

Long-Term Care Risk: Past and Future

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Mission Statement of the SOA

Through education and research, the SOA advances actuaries as leaders in measuring and managing risk to improve financial outcomes for individuals, organizations, and the public.

(Emphasis added)

Types of Risk

- Process Risk: Natural variation around correctly understood risks with known distributions
 - e.g. risk a casino faces
 - Can be effectively eliminated through law of large numbers
- Parameter Risk: Risk that the parameters of your model are incorrect
 - Lapse, mortality, morbidity, interest is unknown
 - Even if you have good experience, future may not be the same as the past
- Model Risk: The model doesn't adequately reflect the real risk of the real world
 - Black swans

How to Model Risk

- Process Risk
 - Can be effectively modeled using Monte Carlo Simulation
 - In principle, simulation can show prediction intervals around any operational or financial metric
- Parameter Risk
 - Traditional approach: Credibility analysis
- Model Risk
 - Model should be reflect actual mechanics and risk of business as well as possible
 - Monte Carlo Simulation does this

Modern Ways of Modeling Parameter Risk

Confidence intervals around model parameters

- Beta Distribution
 - An incidence rate, for example, is a random variable in its own right, with a beta distribution
 - The parameters of the beta distribution are based on amount of experience
 - Beta distribution is shaped almost identically to likelihood function
 - Easy to parameterize
 - For real-world, complicated models, requires some artful application
- Futurology
 - Create a universe of scenarios
 - Each scenario should be equally likely
 - Scenarios should broadly cover universe of conceivable futures
 - Economic Scenario Generators broadly fit into this category
 - For LTC, scenarios should consider relationship between morbidity and mortality
 - Useful for comparing riskiness of product designs, investment strategies, etc.

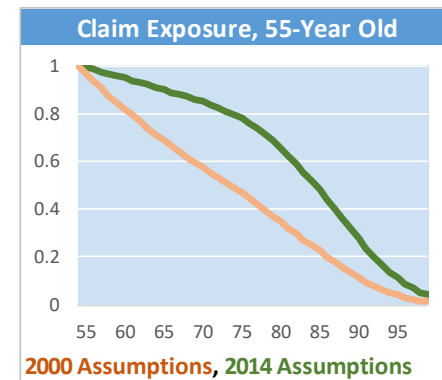
LTC Risk Profile

First, consider term-to-100

- Level premiums to age 100, fixed death benefit
- No cash value
- Lapse supported
- Extremely sensitive to lapse rates and interest rates
- Caused huge problems in Canada in 1990's when interest rates fell and lapses were lower than expected
- Sound familiar?

Current Issues

- Lapses:
 - Historically, biggest factor for mispriced products
 - Very limited downside risk prospectively
- Interest:
 - Assumptions continue to go down
 - Will they rebound?
 - Are they correlated with inflation and cost of care?



Current Issues

- Morbidity Improvements:
 - Eric Stallard demonstrated that on population as a whole, morbidity improved by 1% to 2% every year from 1984 to 2004
 - Does that apply to an insured population?
 - For how long, prospectively?
 - From what original morbidity level are they improving?
 - Is this correlated with mortality improvement?
 - Mortality improving is a bad thing
 - Morbidity improving is a good thing
 - Morbidity and mortality improving in tandem is a good thing
- In aggregate, new sales have big margins and are expected to be very profitable

Combo Products Are Hot

- Insurers are bullish with hybrid life/LTC products
- Modeling shows that life/LTC risks hedge against each other
- Life insurance benefit aligns incentives between insured and insurer
- Acceleration of Benefits policies offer limited LTC risk compared to size of life policy
- Adding an Extension of Benefits rider adds true LTC coverage
 - Can be thought of as a stand-alone LTC policy with a long EP
 - The death benefit of the life insurance policy funds care during the EP

Better Design for Standalone?

We use insurance leverage and prefunding to finance LTC benefits that likely won't be needed for 20+ years after issue

- Interest rates?
- Morbidity?
- Lapse?
- Mortality?

