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Target Surplus and Reserves for Health Plans

Track: Health

Moderator: John C. Lloyd

Panelists: Daniel S. Pribe
John M. Stenson

Summary: Measurement and benchmarking of surplus levels provide health plans with valuable insights regarding their financial strength and performance.

MR. JOHN C. LLOYD: I'm with Reden & Anders. Today, we have John Stenson with Deloitte & Touche and Dan Priebe from Mercy Health Plans. We're going to attempt to talk about target surplus and reserves for health plans.

I'll give you a little background. The curtain will be lifted on how these sessions get set up. About a year ago, a group of people got together. They decided on a great set of topics, but they were one-line topics. That group recruited another group about three months later who got to put content to whatever that one line meant. Then that group recruited speakers who, hopefully, had something they wanted to say that's germane to that topic.

What you sometimes get is a situation where what started out in one person's mind and what winds up in the content of the session may not be the same thing. We ran into that a little bit because when they said "target surplus and reserves," the first thing that comes to mind is that Blue Cross Plans call surplus "reserves." Did they really want us to talk about surplus and surplus, or did they want us to talk about surplus and reserves (which are incurred but not reported (IBNR))? We decided we would attempt to span the gap, and talk about both surplus and reserves. That way we'll hopefully cover all anticipated audiences.

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Around your office, do reserves mean reserves or do they mean surplus? The question then is whether this panel can meet the title's expectations. Today Don Stenson is going to talk a little about IBNR and financial reporting. Dan Priebe is going to talk about qualifying target surplus, which he has done some work on, and I have the goal of attempting to bridge the two concepts. My job is preaching to the actuarial choir about the role of actuaries in either of these two discussions.

The basic equation is surplus equals assets minus liabilities. Target surplus is a function of the risk of the line of business that you have to currently undertake. Reserves and reserve conservatism, another way of scoring away surplus (I used to work for Ernst & Young, so I know about reserves and their ability to score away surplus), are functions of the estimation risk. The role of the health actuary in both of these is he's the person challenged to defend the company's surplus levels in this current environment where everybody's making plenty of money (it may be too much in some people's viewpoints). He's also challenged to explain IBNR and reserves and their impact on earnings and earnings, therefore, rolling into surplus.

The classic challenge is that the loss ratios would be better if the actuaries hadn't messed around with the reserves. None of us has ever heard that. The emerging challenges to this, however, are accountants and property and casualty (P&C) and life actuaries, in which there is currently a debate as to what constitutes a best estimate. That's something that's ongoing now. The financial analysts have questions as to how estimates are derived and what their impacts on reserves are. For those of you who have reviewed some SEC analysts' commentary, it deals with things like days and claims and some rather peculiar metrics that attempt to explain these things.

With Sarbanes-Oxley, there is a real emphasis on fair reporting and a heavy reliance on the actuary. You now have an infrastructure under Sarbanes-Oxley, which John's going to talk about a little bit, in which the executive management is signing off that these are good estimates and a fair representation of earnings and surplus, and the actuary becomes the pivot point for doing those things.

I have a little historical context on the IBNR side of today's topic. If you think about how health actuaries set reserves, we grew up in a hard-copy, claims examiner environment. There was a lot of emphasis placed on lag factors, lag triangles and completion factors. If you read the classic old papers about health reserves, they're all about smoothing lags and harmonic smoothing versus other kinds of things that nowadays are somewhat arcane, I think. There was a lot of worrying about mailrooms and inventory counts. There's a semiapocryphal story about a third-party administrator (TPA) who actually loaded all the paper into a U-Haul and drove it around when the examiners came to make sure that they didn't see how many claims there were on hand. I tend to believe it's true, having worked with TPAs.

After you got past the lags, there was some per-month per-member (PMPM) credibility blending for the most recent months, which everybody hand waves

about. It's like, "We have some lag stuff, and then the past few months, to up our credibility, let's put some PMPM estimates up and move along." If you say that really fast, the auditors go away. In those days, the liabilities could be three to six months of average paid claims depending on whether you were an indemnity business that was spread all over the country. It was not uncommon to be three to four months before 50 percent complete and 12 to 18 months to get fully complete. So you had a substantial impact on the paid-loss ratio to get from paid to incurred.

In the current state, we use electronic processing. We're now in a pretty heavy electronic auto-adjudicated environment. We're still worried about lag factors because they set the base for recognizing the fully incurred history. If you don't get your lag factors right early, later on your PMPM estimates are incorrect. You still do PMPM credibility blending for the most recent months, but that's not a much larger part of the liability because the tail is completing more quickly. We see a lot of liabilities as low as a month and a half to two months of claims. Twelve months out you can be 99 percent done. Often, you can be fairly certain, absent seasonality and some other distortions like that, a quarter later. In terms of absolute dollars, it's still important, but probably not as dramatic as paid and incurred loss ratio to incurred used to be.

That should be easy, right? The answer is that we get the same variations in volatility, but they're based against a much smaller denominator. Secondly, the swings are possible. This is what I call the fly rod effect: If you move the base of the fly rod a lot, the tip goes in a fairly exaggerated manner. If you move your early completion factors a lot, you can distort the line in which you're completing. There are subtler changes. They don't have to rent a U-Haul anymore; they just don't mount a file. The answer is that there is more volatility, and it's harder to find.

There's also credibility. The PMPM has a larger impact on your IBNR estimate, but it still has pretty poor credibility. Nobody pays enough in the first month to know a lot about what's happening there. There is, therefore, more emphasis on trend, seasonality and benefit changes. This little PMPM thing that we used to do as a throw-away is now a very significant piece. This speaks to the fact that the actuary now, instead of sitting in his office and pouring over claims triangles, has to get out in the company and know what's going on. He has to keep his eyes and ears open to tell what's going to be happening.

When we get to the issue of conservatism and sufficiency, there is a question. Actuaries typically set the provision for adverse deviation based on the IBNR. And if the IBNR is smaller, you have less provision if you are going to use some percentage of it unless you increase the percentage. The nature of the model is such that it's not a stochastic model. If you look at the way most people do IBNR with lags, PMPM credibility and seasonal adjustments, there isn't what some people would say is a bell-shaped curve or any of the things that actuaries so dearly like by assuming a distribution.

