SOCIETY OF ACTUARIES

Long-Term Care Insurance: The SOA Pricing Project

November 2016

Long Term Care Insurance: The SOA Pricing Project

PRIMARY AUTHOR	Robert Eaton, FSA, MAAA	
PRIMARY REVIEWERS	Jim Glickman, FSA, MAAA, FCA, FLMI, CLU	Ron Hagelman
	Roger Loomis, FSA, MAAA	Joe Wurzburger, FSA, MAAA
PROJECT COMMITTEE MEMBERS	Noelle Destrampe, FSA, MAAA	Roger Gagne, FSA, MAAA
	Jim Glickman, FSA, MAAA, FCA, FLMI, CLU	Ron Hagelman
	Peggy Hauser, FSA, MAAA	Laurel Kastrup, FSA, MAAA
	Dave Kerr, ASA, MAAA	Perry Kupferman, FSA, MAAA
	Roger Loomis, FSA, MAAA	Dave Plumb, FSA, MAAA
	Al Schmitz, FSA, MAAA	Eric Stallard, ASA, FCA, MAAA
	Mary Swanson, FSA, MAAA	Brian Ulery, FSA, MAAA
	Joe Wurzburger, FSA, MAAA	

Caveat and Disclaimer

This study is published by the Society of Actuaries (SOA) and contains information from a variety of sources. It may or may not reflect the experience of any individual company. The study is for informational purposes only and should not be construed as professional or financial advice. The SOA does not recommend or endorse any particular use of the information provided in this study. The SOA makes no warranty, express or implied, or representation whatsoever and assumes no liability in connection with the use or misuse of this study.

Copyright ©2016 All rights reserved by the Society of Actuaries

TABLE OF CONTENTS

Introduction 4

Executive Summary 4

A New Offering for Consumers 5
- A Need for Protection 5
- Tomorrow's LTC Insurance Consumer 7

Company Perspective 8
- Introduction 8
- New Policy Pricing: Today's Environment 8
- Implications to Company Risks 9
- Current Pricing Perspective 10
  - Morbidity 10
  - Mortality 11
  - Morbidity and Mortality Improvement 12
  - Voluntary lapse 12
  - Investment Income 12
  - Expenses 13

Earning Back the Trust of Long-Term Care Producers 16

Technical Appendix 18
- Introduction 18
- Data 19
- Summary of Key Illustrative Pricing Assumptions 19
- Sales Distribution 20
- Claim Cost Uncertainty 20
- Lapse Uncertainty 21
- Stochastic Methodology 21
- Observations 22

© 2016 Society of Actuaries

Long-Term Care Insurance: The SOA Pricing Project

Introduction

Long-term care (LTC) services are critical to our nation's future by all accounts. There will be an estimated 50 million people aged 65 and older by 2020, and almost 50% of them are expected to use formal, paid long-term care support and serves (LTSS).[1] Long-term care insurance (LTCI) can play a fundamental role in funding those services. Given these demands you might expect a market surge of new insurers, ideas, products, and possibilities to support our aging population. Instead, with some exceptions, we've seen an exodus, a shuttering of doors, and the financial fortification of most existing insurers.

This peculiar reaction to a market opportunity can be understood in the context of the seismic financial shocks that concluded the prior decade. They drove interest rates to their lowest levels in 60 years, which threaten to remain low for the foreseeable future. Many insurance products, and LTC in particular, are financially stressed when interest rates are lower than anticipated. This gave additional anxiety to LTC insurers, who were already cautious after misestimating policyholder lapse behavior. Most carriers exited the LTC business and many have moved to reinsure or sell the business they once sold. Those who remained in the market first made certain that any new sales would be profitable, with only the secondary goal of strengthening market share.

This paper provides historical context and reasons underpinning the uncertainty of the first generations of LTC pricing. We aim to show that, for these same reasons, LTC insurers should be more optimistic about the future financial risks of this product.

Executive Summary

Customers approaching the long-term care insurance (LTCI) market today must be concerned. There are very few options available to them on a retail basis or in the worksite. They are nervous about purchasing LTCI, perhaps having heard from their financial advisors about years of rate increases on existing policies. And the policies left for customers to buy are already priced higher than ever before.

But sellers today should feel more encouraged than ever in meeting the needs of potential LTCI customers. The income and liquid assets of the average LTCI buyer have only increased in the last 15 years:[2] the need to protect those assets has never been higher. As the economy has rebounded from the

---

[1] Office of the Assistant Secretary For Planning And Evaluation (July 1, 2015). Long-Term Services And Supports For Older Americans: Risks And Financing Research Brief,

[2] AHIP (2012). Who Buys Long-Term Care Insurance in 2010-2011? A Twenty-Year Study of Buyers and Non-Buyers (in the Individual Market).

© 2016 Society of Actuaries

recession, and as the college-educated population grows and becomes more mobile, the demand for LTCI should only increase. This paper demonstrates that sellers should feel more confident than ever about the pricing of LTC products from carriers developing products today. In particular, rate increases that we have seen in the past are far less likely to impact the policies sold today.

Insurers are pricing today's LTCI products with remarkably more knowledge than they've ever had, and this experience base continues to grow. Insurers have backed up against the bounds of pessimism in many key pricing assumptions, and further deterioration is less likely than it was in pricing earlier products. Coupled with the high risk margins that carriers require to stay in the LTCI market, as well as with higher explicit margins on estimated benefits paid, the rate of return on new business sold today is expected to be higher than on earlier product generations.

