

LONGEVITY RISK TASK FORCE UPDATE

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Presentation to the NAIC's Life Risk Based Capital Working Group

Agenda

- Overview
- Work since April meeting
 - ▣ Additional analysis of data
 - ▣ Specifications for field study
 - ▣ Risks to be included
- Next steps
- Appendix – Refresher from prior presentation



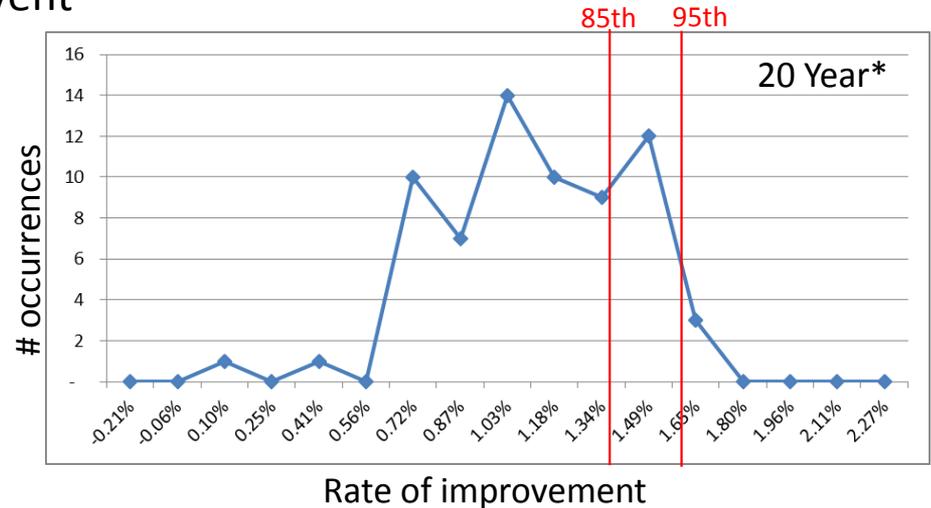
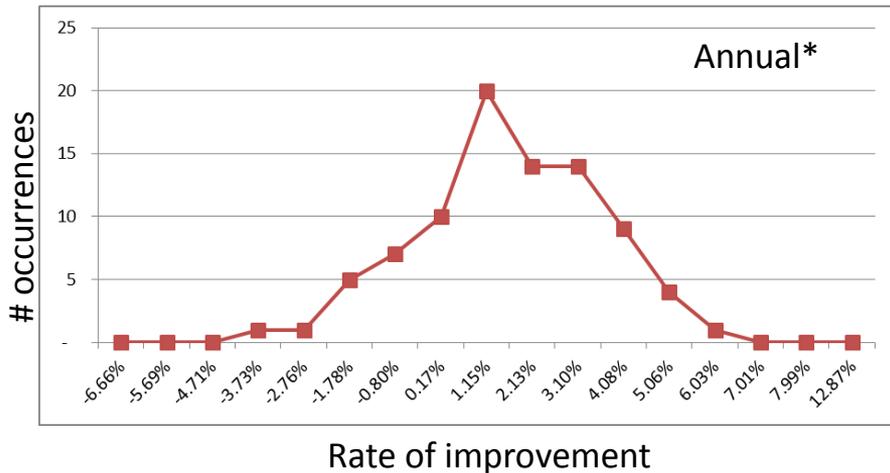
Overview

- April presentation provided an overview of the LRTF's analysis of historical mortality improvement data to derive a 95th percentile improvement stress event
 - LRTF considered both direct use of the underlying data as well as use of an assumed normal distribution
 - Overall calibration using normal model results in a 25% shock (165% at 95th less 140% at 85th). The shock for older ages (85+) would be 50%
 - LRTF performing additional work to determine which approach is most appropriate
- Work since April includes:
 - Further evaluation of the historical data
 - Development of specifications for a field study
 - Re-evaluation of which risks should be included in the RBC charge



Distribution of Mortality Improvement Data

Below is the distribution of annual and 20-year mortality improvement data from 1940-2013 used to develop the shock event