If you have smaller reserves, that brings up the question of whether there is a need for more surplus elsewhere. This is the bridge now. How do we get from the issues surrounding reserves to the issues surrounding surplus? That area comes in with enterprise risk management. There have been a couple of sessions on that; it's a more holistic approach to looking at the business. What are our claims liabilities, but what are they also in the context of the operational risk and the market risk? How do we set surplus now that we know what our IBNR is? There are also challenges on the suitability of the accounting treatment. Are we reflecting real earnings, and are we matching revenue to risk?

In terms of target surplus, what's the framework for integrating the impact of different kinds of risks? If you look at the other actuarial practices, the term that comes up is "extreme" risk. P&C people who look at extreme risk typically model out a catastrophic event, which creates a call on their assets. This then somehow impacts their cash flow, and usually their cost of capital rises.

For health, we typically don't have 9/11-type incidence. We don't have some of the other multirisk catastrophes that the P&C people have. However, there is a possible carrier version of this. If you understate your IBNR and your incurred but not paid (IBNP), you typically do two things. You misstate your earnings, but you also probably miss your pricing and your trend estimates. In this case, then, what you have is a double whammy in which your earnings and surplus drop, and the cost of capital rises because your earnings aren't where you said they would be. It is relevant that health actuaries look at this, even though we don't have the same generation of risk, asset-liability matching (ALM) and catastrophic risk that we see in the other disciplines.

It is a less dramatic extreme risk. My term is "the death of a thousand cuts." You usually don't have any one big thing, but you have the compounding of a lot of small things that tend to harm your bottom line. We don't have much ALM impact. It's a cash-in, cash-out business, and it's a pretty short tail without much investment in support of the product line. On the other hand, there is an extremely wide variety of unknowns—the market, the economy, regulations, providers and contractual. The common excuse for taking a simplistic view of this is that it's so complex that we have a hard time modeling it and, therefore, we're really only going to touch on certain elements of it.

Here are some current observations. We're in a favorable to very favorable underwriting environment right now. Most people are making money. But there are challenges even in favorable times. We have the observations by regulators and boards about how much money we're making and whether that's appropriate. We're sitting here in an environment in which the public sees, coincident with fairly dramatic premium increases, record profits. This is not an easy set of dots for us to connect. There's a question of whether we are using the capital that we have wisely.

The anticipated future challenges include providing some responses to affordability, to provide money for network and product development and to lower our administrative costs, recognizing that, as you push deductibles up, you have less premium to support the expense load. The question then for carriers on target surplus and reserve management, if that's what you want to call it, is how structured the carrier processes are and what kind of ability they have to measure and articulate what these risks are.

In this new expanded dialogue, the targets that we see used most often still are the risk-based capital (RBC) targets. RBC wasn't built to be the benchmark for surplus. If you go out and look at the marketplace, almost everybody holds some multiple of RBC, which is clearly more sufficient than the authorized control level (ACL) or the company action level. For capital markets, cheap debt is buying some time, which may be going away. We're not sure right now. Outside the health industry, the banking industry and the life industry have moved to things like economic capital as a way of doing risk-adjusted return on capital (RAROC). I have one nagging fear: once an analyst in the market learns one set of rules, he applies that hammer to all nails. Sooner or later health actuaries are going to be challenged to describe their risk in economic value terms, and we're not quite there yet.

The process, which Dan's going to talk about, forces a little more analytical linkage than we've traditionally done. But the outcomes are fairly dramatic. They add a lot of credibility to the planning and to the financial statement process. On the other hand, health actuaries are going to force us to recognize unique health industry requirements or suffer from the poor comparison to the other lines of business. Enterprise risk management and target surplus management have some additional ancillary favorable outcomes, which include improving your efficiency, improving strategic decision-making and building general confidence on the part of your board that we have some clue as to what we're doing here.

One approach to this is to assess the risk, determine what the risk factors are and how you prioritize them and classify ones that you're worried about the most. From there, you can go a couple of directions. You can shape the risks, which is to qualify impacts, mitigate them and possibly finance them if you have to reinsure them. Or you can analyze new opportunities to exploit the risk. That essentially says that we're better at some things than other people are, and if we can quantify how much better, we know areas where we might want to invest additional capital. The bottom line is you stay ahead by monitoring change, risk factors and those kinds of things.

Under the second phase of this, there are a couple of things you can do. There are strategic risk factors, which we're going to call the ones, that lie outside your purview—what's happening in the other markets or things that we tend to wave our hand at and say, "Oh, well, it's just the environment." Those at least need to be modeled and quantified, and some of those can be mitigated. For the ones that are residual, there are typically ways to finance, maybe with your own capital and surplus or applying reinsurance.

Mainly the thing we're looking for actuaries to do is to deal with the manageable risk factors. It's a known environment. We have capabilities and resources. It's something that just fell between the cracks. The strategic risk factors, things that are in unfamiliar territory where we don't have resources, may require capital shift. Those may be things that we can't manage our way out of, and that's how you begin to justify additional surplus.

On the mitigating side, you have several environments and knowing what environment your company represents is an important thing. If you have fairly limited internal risk controls, but a culture that includes strong risk takers, you're probably on the verge of gambling. That's where you say, "Let's do it," and then there's nobody following up. On the other hand, if you have strong internal risk controls on a culture that isn't particularly comfortable with it, you fall to the other extreme, which can be stifling. Your company's not taking the needed advances and challenges. Hopefully, you achieve the middle ground of having a balanced risk program, and, in some areas where strategic risk is important, you have managed to optimize your combination of controlled risk-taking.

Part of what Dan's going to talk about today is how you model some of these things: the underwriting risk, the financial risk and distribution. There are some models of probability distributions. They aren't elegant, but they work reasonably well. They at least help quantify this in a way that's more understandable. The problem you have is that there are almost all covariances available in all of these. If you talk about revenue and use the classic way of a spreadsheet model, revenue is impacted by your premium increases, your renewal distribution and your investment income, but it's also impacted by shock lapse and antiselection. When you look at the variables that have to go into these kinds of models, probably the hardest part of this becomes how you deal with the covariance between them.

