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- **Do not** discuss what you or other entities plan to do in a particular geographic or product markets or with particular customers.
- **Do not** speak on behalf of the SOA or any of its committees unless specifically authorized to do so.
- **Do** leave a meeting where any anticompetitive pricing or market allocation discussion occurs.
- **Do** alert SOA staff and/or legal counsel to any concerning discussions.
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U.S. Post Level Term
Survey and Experience Study Results

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October 26, 2020
AGENDA

- Data Cleaning
  - Survey Results
  - Size and Scope of Study
  - Lapse Experience Results
  - Mortality Deterioration Results
  - More PLT Analysis Coming Soon!
Post Level Term Experience Reporting: Common Data Pitfalls.

Four of the most common data issues that will slip passed a contributor’s internal review:

1. Grace Period
2. Premium Mode
3. End of Level Term Premium Jumps
4. Lapses occurring on anniversary date.
Grace Period

- The Concern: When a policy lapses the correct termination date is the paid to date, not the end of the grace period.

- When termination dates are reported as the end of the grace period:
  - Terminations can be recorded in the incorrect policy duration (if they lapse near the end of the policy year).
  - Exposures are overstated because policies are in-force longer.

- Validation: Incorrect treatment of grace period can be easy to miss because the overall distribution of terminations still looks reasonable. Our solution was to compare distribution of lapses by month of lapse (# months since last anniversary) with Premium Mode.
Premium Mode

- Concern: It is common for the premium mode of a policy to be updated upon non-payment of premium. The termination is then reported under the new premium mode and not the true premium mode the policy operated with.

- This drives lapse rates up in the newly assigned premium mode, and lapse rates down in the true premium mode.

- The impact is substantial and relatively easy to catch

- Validation: Review lapse rates by premium mode. Two common appearances: changes in modal period, and switches from auto pay to manual billing.

<table>
<thead>
<tr>
<th>Example 1: Switch to Quarterly</th>
<th>Example 2: Manual Bill Sent on Non-payment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Premium Mode</strong></td>
<td><strong>Premium Mode</strong></td>
</tr>
<tr>
<td>Policies Exposed</td>
<td>Policies Exposed</td>
</tr>
<tr>
<td>Lapse Rate</td>
<td>Lapse Rate</td>
</tr>
<tr>
<td>Annual</td>
<td>Annual</td>
</tr>
<tr>
<td>13,809.0</td>
<td>21,759.6</td>
</tr>
<tr>
<td>2.0%</td>
<td>1.3%</td>
</tr>
<tr>
<td>Semi-Annual</td>
<td>Semi-Annual</td>
</tr>
<tr>
<td>11,821.0</td>
<td>1,859.7</td>
</tr>
<tr>
<td>2.4%</td>
<td>4.7%</td>
</tr>
<tr>
<td>Quarterly</td>
<td>Quarterly</td>
</tr>
<tr>
<td>17,285.0</td>
<td>19,097.7</td>
</tr>
<tr>
<td>16.7%</td>
<td>4.6%</td>
</tr>
<tr>
<td>2,159.0</td>
<td>470.3</td>
</tr>
<tr>
<td>7.2%</td>
<td>36.3%</td>
</tr>
<tr>
<td>Monthly (Auto Pay)</td>
<td>Monthly (Auto Pay)</td>
</tr>
<tr>
<td>3,761.0</td>
<td>21,630.0</td>
</tr>
<tr>
<td>1.5%</td>
<td>1.1%</td>
</tr>
<tr>
<td>Other/Unknown</td>
<td>Other/Unknown</td>
</tr>
<tr>
<td>8,029.0</td>
<td>1,831.1</td>
</tr>
<tr>
<td>3.9%</td>
<td>5.3%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>Total</strong></td>
</tr>
<tr>
<td>56,864.0</td>
<td>66,648.4</td>
</tr>
<tr>
<td>3.6%</td>
<td>1.8%</td>
</tr>
</tbody>
</table>
End of Level Term Premium Jumps

- Concern: When a policy lapses at the end the level term period the new, increased, premium is not reported. The result is limited premium jump info for lapses.

- This can cause understated shock lapse when looking at results by premium jump ratio. In force policies have the necessary premium information, but the lapses do not.