The fluctuations we've seen in the pricing of the first generations of LTC products was due to the paucity of actual claims to analyze, a crippling interest rate environment, and the revelation that policyholders maintain their policies far longer than originally anticipated. Today, in the highest claim ages, we have almost six times the exposure base to analyze LTC claims than we did only seven years ago, and 70 times the exposure since 2000. Interest rates are approaching the lower bound and voluntary lapse rates are assumed to be close to 0%. This paper provides analysis to support the common sense conclusion that long-term care insurance pricing can be relied upon today more than ever in meeting the needs of buyer and seller.

A New Offering for Consumers

A Need for Protection

LTC consumers are like most insurance buyers: they'd like protection against risks and certainty for their future. The possibility of a long-term care event in someone's distant future may be enough to prompt them to purchase LTC insurance. The reason is simple: the financial burden of needing long-term care can be extreme. Not all long-term care events are created equal. The table in Figure 1 illustrates expected LTC claim costs and durations, depending on where care is needed, based on the 2015 SOA Long-Term Care Basic Tables.

Figure 1: Expected LTC Claim Costs and Durations

	Expected LOS (months)[3]	Monthly cost (2016 $)[4]
Home healthcare	29	$3,800
Assisted living facility	33	$3,600
Nursing home facility	25	$7,700

[3] These lengths of stay are illustrative in nature, based on historical industry LTC data found in the 2015 SOA Basic Tables. They are intended to provide only an example of the potential magnitude of LTC stays in various sites of care.
[4] Genworth (October 4, 2016). Cost of Care Survey, 2016. Retrieved October 13, 2016, from https://www.genworth.com/about-us/industry-expertise/cost-of-care.html.

© 2016 Society of Actuaries

Given this high cost, LTC insurance serves primarily to protect the customer's assets. The America's Health Insurance Plans (AHIP) survey of 2012[5] bears this out: for 20 years, "asset protection" has ranked as the most important reason driving the purchase of LTC insurance. The same AHIP survey found that the buyers of LTC insurance have increasingly more assets to protect. The table in Figure 2 shows the financial characteristics of today's LTC buyer from 2000 to 2010.

Figure 2: Characteristics of LTC Buyers

	2000	2005	2010
Median income	$42,500	$62,500	$87,500
Income over $50,000	42%	71%	77%
Total liquid assets over $100,000	71%	76%	79%

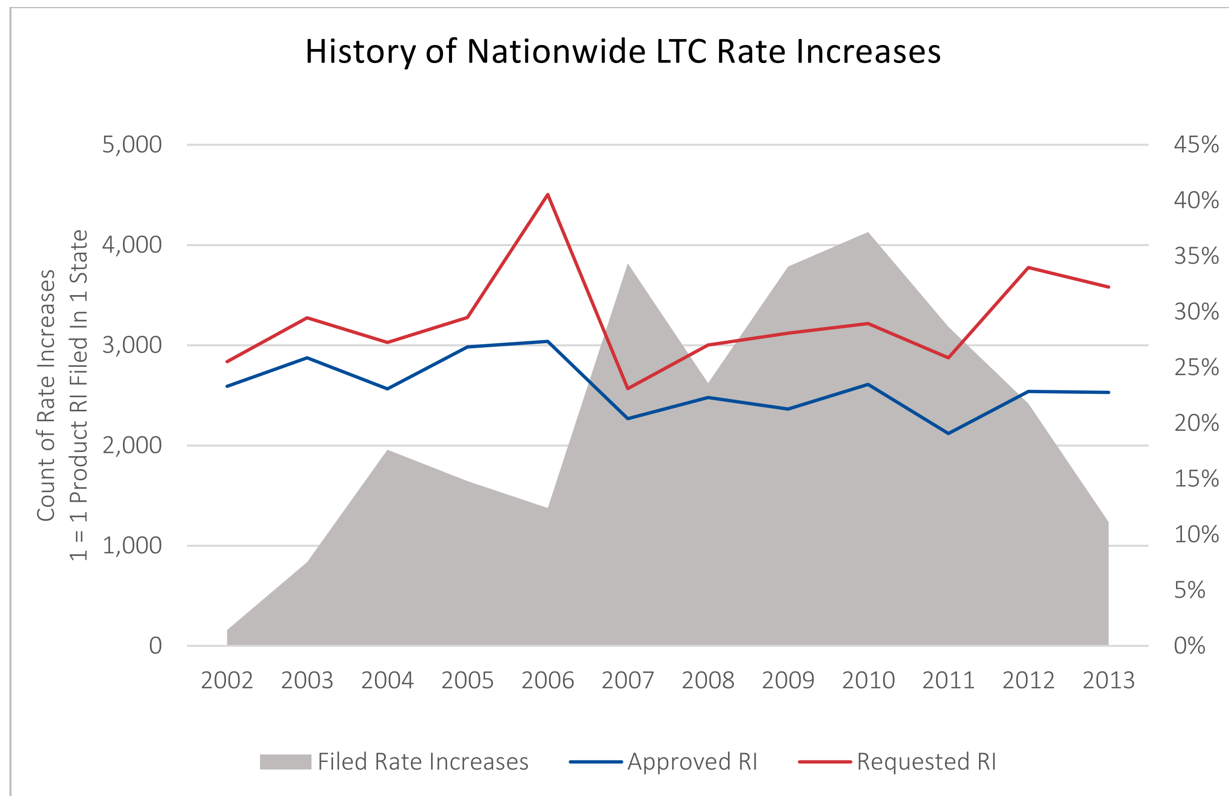
Early generations of LTC insurance products were marketed (though not guaranteed) as level premium products, where premium payments were expected to remain level for life, based on the age of the policyholder at issue. In return, the LTC carrier reimbursed or indemnified the policyholder for certain LTC costs. This level premium plan mirrored the financial stability that the consumer wanted: level premiums in return for mitigating the future costs of a long-term care event.

