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SESSION 12

Financial Projection of Health Coverages -- Long-Term Projections

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FINANCIAL PROJECTION OF HEALTH COVERAGES -- LONG-TERM PROJECTIONS

MR. RONALD M. WOLF: At a previous session, the speakers talked about health projections in somewhat general terms which led up to one session on short-term projections, and this one on long-term projections. The speakers tried to build a base at the short-term projection session, and we will now cover a few more specifics on long-term projections.

I'll proceed with an expansion on some of the thoughts that I expressed at the preceding session about long-term health projections. I would like to discuss the uses or applications of long-term projections: a little bit more in terms of general approach; things that need to be done; some comments on assumptions; reasonability and sensitivity tests; and interpretation of results.

Let's cover uses of long-term projections. Even if we're pricing a new product, we can be doing a long-term projection over the life of that product. For actuarial appraisals, your length can vary quite a bit by product line. Maybe for group coverages, the length is shorter. For coverages like disability, the length is longer. Reserve adequacy and cash-flow testing involve long-term projections.

Surplus adequacy and dynamic financial condition analysis (DFCA) utilize long-term projections. Put a question mark next to the latter one. DFCA typically involves a shorter-term type of horizon or projection of maybe five years or less. If you're looking at GAAP recoverability, or loss recognition, you're probably doing a long-term projection, as you are with value-added reporting.

In some types of applications, like planning and budgeting, we're probably not talking about a long-term projection. Internal projections for management purposes are typically less than five years. A GAAP pro forma projection as a merger and

acquisition situation, where you're doing a pro forma GAAP statement, typically only lasts for a few years.

Pricing work for some product lines, such as group insurance, is typically done over less than five years. And I include here regulatory filings. Those are kind of a mixed bag. If we're doing a projection over the life of our product to obtain present value benefits over present value premiums, that probably is long term in nature.

Now, I have some general considerations pertaining to long-term health projections. We have to decide whether our long-term projection is going to include in-force and/or new business. If we're pricing a unit of new business, that's certainly a long-term projection, or can be. So whether you include new business or not depends on your purpose. If we do include new business, we have to be concerned about the volume of business. I tend to be somewhat skeptical when the marketing department gives me rapidly increasing amounts of new business to project, and I think all of us need to be aware of issues like that.

When we do projections, we're probably going to use some sort of model. We're not going to project every last policy or all the small groups of policies that we have, although I do have knowledge of one counterexample to that. We worked with a company where the people are still doing projections on the mainframe, and they literally are projecting every policy. I think that's definitely the exception rather than the rule. In most cases, if we're doing an in-force projection, it is broken down by issue year.

In most of our coverages, duration of contract is important, so basing our model on a duration or issue-year basis is important. The use of plan/age cells may vary. If we're talking about a product where different cells will exhibit different characteristics, product characteristics, and assumptions, than I think we should be

using plan/age cells. If, for example, for group lines, all of our business is generally of the same nature in a segment, maybe we don't need to do that.

Once we've decided how to set up our model, I think there are two types of validation of our model. First is what I would call a static basis. Here we are talking about representation of a model. Is the model a good representation of the business that we have in force? We're comparing at the start date actual amounts versus model amounts for things such as reserve premiums and units, and units in force.

Dynamic validation means making sure that your assumptions are reasonable, in that the first year of your projection produces projected amounts that are reasonably in line with recent historical amounts. I think that's especially important for the claim elements of our projection.

We do need to decide on the length of our modeling period, which for a long-term projection is at least five years. For true group business, i would tend to look at a ten-year horizon at the most. For other coverages, probably at least twenty years is appropriate.

Let's move on now to some thoughts regarding assumptions, with claims being the key assumption. There are three approaches that we can take to project claims; one is to drive our claims on the basis of incidence and termination rates. The second approach would be to look at a net annual claim cost times units in force to obtain incurred claims. Third, we can take a loss-ratio approach as a loss ratio times the projected premium for each period. Your choice of any of these methods is going to depend on the comfort you have in certain assumptions and the type of produce that you're projecting.

I have a few more words about assumptions. For policy termination rates, I think particularly for over-age or older-age coverage, like Medicare supplement, death

rates are important. For underage coverage, my tendency would be to use a total termination rate with deaths and lapses combined. That probably isn't appropriate for coverages for older age individuals as the two elements will have a different nature or a different direction.

I think the main point regarding investment and inflation is, especially for the long-term lines like long-term care and disability, investment earnings on claim reserves is a very important element of the projection. So we need to make sure that our claim reserves are defined in a reasonable and appropriate manner as to how we're actually holding them. If you're projecting claims using a claim cost times in-force business or loss ratio times premiums, then a separate assumption is needed for how losses and reserves actually develop.

