

Pricing Long-Term Care Insurance for Long-Term Profitability

POPULATION PROJECTIONS FOR THE UNITED STATES show that the over-age-65 cohort will continue to grow. At the same time, rising health care costs and concerns about the viability of Medicare are compounding consumer fears about accumulating enough assets to adequately fund their retirement lifestyle and medical needs. These circumstances present a tremendous opportunity for the insurance industry in the long-term care insurance (LTCI) market.

The LTCI market is evolving, and only a small percentage of the potential market has been penetrated. According to the 2000 *Insurance Fact Book*, published by the American Council of Life Insurers, less than 10 percent of the U.S. population over age 65 has purchased private LTCI. The increasing need for this product improves the prospects for additional tax relief for LTCI purchases, further encouraging sales.

Because of market growth and product evolution, risk management is crucial to long-term profitability. Perhaps one of the most significant risk management challenges LTCI companies face is the difficulty in determining, with a high degree of confidence, premium rates that management believes will be profitable.

Many companies have been reluctant to enter the LTCI market. Some companies already active in the LTCI market are re-examining their strategies and commitment to LTCI. These situations stem from the uncertainty created by a number of risk factors, the most significant of which are:

- Claim levels and morbidity costs
- Persistency of the business
- Investment earnings

Claim Levels and Morbidity Costs

LTCI policies provide an array of services that promote independent living, including institutional care, home health care, assisted living facilities, care management, support for family caregivers, home modifications, homemaker services, and hospice care.

Reliable insured-claim experience tables are still



many years away, due to the relative newness of LTCI and the rapid evolution of product design. Therefore, claim costs are derived principally from government sources using population data from surveys, Medicare, and state Medicaid programs. Claim costs are the most significant risk factor in LTCI and have the greatest impact on the level of premiums.

Persistency

LTCI products are sometimes described as "lapse supported." That is, all else equal, the more policies that lapse, the fewer the claims and the more profitable the business. Therefore, assumptions used for lapse rates can have a significant impact on initial premium levels and profitability. Higher first-year lapse rates generally result in higher premiums to ensure recovery of acquisition costs. However, lowering renewal lapse rates generally results in higher premiums due to the steep claim cost curve.

Mortality can be considered an additional component of lapse because no benefits are paid on death. Mortality improvements mean more policies end up as claims. The mortality lapse can be significant, with the most substantial impact at higher issue ages.

Investment Earnings

LTCI products build up substantial reserves, and LTCI policies can remain in force 30 years or longer. Therefore, investment earnings have a significant im-

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impact on premium levels and profitability. Generally, the higher the net spread earned on assets, the greater the profitability of the product.

Reinvestment and default are the primary asset risks. Since most long-term care insurance has no cash value, there is little disintermediation risk.

Managing LTCI Risks

Companies must emphasize profitability and risk management to succeed in the LTCI market. For those companies that stress growth over proper pricing, the risk factors mentioned previously create the potential for disaster. So, given the risks and uncertainty, how does a company successfully participate in this high-potential market?

To be successful in the LTCI market, a company must develop and implement sound operational practices for risk selection, claim adjudication, experience monitoring, and agent training. Though not unique to LTCI, these practices are essential to developing a profitable block of business.

Perhaps the greatest risk management challenge is determining the appropriate price for the LTCI product. Much of the concern has focused on selecting assumptions, which continues to be a concern for a number of reasons:

- There is a lack of credible experience data as mentioned above.
- The desire to be competitive can result in the selection of unrealistic assumptions to achieve the appearance of meeting pricing targets ("gaming").
- Traditional pricing approaches provide limited information about the true profitability of a product.

Traditionally, LTCI pricing actuaries select best-estimate, deterministic assumptions using industry information and company experience, if available and credible, that reflects the product design and company circumstances.

Next, using an iterative process, they calculate the premium rates that are deemed both competitive and close to the desired profit targets.

