



Developing Alternative Options During LTC Premium Rate Increases: Company Considerations and Regulatory Perspective for Offering Reduced Benefit Options

By Robert Eaton and Rhonda Ahrens



Many companies offering long-term care insurance (LTC, LTCI) unfortunately face large future claims losses. To manage the financial health of their in-force blocks, these companies often seek premium rate increases. Rate increases can be difficult for policyholders to afford, especially as companies seek multiple increases over many years.

In order to provide insureds with more options than a full lapse after being informed of premium increases (i.e., dropping coverage because it is unaffordable), LTCI companies often present reduced benefit options (RBOs) within policyholder notice letters. Recently, companies have offered RBOs that are not already available to the insured within the original contract but rather only available at the time of the rate change. The RBOs that are presented may help an insured manage benefits such that the ending premium after the rate schedule increase is similar to the premium paid prior to the increase.

The RBOs that LTCI companies traditionally offer take the form of a reducing benefits to other existing, lower benefits. The following examples illustrate options that companies might offer:

- Reduction in daily benefit amount (e.g., from \$200 to \$160)
- Reduction in benefit period (e.g., from lifetime to 10-year)
- Increase in elimination period (e.g., from 30-days to 90-days)
- Reduction in annual benefit increases (e.g., from a 5 percent compound inflation to 3 percent)

- Contingent nonforfeiture benefits, allowing the policyholder to stop paying premiums altogether in return for a benefit pool equal to the sum of the premiums paid

As we see in the in these examples not all RBOs are developed with equivalent values. This article explores in detail two methods of developing RBOs: the future loss ratio (LR) neutral approach and the cash flow neutral approach. We discuss the considerations that LTCI companies have when deciding to offer these options, and we examine the implications from a regulator’s point of view.

There are industry discussions about the concept of “actuarial equivalence” as a lens through which to view premium rate increases (for instance, Bergerson and Hebig, 2017¹, discusses actuarial equivalence among different premium rate increase strategies). We believe this is an important discussion, though the industry has not reached consensus on the meaning of “actuarial equivalence.” To avoid potential confusion, we have used other terms throughout this article.

FUTURE LOSS RATIO NEUTRAL APPROACH

LTCI companies seek premium rate increases, and file new premium rate cards representing the higher rates. To offer a future loss ratio neutral RBO, the company uses the new, higher rates but applied to a lower benefit. The lower benefit may be selected in such a way to offset the impact of the premium rate increase. The final premium rates are presented to the policyholder in a notification letter. This approach maintains the same expected future loss ratio under certain assumptions as we show in the following illustration.

The future loss ratio neutral approach bases the value of the RBOs on existing premium rates and is therefore relatively easy to administer. This approach may also be the easiest for policyholders to understand.

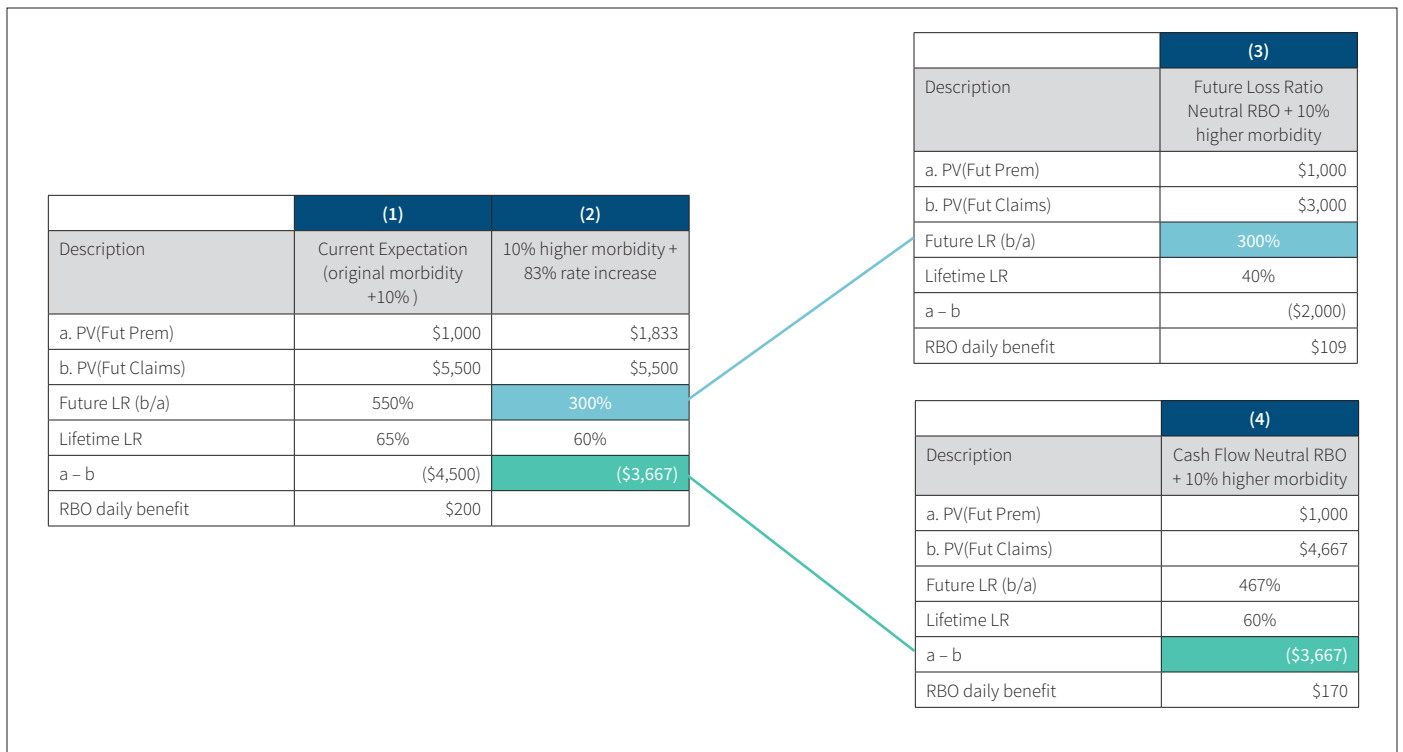
For example, a company may seek to raise premium rates on all policies by 25 percent. A policyholder with a \$200 daily benefit and a 10-year benefit period, who is facing a 25 percent rate increase, may choose the following RBO: elect to reduce the daily benefit to \$160 [= \$200 / (1+25 percent)] and maintain the same annual premium amount as prior to the rate increase. The premium rate per dollar of daily benefit still increases by 25 percent.

