1992 VALUATION ACTUARY
SYMPOSIUM PROCEEDINGS

SESSION 4

Recoverability/Loss Recognition

Steven H. Mahan
Stephen A. J. Sedlak
Charles M. Underwood II

RECOVERABILITY/LOSS RECOGNITION

MR. STEVEN H. MAHAN: This is the session on recoverability and loss recognition. I am the moderator of this session and a Fellow of the Society of Actuaries, a Member of the Academy of Actuaries, and a Principal with Peat Marwick in Dallas.

Stephen J. Sedlack is a Vice President and corporate actuary with Nationwide Insurance in Columbus, Ohio. In this position, Steve serves as the appointed actuary for Nationwide Life and is responsible for modeling including cash-flow testing and loss-recognition analysis. Steve is a Fellow of the Society of Actuaries and a Member of the American Academy of Actuaries.

Charles M. Underwood is also a Fellow of the Society of Actuaries and a Member of the American Academy of Actuaries and is Vice President and corporate actuary at American Skandia Life Reinsurance Corporation (formerly Hudson Life Reassurance Corp.). Chuck's current responsibilities include loss-recognition liabilities for GAAP and statutory reporting, reserve adequacy, deferred acquisition cost (DAC) recoverability testing, Regulation 126 reporting, and embedded-value analysis. Previously Chuck was with Deloitte & Touche where he dealt with reserve adequacy, DAC recoverability, and loss recognition for a number of audit clients.

The title of this program is recoverability/loss recognition. In this context, traditionally, the term recoverability has been used to refer to the recoverability of DAC at the time of the deferral of costs (i.e., at issue) while loss recognition generally refers to the net liability sufficiency at valuation dates down the road. I have found that in only a few instances is this distinction important. During this presentation you may hear these terms used interchangeably with the distinction pointed out only when applicable.

Recoverability and loss recognition have been with us since the origination of the audit guide in 1972. FAS 60, "Accounting and Reporting for Insurance Enterprises," was set forth in

1982, and it extracted most of its concepts from the audit guide. The American Academy set forth its interpretations and implementations of the concepts in its Recommendation 1 adopted in 1973 entitled "Actuarial Methods and Assumptions for the Use in Financial Statements of Stock Life Insurance Companies Prepared in Accordance with GAAP." This was incorporated into the Actuarial Standards of Practice in 1990.

Although some issues still arose from time to time, the interpretations and applications of those concepts have been well-established for quite some time. I will briefly summarize some of those precepts:

- Deferrable costs: FAS 60 says acquisition costs are those that vary with and are primarily related to the acquisition of new and renewal insurance contracts. And says that acquisition costs should be capitalized and charged to expense in proportion to premium revenue recognized. Over the years the industry has sorted through what exactly this meant.
- Selection of assumptions: FAS 60 says that the assumptions used should be expected experience with a provision for the risk of adverse deviation.
- Academy Recommendations: The Recommendations naturally addressed this from an actuarial factor driven perspective and told us that if the total net valuation premium is greater than the gross premium, first the margins for adverse deviation should be removed from the assumptions. If the net is still greater than the gross, the amount of deferrable costs should be reduced until the net equals gross with the excess being charged to earnings in the year incurred.
- Lock-in principal: FAS 60 says that original assumptions shall continue to be used in subsequent accounting periods unless premium deficiency exists, as long as resulting reserves are sufficient to provide for future benefits and expenses. This results in variances from original estimates being recognized in the period such variances occur.
- Audit guide: This guide suggests that actual experience compared to expected should be monitored and a gross premium valuation (GPV) done, particularly when the company

experiences or anticipates adverse deviations from original assumptions that could materially affect the reserves.

- GPV: The audit guide calls for a comparison of the premium valuation of future benefits and expenses using current best estimates assumption less premium valuation of future gross premium with the reserve at the valuation date less DAC. If the GPV is bigger, then a reserve deficiency exists that should be charged to earnings (usually through a write-down in DAC) at the time the loss becomes apparent. Future reserve calculations should be based on the revised assumptions.

RECOVERABILITY/LOSS RECOGNITION

MR. STEPHEN A. J. SEDLAK: This presentation will cover several areas of cash-flow testing as it relates to GAAP, in particular, testing performed to determine loss recognition or recoverability. Since there are many GAAP and cash-flow testing issues that are evolving or are in the process of being defined, a word of caution is in order. Some of the following is based solely on my opinions, and no agreement or disagreement has been expressed by the accounting profession in this regard.

In addition, the terms *recoverability* and *loss recognition* will be used as opposite sides of the same process in most of the following, even though there is a different meaning in accounting circles. This distinction can be expressed by saying that a lack of recoverability means that you realize your mistakes in advance while loss recognition means that they are finally catching up to you. In any event, I apologize in advance if this lack of precision causes any discomfort, or worse yet, lack of understanding.

Is Cash-Flow Testing Required for GAAP?

Actuarial Standard of Practice (ASOP) 14: When to do cash-flow testing -- Section 5.1 states that "cash-flow testing should be considered" in a wide variety of actuarial work, including "long term financial projections and forecasts (GAAP, statutory or tax)." While GAAP is mentioned specifically, the language might be interpreted as allowing no testing as long as the need for it is considered.

Section 5.2 speaks to situations where cash-flow testing is desirable or necessary. In particular, the first paragraph states that "the need for cash-flow testing may be readily apparent" for products or lines where cash flows "are very sensitive to changes in economic conditions and investment scenarios, mortality rates, morbidity rates, premium payment patterns, lapse rates and expense inflation."

The last paragraph says "where options have been granted to policyholders or borrowers and the likelihood of antiselection is significant, cash-flow testing is needed to help quantify the risks."

GAAP as an alternate reserve system -- GAAP financials differ from statutory due to certain accounting adjustments. However, by far the major difference is generally that net GAAP reserves are substituted for statutory amounts. This applies to GAAP reserves under both FAS 60 and FAS 97 (see Appendix I).

GAAP reserves include the deferred policy acquisition cost (DPAC) asset (and perhaps the mandatory securities valuation reserve [MSVR] adjustment as well). This will generally result in lower overall reserves. Thus, it appears that cash-flow testing will be needed at least as much as it is for statutory reserves.

Conclusion -- The situations in Section 5.2 would seem to strongly indicate that cash-flow testing is needed for many life company products. The inclusion of GAAP in Section 5.1 indicates that if cash-flow testing should be done for statutory purposes, it should almost always be done in regard to GAAP as well. In particular, for lines or products where asset adequacy analysis must be used to demonstrate reserve adequacy, cash-flow testing should probably accompany any determination of the adequacy of the net GAAP liability.

In particular this would include gross premium valuations (GPVs) done to establish that no loss recognition or unrecoverable condition exists. To do otherwise would appear to require justifying why GAAP reserves should be treated differently than statutory. This applies to all GAAP reserves. However, the balance of this paper will only specifically address those computed under FAS 60 and 97.