- Validation: End of level term shock-lapse and volume of business by premium jump ratio.

<table>
<thead>
<tr>
<th>Premium Jump</th>
<th>Policy Count</th>
<th>Lapse Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>N/A</td>
<td>37,368</td>
<td>37.0%</td>
</tr>
<tr>
<td>= 1.00x</td>
<td>25,764</td>
<td>57.3%</td>
</tr>
<tr>
<td>1.01x-2x</td>
<td>1,824</td>
<td>23.2%</td>
</tr>
<tr>
<td>2.01x-3x</td>
<td>9,907</td>
<td>26.4%</td>
</tr>
<tr>
<td>3.01x-4x</td>
<td>22,413</td>
<td>30.1%</td>
</tr>
<tr>
<td>4.01x-5x</td>
<td>27,713</td>
<td>24.6%</td>
</tr>
<tr>
<td>&gt; 5x</td>
<td>34,217</td>
<td>39.7%</td>
</tr>
</tbody>
</table>
Lapses occurring on Anniversary Date

- Concern: When a policy lapses at the end of the level term period, the termination date is submitted as the policy anniversary date. This causes the termination to occur in the first duration of the PLT period rather than the last duration in the LT period.

- Therefore apply a 1-day setback of termination dates for any policy that lapses on the anniversary date.

- Most companies have a similar practice for internal analysis, but the correction does not always make it in to the submitted data.

<table>
<thead>
<tr>
<th>Duration</th>
<th>Number of Lapses</th>
<th>Lapse Rate by Policy</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>212</td>
<td>4.6%</td>
</tr>
<tr>
<td>2-8</td>
<td>576</td>
<td>4.2%</td>
</tr>
<tr>
<td>9</td>
<td>234</td>
<td>6.9%</td>
</tr>
<tr>
<td>10</td>
<td>289</td>
<td>8.3%</td>
</tr>
<tr>
<td>11</td>
<td>1,543</td>
<td>85.2%</td>
</tr>
<tr>
<td>12+</td>
<td>327</td>
<td>27.4%</td>
</tr>
<tr>
<td>Grand Total</td>
<td>3,181</td>
<td>9.8%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Duration</th>
<th>Number of Lapses</th>
<th>Lapse Rate by Policy</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>226</td>
<td>4.8%</td>
</tr>
<tr>
<td>2-8</td>
<td>584</td>
<td>4.3%</td>
</tr>
<tr>
<td>9</td>
<td>227</td>
<td>6.7%</td>
</tr>
<tr>
<td>10</td>
<td>1,527</td>
<td>69.3%</td>
</tr>
<tr>
<td>11</td>
<td>489</td>
<td>73.2%</td>
</tr>
<tr>
<td>12+</td>
<td>128</td>
<td>8.4%</td>
</tr>
<tr>
<td>Total</td>
<td>3,181</td>
<td>9.8%</td>
</tr>
</tbody>
</table>
AGENDA

Data Cleaning

Survey Results

Size and Scope of Study

Lapse Experience Results

Mortality Deterioration Results

More PLT Analysis Coming Soon!
PLT Survey Results – Overview

- Research began in Spring 2019
- Data request and survey sent to US Term writers
- A total of 25 companies completed the survey
PLT Survey - Rate Change Practices

How was the rate change communicated?
- Notice of rate change sent, generally 30 to 60 days before end of term
- Change was communicated to agents in addition to notice of rate change
- Varied by policy form and/or year

Reasons for not changing PLT rates:
- Regulatory limitations
- Need approval from legal
- Need reinsurer support
- Limited data to make decisions with

Have you ever changed PLT rates on inforce business?
- Yes: 36% (9)
- No: 64% (16)

Have you observed persistency changes due to the PLT rate change?
- Yes, improved persistency: 78% (7)
- Too soon to tell: 22% (2)
PLT Survey - Communication

Common options for lower premium rates included:
- Reduced face amount
- Change to alternate PLT premium structure

Efforts to promote persistency included:
- Communication near end of term (13)
- Conversion or exchange encouraged with agent incentives (5)
- Conversion or exchange encouraged without agent incentives (7)

Do you provide options to apply for lower premium rates at the end of level period?
- Yes: 44% (11)
- No: 56% (14)

Is there an organized effort to promote persistency at the end of the level term?
- Yes: 60% (15)
- No: 40% (10)
Several companies indicated that EFT policyholders that were not automatically changed to direct bill were:

- Sent a letter notifying them of the premium increase at the next withdrawal
- Contacted by a customer service representative and presented with the option to change payment type to direct bill.

