve was 34. I paid out 22 and now my restated is 11, so my total restated beginning reserve would be 33, the 11 here, plus the 22 paid. So my revised margin then is going to be 34.1 minus 33, or a 1.1 margin.

You keep doing that process, keep following it all the way up to the top. Again, here I've taken 11 + 22 to get to 33 and compared that to my original beginning reserve. It actually proved to have a little margin so I could squeeze that back out. This whole exercise is determining what your margin less reserve would be.

If I get back to my restated beginning reserve of 248.6 and compare that to my original beginning reserve of 247, I've actually had to put in an extra 1.6 of reserves. I had 4.6 in margin and I've just increased my reserve by 1.6, and I then have zero in margin. By doing the run-out testing here and building it back into reserve, I've actually found out that this reserve margin of 4.6 that I had was actually not there and, in fact, there's a little bit of a deficiency.

In summary, your GAAP margin is only affecting the timing of your earnings. It's not going to affect your cash-flow earnings over the long haul. If you want to improve on the earnings, you need to get focused on your fundamentals. You need to get back to your pricing, and you need to figure out how your prices are compared to the cash that's actually going to go out the door. To make sure that you have that, you need to test your run-outs.

**MR. DAVID G. FITZPATRICK:** Nick, I'm not going to debate publicly whether our reserves are adequate or not. I do sleep well at night, by the way, and have no trouble signing our statement. If, in fact, companies are not holding adequate GAAP reserves, isn't that going to show up somewhere down the road?

**MR. SMITH:** It should, if they're inadequate. My main point on that is you may be holding adequate reserves, but they're not adequate according to your stated financial objectives that you're telling investment analysts.

**MR. RICHARD CARLSON LEAVITT:** I agree with your approach. Of course, you're my boss, so I'll say that. However, I do think that the return on capital that some companies report is based on an inadequate return from the capital backing reserves, coupled with a more than adequate return on the capital backing the new business. So this isn't the disaster that it first appears to be. To think that you have to increase your reserves by 10 percent because the reality is your connection between profit as a percentage of premium and return on capital is based upon some model which presumably assumes return on the reserves from your prior claims, that's consistent with the margin that you're holding. So what that means is that if you begin to hold more margins on your reserves so that they provide the return that you need, then you don't need as much profit as the percentage of premium on your new business to produce the same return on capital. Of course, if you're growing your block, then in the end you are going to have to charge a little bit more to produce this return, but it doesn't seem to be quite the disaster that it seems to be on first view.

**MR. SMITH:** I guess I agree with that. Part of the comments that I was making are more stated—looking at the reserves in isolation. If your reserves don't have that margin in it, then you're creating a potential problem. Obviously if you've had your block in force for years and it is static and you were getting proper returns, then that will stay static. If you're growing at a certain rate and you're okay, then as long as you grow that rate, it will stay okay but as soon as some change happens, then it's going to put pressure on your margins.

**MR. HARE:** I'll add to that a little bit. There's a little bit of a subtle difference here. When we're talking about inadequate reserves, it's not necessarily that there's negative margin in it. It's the next point here—the margin that's in it may not be positive enough. Your reserves are adequate in that they are not going to create a loss down the road, but it does catch up with you. Your earnings then in that case are fully dependent on being able to produce new business that's producing that front-loaded profit. If at any point down the road your sales growth slows down, then as a result your profit growth is going to slow down as well, so you become very dependent on top line growth.

Chart 1

## Expanded Income Statements

| <u>Source</u> | <u>Premiums</u>                         | <u>IBNR</u> | <u>Tabular</u> | <u>Reopen</u> | <u>CER</u> |
|---------------|-----------------------------------------|-------------|----------------|---------------|------------|
| Premiums      | 1000                                    |             |                |               |            |
| Required Int. | 6                                       | 15          | 195            | 1             | 2          |
| Payments      | 10                                      | 100         | 700            | 10            |            |
| Resv Chg      | 740                                     | (80)        | (520)          | (20)          | (25)       |
| Expenses      | 250                                     |             |                |               | 27         |
| -----         | -----                                   |             |                |               | -----      |
|               | Before Tax Insurance Operation Earnings |             |                |               |            |
| BTIOE         | 6                                       | (5)         | 15             | 11            | 0          |
| N.R. Int      | 1                                       | 2           | 23             | 0             | 0          |
| Int On C&S    | 1                                       | 2           | 28             | 0             | 0          |
| -----         | -----                                   | -----       | -----          | -----         | -----      |
| BTOE          | 8                                       | (1)         | 66             | 11            | 0          |
| Capital       | 110                                     | 195         | 1300           | 12            | 20         |
| After Tax Roc | 19%                                     | (3)%        | 13%            | 238%          | 0%         |

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Chart 2

## Expanded Income Statements

| <u>Source</u> | <u>Premiums</u> | <u>IBNR</u> | <u>Tabular</u> | <u>Reopen</u> | <u>CER</u> |
|---------------|-----------------|-------------|----------------|---------------|------------|
| BTOE          | 8               | (1)         | 66             | 11            | 0          |
| Capital       | 110             | 195         | 1300           | 12            | 20         |
| After Tax Roc | 19%             | (3)%        | 13%            | 238%          | 0%         |