Adjustments must be made to hit target



Typical Claim Cost Pattern

Claim Costs run very low for a number of years, and then sharply increase

For first several years, most premiums are saved to pay future benefits

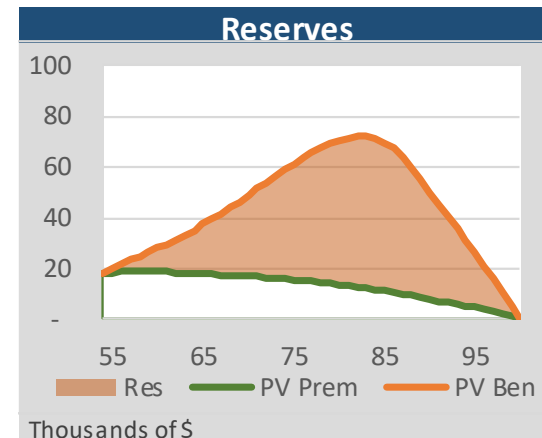
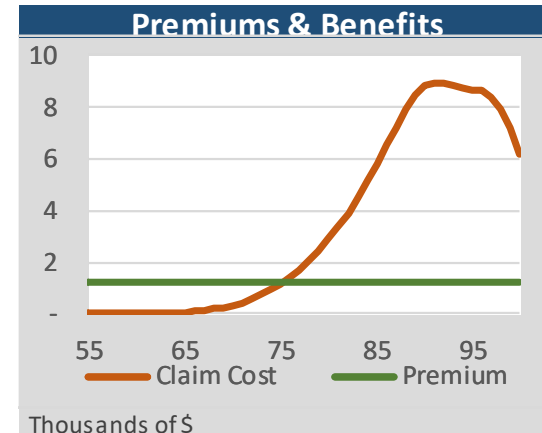
Reserve formula:

$$Res = PV \text{ Fut Benefit} - PV \text{ Fut Premium}$$

Money to pay future claims:

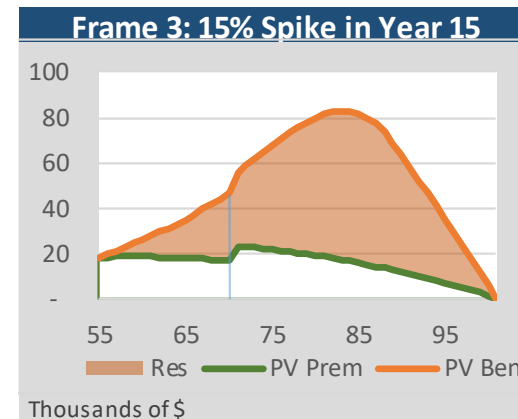
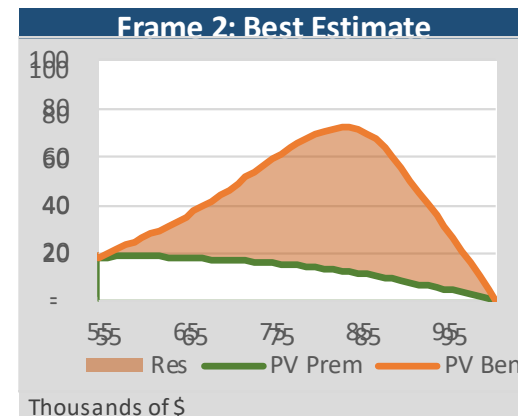
$$PV \text{ Fut Benefit} = Reserve + PV \text{ Fut Premium}$$

After 10 years, most of future claims funded by reserves, not future premium



Adjustment Needed

- Suppose that in year 15, we figure out claims will be 15% higher than expected
- With traditional LTC, only lever for adjustment is future premium
- At this point, most premium in past, but most claims in future
- 15% increase in claims means 38% increase in premium