These RBOs can produce similar future loss ratios, as the increase in premiums is exactly offset by a proportional reduction in future claims.

1. Future LR, pre-rate increase: = PVFC / PVFP
2. Future LR, after 25 percent rate increase: = PVFC / [PVFP x (1+25 percent)]
3. Future LR reducing future daily benefit by 20 percent = [PVFC x (1 - 20 percent)] / PVFP = #2

The impact of RBOs on a policyholder’s annual premium is determined by using the increased premium rates on file with the state insurance department, then selecting the lower benefit option. A company offering the daily benefit RBO described above can—under certain assumptions—maintain the future loss ratio. Other RBOs offered by the company will not necessarily maintain the future loss ratio.

Figure 1
RBO Example (60% original pricing loss ratio)



THE CASH FLOW NEUTRAL APPROACH

A company may design an RBO that maintains the net dollar impact of increased premiums with that of lower claims, on a present value basis. We refer to this approach as the cash flow neutral approach, because the concept is intended to recognize the impact of the RBO on the present value of future claims (PVFC) and the present value of future net premiums (PFVP). We are not suggesting that the cash flow neutral approach equates all future cash flows in any way, but rather aims to equate the impact of the RBO on the present value of future cash flows. We also recognize that some premium components (e.g., premium taxes) will make exact cash flow neutrality difficult, but the concept is useful nevertheless.

We continue the previous example:

The company originally priced the LTCI policy anticipating a 60 percent loss ratio. Many years following the initial pricing, the company adjusts its expectation of future morbidity, raising it by 10 percent. At that point, the company expects from a policyholder a present value of future claims of \$5,500 and a present value of future premiums of \$1,000 (Column 1 of Figure 1). To maintain the health of the business, the company seeks an 83 percent rate increase on future premiums to achieve the original 60 percent lifetime loss ratio (Column 2). Figure 1 compares the RBO equating the future loss ratio (Column 3) with a hypothetical RBO equating future dollars, i.e., the cash flow neutral approach (Column 4).

In this example, while the future loss ratio neutral RBO maintains the future loss ratio of 300 percent (Columns 2 and 3), the cash flow neutral daily benefit RBO maintains the net present value of cash flows of \$3,667 from after the proposed rate increase (Columns 2 and 4). Notably, in the cash flow neutral RBO, the new daily benefit is \$170 ($=\$200 \times \$4,667 / \$5,500$) compared with the future loss ratio neutral approach where the new daily benefit is \$109 ($=\$200 \times \$3,000 / \$5,500$). The greater policyholder daily benefit under the cash flow neutral RBO (\$170 vs. \$109) stems from the fact that the cash flow neutral approach *recognizes the policyholder's pre-funding of future benefits*.

When policyholders elect RBOs they stand to lapse part of their existing benefit, and thus reduce their lifetime loss ratio expectations.² Under a cash flow neutral RBO, the policyholder recognizes the highest lifetime loss ratio compared with most other methods of RBO offered today. As a result, some carriers consider the cash flow neutral RBO the more policyholder-positive approach that still recognizes the financial health of the company in seeking a premium rate increase.

These RBOs may help secure needed rate increases from regulators and mitigate some of the reputational risks that ongoing rate increase actions pose.

Companies may create cash flow neutral RBOs using many of the parameters of a policyholder's LTCI plan. For instance, a company may need to raise premium rates on lifetime benefit period policyholders. As an option to mitigate this increase, the company could offer a cash flow neutral benefit period RBO. This RBO may reduce the benefit period to another that the company already offers, assuming the calculation indicates neutrality, or it may reduce the benefit period to a new option.