How Do We Cash-Flow Test GAAP Reserves?

Before we can answer the question of how cash-flow testing applies to GAAP (and how much extra work is needed), a brief review of current methodologies is in order.

GPV -- GPV is the technique specified to test recoverability under both FAS 60 and FAS 97. It involves calculating the present value of noninvestment cash flows at the expected investment earnings rate, which is usually level. This is usually done over a fairly long time horizon on a pretax basis.

In computing the GPV, most noninvestment cash flows should be used, even if they are not reflected in GAAP-reserve computations. However, federal taxes and overhead would still be excluded. Also, the margins for adverse deviation required by FAS 60 should be removed. In addition, the expected credited rate used in FAS 97 reserves is replaced with the earned rate.

If the currently held GAAP reserve (net of the DPAC asset) less the GPV reserve is negative, a deficiency exists. In this case, the DPAC asset is reduced to eliminate the deficiency, and if this isn't sufficient, additional reserves must be set up for contracts to which FAS 60 applies. However, the response to Question 15 in AICPA Practice Bulletin 8 indicates that such extra reserves may not be set up for investment contracts as defined in FAS 97, even though they have GAAP reserves calculated as if they were UL policies (as specified in Question 2). Generally, the GPV does not address deficiencies that may or may not occur at interim durations shorter than the testing horizon.

Asset Adequacy Analysis -- The model revisions to the standard valuation law require the submission of an actuarial opinion that reserves are adequate to support the related policies and contracts. The associated model regulation requires that asset adequacy analysis is to be used in forming this opinion (although smaller companies may be exempt subject to certain conditions). Throughout the rest of this paper, the term AAA will be used (not to be confused with the Academy or the claim payment rating we'd all love to have). Under AAA, we must examine cash flows from our contracts in conjunction with those from the assets used to support them and determine whether our reserves are adequate.

The definition of reserve adequacy that we'll use (although there may be others) is that no surplus is consumed by the end of the testing horizon. This means that the accumulated

statutory surplus that emerges from the block of business in question and the associated assets is not negative. Generally, the horizon used should be enough so that any remaining reserves are not material. In doing this, all cash flows (including investment income and taxes) are recognized, as are the future reserves and their pattern.

It should be noted that this is not the same as surplus adequacy. For surplus to be inadequate, the reserves (and associated assets) will have to be so inadequate that the emerging surplus from the business is negative enough that it consumes all company surplus. Thus, under this definition, reserve adequacy is a much more stringent test.

The underlying assets are specifically recognized in AAA, so they must be allocated to the business being tested in a reasonable manner. All asset flows are recognized as well as those from reinvestment, so detailed reinvestment assumptions are needed. As a result of this process, a level future earnings rate will be the exception, unlike most GPV where level rates are used. Also, liability and asset cash flows under AAA are responsive to one another so that assumptions such as persistency and dividends or nonguaranteed elements, which are usually static for a GPV, will vary with changes in assumed future investments and their yields.

Under our definition of reserve adequacy, surplus is accumulated to the testing horizon. If the accumulation is positive, reserves are adequate, but if negative, extra reserves will be needed. It may be desirable or necessary to discount the accumulated surplus amounts to the valuation date. This would enable the valuation actuary to determine the amount of current reserves needed or redundant to offset against the results from testing other blocks of business.

This should be done on a basis consistent with the investment assumptions used in the particular test in question. One method is to project the amount held at the testing horizon that would result from accumulating (on an aftertax basis) one dollar invested and reinvested using the investment strategy applicable to assets used to support the business in question, but held separately. Dividing this into the accumulated surplus gives an amount of extra (or redundant) reserve needed to offset the negative (or positive) surplus accumulation. In symbols:

$\Delta V = -AS_H / AV_H$, where

ΔV is the extra reserve needed at the current time to attain adequacy
AS_H is the accumulated surplus at the testing horizon, H
AV_H is our accumulated value of one dollar by the end of H

This equivalent value (to distinguish it from the more traditional present value based on predetermined discount rates) can also be determined at interim points prior to the testing horizon. These values can be used to examine the need for surplus that may occur at interim points in the future of the business. This is not an issue for "classical" reserves that typically compare benefits and premiums over the product lifetime. However, our products have changed so much in the past decade or so that ignoring interim points may be oversimplistic in today's environment.

It should be noted that this technique implicitly assumes that any extra reserve is held and accumulated completely apart from the business it supports. To the extent that this is not expected to occur, another test may be needed to see if this amount is actually enough to guarantee adequacy if held and administered as part of the business in question. Depending on the business, its operation, and the particular scenario, it may be that either more or less reserve will be required.

Testing at interim durations is analogous to the philosophy underlying the commissioners annuity reserve valuation method (CARVM) for annuities. Essentially, CARVM holds that a reserve is only adequate if it can support the associated business at all times (read literally, at each anniversary). It also addresses the fact that any subsequent recovery of surplus is dependent on assumptions for relatively long durations which may be less accurate than we might like.

A potential problem with using interim values under AAA is that the reserves held tend to be more material as the duration being examined is reduced. One way to deal with this is to assume a liquidation at each future duration and adjust the interim results accordingly. This

probably should be done at the end of the projection horizon anyway. However, this appears to be less than realistic in relation to how we actually operate our business.

Alternatively, we can take the approach that interim values of AAA are used only to determine if the company will encounter an incursion into surplus at any point based on the reserves currently expected to be held. This is the approach we now use. However, it must be pointed out that this approach does not address the question of whether such expected reserves would actually be adequate if AAA was performed at the interim duration. If not, additional surplus incursions would occur, and the results for that duration would be that much worse. Unfortunately, such prospective testing would greatly complicate the valuation process.

Another approach might be a combination of these two. Here, an interim incursion into surplus would be looked at from the standpoint of materiality. Thus, if it was less than X% of reserves or surplus or some other relevant quantity, it would be deemed to be immaterial and of no further concern. However, if the reverse were true, it would indicate a potential concern for management. In this case, further analysis would be done, possibly including an assumed liquidation (the implication being that a material surplus incursion might warrant or even force such an action).

GPV versus AAA -- At this point, a comparison of the GPV and AAA methodology is in order. GPV is generally less sophisticated than AAA in that it is usually on a before-tax basis and doesn't specifically recognize certain assets and usually makes a level (or at best a trend-line-based) yield assumption. Also specific assets are not recognized, nor are their interactions with the related contracts.

On the other hand, both concepts involve analyzing future cash flows in order to determine the adequacy of a reserve. In addition, it appears that cash-flow testing under more than one scenario of future conditions will be needed. Thus, many of the issues that apply to one will apply to the other as well in some form.

