



Risk Considerations for Innovative Products

A Case Study of the Long-Term Care Insurance Industry





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Report Prepared by Milliman, Inc.

AUTHORS

Robert Eaton, FSA, MAAA, Consulting Actuary
Tim Kempen, FSA, MAAA, Consulting Actuary
Stephanie Moench, FSA, MAAA, Consulting Actuary
Amy Pahl, FSA, MAAA, Principal and Consulting Actuary
Al Schmitz, FSA, MAAA, Principal and Consulting Actuary

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The Society of Actuaries (SOA) retained Milliman, Inc. (Milliman) to conduct a research project related to product innovation. This report explores key risks and considerations for product innovation using the long-term care insurance (LTC, LTCI) industry as a case study. We identify how actuaries of all backgrounds can apply the lessons learned, and challenges overcome, by the LTCI industry to improve future innovation, product development and risk management.

The authors of this report are members of the American Academy of Actuaries and meet the qualification standards of the American Academy of Actuaries to render an actuarial opinion as described herein. Any references in this report to “we,” “our” or likewise represent the report authors’ opinions.

Section 1: Executive Summary

With innovation comes the unknown. While innovation can give a company a competitive advantage, it can also introduce substantial risk. LTCI is an innovative product, and the LTCI industry is a great example of the ups and downs associated with innovation. Since its inception, the LTCI industry has overcome several challenges encompassing all aspects of the product life cycle, from initial product design and assumption development to monitoring and reacting to emerging experience.

Based on the lessons learned from the evolution of the LTCI industry, this report explores the following key considerations for an innovative product offering:

1. **Contractual provisions.** Companies should ensure that contracts have clear, detailed wording and include protection against future changes in the environment. Steps should be taken to ensure that contract language is unambiguous and written in easily understood language.
2. **Embedded guarantees, incentives, and policyholder behavior.** The product design should align the policyholder’s incentives with those of the company to the extent possible. Additionally, it is important for actuaries to consider and understand the ability to hedge or otherwise mitigate risks through product design.
3. **Potential limitations in future ability to leverage risk management tools.** Companies should build mechanisms into the product design, when possible, to mitigate or offset future unfavorable experience. Potential limitations in the company’s future ability to leverage these mechanisms should be understood and accounted for in pricing.
4. **Distribution system risk.** Distributors should be familiar with product features and understand the company’s philosophy and strategy in offering the product. Actuaries should consider the ways in which underwriting processes may change in the future and how any changes could impact profitability.
5. **Assumption-related risk.** Since future experience will be unknown for innovative products, actuaries can use sensitivity and scenario testing to identify pressure points and quantify the

impact of various assumptions on profitability. Even assumptions that may seem unreasonable at the time should be tested to determine their impact.

6. **Reacting to emerging experience and environmental changes.** Companies should pay attention to early indicators that experience may be deviating from initial pricing projections and/or any sensitivity or scenario testing results. Future experience could emerge differently from the past in several ways (due to environmental, social, political or other drivers). Actuaries should consider the impact of such changes in the development of an innovative product.
7. **Competitive pressures and the importance of including margins.** It may be prudent for actuaries to build in pricing margins that are substantially higher than those reflected in existing lines of business, especially where there is increased uncertainty.
8. **Regulatory risk.** It is likely that the regulatory environment and effective regulations will change during the product's life. It is important for companies to identify and consider how reasonable changes in applicable regulations may impact a new product.

There are many examples of each of these considerations in the LTC industry. LTCI carriers have taken positive steps to address several key risks associated with each consideration in ways that may be insightful to future innovators. We believe that understanding the lessons learned by the LTCI industry, and applying these lessons more broadly across other industries, can improve future innovation and product development, allowing companies to take advantage of emerging opportunities.

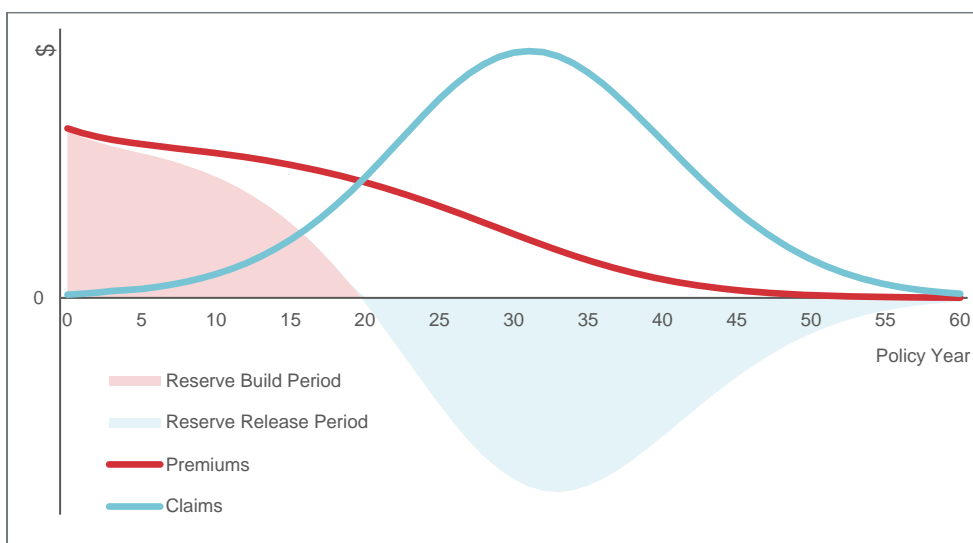
Section 2: What Made Long-Term Care Innovative?

