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Moving Beyond Retrospective Testing for LTCI Reserves

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It has long been accepted among actuaries that retrospective—or “retro” testing—is a blunt tool when it comes to establishing the ongoing adequacy of claim reserves for blocks of long-term care insurance. A retro test examines the adequacy of claim reserves by comparing them to the sum of paid claims following the valuation date and the estimated remaining reserve. But, because remaining reserves are estimated, the test is not conclusive.

Claim reserves shape early financial perceptions of a block of Long-Term Care Insurance (LTCI) business, for both good and bad. Profits and pricing decisions are heavily dependent upon accurate reserves. When it comes to financial reporting, claim reserves offer the most direct method of reflecting emerging experience. Other reserves are typically locked-in, but claim reserve assumptions can be updated as often as quarterly—based on emerging experience—and play an important role in profitability. Therefore, closely tracking and monitoring the appropriateness of the claim reserves plays an important role in managing any LTCI business. In fact, follow-up studies and tests of reasonableness of prior period incurred claim and reserve estimates are required as part of Actuarial Standard of Practice #5.

As Jim Berger pointed out in the August 2007 issue of *Long-Term Care News*, pure statistical fluctuation or randomness is one source of claim reserve variation from expectation. Keeping in mind statistical randomness, a retro test is one approach an actuary can use to examine the appropriateness of the claim reserves.

Inherent Weaknesses of Retro Tests

Retro tests have a number of weaknesses. To begin with, retro tests are somewhat circular,



since part of the test involves the tail reserve level—a number often derived from very little (if any) hard, experiential data. If that tail level is destined to ultimately prove inadequate, then the retro test results will be flawed. The situation is further complicated by the inclusion of multiple claim durations in a single calendar period. A basic retro test looks at aggregate experience over multiple claim durations. It does not thoroughly test the adequacy of reserves. It only shows that the reserve estimate made at the beginning of the period looks sufficient or, conversely, deficient. In either case, the determination is being made with limited data aggregated over different claim durations. Relying on this basic level of retro testing as the primary determinant of claim reserve adequacy is the actuarial equivalent of predicting the Super Bowl winner based on team pass completion percentage through October. It may help, but there are many other items to be considered.

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To address the deficiencies built into basic retro testing, it is necessary to dig deeper and acquire more information to evaluate and report on the adequacy of LTCI claims reserves.

Despite its limitations, this basic level of retro testing is required as part of year-end financial reporting and in Schedule O. In addition to other limitations of retro testing (described in this article), Schedule O includes two primary deficiencies with respect to LTCI claims.

1. Schedule O does not account for interest. Claim reserves for LTCI are calculated using an interest rate discount; therefore, including interest as part of the retro testing calculation is important.
2. Schedule O is performed on a calendar year basis and aggregates claim data across claim durations. This can lead to inappropriate conclusions about the appropriateness of claim reserve levels as demonstrated in the following example.

Part of the problem with performing retro tests on a calendar year basis across claim durations occurs because the duration of a claim can vary from a fraction of a year to more than a decade. In addition, different diagnoses are associated with widely different claim intensity levels, from a small number of hours per week of home care, to more intense care provided in a nursing facility. Many other factors, briefly described later in this

article, can influence LTCI claim termination rates and retro tests as well. For example, if the mix of claims currently in force is heavily weighted to claims in their early durations, and the claim termination rate assumption underlying the claim reserves are too high in the early durations and too low in the later claim durations, the basic retro test may yield inappropriate results.

To address the deficiencies built into basic retro testing, it is necessary to dig deeper and acquire more information to evaluate and report on the adequacy of LTCI claims reserves. Performing retro tests on a durational basis is critical toward that end. The illustrative example describes how that can be accomplished.

Illustrative Example

The following example demonstrates how misleading basic retro tests can be when it comes to measuring reserve adequacy. Consider a set of hypothetical valuation assumptions as shown in Table 1 for a cohort of 1,000 claimants. The table shows expected annual termination rates, corresponding expected paid claims and claim reserves.