Can We Use AAA for GAAP Cash-Flow Testing? -- Besides investment income, future reserve changes, taxes and statutory income on a before-tax and aftertax basis, AAA produces noninvestment cash flows. Thus, we can use results inherent in our AAA projections to obtain a GPV by discounting these cash flows at some appropriate rate. Alternatively, the earned rates implicit in the AAA equivalent values can be used instead.

It should be noted that the results will differ from a GPV done in the traditional manner. This is due to the fact that the cash flows produced under AAA will usually differ, if for no other reason than asset/liability interactions. This should be regarded as an advantage from the standpoint of being more realistic.

Other potential advantages of AAA are that the investment yields produced will be more realistic and that scenario-dependent equivalent values are possible. In addition, before-tax and aftertax values are more readily available so that potentially adverse tax effects can be examined. AAA also lends itself to multiple-scenario testing and examining interim insufficiencies.

These features of AAA all appear to produce potentially more realistic results. However, they are arguably different from what was envisioned when FAS 60 was drafted. Because of this, it seems advisable to check your auditing firm's position before actually using amounts produced by AAA. Offhand, it's hard to see how they could have any objections, but the ways of GAAP can be mysterious at times.

In addition, your auditors may have some useful suggestions as to what procedures to use, not the least of which may involve things that can minimize the effort needed to test recoverability and to audit the process. Finally, given the number of emerging issues here, your auditor can be a valuable source of information on what these are and the current thinking on how they will be resolved. Some of these issues are discussed throughout this paper and are summarized in the Appendix II.

Of course, to use AAA, the company has to actually make the requisite projections. However, for many companies, the model regulation does not require this to be done each year. While it can be argued that cash-flow testing for GAAP reserves may be needed more frequently than for statutory to the extent GAAP reserves are lower, it is also true that many companies don't test for loss recognition on an annual basis currently.

On the other hand, this is far less true for recoverability. This may or may not also be the case for the "true-up" required under FAS 97. In any event, the opinion of the company's auditor and its financial condition are likely to be key factors in what has to be done here.

Multiple Scenarios and Cash-Flow Testing

Use of AAA Scenarios -- It appears that most of the time more than one scenario of future conditions will be needed to do an adequate job of AAA. To the extent that the GAAP net reserves are lower than those held statutorily, this may be even more likely for testing GAAP loss recognition. In any event, there seems to be no reason why the scenarios used for AAA can't be used for GAAP as well.

Modifications for GAAP -- Given the differences noted above between AAA and GPV it appears that some modifications will be required for GAAP purposes:

1. Before tax: This is needed to conform to GAAP methodology. An aftertax calculation might also be done to provide a broader perspective. However, in this case it should be remembered that the deferred tax liability should also be taken into account.
2. Reserves: The reserves which are compared to the GPV should only be the net GAAP reserve.
3. Assets: Since a GPV only uses noninvestment cash flows, the assets underlying the business are only used to calculate equivalent values for GAAP. Thus the equivalent values used in AAA shouldn't be changed unless the mix of invested assets underlying the GAAP calculations will differ.
4. Aggregation: The AAA is typically done for all in-force business. However, to the extent that recoverability is being tested, it appears that the new business must be split

out separately. The same may also be true if GAAP lines of business differ from those for which AAA is performed. This can arise since GAAP generally requires business to be treated as a separate line if it differs in its methods of acquisition or operation or in how its profits are measured. Thus, traditional and universal life are separate GAAP lines. To the extent that these splits of business must also be used in GAAP cash-flow testing, aggregation of results will not be possible to the degree allowed for AAA.

5. Margins: Any margins used in AAA for conservatism (e.g., the margin for adverse deviation under New York Regulation 126) should be removed unless it can be determined that they are not material for GAAP testing. In this regard, it is worth noting that, unless a lot of care is used, adding margins to some assumptions for conservatism may in some cases produce the opposite effect. Some of these situations can be subtle enough to avoid detection for long periods.
6. Other: Emerging practice or your audit firm's requirements or good sense may indicate other needed modifications.

What If Some Scenarios Fail? -- The possibility of scenarios that produce GPV reserves above those being held always exists. The likelihood of encountering such "failed" scenarios increases the greater the number of scenarios examined, the harsher they are, and the lower that margins are for the business being tested:

1. Deterministic scenarios: If the scenarios are deterministic (e.g., the New York 7) it is probably best to treat them like sensitivity tests. In this case, the results can be used, with other information, to form an opinion of reserve adequacy. Judgment will be very important in this process, and the presence or absence of failed scenarios does not, by itself, determine reserve adequacy.
2. Stochastic Scenarios: A big disadvantage of deterministic scenarios is that they may be biased, either intentionally or by accident. For example, it is entirely possible that important aspects of the business are not addressed in just a few predetermined scenarios. In addition, probabilistic statements are not possible unless we make a suitable number of projections under random scenarios:

a. A stochastic definition of reserve adequacy -- Since it is likely that some scenarios will fail, a new definition of adequacy will be needed. One possibility is to use a ruin-theory-based definition.

Reserves are adequate if it is expected that they will produce positive results by the end of the testing horizon X% of the time.

For GAAP, "positive" means that the net GAAP liabilities held less the GPV reserve exceeds zero. Note that the definition requires a value of what I'll call the comfort level, X, to be usable. The comfort level is the desired probability that reserves will be adequate as determined by management, state regulators, your auditors or other interested parties. For AAA, informal discussions indicate that 75-80% may be a good value for the comfort level.

It should be noted that, as above, the adequacy of reserves (either GAAP or statutory) is not the same as surplus adequacy. In addition, under this stochastic definition, we may not be able to say that surplus adequacy is a less stringent subset of reserve adequacy since some of the scenarios that fail can also consume all surplus. Unless we set the comfort level for surplus adequacy comparable to 75-80% (which appears to be unacceptably low), it may work out to be a more rather than less stringent condition than reserve adequacy.

In any event, surplus adequacy is not needed for GAAP testing. In addition, it may be that the 75-80% comfort level may be too high. There is a body of thought that holds that a most likely or best estimate approach applies here, and a 50% comfort level is sufficient to pass a recoverability test.

It is worth mentioning that, for many of the reasons mentioned above, there is some thought that the above definition for comfort level needs to be made more stringent for AAA by addressing interim durations as well. This could be done

by requiring positive value at all durations in each scenario at least X% of the time. A somewhat less stringent definition would allow negative interim values for only a year or so (in effect assuming that the company can "hold its breath" for a time). However, it does not seem that this issue has yet surfaced for GAAP, and if the philosophy underlying the more traditional GPV definition now in use is retained, it may never do so.

b. How many scenarios are needed? -- The simple answer is that we will need enough scenarios to get a picture of the distribution of results. This should be sufficient to allow us to make probabilistic statements about the chance of having positive results with a desired level of confidence. This is the same as saying that our random sample of the underlying distribution needs to be large enough to describe it in the area in which we are interested. To the extent that we are concerned with the tail of the distribution, this will require a larger sample since the likelihood of "a hit" in the tail is much less.