LTCI is an innovative product; before its introduction, no product was designed to specifically address the need for LTC funding. Early LTCI products were created to fill a need not otherwise covered by private or social health insurance, and the core product design (i.e., level premiums and defined benefit structure) has remained largely unchanged since the coverage was first introduced in the late 1980s.

2.1 CORE PRODUCT DESIGN

Similar to level-premium whole life insurance, LTCI generally has a level premium structure and is rated on an issue age (versus attained age) basis. The benefit structure, however, is generally more similar to disability insurance than life insurance. LTCI benefits payable may vary drastically from claim to claim, claims can extend for years (or even decades), and it is possible for policyholders to recover from claims. The level premiums paid in early years when LTCI claims are low are used to establish reserves to cover claims in later years, as demonstrated in Figure 1.

Figure 1
ILLUSTRATION OF LTCI PRE-FUNDING



2.2 INDUSTRY CHALLENGES AND EVOLUTION

LTCI was (and still is) priced as guaranteed renewable, which facilitates risk mitigation by allowing for future premium rate increases on a class basis. Despite this built-in risk management tool, there are several challenges associated with LTCI. In particular, there are multiple actuarial risks inherent in LTCI (morbidity, persistency and investment-related risks) that make the product especially sensitive to assumption changes over time and expose carriers to potentially large downside risk. Furthermore, morbidity experience is slow to emerge with any credibility given the span of time between the average issue age (approximately 60) and the average claim age (around 80). This lag makes assumption development challenging and may impede companies' ability to react to emerging experience in a timely manner.

These challenges, combined with a changing care environment and other emerging risks (e.g., low interest rate environment, introduction of new regulations and adverse policyholder behavior), have forced the LTCI industry to evolve, and many carriers once in the market have ceased new business sales. The companies that are still issuing LTCI business have redesigned their products by removing or reducing riskier benefit features. Additionally, carriers have generally revised their assumptions in ways that may better position them to overcome future challenges.

Section 3: Applying Lessons Learned From Long-Term Care to Future Innovation

Designing a new and innovative product can be challenging for many reasons. While certain challenges may be specific to the particular product and/or industry, many of the challenges associated with innovation can be generalized to uncertainty—uncertainty related to the marketplace, assumptions, policyholder behavior, environmental factors, etc. This uncertainty makes innovation risky. One approach for mitigating this uncertainty is to incorporate information learned from past innovation (both successes and failures). With this in mind, this report explores ways that future actuaries may be able to better understand and mitigate risks associated with innovation using the LTCI industry as a case study.

There are innumerable considerations, risks and complexities associated with new product development and innovation. The following are key considerations for approaching innovation in the insurance industry:

1. Contractual provisions
2. Embedded guarantees, incentives and policyholder behavior
3. Potential limitations in future ability to leverage risk-management tools
4. Distribution system risk
5. Assumption-related risk
6. Reacting to emerging experience and environmental changes
7. Competitive pressures and the importance of including margins
8. Regulatory risk

Each of these key considerations is described in more detail below. Based on lessons learned from the LTCI industry, we suggest positive steps to help future innovators mitigate or better understand the risk associated with each consideration. Additionally, we provide examples from the LTCI industry to demonstrate how LTCI carriers addressed these risks as the industry evolved. The examples provided in this report are generalizations based on the evolution of the LTCI industry and may not hold in every situation or scenario.

3.1 CONTRACTUAL PROVISIONS

If contract language is ambiguous, it is more likely to be misinterpreted by the consumer and can potentially lead to litigation. Such misinterpretation may also require a company to institute a more liberal definition than intended going forward to avoid future litigation. Additionally, if different benefits are interpreted as being covered under the policy than originally intended in pricing, profitability may be negatively impacted. It is also possible that environmental changes may impact interpretation or application of contractual provisions.

3.1.1 Examples From the LTCI Industry

In early LTCI contracts, prior to the assisted living facility (ALF) emerging as a new care setting, benefits were often defined vaguely. Carriers needed to consider more liberal interpretations of the contract language or run the risk of litigation to the extent that ALF services later received by policyholders were covered under the existing benefits. In many cases, pricing actuaries had not anticipated this additional coverage. Additionally, certain LTCI contracts include provisions for premium guarantees or cost disclosures. Because carriers may not have anticipated the likelihood or magnitude of adverse emerging experience, these premium guarantees or cost disclosures were generally more constrictive in early LTCI contracts. This ultimately limited carriers' ability to pursue premium rate increases when experience began to emerge more unfavorably than anticipated.

As the LTCI industry has evolved, LTCI carriers have addressed contractual looseness by observing policyholder behavior and adjusting contract language to anticipate future issues. Some general examples of how LTCI contract language and provisions have evolved over time include the following:

- Contract definitions have generally become more robust and exhaustive. More recent LTCI policy forms may include more comprehensive definitions for eligible services and care settings. Such definitions may include a listing of the criteria for a care setting to be considered a nursing home or ALF (e.g., number of days the care setting operates per week, number of staff employed, number of clients served). Because all possible future care settings cannot be fully anticipated or defined, LTCI contracts also include Plan of Care provisions. Though more loosely defined than the core benefits,

Plan of Care provisions provide a mechanism for covering appropriate new care settings that may emerge in the future. These provisions help ensure that LTCI coverage is provided as intended, even though the situs of such coverage may not exist at the time the contract is drafted.