The level you uses for general expenses somewhat depends on the purpose. If, for example, you're doing a projection or appraisal for a block of business, you may want to assume that the expenses that would be appropriate would be, say, at industry average level, or at a level an assuming company might realize rather than the level of expenses in the current company, especially if you think those are on the high side.

Our standards of practice pretty much require that at least that we make mention of risk-based capital in the communication of our projections. You should probably be using the level of risk-based capital that you're currently holding in your company, but I would suggest certainly no less than the NAIC formula.

Sometimes I am asked to do projections before tax and let somebody else handle the taxes. But if that's not the case and, as we need to take into account the regular tax rate, either the full corporate rate or a small company rate perhaps, differences between statutory reserves and tax reserves are particularly important for long-tail coverages such as long-term care and disability. The deferred acquisition cost tax, which is an ongoing tax for guaranteed renewable and noncancelable lines, should

be taken into account. A purchase tax adjustment is used in situations where a block of business may be assumed by assumption reinsurance. Here, one gets involved with things like the ceding commission that is actually paid being deductible, perhaps immediately or maybe over a period of time. And there's also a provision whereby the net assets transferred become a deferred acquisition cost taxable premium to the assuming company.

We need to be aware of what our trend period is and what a reasonable trend period is. My own preference is in projecting a coverage for which there is trend, to take the trend rate out for no more than five years and leave it at a level amount thereafter so that distortions aren't introduced. If you're projecting a coverage that has rate increases as one of its elements and those rate increases are large, you need to be aware of the possible effects of antiselection and high lapse rates.

We might use different expense assumptions for different purposes. If we're doing a GAAP loss recognition calculation, for example, we might use our very best estimates and pull out any kind of margins that we think might exist; whereas for cash-flow testing, perhaps we would be somewhat on the conservative side.

Let's move along now to reasonability and sensitivity tests. Especially with health coverages, I think it's a good idea to test sensitivity of projection results with changes in key variables. Three of them are lapse, claims, and investment earnings. The latter is mainly for the long-tail lines.

If we have trend, the loss ratios that we're using and the effective rate increases need to be reasonable. A good example of that might be if your line is underpriced at the moment and you're trying to get back to a reasonable level, how soon can you do that? Is it even possible to do that? Especially for new business, we need to be aware of reasonable assumptions for premium growth rate. If our trend assumptions

and rate increase assumptions are out of sync, we may end up with an unreasonable result of growing premiums for a declining block.

As far as interpreting results, if we're going to determine results in terms of present value, we need to be concerned with a couple of things. One is, make sure you understand the timing of the earnings that are coming our of your model. Have you calculated them to be coming out at the middle of the year? At the end of the year? That will be important in your discounting process. Also, you're going to have to make a choice of what discount rate you want to use in taking your present value back to the start of the model.

We should be examining the reasonableness of projected annual earnings, what their level is year by year, and also their pattern. For example, if you have a pattern where earnings are positive for a while and then are negative, you may want to ask yourself whether the company should begin to set up a reserve for those future losses.

Regarding selection of scenario results for your claim and investment projections, you need to decide how wide a range of results you want to use and what likelihood you would attach to those.

And finally, in presenting your results to management, I think it's important to clearly state in your communication the purpose for the projection. Make sure you describe the methodology and the assumptions that you use, and what your qualifications for them might be. And finally, in stating your results, I always like to use an executive summary that appears up-front in the communication that gives the key elements for the results of the projections, the key assumptions, and then also what the conclusions and key observations might be.

Helen will tell us in more detail about projections on long-term health coverages in her company.

FINANCIAL PROJECTIONS OF HEALTH COVERAGES -- LONG-TERM PROJECTIONS

MS. HELEN HOFMANN: I'm with Bankers Life and Casualty Company in Chicago. We sell primarily individual health coverages as well as individual life and annuities. Of the health coverages, Medicare is our primary line of business, along with long-term care and comprehensive business. I will focus on the projections that we do for health insurance and, in particular, Medicare supplement. In some cases, I will indicate how our treatment of Medicare supplement differs from the other lines of business.

First, I will cover the various uses we make of projections. Second, I will go into more detail as to how we go about setting our assumptions and what factors we consider. Third, I'll cover briefly our modeling techniques. Finally, I'll talk about the interpretation and presentation of the results.

Uses of Projections

These are the various uses that we make of long-term projections. We use projections, of course, for our pricing and regulatory filings. For financial reporting, we use the long-term projections for reserve adequacy testing required on a statutory basis. We have used long-term projections for the development of purchase-GAAP reserve factors and also for GAAP recoverability testing. To a much lesser degree than in some other lines of business, we have used projections for reinsurance. Finally, we have used long-term projections for doing some appraisal work.