Unfortunately, what we are most concerned about from the standpoint of reserve adequacy being addressed by AAA is usually the left-hand tail of the distribution (unless the business is unusually profitable). This may be even more true if we address surplus adequacy since our pass point will probably be much higher. (I, for one, don't want to have to tell our board that we have a 20% chance of insolvency.) On the other hand, if a most likely definition is the criterion to be applied to GAAP recoverability and a 50% comfort level is acceptable, we may need far fewer scenarios.

Since we only have a sample of the underlying distribution, we will not be totally certain that our determination of the comfort level is correct. However, we can establish a confidence level that what we calculate is correct for any given number (sample size) of scenarios. However, the penalty is that, as the confidence level we choose increases, we'll need more observed successful

scenarios than our definition of comfort level would indicate. This is shown in the following table:

Smallest Number of Scenarios Needed
at Various Comfort and Confidence Levels

Comfort Level*		Confidence Level 95%	99%	99.5%
50%	Number Needed	14	28	35
	Pass Point**	10	20	25
80%	Number Needed	45	89	109
	Pass Point**	40	79	96
90%	Number Needed	95	191	234
	Pass Point**	90	180	220

* The desired proportion of adequate (or successful) outcomes from the underlying distribution.
** Smallest number of successes needed to pass.

Thus, if we ran 45 scenarios and wanted to determine the result such that 80% of results were at least as favorable (the 80% comfort level) with a 95% confidence level, we'd pick a point where 40 (89%) of the scenarios were more favorable (instead of 36 or 80% of them). In fact, the proportion of observed successes depends upon the number of scenarios, the desired percentage comfort level and the confidence level selected. In his discussion of a paper by Jetton, Joe Tan derives the following useful approximation (*TSA* XL, 467-73).

$$Pr[C \geq p - Z_r\sqrt{p(1-p)/n}] \approx r,\ n(1-C) > 5 \text{ if } C \geq 0.5,\ nC > 5 \text{ if } C < .5$$

Where n is the number of scenarios (the sample size)

r is the desired confidence level

Z_r is the value of the standard normal distribution
having area r to its left

C is the desired comfort level

p is the observed proportion of passing scenarios needed to achieve a comfort level of C with confidence r

From this, we can determine the number of scenarios we need by rearranging the terms inside the bracket.

$$n=\frac{Z_r^2 p(1-p)}{(p-C)^2},\ n>5/(1-C),\ C\geq .5$$

Some Other Implications

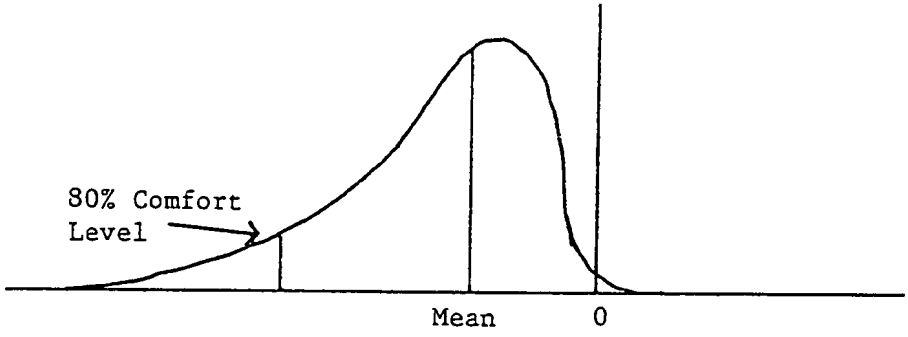
Risk and Risk Charges -- Risk is present to a greater or lesser extent in all products we write. It arises due to statistical fluctuations that result from volatility in the environment. Risk manifests itself in insured benefits (e.g., death-claim fluctuations) and costs (expense inflation and unexpected expenses). It also arises due to the options we put into our products such as floor guarantees, book-value withdrawals and the allowance of future deposits with little or no restriction.

Many current products that are properly priced will have risk charges built in to offset some of their risk, especially those associated with these options. However, this can have unintended and misleading effects on the traditional best estimate GPV test of recoverability. To illustrate this, consider a product that provides material options to the policyholder and makes an appropriate charge for the resulting risk.

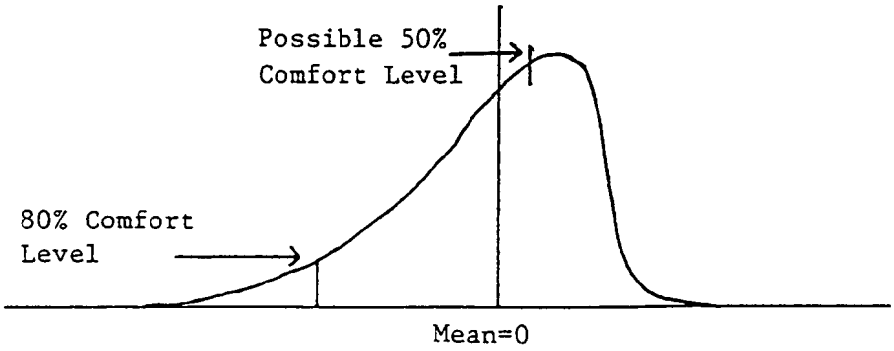
Under best-estimate GPV, little or no risk from options may manifest itself. On the other hand, any risk charges are typically made under all circumstances and will therefore manifest themselves in the GPV. Thus, if the product would produce a result of zero (a GPV reserve equal to net GAAP liabilities) under GPV assumptions excluding its risk charge, it will have an ample recoverability margin if they are included.

To resolve this apparently counterintuitive result appears to require some adjustment for the risk charges, such as assuming that they will be set aside to eventually be consumed by the risks they are intended to cover. Alternatively, stochastic testing can be used to bring out the effects of product risks. The following idealized probability distribution of an equivalent value of

accumulated surplus illustrates this. First, if we remove the risk charge from the product, our results look like this:



The product exhibits a distribution with a negative mean or expected value (since its risk charges were removed). If we replace its risk charge (and assume that it was designed to produce expected results of exactly zero), the distribution will shift to the right as the following graph shows:



Now, while the expected result for the product will equal zero, it will still not be recoverable if an 80% comfort level is needed. On the other hand, if a 50% comfort level is allowed, it may be recoverable. Thus under stochastic testing:

- "Best estimate" has a different meaning.
- The need to adjust for the risk charge is eliminated.
- Loss recognition may or may not still result depending on the distribution of results due to product risks and the comfort level allowed to "pass" the test.