Though all may not have been fully cash flow neutral, some companies have filed and administered non-standard RBOs for LTCI blocks over the last 10 years. These RBOs have made an effort to consider the policyholder pre-funding in determining the ultimate post-rate increase reduced benefit level. While not an exhaustive list, the cash flow neutral RBOs have included reductions in future inflation protection, benefit periods, daily benefit level, and an option that requires the policyholder to pay an additional coinsurance during claim. Cash flow neutrality can also be a useful lens through which to view potential policyholder buy-out options, though the actuary should take special consideration when applying aggregate assumptions at the policy level.

COMPANY CONSIDERATIONS

Most LTCI policies were fully underwritten to mitigate policyholder anti-selection. Because LTCI sales peaked in the mid-2000s, the majority of policyholders in force are likely reaching an ultimate morbidity period where the favorable impact of underwriting selection has worn off. As a result, companies should be prudent when extending RBOs to individuals who are reaching peak claim ages. These individuals may be more aware of their own health and the likelihood that they will trigger a future LTCI claim, compared to when they purchased the policy. In particular, most carriers may view the event of a premium rate increase as the only viable time to offer cash flow neutral RBOs.

The company will need to notify the policyholder of a rate increase, and this communication is a natural time to offer any unique RBOs. Companies may not wish to offer cash flow neutral RBOs outside of the premium rate increase window due to many concerns. First, offering a cash flow neutral (as opposed to future loss ratio neutral) RBO may pose concerns of equity among other policyholders who voluntarily elected standard RBOs outside of the rate increase window. LTCI companies have always anticipated lapsation, both partial and full. In the regular course of business policyholders may request reductions in benefits. Allowing for cash flow neutral RBOs outside of the rate increase window will, in most cases, disrupt equity between otherwise similar policyholders.

Many companies develop the justification for premium rate increases making assumptions about shock lapses and anti-selection. A company introducing a cash flow neutral RBO (if they had not before) may adjust these assumptions based on their new expectation of policyholder behavior. This change in assumptions can impact the magnitude of the premium rate increase requested.

Companies will also need to consider the administrative implications of offering new benefit options. New product codes and premium rates will need to be loaded into administrative systems, and IT departments will need to conduct rigorous testing to ensure proper policy administration. Some companies have installed 'in force management' teams that routinely work on these tasks, but others may not have the infrastructure available to implement these changes. Part of the company's role is to monitor the permutations of potential benefit offerings that arise from developing new benefit levels during ongoing premium rate increases. The company should have in place a long-term operational strategy to handle these complexities.

In some instances, states have requested that companies implement larger premium rate increases as a series of smaller premium rate increases. In these cases, offering a new RBO at each step of the serial rate increase would produce exponentially more premium rates to administer. Most companies are not equipped to handle such complexity, and doing so could be very costly.



Newly offered benefits (say, a lower inflation option or a new benefit period) will require new endorsements to be filed in all states. A company offering cash flow neutral benefits should also develop a policyholder notification letter describing the RBO and why it is being offered at this time. These policyholder letters require filing with most states, and should be crafted with the assistance of the company's marketing team. The letter should disclose the value of each of the options offered and should not steer the insured to one offer over the other.

Company actuaries will need new benefit options and data indicators flagging the cash flow neutral RBOs. New assumptions may need to be loaded into actuarial models. Some changes to assumptions may be due to anti-selection (see next paragraph). In the instance of new, lower benefit options, actuaries may modify the benefit utilization (or salvage) assumption. Moreover, if ongoing rate increase offerings produce a wide array of benefit levels, the actuary must be sure that the assumptions for all policyholder attribute combinations hold together. Actuaries will also want to monitor experience closely, including the take-up rates of any RBOs and potentially review longitudinal studies of policyholders as they move from one benefit level to another.

Policyholders who retain their benefits in the face of premium rate increases may have an understanding that they are more likely to use their benefits than the average policyholder. As a result, actuaries may anticipate some anti-selection among policyholders who elect to take the full rate increase. This anti-selective behavior should be considered in setting the cash flow neutral RBOs and the initial premium rate increase. The actuary should also consider the policyholder response to the company presenting an entire suite of options at the time of a premium rate increase.

REGULATORY CONSIDERATIONS

Cash flow neutrality has not been a requirement of historical RBO practice and is not necessarily a requirement today. However, it is important for the regulator to consider whether cash flow neutrality might be required in certain situations or whether the additional offer is a benefit to consumer choice and therefore may not need to be cash flow neutral.

There has never been a requirement for a full lapse on- or off-rate increase to produce cash flow neutrality to the company or insured. LTCI policies traditionally do not have cash value and those with nonforfeiture or return of premium riders have not necessarily been designed to produce cash flow neutrality.

Instead, they produce optionality to the insured. Optionality is a benefit itself, and provides economic value to the consumer in its own particular utility function. The value from optionality of this type is not easily measured, so it is not directly comparable with cash flow neutral approaches. RBOs as partial lapses are generally available to insureds even when rate increases are not going into effect. These partial lapses are not cash flow neutral to the insured. Prior to special offer RBOs being introduced, a policyholder could elect to partially lapse during a premium rate increases to manage their resulting premium payment. The policyholder could do so by reducing their benefit, and in this case cash flow neutrality is not a consideration. In any case a disclosure to the policyholder could be required.