I'm not going to talk any further about the use of projections for pricing, but I do want to point out that we do use these projections as a starting point for the new business portions of the projections.

I will now address what we have done for reserve adequacy testing. I will talk later about the various scenarios we tested when I cover the sensitivity testing. The reserve adequacy testing for the statutory financials is based, of course, on existing business

only. We have used conservative assumptions in doing our reserve adequacy testing. We have included full unit costs, not differentiating between fixed and marginal expenses, and we have not included exchanges in our reserve adequacy testing.

The health coverage is changing constantly, and we have had a number of exchange programs that we offer our agents. We allow internal replacements where the agents can replace an existing policy with one of our more current policies. The levels of the exchanges fluctuate greatly depending on whether we have such a program currently in place. For reserve adequacy testing we made the assumption that there would be no exchange programs.

We have used long-term projections for purchase-GAAP accounting. We were purchased by ICH in 1984 and did develop purchase-GAAP reserves at that time. We were purchased by Conseco in November of 1992, and again developed purchase-GAAP reserves for that acquisition. When Conseco bought ICH's portion of the shares in 1993, we developed another set of purchase-GAAP reserves at that time. We also used the long-term projections for GAAP recoverability testing. For purchase GAAP, once again, we are including existing business only. We have typically used full unit costs, but we have made assumptions based on the ability to control the expenses in the first several years after the acquisition. Again, we have not included exchanges. For the postsale business for GAAP, we have basically used the pricing projections for GAAP reserves.

We have used long-term projections for reinsurance when we are considering the possible acquisition of blocks of business. Not for Medicare, but on some of our other lines of business, we have used long-term projections for valuing a block of business at the time of recapture. Some states require that the recapture fee take into consideration the current value of the business, and not be based on a preset fee in the contract.

Over the past years we have on occasion done some projections for appraisals. Much of the work for appraisals has been done by outside consulting firms, but we have also

done some work internally. For appraisals we include both existing and future business, and for this purpose, our assumptions may be less conservative. We try to get a more realistic assessment of the block.

With respect to the reserve adequacy testing and purchase-GAAP reserve development, we do not assume benefit inflation. For appraisals, we do include assumptions for benefit inflation and an assumption for the corresponding rate increases for the benefit inflation. We also include an assumption as to the level of exchanges. For appraisals, we have also considered which expenses we expect will be fixed expenses and which expenses would be marginal expenses.

Assumptions

This is a checklist of the assumptions that I am going to cover: claims, policy termination rates, field compensation, investment income, general expenses, federal income taxes, the level of new business, and the period of time for which the projection is done.

For projecting claims, we have used both the claim cost approach and the loss ratio approach. For example, for our reserve adequacy report at the end of 1993, we used claim costs for our older issues and loss ratios for our more recent issues. For the older issues, (1990 and prior), we used claim costs. We have quite a bit of experience for those issue years by now, and so we can better assess how we think the claim costs are progressing. On the older issue years, loss ratios for different years can be distorted by the timing of the rate increases. It is easier to analyze the claim costs by issue year, which would typically have similar patterns, than the loss ratios. We have used loss ratios for the more recent periods since we use pricing loss ratios as a basis. These pricing loss ratios are adjusted for current experience.

Next I'll cover some of the aspects we consider in our projections for claims. We include an aging assumption, and that is an assumption as to how much the claim cost

curve will rise because people are getting older. We include an assumption for selection wearing off, which is very similar in concept to what we do on a life product. We consider whether the products were guaranteed issue or underwritten, and for the underwritten products, we make an appropriate assumption for the impact of selection. This has been one of the assumptions that has been a little bit more difficult in setting.

As I mentioned previously, we include in certain types of projections benefit increases due to inflation. It has been our belief that we will most likely have some future benefit inflation on the Medicare supplement products. We have been in the Medicare supplement business ever since the program started, and generally there have been increases, for example, in the part A deductible every year. We include the corresponding increases in premiums that we would expect to go along with those benefit increases. We make an assumption on the rate increases as to the percentage we expect would be approved by the states.

The one point I would like to emphasize is that on the long-term projections our assumptions for benefit increases are more simplified than on our very short-term projection. On short-term projections we do a detailed analysis of rate increases by state. We develop assumptions as to the amount, timing, and probability of approval by state. On long-term projections, we use a much more simplified approach with an aggregate assumption across all states.