In that attempt to stay on the difference between reserves and reserves depending on what you define them as, John Stenson is going to talk a little bit first about financial reporting, the impact of Sarbanes-Oxley and risk management in a sense that relates back to this enterprise risk management we talked about.

Dan has done a lot of work on ways that we can do this quantification that we're talking about and ways that we can model surplus and begin to talk about this in a more analytic way than taking RBC and multiplying it by three or six or whatever we think the right number is.

MR. JOHN M. STENSON: As John indicated, he asked me to come in and talk a little bit about what's happening from a financial reporting perspective and the obvious linkages between reserves and what we do in the development of those reserves. I'll also discuss the kinds of impacts outside influences are having, should be having or maybe we wish they didn't have on the processes that are in place as we, as actuaries, play the important role of developing reserve levels for our company.

I'm going to go briefly through a discussion on the external environment. We're all operating in it. I'm going to try to go through it fairly quickly. The reason I want to talk about it at all is to illustrate how important it is that we now look differently at a lot of the things that we do, a lot of the information that we see and a lot of the analysis that we perform. With linkages, controls and procedures set up in place we may have been there at one level. Now, as a result of Sarbanes-Oxley, the CEOs and CFOs that we work for are personally attesting to the financial statements that they file, so they're a lot more interested in the details of our process than perhaps they were before.

Given that they're going to be interested in the details of how we develop reserves, I think we're going to, as a profession, need to explain what can cause variances in our estimates. What are the factors that can cause us to wind up with variances? We're smart people. We have a lot of training. We've done a lot of work to get to where we are today, but we're not accountants. We're not looking at a pile of beans and counting how many there are. We're doing something that's a little more esoteric, but we are going to have to be able to explain what the drivers are that cause those variances. What are some of the practices in place that we've seen that perhaps can help minimize that variance?

I'm not going to talk necessarily about detailed analytics. John was talking about harmonic and geometric means. I'm not going to talk about completion factors six of eight or three of five, but about higher-level business processes that allow us to the key drivers in our companies. I think our companies will be better suited if we take a more proactive and aggressive role.

Of course, there's a lot of compliance in our world. We can thank some of the massive corporate failures of the late past decade and the early part of this decade, but there's a lot more compliance. One of my concerns, to be perfectly honest, is that Sarbanes, and especially Section 404 of Sarbanes, can cause other entities (for example, the SEC and the new Public Company Accounting Oversight Board (PCAOB)) to be more proactive in trying to at first understand what we do. If they can't understand what we do, my fear is that they may start telling us more about what to do. I think we want to be able to move beyond just the compliance with these various laws and show the value that our procedures and processes can bring into place, and how we can be a significant part of helping the company address operating efficiency and effectiveness.

We're all operating in an environment where, as John indicated before, we're coming off of 2003 where a lot of plans did well. In fact, most of the plans made a lot of money. That's had its issues in the forum of public opinion. Who knows what will happen this November in the election? I think we are going to be dealing with health care as a public affairs issue, so we're going to need to be on top of what is happening to our costs. Obviously, the biggest component of cost is estimating what's remaining out there. Traditionally, after coming off of cycles of profitability, there's been the historic three-year underwriting cycle where we then have losses. I

think we're going, for many reasons, to need to be more on top of that cost curve as it starts getting closer to our revenue line and be able to explain that accordingly and all the drivers behind it.

As far as the cost curve is concerned, I don't know how many people here are seeing at their company that providers are emboldened. They're asking for relatively significant increases for a few reasons. They, too, have seen the profitability that the carriers have had. They read the papers and see that it's been because their customers have paid higher premium rates, so like any good capitalist they want part of the gain. They're asking for a lot more of the money. I think they're in a position to do that because, while our market is consolidated, so is theirs. In many instances, they're the only game in town, and they're driving a little bit of the price up.

Changing products is something that I'm sure a lot of us to varying degrees are dealing with. The product market is changing. There's certainly the well-publicized movement away from HMO-enclosed network products to products that have more open access. That complicates the reserving process a little bit. I think it also has more risk because we may have less structured contracts, if we have contracts at all, with some of these other providers. I think that is increasing some of our capital requirements.

I saw a survey about consumer-directed products. If our companies aren't out there with a product right now, we're getting ready to have a product. Some surveys indicate that if you take a look at what happened in the 1970s with the passage of the HMO Act, it took a few years for HMOs to gain traction in the marketplace. I saw an analysis that compared the passage of the Medicare Modernization Act, which included the health savings account (HSA) component, and tried to make the parallel between that and the passage of the HMO Act. The forecast is that, by the end of this decade, consumer-directed products as a percentage of covered lives will be second only to PPOs at about 20 percent or 25 percent of the market.

Obviously, consumer-directed products and the accounts underneath them, whether they be HSAs or health reimbursement accounts (HRAs), will complicate our reserve development process because we will have to study and understand how they impact member utilization underneath, especially after the products have been in place a few years, those products that have carryover provisions, that will impact utilization as people have funds that may even exceed that annual deductible.

In products, there used to be a lot of flexibility. What's interesting is technology seems to be enhanced. You could argue that because of our ability to have more flexibility in our product offerings, there's a lot of commoditization of the products. Many companies are trying to add additional features and incorporate new programs, whether they be around medical management, member service or member outreach, that are changing the nature of the products. The insurance that people buy today, relatively speaking, is being viewed more and more as a

commodity. It's the other features that may change the nature of the product which we're going to have to be on top of and understand. We'll need to be able to document and describe how we make those adjustments when we're developing our reserves.

Next I'll discuss regulatory changes. I think it will be interesting to see, with the increases in Medicare reimbursements as a result of the Modernization Act, whether that will slow down some of the traditional cost-shifting that has occurred from the public sector to the private sector payers. Time will tell. When we see all of the consolidation that's taking place in our industry, it makes me wonder whether Paul Ellwood, when he was talking about "super meds" in the '80s, wasn't off a few years in his predictions.

In the world we operate in today, there are a lot of people looking over our shoulders at what we're doing. This may be because we're a publicly traded company and the investor analysts are trying to understand and interpret the results that we're putting out there. Unfortunately, we're dealing with these investor analysts that don't know a lot about our business. I don't know whether any of you have participated in or listened in on calls with investor analysts. They don't understand our business well. They try to develop simplified views of our world either through the development of ratios such as days claims payable or try to apply quick balance-sheet ratios to understand what's going on. With the variability in our business, we can be over- or, perhaps, underreserved. Those ratios get out of whack at times, and they don't understand why. But that doesn't mean that they're ignoring us. They're just pressuring us even more.