The regulatory requirement to offer contingent nonforfeiture (CNF) benefits does not produce cash flow neutrality. In general, there is a lot of room for improvement in the disclosure of CNF benefits, given the dramatic reduction in value to the policyholder. Improved CNF disclosure could prompt better disclosure in the future for standard (future loss ratio neutral) RBOs and cash flow neutral (or other) RBOs.

The level issue age premium structure of LTCI does not contractually allow credit for past premiums in excess of past costs of insurance. As a result, using a lifetime loss ratio standard to determine the reasonableness of offering RBOs to only certain segments of a block of business—without giving similar consideration to the remainder of the block—could implicate requirements in most state health insurance rating statutes that policy provisions are also fair and equitable.

Special RBOs, which may be the case with cash flow neutral RBOs, are often only available to certain rating cells with richer benefits. It is extremely important to contemplate the appropriateness of the resulting premium rate schedule as reasonable (and fair) across the block. We note especially that the future loss ratio neutral RBOs (or almost-neutral options, which may be the case in reductions to benefit periods or other policy features) are available at any time, not just during rate increases. As we demonstrate in the previous example, if an insured elects a particular RBO, and substantially reduces their lifetime loss ratio, the insured gives up value and the company benefits (possibly along with remaining insureds).

Finally we wish to emphasize that it is important for companies to appropriately disclose these options. RBOs and CNF options expire: they are one-time offers that cannot be revisited by the insured at a later date without another offer being made by the company. Companies should avoid steering and misrepresenting their RBO offers. In particular:

- Offers should not be presented as the predominant offer or the best choice available.
- Offers should not be presented as a way to “avoid” a rate increase. The premium rate schedule increase will happen

to the customer no matter what. The customer may be able to manage the resulting premium payment to the company, but the rate for the current benefit is going up regardless. There is a difference between managing premium dollars spent and avoiding a premium rate schedule increase.

- Expiring opportunities should also be explained along with enough notice for an insured to make an appropriate decision about electing the opportunity.

Companies should take the event of a rate increase to communicate and educate their consumers, though companies have not always taken the opportunity to do this. In these cases where extracontractual offers are being made, such as cash flow neutral RBOs, it is even more important to take the opportunity to re-educate policyholders.

CONCLUSION

Companies will continue to file for LTC premium rate increases as they are justified. Compared with other traditionally-offered RBOs, some companies find that cash flow neutral RBOs can be a policyholder-positive approach. These RBOs may help secure needed rate increases from regulators and mitigate some of the reputational risks that ongoing rate increase actions pose.

Creating and administering cash flow neutral RBOs for most companies will likely be administratively burdensome and costly. For those who do create cash flow neutral RBOs, the companies can point to these efforts—which are often costly—in discussions with regulators, on investor calls, and through other media, as a demonstration of meeting stakeholders half-way, and doing so in a financially sound manner. ■



Robert Eaton, FSA, MAAA, is a principal at Milliman. He can be reached at robert.eaton@milliman.com.



Rhonda Ahrens, FSA, MAAA, is chief actuary at the Nebraska Dept. of Insurance. She can be reached at rhonda.ahrens@nebraska.gov.

ENDNOTES

- 1 Bergerson, M. and John Hebig. (April 2017). “Detail Matters: Level vs. Relative Premium Increases and Their Effect on Actuarial Equivalence in Long-Term Care Insurance.” Society of Actuaries *Long-Term Care News*. Retrieved Jan. 22, 2020, from <https://www.soa.org/globalassets/assets/library/newsletters/long-term-care/2017/april/ltc-2017-iss44-bergerson-hebig.pdf>.
2. In this example we can imagine creating an RBO that maintains the lifetime loss ratio as well, though it would not be cash flow neutral as we’ve defined it.



Get Plugged in—New InsurTech Partnership

The SOA and Plug and Play relationship will allow InsurTech start-ups to validate their technology and modeling processes with actuaries. In turn, SOA members will have an exclusive look inside the world of emerging technologies. These efforts will help with the development of fair and financially sound insurance products to better serve consumers.

The strategic partnership with Plug and Play demonstrates the SOA's commitment to providing its members with dynamic learning experiences, rewarding volunteer opportunities, and collaborative events where they can learn from the experiences and ideas of peers around the world. Through this partnership SOA members and start-ups can share best practices and advance ideas for the benefit of the insurance industry, regulators and the public. The SOA and Plug and Play [officially announce this partnership](#) to support an exchange of knowledge between actuaries and start-ups. ■





Setting LTC Assumptions in the Times of Targeted Improvements

By Bob Yee

Statements and opinions expressed in this article are that of the author alone and not of his employer, PwC.

The forthcoming Targeted Improvements (FASB Accounting Standards Update No. 2018-12) for accounting of long-duration insurance contracts presents an opportunity for insurance companies to improve the financial management of their long-term care insurance (LTC) business. The LTC industry has been plagued by intermittent sizable reserve strengthening due to changes in assumptions with respect to future liabilities. With concerted efforts, companies can leverage Targeted Improvements' directives on reserving to set better assumptions. These efforts can lead to fewer assumption changes, more stable earnings and greater confidence in the adequacy of the reserves.

This article discusses the challenges and practices in assumption management for estimating future LTC liabilities. The discussions herein are applicable for other long-duration contracts as well.