Our reserve projections take into account the incremental approach we use for reserves on benefit increases. While the entire reserve could be increased proportionately for the level of benefit inflation, this would generate a higher reserve than necessary. Instead, for reserves on our Medicare policies, we use an incremental approach. For example, if we had a 6% benefit inflation, we could increase our overall reserves by 6%, but that generates a higher reserve than is really necessary. We develop reserves by basically setting up a reserve for each benefit increase as of the effective date of the benefit increase. So, for example, for a 1987 issue for which we are doing a projection in 1994,

we will have a benefit increase in 1995, another benefit increase in 1996, another one in 1997 and project the corresponding layers of reserves for those benefit increases. There would be a separate reserve increment for the 1995 benefit increment, one for the 1996 increment, and so on.

In projecting claims it is important to make an assessment of what you think is the true level of claims. In our company, the individuals doing the financial reporting are not the same individuals as those doing the projection. We take a hard look to determine what we think is the level of conservatism that is in the claim liability in the financial statement. The reason for this is that the claim liability portion of incurred claims is going to be the heaviest for the most recent period. For example, if we were doing a June statement, the liability is heaviest for second quarter incurred claims. There is still quite a bit of liability for the first quarter incurred claims, but for claims incurred a year ago, the liability will be very low. If there is conservatism in the liability, it will look as though the loss ratios are increasing somewhat. What can happen is the person doing projections may be looking at the current experience based on the claim liability and seeing a slight increase in loss ratios. That individual may decide that claims seem to be increasing more now than they did in the past and add another layer of conservatism to the loss ratios in the projection. As a result we could end up with additional conservatism in the projection.

Next I'll cover the policy termination rates. Here it is important to be aware of what is included in the actual statistics you are using for termination rates. Obviously, there's the voluntary lapse rate in there. There is also a termination rate for deaths. On a product line like Medicare supplement, where the average age might be 72, the terminations due to death may not be that great currently. If you're doing a projection for a closed block of business as for reserve adequacy testing, that death rate is clearly going to rise substantially in the future, and you need to account for that. For us, tracking the level of exchanges that are in the termination rates is very important, or in a projection with exchanges, we may end up double-counting exchange terminations.

Finally, policy termination rates can be impacted by the level of rate increases that are projected. If a high level of benefit inflation is projected along with corresponding rate increases, there may be additional terminations due to the impact of those rate increases. In looking at historical experience, it is important to be aware of the level of rate increases over those time periods and how much they may have affected termination rates. That is less of a concern for us on Medicare supplement than it is on our comprehensive block of business.

For field compensation, we include both agent commissions and other field compensation including items such as agent's and/or manager's benefits or other manager's compensation. Bankers currently sells the majority of our business through a direct agent force rather than brokers or general agents.

These are the factors we look at in projecting agent's commissions. First, we consider the portion of the premium that is commissionable, in addition to the commission rates on the various forms for various issue years.

Second, for some issue years we may not be paying commissions on rate increases and need to consider that in our projections.

Third, we include the effect of agent's persistency on commissions. We have done a study of agent's persistency by the duration of the policy. So, for example, if a policy is in its third policy year, we have an assumption as to the percentage of agents who are still remaining with the company and, therefore, the percentage of policies on which the commissions would be paid.

Finally, we need to consider the exchange assumption since commissions may not be paid on the full amount of the replacement policy.

Regarding other field compensation, we relate the various elements of compensation to a number of variables. Portions of the compensation are related to collected premium, and portions are related to commissions, first year or renewal. We have developed our model so that we have the capacity to use all these bases in projecting the other field compensation.

We project investment income based on the mean liabilities plus cash flow. Here it is important to consider that there are liabilities other than policy reserves, and these can be very significant on health insurance. For example, for our Medicare supplement business, our policy reserves are only $64 million out of the total Medicare liabilities of $300 million. It is important to include these other liabilities, which have assets backing them and on which investment income can be earned, even if the calculation of the liability does not take interest into account.

The liabilities we have for Medicare supplement include, as mentioned above, the policy reserves, i.e., the active life reserves included in exhibit 9.

Another liability included in the calculation of investment income is the claim liability included in exhibit 11 for incurred but not reported claims. This can be quite significant on a block like Medicare supplement. Also, the claim reserve for amounts not yet due included in exhibit 9 should be included for lines such as long-term care and disability income.

Finally, we include investment income on the unearned premium reserve. While the unearned premium reserve is a very short-term liability, it is large, and we do have assets backing this liability.

All of the above-mentioned liabilities should be considered in computing investment income.

Considerations for general expenses for long-term projections for health insurance are similar to the considerations for any type of long-term projection.

Considerations for federal income tax are also not particularly unique. We use a tax rate, for example, of 35% in our case. Tax reserves and the deferred acquisition cost tax need to be considered.