Sarbanes-Oxley, as I indicated and John indicated in his prior comments, is an emphasis on fair representation. It's an appropriate backlash to a lot of what happened with Enron, WorldCom and all the other well-publicized accounting problems. Besides the CFO and CEO having to certify to their financial statements, the outside audit firm has to certify to the control procedures that the plans have in place.

How many people here work for health plans? Have any of you been involved in a 404 exercise at your health plan? Even if you're not with a publicly traded company, a lot of not-for-profit or private companies have fear about exposure that they have for their fiduciary responsibility, and it's probably driven by the companies' boards of directors. I've seen even private companies decide they're going to adopt Sarbanes-Oxley requirements. I don't know if they're viewing it as a safe harbor. Some companies are conservative. If there's something to comply with, they'll comply with it. I think you would want to understand where your company is in this process, and I think you'd want to understand what role you and your departments have had in that process because your CFO and your CEO are going to be certifying to that process, and your audit firms will be taking a look at it.

In terms of our business, I'm not telling you anything you don't know. We have a complex set of business processes across multiple functions, and that's not revealed anywhere more than it is in the development of health reserves. We obviously take a look at what's happening on the claims payment side and all the administrative issues that impact that. We also take a look at what our provider-contracting people are doing. We need to understand what's happening in our marketing efforts. We should be looking at and understanding every functional area in our company to be able to estimate those reserves. What Sarbanes-Oxley was going to require is that that process, which takes place to one degree or another in most places, has documentation around it and that you have control procedures and checks around that.

A perfect example is one I was involved with. Actuaries at a company appropriately looked at the development of their period reserves, where there would be year-end or any quarter-end, to understand if there were unsigned potentially retroactive provider contracts out there, especially at some of the major providers. They talked to the provider network people about that to understand it. The provider network people would give the company information. The provider network people, not wanting to be culpable in any negative surprise, were understandably conservative in the information that they gave to the actuaries. The actuaries would use that information, but there wasn't a process to go back and take a look at what those contracts came in at. Did they get that level of increase that they feared? Many times they didn't. People were being conservative, and it was a process gap that, through the 404 exercise, was identified and cleared up, and now there is retroactive analysis on that information. There's a check to make sure that that information is represented as being reasonably accurate versus overtly conservative.

In the process of developing reserves, there are always going to be variances. As I said before, this is not an exact bean-counting-type science. I think many of you would recognize some of those drivers and have dealt with them at various times in the reserve-development process at your company. There are a couple of the areas that I would like to point out quickly that I think are linked to the whole 404 documentation process. A lot of companies, especially those that are publicly traded, are looking to get results out there as soon as possible. The market insists on that. There's a lot of pressure to get the results out as soon as possible. That can cause problems at times with data accuracy and an understanding of the timeliness of the data that you're dealing with.

You can push back and understand: Are you dealing with data all the time through a month-end? Some companies have appropriate controls in place to make sure that adjustments happen, but they actually cut triangles off earlier than the 30th or the 31st of the month. If you're getting that kind of pressure and you're using that kind of data, what controls and procedures do you have in place to check the assumption you make to the reality that flows out later?

There are a couple of other things that I've seen, and I'm sure you've all seen as well. I had one client that had a lot of small group business, and the actuaries didn't understand a change in incentive compensation arrangement that was put into place with the brokers. For those of you who have a lot of small group business, brokers are a main part of your life, sometimes maybe the bane of your existence. But they didn't understand that that incentive arrangement didn't line up as well with incentive arrangements that some competitors had out there. There was a deterioration, relatively speaking, in the block of business that the actuaries certainly recognized in hindsight and could have been part of a valuable discussion going forward, at the time, and could have made marketing and sales aware of what potentially happened. Unfortunately, that did not take place.

Next I'll discuss inside and outside trends and the regulatory field. I've been involved in some concerns that various insurance departments have had around surplus—actually, companies having too much surplus. With the high level of profits that we've had, some regulators are going in and not only taking a look at the surplus levels, but requiring that companies perform independent analyses of the reserves because, as John said before, there have been companies who have squirreled away additional surplus and reserves.

There are positive and negative implications in this process in terms of how well we're able to do it. The reserve process obviously feeds into the medical trend and medical cost-estimate process. Some of these are fairly straightforward. Obviously, some are the negatives of the other if we don't do it well. I think one thing, which is going to be key, and it's a reflection of the society we live in, is we do the best that we can do. We make the best estimates using our knowledge, our experience and the data available to us. That doesn't mean that we're not going to have our errors "criminalized." Unfortunately, in today's world people are looking many times for somebody to blame for when something goes wrong. I've seen these situations. They're not pretty, and, unfortunately, what has contributed to some of the problems is lack of clear documentation, clear control process and control procedure. In that regard, Sarbanes and the requirements behind it are not all that bad.

Chart 1 is trying to represent the linkage between the stuff that we take a look at that we should be involved with at our companies that we can get information about. These are things that we can have some control over, and the chart shows how it feeds the processes of our company at a higher level that are perhaps less controllable. Depending upon whether you're publicly traded or not, these will have impacts on things that are going to be important to your board, to your stockholders and to your CFO.

I talked a little bit before about some processes that I think are important in being able to mitigate some of the volatility in IBNR estimates. Like most business processes, they involve the five key areas, and ours is no exception: the people, the process, technology, data and tools. Basically, Chart 2 is one person's view of the world. You can do what you will with the column headings, but going from left to right, I think it's a fair representation that it's less control to more control, and in an environment where you may see more volatility to where you'll see less volatility.

I think one of the important parts that we can take control over and be an integral part of is on the people side. We need to make sure that we get with the right people in our organization, that we document those conversations, that we push back on the data that we receive from those people, that we understand the control procedures and processes in place in that information that we receive and that we have all the tools that we need.