Levers for Future Adjustments

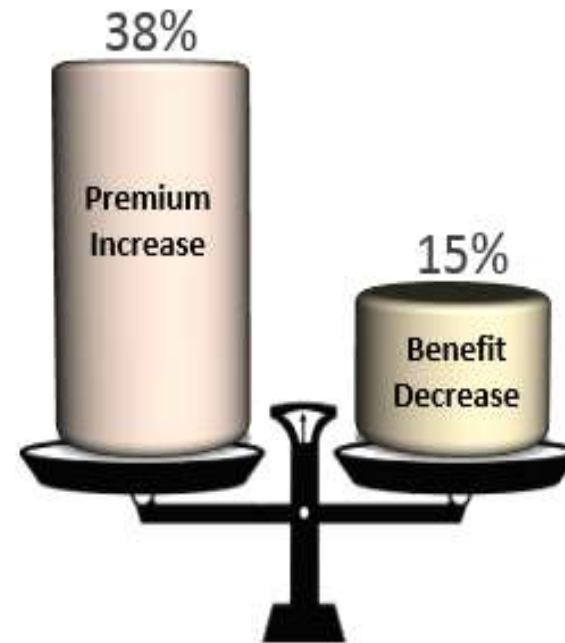
High margins from issue can mitigate need for unfavorable adjustments


But ability to make adjustments are always needed

Since premiums are front-loaded, are weak mechanism for future adjustments

Adjusting benefits has more leverage

If claims increased by 15%, would you rather have a 38% premium increase or a 15% benefit reduction?





“Looking back now, some executives say marketing policies on a ‘level premium’ basis also left insurers with a disastrously slim margin of error.

““We never should have done it, and the regulators never should have allowed it,’ Tomas McInerney, president and chief executive of Genworth Financial Inc. since 2013, says of the pricing strategy. ‘That’s crazy.’”

-*Wall Street Journal*, January 17, 2018

Objective With Variable Benefit LTC

- Adjustments to benefits must be:
 - Transparent
 - Objectively calculated
 - Guarantee that most premiums paid accumulated with interest are in fact used to pay benefits
 - Achieve strong insurance leverage
 - Fair

See Contingencies Jan/Feb 2018 for More Details

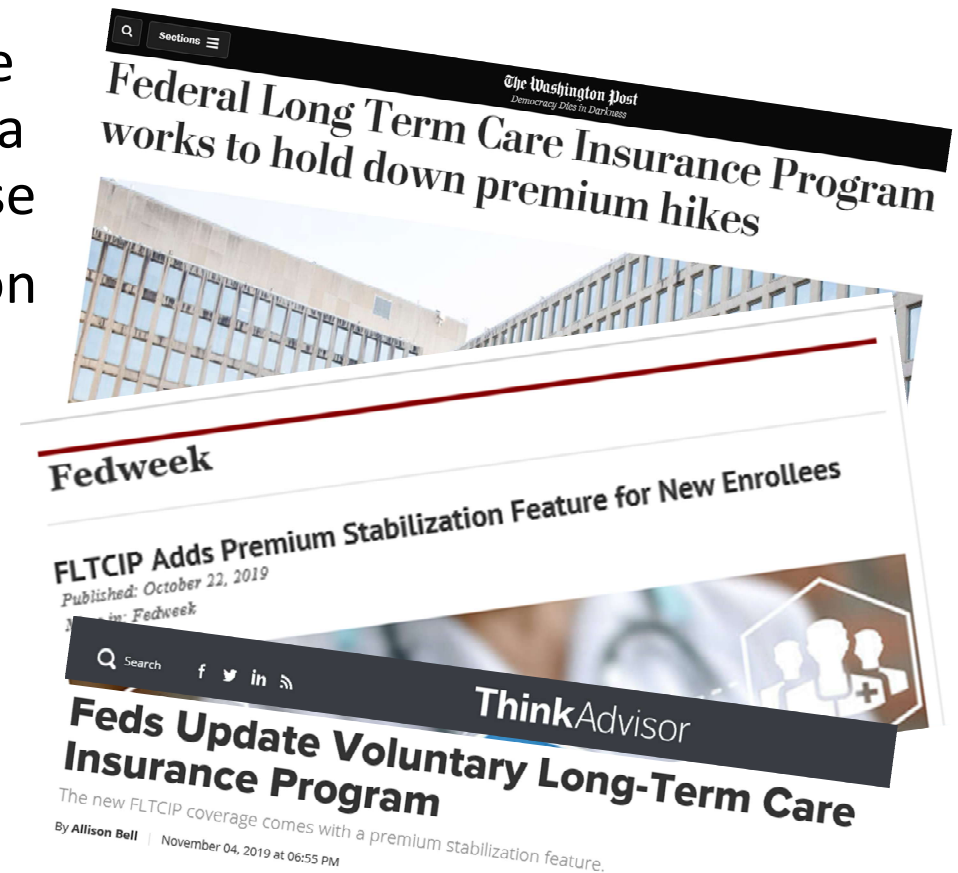
The Case for Variable Long- Term Care Insurance