Regarding the level of new business, the primary aspect that is different for the Medicare block versus some of the other blocks of business is the benefit inflation. The other aspects of new business are similar to other blocks of business. Some projections have used an assumed growth rate. Others have been based on assumed increases in agent's productivity, along with an assumed growth in field offices and the agency force. The main thing on Medicare supplement is to remember that most likely there will be benefit inflation, and that does impact the level of new business. We can expect some increase in new business solely due to the benefit inflation.

For the projection period, we have used 20 years. We do have products that are level premium rated and carry policy reserves and so a 20-year period shows how the reserves actually run off. Also, the 20-year period gives an opportunity to demonstrate how new business affects the projection. Finally, for our other lines of business we use 20 years for the projections and use that time period for Medicare supplement to be consistent. Later, when I describe how we presented the results in our reserve adequacy testing report for stockholder dividends, you will see that we would want all the lines of business to have a consistent projection period.

Modeling Techniques

As far as modeling techniques are concerned, we use our own in-house projection systems. One thing we do differently than might be expected is that we use relatively large single cell models. We don't break down our projections by age group as you often see in a projection of life business. While the pricing might be done for certain

age bands, for our long-term projections we develop an assumed aggregate age/sex distribution.

We develop the assumptions for each of the elements described earlier by issue year and policy form grouping. Once we have those assumptions for the various elements (i.e., loss ratios, commission rates, and so on), we project forward at an aggregate level. The projection cells are consistent with experience monitoring reports we have for this purpose, so when actual results are different from projected, we can go back and review in more detail the assumption in question.

Interpretation and Presentation of Results

First, I will talk about the sensitivity testing that we did for our reserve adequacy testing. Then, I will cover the presentation of the results and unexpected benefits of long-term projections.

For sensitivity testing, these are the differences in the risks for Medicare supplement versus some of our other health lines, specifically the long-term care and the comprehensive blocks. On the long-term care block, we think there are two key areas of uncertainty. First, better persistency and better mortality than expected could have an adverse result on long-term care in the later years, that is, when the claims are high, and cause claims to be higher than projected.

Second, long-term care is a relatively new product. There isn't a lot of experience out there, especially for the insured population. While we do have perhaps five years of experience now, we don't know what the long-term experience will be on long-term care. Also conditions could change quite a bit in the future, so the actual level of entry into the long-term care institutions could vary significantly from the level assumed.

Also on long-term care, while we don't consider it interest sensitive and did not do cash-flow testing, we did look at the impact of various interest rates on the long-term care

projection, i.e., increasing, decreasing, or level interest rates. For long-term care we had six scenarios in our report.

The comprehensive business has been a line that has been subject to fluctuations in experience. We have seen periods of rapid benefit inflation on comprehensive business requiring high rate increases. This has caused antiselection on lapse, with healthier lives lapsing. On comprehensive, we have tested adverse scenarios including both adverse persistency and adverse morbidity.

On our Medicare supplement line, we don't believe we have the same risks as on the long-term care or comprehensive. One of the risks on Medicare supplement is a delay in getting the rate increases, but we expect we will be able to obtain rate increases. Second, worse persistency than expected is a risk. For our adverse scenario on Medicare, we tested the impact of worse persistency than expected. We used a level interest scenario only on our Medicare supplement testing.

Next I'll cover the presentation of results. For the reserve adequacy testing report we did at year-end, on our interest sensitive lines of business, we performed cash-flow testing. For that business we determined whether the present value of the market surplus at the end of 20 years was positive. On the health lines, we performed a gross premium valuation. In other words, we tested whether the reserve could cover the projected future negative cash flows. We compared the present value of those negative cash flows for the next 20 years to our reserve.

On the asset adequacy testing report, we did a third test and that was in aggregate for all lines of business, i.e., life, annuities, and health. We looked at our projected earnings net of payments on loans, and net of taxes, and tested whether those were positive in all years. It is currently somewhat controversial as to whether loan repayments should be considered in reserve adequacy testing. We know the regulators are quite concerned, particularly in a company such as ours where our profits are expected to be utilized

indirectly to make principal and interest repayments, so we did include that test as part of the report. At the last session on the regulatory issues, Larry Gorski gave his thoughts on how you should consider loan payments or stockholder dividends in the reserve adequacy reports.

I will conclude with some of the unexpected benefits that we have seen from these long-term projections. First, even though the projections are not specifically done for the purpose of strategic planning, we do at times end up with projected results that aren't what we expect. This generates some discussions, which get into strategic planning, what I would call unexpected strategic planning, taking place as a result of the process.

Second, there is nothing like a projected stream of profits, particularly when you are including all the elements including new business, loan repayments, and so on, to generate communication across departments. Questions arise about the assumptions along with questions such as, "What would we really do in that situation?" I think these unexpected benefits are really the icing on the cake in doing these long-term projections.