Our firm, obviously, is mostly an accounting firm. The accountants have had their bruises in the past few years, as you can imagine. Maybe it's trying to make lemonade out of lemons, but we can take the whole process required out of Sarbanes and comply with it. We can do a typical approach, or we can decide that we can take it a step further and have it improve our processes and our results. It can open up a new cultural environment for us where there's a lot more communication and a lot more collaboration. Given that we deal with the most significant item on our companies' balance sheets, I think we can take the lead in that discussion. We should take the lead. We should coordinate with our right colleagues whether they are in the CFO's department or in the marketing department. It's a significant opportunity for actuaries to be leaders in this process. We can help transform our organizations.

We can also take advantage of this time to be as transparent as possible in the processes that we do. Let's be clear about the data that we use and be clear about the quality checks and everything else we need to use those data appropriately. What we do is complicated. There's no doubt about it. But what we do can be transparent, and it will make explaining it to our colleagues in other functions or our colleagues at other companies easier.

Why should we do this? As with anything, sometimes we need a hammer. Sarbanes 404 is there. The CFO may many times be an accountant. The accounting firms obviously comprise accountants. They're being asked to sign statements and certify the processes and procedures, so they're going to want to understand what those processes and procedures are, especially the ones that go into the development of the reserve. This will also serve other purposes for our company. I think we will realize the benefits of earnings and periods when they're generated. The better we are at this process, and the more collaborative we are, we will do better at estimating those reserves.

We won't deal with the marketplace discounting our numbers because they can never be sure if they're right because we're constantly restating our reserves. We won't get the benefits of our earnings from the analysts, or it won't be reflected in price/earnings (P/E) ratios in our prices, or the regulators will call in to question the amounts of money that we're holding. It will help us to make better pricing decisions and help us to come out of the curve. As health care goes further and further into public policy discussions, we will be better able to play our important role in truly showing what the costs of health care are if there is any proposal that may come into play.

Basically, reducing variability in our estimates will be a good thing. I think the results are all favorable. These may sound a little like motherhood and apple pie, but I think that they will lead to our enhanced role at our companies, or at our clients' companies for those who are consultants, and I think this will lead to better information sharing and better results. We'll be able to explain the importance of what we do in a transparent fashion.

MR. DANIEL S. PRIBE: I'm an actuary with Mercy Health Plans in St. Louis. We are a provider-owned HMO that does commercial, Medicare and Medicaid business. The comments that I'm going to make today are mainly going to be geared toward HMO- and PPO-type products, which have a relatively short tail, or runout period. However, the concepts that we're going to go over are applicable to any kind of health product.

Some of the traditional tools that we have available to us are cash-flow testing (CFT), gross premium valuation (GPV) and dynamic solvency testing (DST).

To set the stage on how to use these tools, keep in mind three separate examples.

First, let's say that you're an actuary in a provider-owned plan, and your provider/owner just purchased another hospital that happens to also have a health plan associated with it. That plan is globally capitated, and now they want to transfer the risk of that global capitation arrangement to your organization along with the assets to cover that risk.

Second, let's say that your company wants a strategic initiative to increase your market share by 10 percent. The marketing area has stated that in order to grow 10 percent, the rates must be lowered by 10 percent. The question then becomes what will happen to your surplus position?

The third example is a little bit more complicated. Let's say that you're developing a new product, and to attain critical mass, the marketing area has said it needs rates that are 10 percent lower than what you deemed necessary. However, your senior management does not want the surplus position of the company to be damaged by entering into this new market. What are you going to do?

There are several considerations that need to be taken into account to address these scenarios and others like them.

The first consideration is to define your objective. In the first example, where you had the global capitation arrangement, your objective is to see if the assets that you've been given are sufficient to cover the runout risk. The second example is a pricing and contribution to surplus issue.

The third example is more complicated. In this example, you will need to review the business plan of the company. Here are some items that you could consider in trying to gain your critical mass while maintaining the company's surplus position.

Define Objectives

- Analysis of surplus volatility
- Opportunity analysis
- Alternatives for corporate restructuring
- Pricing/repricing policies

Review Business Plan

- New business production
- New market entry
- Pricing strategy
- Divestitures
- Capital formation
- Joint ventures

The next considerations, after defining your objectives, are the steps for your analyses.

Steps

- Identify lines of business to project
- Identify risks to consider
- Select scenarios to project
- Define projection horizon
- Review standards of practice and practice notes
- Identify data requirements
- Determine company's minimum capital requirements
 - RBC
 - MCCR
 - Statutory standards
 - Rating agencies
 - Internally defined

You will notice that this list includes considering the Actuarial Standards of Practice (ASOPs) after the first couple of steps have been considered. In practice, this is usually what happens with my projects. I usually do the first couple of steps and then start asking whether there is anything else I should be taking into consideration. At that point, I pull out the ASOPs.

You will also notice that this list includes different types of capital requirements. You will need to be aware of these as you develop your projection.

Let's get back to the first example. Items identified in these steps that you will need to complete the analysis of whether or not the assets will cover the runout risk include a list of assets, an assumed completion pattern for the claims and the time horizon, and claims paid to date.

Finally, you want to consider the different types of risks. Doing so may help in structuring your product or strategy to mitigate those risks.

Operational Risk (risks that are somewhat within the control of the company)	
▪ Mortality	▪ Expense
▪ Morbidity	▪ Liquidity
▪ Persistency	▪ Mismanagement
Environmental Risk (risks that are largely out of the control of the company)	
▪ Economic	▪ Governmental actions
▪ Legal	▪ Accounting actions
▪ Society's perception of insurance	▪ Competitive forces
Determinants of Risk Variability	
▪ Covariance of risk	▪ Distribution channels
▪ Reinsurance	▪ Underwriting
▪ Product guarantees	▪ Asset characteristics
Company's desire to control risk	
Company's flexibility to meet changing capital requirements	

There are two general categories of risk that you will face: operational risk and environmental risk. Operational risks are those that are somewhat under the control of the company. Environmental risks are those that are largely out of the control of the company.

Let's get back to the capitation example. What are the assets in question: cash, short-term bonds or something else? If they are bonds, what are the maturity dates? Clearly the answer to these questions will determine liquidity and thus will have an effect on your projection.