Lapse-Supported Products – Certain products are structured so that at certain portions of their lives increased lapses have the effect of increasing the current value of future statutory profits. This can happen if the current profit on withdrawal (e.g., surrender charges) exceed the future profits which would have resulted otherwise. A special (and potentially pernicious) form of this is when the future profits on persisting policies are negative. This is because, at least arguably, such conditions can indicate inadequate reserves. A good example is a product that pays a large "bonus" upon reaching a long duration (e.g., the 20th anniversary).

Results under cash-flow testing for such products can differ considerably from those of GPV under best-estimate assumptions for many reasons. For example, asset/liability interactions for such products might be quite material. In addition, if interest rates vary, the value of the longer-duration benefits such as bonuses can fluctuate widely.

This may be offset if these benefits are made interactive with policy experience. For example, a bonus can be made dependent on lapse experience and/or forecast yields. However, this is probably a lot more acceptable if there is clear and unambiguous evidence that such changes will be made. As a first step, the company's policy for such nonguaranteed items should reflect the methodology and circumstances for making such changes.

Variable Products -- At first glance, it may appear that cash-flow testing is not needed for variable products. However, this is probably a misconception in at least four situations:

1. Fixed/variable transfers: Many variable products allow transfers between general and separate account funds. To the extent that the restrictions on such transfers are not very material, these options can be at least as dangerous as cash withdrawals since no surrender charge typically applies.
2. The C-2.5 risk: As the title implies, this risk is a combination of the pricing risk and that of yield movement. To the extent that separate account performance is less than expected, the funds on which risk fees are based will be depressed. However, if costs tend to be largely independent of such experience, future margins can fall considerably, especially since separate account yields can be negative.

3. Minimum Death Benefits (MDBs): The MDB generally refunds the premium on death if the contract fund value is less and is generally considered to be a fairly *de minimus* benefit. However, the MDB is really a lot like a put option. If the separate account is depressed, this option comes into money (although it still requires death in order to be exercised). If the age of the life covered by the MDB is high, the cost may become quite material. This is even more true of MDB forms that periodically increase their floor benefit.

4. Separate Account Products with Principle Guarantees: Certain products that provide guarantees of principle have their assets and reserves held in a separate account. For example, to avoid being pooled with the rest of the company in the event of its insolvency, this methodology is being used for some GICs. However, interest-rate fluctuations and related cash flows can cause losses for these products to the extent that the guarantees become operative.

APPENDIX I

GAAP RESERVING

Let X represent an array of items, X_t , each occurring at distinct time t

$PV_k(X)$	Be the present value as of time k of X where only X_t , $t \geq k$ are reflected
G	Be the gross premiums
I	Be the investment income
B	Be death benefits
S	Be surrenders
D	Be dividends
E	Be expenses and commissions
${}_tV^{60}$	Be the GAAP reserve at the end of t under FAS 60
${}_tV^{97}$	Be the GAAP reserve at the end of t under FAS 97
${}_tV$	Of the statutory reserve at the end of t.

It should be noted that the discounting of PV_k only assumes some rate or rates of interest. Any lapse or mortality effects are reflected in the various values of X.

FAS 60

For FAS 60, GAAP values are arrived at using the concept of natural reserves. These are computed using net premiums that are uniform percentages (p^B and p^E) of each gross premium. This is done separately for the benefits and expenses so that:

1. $\pi^B_t = p^B G_t$

   $\pi^E_t = p^E G_t$

These nets are computed using the nonpremium and investment cash flows so that:

2. $PV_o(\pi^B) = p^B PV_o(G) = PV_o(D+S+B)$

   $PV_o(\pi^E) = p^E PV_o(G) = PV_o(E')$

Where PV_o denotes the present value at issue. Note that E differs from E'. This is because nondeferrable expenses (those not directly related to production of new business) must be eliminated to avoid deferring them.

This is subject to the additional constraint that:

3. $PV(\pi) = PV_o(\pi^B + \pi^E) \leq PV(G)$ or $p^B + p^E \leq 1$

In the event that this condition is not met, the business is not recoverable. In this case, p^E (and then p^B if necessary) are reduced until it is. This gives rise to GAAP reserves in essentially the same way as net level premiums are used in net level statutory reserves (although using different assumptions).

4. ${}_tV^{\infty} = PV_t(B+S+E) - PV_t(\pi)$

Here it can be seen that the above reductions in p^E (and possibly p^B) are analogous to deficiency reserves.

In summary, GAAP reserves under FAS 60 are calculated using five steps:

1. Determine assumptions.
2. Determine cash flows.
3. Eliminate nondeferrable expenses.
4. Compute net premiums that are a uniform percentages of gross premiums.
5. Compute GAAP reserves.

FAS 97

Instead of net premiums that are a level percentage of gross premiums, this standard bases its reserves on product margins. For products subject to FAS 97, an accumulated fund, F, is calculated, either explicitly or implicitly. Thus

5. $F_{t+p} = F_t + G_p + IC_p - MC_p - EC_p - FD_p - FS_p$, where

F_{t+p} is the fund at the end of period P

IC_p is the interest credited to the fund during P

MC_p is the mortality charge to the fund during P

EC_p is the expense charge to the fund during P

FD_p is the amount of funds released during P due to deaths

FS_p is the amount of funds released during P to surrenders

For any period the statutory profit (or loss) before tax is:

6. $P_p=G_p+I_p-D_p-S_p-E_p-({}_{t+p}V-{}_tV)$

7. $P_p=G_p+I_p-D_p-S_p-E_p-({}_{t+p}F-{}_tF)+(\Delta_pF-\Delta_pV)$

Where the last term represents the extra statutory profit or loss from holding statutory reserves different (usually less) than F.

Unlike FAS 60, reserves under FAS 97 do not rely solely on cash flows. Instead of net premiums that are a level percentage of gross premiums, this accounting standard requires amortization in proportion to product margins. This in turn results in reserves based on the product margins. If we substitute (5) in (7) we have

8. $P_p=(I_p-IC_p)+(MC_p+FD_p-D_p)+(FS_p-S_p)+(EC_p-E_p)+(\Delta_pF-\Delta_pV)$

Thus, profit is now stated by source: Interest spread, mortality margin, surrender charge, loading less expense and reserve profit or loss. These are the product's margins, but two more steps are needed to obtain the "estimated gross profits" used in computing GAAP reserves under FAS 97. The first of these is to define the GAAP benefit reserve as F. Besides generally increasing GAAP reserves, this eliminates the last term in (8).

The next step is to eliminate nonadministrative expenses (NAE) and charges for nonadministrative expenses (NAEC). Thus acquisition costs and front-end loadings are eliminated. Denote these modified expenses and charges as follows:

$$E'_p=E_p-NAE_p$$

$$EC'_p=EC_p-NAEC_p$$

We have the following formula for estimated gross profit:

9. $EGP_p=(I_p-IC_p)+(MC_p-FD_p-D_p)+(FS_p-S_p)+(EC'_p-E'_p)$

We then find a level percentage of the estimated gross profits, R, such that

10. $PV_o(DE-DEC)=R \bullet PV_o(EGP)$

Where DE and DEC are deferrable expenses and charges which must be spread into income over the future period where the benefits or services charged for actually occur.

