A Period of “Inflated Actuarial Confidence”?
Keith Brown, James Orr & Chris Smerald
Format for this Roundtable

Three Themes
• Modelling Inflation - Chris
• Business Context - James
• Micro Level : Claims Drivers - Keith

Roundtable Discussion
• Clustering delegates in six groups
  – two groups per theme; one facilitator per theme
  – one scenario per group; handouts provided
  – one rapporteur per group
  – success is a good discussion in the room and capturing “take away” points

Modelling Inflation
Chris
Modelling Inflation

A Modelling View of Inflation

\[ E[\text{Incremental Loss}_{AY=i, DY=j}] = E\text{posure}_{AY=i} \]

* Pure Loss Rate \( \rightarrow \) Year 0
  * \( \prod_0^i AY \text{ effect}_t \)
  * \( \prod_0^j DY \text{ decay}_t \)
  * \( \prod_{i+j} CY \text{ effect}_t \)

\[
\log \left( E(\text{Loss}_{i,j}) \right) =
\log(E_i) + \text{intercept} + \sum_{0}^{i} AY_t + \sum_{0}^{j} DY_{t,k} + \sum_{i}^{i+j} CY_t
\]
A Simple Example

OLEP * Base ELR * AY Factor * DY Factor * CY Factor

<table>
<thead>
<tr>
<th>Exposure</th>
<th>Constant Exposure</th>
<th>AY Direction</th>
<th>CY Direction</th>
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<tbody>
<tr>
<td>AY</td>
<td>Pure ELR</td>
<td>Trends Factor</td>
<td>Trends Factor</td>
</tr>
<tr>
<td>2018</td>
<td>1,000</td>
<td>75.00%</td>
<td>1.000</td>
</tr>
<tr>
<td>2019</td>
<td>na</td>
<td>na</td>
<td>1.000</td>
</tr>
<tr>
<td>2020</td>
<td>na</td>
<td>na</td>
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<tr>
<td>2021</td>
<td>na</td>
<td>na</td>
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<table>
<thead>
<tr>
<th>Incremental Loss / Forecast Triangle</th>
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<tbody>
<tr>
<td>AY</td>
</tr>
<tr>
<td>2011</td>
</tr>
<tr>
<td>2012</td>
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<td>2018</td>
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<table>
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<th>Loss Development Factors</th>
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<tr>
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<td>2013</td>
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<td>2015</td>
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<td>2016</td>
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Structural Driver Model

\[ \log \left( E \left( Loss_{i,j} \right) \right) = \log \left( E_i \right) + \text{Intercept} + \sum_{t=1}^{i} AY_t + \sum_{n=1}^{N} \beta_{AYn} \sum_{t=1}^{i} SD_{AY_{n,t}} + \sum_{t=1}^{i} DY_t + \sum_{t=i+1}^{i+j} CY_t + \sum_{m=1}^{M} \beta_{CYm} \sum_{t=i+1}^{i+j} SD_{CY_{m,t}} \]
1. GLM

• The reserving team implemented a GLM-based model for the current year.

• The chief actuary commended the team for their rigour and identifying the inflationary contributors and “common trends”.

• They used on-level earned premium as their exposure base and found the ultimate net loss ratio trend to be -2% p.a. after adjusting for a fitted calendar year trend of +0.5% p.a.

• Note: The standard Link Ratio methods were less favourable.

**A. What unknowns would you be more worried about than for your standard link-ratio methods?**

**B. How would you decide what weight to give the GLM results and would this be different if the relative method indications were reversed (e.g., standard methods more favourable, GLM less favourable)?**

2. Past Trend Analysis

• The reserving team have refined their inflation analysis.

• They now re-segment their data to allow for business-mix effects, remove shock losses and other outliers, and obtain economic forecasts of their inflation drivers. Historically, the actual versus projected has been good.

**A. Is this a good approach?**

**B. What factors make your models susceptible to modelling error that we need research for?**
Business Context

James
3. Financial Plan Assumptions Mismatch Reserving Risk

- During the reserve-risk assessment, analysis of smart phone inflation found an inflation rate of 2% +/- 1% p.a. These figures were agreed as assumptions to the latest capital calculation.

- In a department not so far, far away, the financial planning team provided their estimate of gross written premium. They allowed for 7% rating increases, as a result of claims-cost inflation being expected to be the same figure.

A. Who is right?

B. Why could they be different?

C. What happens if the reserving actuaries are wrong, should they revisit their analysis in the next reserve review?

4. Underwriting Assumptions Mismatch Reserving

- The inflation committee at an insurer produced a joint inflation figure for household contents of 5% p.a. after pricing analysis showed flat inflation (0%) and reserving analysis gave 10.2% p.a.

- Underwriters suggested the agreed figure of 5% was very generous of them, reserving actuaries are after all known to be prudent!

A. How could these estimates differ?

B. Is a single rate sensible?

C. How could we get a better estimate in reserving?
Micro Level: Claims Drivers

Keith
5. Concordia Shipping Loss – a Step Change?

- The Costa Concordia, a multi-story liner carrying over 4,000 passengers and crew, ran aground in January 2012 and capsized off Italy’s west coast, killing 32 people.

- Loss estimate may rise to $2bn. The costs of removal were high, as it was decided for environmental reasons to remove the wreck piece-by-piece and re-float. LOF [Lloyd’s Open Form], a salvage contract, was amended quite a few years ago to incorporate the ability to be paid for the prevention of pollution.

A. Could this have been foreseen?

B. How could links between Claims and the rest of the business save future costs?

6. Escape of Water – a Creeping Trend?

- According to The Association of British Insurers, escape of water causes approximately £2million worth of damage every day. In the last three years, the average cost of these claims has risen by 31% to £2,638. ABI suggested this area may be a number-one priority in 2018.

- Factors such as more hidden or integrated pipework and less damage-resilient building materials may contribute towards higher claim costs.

- Also more plumbed-in domestic appliances; more central heating; an increase in en-suite bathrooms and downstairs toilets; more complex plumbing systems; hidden and integrated plumbing and the use of less damage-resilient materials such as chipboard could also be factors.

A. Are the incidence of plumbed appliances/DIY linked to economy? Does this matter?

B. Could joint analysis help reduce risk for customers, whilst minimising risk for the insurer too?
Questions

Comments

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