The "value" of these risks, or variability, will be determined by items such as covariance of risk, reinsurance, product guarantees, distribution channels, underwriting and asset characteristics. Building this variability into your projection is important in developing a plausible range of outcomes.

Let's move on and get to the specific methodologies previously mentioned. CFT is an analysis of the specific timing of the cash flows of assets and liabilities. You can

use CFT for capital surplus requirements, capital adequacy analyses, ratemaking studies and reserve adequacy, which is the analysis required for the capitation example. You will need your balance sheet, claims paid to date, the completion factors and the asset characteristics of those assets covering that liabilities. You also need to have a closed block of business and know the time horizon.

After you get all the information that you need, build the models, run a Monte Carlo simulation and summarize the results. This process is basically the same for all three types of analyses: CFT, GPV and DST.

GPV is the tool that can be used for the second example mentioned earlier. Texts define this as "a present value analysis of your future premium offset by your claims and your administration."

GPV can be used for premium adequacy, reserve adequacy, product development, rate making, financial projections and actuarial valuations. You will need to know your membership, premium, claims and administration. If you're using investments in your pricing, include them in your projection. Finally, I use claims probability distributions (CPD) tables in my projections as this helps determine the variability in the possible claims outcomes.

What's interesting in these analyses is that there are a couple of different choices you can use when you're projecting claims. One method is projecting claims in aggregate for an entire population. You can take a CPD and convert it into something that looks like a normal curve and then do your Monte Carlo simulation on that curve.

Another method to use for group insurance is to develop claims distributions that vary by size of groups. These distributions can be developed by using the CPDs, as well. Run a Monte Carlo simulation for your book of group business with each group, hitting its appropriate claims distribution table.

The process for performing GPV is essentially the same as CFT. You basically collect all the information, determine the projection period, run your Monte Carlo simulation and then summarize your results.

If you also want to summarize your net income and the potential effect on your surplus, use DST. DST is kind of a combination of CFT and GPV because it's a look at your ongoing business operations, as well as attempting to identify any risks associated with those ongoing business operations.

You will need the same type of assumptions for DST as you need for CFT and GPV. Again, the process is basically the same as for CFT and GPV. You gather the assumptions, put together the model, run the simulation and summarize the results.

Let's look at some examples I put together in Excel spreadsheets. Several simplifying assumptions were made in the development of these examples. They include the assumptions that the premium is paid monthly, there are no lapses and the administrative expenses vary with claims. Example 1 is the capitation example mentioned before using CFT to do the analysis.

Example 1: All assets in cash

Balance Sheet

- Assets:
 - Current Assets: \$92.5 million
 - Other Investments: **\$0**
- Liabilities:
 - Claims and LAE Reserves: \$89.5 million
 - Surplus: \$2.5 million

Claims Data, including completion factors, from company records

Assumptions made for administrative expenses and variability factors

The example details the balance sheet. The capitation/claims and administrative expenses are covered by cash assets of \$92 million. We want to see if we will have enough cash at the end of the period to cover the liabilities. To do this, the model I built projects the balance sheet, the cash-flow statement and income statement. I also had to project the claims runout using development and completion factors. I put a variability factor into the development factors of ± 2.5 percent. This reflects the variability of the claims runout.

Administrative costs are a function of claims costs, so these will vary as the claims vary. In this particular example, the assets are all in cash, so there were no investments to necessarily project. There is a tab in the spreadsheet that specifically summarizes the cash positions for the entire time horizon. The values in this tab come from the balance sheet. A Monte Carlo simulation is run with the results copied on this tab. The results of the cash position for each month in the time horizon are summarized and then graphed (see Chart 3).

This graph is showing that the cash position, as expected, is going down pretty steadily. Of concern, though, is the part on the tail end of the curve because it shows the cash may go negative.

Let's expand this same example.

Example 2: Assets in cash and Other Investments

Balance Sheet

- Assets:
 - Current Assets: \$81.5 million
 - Other Investments: **\$10.5 million**
- Liabilities:
 - Claims Reserves: \$89.5 million
 - Surplus: \$2.5 million

Claims Data, including completion factors, from company records

Investment characteristics from company records (e.g., maturity date = Jan 01, 2005, 2.5% return paid semiannually)

A variability factor was included for incurred claims estimates and completion factors

Instead of the assets all being in cash, you now have assets that are in cash and a bond that will mature on January 1. I'm assuming that there's no risk associated with this bond and everything is pretty much known about it, so I haven't modeled any kind of asset risk here. I go through the same procedure where I'm modeling the projected cash positions at each month in the time horizon (see Chart 4)). There's a little dip on the cash position around December '04, and it's close to zero. What's happened is that the cash is going way down because the bond has not matured. Now you have a potential liquidity issue. It is important to point out that at each one of these cash points on this graph, there's a distribution of possible cash positions that is approximately a normal curve.

For December '04 (Chart 5), by finding the point at which there is no cash, you can see there is a good chance that they're going to run out of cash at the end of the year. By analyzing the cash position for December '05 (Chart 6), you can see that there is approximately a 50/50 chance that the assets will not cover the liabilities.

Let's look at a GPV example. Let's say that we have a block of business that is 50,000 members, or about 600,000 member months. The model projects the premium with a random factor of ± 1.5 percent. The model also projects the administrative expenses and the claims using a claims probability distribution as mentioned above.

Finally, the model projects the net income. This is where the Monte Carlo comes in. Similar to the CFT model, this model sets up a separate tab that summarizes the premium, claims, administration and net income of several thousand runs. In particular, the net income is summarized and graphed (Chart 7). This is the distribution of net income for the product we're trying to model. The lightly colored line at a loss of \$1.5 million is the 99th percentile.

This type of analysis can then be used with senior management to assist in things like setting pricing strategy.

Let's look at the DST. DST will produce the results for an ongoing business operation. Again, you're using the same types of assumptions for your claims runout and the same assumptions for your claims, premium, investment and administration projections.

DST will also project the income statement, the cash-flow statement and the balance sheets. In particular, I want to show a summary of the surplus position. A Monte Carlo simulation was run with the results summarized in the following graph (Chart 8). We're seeing the surplus increasing and then flattening near the end of the year. This is mainly due to claims trend. The premium is set annually as of January 1, while the claims are steadily increasing due to trend.