- Contract language regarding the potential for future rate action has generally become more detailed and explicit. More recent LTCI policy forms may include prominent language on the cover page (or early pages) to indicate that premiums may change in the future. Such language may include statements regarding when such premium changes can occur (e.g., no more frequently than once every 12 months, a specified number of days following written notification of the increase) or clarification on how such premium changes will be applied (e.g., all similar policies issued on the same form in the same state will be impacted).

3.1.2 Takeaways for Innovators

As illustrated by the evolution of the LTCI industry, contracts should have clear, detailed wording and include protection against future changes in the environment. The following additional considerations may also help minimize the risk associated with ambiguous contract language for future product innovation.

- Where contract wording may be open to interpretation, a clear definition should be added to the contract.
- Benefits and exclusions are particularly important and should be written in plain, easily understood language.
- It may be beneficial for the contract drafting team to pose certain hypotheticals to see how specific fact situations may be applied to the contract terms.
- It may also be prudent to have an individual who has not been involved in drafting the contract act as an independent reviewer, because it may be easier for such an individual to identify ambiguities.

3.2 EMBEDDED GUARANTEES, INCENTIVES AND POLICYHOLDER BEHAVIOR

It is important to understand the value of embedded guarantees, especially long-term guarantees, and how certain features or benefits may incentivize policyholders to act a certain way. Policyholder behavior often drives profitability results. Developing assumptions around policyholder behavior is very challenging, especially because the degree to which policyholders understand the insurance coverage may impact the potential for anti-selection. Furthermore, policyholder behavior is tied to the intrinsic value that the policy has for each insured, and the drivers for policyholder behavior are difficult to quantify. For an innovative product that has no prior observable policyholder behavior available for use in developing an assumption, significant actuarial judgment may be required.

3.2.1 Examples From the LTCI Industry

With regard to LTCI, the following features act as embedded guarantees and incentives to policyholders:

- **Guaranteed renewability.** LTCI is guaranteed renewable, which means that coverage will continue as long as premiums are paid and until benefits are exhausted. This provision is a long-term embedded guarantee.
- **Waiver of premium.** Many LTCI policies include a feature where premiums are waived once a policyholder goes on claim. This feature misaligns the incentives of the policyholder and the company as it incentivizes policyholders to go on claim earlier to avoid paying premiums.

Certain product features originally offered on LTCI products proved to be much riskier to companies than expected, mostly due to unanticipated policyholder behavior (including anti-selection). These features included lifetime benefit periods, zero-day elimination periods, cash or disability-style benefits, and limited payment durations. One reason why certain product features are riskier to insurers is that policyholders have less incentive to conserve their LTCI benefits compared to policyholders with less rich options (as may be the case with shorter benefit periods or reimbursement-style benefits). Additionally, richer policy features may expose the company to a higher risk of policyholder anti-selection. With regard to limited premium payment terms, policyholders with these options may not be subject to future rate increases to the extent their policies are paid up.

As the LTCI industry has evolved, LTCI carriers have redesigned the benefits offered on their products to reduce the number of risky features. To demonstrate, in part, how the mix of LTCI policy characteristics sold in the market has changed, Figure 2 provides a comparison of the LTCI sales distribution in 2005 and 2018 by benefit period and facility elimination period based on data from the 2010 and 2019 Broker World Long Term Care Insurance Surveys.

Figure 2
LTCI SALES DISTRIBUTION BY BENEFIT PERIOD AND ELIMINATION PERIOD

Benefit Period	2005	2018	Elimination Period	2005	2018
< 3 years	14%	13%	< 20 days	5%	0%
3–4 years	35%	60%	20–44 days	14%	3%
5–6 years	19%	25%	45–83 days	6%	0%
7–10 years	6%	2%	84–100 days	69%	90%
> 10 years	26%	0%	> 100 days	6%	7%

Helwig, Dawn, Allen Schmitz, and Claude Thau. "2010 Individual Long Term Care Insurance Survey." *Broker World*, 1 July 2010, pp. 3–27.

Giese, Chris, Allen Schmitz, and Claude Thau. "2019 Milliman Long Term Care Insurance Survey." *Broker World*, 1 July 2019, <https://brokerworldmag.com/2019-milliman-long-term-care-insurance-survey/#> (accessed September 21, 2019).

As shown in Figure 2, the risky features (i.e., benefit periods greater than 10 years and elimination periods less than 45 days) make up a much smaller portion of recent LTCI sales compared to the sales mix from the early 2000s. Reducing the number of risky product features has allowed LTCI carriers to better manage the multiple actuarial risks inherent in the product.

Sales of combination LTCI and hybrid LTCI products are also becoming more prominent. These coverages combine traditional LTCI coverage with life insurance or annuity products. This product design enables carriers to mitigate some of the risk associated with traditional LTCI by leveraging the pricing and expense synergies that exist between insurance coverages. Additionally, combination LTCI products better align the incentives of carriers and policyholders than traditional LTCI. In particular, combination LTCI policyholders are less incentivized to go on claim as soon as they become eligible for LTC benefits because payments for LTC services often reduce the death or annuity benefits they would otherwise receive under the policy. There is also a natural hedge between the actuarial risks inherent in LTCI and life or annuity insurance that further mitigates carriers' risks. For example, lower-than-anticipated mortality reduces profitability for traditional LTCI because it implies that more insureds reach the advanced attained ages where significant LTCI claims are expected. However, lower-than-anticipated mortality generally increases profitability for life insurance, so when combined with LTCI, it offsets some of the adverse LTCI profitability associated with lower mortality rates.