by Paul E. Forte and
Roger D. Loomis



FLTCIP's New Premium Stabilization Feature

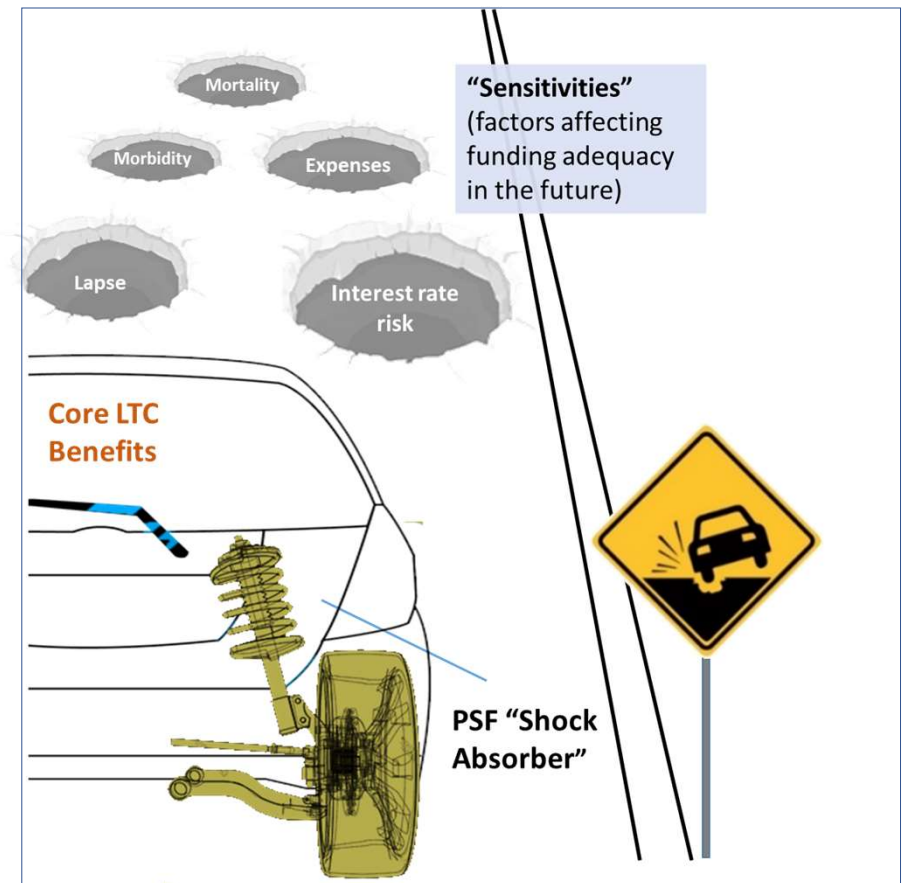
- In 2019 the Federal Long Term Care Insurance Program (FLTCIP) added a feature to lower risk of rate increase
- It is called the Premium Stabilization Feature
- Essentially a variable Return of Premium benefit



The New Concept: Premium Stabilization Feature

Premium Stabilization Feature (PSF)

- Additional margin built into premium at purchase
- PSF amount is tracked and can vary over time (up or down) based on actual and projected experience of program as a whole
- PSF can be used in up to three ways



How PSF Will Be Used

Premium Stability

- The PSF will be used to avoid or reduce premium increases that would otherwise be needed in the event of adverse experience or modified actuarial assumptions.
- In such cases, the **PSF Percentage** (and therefore the **PSF Amount** for each enrollee) will be automatically reduced on a group basis, rather than increasing premiums or offering options to reduce benefits.

Focus group quotes

- Referring to previous rate increase:
 - *"It was supposed to be your premium forever, at least that was implied"*
 - *"Premiums increased, skyrocketed, and now [enrollees are] stuck between a rock and a hard place."*
- *"I would much rather pay extra up front [than be surprised later]."*

Additional PSF Benefit Provisions

1. Refund of Premium Death Benefit

If coverage is in force on the date of death, a refund of premium death benefit may be payable.