If R exceeds one, the business is unrecoverable. If this occurs, R is set equal to one and DE is reduced accordingly. In any event, the GAAP expense reserve is then given by:

11. $${}_tV^E = PV_t(DE\text{-}DEC) - R \bullet PV_t(EGP)$$

and in total

12. $${}_tV^{97} = PV_t(DE\text{-}DEC) - R \bullet PV_t(EGP) + F_t$$

Note that the first term is to provide for costs after issue that may be treated as deferable. This is very small or zero for most products. It is also worth noting that the expense portion of the FAS 97 reserve is analogous to other GAAP reserves except that a percentage of product margins is used instead of a percentage of premiums and that the reserve for future "benefits" is generally limited to the accumulated fund.

In summary, the steps needed to compute GAAP reserves under FAS 97 are as follows:

1. Determine assumptions.
2. Determine cash flows.
3. Determine statutory sources of profit assuming reserves equal funds held.
4. Eliminate nonadministrative expenses and charges.
5. Compute the percentage of the result that is sufficient to amortize deferable costs and spreadable charges.
6. Compute GAAP reserves.

APPENDIX II
SUMMARY OF EMERGING ISSUES

1 Must we cash-flow test our determinations of GAAP recoverability?

2
a. Should results at interim durations be recognized under AAA?
b. If so, how should such values be modified (assume liquidation, no modification, other)?
c. How should the results be interpreted (worst result, reduce by subsequent improvement in one or two years, other)?

3 Should results at interim durations be recognized for GAAP? If so, how?

4 How often is cash-flow testing for GAAP loss recognition needed? Is testing needed any more frequently for recoverability? For FAS 97 true-up?

5 Can we aggregate lines of business for GAAP cash-flow testing? For interim values?

6
a. What constitutes reserve adequacy under AAA?
b. What constitutes surplus adequacy?
c. Should comfort levels apply for adequacy? If so, what are acceptable values for reserve and surplus adequacy?
d. How do these answers change for GAAP?

7 Does the amount of any GAAP write-down depend on its probability, or is it on an all or nothing basis?

RECOVERABILITY/LOSS RECOGNITION

MR. CHARLES M. UNDERWOOD II: I would like to start with a couple of brief observations before getting into the main body of my discussion. First, although we are primarily discussing GAAP in the loss recognition segment of this session, the principles apply equally to statutory, since the actuarial opinion addresses reserve adequacy. If your gross premium reserve (GPR) is larger than the statutory reserve you would otherwise establish, you might want to consider reserve strengthening with GAAP.

Second, very few of the issues we are discussing have an absolute yes-or-no, right-or-wrong answer. Most will depend on product characteristics, company situation, materiality and other factors. For example, my company has a defined block of business where the GPRs exceed the basic statutory reserves we hold in Exhibit 8, part A. The excess of GPR over basic reserves exceeds conventionally defined statutory deficiency reserves, so we hold the GAAP GPR excess in part G instead of the normal deficiency reserves. This was the right answer for us, but similarly situated companies could come up with several different answers that could be just as right for them.

In citing examples of what my company does, I shall mention embedded value occasionally. This is because loss recognition and embedded value are a single project for us using a single set of cash-flow projections. DAC recoverability testing is simply the part of the loss-recognition portion of the exercise that applies to contracts that are not part of the loss-recognition era.

Line of Business

A line of business may be defined broadly, as by page 5 columns, or more commonly with breakouts such as term, conventional permanent, and universal life (UL) for life coverages, along with participating versus nonparticipating where applicable. With products that have been developed in the last fifteen years, new distinctions have been drawn but others have

been blurred. In UL, the insurer's interest crediting policy and rights to change contract charges lessens the participating/nonparticipating distinction. A fixed-premium UL policy, with nonforfeiture options or automatic premium loan on premium default is very much like a conventional participating policy. Many flexible premium UL policies enable the policyholder to use the contract as a term policy with a premium deposit fund. Indeed, many UL plans are designed and marketed with that specific objective. To the extent that different types of contracts are in substance similar in characteristics, you certainly can treat them together for reserve adequacy, DAC recoverability and loss recognition purposes. One caution where the UL form is used: FAS 97 is very specific as to what defines a UL contract. You may still have to account for UL contracts differently, or make a strong case to your auditor about substance over form.

Within each line of business, or block of business within line, you would normally have issue-year eras -- issue-year groups that contain policies with similar characteristics. Different products may have different era definitions. Eras may be distinguished by rate change, dividend eras, experience trends or a myriad of other factors.

Within an era, of course, companies will have different products and likely different assumptions for the same product at different issue periods in their models. I shall quickly outline how we split it up. Remember, my company is a reinsurer only with no direct business, and what we do should be considered an example rather than a model.

We define line of business as:

1. individual life
2. group life
3. annuities (individual and group)
4. A & H

Individual life is the bulk of our valuation work, and is broken down into several block/era categories:

1. conventional 1981-1987
2. conventional 1988-1992
3. block acquisitions
4. corporate owned life insurance (COLI)

Conventional business is predominantly coinsurance of term products or modified coinsurance or YRT. Thus it is a FAS 60 term portfolio. The 1981-87 issues are designated as our loss-recognition era and treated quite differently from more recent issues. The new era block of conventional business is still open, that is, each year new issues are added to the era for aggregation purposes. A separate model is created and maintained for each issue year. Within each model year we have a number of varied cells. Coinsurance and modified coinsurance are projected separately from YRT. Refunding business is projected separately from nonrefunding business. Our definition of cells is more or less on a product or company basis, and each of our "cells" has a number of subcells representing age, sex, underwriting classification and sometimes size. Each issue year is a separate model, and the whole new era block is aggregated for presentation purposes, testing for reserve adequacy, and expense coverage verification. For variance analysis and for mortality and persistency studies, we split out refunding and nonrefunding business within each issue-year model, but not for reserve adequacy tests.

Block acquisitions consist of two former retrocession treaties that were recaptured in 1989 and 1992. Each is being accounted for as a purchase. We basically hold the GPR for GAAP reporting, plus a profit reserve that was originally set up to avoid booking a profit at the time of acquisition. For the 1989 block, the GPR exceeds conventionally defined statutory reserves, so we hold the GPR for statutory purposes as well.

The COLI block is leveraged corporate-owned UL business assumed on a coinsurance basis. Because of the predominance of policy loans, it has a number of features like term or modified coinsurance and we use a net-level-valuation approach. (We no longer report on U.S. GAAP, and our Swedish reporting manual has nothing remotely resembling FAS 97.) There is very

little C-1 or C-3 risk in the product because the policy loans are fully secured by policy values and asset/liability matching is 98% exact, 2% pretty close. Reserve adequacy testing is separate for this product line and follows what we do for conventional business.