Last, they test variances in the critical

assumptions to determine if management is comfortable with the overall level of the profits under adverse experience.

To enhance the traditional process and address the issues noted above, more information is needed. The application of simple statistical techniques to the traditional approach can provide useful information to enhance the process.

To illustrate this process, we developed a premium rate for a prototype LTCI policy. The primary product features, pricing assumptions, and sensitivity variances for our prototype product are summarized below:

Product Description

- Qualified, comprehensive nursing home, assisted-living facility, and home care, including respite and adult day care
- Failure of two of six activities of daily living and cognitive impairment trigger
- Ninety-day elimination period and lifetime benefit coverage
- Compound inflation of 5 percent

Pricing Assumptions (Best Estimate)

- **LAPSE:** 8 percent, 6 percent, 5 percent, 4 percent, 3 percent, 2 percent thereafter, plus 1983 Group Annuity Mortality (GAM)

- **MORBIDITY:** Claim costs are developed from the 1982/89/94 National Long Term Care Surveys and the 1995 National Nursing Home Survey

- **NET INVESTMENT INCOME RATES:** 7 percent level

- **COMMISSIONS AND EXPENSES** reflect company circumstances

- **RESERVES:** One-year Full Preliminary Term using 4.5 percent interest, 1983 GAM, pricing morbidity and selection, and lapse rates equal to 80 percent of pricing

Sensitivity Tests (Adverse Variances)

- **LAPSE:** 6 percent, 4 percent, 2 percent, 1 percent thereafter, plus 1983 GAM

- **MORBIDITY:** 115 percent of the best-estimate assumption

TABLE 1
Traditional Profit Testing Results

SCENARIO	PROFIT MARGIN
Best estimate	10.0%
Adverse morbidity	0.6%
Adverse lapses	1.6%
Adverse investment returns	2.2%
Combined "worst case"	-19.2%

■ **NET INVESTMENT INCOME RATES:** 6 percent level

(For this case study we have assumed the primary interest is in the adverse development of experience. In practice, favorable variances would also be tested.)

Pricing Cell

■ **GENDER MIX:** 40 percent male and 60 percent female

■ **ISSUE AGE:** 62

Profit Target

Pre-tax profit margin (present value of pre-tax profits divided by the present val-

TABLE 2
Profit Margin and Break-even Confidence Levels

SCENARIO	MEAN PROFIT MARGIN	BREAKEVEN CONFIDENCE LEVEL
Best estimate	10.2%	75.8%
Adverse claims	0.5%	51.1%
Adverse lapses	1.9%	55.0%
Adverse investment returns	2.4%	55.7%
Combined "worst case"	-19.4%	19.2%

ue of premiums, both at the net investment earnings rate) of 10 percent

For our case study, the resulting annual premium calculated to achieve the 10 percent profit target under baseline, "best estimate" assumptions is \$2,730. Table 1 contains profit testing results obtained from the traditional pricing analysis.

From this information we may conclude that, using best-estimate assumptions, the 10 percent target is achieved. Also, the company is expected to make money except under the worst-case scenario. If the premium is reasonably competitive, company management may find

the results contained in Table 1 acceptable and move to the next stage in implementing the product. However, an important question should be asked: What is the *likelihood* that this product will be profitable?

This question can't be answered using the traditional pricing approach. But by substituting random variables for the best-estimate point-value assumptions, we can gain insight into the impact the statistical variance of the assumptions has on the profit margin.

For our case study we have assumed the claim cost multiplier, lapse rates, and interest rates are normally distributed and have mean values equal to the best-estimate point values. This distribution was selected for convenience and may not represent best estimates of the actual distributions of these variables. An additional convenience was to use only 1,000 trials in the Monte Carlo simulation. The results of the simulation are contained in Chart 1 and Table 2.