- The PSF amount available will be paid as a refund of premium death benefit to the enrollee's estate or a designated beneficiary.
- The refund of premium death benefit will be based on the PSF percentage in effect on the enrollee's date of death and will be reduced by benefits paid*.

2. Premium Offset

The PSF amount can be used to pay for half of the enrollee's monthly premium obligation when they have met the following conditions:

1. Attained the age of 85
2. Enrolled for at least 10 years
3. Have sufficient PSF amount available to pay half of the monthly premiums for at least the next 12 months based on current premium

Focus group quotes

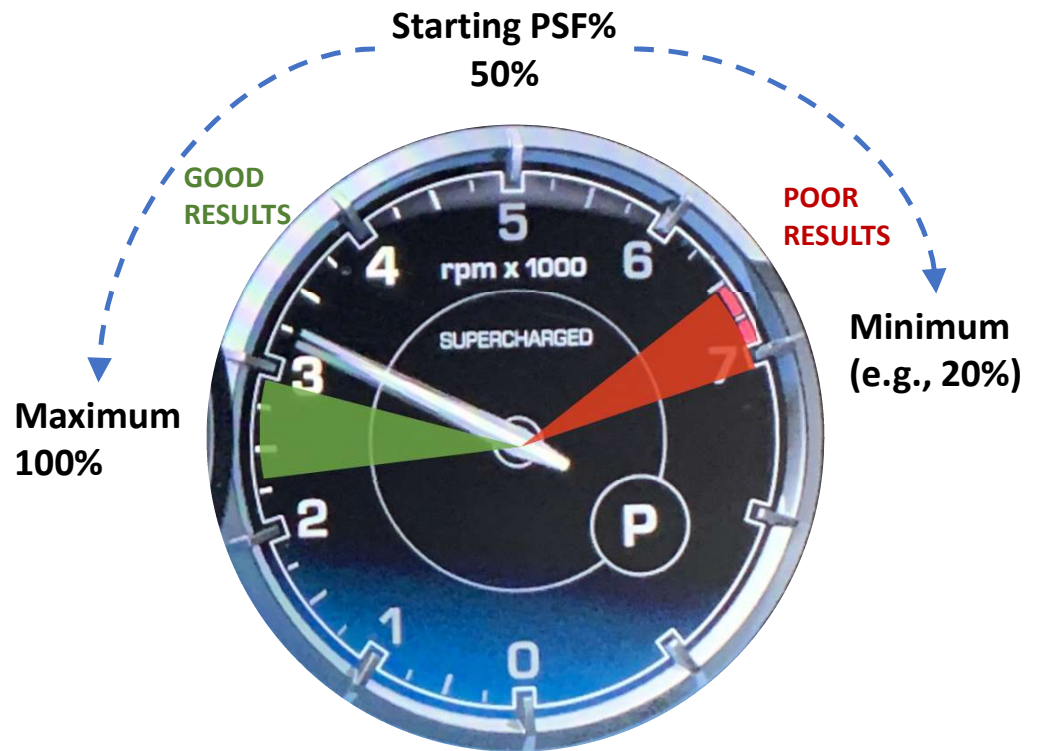
- *"You pay in, what if you don't need it?"*
- *"Return is a good way of making the program fair."*
- *"If I don't need LTC...it will go back to my family, it won't just go down the tubes"*
- *"Could there be an alternative for those without beneficiaries?"*

*Benefits paid means benefits for claims paid and premium offset used.