Annuities

FAS 97, of course, has forced a different way of looking at annuities for accounting purposes. Deferred annuities and immediate annuities certain are no longer insurance contracts, and thus not subject to FAS 60. Thus the loss-recognition provisions of FAS 60 do not specifically apply to these investment contracts. This does not mean you can exclude them from reserve adequacy or DAC recoverability testing. As far as DAC is concerned, all assets of any kind are subject to being written down or charged off entirely if they become impaired. If you do not have the future margins on a best-estimate basis to fully recover the DAC you have established, you write it down just as you would an oil well that has gone dry. (Our Swedish reporting, incidentally, is far more strict as regards asset values.)

As far as increasing the liability goes, I consider it unfortunate that the FASB did not address the issue in FAS 91. FAS 91, of course, is primarily aimed at assets, such as mortgage loans, and as assets these instruments are subject to the impairment concept. For guidance from the FASB on investment contracts as defined in Statement 97, I guess we have to look back to Statement 5, which was issued in 1975 and says in effect that, if a loss is probable and quantifiable, you book it:

> 8. An estimated loss from a loss contingency . . . shall be accrued by a charge to income if BOTH of the following conditions are met:
>
> (a) Information available prior to issuance of the financial statements indicates that it is probable that an asset had been impaired or a liability had been incurred at the date of the financial statements
>
> (b) The amount of the loss can be reasonably estimated

FAS 5 requirements are less stringent than those of FAS 60, but it is still around as a reminder that the unfortunate wording of FAS 97 does not let you off the hook for reserve adequacy tests on annuities.

Of course, the FASB's decision to pull investment contracts away from FAS 60 does not effect statutory reporting, asset adequacy analysis or the practice standards we must adhere to. My message is simply a reminder that you still have to do the work for statutory purposes whether or not you have to do it for GAAP. (Our Swedish reporting has a loss-recognition requirement very similar to what is contained in FAS 60, but does not excuse SPDAs or other investment products from the requirement.)

Purchase Accounting

Purchase accounting is a peculiar animal -- an art unto itself that has generated diverse interpretations within the actuarial community. One question I was asked to address here is, "Under purchase accounting, can/should prepurchase and postpurchase issues be combined or are they different lines?" The short answer to this question, in my mind, is "Yes, you can, but most of the time you probably do not want to." The long answer would take longer than our time permits, so I plan to give a quick basis for the "Yes," an observation relating purchase accounting and loss recognition, and a couple of examples that illustrate the issue.

Accounting Principles Board (APB) opinion 16 is a rather imposing document, running some 99 paragraphs. It establishes the basis for creating a starting balance sheet when you buy a company. When you finish the exercise, you have a new balance sheet that gives your new company a value exactly equal to what you paid for it. After that, APB 16 is out of the picture. How the assets and liabilities you have established develop after the purchase is governed by whatever historic cost accounting rules are applicable. This is the cornerstone of historic cost accounting: when you acquire something, a car or a life insurance company, you carry it initially at what you paid for it. And defining this principle, when you buy an insurance company or block of business, is all APB 16 does. Once you have constructed your balance sheet, you are back to FAS 60, FAS 97, FAS 91 or whatever current rules apply. Given that, if some of the acquired policies are logically associated with postpurchase policies, there is nothing to stop you from combining them for loss-recognition purposes. The same caveat applies here as with mixing UL and conventional business: assumptions, presentation format and/or valuation procedures may differ, and more often than not a company will find

it more convenient to use the purchase date as the cutoff point in defining blocks or eras. Some auditors may insist.

One obvious advantage for isolating the purchased contracts is to enable the acquiring enterprise to look at "what we bought" separately from "what we did after we bought the company." This is of particular interest when management change accompanies the acquisition. In a company that has not been sold, it is not uncommon for a management change to be followed by the establishment of loss-recognition liabilities. Frequently, the cause of the loss recognition is the cause of the management change. More important, it enables new management to start with a "clean slate," by we hope eliminating future losses from old business, and to keep the slate relatively clean by isolating the old block experience from business produced by the new management team.

APB 16 applies to the purchase of a block of business as well as to the purchase of a company. In 1989 my company recaptured a significant volume of retroceded business. The retrocessionaire was one of the founding owners of the company, that decided to get out of the business. It sold its share of the company, and was willing to pay us a modest premium to take back the business we had retroceded to it. Accounting for this as a purchase under APB 16, we established a GPR based on then current assumptions and set up an extra liability -- we called it a profit reserve -- to bring the initial transaction to a break-even basis. In addition, we had to split the GPR into two pieces:

1. the traditionally defined base reserve, and
2. the excess of GPR over base.

This was necessary because our projection model covers the business as it currently exists. That is, the effects of the recapture are reflected in our gross premium valuation. Since virtually all of the underlying business was written during the loss recognition era, we have to back out both the GPR and the base reserves from this block, in order to come up with valid loss-recognition, block-valuation results.

We have determined that this recapture is a separate block of business for valuation purposes, and thus excluded from the loss-recognition-era block, even though the underlying contracts are included. This is because the recapture was really a negotiated purchase, and thus represents 1989 new business, putting it outside of our loss-recognition era. It was several years before that we had to face up to this question, and the reason was improved technology. Once our systems developed to the point where we could recast converted contracts and reentries according to original year of issue, we discovered that previous studies had overstated lapses. At the same time we agreed with both our Swedish financial management and our local external auditors that we would no longer assume that volume growth would indefinitely forestall inflation in unit maintenance expense. The combination of lower lapse and 2.5% inflation in maintenance costs for the loss-recognition block left us with inadequate liabilities for the pure loss-recognition era, but these inadequacies were fully covered by the profit reserve on the recaptured block. Faced with the need to commit once and for all, we chose the separate block treatment with the "blessing" of both Swedish management and local independent audit staff. This meant further reserve strengthening for the loss-recognition block. It is quite likely that another company in a similar situation could have gone the other way, on the basis that the recapture was not new business but rather sound management of the old block, and thus avoided the additional reserve strengthening. A good case could be made for either approach, and auditors would not appear to have a basis to quarrel with either decision so long as it is applied consistently from year to year.

Federal Income Tax (FIT)

For loss-recognition purposes and DAC recoverability tests on the nonloss-recognition block, we do most of our projections on a pretax basis; although we do reflect FIT in our embedded-value calculations.

For embedded value, we simply record a tax provision of 34% of value of business for regular income tax on most of our business. For DAC tax, we treat past and future capitalized DAC separately. For past capitalizations, we take the present value of scheduled amortization. For future capitalizations, we project future premium subject to DAC deferral from the same cash-

flow projections used for loss-recognition purposes and apply a single factor to present value of DACable premium.