APPROPRIATE ASSUMPTIONS

LTC reserves under Generally Accepted Accounting Principles (GAAP) are formulated to offset the effect of rising claims on income. When done properly, the reserving mechanism will generate relatively stable earnings as a percentage of premiums. A company's LTC earnings are the net result of the experience factors¹ that drive reported premiums, benefits, expenses and investment returns. When the reserve assumptions misalign with the underlying experience, financial results in the income statement will not be as expected based on these assumptions. In the past, material period-to-period variances between actual and anticipated results, together with reserve strengthening due to assumption changes, caused instability in earnings.



The key to stable earnings is to determine a set of appropriate assumptions that tracks well with future experience. Such a set of assumptions has been elusive for many companies. Because of unpredictable earnings, management faces constant uneasiness that has a ripple effect on other stakeholders—shareholders, policyholders, and regulators. When there is confidence in the assumptions, management can rely on financial projections to quantify the extent of the company's LTC liability shortfall. This can lead to effective responses such as timely premium rate filings and risk transfer transactions that serve the best interest of the stakeholders. Instead of uncertain rate increases due to future changes in assumptions, for example, company and policyholders are better off if there is high level of assurance on the amount of the necessary rate increase.

Trust in the assumptions can only be earned over time. Management only needs to look at the trend of its actual experience

“The thing that overwhelms me about the pricing of long-term care is the uncertainty of the claims level . . . I’m also not convinced we have any real sense of what claims levels are going to be 5, 10 or 15 years from now.”

Tom Foley, North Dakota, former Florida and Kansas Insurance Department Actuary, “Long-Term Care: 4 experts offer insights into one of the industry’s new products,” *The Actuary*, 1997.

against assumptions in recent years in order to gauge how close they are to a set of appropriate assumptions.

At any time, there are three probable reasons for actual financial results to be different than those anticipated from a set of assumptions:

1. Statistical fluctuation

Even if the assumptions reflect true experience, actual experience will vary from the expected due to randomness of events. A large block of business will generally have less random fluctuation than a small block, and fluctuations tend to offset each other over time.

2. Unforeseeable events

The underlying experience may be evolving, causing historical experience data to be unreliable for estimating the future. Past examples include improvement in mortality experience, shift in incidence of claim from nursing facility care to assisted living facility care, and that from facility care to home health care. Early product development did not foresee these trends. As experience analysis becomes more sophisticated and granular, new types of assumptions may emerge. Examples include total lives split into active and disabled lives and total claim termination rates replaced by distinct disabled mortality, claim recovery and benefit exhaustion rates.

Future LTC experience is also subject to catastrophic events. A hyperendemic disease can occur that renders a large segment of the population chronically ill. This would drastically increase the incidence of claim. On the other hand, new treatments for Alzheimer's disease can dramatically reduce incidence.

3. Inappropriate Assumptions

Trends may be hidden until an adequate amount of experience data is available. Even when data is credible, assumptions may not capture the full impact of trends on future events. Inexperience, incomplete data, incorrect calculations and other deficiencies in experience analysis and assumption setting² can also result in inappropriate assumptions.

Statistical fluctuation, emerging trends and catastrophic events are unavoidable. Over the span of multiple reporting periods, the impact of statistical fluctuation on earnings will likely balance out. In recent years, identifiable claim and persistency trends appear to be stabilizing as blocks of LTC business mature. Yet the frequency of assumption changes has not diminished. A number of industry experts suspect that large reserve increases are mostly driven by inappropriate assumptions, rather than worsening experience.

CHALLENGES IN ASSUMPTION SETTING

Most individuals purchase LTC insurance in their 50s and 60s, but claims do not materialize appreciably until they reach their late 70s. Credible claims experience takes a relatively long time to develop. Moreover, even with 40 years of industry experience, claims experience is not well understood due to changes in policy features, policyholders' demographic profile and their behavior. Earlier policies tend to be issued to older policyholders covering mostly facility care and under less stringent underwriting standards. Accordingly, credible experience from earlier policies may not be applicable to the majority of the in-force business that were issued later.

Experience at late policy durations and old attained ages are increasingly relevant in estimating future liabilities since they are precursors of future experience as the business matures. Yet this segment of experience data is precisely the least credible. Data credibility has always been an impediment to critical experience analysis.

Companies have generally been slow to recognize the many factors that affect LTC experience. For example, actual claim incidence rates vary materially by care setting (nursing home, assisted living facility, or home care). If incidence is not separately identified by care setting, the resulting assumption may not reflect the changing preference of care setting over time. In addition, correlation among assumptions has not been universally appreciated. For example, some companies doubt-count the improving trend in incidence over time by assuming both improvement in incidence rates and lower attained age incidence rates in younger issue age groups relative to those for the same attained ages in older issue age groups.

Despite these challenges, appropriate assumptions are becoming more attainable for the following reasons:

- Relevant data is more credible than before
- Previously hidden experience factors are now better understood
- Most of the major mistakes in assumption setting have been recognized
- Analytical methods have advanced

Appropriate assumptions generate estimates of future events that are most likely to occur. They are unbiased in that they are neither conservative nor aggressive.³ Certain favorable outcomes may well offset unfavorable outcomes elsewhere. Thus, in some circumstances, assumptions can be improved without a significant impact on reserves.