3.2.2 Takeaways for Innovators

As illustrated by the evolution of the LTCI industry, it is prudent to consider the following when developing an innovative product to minimize the risks associated with unexpected policyholder behavior, embedded guarantees and misaligned incentives:

- Determine whether there are any aspects of the product design that act to misalign the incentives of carriers versus policyholders. Include product features that align the incentives of the policyholder and the carrier; this can include features that put more policyholder skin in the game or otherwise compel the policyholder to share in the risk with the company.
- Consider how various product features increase or decrease the potential for adverse policyholder behavior. Are there any policy options or features that have potential to be more or less risky depending on policyholder behavior?
- Attempt to understand how policyholders will perceive the product's value, the ways in which policyholders will act in their own best interest, and how this behavior may differ from the initial pricing assumptions. Consider profitability under scenarios that assume policyholders behave contrary to initial expectations. It may then be prudent to include additional pricing margins when there is increased uncertainty regarding policyholder behavior and incentives.
- Identify policy provisions that could be introduced into the design to provide natural risk hedges or to mitigate the risk of other product features.

3.3 POTENTIAL LIMITATIONS IN FUTURE ABILITY TO LEVERAGE RISK-MANAGEMENT TOOLS

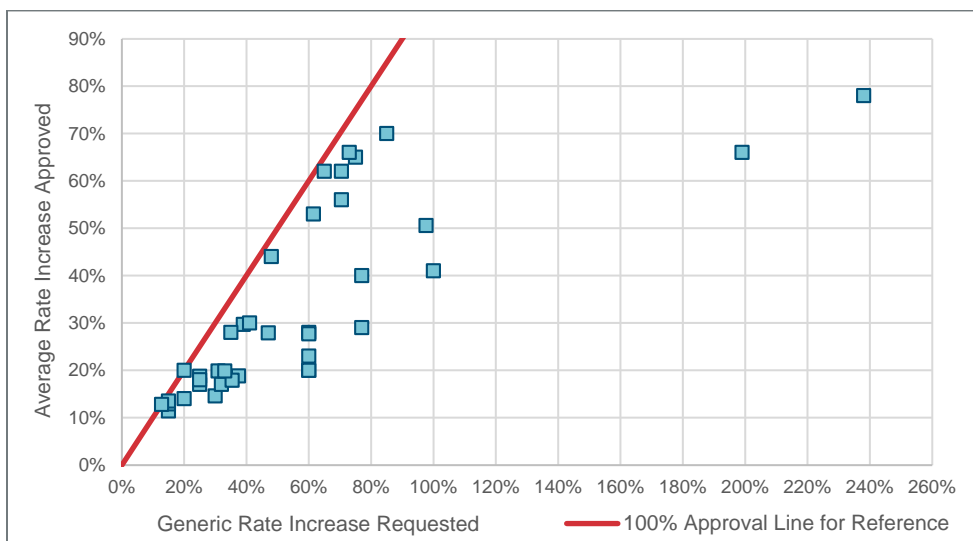
Many insurance products are designed to include inherent tools that a company can use for risk management. For example, albeit not specific to LTCI, deductibles and copays are used across various product lines to mitigate risk via cost sharing with consumers, while performance-based pricing (most commonly used in auto insurance) mitigates risk via better alignment of consumer behavior and policy premiums. For LTCI, one of the primary risk-management tools inherent in the product is carriers' ability to increase premium rates. While the inclusion of such mechanisms in the product design can help to mitigate future risk, unforeseen limitations to inherent risk-management tools can emerge, and such limitations can negatively impact profitability.

3.3.1 Examples From the LTCI Industry

While LTCI products are not priced assuming future rate increases will be needed, one of the key risk-management tools inherent in LTCI is insurers' ability to request rate increases. However, the regulatory environment directly impacts LTCI carriers' ability to obtain rate increases on in-force business. In evaluating rate increases for LTCI, regulators address issues such as data credibility, policyholder equity and who should bear the burden of unfavorable actual-to-expected experience. While the regulatory environment for LTCI rate increases is fluid, in general, regulatory approval for rate increases has been more difficult to obtain than original pricing actuaries may have expected.

As an illustration of how regulatory approval may impact LTCI rate increases, Figure 3 provides a comparison of the generic nationwide rate increases requested versus the average rate increases approved, according to Milliman's 2016 Long-Term Care Rate Increase Survey. For the purpose of this illustration, the generic request represents the increase request submitted to all jurisdictions, except where jurisdiction-specific modifications to the increase request are required.

Figure 3
AVERAGE RATE INCREASE REQUEST APPROVED BY AMOUNT OF GENERIC REQUEST



Gordon, Missy, and Amy Pahl. "Long-term care rate increase survey." *Milliman*, 23 September 2016, <http://www.actuarialsoftware.com/insight/2017/Long-term-care-rate-increase-survey> (accessed September 21, 2019).

