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## A Primer on Some LTCI Pricing Challenges

by Jim Berger & Yang Ho

*Editor's Note: This is part one of a two-part article. It will be concluded in the next issue of Long-Term Care.*

Actuarial challenges in product pricing are not unknown to other lines of business, but they take on new meaning and significance when pricing long-term care insurance (LTCI). A discussion of some of the elements of importance in pricing should illuminate issues that all pricing actuaries should keep in mind.

### Gender

One common practice in this "unisex priced" world is the use of unisex data. Male and female frequency and average length of stay tables, along with the assumed mortality and lapse rates, are combined by applying the expected sales mix by gender for each age at issue. Then the income statement for a given issue age cohort is calculated to show the cash flows and the loss ratio development.

Different claim cost streams are developed for each issue age, since the gender mix should be expected to change as the block ages, e.g.,  $q(70)$  is not equal to  $q(60+[10])$ . In other words, unique incidence rates for each issue age are necessary, even after the impact of underwriting has worn off. Females have lower involuntary lapse rates (death) but their claim cost curve tends to be steeper, thus requiring

unisex pricing to use separate issue age claim cost streams.

One of the concerns with unisex pricing is that the reserves are then unisex. If the anticipated gender mix does not materialize as assumed at issue or changes by a different pattern than anticipated over the course of the product's life, the reserves do not adapt. This weakness should indicate to the pricing actuary the need to have sex distinct reserves even if the pricing is done on a unisex basis.

Of course, the alternative is to develop separate male and female

income statements at each pricing age and then combine them.

Sex distinct pricing has an added advantage of more transparent sensitivity tests to differing claim costs, lapse rates, and gender mix. This can be helpful, for example, when considering the pricing of the married couples' discount.

The block's experience, unlike what may be assumed in pricing, should be expected to develop uniquely for each gender.

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## A Primer on Some LTCI Pricing Challenges

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### Underwriting Classes

Another pricing realm that deserves extra attention is the experience of preferred and standard risks, and also substandard risks where applicable. One should expect the claims to develop differently for each class not due only to morbidity but also due to differences in mortality, underwriting selection, and lapses.

It may be reasonable to expect preferred and standard risks to have the same ultimate claim costs, but even this is unclear. If preferred insureds are considered better risks due to lifestyle issues, these lifestyle differences may persist throughout the remainder of the preferreds' lives.

Once again, reserve assumptions should be in sync with pricing assumptions. Risk classification by preferred/standard/substandard can vary more greatly than even the male/female mix, as underwriting is refined and the marketplace exerts pressures for new underwriting rules.

Of course, the challenge here is to know if a company has significant knowledge (through experience or otherwise) to make sense of this dichotomy/trichotomy and is able to differentiate the risks accurately. Every effort should be made to avoid being targeted in maybe the more weakly priced sections of the rate book. While theory points us down one road, practicalities of cost vs. benefit must be considered.

### Disability Model?

For an integrated plan, a proper model should theoretically recognize the existence of two (or more) modes of care (e.g., home care and nursing home care) and the transitions

between these sites. The disability income product line might appear to be a model in this regard, as it has two methods of disablement: accident and sickness. Unfortunately, LTCI is much more complicated.

While it would be very unlikely for the disability income beneficiary to move from disablement by accident directly to disablement by sickness, or vice versa, it would be common for the LTCI claimant to start with a community-based care benefit and then move to a facility benefit. This indicates a semi-Markov model, at least with regard to policies with both community-based and facility care features. The difficulty is the complexity of implementing this semi-Markov model.

benefits offered or in combination with limited experience data.

The disability income model may look to do a reasonable job, but ultimately it would be best to recognize LTCI for what it is — a unique product needing unique thinking.

### Claim Continuance

Another modeling challenge arises from the concept of continuance of claim. One practice is to develop claim costs by taking frequency times the average length of stay (ALOS) for each mode of care at each age and then adding the claim costs per mode to gain the total claim cost per age. The ALOS should be discounted with interest due to their significant lengths.