Each one of these surplus data points has a distribution of possible outcomes around it. Thus, I want to see the chance of running out surplus where we see this little dip. The following graph (Chart 9) shows the distribution of possible surplus positions. We can see there is approximately a 1 percent chance of running out of surplus.

Let me get into an Excel spreadsheet to show how the simulation is run. It's easy to set these things up for your simulation. The hard part is setting up the model itself. You will have to decide what it is you are trying to project. In this particular case, I'm looking at these four items again: premium, claims, administration and in particular net income.

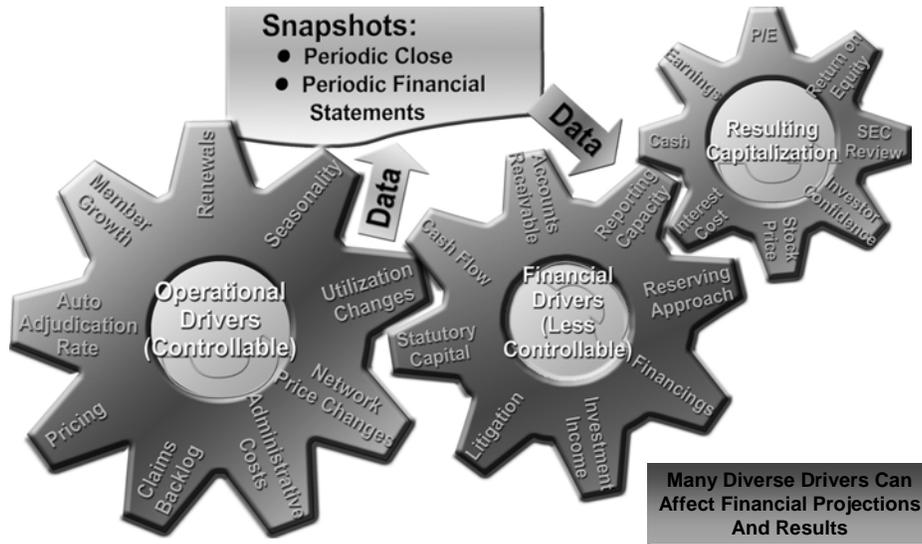
There's a simple macro routine you can set up that basically copies these four items (premium, claims, administration and net income) down whatever number of times that you want. The macro will calculate and then copy the results. It goes through pretty quickly. This is going through the process 1,000 times. There, the simulation is done (about 30 seconds later). Another part of the spreadsheet is set up to summarize and graph the results of these runs. Again, the hard part is actually setting up the model itself. The easy part is running the simulation. How big the spreadsheet is determines the amount of time that it takes.

In conclusion, CFT, GPV and DST can be used for HMO- and PPO-type product with shorter tails. They can be set up in Excel such that Monte Carlo simulations can be run to give a range of possible outcomes for whatever scenarios you may be modeling.

MR. LLOYD: Hopefully, what you got out of Dan's piece and John's piece is that we need to do a more analytical job of approaching it. Dan has shown that there are some powerful tools now that technology has caught up with, and it allows us to do that if we feed the right assumptions in.

Chart 1

Complex Interlocking Drivers



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Chart 2

Leading Practices in Mitigating Volatility in IBNR Estimates

Risk Areas	High Risk Practices	Moderate Risk Practices	Sound Practices	Leading Practices
People	Major changes in processes not shared between disciplines	Routine monthly reporting shared between all disciplines	Major operational changes are routinely discussed with interdisciplinary team	Major operational changes are discussed & decided by interdisciplinary team
Process	Policies inconsistent and/or undocumented & process inconsistent and/or not well controlled	Policies are documented but deviations are common	Policies are documented & deviations from policy are infrequent	Consistent policies are fully documented & followed across entire organization
Technology	Multiple input systems require manual feeding of data	Multiple input systems require minimal manual feeding of data	Input systems provide the critical data needed	Input systems provide all data needed in a reliable & timely manner
Data	Critical data is unavailable or lacks consistency & integrity	Data quality questions exist due to multiple reporting systems that do not reconcile	Only minor reconciliation issues between multiple reporting systems	All data reconciles with other reporting systems
Tools	Multiple tools are required & interpretation of results is difficult. Manual intervention required	A single tool is required but manual adjustments are frequent and interpretation of the results is complex	A single tool is employed with clear results and minimal manual adjustments	A single tool produces clear and accurate results