FINANCIAL PROJECTION OF HEALTH COVERAGES -- LONG-TERM PROJECTION

MR. ROBERT K. W. YEE: Both Ron and Helen gave excellent and thorough discussions on a variety of issues on the long-term projection, and all three of us are going to have some overlap. My emphasis will be more on the mechanical side of how some of the projections are being done. Long-term projections of health coverages are appropriate for certain products, the ones that come to mind are long-term care, individual disability insurance, and Medicare supplement. The rest of the health coverages are generally short term in nature. And when we talk about long-term projection, we mean more than five years.

I'm going to review what types of models there are; it all depends on the purpose. Then I'm going to briefly talk about what goes in the model and what comes out, and discuss in detail the difference between new business projection and in-force projections. They take on different flavors. In between, I'm going to briefly discuss the structure of the model that would make the projection maybe closer to reality. And finally, I'm going to give a couple of examples. As my recent involvement has been in long-term care, my examples would be based on long-term-care insurance.

Types of Actuarial Projection

Essentially there are two types of models. The deterministic model uses expected claims (averages) and applies formulas and relationships to arrive at balance sheets or income statements. Its application is primarily on pricing, appraisals, and recoverability.

I believe stochastic modeling for pricing is the wave of the future. If I can get a good handle on claim distribution for long-term care, I would probably do the same thing.

There are differences in what you would get out of projections. The uses in our company have been to obtain projections for the next five years to determine what's going to happen for budgeting and strategic purposes. With the amount of precision

required, we believe the deterministic model probably works well for this kind of situation.

The stochastic models are basically looking into variances from expected. The most common technique I know of is the Monte Carlo method that utilizes a random number generator to come out with probability distributions and ruin probability. The major applications are in surplus adequacy testing, risk-based capital requirements, and stop-loss reinsurance.

Input and Output

Let's examine what goes into a projection model and what comes out. What goes in are the assumptions and in-force data. The choice of the period of projection is important as it is affected by the precision of the model. Some models are not useful for more than ten years of projection because of simplification. The final inputs to the model are the specified scenarios. What you want to see is the sensitivity of the output to various inputs.

What comes out of the model are typically income statements, balance sheets, in-force measures, and profit measures. An income statement could be a regular statutory or GAAP income statement or a source-of-earning type statement. In-force measures sometimes are useful to understand staffing requirements.

New Business Projection

With regard to new business projection, our company basically uses an asset share unit projection approach. We determine claim costs and other pricing assumptions for each age grouping. Based on distribution of new business by age, we combine them together into a model run of a single unit projection of new business, say $1 million of premium.

Added on to that would be the new production assumption in multiples of units. This can be increasing, level, decreasing, or any pattern by calendar year into the future. To

get from a unit projection to a block of new business projection, we use a layering technique. It's very commonly used. We have a unit projection by year, and we apply new business in the first year to the first-year unit projection in order to arrive at the first-year results.

For the second projection year, we would apply the then in-force first-year new business to the second-year unit projection and apply the second-year new business to the first-year unit projection. Add them together and that would give us what would happen during the second year and so forth.

A major consideration in new business projection is the allocation of expenses and risk-based capital. This would depend on the purpose of the projection. For example, if we try to justify a mail solicitation campaign relative to other campaigns, we might look at expenses on a marginal basis, as we have already spent investment money on systems and other start-up expenses. Based on the company's product portfolio, products that benefit quite a bit from the covariance on the risk-based capital may be allocated marginal capital. When we are projecting total lines for the entire company, clearly we need to account for all the expenses.

What comes out of new business projection are profit measures, in the forms of present value of after-tax GAAP profits and statutory profits as percentages of premium discounted at a certain interest rate. Another measure that's used often is the internal rate of return. This is the return rate of the shareholders' investment over a period. The yearly returns on investment are defined as the after-tax statutory profit less target surplus or risk-based capital requirements.

For a new product with production assumption, we would also be interested in the surplus requirement necessary to grow the business. Sometimes you would be amazed how much surplus is needed to grow a block of business.

Finally, another profit measure that is not looked at a lot -- but it's somewhat important -- is the turnaround year when the cash becomes positive.

Model Considerations

I'm going to digress a little and discuss some considerations in designing the model. The first consideration is whether this model will produce policy-year results or calendar-year results, and it all depends on the purpose. For pricing and GAAP recoverability, maybe all you need to look at is policy-year results. But for in-force evaluation of the value of a block of business, calendar year is clearly more appropriate.

Since most of the pricing assumptions are based on policy year, you will have to somehow translate them into calendar-year assumptions. That's usually done by assuming everything (cash, claims, premiums, and so on) happens in the middle of the calendar year.