*"Risk classification by preferred/standard/substandard can vary more greatly than even the male/female mix..."*

Not only would the model itself be very complex, but also where would the data come from that possessed any degree of credibility? Thus, even though a proper model is known, practicality dictates that the combination of the community-based and facility care claim costs be made before the model is run. Anticipated pricing methods thus dictate desirable statistical methodology. Experience should be studied so as to develop combined claim costs for integrated policies.

The values will be derived from experience data for those companies with sufficient experience, while others will develop it from published data adjusted for the

This does a reasonable job of showing the cashflows, except that the disabled life reserve (DLR, a term borrowed from disability insurance) and its corresponding drag on earnings are not properly recognized. This earnings drag can be roughly modeled by using a lower discount rate for the average lengths of stay. This is not a perfect method.

Also, the claim expense reserve should be considered in any evaluation; it is not considered as part of the DLR and is not deductible for tax purposes.

The better approach is to use continuance tables, though the complexity of the model increases. Then the DLR is adequately reflected while the ALOS is not

used; the continuance allows the proper discounting in the cash flows, depending on the purpose of the discounting. For example, ALOSs may be discounted at the reserve interest rate, at the investment earnings rate, or at the hurdle rate.

While the use of continuance certainly complicates the model, our experience is that a spreadsheet model is only slightly more difficult to implement and is worth the effort. Though the DLR can be estimated when needed (for example, for filing in New York), the proper model solves this issue and gives a clearer understanding of the cash flows. Note that using continuance in the model allows for a better comparison of the actual experience of claims payments with the expected experience from the pricing model.

### Lapse

While the accuracy and detail selected for the model must be appropriate for the purposes at hand, the inputs to the model must also reflect a measure of reality. While we can simplify assumptions to price LTCI, we may miss important insights if we simplify too much.

Lapses, arguably the most critical assumption for this lapse-supported product, should be examined in detail. For example, ultimate claims assumptions should be increased when using higher ultimate lapse rates, thus accounting for antiselection in lapsation.

A thorough understanding of lapses can shift the pricing of various benefit features. Customers who purchase inflation protection may be less likely to lapse. Married couples may have lower claim costs, but they may also have lower lapses, at least while both are alive. What about males and females, older ages vs. younger ones, facility only vs. integrated

products, policy size, and even variations by region of the country? All can affect lapsation.

### Mortality

Mortality is often assumed to be according to a given table, say the 83 GAM; but mortality should improve over the life of the block. If the actuary feels positive about the claim experience, shouldn't mortality be assumed to improve? Also, shouldn't mortality be adjusted by the selection factors during the select period, though perhaps not to the level of life insurance? And while the 83 GAM may have certain desirable properties, it is not clear that it has the desired mortality level, not to mention any provision for mortality improvement.

As pricing is done in a world that determines premiums as the "best" balance between expected profits and competitive pressures, an understanding of all these sensitivities is helpful in seeing where a block of business may be most at risk of being out of balance.

*(Part II to come in the next issue.)*

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### NAIC Activities

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Finally, the date for a two-day meeting was set (January 13 and 14), possibly in Dallas. This meeting would focus on continued draft changes to the NAIC Model. The latest model is available on the NAIC web site (<http://www.naic.org>), then go to "Papers/Model Laws/Drafts" and look under "Draft Model Acts and Regulations for the Long-Term Care Insurance Model Regulation (rating)."

### HIPAA

The latest HIPAA draft should be available on the NAIC web site (same as above but with "HIPAA changes").

The final issue relating to HIPAA apparently was resolved in December. HIPAA requires the reporting of "Claim Denials" with little definition of what this is to include and to whom the report is to be made. The NAIC Model defines many of these issues, but still leaves a number to each company to determine. The Model defines a "denial" and attaches a format for reporting both certain "not-paid" claim requests (e.g., not paid during the elimination period) and other denials, including appropriate denials in several categories.

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