*Annual is improvement over historical one year periods

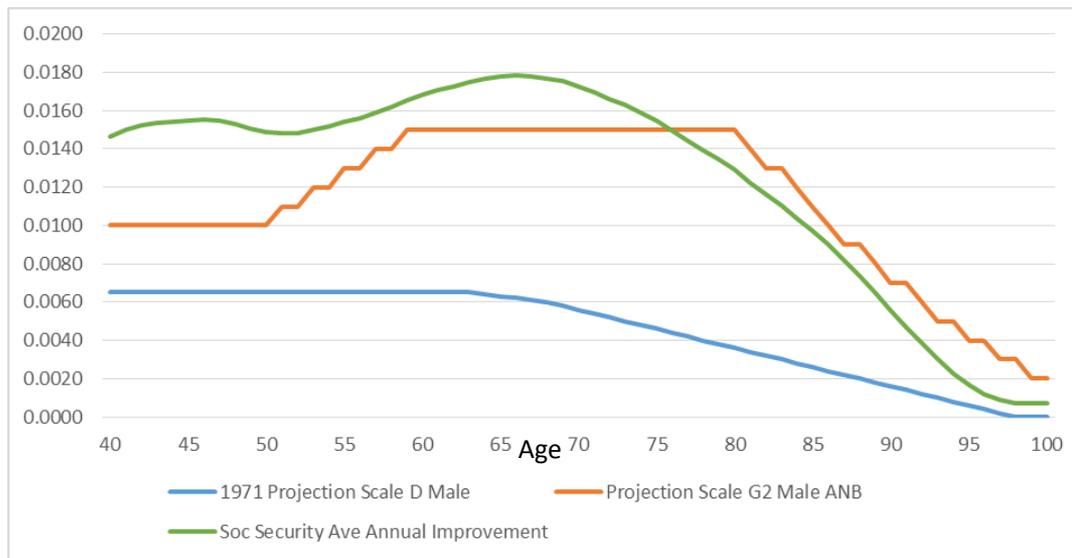
*20 year is improvement over historical 20 year periods, converted to an annual rate



Backtesting

We also compared certain improvement scales to social security-average improvement from actual historical data (1971 to 2013). The original scale developed in 1971 was clearly insufficient relative to experience now available. Scale G2, at least at retirement ages, is aligned with the social security data we evaluated

Rate of improvement



Field Study

- LRTF suggests that the NAIC Longevity Risk Subgroup (LRSG) conduct a study to evaluate results of applying the agreed upon approach to actual company blocks of business
- LRTF developed instructions and a template to be completed to enable LRSG to conduct a field study on individual and group annuities
- Pending determination of stress event to be evaluated



Field Study Details

Request Dec. 31, 2016 statutory reserve amounts calculated on the following 2 assumption bases, under a range of valuation interest rate, issue age, duration since issue, and gender combinations:

Run A – 2016 CARVM Valuation Basis (assumed to be 85th %ile)

- CARVM methodology
- 2012 IAM Table (1994 GAR for Group business)
- Projection Scale G2 (Projection Scale AA for Group business)

Run B – 95th Percentile Stress

- CARVM methodology
- 2012 IAM Table (1994 GAR for Group business)
- Projection Scale G2 (Projection Scale AA for Group business), all improvement factors adjusted for our defined stress event



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Risks To Be Included

- ❑ Previously determined that focus should be on trend risk only (mortality improvement)
- ❑ However, current reserve basis (2012 IAM) appears to only include a margin for basis risk (risk that actual company mortality varies from the table)
- ❑ Considerations for longevity charge:
 - ❑ Should RBC charge for longevity risk include both?
 - ❑ Should reserve basis include margin for trend risk?



Immediate Next Steps

- ❑ Determine whether to include basis risk
- ❑ Develop recommendation for stress event
- ❑ Finalize specifications for field study
- ❑ Support LRSG with field study
- ❑ Continue to evaluate approach for a potential RBC charge for lifetime income benefits



Appendix

Refresher on Prior Update



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Refresher - Approach

- Statutory reserves are generally held at the 85th percentile level
 - Tabular plus any additional reserves from asset adequacy analysis
 - Capital requirements are established under the assumption that statutory reserves are adequate; RBC is not a balance sheet item and is not intended to make up for shortfalls in reserves
- RBC factors generally cover risks in excess of reserves up to a 95th percentile event
 - The longevity risk stress event is defined at the 1/20 mortality improvement level, using a 5-10 year time period
 - Mortality improvements up to the 85th percentile are assumed to be covered in reserves
- RBC charge will be based on difference between “current” Statutory reserve and Statutory reserve calculated under a longevity stress



Refresher – Determining Tail Event

- ❑ LRTF analyzed historical population data over the period 1900-2013 using Social Security population data
- ❑ Calculated 1, 5, 10, 20, and 40 year rates of improvement by age bucket and gender
- ❑ Fit historical improvement data to a normal distribution to evaluate use of a normal model
- ❑ Developed a 95th %ile improvement event, focused on the 20-year historical period (which is conservative vs current RBC's typical 5-10 year horizon)
- ❑ Evaluated difference between 95th %ile and 85th %ile for use in RBC



Refresher – Risks Covered

- Longevity risk comprised of:
 - Base table mis-estimation risk (or “basis risk”)
 - Trend risk (i.e., mortality improvement)
 - Short-term mortality volatility risk
- LRTF has been focusing on trend risk only
 - Base table mis-estimation; very difficult to separate mis-estimation risk from trend risk in historical data
 - Short-term volatility risk will have a small financial impact on longevity products



For more information

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