Table 1 Valuation Assumptions							
Claim Duration in Years	Claimants (BOY)	Termination Rate	Claimants (EOY)	Claim Reserve (BOY) (M)	Expected Paid Claims (M)	Claim Reserve (EOY) (M)	Claim Reserve Factor* (EOY)
1	1,000	40%	600	\$66.9	\$29.2	\$37.7	\$62,833
2	600	30%	420	37.7	18.6	19.1	45,476
3	420	25%	315	19.1	13.4	5.7	18,095
4	315	100%	0	5.7	5.7	0.0	0

BOY = Beginning of Year, EOY = End of Year, Claim Reserves assume no interest discounting (for simplicity). \$ in Millions.
*Claim Reserve Factor is the Claim Reserve per active claimant at the end of the year.

To illustrate the problems with basic retro tests, assume an in-force block of LTCI claimants with 1,000 claimants in duration 1, 300 in duration 2 and 200 in duration 3. The starting reserve, based on the valuation assumptions, is approximately \$95 million and actual experience emerges as shown in Table 2. The retro test is calculated by taking the claim reserve at the beginning of the year and subtracting the sum of paid claims and ending reserve.

Breaking apart the retro test by duration provides more insight than merely looking at the total, and essentially provides a high level continuance table or actual-to-expected analysis of termination rates. As discussed below, there are many other complicating factors to a detailed continuance table analysis; however, the durational retro test will help to begin unmasking some of those issues.

Claim Duration in Years	Claimants (BOY)	Claimants (EOY)	Claim Reserve (BOY)	Paid Claims	Claim Reserve (EOY)	Retro Test
1	1,000	650	\$66.9	\$30.1	\$40.8	\$(4.0)
2	300	180	18.9	8.8	8.2	1.9
3	200	100	9.1	5.5	1.8	1.8
Total	1,500	930	94.9	44.4	50.8	(0.3)

BOY = Beginning of Year, EOY = End of Year, Claim Reserves assume no interest discounting (for simplicity). \$ in Millions.

A calendar year retro test is typically done by focusing on the total line in Table 2. This retro test would suggest a deficiency of \$0.3 million. By examining each claim duration individually, important information can be gleaned on the appropriateness of the initial valuation assumptions by duration. For instance, claim duration 1 shows a deficiency of \$4.0 million. While there could be many reasons for this deficiency, such as the frequency of HHC services or payments per day, this illustration assumes any variation from expected is due to claim termination rates. This implies that the actual claim termination rate was lower than assumed in the valuation. In claim durations 2 and 3, the opposite is true. The result of the retro test in both of these is favorable, implying the actual claim termination rates were higher than assumed.

Retro tests can be taken one step further. Instead of using the ending claim reserve based on initial valuation assumptions, one can reestimate those reserves based on past experience. For example, in Table 3 on page 12, we can use actual experience by claim duration from Table 2 and recalculate the ending claim reserves and durational retro test. For simplicity, we assumed that the actual experience was 100 percent credible. The total retro test result changes dramatically to a \$8.7 million surplus versus a \$0.3 million deficiency.

As shown in Tables 2 and 3, recognizing emerging claim termination rates can dramatically alter the view of the adequacy of the reserves. The retro tests in Table 2 would ultimately, assuming all experience runs out consistently, be equivalent to Table 3. This result

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occurs because as claims move through the last two durations, where actual termination rates were higher than expected, reserve excesses would develop.

New NAIC Experience Reporting Forms

Some of the deficiencies of Schedule O will soon be addressed by new NAIC reporting forms,

Table 3 In-force Claims and Actual Experience for Calendar Year Period Updated Ending Claim Reserves						
Claim Duration in years	Claimants (BOY)	Claimants (EOY)	Claim Reserve (BOY)	Paid Claims	Claim Reserve (EOY)	Retro Test
1	1,000	650	\$66.9	\$30.1	\$33.4	\$3.4
2	300	180	18.9	8.8	6.6	3.5
3	200	100	9.1	5.5	1.8	1.8
Total	1,500	930	94.9	44.4	41.8	8.7

BOY = Beginning of Year, EOY = End of Year, Claim Reserves assume no interest discounting (for simplicity). \$ in Millions.

The approach illustrated in Table 3 (i.e., updating claim reserve assumptions based on emerging experience), allows the valuation actuary to draw conclusions about the claim reserve years earlier than the Table 2 approach. The validity of the approach in Table 3 is dependent on the appropriateness of the future claim runoff assumptions. Therefore, it is important to not only carefully review past experience and apply credibility weighting, but to also account for other influences and complicating factors discussed below.