It's no surprise that customers and regulators alike were upset at the waves of LTCI policy rate increases that swept across the nation over the past 15 years, no matter how justified they were from an actuarial perspective. The reason that customers bought LTC insurance to begin with was to help stabilize their families' future financial outlook. Insurers were raising premium rates by 25% to 100% in a single year, with the added uncertainty of future rate increases. This did not give customers much comfort. Figure 3 illustrates average LTC rate increases requested and granted nationwide, as well as the count of rate increases filed, over time.

[5] Cost of Care Survey, ibid.

© 2016 Society of Actuaries

Figure 3: History of Nationwide LTC Rate Increases



Source: California Department of Insurance (DOI) listing of company historical LTC rate increases, for companies who filed for a rate increase in California, as of September 2014.[6]

We have reason to believe that many of the causes of this premium rate instability have been addressed in today's LTC pricing. In all likelihood, insurance carriers will continue to raise premium rates on earlier generations of LTC products. In order to make an informed purchase today, LTC buyers must be equipped with the context of those rate increases, namely that they are based on an earlier understanding of LTC risks. This prior understanding has been improved upon drastically, with the recent 15 years of emerging data.

Tomorrow's LTC Insurance Consumer

While insurance carriers wrestled with the pricing of traditional stand-alone LTC policies, new forms of LTC insurance coverage emerged to meet the needs of some consumers. Combination life and health insurance products, referred to as "combo," "hybrid," or "living benefit" products, have emerged as an avenue for consumers to mitigate LTC risks in their future. Some of these products offer less asset protection than traditional LTC insurance, for instance by only accelerating a portion of the death benefit

[6] California DOI website.

© 2016 Society of Actuaries

of a whole life or universal life policy. But they do so at a cost that is reasonable to the consumer and that fits a market need.

Tomorrow's LTC insurance buyer will have the benefit of selecting from a spectrum of LTC products—from traditional stand-alone LTC to living benefit riders to accelerated death benefit (ADB) riders—each meeting a particular need. Regardless of ongoing rate increases on older LTC products, this paper demonstrates that tomorrow's LTC insurance buyers may be more confident in how insurance carriers have priced these products.

Company Perspective

Introduction

Long-term care insurance has evolved substantially since its infancy in the 1970s and 1980s. The surge of premium rate increases in the 2000s put significant strain on policyholders, sellers, and on the product managers of carriers. This adolescent period for LTC insurance was difficult for all parties, and the pain continues for many older blocks today.

From the perspective of an insurer selling new long-term care business, or considering entering today's market, new business pricing has reached a more mature stage. LTC products issued today face less risk than earlier generations of LTC insurance on a number of fronts. This paper quantifies certain aspects of those risks and demonstrates the improved rate stability we can expect from new product pricing today.

New Policy Pricing: Today's Environment

Carriers that are considering entering today's LTC market, or that have discontinued selling, should welcome the current pricing environment. To be clear about one point, this paper does not claim that today's LTC products will not need future rate increase. Rather, based on an analysis of pricing assumptions and the emergence of historical experience, we conclude that LTC policies priced today are significantly less likely to need future premium rate increases than any earlier product generation.

We explain our methodology in a subsequent section and include technical details in the Technical Appendix to this paper. It is a simplistic view to look back on how experience emerged and conclude that original pricing assumptions were inappropriate. The analysis in this paper approaches LTC product pricing over many generations from a different perspective. We calculate prospectively, i.e., from the view of someone developing LTC pricing in an earlier year, how likely premium rate increases were given the information available at the time to develop premium rates.

Companies pricing products during the years addressed in this study have increasingly sought greater rates of return on their LTC sales—e.g., internal rate of return (IRR) on a statutory reporting basis—as market participation has dropped and the perceived risk of issuing new LTC policies has increased. As a result, the pricing margins and resulting IRRs today are higher than ever before. In 2000, LTC was viewed as a high-growth and relatively safe product, and thus a 10% IRR was sufficient to address these risks. By

© 2016 Society of Actuaries

2014, pricing IRRs of 20% to 25% are more common, which is due to stricter underwriting standards and higher margins for adverse claims. The table in Figure 4 shows the industry average pricing margins and IRRs in the three years covered by this study.

Figure 4: Industry Average Pricing Margin, IRR

Pricing Year	Pricing Margin % of Premium	IRR
2000	10%	10%
2007	11%	15%
2014	13%	25%

Based on our analysis, we conclude that products priced today, in our current economic environment with a more mature experience base, are less likely than earlier products to experience future rate instability.

Because of this, premium stability on today's LTC products is at its highest. The benefits of this understanding to the LTC industry are widespread.

Implications to Company Risks

Pricing Risks: The next section of this paper discusses actuarial pricing risk in LTC policies. There has been a substantial evolution in industry thinking on key assumptions such as voluntary lapse rates, morbidity, and mortality. We document this evolution using data from carriers who have priced LTC products for over 15 years. We also discuss the interest rate environment and expense assumptions.

Operational Risk: For a company with greater rate stability, fewer additional resources are needed for premium rate in-force management. Companies managing in-force rate increases use more compliance and administrative staff and legal resources. Rate increases are rarely implemented in a uniform manner across all policies, given the statutory nature of regulations and preferences of regulators. The uncertainty of future administrative burdens accompanying rate increases should likewise reduce, particularly for companies that issue primarily new products.