The next consideration is incidence of claim cost. A simplified model could assume that, whenever there's a claim, the payments on the claims are immediate. That is, the future claim payments are condensed at one point. A more sophisticated model would keep track of the cash and establish cash reserves. When you establish cash reserves, you then need to account for the interest earned on cash reserves.

Invested assets and dividends are related. What are invested assets? Invested assets are assets you set aside for this line of business that generate investment income, and that depends on your dividend policy. A typical dividend policy might require you to dividend everything you don't need except to support that product line, although in practice, you almost never do that. But if this were the case, then the dividend would be defined as the after-tax statutory profits less the change in target surplus. Then the invested assets will turn out to be simply all the statutory reserves, including claims and incurred but not reported, plus your target surplus.

In-Force Projection

In-force projection is more complicated than new business projection.

The first thing to consider is what I call granulation. How many cells are necessary to do a projection based on the required precision that someone might have set? For instance, what if you want to match your current net income to within 5%? Say you have only two plans and each one has more than a 5% difference in respective profit; you probably want to separate them into different cells instead of combining them together. The more cells you have by each issue age group, plan mix, or benefit period, the more precision you should able to achieve in matching actual results.

This is what I think Ron referred to as static valuation, which is trying to match the in-force business and all your balance sheet items. They include invested assets, cash flow, the reserve balances, and earned premiums. That's the first stage of trying to see how well the input of the cells that you have specified can give you reasonable results. We have attempted to get within 5% of actual. Otherwise, we go back for more cells and look at what's wrong.

When you are satisfied with matching balances, then you would want to make assumption of trends on claims, expense, persistency, interest, and so forth. So these are the things that we hope would give you a good first try, that is, first stage results on how well you match the income statement.

There are two techniques that I'm aware of to project a block of in-force business. One is to use a unit of new business projection, and again, layer it. For instance, say a block of business is currently in its second and third year only. You would take the unit projection of the second calendar year onward and apply it to the second year in force. Take the unit projection after the first two years and apply it to the third year in force. Then sum up the two results.

The other way is simply examine the trends on claims and expenses and just project them forward.

Needless to say, cash flow is important to project since it affects investment income. Typically, you wouldn't be able to match cash flow at the start because real life is complicated. So you might have to adjust your starting initial cash flows, and that will have an impact on your projected investment income.

When you get all balances matched, it's time to see how well the model matches the last couple of years' net incomes. On a typical project, that's about 50% of the total time spent. It's laborious because the first thing you have to do is understand what the product line was really running. There could be conservatism or lack of conservatism in reserve items that need adjustment. The number of years of actual results will naturally also affect the time necessary to calibrate the projection.

By adjusting the trends, you might get close or you might not. In my experience, you would never be perfect. But at least it gives you a good starting point. The closer you are to the actual results, the more confidence you will have on how well the model is going to represent the future.

The what-if questions would be on a calendar-year basis. For example, what if expenses were reduced to pricing in seven years? Since most of the assumptions will be based on policy year, the model should have a way to adjust from policy assumptions to results on a calendar-year basis.

The profit measures are present values and annual profits. Return on statutory and GAAP equities are frequently critical measures for in-force projections.

So this is a summary of the steps necessary for in-force projections. They usually take significantly more effort than new business projections.

MR. DAVID E. OLSHO: You're talking about sensitivity testing. I've had an instance where there seemed to me to be minor changes in some of the assumptions. The variability was plus or minus the company's surplus. That obviously has some pretty interesting results depending on when we're presenting these results to the regulators. How do you determine what to do in that instance?

MR. WOLF: Would either of you like to try that one?

MR. YEE: I've never faced this situation before. I don't know what surplus level this company has.

MR. OLSHO: It's pretty small.

MR. YEE: Yes, then it just means you need to do a lot more work with sensitivity testing. You know, the amount of surplus required is a lot more than you think you'd need depending on the product line, especially long-term type of coverage. It eats up a lot of surplus, and it's primarily caused more by competition (higher acquisitional expenses) than anything else.

MR. WOLF: You know, I think before I went with a result like that, I would question how wide a range of sensitivity I'm testing. Am I really comfortable that the sensitivity boundaries have some sort of reasonable likelihood? But other than that, this is one of the challenges, I think, in doing these types of projections and drawing conclusions from them. And perhaps that conclusion and that communication is, in fact, the communication needs to be made, and we need to form a judgment whether that's the case and be prepared to stand behind the work that we do.

I would add in a case like that, get someone else from your own shop, or even someone else from the outside, to give you a second opinion before you ultimately state your conclusions like that.