Other responses were as follows:

- Depends on whether they have PLT changes
- Policyholders always have the option to change mode
Policies issued using accelerated underwriting will not reach PLT for several more years.

However, accelerated underwriting may affect policyholder behavior in PLT with other options now available.

Simplified issue will be studied in the full report.
U.S. Post Level Term Survey and Experience Study Results

AGENDA

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More PLT Analysis Coming Soon!
## Size and Scope – Comparison

### SOA PLT Study Participants

<table>
<thead>
<tr>
<th></th>
<th>2010</th>
<th>2014</th>
<th>2020</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>26</td>
<td>37</td>
<td>25</td>
</tr>
</tbody>
</table>

### SOA PLT Study Data

<table>
<thead>
<tr>
<th>Level Term</th>
<th>PLT Study Lapses</th>
<th>% with Premiums</th>
<th>PLT Study Claims</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>257,715</td>
<td>34%</td>
<td>763</td>
</tr>
<tr>
<td></td>
<td>694,337</td>
<td>63%</td>
<td>3,380</td>
</tr>
<tr>
<td></td>
<td>984,355</td>
<td>57%</td>
<td>5,577</td>
</tr>
<tr>
<td>15</td>
<td>13,550</td>
<td>90%</td>
<td>158</td>
</tr>
<tr>
<td></td>
<td>39,037</td>
<td>97%</td>
<td>444</td>
</tr>
<tr>
<td></td>
<td>182,997</td>
<td>84%</td>
<td>1,423</td>
</tr>
<tr>
<td>20</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>78%</td>
<td>204</td>
</tr>
</tbody>
</table>

- **More PLT data available over time**
- **More term products reaching PLT**
Post Level Term Premium Structures Definition

**Jump to ART and Graded PLT Structures**

**Post Level Term (PLT) Premium Structures**

**Jump to ART**
- Large increase in premium at end of term followed by annual age rated increases
- Traditional most common for US Term

**Graded**
- Instead of a large premium increase at end of term, premium increases in a stepwise pattern
- Lower premium increases initially but increasing each year in PLT to 'grade' up to large premium
- May reach original PLT rates or new ultimate rate set as % of industry table
- Grading over a period of 5, 7 or 10 years is common. Examples shown for 7 year grading.

**Other structures**
- Jump to New Level
- Decreasing Face Amount
- Expiry
### Size and Scope of 2020 Study

#### 2020 PLT Study
- Calendar 2000-2017
- Issue years 1990+
- 25 Participants
- Multiple PLT structures

#### New in 2020 Study
- PLT experience for 20
- Graded PLT Structure
- Later duration experience
- More policyholder characteristics

<table>
<thead>
<tr>
<th>Level Term</th>
<th>Lapse Data</th>
<th>SOA PLT Study</th>
<th>Mortality Data</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Lapse Data</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Jump to ART</td>
<td>750,590</td>
<td>3,958</td>
</tr>
<tr>
<td></td>
<td>Graded</td>
<td>107,116</td>
<td>439</td>
</tr>
<tr>
<td>15</td>
<td>Jump to ART</td>
<td>102,481</td>
<td>674</td>
</tr>
<tr>
<td></td>
<td>Graded</td>
<td>45,497</td>
<td>249</td>
</tr>
<tr>
<td>20</td>
<td>Jump to ART</td>
<td>18,525</td>
<td>59</td>
</tr>
<tr>
<td></td>
<td>Graded</td>
<td>18,055</td>
<td>82</td>
</tr>
</tbody>
</table>
U.S. Post Level Term Survey and Experience Study Results

AGENDA

- Data Cleaning
- Survey Results
- Size and Scope of Study

Lapse Experience Results

- Mortality Deterioration Results
- More PLT Analysis Coming Soon!
Lapse Experience - Overview