Nevertheless, appropriate assumptions are not immutable. They are moving targets because of hidden trends and new developments. Cost of care inflation has become an important assumption for policies with inflation protection features. Companies are assessing the need for an assumption to account for improvement in mortality for the disabled lives. Premium rate increases and the associated shock lapses were rare 20 years ago but are

now prevalent. The increasing application of statistical learning in experience analysis together with new data source may identify new factors for assumptions. Management should anticipate future changes in appropriate assumptions in response to developing trends.

For various reasons, assumption changes in LTC occur frequently for many companies. Because of the long-tailed nature of LTC liabilities, a minor change in assumption can result in a significant change in reserves. Targeted Improvements require, at minimum, an annual review of assumptions with reserves promptly reflecting any assumption change. If companies maintain status quo, Targeted Improvements will likely exacerbate earnings volatility. However, by minimizing future assumption changes through improvement in assumption development, earnings volatility can actually be tempered under Targeted Improvements.

“Extrapolation is a very basic method of prediction – usually, much too basic.”

Nate Silver, *The Signal and The Noise: Why So Many Predictions Fail – But Some Don't*

PRACTICAL CONSIDERATIONS FOR SETTING ASSUMPTIONS

To improve the assumption setting process effectively, there are two fundamental issues to ponder:

I. Assumption setting criteria

In recent years, several companies established the following criteria for setting assumptions:

1. Assumptions should reasonably reproduce the past
 - for example, expected claims should reproduce actual incurred claims for the past five calendar years
2. Assumptions should closely match the present
 - for example, assumptions for projection model are calibrated to actual premiums and new claim counts for the past two calendar years)
3. Assumptions should fittingly represent the future
 - for example, expected active life mortality beyond the 15th policy year for attained ages 80 and over should track with the corresponding actual mortality rates)

Some companies are satisfied with only fulfilling the first criterion. Concerned with data credibility, they rely primarily on actual to expected comparisons of experience data aggregated



over a 10-year study period or longer. However, many of LTC assumptions vary by policy duration and attained age. As the in-force block matures, future experience will likely deviate from aggregate pattern of the past based on all durations or all ages.

Past experience provides innumerable paths for estimating future events. As suggested by the second criterion, it is important to understand how the chosen assumption path explains financial results for the most recent years. Even so, many paths remain that can reasonably match recent results. The third criterion advocates focusing only on experience data that are relevant for the future. This approach would concentrate on experience of late policy durations and high attained ages. Because data are typically scarce for these segments, developing assumptions from these segments of the experience data would require sound choice on minimum credibility standards.⁴

Management often underestimates the amount of resources and attention required to develop a set of appropriate assumptions. Management that is committed to meet all three criteria will find that their efforts are well worthwhile.

II. Judgment

The data necessary for setting critical assumptions are almost never fully credible. Increasingly granular analysis and continuous refinement in methodology invariably lead to places where data are limited. It follows that management often selects assumptions derived from partially credible data together with professional judgment. By nature, judgment is hazardous. However, several practices can reduce the level of judgment needed or provide additional information for a more informed decision.

1. Aggregating data is the most common method to booster credibility and reduce the reliance on judgment. Some details will be lost, but generally the resulting assumptions are sufficiently reliable.
2. Combining internal data with comparable external data can enhance credibility.
3. Exploring the interrelationship among various assumptions and performing stress tests on assumptions can provide greater insight.
4. Adhering to a triangulation approach where two or more independent methods are employed in order to form a consensus. For example, the use of predictive analytics to verify assumptions derived from the traditional method of fitting expected outcomes to the actual experience.

In general, the less credible the data, the more latitude for judgment. Future premium rate increases, mortality improvement and morbidity improvements are examples of assumptions that require considerable judgment. These are the areas where careful deliberation is warranted.

The above practices can reduce, but not eliminate, the use of judgment. Accordingly, it is important to recognize the human element in setting assumptions. Often, appropriate assumptions are known but not selected due to judgment, which may be influenced by self-interest, commitment and attitude towards risk averseness. In addition, the following leadership dimensions of the decision-maker come into play:

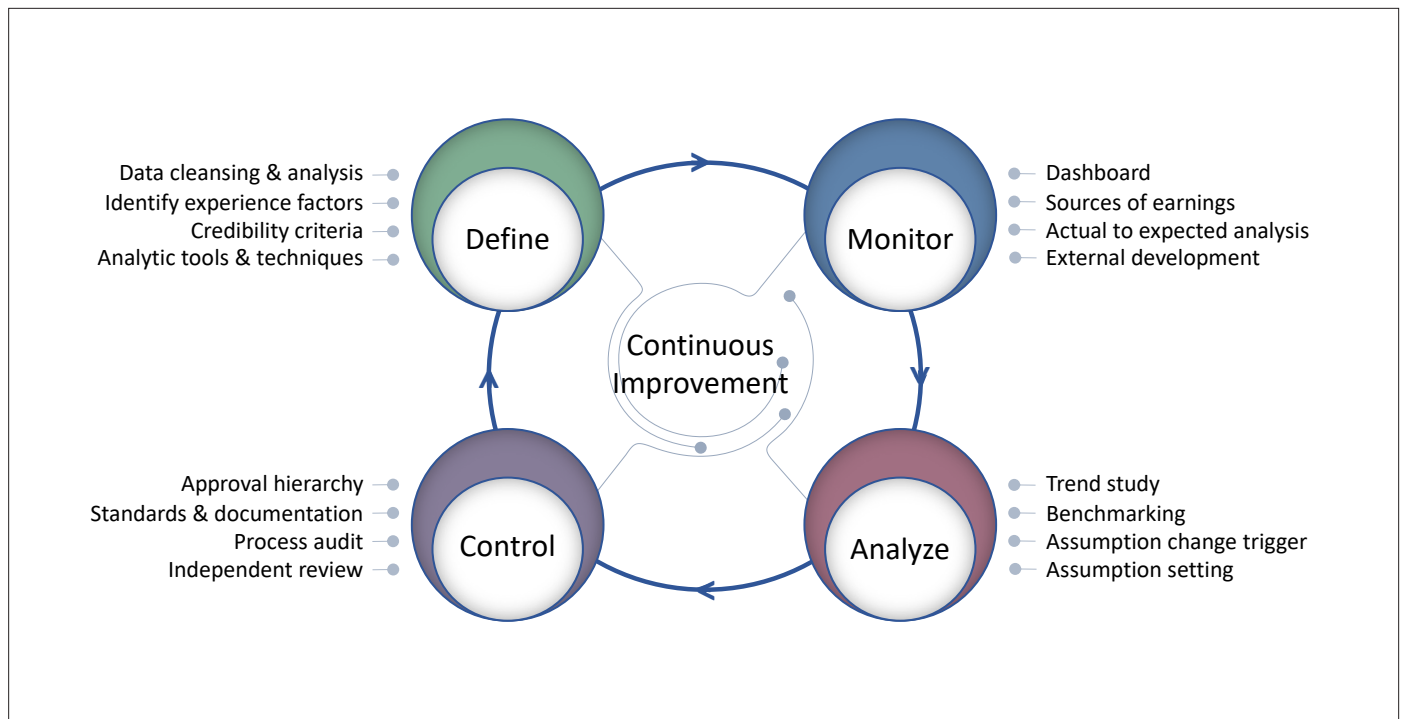
- The level of LTC expertise
- Able to make a balanced and objective assessment of all alternatives
- Mindful of the difference between reality and his or her mental model which is a perception of reality

ASSUMPTION MANAGEMENT PROCESS

Appropriate assumptions are the end-products of a well-designed and robust assumption management process.

Figure 1 illustrates the framework of a quality process for LTC assumption management.

Figure 1
Framework of a Quality Process for LTC Assumption Management



“The essence of risk management lies in maximizing the areas where we have some control over the outcome while minimizing the areas where we have absolutely no control over the outcome and the linkage between effect and cause is hidden from us.”

Peter L. Bernstein, *Against the Gods: The Remarkable Story of Risk*

Due to the complexity of the data and analysis, process defects in assumption management are major risk concerns. Defect detection relies on diligent auditing procedures and independent validation. Validation can be made through either internal or external review of data and methodologies. Benchmarking of industrywide experience is frequently used to confirm internally developed assumptions.

Assumption management is necessarily dynamic to be in step with evolving LTC experience. A process improvement plan should be devised to ensure continuous refinements in data analysis and analytical techniques. Strategies aiming at knowledge retention, in the form of research, documentation, training and succession planning, should also be articulated.

CONCLUSION

Targeted Improvements provides a strong impetus for commitment by management to develop and maintain a set of appropriate assumptions. As even the best of assumptions will take time to season, the sooner the improvements in assumptions are made, the quicker the goal of stabilized earnings can be realized. ■



Robert K. Yee, FSA, MAAA, is a director at PricewaterhouseCoopers. He can be reached at robert.yee@pwc.com.

ENDNOTES

- 1 Assumptions are commonly established for the following experience factors:

Claim incidence	Claim recovery
Incidence improvement	Benefit utilization
Voluntary lapse	Cost of care inflation
Healthy life mortality	Future premium rate increase
Disabled life mortality	Shock lapse rate due to rate increase
Mortality improvement	Investment return
	Expense
- 2 In this example we can imagine creating an RBO that maintains the lifetime loss ratio as well, though it would not be cash flow neutral as we've defined it.
- 3 Statutory reserve assumptions generally started from appropriate assumptions with explicit margins for conservatism or based on implicit margins when setting assumptions.
- 4 For rate determination, (incidence rates, mortality rates, etc.), a rate derived from 1,082 or more data points has generally been recognized as fully credible in that there is a 90 percent probability that the observed rate is within 5 percent of the true underlying result. Some practitioners would accept as low as 200 data points as minimally credible (approximately 40 percent partial credibility).



An Important Matter Related to Combination Life/LTC Insurance Products

By Bruce Stahl, Elizabeth Dinc and Brian Kelly



A Monday morning quarterback would most likely insist that long-term care insurance carriers should have held more capital in the 1990s. Fast forward: could the same be true for today's combination life/LTC insurers?

In 2012, Milliman Inc. prepared a study for the Society of Actuaries (SOA) Long Term Care Insurance Section and the ILTCI Conference Association. The study sought to quantify the internal natural hedge of combination life/LTCI and annuity/LTCI products.