————— Variance Reduction —————>

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Chart 3

CFT – Example 1: Cash Position

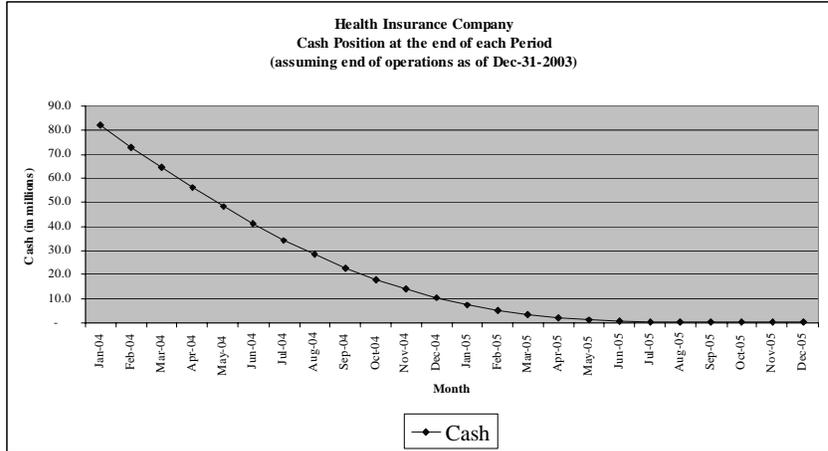


Chart 4

CFT – Example 2: Mean Cash Positions

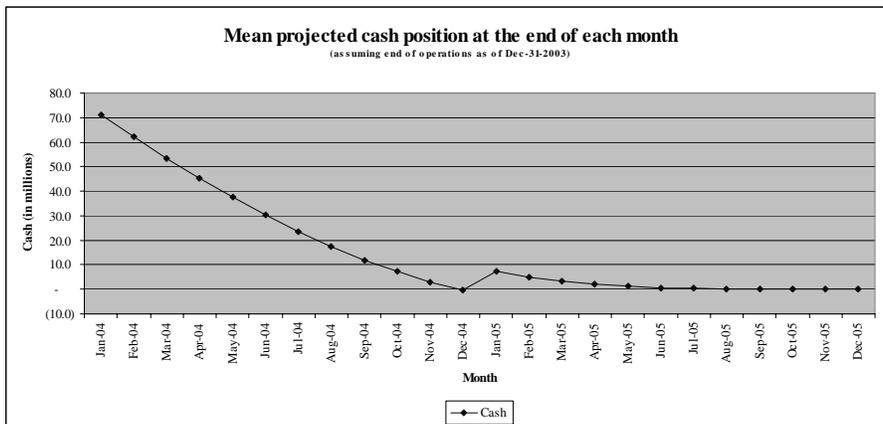


Chart 5

CFT – Example 2: Possible *Cash* Positions for *Dec-2004*

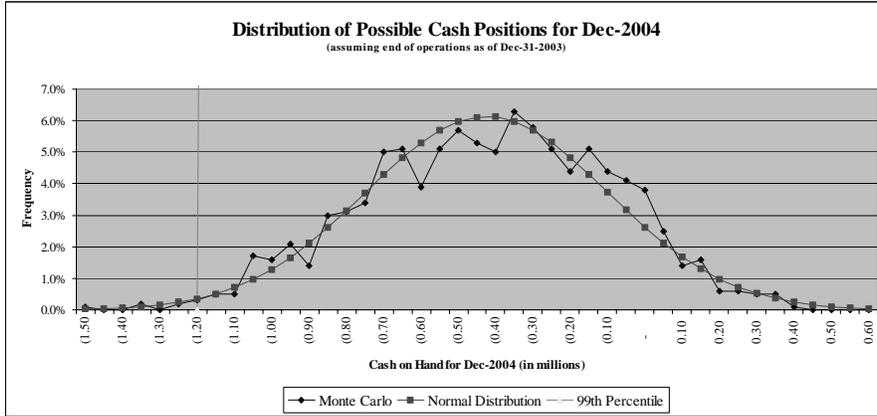


Chart 6

CFT – Example 2: Possible *Surplus* Positions for *Dec-2005*

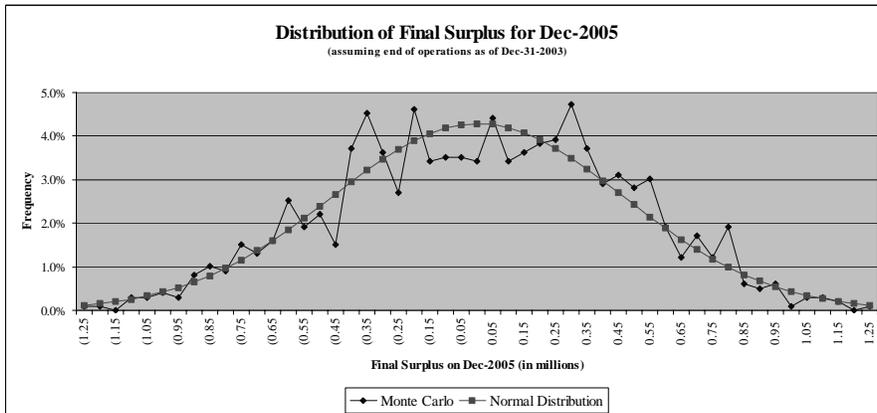


Chart 7

GPV – Example: Summary of Possible Net Incomes

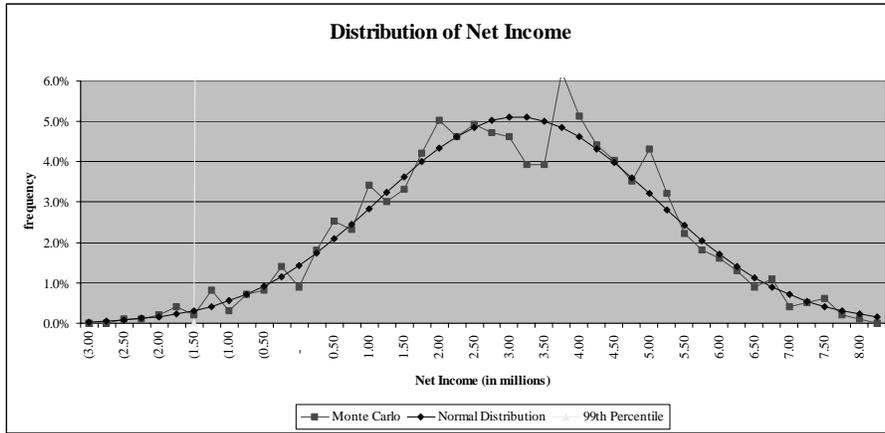


Chart 8

DST – Example: Mean Surplus Positions

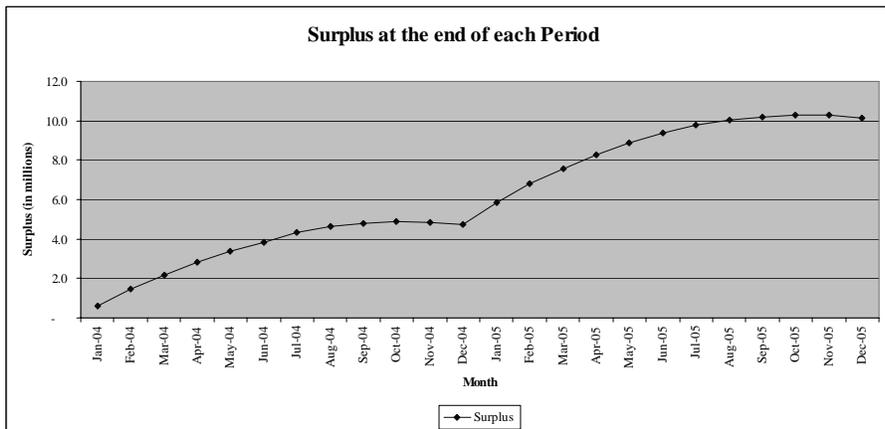


Chart 9

DST – Possible *Surplus* Positions for *Dec-2004*