Regulatory Risk: With a lower burden to seek new rate increases, carriers are better able to fortify their existing regulatory relationships on other fronts, for instance on other products. It is important to keep in mind that with a greater expectation of rate stability, regulators may be less sympathetic to future changes in LTC pricing.

Legal Risk: LTC rate increases have left some companies prone to litigation from dissatisfied policyholders. Future, higher rate stability should reduce legal risk, all else equal.

Reputational Risk: The consumer's perception of impending LTC rate increases is one of the largest hurdles to overcome for new carriers in the LTC market. For many older product generations, this perception is reality. New products priced today will likely have fewer rate increases than earlier generations, if priced appropriately. It is the role of marketing departments and other players in the LTC insurance industry to tout the stability of products priced today. This extends beyond traditional stand-

© 2016 Society of Actuaries

alone, comprehensive LTC policies into living benefit riders and other combination life plus health products.

Current Pricing Perspective

Pricing an LTC product in today's environment, on many fronts, is less risky than it has been in prior years. To demonstrate this, we look at industry trends from public sources, as well as data collected from insurers. We review the primary pricing assumptions: morbidity, mortality, voluntary lapse, investment income, and expenses. We analyze the trends in these assumptions between three distinct pricing period years: 2000, 2007, and 2014. We selected these points in time as they represent distinct periods in the LTC product historical pricing:

> 2000: A baseline year, prior to the full-scale implementation of the National Association of Insurance Commissioners (NAIC) Long-Term Care Model Regulation of 2000 (aka the rate stability regulation).
>
> 2007: A period of accelerating sales in the LTC industry, prior to the financial crisis of later in the decade.
>
> 2014: The most recent year available at the time the study was begun.

Morbidity

We reviewed industry ultimate morbidity assumptions at each time period. Beginning in 2000, many companies used the 1985 National Nursing Home Survey (NNHS) with an underwriting selection applied. More comprehensive policies covered home healthcare and sometimes priced this benefit as a rider to facility coverage. Companies with larger in-force blocks may have relied to some degree on their own experience.

We compared the industry average ultimate morbidity assumption in 2000, for attained ages (AAs) 80, 90, and 100, to the assumptions used in 2007 and 2014. The table in Figure 5 shows this comparison.

Figure 5: Ultimate Morbidity vs. 2000 Pricing Assumption, by Attained Age

Pricing Year	AA 80	AA 90	AA100
2000	--	--	--
2007	+10%	+15%	+0%
2014	+15%	+45%	+25%

Because of the exponential nature of the LTC insurance claim cost curve, claim credibility has increased dramatically since 2000. In particular, at older attained ages, we find that the amount of historical claim experience in 2014 is 70 times greater than in 2000. This implies that the credibility of LTC claim experience in the older attained ages is more than eight times greater in 2014 than in 2000.

The select period following initial underwriting has also changed since the 2000 pricing. Morbidity selection factors in our three pricing periods followed the pattern seen in the table in Figure 6.

© 2016 Society of Actuaries

Figure 6: Industry Average Morbidity Selection

Pricing Year	Initial Selection Factor (grading to 100%)	Select Period
2000	50%	5 years
2007	50%	5 years
2014	25%	7 years

This improvement in select morbidity and the lengthening of the select period are likely due to carriers' increased rigor during underwriting. As underwriting continues to benefit from improvements in technology we may expect to see further lengthening of the select period.

In aggregate, estimates of ultimate morbidity costs have increased since 2000. Morbidity assumptions developed today are more credible and thus less likely to experience extreme deviations. This improved credibility is a major driver of our conclusion that there is a lower likelihood that products priced in each succeeding generation of LTC products will need a rate increase.

Mortality

Mortality has continued to improve through the course of the study period. In 2000, the average industry mortality assumption relied on the 1994 Group Annuitant Mortality (GAM) table, coinciding with the table's prescribed use for valuing LTC policies in the Health Valuation Manual.[7] Pricing mortality for LTC policies improved during the study years, as shown in the table in Figure 7.

Figure 7: Industry Average Mortality Assumption

Pricing Year	Ultimate Mortality	Selection
2000	1994 GAM	Included
2007	10% lower vs. 2000 assumptions	Greater early duration selection
2014	20% lower vs. 2007 assumptions	Greater early duration selection

Long-term care insurance pools risks in order to finance claims in later durations with premiums paid in earlier policy years. A certain expectation of lapses and mortality supports the premium rates developed. In general, because since earlier LTC products were priced more policyholders have retained their policies than insurance carriers anticipated. Policyholders were dying at lower rates than expected or lapsing their policies less frequently than assumed. From the consumer's perspective, a lower lapse rate demonstrates an understanding of the value of the LTCI policy. In order to maintain the financial health of LTCI blocks, though, insurers have raised premium rates to account for the greater volume of insureds retaining their policies and going on claim.

From this perspective, improved mortality (to a greater degree than what pricing actuaries expected) places a financial stress on LTC blocks. While the theoretical limit to mortality improvement is still far off, life insurance carriers often project 10 to 20 years of mortality improvement as a best estimate in cash flow testing analysis. Forces that drive the underlying causes of population mortality improvement may

[7] Life and Health Valuation Law Manual. Health Insurance Reserves Model Regulation, Appendix A.

© 2016 Society of Actuaries

be tied to those that will drive improvement to morbidity as well. For this reason, the two assumptions are often developed in parallel.