The introduction of rate stability regulation also changed the rate increase environment from what original pricing actuaries may have envisioned. This regulation requires carriers to request the rate level needed to certify that rates will remain stable under moderately adverse conditions and also requires that a generally higher lifetime loss ratio be met than regulation before rate stability. Beyond regulatory approval and requirements, there are several additional hurdles that can limit an LTCI carrier’s desire or ability to use rate increases as a risk-mitigation tool. These hurdles include operational constraints, legal risks and reputational concerns, such as:

- In-force premium rate management requires substantial resources, including actuaries and company management, as well as compliance, administration and legal staff.
- Rate increase filing requirements and follow-up requests from regulators can vary drastically across jurisdictions, which can make preparing rate filings very time-consuming.
- Companies pursuing rate increases for their in-force LTCI business may be subject to greater litigation risk as a result of consumer dissatisfaction and greater anti-selection risk from policyholders who elect to maintain their benefit levels.
- Certain contract provisions (such as the cost disclosures required to be included in LTCI policy forms issued in Delaware) may limit a company’s future ability to pursue rate increases.
- For companies still selling new business (LTCI or otherwise), there may be reputational risk associated with LTCI rate increase filings. For companies still issuing LTCI, regulation requires disclosure of a company’s rate increase history to all potential new business applicants; however, negative publicity associated with LTCI rate increases has the potential to impact a company’s non-LTCI customers and/or marketing strategies as well.

These limitations, which may have been unforeseen (in full or to a certain degree) by company managers during the early years of LTCI pricing, have impacted companies’ ability to pursue rate increases as a risk-mitigation strategy. To overcome the nonregulatory limitations related to rate increases, LTCI carriers have taken several approaches, including implementing some (or all) of the following strategies:

- Leveraging outside actuarial consultants and/or compliance experts to alleviate resource constraints.
- Conducting in-person meetings with insurance departments as part of the rate increase request process.
- Bringing together other stakeholders, such as trade associations, to create uniform messaging on key issues.
- Offering benefit reduction options that allow policyholders to partially or fully offset the rate increase to mitigate anti-selection risk while improving consumer relationships.
- Revising contract provisions (e.g., rate guarantees) in new LTCI business to be less constricting than early products.

3.3.2 Takeaways for Innovators

Based on the lessons learned from the rate increase challenges the LTCI industry has faced, the following are positive steps and key considerations for future innovators in relation to risk-management tools:

- When developing an innovative product, it is important to have mechanisms available in the product design to mitigate or offset future unfavorable experience.
- Consider potential future roadblocks to using risk-mitigation tools. These limitations may be environmental, regulatory, operational or social (e.g., the pressure to provide benefits when there is ambiguity in contract language).
- To the extent possible, the impact of limitations to anticipated risk-management tools should be quantified to ensure that the company is comfortable with the profitability implications in a scenario where these tools cannot be utilized as intended. This quantification should be designed to be easily updated to allow frequent monitoring.

3.4 DISTRIBUTION SYSTEM RISK

It is important to understand the distribution system (i.e., the process from initial sale to policy acceptance) that will be used for the product. Distributors' ability to understand the product and convey the complex issues to applicants can impact sales. Furthermore, sales mix and risk profile can drive profitability, and it is possible that the distribution system will capitalize on any implicit subsidization in pricing.

3.4.1 Examples From the LTCI Industry

The distribution system challenges that the LTCI industry faces include:

- Distributors may set expectations with potential insureds that ultimately may not be met.
- When using brokers to market LTCI, there is higher potential for the distributor to exploit implicit subsidization in pricing by finding the areas in the rate schedule that work to the disadvantage of the various carriers they represent. This may also be the case for LTCI products marketed via captive agents, albeit to a lesser degree.
- There may be pressure for carriers to make underwriting exceptions (concessions) that can lead to a more adverse risk pool than intended.
- Certain producers may only sell a handful of LTCI policies per year, and those policies generally have worse experience than policies placed by producers that focus on LTCI.

Underwriting protocols have tightened over time as new techniques and technologies have emerged. Based on information learned from early LTCI products, underwriting tools (such as cognitive and prescription drug screening) and policyholder applications have evolved to better assess morbidity risks. Predictive analytics is also emerging as a means to assess the riskiness of potential insureds. The tightened

underwriting processes now in place have helped reduce the potential for underwriting concessions. Additionally, some LTCI carriers have taken steps to limit sales through brokers and/or shift sales of group LTCI products to less-risky industries as a means of mitigating distribution system risk.

3.4.2 Takeaways for Innovators

Key considerations for innovators to minimize the risk associated with the distribution process (including marketing and underwriting), based on lessons that the LTCI industry has learned since its inception, include:

- Ensure that distribution channels are familiar with product features, and understand the company’s philosophy and strategy in offering the product. Additionally, in developing the product, it is prudent to review provisions such as commissions to ensure that agents do not have incentives that are contrary to those of the company.
- Pricing assumptions for underwriting selection and sales mix should align with underwriting processes and anticipated distribution systems. Because demographics can drive profitability, the actual mix of business (in terms of both benefits and risk classification) should be monitored against pricing expectations to identify material deviations. Such monitoring should be done early and frequently to facilitate re-pricing in a timely manner, should material deviations occur.
- Consider how any illustrative policy or sample benefits are displayed. For example, presenting default policy benefits that are very rich may entice consumers to elect these benefits regardless of their perceived needs.
- Understand whether there are cohorts of business that are more or less profitable, and test different sales mix assumptions to understand pressure points.
- Underwriting protocols will evolve over time, and such evolution should be considered when using experience to develop future assumptions.
- In establishing underwriting processes, it is important to balance the comprehensiveness of the underwriting protocols and accuracy of the risk classification with (1) the invasiveness of the tools and applications (perceived or actual) and (2) the timeframe for making an underwriting decision.
- Understand the nature of any underwriting exceptions and build them into future underwriting rules when possible.