Three types of plans were compared—standalone LTCI, life with LTC riders, and annuities with LTC riders—for issue ages 55, 65, and 75, over a maximum benefit period of six years. The combination plans incorporated both acceleration of benefits (AB) and extension of benefit (EOB) riders. Both assumed a 5 percent compound inflation option. A handful of sensitivities were assumed to quantify the value of the natural hedge.

Statutory returns and after-tax profits for each type of plan were examined and quantified for two scenarios: a two-year AB providing approximately 4 percent of the face value per month with a four-year EOB, and a three-year AB with a three-year EOB. The study did not measure the value of the AB separately from that of the EOB. Comparing the two options advanced the notion that the natural hedge may favor the acceleration benefit, as the natural hedge in the 3-year/3-year scenario, where the acceleration benefit comprised a larger component of the total LTC benefit, turned out to be the stronger one.

A CLOSER LOOK

We thought that separately measuring the AB and EOB risks by using a principles-based economic capital (PBEC) approach might increase our understanding of the financial risks of life/LTC combination policies.

Our analysis tested three scenarios: mortality alone, mortality with AB, and EOB alone; using the following assumptions:

1. **Type of policy:** Single premium life policy.
2. **Age at issue:** Age 60.
3. **Marital status:** 60 percent were married with a reasonably healthy spouse, and 40 percent were either not married or did not have a reasonably healthy spouse. (“Reasonably healthy spouse” was defined as one who can apply for LTC coverage and would be accepted.)
4. **Automatic increasing benefit features:** No increasing daily and lifetime maximums.
5. **Benefit periods (lifetime maximum):** The AB and EOB were assumed to pay out at the maximum permitted per month in all months. Many combination policies assume the AB can be up to either 2 percent or 4 percent of the face. The AB period was assumed at 50 months for up to 2 percent of the face and 25 months for up to 4 percent. The EOB period was assumed at six additional years.
6. **Utilization:** Utilization was assumed at 100 percent.
7. **LTC incidence (claims) rates:** Because policyholders are generally assumed to want to preserve their life policy's death benefit, we used incidence rates that were lower than standalone LTCI incidence rates. We assumed that average

AB claimants tend to enter claim status at a later point of disability than the average traditional LTCI claimant, trying to preserve the death benefit. While still applying lower incidence rates for policyholders with an EOB, we assumed the incidence rates were not as low as those with an AB alone. These policyholders may not be as inclined to preserve the death benefit, as doing so would mean forgoing the EOB.

8. **Recoveries:** All claim terminations were assumed to be due to death, as combination policy claimants are generally less likely to recover their health due to their delay in entering initial claims.
9. **Active life mortality:** Various multiples of the 2000 Annuity Table were used, depending on the policyholder's sex and the policy duration, in line with mortality assumptions generally used for traditional standalone LTC.
10. **Disabled life mortality:** This assumption was set significantly higher than the active-life mortality assumption and was in line with assumptions generally used for traditional standalone LTCI.
11. **Lapse rate:** Buyers were purchasing a combination life product to plan for potential LTC needs, so no one was assumed to have borrowed from the policy or to have used its non-forfeiture benefits.
12. **Claims administration expense:** 4 percent of paid claims, inflating 3 percent per year from inception.
13. **Death benefits:** These equaled the policy face amount minus any claims paid.
14. **Interest rates:** Present value calculations assumed the same interest rate expectations for all stochastic runs.

We stochastically measured the required PBEC for the death benefit alone, for the AB with the death benefit, and for the EOB alone.

We found that the PBEC amount needed for both the morbidity and mortality components of the AB was smaller than what would have been needed for the mortality component alone. This is not to say the AB had no value, as the median scenario with AB and mortality had higher present value of future cash flow amounts than did that scenario with mortality alone. Yet the difference between the present value of cash flows for the extreme scenario we selected for the PBEC calculation and the median scenarios was smaller for the policy with the AB than for the standalone life policy without LTC benefits.

In contrast, the morbidity risk component of the EOB alone showed a very large difference between the value of the selected extreme scenario and that of the median scenario. This



difference was due to two facts: no other benefits are reduced when the EOB payments are being made, and there is no ability to increase premium rates. Essentially, this rider's risk behaves like that of a traditional standalone LTC policy, but with a very lengthy elimination period and guaranteed premium rates. Extended benefits have no natural hedge with other benefits.

Our analysis suggests that at a minimum, quantifying capital requirements for combination life/LTC products would help manage the risk associated with having EOB riders. Further analysis is needed, including measurement of a range of additional risks and diversification across risks. An analysis of asset and interest rate risks could also be quite beneficial, but how important those two risks might be would depend on policy structure as well as any reinsurance protection. ■



Bruce Stahl, ASA, MAAA, is senior vice president and head of U.S. Individual Health at RGA Reinsurance Company. He can be reached at bstahl@rgare.com.



Elizabeth Dinc, ASA, is associate actuary, U.S. Individual Health at RGA Reinsurance Company. She can be reached at edinc@rgare.com.



Brian Kelly, FSA, is actuary, U.S. Individual Health at RGA Reinsurance Company. He can be reached at bkelly@rgare.com.