Morbidity and Mortality Improvement

While mortality has improved consistently, morbidity is likely also improving for each new generation of LTC policyholders. One study estimates that, for an LTCI population, mortality and morbidity each improve at between 1% and 2% per year.[8] The positive effect of morbidity improvement in this study offsets the unfavorable financial impact of mortality improvement. The result is an overall favorable impact of the combined morbidity and mortality improvement.

Many companies project similar morbidity and mortality assumptions, namely projecting no improvement at all, or improvement in both assumptions for the same projection period (e.g., 10 years).

Voluntary lapse

As indicated in the mortality discussion above, increased policyholder persistency—above that anticipated during policy pricing—will place a financial strain on LTC blocks. Earlier generations of LTC policies were priced with voluntary lapse rates similar to those seen on annuity blocks, reasoning that long-term care benefits resembled an annuity-like benefit. The table in Figure 8 shows industry average voluntary lapse rate assumptions in the three pricing years.

Figure 8: Industry Average Voluntary Lapse Rates

Pricing Year	First Year Lapse Rate	Ultimate Lapse Rate
2000	8.5%	2.8%
2007	4.5%	1.1%
2014	5.0%	0.7%

Voluntary lapse rates that emerged on in-force blocks in the past 15 years were significantly lower than anticipated. This was the impetus both for much of the premium rate increases requested in the past 15 years, as well as the decrease in lapses assumed in pricing seen in Figure 8.

Because ultimate lapse rates are already close to the theoretical floor of 0%, it is far less likely that rate increases on products priced today will be required, which is due to the unfavorable emergence of the voluntary lapse assumption.

Investment Income

Long-term care policies are typically guaranteed renewable, and projections of future claims and premiums extend for 50 years or more. Premiums earned in the initial policy years are invested to contribute to the assets backing the growing active life reserve (ALR). The investment interest

[8] Stallard, P.J. Eric and Anatoliy I. Yashin. 2016. LTC Morbidity Improvement Study: Estimates for the Non-Insured U.S. Elderly Population Based on the National Long-term Care Survey 1984–2004.

© 2016 Society of Actuaries

assumption, therefore, is critical to the financial health of the LTC policy. The table in Figure 9 shows how investment income assumptions have decreased over the past 15 years.

Figure 9: Industry Average Investment Income Assumptions, by Pricing Year

Pricing Year	Average Investment Income Assumption, *All Years*
2000	6.4%
2007	5.9%
2014	4.6%

This reduction in the earned rates may represent more risk to existing, in-force blocks. At the same time, lower investment income earnings imply that premiums for LTC products sold today will need to be higher to fund claim payments in the future. That said, the current low-interest-rate environment presents upside to currently sold policies.

Expenses

Commissions paid to LTC producers in 2000 were more similar to commissions found on other individual health products. First year commissions in 2000 were lower than typical life insurance commissions, with higher renewal commissions to protect the company from replacements, to minimize surplus strain, and to the encourage persistency. The table in Figure 10 shows industry average commissions in our three study years. Note that the final column of Figure 10 (% of PV Premium), and Figure 11 below, show the average of results reported from the carriers in the study, and do not represent the result of an explicit calculation of present value of premiums.

Figure 10: Industry Average Commissions by Policy Year

Pricing Year	Year 1	Years 2 to 9	Years 10+	% of PV Premium
2000	70%	10%	7%	12.6%
2007	100%	10%	5%	13.4%
2014	105%	9%	5%	12.3%

Following pricing in 2000, lapse rates emerged far lower than anticipated. As a result, companies reduced renewal commissions and increased first year commissions, more in line with life insurance products.

LTC policies overall have a more complex underwriting process than life insurance policies. Moreover, processing LTC claims is more expensive than processing death benefits. Initial administrative expenses are related to the policy acquisition, and later duration expenses are mostly claim processing. As a portion of the present value of premium, administrative expenses have declined in the study years of this paper as seen in the table in Figure 11.

© 2016 Society of Actuaries

Figure 11: Industry Average Administrative Expenses

Pricing Year	Admin. Expense % of PV Premium
2000	20%
2007	18%
2014	16%

Market Pricing Landscape

The pricing landscape has changed substantially in the course of the 15 years spanned by this study. Margins for adverse claim experience—as permitted by regulators—have increased under each new NAIC LTC Model Regulation. The table in Figure 12 shows the industry average pricing margin loads in our three study years.

Figure 12: Average Industry Pricing Margin Loads

Pricing Year	Pricing Margin Load
2000	Under minimum loss ratios, explicit margins to claims were zero.
2007	Under rate stabilization, 5% to 10% margins were effectively mandated.
2014	Margins have increased to 5% to 17%. Under adoption of the 2014 NAIC Model Regulation, the minimum is 10%.

Today there are fewer companies competing in the stand-alone LTC insurance marketplace, and thus concern for market share is lower than ever. Premiums for LTC products priced in 2000 were lower than those priced today, which is due to assumed lower persistency and higher investment earnings. Greater marketplace competition in 2000 fueled much lower premiums, and a wider spread of premiums among companies. Subsequently, as claim margins increased, persistency rose, and as investment earnings fell, premiums increased. The spread of premiums among carriers, with fewer carriers in the market, decreased. The table in Figure 13 shows the level of premiums and the spread of premiums in our three pricing study years:

Figure 13: Industry Average Premiums and Spreads

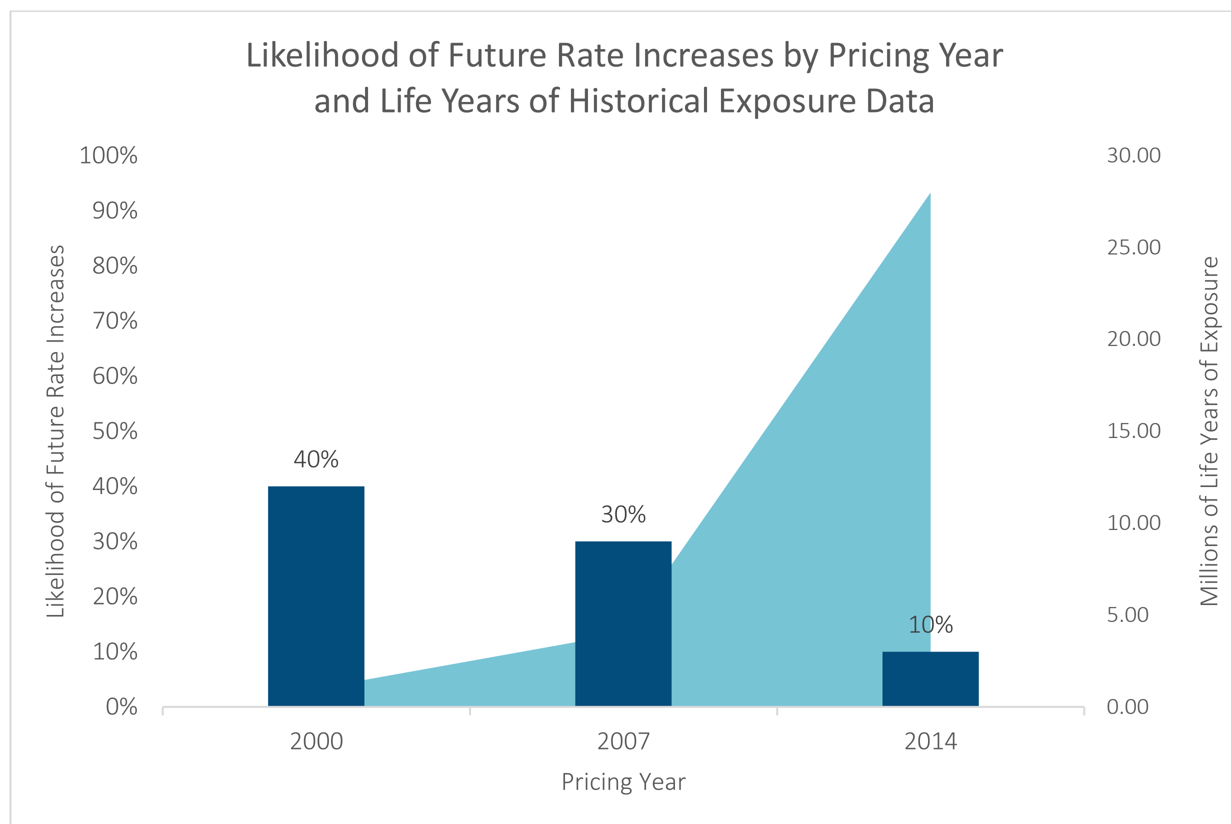
Pricing Year	Highest / Lowest Premiums (spread)	Vs. 2000 Baseline Premiums
2000	200%	100%
2007	160%	125%
2014	145%	215%

Companies in the stand-alone LTC market today face an uphill marketing battle, as customers see in-force blocks of LTC policies pummeled by rate increases. The critical finding of this Society of Actuaries (SOA) LTC Pricing Project is a demonstration that LTC premium stability is greater today than ever before. Our research evaluates the likelihood that premium rates would need to rise for products priced in each of the three study years 2000, 2007, and 2014. The analysis uses best-estimate assumptions, which were in place at the time of pricing, and determines—based on stochastic model scenarios—how likely future premium rate increases would be, as determined by the actuary *in that pricing year.* Because of the growing volume of empirical data, and the resulting improvement in data credibility, the potential for

© 2016 Society of Actuaries

future rate increases on new LTC products has fallen in each of our study years, and today is the lowest it has ever been. Figure 14 illustrates these key results.

Figure 14: Likelihood of Future Rate Increase by Pricing Year and Life Years of Historical Exposure Data



The likelihood of needing future rate increases, by pricing year, and the life-years of historical exposure data available at the time of pricing.

In Figure 14, the likelihood of a rate increase is based upon the quantity of historical data used for morbidity assumptions, by the risk of lower-than-expected lapses, and by the size of the company's risk margins. The distribution of actual future morbidity was assumed to be normally distributed around the *a priori* best estimate. The probability of a rate increase is highly correlated across companies. For example, a 40% chance of a rate increase affects all companies in the industry the same way that a 40% chance of rain affects all houses in a neighborhood. Future results may be significantly different from the ranges in the model because of secular changes in morbidity, mortality, and lapses. For example, an effective treatment of Alzheimer's would cause future morbidity to improve beyond the range implied by the normal distribution in this model. Please see the Technical Appendix for more details.

There should be optimism around the implications of these results. To start with, improved premium stability implies a lower risk of policyholder disruption. Moreover, if rate increase requests are less frequent and/or lower, there is less regulatory risk for companies seeking any future rate increases. Finally, the reduced likelihood of premium rate increases implies more stable, and potentially greater, profitability for companies issuing policies today. Technical details on the modeling of these results can be found in the Technical Appendix.