3.5 ASSUMPTION-RELATED RISK

Assumptions are a critical part of any product development. The specific assumptions required may vary drastically depending on the product’s purpose and features, but certain considerations are applicable regardless of the product:

- How do various assumptions interact?
- Which assumptions materially drive the results?
- How do changes in assumptions impact profitability?
- How could assumptions improve or deteriorate over time?

Understanding the above questions is key to mitigating assumption-related risk.

3.5.1 Examples From the LTCI Industry

With regard to LTCI, establishing reasonable assumptions is crucial to profitability, because the product design relies on premiums paid in the early years to establish reserves for future anticipated claims. Due to

the long duration and multiple actuarial risks inherent in LTCI, assumption development can be especially challenging, and there is a large potential downside risk. For example:

- If the interest rate environment is unfavorable compared to expectation, reserves may not be sufficient.
- If lapses and/or mortality are lower than anticipated, there will be more policyholders in force in later years when the majority of claims occur.
- If the diagnosis mix is unfavorable (e.g., material portions of cognitive impairment diagnoses such as Alzheimer's disease), it can significantly increase the expected severity of claims.

When LTCI was first introduced, there was no available insured experience specific to the product. Assumptions for early products were based on experience from other industries believed to be comparable, such as life insurance and other senior health market coverages. Population studies, such as nursing home surveys, were also used to develop certain assumptions. As the industry has evolved, experience has generally unfolded differently from what was anticipated in early pricing due to a number of factors. Morbidity experience, in particular, is slow to emerge with any credibility, making assumption development challenging and impacting companies' ability to react to emerging experience in a timely manner. Additionally, it has become evident that LTCI insureds appreciate the value of their policies and, as a result, are lapsing at a much lower rate than anticipated in original pricing. Some early LTCI products assumed ultimate lapse rates as high as 10%, but recent LTCI experience suggests ultimate lapses for many blocks are generally at or below 1%.

The product and underwriting evolution in the LTCI industry has also made it difficult for carriers to gather information on an apples-to-apples basis with new LTCI products. For example, LTCI products priced today may not offer the same benefits, have the same policy provisions or use similar underwriting methods as earlier LTCI products. However, the earlier products are the ones for which credible experience is emerging, which adds complexity to the assumption development process for newer LTCI products.

As the LTCI industry has matured, many LTCI carriers have refined their assumptions as well as the development processes to capture additional variance by key parameters, such as marital status and inflation option, and reflect information learned from past experience. Current assumptions are generally based on LTCI-specific industry experience, which has continued to emerge with more credibility. Company-specific experience may be supplemented with industry data to increase credibility for certain cohorts where company data may still be sparse (morbidity for advanced attained ages). Additionally, more detailed assumptions are being captured in current pricing, including utilization and benefit expiry. Some carriers are also incorporating predictive analytics into their experience study processes in lieu of, or as a supplement to, traditional actual-to-expected experience studies.

Approaches for modeling assumptions have likewise become more robust as the LTCI industry has evolved. LTCI experience is being analyzed over a much longer time horizon, with lifetime projections that reflect a 60- to 80-year projection window to capture the product's very long duration nature. Advancements in technology, combined with more credible LTCI-specific experience, have facilitated the use of morbidity assumptions that are developed at the component level (i.e., on a first principles basis) rather than on an aggregate claim basis. The use of first principles assumptions enables companies to better understand the drivers of emerging experience and react accordingly. Some companies have also introduced stochastic modeling and more advanced investment earnings measures to better understand the range of possible outcomes.

3.5.2 Takeaways for Innovators

In addition to considering the questions outlined above, the following are some considerations and takeaways based on the lessons learned from the LTCI industry evolution that may help minimize assumption-related risks for future innovation.

- Understand limitations in the data and methodology used to develop the assumptions, especially when assumptions are developed by extrapolating experience from different products. An example of this includes projecting ultimate age experience (if the contract is guaranteed renewable for life, for instance).
- When using experience for alternative or older products, be aware of any differences in benefits, policy provisions, underwriting techniques or policyholder motivations. Any differences should be accounted for in the assumption development process. Depending on the specific design and features of the innovative product, it may be necessary to use assumptions that have not been used before on other products.
- Ensure that the assumptions being made for policyholder behavior are reasonable given the product design. Using predictive modeling, or other advanced analytics as they emerge, in conjunction with data for a similar product, for example, may facilitate a better understanding of possible policyholder behavior.
- Sensitivity and scenario testing can be used to quantify the impact of various assumption changes on profitability. A range of assumption scenarios (where assumptions are adjusted individually and in combination) should be tested, including moderately adverse assumptions and a worst-cast scenario. Stochastic modeling can provide for a distribution of outcomes, allowing decision-makers to select points of risk tolerance based on levels of outcomes.
- It is important to design thorough experience studies that are conducted early and often. Such studies should be refined as needed based on emerging results. Having a robust administration system can facilitate assumption development once company-specific experience begins to unfold. If a company is not able to track experience at a granular level, it will be more challenging to analyze experience at such a level if desired in the future.

3.6 REACTING TO EMERGING EXPERIENCE AND ENVIRONMENTAL CHANGES

Balancing credibility concerns with timely action to emerging trends can be challenging. It may take many years for experience to unfold for long-duration products. Even as experience starts to become available, it will likely be limited in credibility, and there may be cohorts of the business where data is still extremely sparse. While there may be an established process around assumption development, credibility concerns can dissuade management from reacting to early indicators that experience may be emerging worse than anticipated. Having limited (or no) emerging experience may be taken as an indication of good experience, or at least experience consistent with pricing expectations. Furthermore, if there is no concrete evidence to the contrary, there can be internal pressure from other stakeholders to revise assumptions to be more favorable to enhance product competitiveness.