How Variability in the PSF Concept Works: the PSF Percentage

- Starting value for PSF percentage is pre-determined by insurer
- Adequacy is monitored over time. PSF percentage may be adjusted by insurer periodically, depending on actual and projected experience
 - Provides insurer the ability to make earlier and more frequent “course corrections”
- Adjustments can be graded in
- PSF percentage remains uniform for all policies within cohort
- Transparency: insured is notified of any changes to the PSF percentage

The PSF percentage: a variable feature



Calculating the PSF Amount

PSF Amount

The portion of premium available as the enrollee's PSF amount is equal to:

$$\left(\begin{array}{l} \text{Total premium} \\ \text{paid on policy} \end{array} \times \begin{array}{l} \text{Current PSF} \\ \text{percentage} \end{array} \right) - \begin{array}{l} \text{Benefits} \\ \text{paid and} \\ \text{premium} \\ \text{offset used} \end{array} = \begin{array}{l} \text{Current} \\ \text{PSF} \\ \text{amount} \end{array}$$

Note:

The PSF Amount:

- Has no cash surrender value or monetary value
- Is not a dividend

Leverage of Variable Benefit Designs

Future benefits are funded by two things:

- A. Future premiums, accumulated with future interest
- B. Current reserves, accumulated with future interest

As a policy ages, the primary source of future benefits quickly changes from A to B

Rate increases only affect A

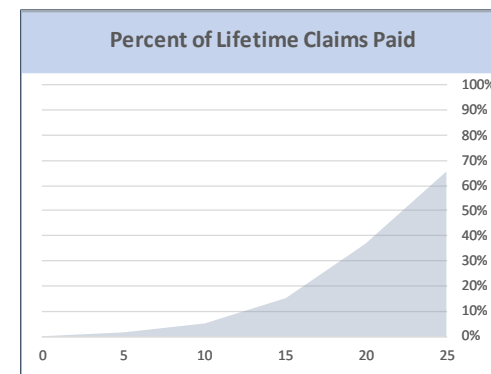
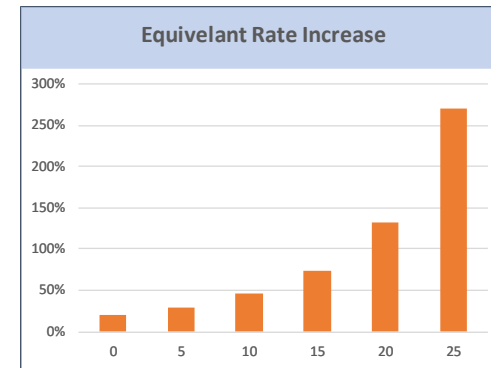
This mechanism amplifies the size of rate increases rather than dampening the size

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Margin Strong Lever Against Rate Increases

Year	20% Margin at Issue Equivalent to Following Rate Increases	Percent of Lifetime Claims Incurred Before Each Future Duration
0	20%	0%
5	30%	2%
10	46%	5%
15	74%	15%
20	132%	37%
25	269%	66%



Mutual Company Philosophy

- The company's surplus is an endowment for the benefit of current and future policyholders
- Policies include margin commensurate with product's inherent riskiness
- As cohort ages, margin accumulates in surplus
- As cohort's accumulated surplus grows and the risk resolves itself, return most of margin with interest to policyholders in the form of dividends
- Remaining accumulated margin remains in surplus for the benefit of future policyholders
- Dividends are a *variable benefit*
- Margin is really the value of the expected dividends

What About Benefit Reductions?

- Do traditional LTCI designs already have *de facto* variable benefits because rate increases already include benefit reduction options?
- Yes and no: Biggest differences:
 - Benefit reductions only ratchet *down* benefits
 - Upside isn't shared with policyholders
 - Non-automatic and less nimble
 - Traditional plans require higher margins
 - Getting rate increases approved isn't easy or guaranteed