© 2016 Society of Actuaries

Regulatory Environment
In order to address premium rate instability, the first "rate stabilization" NAIC Long-Term Care Insurance Model Regulation (the Regulation) was passed in 2000. The Regulation was adopted by states over the succeeding five to 10 years. The Regulation has since been revised twice, in 2009 and in 2014. In hindsight, some may smirk at the almost ironic name applied to that Regulation, as it was followed by over a decade of large LTC rate increases. In practice, the Regulation forced insurers to add a premium margin for adverse deviation, which is intended to keep rates stable.

In 2014, the Regulation was revised to include an explicit minimum margin of 10% or more in premium rates, intended to further temper the need for future rate increases. The Interstate Insurance Product Regulation Commission (the IIPRC, or the Compact) is a regulatory body formed by the NAIC that allows companies to file products with a single entity, and have their filings accepted in up to 44 different states. As of this paper's publication, the Compact is revising its regulatory Standard on individual LTC. This revision may also include the 10% required premium margin, as the Compact Standards generally dovetail with the latest NAIC Model Regulations on key issues.

Earning Back the Trust of Long-Term Care Producers

Agents selling long-term care have understandably felt an incredible amount of disillusionment and betrayal from the large-scale implementation of LTC rate increases over the past 15 years. These agents are the individuals who sat across the table from applicants, looked them in the eye, and made promises to them on behalf of the carriers. Agents who had entered this field with the best intentions were increasingly finding it hard to wake up in the morning and find a reason to come to work.

When the first real wave of LTC premium rate increases began, many agents faced them understanding that they needed to take the medicine: they had a one-and-done attitude. Rate increases were a huge distraction from the rest of their business, and most just wanted to get back to work. But the rate increases kept coming. What had been an expectation of a one-time hit went to being a routine conversation with their clients.

As a result, most agents have walked away, not wanting to risk their reputations. Carriers have lost the trust of producers, who don't want to be in damage control mode or risk their relationships with clients and/or referrals sources.

At the same time, the actions carriers have taken to rein in risk over the past 10 years have led to outcomes that also turn away agents:

- Products that dispense with desired benefits and are perceived as more difficult to sell
- Products so innovative that agents lack the patience to learn them
- Underwriting perceived as "tighter," which prompts agents to flee or to try less burdensome products
- Sex-distinct pricing, which hit the target market the hardest

© 2016 Society of Actuaries

It is far past time for insurance carriers to win back the trust of producers. While it is cliché to iterate "this time is different," the goal of this SOA LTC Pricing Project is to put firm numbers behind this message. While this time may not be different, LTC pricing today has a demonstrably lower risk of facing future rate increases, as this analysis concludes.

Agents know they ought to recommend LTCI, and they need reassurance that it is safe to do so. For the first time ever, the media, government institutions, and public policy initiatives are operating in tandem with private LTCI. All agree that this is a necessary product.

© 2016 Society of Actuaries

Technical Appendix

Introduction

The SOA's 2015 LTC Pricing Project addressed the research question, "what is the probability of a rate increase on new issues of LTCI?" Theoretically, this could best be done by creating a universe of all possible scenarios of future morbidity, mortality, lapse rates, and interest rates. We could then assign a probability to each scenario, determine which scenarios trigger a rate increase and which do not, and then sum the probabilities of the scenarios with rate increases. While such an approach would produce a technically correct result, we wanted our analysis to be less subjective.

What we objectively know is that, when comparing the policies being issued now with those issued in the past, today's policies have the benefit of more data supporting the morbidity assumptions, near rock-bottom lapse assumptions, and higher risk margins. Our objective in this project was to create a model that calculates the probability of a rate increase based upon these facts. We created a stochastic model that takes into accounts these elements and populated it with industry data. The model required some additional assumptions, which we set based on our professional judgment. In order to provide context around the results, the model was run using industry data for three historical pricing points in time. Other than industry data, all other assumptions remained the same across the three historical pricing points. The results are in the table in Figure 15.

Figure 15 – Probabilities and Average Size of Rate Increases, by Year

Pricing Point Year	Probability of a Rate Increase	Average Size of Rate Increase
2000	40%	34%
2007	30%	18%
2014	10%	10%

Three points should be kept in mind when interpreting these results:

1. There is no 20/20 hindsight with the historical results. If we would have taken this model with the same additional assumptions back to these historical points in time, these are the probabilities of rate increases we would have estimated at those times.
2. There is a high correlation among companies with these numbers. So a 40% chance of a rate increase doesn't imply that 40% of the companies will have a rate increase. Rather, it means that, with the industry averages we are using, there is a 40% chance that the industry as a whole will be hit with widespread rate increases.
3. These probabilities are simply estimates based on the specific assumptions described here. Actual future results could be outside of these ranges if secular trends in the assumptions cause the future to be fundamentally different from the past.

© 2016 Society of Actuaries

Data

Six companies that continuously sold LTCI for at least 15 years volunteered to participate in this study. A survey was sent to each company requesting pricing data for a representative group of pricing cells. The data requested included:

- Best-estimate claim costs
- Best-estimate lapse rates
- Best-estimate mortality rate
- Best-estimate interest rate
- Aggregate risk margin

Additionally, the companies estimated the amount of data their assumptions were based on. They provided both the total policy-years of exposure across all policies, and the number of policy-years of exposure for the exposure years when most claims happen: policy duration 10 and above and attained age 80 and above. Though best-estimate interest rates were provided, the final study did not incorporate interest rates into the determination of the likelihood of future rate increases.

The participating companies sent their completed surveys directly to the Society of Actuaries. The SOA averaged the results across the six companies into a single composite set of assumptions referred to as the "Illustrative Pricing Assumptions." These data were the basis of the rest of the work.