As an added consideration, the longer the product duration, the more likely that the environment will change during the product's life. Even with short-duration products, it is almost certain that something will change while the product is in force. Environmental changes can have material impacts on the product's performance and profitability, necessitating unanticipated revisions to the product.

3.6.1 Examples From the LTCI Industry

LTCI rate increases provide an explicit example of the cost of waiting to react to emerging experience. As demonstrated earlier in Figure 1, LTCI has very low annual loss ratios (i.e., ratio of claims divided by premiums) in the early policy durations. Many years may pass between when an LTCI policy is issued and when significant and credible claims actually start to occur, which adds to the complexity of knowing when to react to emerging experience. These factors, among other considerations, can make it difficult to balance early rate increase implementation with having a reasonable amount of experience to support a requested increase. However, because the future premium base to which the rate increase would apply continues to shrink over time, delaying a rate increase even just a few years can exponentially increase the amount needed to achieve a company's target metric (e.g., loss ratio, profit, etc.).

As the LTCI industry has evolved, carriers have recognized the need to react to emerging experience in a timely manner. To increase credibility and provide a better indication of experience, even for those carriers with considerable amounts of data, LTCI carriers may use LTCI-specific industry data with company-specific adjustments. Some carriers have pursued rate increases relatively earlier for their more recent LTCI business (e.g., products priced in the mid to late 2000s) compared to older blocks (e.g., products priced in the late 1990s and early 2000s). Additionally, regulators are working with LTCI carriers to facilitate earlier premium rate action based on revised assumptions that reflect industry experience.

There have also been a plethora of environmental changes since the inception of the LTCI industry to which carriers have had to react. The stock market crashes and a subsequent low-interest-rate environment led to significant deterioration in investment returns for LTCI carriers. Advances in medicine and care delivery have necessitated product design changes. For example, ALF emerged as a new and more appealing care situs, and home health care services are becoming more prevalent. Additionally, population health has evolved and longevity has increased. There have been cures for, or reductions in, previously fatal diseases such as AIDS and cancer, while dementia and Alzheimer's disease are becoming more prevalent.

In response to the changing care environment and emerging risks, many companies have redesigned certain aspects of their LTCI products. The changes in product design may include but are not limited to:

- Adding ALF and adult day care coverage.
- Expanding home care benefits to include things like Meals on Wheels.
- Incorporating benefits for informal care.
- Revising premium rates to be gender-distinct versus unisex.
- Exploring copays and deductibles as potential cost-sharing options.
- Combining LTCI coverage with life insurance or annuities to capitalize on the natural hedge effect.

3.6.2 Takeaways for Innovators

A key takeaway from the LTCI industry is the importance of reacting to emerging experience and environmental changes. While environmental changes are generally beyond companies' control, the following considerations may help to minimize the risk of emerging experience and facilitate timely action:

- Pay attention to early indicators of experience deviating from initial pricing projections and any sensitivity tests performed, with consideration for the level of margin included in initial assumptions. If early indicators are not given proper consideration, the profitability impacts of any assumption deterioration (should it occur) may be exaggerated as time goes on due to continued sales under the original pricing assumptions.

- Establish formal processes by which to actively monitor emerging experience for unexpected trends and quantify the financial impact of such trends. Monitor on a frequent basis (e.g., annually), and establish thresholds to facilitate determining when actions should be taken.
- Leverage available industry data to increase credibility and provide a better indication of emerging experience.
- Diligently update the product design and/or assumptions to reflect changes in the environment and issue new generations of the product as experience emerges.

3.7 COMPETITIVE PRESSURES AND THE IMPORTANCE OF INCLUDING MARGINS

An abundance of unknowns are associated with innovation. One approach to account for this uncertainty is to include margins in pricing assumptions. The inclusion of margins is particularly important for long-duration products, because substantial changes in the environment can occur over the life of the business.

It can be challenging to balance the inclusion of margins with the competitiveness of rates. When pricing a product that doesn't exist or does not yet have historical data, there can be pressure to be competitive because no evidence exists to suggest rates are too low. As additional companies enter a particular market, there may be pressure to reduce (or eliminate) certain margins to achieve lower rates. In an extreme scenario, a company may be faced with the option of lowering margins to maintain competitiveness or not selling any policies (and being forced to exit the industry). While having higher margins (and rates) may save an individual company from future financial concerns, higher rates may not improve the health of the emerging industry unless other companies in the market follow suit.

3.7.1 Examples From the LTCI Industry

Margins are especially important for LTCI, given the long-duration nature of the product, the number of assumptions and the period of time between policy issue and policy claim. Given the complexity of the product and the sensitivity to certain assumptions, relying on past experience alone to forecast the future may not capture potential changes in the environment that could occur over the life of the business.

Original pricing for early LTCI products was based on the best information available at the time; however, when the perfect storm of assumption deterioration occurred (historically low interest rates, lapse rates close to 0% and adverse morbidity), many companies exited the market. The margins that would have been needed to allow LTCI policies to weather the storm without requiring rate increases would have been extremely high and out of step with other lines of business. As the LTCI industry has evolved, so have the modeling techniques and assumption methodologies, as mentioned above. The more recently available techniques have facilitated a better understanding of the amount of variation (in assumptions and various cohorts of business), which allows actuaries to adjust margins accordingly.