To keep things simple, this illustrative example assumes a 0 percent discount rate in all calculations. While including interest in this example would change the magnitude of the results, the conclusions would remain consistent. However, if claim reserves are calculated using discount rates and the retro test calculation itself ignores discount rates (as is the case for Schedule O), the results can be very misleading for LTC insurance.

currently estimated to be effective for reporting year 2008. The NAIC plans to introduce three new LTCI Experience Reporting Forms (Forms 1, 2 and 3) to begin replacing the current forms (Forms A, B and C), all requiring more in-depth analysis. These new forms could prove to be an important tool in helping actuaries and outside interested parties by providing more standardized data. The new Form 3, in particular, will serve as an expanded Schedule O type retro test, accounting for interest, and allowing for additional information that will aid valuation actuaries by allowing them to include more data and perform durational retro test calculations.

Valuation actuaries should begin familiarizing themselves with the new forms. Proposed prototypes can be found by visiting the following Web sites:

- http://actuary.org/pdf/health/proposed_ltc_0905.pdf;
- http://actuary.org/health/ltc_forms_0905.xls; and
- http://actuary.org/health/ltc_examples_0905.xls.

Valuation actuaries should begin looking at the kind of information that will be required to complete the forms, and start planning for the challenges the new forms will present. The new forms will provide additional information to outside parties, so the valuation actuary should be prepared to answer questions that may arise as a result of this new information.

Other Claim Reserve Considerations

In performing additional analysis beyond basic retro testing, one still looks at the emerging claim duration experience, but other factors should be added into the mix to predict how the reserve is going to ultimately play out. In other words, just because the tail takes a long time to emerge, this doesn't mean that the early experience is of no importance—only that it needs to be augmented with information available from other sources.

When drawing conclusions from the combination of data from retro testing and other sources, there are several factors one needs to consider to ensure that the data is appropriate and not just situational, including:

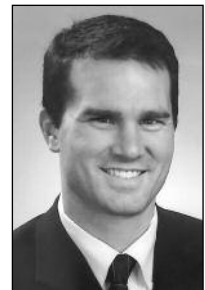
- *Diagnoses Mix.* The mix of different diagnoses in a block can change over time. For example, the company may have a historical block in which there were a great many cognitive claims for conditions such as Alzheimer's. Cognitive claims tend to go on for a long time. Relying on data from a block that has a large proportion of cognitive claims could distort your evaluation, especially if new blocks of business have tighter underwriting which could screen out these types of claims.
- *Changes in Benefit Design.* It is important to take into account trends in benefit design over the years and its impact on claim

utilization, such as changes in benefit triggers.

- *Type of Care.* Long-term care can be received in various settings including nursing homes, assisted living facilities or home care. The mix of claims by type of care and transition between types of care can cause prior assumptions to be modified.
- *Health Improvements.* New technologies and medical advances are leading to improvements in health care. Consideration needs to be given to how these changes will impact claim mortality and recovery rates.
- *Care Management.* Many companies are starting or expanding various care management and wellness programs, along with provider contracting. These also need to be considered when setting future claim expectations.
- *Cost of Care Relative to Benefits Purchased.* Often people purchase more LTCI with higher benefits than they need for their geographic location. Typically this will extend the benefit period for a "pool of money" policy design. Cost of care inflation will influence the magnitude of this issue. The relationship will change over the life of the policy, especially on policies that do not have an inflation protection option.
- *Claim Operational Changes.* Claim department processing can have a significant impact on the claim reserves. Changes in operational rules and staffing levels can lead to changes in lag times and the reporting of closing of claims.
- *Policy Riders.* Several riders that have become popular in the industry over the last several



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years require special consideration, such as shared care among spouses, return of premium riders and supplemental cash riders.

Conclusion

Claim reserve retro tests should be reviewed by claim duration, include the impact of interest consistently in all calculations, and include updated assumptions for multiple issues that can

have an impact on claim termination rates or other factors. The new NAIC LTC Experience Reporting Forms (estimated to arrive for reporting year 2008) will help modernize LTCI retro tests, providing additional accuracy and standardization to the industry when it comes to evaluating the adequacy of claim reserves. Actuaries should not wait for these forms, but rather ensure that any claim reserve analysis moves beyond a basic calendar year retro test. *

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