Principles-Based Reserving for Health Insurers

Amy Pahl, FSA, MAAA; Milliman, Inc.
John K. Heins, FSA, MAAA; PolySystems, Inc.

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Session Outline

- Principles-Based System Introduction
  - State Long Term Care Principles-Based Work Group
  - State Health Principles-Based Work Group
- Recent work of the LTCPBWG
  - Issues Subgroup
  - Technical Subgroup
Principles-Based System
Introduction
Long Term Care Products

- LTC is the Academy’s starting focal point for the Healthcare Insurance Industry - LTCPBWG

- A second committee was formed this year to address all other health lines - HPBWG
Principles-Based System

Introduction

Current Valuation & Accounting Bases

Current Valuation Bases
- Standard Valuation Law
- Health Insurance Reserve Model Regulation
- Health Reserve Guidance Manual

Current Statutory Accounting Bases
- AP&P Manual, SSAP #54 & SSAP #55
- AP&P Manual, primarily Appendix A-010
- AP&P Manual, primarily Appendix A-641

LTC Statutory Reserves Must Meet:
- Minimum Statutory Reserve Standards
- Gross Premium Valuation Testing
- Asset Adequacy Test
Principles-Based System
Introduction
Current Valuation of LTC Policies

Before Claim
(Active Life Reserves)
- One-Year Preliminary Term Method (Generally)
- Defined Mortality Tables
- Limitations on Lapses and Interest Rates
- No Prescribed Morbidity Table

After Claim
(Claim Reserves)
- PV Future Payments
- Include Incurred But Not Reported Claims
- Interest Rates by Incurred Year
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Introduction

Reasons for Change

- Current Statutory Standards include “lock-in”
  - May not capture all risks
  - Over/understate reserves and capital
- Value of consistency with PBR within companies and with GAAP
  - Coordination with the IASB and FASB
Principles-Based System
Introduction
The Principles

- As developed by AAA for LHATF
- June 3, 2007 NAIC exposure draft of overarching principles
  - Principles-based reserving framework
  - Reserve liabilities
  - Capital adequacy
  - Corporate governance
  - Disclosure & financial examinations
Principles-Based System

Introduction

Statements Defining PBA – for L Hatf

1. Reserves reflect all material risks
2. Utilizes risk analysis & risk management techniques
3. Incorporates assumptions & methods consistent with company’s overall risk assessment process
4. Use of company experience
5. Assumptions based on prudent estimate
6. Reflects risk in calculation of reserves and capital
Principles-Based System

Introduction

LTC Risk Characteristics

- Lapse Rates
- Morbidity
  - Incidence/severity
  - Claim variability
- Mortality
- Interest Rates & Economic Environment
- Movement among status categories
Principles-Based System

Introduction

Key Concerns for LTC

- Reflection of rate increases in future cash flows under stochastic scenarios
- Changing marketplace & government programs’ impact on assumptions, products
- Margin in rates vs. margin in reserves
- Limited experience
- Anticipated limits on interest rate assumptions
LTCPBWG
Issues Subgroup

- Chair: John Timmerberg
- Identify and address PBS Issues for LTC
- Monitor and support PBS development in life/annuity products
- Monitor international developments
LTCPBWG Issues Subgroup
Discussions to Date

- Defining risk margins
  - What level
  - Variability by business
- Investigating statistical distributions of claims
- Monitoring efforts relating to data availability for morbidity table
- Developed outline of modeling issues
LTCPBWG Issues Subgroup
Issues to Address in Stochastic Model

- Premium rate changes
  - Unscheduled vs. planned
- Timing
  - Trigger point
  - Reaction time
  - Effectiveness
- Policyholder behavior
LTCPBWG Issues Subgroup

Issues to Address in Stochastic Model

- Interest Rate Scenarios
  - Traditional impacts
  - Impact on policyholder behavior
LTCPBWG Issues Subgroup
Issues to Address in Stochastic Model

- Unanticipated changes in morbidity or benefit utilization
  - Shift in claim cost curve
  - Examples
LTCPBWG Issues Subgroup
Issues to Address in Stochastic Model

- Regulatory Intervention
  - Examples
  - Retroactive application
LTCPBWG Issues Subgroup
Issues to Address in Stochastic Model

- Morbidity and/or mortality improvement?
  - Measurable “population” impact
  - Treatment breakthroughs
  - Exist in isolation?
Health PB Work Group

- Chair: Shari Westerfield
- Purpose
- Discussion Items to date
  - Health Reserves Guidance Manual
  - Commenting on Principles
Recent Work of the LTCPBWG
Technical Subgroup

John K. Heins, FSA, MAAA
PolySystems, Inc
LTCPBWG
Technical Subgroup

- Chair: Al Schmitz, Milliman
- Specify Model Requirements
- Design, Develop and Test Model
- Analyze Results
- Monitor and Support LRWG and LRWG Modeling Subgroup
- Coordinate with SVL2 Economic Scenario Group
Consider potential management action

Ease of ability to program the multi-stochastic-variable LTC product lines

How much variance is acceptable?

# of trials to run to establish the proper reserve and capital levels
LTCPBWG Technical Subgroup
Modeling Stage

- Non-Excel models not viable
  - confidentiality issues
  - portability

- Launching pad: Excel-based Cash Flow projection model developed by Jim Robinson, independent consultant

- Must consider business segmentation
Method 1 – Random Walk on each Policy

Generate a random number to test each policy’s probability of a change in status, duration by duration
LTCPBWG Technical Subgroup
Modeling Stage – Method 2

Method 2 – Random Walk by Duration

- Generate the book of business at a specific point in time
- Generally the same as method 1, but better suited to management action considerations
Method 3 - Stochastic Simulation by Database Lookup

- Every Possible Random Walk is Generated and placed into a table
- Generate the book of business at all points in time based on a random number generator data lookup from the table
- Method effectively eliminated from consideration due to run time and data storage considerations
Method 4 – Waiting Time Model

- Developed by Eric Stallard, Research Professor, Duke University

- Generate two random numbers
  - The first determines the time of the next change in status
  - The second determines what the status change is
Method 4 – Waiting Time Model

- Relies on the hazard rate function:

\[ H_{x+t} = -\log p^r_k \]

\[ k \]

\[ x+t \]

- Assuming independent probabilities,

Total Hazard Rate = \( \sum \) Individual Hazard Rates
Results provide a cash flow projection for each policy

May permit use of fewer trials to establish statistical significance of results

Point-in-time analysis is possible for management action
Interpolation used to choose the exact point of occurrence within the random period generated.

Assets and Yield Rates must be chosen since PBS requires Asset Cash Flow net of Liability Cash Flow.

Survival at valuation date x is normalized to that date from the issue date x-n.

Change in assumptions required for policies that have been on claim?
Method 1 & Method 2 to be used as corroboration for Method 4 results

Method 3 seems overly time-intensive and space-intensive and not a viable option
LTCPB Work Group

Next Steps

- Development of a Standard Morbidity Table to assist companies with small blocks of LTC business -- Issues Group
- Model 4 runs, timing and checking with Model 1 and/or Model 2, discussion of results, findings documentation – Technical Group
Questions/Discussion