Lapse Analysis Details

- Shock lapses occur at end of level period, before any premiums are paid in the post-level period
- Lapses include both lapse and conversion decrements
- Unless explicitly stated, T10, T15, and T20 results are combined
- Results for Jump to ART and Graded post-level premium structures are presented separately
Shock Lapse Experience by Premium Jump

Shock lapses increase as the premium jump increases for both premium structures.
Lapse Experience for Post-Level Term Durations

Graded with similar initial premium jumps to Jump to ART exhibit higher lapses in later durations.
Shock Lapse Experience by Attained Age and Premium Jump

Shock lapses increase as attained age increases for a given premium jump.
Shock lapse experience by Premium Mode and Premium Jump

Shock lapses are significantly lower for monthly premium mode business.
Shock Lapse Experience by Billing Type

Shock lapses are higher for bill sent versus automatic payment.

Policies that switched from automatic payment to bill sent in PLT exhibit the highest shock lapses.
Shock lapses in the 2020 study follow a similar pattern to the 2014 study. Variations are attributed to business mix differences such as attained age and premium mode.
U.S. Post Level Term Survey and Experience Study Results

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Mortality Deterioration Results

More PLT Analysis Coming Soon!
Mortality Deterioration - Overview

Mortality Analysis Details

- Mortality deterioration occurs in the first year following the level term period.
- Mortality deterioration is calculated as a **relative ratio** compared to the level period.
- T10 compares each PLT period to the 2015 VBT actual to expected for durations 6-10 combined.
- T15 compares to durations 6-15 combined and T20 compares to durations 11-20 combined.
- Results for Jump to ART and Graded post-level premium structures are presented separately.
Mortality Deterioration by Premium Jump - PLT Duration 1

Mortality deterioration increases as the premium jump increases for both premium structures.
Mortality Deterioration by PLT Duration

Mortality deterioration is highest for Jump to ART with higher premium jumps.
Mortality deterioration decreases for subsequent PLT durations for Jump to ART.
Mortality Deterioration by Attained Age - PLT Duration 1

Mortality deterioration increases as attained age increases.
Monthly premium mode has significantly lower mortality deterioration than all other premium modes.
Mortality Deterioration by Risk Class - PLT Duration 1

<table>
<thead>
<tr>
<th>Risk Class</th>
<th>Jump to ART</th>
<th>Graded</th>
</tr>
</thead>
<tbody>
<tr>
<td>Super Preferred NS</td>
<td>130</td>
<td>129</td>
</tr>
<tr>
<td>Preferred NS</td>
<td>328</td>
<td>127</td>
</tr>
<tr>
<td>Residual NS</td>
<td>384</td>
<td>127</td>
</tr>
<tr>
<td>Preferred SM</td>
<td>65</td>
<td>All SM</td>
</tr>
<tr>
<td>Residual SM</td>
<td>82</td>
<td>57</td>
</tr>
</tbody>
</table>

Mortality deterioration by risk class exhibits a different pattern for Jump to ART versus Graded.

Undifferentiated nonsmoker and smoker classes excluded. Substandard policies excluded. Numbers above bars represent claim counts.
Mortality Deterioration by Billing Type - PLT Durations 1+

Policies that switched from automatic payment to bill sent in PLT exhibit the highest mortality deterioration.
Mortality deterioration in the 2020 study follows a similar pattern to the 2014 study. Variations are attributed to business mix differences.
Shock lapse and mortality deterioration increase as premium jump increases.
U.S. Post Level Term Survey and Experience Study Results

AGENDA

Data Cleaning

Survey Results

Size and Scope of Study

Lapse Experience Results

Mortality Deterioration Results

More PLT Analysis Coming Soon!
More PLT Analysis Coming Soon!

Full Post Level Term report is anticipated for release in 2021

Analysis by Level Term Period Products
- First look at 20YT experience
- Comparison across LT products

Patterns by Duration
- Lapse Skewness
- Persistency in PLT
- Mortality wear-off patterns

PLT Premium Structures
- Deep dive on 'Graded' PLT
- Compare to traditional 'Jump to ART'
- Lapse and mortality differences
- Other PLT structures

Machine Learning and Statistical Modelling
- Identify the key drivers of lapse and mortality
- Highlight interactions and relationships
- Predictive modelling for PLT lapse and mortality