- Adequate emergence of profit
- From Guidelines...  
*“Margins should be consistent for each reserve type so that a claimant’s reserve flows smoothly from reserve type to type.”*

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Chart 3

## Expanded Income Statements

- Analyzing results at the incurral period level for a reserve type
- Measuring adequacy of each cohort within a reserve type

| <u>Inc. Qtr</u> | <u>Beg-IBNR</u> | <u>Paid</u> | <u>Tab.</u> | <u>Reop</u> | <u>IBNR</u> | <u>Gain %</u> |
|-----------------|-----------------|-------------|-------------|-------------|-------------|---------------|
| Q               | 500             | 70          | 230         | 8           | 270         | -14%          |
| Q-1             | 250             | 10          | 100         | 1           | 120         | +8%           |
| Q-2             | 100             | 10          | 32          | 1           | 60          | 0%            |
| Q-3             | 60              | 1           | 35          |             | 30          | -10%          |
| ...             | ...             |             |             |             | ...         |               |
| Q-6             | 10              | 3           | 6           |             | 0           | +10%          |
| Total           | 1000            | 100         | 410         | 10          | 500         | (0.5%)        |

Chart 4

## Expanded Income Statements

- IBNR= PV of future tabular reserves

| <u>Inc. Q</u> | -----Reported Quarter----- |            |            |            |            |            |            |
|---------------|----------------------------|------------|------------|------------|------------|------------|------------|
|               | <u>Q+1</u>                 | <u>Q+2</u> | <u>Q+3</u> | <u>Q+4</u> | <u>Q+5</u> | <u>Q+6</u> | <u>Q+7</u> |
| Q             | 220                        | 170        | 53         | 20         | 12         | 13         | 12         |
| Q-1           | 164                        | 45         | 10         | 8          | 11         | 12         |            |
| Q-2           | 48                         | 25         | 8          | 10         | 11         |            |            |
| Q-3           | 33                         | 10         |            | 10         |            |            |            |
| Q-4           | 24                         | 15         | 1          |            |            |            |            |
| Q-5           | 21                         | 9          |            |            |            |            |            |
| Q-6           | 10                         |            |            |            |            |            |            |

Actual cost was: \$70 (paid) + \$238 (reserves)

Chart 5

## Conclusions

- Most if not all LTD insurer’s GAAP LTD reserves are held less than stated financial objectives require.
- The required margins are simple to determine.

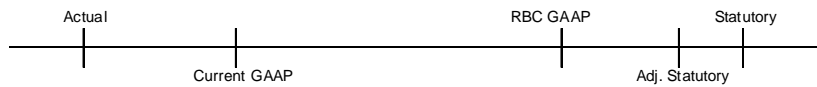


Chart 6

## GAAP reserves with no margin

|                   | <u>Period 1</u> | <u>Period 2</u> | <u>Period 3</u> | <u>Period 4</u> | <u>Total</u> |
|-------------------|-----------------|-----------------|-----------------|-----------------|--------------|
| Premium           | 1,000.0         | 0.0             | 0.0             | 0.0             | 1,000.0      |
| Total Expense     | 260.0           | 0.0             | 0.0             | 0.0             | 260.0        |
| Claim Payments    | 250.0           | 215.0           | 145.0           | 100.0           | 710.0        |
| GAAP Reserves     | 415.8           | 225.8           | 94.3            | 0.0             |              |
| GAAP Res Increase | 415.8           | (190.0)         | (131.5)         | (94.3)          | 0.0          |
| Assets            | 490.1           | 264.9           | 110.0           | 0.0             |              |
| Investment Income | 0.0             | 29.4            | 15.9            | 6.6             | 51.9         |
| GAAP Net Income   | 74.2            | 4.5             | 2.3             | 0.9             | 81.9         |

Chart 7

## GAAP reserves with margin

|                   | <u>Period 1</u> | <u>Period 2</u> | <u>Period 3</u> | <u>Period 4</u> | <u>Total</u> |
|-------------------|-----------------|-----------------|-----------------|-----------------|--------------|
| Premium           | 1,000.0         | 0.0             | 0.0             | 0.0             | 1,000.0      |
| Total Expense     | 260.0           | 0.0             | 0.0             | 0.0             | 260.0        |
| Claim Payments    | 250.0           | 215.0           | 145.0           | 100.0           | 710.0        |
| GAAP Reserves     | 464.9           | 251.7           | 104.8           | 0.0             |              |
| GAAP Res Increase | 464.9           | (213.3)         | (146.9)         | (104.8)         | 0.0          |
| Assets            | 490.1           | 264.9           | 110.0           | 0.0             |              |
| Investment Income | 0.0             | 29.4            | 15.9            | 6.6             | 51.9         |
| GAAP Net Income   | 25.1            | 27.7            | 17.8            | 11.4            | 81.9         |