3.7.2 Takeaways for Innovators

When developing an innovative product, it may be prudent to build margins that are substantially higher than those reflected in existing lines of business. Based on lessons learned from the LTCI industry, some additional considerations that can facilitate the development of reasonable margins include:

- Understanding the impact of assumptions on different cohorts and whether there are cohorts of business that are more or less profitable.
- Testing different sales mix assumptions to understand pressure points, particularly if some cohorts have lower margins than others.

- If practical, calculating a Probable Maximum Loss (which represents the maximum loss expected to be incurred in a worst-case scenario) to better understand the potential risk associated with the innovative product.
- Identifying where key assumptions fall within a reasonable range based on sensitivity and scenario testing and leveraging this information to establish margins.
- Considering and understanding the ability to hedge or otherwise mitigate risks. For example, risk may be mitigated via reinsurance arrangements. Alternatively, a company may issue smaller (or otherwise less risky) benefits as part of an initial product offering or “sit out” initially and re-evaluate their position once experience accumulates and/or the industry matures. In determining the desired approach, it is important to weigh both the opportunity and associated risk.
- Considering ways in which future experience could emerge differently from the past (due to environmental, social, political or other drivers). Stochastic modeling techniques could be leveraged to gain a better understanding of variability, though it is important to take caution in developing and using stochastic models due to their complexity.

3.8 REGULATORY RISK

Jurisdiction-specific requirements should be considered fluid because they can change based on the regulatory and/or political environment, revisions to applicable legislation, changes in department personnel and desk drawer rules imposed. Regulatory interpretations and restrictions can drive policy design and pricing considerations and can ultimately impact the financial performance of a product.

3.8.1 Examples From the LTCI Industry

Several regulations have been introduced that have impacted LTCI product design, pricing, in-force rate management and valuation. They include but are not limited to HIPAA, the National Association of Insurance Commissioners (NAIC) Long-Term Care Insurance Model Regulation (LTCI Model Regulation), and Actuarial Guideline 51 (AG 51).

- **HIPAA.** This legislation provided for favorable tax treatment of premiums and benefits for tax-qualified LTCI policies, assuming that certain product design requirements, primarily related to benefit eligibility, are met.
- **Rate Stability in the LTCI Model Regulation.** Introduced in the early 2000s, and adopted by most jurisdictions, this regulation focused on stabilizing rates and reducing the need for future premium rate increases. It requires actuaries to certify that LTCI premium rates are reasonably expected to be sufficient under moderately adverse conditions.
- **AG 51.** This guidance was enacted with the goal of increasing transparency in LTCI asset adequacy testing. Beginning with year-end 2017 reporting, AG 51 required many LTCI carriers to perform standalone LTCI asset adequacy testing, including submission of a dedicated LTCI memorandum and responses to supplemental questions related to in-force characteristics, projection assumptions, sensitivity testing, etc.

Regulatory interpretations can also impact LTCI product design and the financial performance of LTCI. The following are examples of areas where regulatory interpretation has impacted the LTCI industry:

- The definition of moderately adverse experience.
- How loss ratio is defined (lifetime versus historical).
- The level of rate increases that are allowable.
- Whether facility care is interpreted as including coverage for ALF care.

As the LTCI industry has evolved, so has the LTCI regulatory environment. LTCI carriers have adjusted their products (e.g., requiring a licensed health care practitioner to certify that impairment is expected to last at least 90 days as a condition for benefit eligibility) and assumptions (e.g., including explicit margins in pricing and reserving) to comply with changing requirements. To help mitigate regulatory risk, LTCI actuaries are working more closely with regulators to better understand their review approaches and anticipate their requests. Additionally, the NAIC has established an LTCI pricing subgroup as well as an LTCI executive committee task force. One of these groups' focuses is making LTCI rate reviews and approvals more uniform across jurisdictions.

3.8.2 Takeaways for Innovators

While it may be nearly impossible to predict when and how the regulatory environment and effective regulations will change during a product's life, it is likely that they will. Leveraging information learned by LTCI carriers, the following provides some key considerations for future innovators related to regulatory risk:

- Identify and consider how reasonable changes in applicable regulations may impact a new product.
- Research proposed changes, or recent revisions, in applicable regulations for insight into possible changes that could occur in the future.
- Work collaboratively with the commissioner in the company's state of domicile when developing an innovative product. This may provide the company with valuable perspective regarding how a regulator may perceive the risks associated with a new product. Scheduling 101-type sessions with regulators can go a long way toward creating mutual understanding.
- Flexible or bracketed contract language may allow a product to withstand certain regulatory changes. However, as mentioned above, it is important to avoid language that is ambiguous, because this introduces additional risk.

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Janet Perrie, Pricewaterhousecoopers LLP
Joe Wurzburger, SOA

For any questions or feedback, please contact any of the following:

- Robert Eaton at robert.eaton@milliman.com
- Tim Kempen at tim.kempen@milliman.com
- Stephanie Moench at stephanie.moench@milliman.com
- Amy Pahl at amy.pahl@milliman.com
- Al Schmitz at al.schmitz@milliman.com
- Joe Wurzburger at JWurzburger@soa.org

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Society of Actuaries
475 N. Martingale Road, Suite 600
Schaumburg, Illinois 60173
www.SOA.org