The loss-recognition block, incidentally, produces positive value of business from an embedded-value perspective. This is because statutory reserves for the block exceed GPR. Provision for DAC taxes on the loss-recognition block produces a significant debit balance for several reasons:

1. The 1990-91 capitalizations were based on premium minus dividends, while future capitalizations are assumed to be based pretty much on a net cash-flow basis (ignoring internal expenses).
2. The worst issues in the loss recognition block are 1981-85. These produce negative cash flows to us on the assumed side, which are partially offset by positive cash flows from our retrocessionaires arrangements. During that era, our retrocessionaires were almost exclusively European carriers which are not U.S. taxpayers, and thus the retrocessionaires recoveries are not recognized for DAC-tax purposes.
3. Even without the benefit of ignoring business ceded outside the U.S. tax system, our overall present value of cash flows is negative -- else we would not have loss recognition.

   If the Treasury changes its mind on the death benefits issue, our calculation will be quite different.

We chose to not record any net debits on DAC taxes for loss-recognition purposes, but would anticipate revisiting the issue if an aggregate liability were the result.

Expenses

We use a base rate per $1,000 applied to assumed volume in 1988, with 2.5% annual inflation in unit costs from there. No internal expenses are assumed for the retroceded business. Rather, these costs are assumed attributable to the assumed business and incorporated there.

The key to maintenance costs is not how you allocate by line, block or era, but rather, does aggregate expense provision in the valuation cover actual maintenance costs? We do separate expense studies for pricing and valuation, and compare the results before year-end for consistency. In essence, the pricing study covers all Exhibit 5 and 6 expenses, and allocates them per issue, per volume issued, per death, and per in force based on a target critical mass. This leaves us with an overrun but puts the onus on the sales department to eliminate it by achieving critical mass. For valuation purposes, the study allocates costs by acquisition, maintenance, development and overhead. Acquisition and maintenance costs are policy related. Acquisition costs that fail the FAS 60 "vary with" test are considered development. Development costs and overhead are expensed as incurred, and are properly ignored in the valuation process. Development costs should be discretionary, and true overhead is an accounting issue only if it threatens the *a priori* assumption that the company is viable as a "going concern."

Once we have quantified the dollar amount of maintenance costs, and verified consistency with the pricing study, we simply compare this dollar amount to what is available from valuation assumptions. If there is a shortfall, we go back to the drawing board, which is how we came to incorporate inflation in our model.

The inflation assumption, of course, should be consistent with investment-yield assumptions, or at least some reconciliation should be possible.

Validation

Our general valuation approach is to start with pricing assumptions for valuation purposes, and adjust them for experience. Our process begins by restating premiums, allowances, claims and in-force insurance from past years: This is in order to replace previous estimates with the actual development of these estimates. (For reinsurers, the development of in-force insurance has a longer tail than the development of incurred but not reported death claims.) Model assumptions are then applied to recast actual in force to produce expected values for premiums, allowances and claims. These are compared to recast actual premiums, allowances and claims.

In addition, we have a quick check of persistency from the ratios of successive years of in-force insurance. These are done by year of issue, but the validation test is for the whole block, and the nonloss-recognition era is similarly aggregated.

More formal mortality, persistency and expense studies are done for pricing purposes, and consistency is verified, but the actual-to-expected comparisons on a recast basis are the key to the loss-recognition validation process.

Mortality

For new issues, as I mentioned earlier, we start with pricing assumptions and adjust as experience warrants. Where possible pricing is based on the cedants' actual experience. For actively producing clients, we do both underwriting and administrative audits, and supplement our own experience studies with any internal studies the client provides. For facultative business, our retrocessionaires conduct underwriting audits on us. We are fairly comfortable about using pricing mortality as the valuation basis for new issues, with modest valuation margins.

For loss recognition, we use percentages of original pricing mortality assumptions, which vary by issue year between 100% and 175%. The years 1981-87, of course, cover the period where AIDS-related antiselection is presumed to be at its worst. The years 1981-85 were also marked by somewhat optimistic pricing and quite liberal underwriting standards. Our company got religion in 1986, which is why new business volume dropped dramatically, and also why the low end of the mortality ratio range is 100% rather than something higher.

As with most other kinds of estimates, how you set original assumptions is less important than how you monitor, validate and adjust them.

Persistency

With loss recognition, you look at persistency a little differently than for many other blocks. There has been much general discussion about "lapse-supported" products, but here the

company's preference for higher lapse is not necessarily by design. Some blocks of business will get into loss recognition because of higher lapse, where positive future margins exist but because of high lapse these margins are not adequate to fully amortize acquisition costs that have been deferred. More common, in my experience at least, is the situation where mortality is much higher than expected or where competition reduces available interest margins to the point where overall future margins are negative. In my company's case, it was primarily higher than expected mortality. With negative overall margins, higher lapse will help you and lower lapse can hurt. A sensitivity test we did on our loss-recognition block showed that decreasing our lapse rate by 10% of itself would increase our net GPR by approximately 40%. This should not be taken as something to generalize. I would expect term-life-reinsurance, loss-recognition blocks to be more lapse sensitive than direct blocks.

Another persistency concern to reinsurers is conversions. Picture an annual renewable term plan reinsured on a coinsurance basis, which is convertible to a permanent plan reinsured on a YRT basis. If the slope of the ART premiums less allowances is steeper than the slope of the reinsurer's YRT rates, the reinsurer could be hurt by an act of the consumer with no antiselective motivation. Arrangements of this sort were not uncommon a decade ago.

Interest

We do cash-flow testing only for our annuity business, and that is basically limited to the eight interest rate paths we use for Regulation 126 filings. We have retrocessional arrangements and contractual provisions that effectively minimize the C-3 risk -- enough that we feel that we are exempted from the cash-flow testing requirements under Regulation 126. We do the filing rather than the exemption cop-out when we actually run the projections, which is about every other year. We shall likely move to an annual basis if the penalty for not doing so stays in the NAIC risk-based-capital formula. For conventional term business, we use a level interest assumption that varies only by issue year. The entire loss-recognition block uses the same rate as 1988 issues, and the assumed rate has declined since. The rate for 1992 issues will be 6.5 or 7% I believe, and that fits nicely with my rule of thumb for the logical relationship between yield and inflation. I use inflation plus 2-4% as a baseline range of short-term, risk-free yield

assumptions. If you are working up from inflation, you can add a factor for longer maturities and perhaps a little for some modest risk. If you can demonstrate future economies of scale from volume growth, you can perhaps back off the inflation rate a bit, but this is becoming more difficult. First, it is not easy to demonstrate perpetual volume growth sufficient to counter the effect of inflation, particularly in markets with limited growth potential. Second, there seems a trend among auditors to insist on some inflation for closed blocks of business, particularly where loss recognition is involved.