MR. OLSHO: My second question is specifically for you, and that's why don't you let your trend go beyond five years? I think on a lot of these health coverages you really are going to see trend inflation rates forever. This maybe won't be at the level we're seeing now, and with that you need to perhaps have the expenses or premiums going up with trend.

I realize that, at times, level-premium products, or alleged level-premium projects, are not competitive if priced that way. But in certain instances, maybe it's realistic to have trend going for the length of the projection period.

MR. WOLF: I guess that's my way of introducing a little conservatism, perhaps. Plus, I'm just not comfortable, on a long-term basis, with having a situation where maybe you could put it in terms of "profiting from the coming inflation." If your trend rate is higher than the rate that you're using to inflate your expenses, you're going to widen your margin as you go. And I'm not sure the market allows you to do that.

FROM THE FLOOR: In assessing trends for a long projection, you should take into account not only the short-term oscillations, but also a medium-term oscillation. And after you've gotten those out of the way, then there may be a trend.

MR. WOLF: So you're saying there's a short cycle and a long cycle.

FROM THE FLOOR: I think that's certainly a way to do it and a way to look at it.

MR. YEE: In many health coverages, it is very difficult to discern what are short- and long-term trends. I submit the purpose of these long-term projections is really trying to understand the relative sensitivity of results, instead of trying to get to what is a most likely number.

MR. MICHAEL A. SHUMATE: In projecting trend on long-term-care insurance as an example, one of the things that we've noticed that has a major effect on the overall trend is not the level of medical inflation, but it is the number of units available.

You can almost track the cost for long-term-care insurance by state by noting the number of beds available in that state. As a matter of fact, one of our worse states, North Dakota, advertises that it has the most beds per capita in long-term-care facilities of any state in the union, which brings back the point. Maybe one reason for not projecting trend beyond a reasonable period of time is that your projections become so imprecise -- that's a good word to use with a projection. It's more and more difficult as you project further out to make sense of your trend. Who knows how many long-term-care beds are going to be available in the U.S. in 20 years, or what medical inflation is going to be? For that very reason that may be the best reason for not going more than five years or so to get some reasonable inflation on your medical costs.

MR. YEE: That's true. There are just so many things that can happen in the future. That couldn't be the purpose of long-term projections. You can't predict the future. You can vary the assumptions to see how they can affect your bottom line, your balance sheet, your surplus, and so forth. That, to me, is the purpose of the long- term projections. It's not to find out how much money you think you'll make way out in the future.

FROM THE FLOOR: I would agree there, but the problem is, are you going to project at 20% medical inflation, which is entirely possible at some point in the future? Are you going to project at 5% or 3%? And at some point, it becomes a guessing game as to what is an appropriate level of inflation. And I think in the short-term, one could say that given that medical inflation and other kinds of inflation are at *x* level today, in a reasonably short period of time one could assume that level.

But what about when one is talking about 10, 20 and 30 years in the future, which unfortunately is what the regulators want us to project, in cases of Section A opinions? And then sometimes we have to do that sort of thing for appraisals and so forth. Why is it an appropriate level of inflation for those periods to say that 3% is appropriate for 20 years down the line when in fact it may be 20%, or zero, or a negative number? That's unlikely, but possible. How can you say that 3% is more accurate than 0%? It's like the example in Andersen's book that, if you don't know what the mortality is within some certainty, assuming no mortality is better than assuming any.

And I think maybe that is the case here when you're looking at long periods.

MR. WOLF: I think it is challenging to project a trend over a long period of time if you feel a need to do that in your projections. But you could probably say the same thing about a number of the elements of your projection, like your basic claim-cost assumption. When projecting many things, there are a number of different variables. Projecting 15 or 20 years from now is a challenge. I think I agree with you; certainly one of the key items is to set something up and talk about the variability.

I guess, fortunately or unfortunately, for some of these tasks or purposes, you are called upon to say: Here's a projection. This is my best estimate. Qualify it as you feel appropriate with some range around it. But that is the challenge we're faced with, and I keep coming back to being comfortable with your mechanics, your methodology, and being careful in describing as best you can the source of what your assumption is, buy into those, and then go forward with your best estimate.

MS. HOFMANN: I'd emphasize, again, looking at the purpose of the projection. It's one thing to include no inflation if you're doing it for purposes of a reserve adequacy report and you think you're being conservative. But it's another thing if you are doing a lot of long-term projections, that is, the purposes of which are to understand what your

company is going to look like in the future, with flat out no inflation or no alternate scenarios with inflation.

MR. WOLF: I think, too, one thing I like to do in communicating results, especially long-term results, is that projections are only estimates of future results, and actual results will vary from those results.

That's a pretty trite statement to make, and perhaps we can't take a whole lot of comfort in it, but it is one statement that I almost always try to communicate in my projection results.