Mortality Improvement Scale Methodology AG38 and VM20

SOA Preferred Mortality Oversight Group ("Joint Committee") and Life Mortality Improvements Subgroup ("LMIS")
Agenda

- Purpose of Individual Life Mortality Improvement (MI) Recommended Scale
- Current methodology for annual recommendations
- Application of recommended scale
- Next steps
Purpose of the Individual Life MI Recommended Scale

- Used in conjunction with AG38 and VM20 reserve development
- Updated each year to account for an additional year of mortality improvement
- Applied to improve Valuation Basic Table mortality from the table date (e.g., 2015 for the 2015 VBT) to current valuation date
Current methodology for annual recommendations

- In use since year-end 2013 for AG38
- Approach is consistent with development process for the MI scale used in the 2015 VBT and 2017 Commissioners Standard Ordinary table development work
Current Methodology for annual recommendations

- **Historical Data**
  - Most recent relevant historical MI data (10 years)
  - Age and gender-based data
  - Use of long-term consistent source of population data (Social Security Administration (SSA))

- **Forecasted Expectations**
  - Most recent forecast of future improvements over future period (20 years)
  - Age and gender-based data
  - Consistent with historical data and projections available through SSA publication of annual Trustees Report (Alt 2)

- **Unsmoothed MI Scale**
  - Weighted average of historical data and forecasted expectations
  - Average of historical data and forecasted expectations

- **Smoothed MI Scale**
  - With smoothing process applied
Limitations of current scale

- One-dimensional (age/gender only)
- Basis risk due to use of population data
- Not intended for long-term projections
## Mortality Improvement Scales for US Insured Mortality Tables

Varies by use and product but none use actual insured data.

<table>
<thead>
<tr>
<th>Scale</th>
<th>Use</th>
<th>Last updated</th>
<th>Use Period</th>
<th>Underlying Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annuity/Retirement</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MP-2019</td>
<td>Pension</td>
<td>2019</td>
<td>2014+</td>
<td>SSA with assumed LTR = 1.0%</td>
</tr>
<tr>
<td>Life</td>
<td>AG38-MI</td>
<td>2019**</td>
<td>2013+</td>
<td>SSA actual + SSA (Alt. II)</td>
</tr>
<tr>
<td>MI-2017</td>
<td>Canadian projections</td>
<td>2017</td>
<td>2017+</td>
<td>HMD (1967-2011) + OAS (2005-2015); graduated to long term rate over 10-20 years; LTR varies between 0% and 1%</td>
</tr>
</tbody>
</table>
Current methodology considerations

1. Strive to limit volatility in year-to-year recommendations unless warranted by emerging trends
2. Provide for a repeatable and data-based methodology with minimal actuarial judgement
Next Steps
Develop a consistent framework for producing MI scales

- **Objective:** Develop a common tool, which would be made available to SOA members, to be used by practitioners from individual life, individual and group annuity, and pension/retirement (Target: 2020)
  - Tool, currently in development, will use 2-dimensional approach
  - Similar to CMI and RPEC MP table development, with some modifications
  - For life tables, intent is to use gender specific SSA data for the US population and SOA non-smoker and smoker experience with consideration to eventually allow users to input their own data
  - Will allow practitioner decisioning to convergence period
  - Requires significant testing from multiple practitioners across practice areas
Suggested Next Steps

• Revise prescribed methodology to remove any material actuarial judgement – Develop a threshold level of change to indicate update to the scale in any given year (timeline: for 2020 scale update)

• Include a description of the methodology used each year to updated the life MI scale in the current valuation manual (timeline: TBD)

• Scale updates would be made each year without required formal approval by LATF as long as no changes are made to the prescribed methodology (next change: expected only after recommended MI framework is released by SOA Mortality and Longevity Steering Committee)
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