Analyzing Risk of Variable Benefits

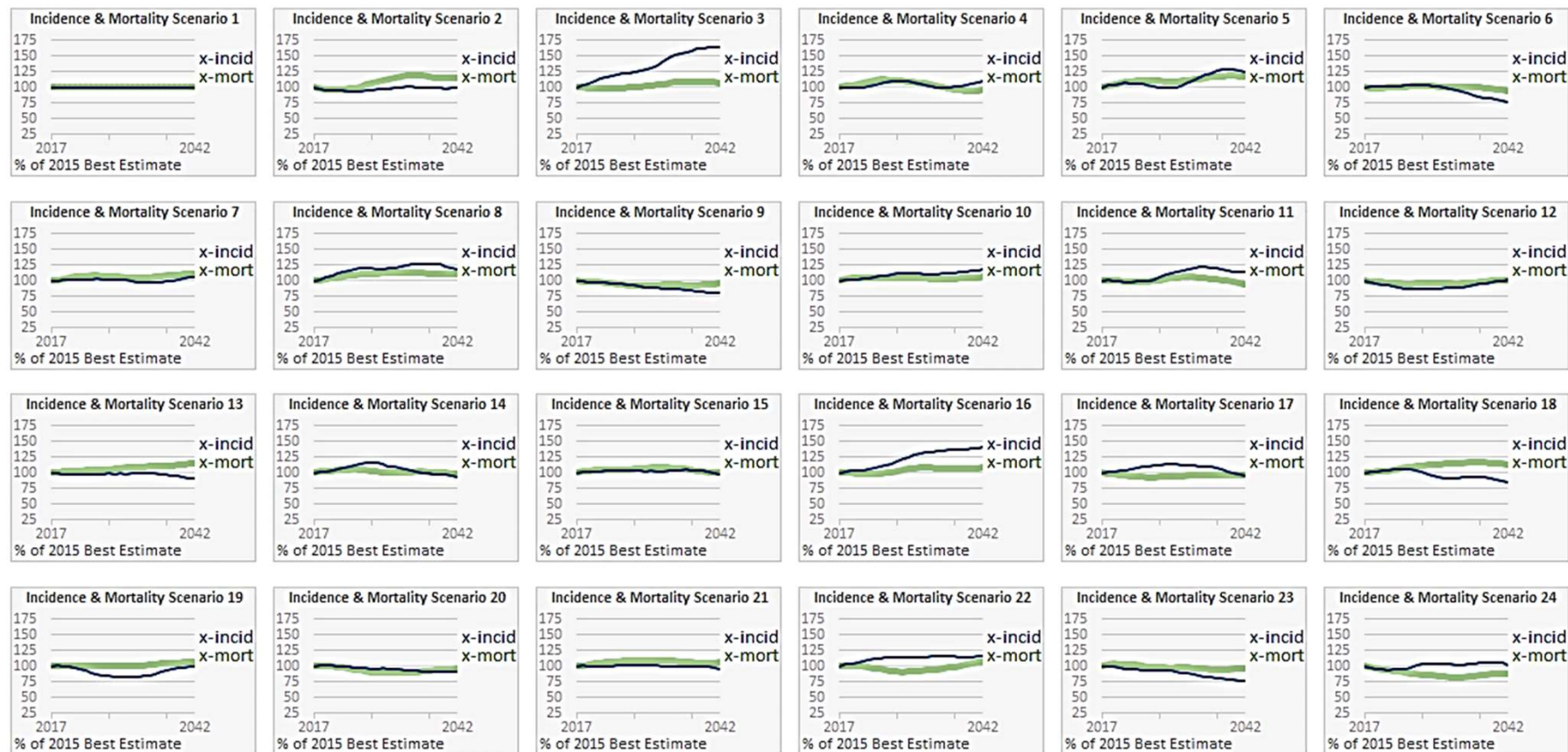
Steps of Analysis

- Create a comprehensive universe of equally likely morbidity, mortality, and economic scenarios
- Create a cohort of policyholders to model
- Model the emerging experience without 20/20 foresight. Emerging experience gives a clue about the future, but isn't definitive
- Dynamically implement rate increases and benefit reductions according to trigger criteria
- Compare performance of multiple plan designs

Creating Sample Scenarios

- Look for a wide variety of scenarios, but with many scenarios similar to past experience
- Loose correlation between mortality and morbidity
- Moderately strong auto-regressive patterns—morbidity and mortality of year x is highly correlated with morbidity and mortality of year $x - 1$
- Universe of patterns looks reasonable
- Benchmark results look reasonable