Summary of Key Illustrative Pricing Assumptions

Claim costs: On average, the 2007 claim costs were 17% higher than the 2000 claim costs, and the 2014 claim costs were about 54% higher than the 2000 claim costs.

Lapse rates: The ultimate lapse rates decreased as follows:

Pricing Point	Ultimate Lapse Rates
2000	2.8%
2007	1.2%
2014	0.7%

Pricing margins: The pricing risk margins increased as follows:

Pricing Point	Risk Margin
2000	5.1%
2007	7.1%
2014	11.3%

© 2016 Society of Actuaries

Sales Distribution

We assumed the following sales distribution:

Issue Age	
50	25%
60	50%
70	25%

Benefit Period	
3 Years	33.3%
5 Years	33.3%
Lifetime	33.3%

Inflation Protection	
None	50%
5% Compound	50%

Claim Cost Uncertainty

In order to estimate the probability of whether premium levels are sufficient to pay future claims without a rate increase, we need statistical distributions of what the future claim costs will actually be. These distributions are a function of how many policy-years of exposure are supporting each cell. Creating these distributions requires significant actuarial judgment, especially in the context of this study, where only summaries of the actual data were available. The most important thing to understand is that the same judgments were consistently made across the three historical pricing points so that the respective probabilities of a rate increase are comparable.

For each of the three historical pricing points, the reported exposure years of data were distributed across an array of policy-years in a smooth pattern that fit the data constraints (i.e., the total number of policy-years and the total number of policy-years above attained age 80). Once the exposure was distributed this way, we estimated how many policy-years of experience were supporting each claim cost estimate. With this, we estimated the variance of each claim cost.

We then assumed that there was a 100% correlation across policy durations. In other words, if the actual claim cost for the first policy year of a pricing cell was in the 95th percentile of its distribution, all subsequent claim costs would also be in the 95th percentile of their respective distributions. We then calculated to coefficient of variation for each historical pricing point.

The coefficients of variation are:

Pricing Point	Coefficient of Variation
2000	31%
2007	16%
2014	9%

© 2016 Society of Actuaries

Lapse Uncertainty

We assumed the actual future lapse rates follow a beta distribution, with parameters equal to the assumed lapse rate and the following sample strengths:[9]

Pricing Point	Sample Strength
2000	1,900
2007	9,000
2014	11,000

The sample strengths were set largely by actuarial judgment. The rates in 2000 are relatively low to reflect very little experience with lapses at high policy duration. The 2014 rate is only slightly more than the 2007 rate to reflect a tapering off in historical credibility and intrinsic uncertainty about how precisely we know what future lapse rates will be.

Stochastic Methodology

An actuarial forecasting model was created using the Illustrative Pricing Assumptions. The model does not include an expense assumption or profit margin. The premiums were set equal to the best-estimate net premiums plus the risk margin. Because disappointing investment yields are not typically used to justify rate increases, all interest rates in the model are set to 0%.

The model has two stochastic elements: lapses and claim costs. To model the uncertainty of claim costs, at the beginning of each simulation, a random number, referred to as a “fuzz factor,” is drawn from a normal distribution with a mean of 1.00 and a standard deviation equal to the claim cost uncertainty coefficient of variance described above. This fuzz factor is then multiplied by every claim cost for every policy for the entire simulation. This product represents the real claim costs for each simulation.

To model the uncertainty of lapses, a random number is drawn from the beta distribution with the lapse rate and sample strength (SS) described above. The same quantile is used for every lapse in the simulation, so that if the lapse for the first year is in the 35th quantile, the lapses for all policies and durations of that simulation are in the 35th quantile. The claim costs and lapses are assumed to be statistically independent.

In each simulation, premiums and claims are projected and the present value of profits is calculated. If the present value of the net premium plus risk margin is sufficient to cover the present value of claims, no rate increase is deemed to be needed. If the net premium plus margin is less than the present value of claims, then a rate increase is required for that simulation. For the simulations where a rate increase is required, the average rate increase as a percentage of premium is calculated.

[9] Sample strength (SS) $= \alpha + \beta$. See Loomis et al., Understanding the Volatility of Experience and Pricing Assumptions in Long-Term Care Insurance, page 64, Society of Actuaries (2014).

© 2016 Society of Actuaries

Observations

One of the fundamental assumptions of this model is that the original pricing assumptions are in fact a best estimate of future claims. Thus, by design, if there is no risk margin added to the premium, then the probability of a rate increase would be 50%. This is true regardless of how credible the data is. For example, if the data is very credible and there is no margin, then the average size of the rate increase may be small, but 50% of the scenarios would still require a rate increase. With this in mind, 40% of the scenarios requiring a rate increase in the 2000 model is in fact a very high number and indicates that the risk margin was very low for the uncertainty in assumptions that existed at that point. The 10% probability of a rate increase in 2014 suggests that today's products really should be able to withstand marginal adverse experience without requiring a rate increase.

Another important point is the implication of using the normal distribution to represent uncertainty about future morbidity rates. This assumption implies that future morbidity and mortality will be driven by the same basic forces of morbidity and mortality that created past experience. While this may be true when using recent experience to project the near future, this is not realistic over longer time horizons. Secular trends in morbidity and mortality will cause the future to be fundamentally different from the past—thus the normal distribution is inappropriate for forecasting what is really going to happen over the long term. Nevertheless, using the normal distribution is an objective and quantitative way to illustrate the effect of more data and higher margins on the probability of a rate increase with everything else being equal.

SOCIETY OF ACTUARIES
475 N. Martingale Road, Suite 600
Schaumburg, Illinois 60173
www.SOA.org

© 2016 Society of Actuaries