As can be seen from Chart 1, the mean profit margin is 10.2 percent and the break-even confidence level is 75.8 percent. To develop results for the adverse scenarios in Table 2, the distribution was shifted in each case so the mean value was equal to the adverse assumption point value.

With this new information we know that even though the product was priced to achieve the target margin of 10 percent, there is one chance in four that the product will lose money. Furthermore, chances increase to almost one in two if any of the best-estimate assumptions develop adversely. Given the uncertainty described previously, company management should be concerned about the long-term profitability of this product priced at \$2,730.

An additional consideration is the new requirement under rate stability regula-

tions that requires the actuary to certify that the rates are adequate for the life of the business under moderately adverse assumptions. Many actuaries may be uncomfortable certifying as to the adequacy of the \$2,730 premium in light of the results in Table 2.

A Better Approach to Premium Rate Development?

By using a stochastic approach, adequate premiums can be developed in a number of ways. Two examples can illustrate:

Example 1: Determine the premium needed to be X percent confident that the company will break even under best-estimate assumptions. In this example, X can be set at the level necessary to give management a high degree of comfort that the company can be profitable selling LTCI.

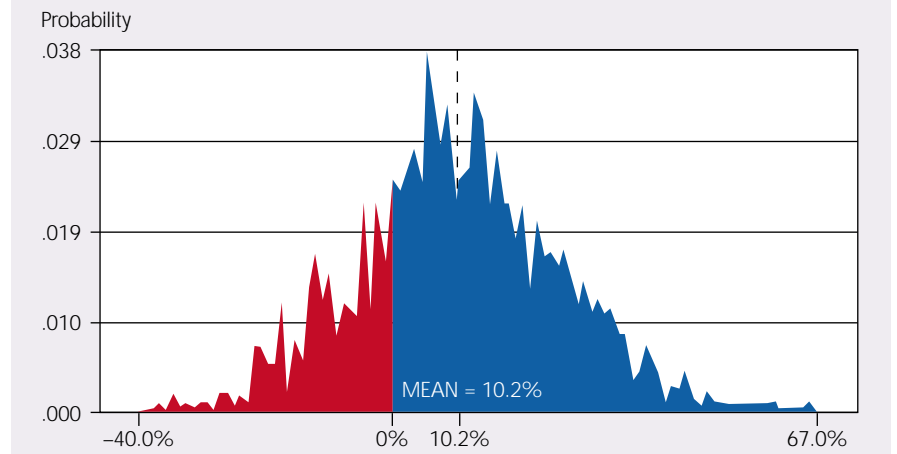
In this example, the premium necessary to be 90 percent confident that the company will break even is \$3,300. The associated mean pre-tax margin is now 20 percent—double the original target!

Example 2: Determine the premium needed to be X percent confident the company will break even under “moderately adverse” or “worst case” assumptions. These cases may be of interest to company management and the certifying actuary to determine the level of premiums needed under regulatory certification requirements or a worst-case scenario. For example, the premium necessary to be 50 percent confident that the company will break even under the worst-case scenario is \$3,425.

These examples illustrate additional ways a stochastic approach can aid the premium development process. Based on these examples, we may be concerned that our traditionally priced premium is significantly below the level needed to achieve the necessary comfort level for the certifying actuary and company management. As experience becomes more credible and companies enhance their pricing analyses, we expect the overall level of premium rates will probably increase.

This approach can provide useful information in the pricing process, but it's not without a number of limitations. First,

CHART 1
Profit Margin Frequency Chart—1,000 Trials



as with any statistical application, determining the mean, variance, and shape of the distribution requires good data. Second, subjectivity still enters the process in selecting representative assumptions, and because of this, gaming can still be a problem. Therefore, the professional judgment and integrity of the actuary continue to be essential.

LTCI is a significant growth opportunity for the insurance industry. But the opportunity exists only if companies properly manage and price the business. By making use of statistical techniques such as those described in this article, the actuary and company management can gain additional insight into developing adequately priced products.