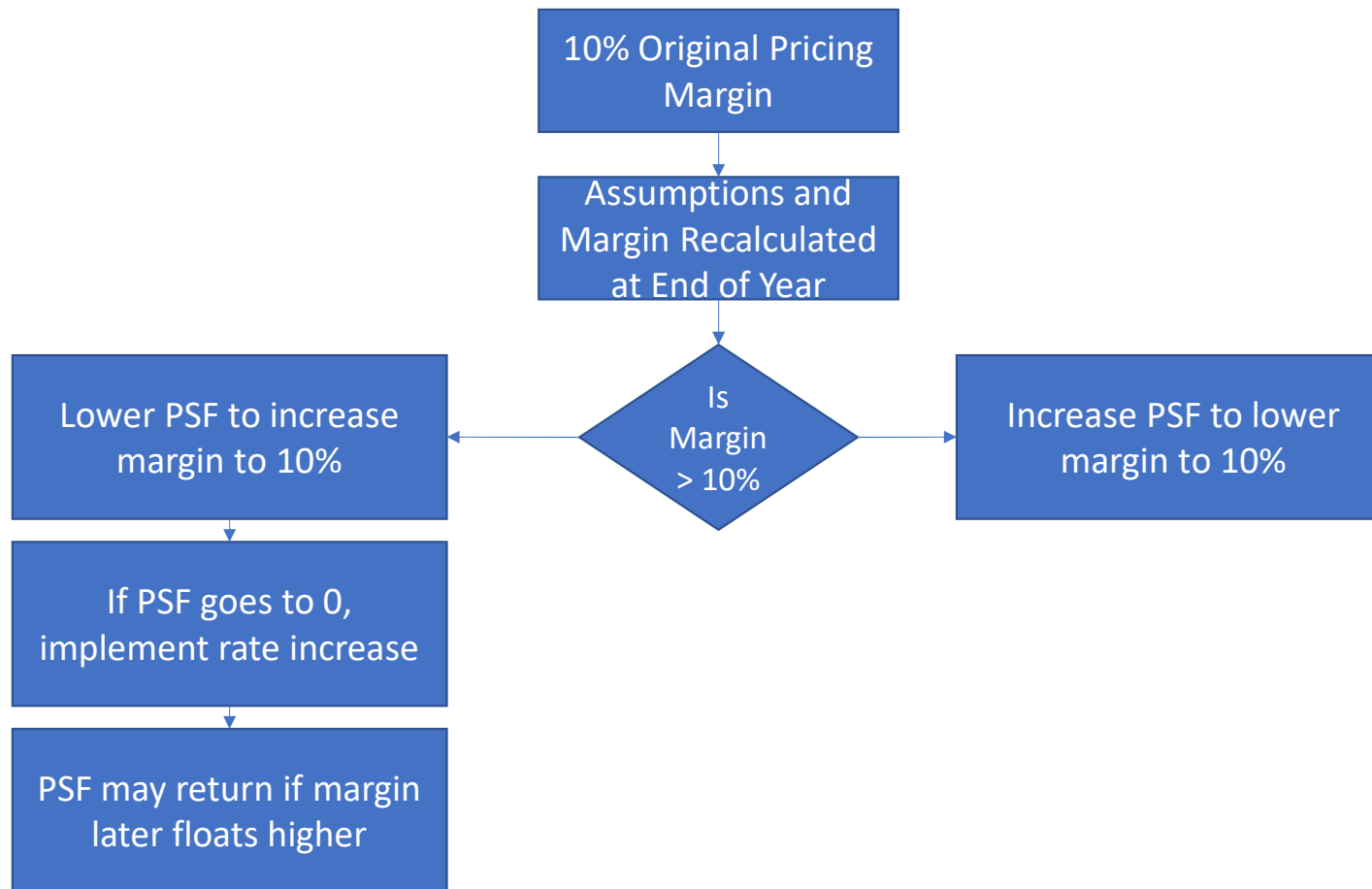
Scenario Examples



Benchmark Result

- Benchmark: traditional LTC plan
- 10% initial pricing margin
- If margin falls below 0%, a rate increase is triggered to bring margin back up to 10%
- 35% of scenarios required at least one rate increase
 - Half less than 20% in aggregate
 - Half between 20% and 60%
 - This is driven by the chosen scenarios

PSF Mechanics



In Aggregate

- Only 3% of scenarios with PSF required a rate increase (compared to 35% for traditional)
- 90% of scenarios had PSF benefit of at least 65% after 25 years
- Takeaway:
 - PSF dramatically lowers probability of rate increases
 - Reduces the need for margins
 - Provides upside benefits to policyholders
 - Richer benefits to policyholders
 - Lower risk to insurer

Questions?

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