Agenda

- Introduction
- Survey results
  - Examples of current issues affecting claim frequency and severity
- Methods for estimating claims inflation
- Pitfalls, traps and misunderstandings

The Importance of Claims Inflation

- One of the key assumptions used by non-life actuaries
- Needed for reserving, pricing, capital modelling, planning, …
- Need to estimate historical and future rates
- But very elusive
- Difficult to accurately gauge historical levels
- Even harder to estimate future levels
Focus of the Working Party
- Claims inflation rates differ between:
  - Different countries
  - Different lines of business
- Working Party focussed on:
  - UK Employers Liability
  - UK Public Liability
  - UK Professional Indemnity
  - UK Motor (Bodily Injury and Property Damage)
  - US Medical Malpractice
  - US Professional Indemnity

Working Party Survey
- Decided to conduct an extensive survey to
gauge the views of actuaries on claims inflation
- Surveys flooded out …
- … and trickled back
- How many responses do you think we received?

300?
So ...

- Apathy is alive and well within the profession!
- Difficult to draw any definitive conclusions from the results
- But actuaries appear to be using a wide range of claims inflation assumptions
Survey Results - Inflation Assumptions

<table>
<thead>
<tr>
<th>Class</th>
<th>Min</th>
<th>Max</th>
<th>Ratio</th>
<th>Mean</th>
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</thead>
<tbody>
<tr>
<td>UK Motor BI</td>
<td>6.0%</td>
<td>12.0%</td>
<td>2.0</td>
<td>8.9%</td>
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<tr>
<td>UK Motor PD</td>
<td>2.5%</td>
<td>6.0%</td>
<td>2.4</td>
<td>3.8%</td>
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<tr>
<td>UK Employers Liability</td>
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<td>2.4</td>
<td>8.4%</td>
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<tr>
<td>UK Public Liability</td>
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<td>10.0%</td>
<td>3.3</td>
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<tr>
<td>UK Professional Indemnity</td>
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<td>2.0</td>
<td>7.5%</td>
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<tr>
<td>US Medical Malpractice</td>
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<td>15.0%</td>
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<td>10.9%</td>
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<tr>
<td>US Professional Indemnity</td>
<td>5.0%</td>
<td>10.0%</td>
<td>2.0</td>
<td>7.5%</td>
</tr>
</tbody>
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Examples of Current Issues Affecting Claim Frequency

- Compensation culture
- Conditional fee arrangements
- Claim management companies
- Changing weather patterns
- Introduction of penalty points in Ireland
- Merger and takeover activity

Examples of Current Issues Affecting Claim Severity

- Cost and wage inflation
- The Courts Act
- NHS recoveries
- Fixed fees
- Court decisions (e.g., pleural plaques)
- Advances in medical science
Measuring Claims Inflation: Considerations

- Model of Frequency or Severity or both?
  - Model Type?
    - Proxy
    - Econometric
    - Direct Calculation

Direct Measurement

- Cohort To Use
  - Underwriting Year, Accident Year, Settlement Year
  - Incurred or Settled?
  - Individual or Grouped data?
  - Measure – Average or Percentile?

Percentile Method

- Consider individual settled claims by year
- Ignore nil claims
- Select percentile appropriate to cover
- Compare percentile loss from year to year
- Determine inflation from this ratio
Why Use Percentiles instead of Average?

- Greater statistical stability (for skew distributions)
- For Lognormal distribution the improvement in efficiency as given by CV is very stark

<table>
<thead>
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<th>n</th>
<th>Ratio of Stddev to mean</th>
<th>Ratio of median to CVs</th>
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<tr>
<td>1</td>
<td>1.72</td>
<td>1.85</td>
</tr>
<tr>
<td>1.6</td>
<td>4.77</td>
<td>3.08</td>
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<tr>
<td>2</td>
<td>21.58</td>
<td>7.39</td>
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<tr>
<td>1.5</td>
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</tr>
<tr>
<td>2</td>
<td>21.58</td>
<td>7.39</td>
</tr>
</tbody>
</table>

Burning Cost Approach

- Consider cost to a series of layers from a given cohort of claims (say UW year)
- Fit a suitable distribution to the grouped claims
- Repeat for successive years
- Trend in the scale parameter is the inflation measure

Review of Burning Cost Approach

- Pros
  - Use of grouped and capped data reduces individual claim dependence
  - Fits well with requirements of excess reinsurance
- Cons
  - Assumes stable mathematical distribution over time (with just the scale parameter varying)
Pitfalls

- Appropriate Measure?
  - Frequency and severity trends
  - Different claims types and size
  - Ground up vs. excess trends
  - Potential for double count
More Pitfalls

- Correctly applying inflation
- Estimating inflation
  - Stable?
  - Credible data
  - Open claims and IBNER

Claims Inflation -
The Scarlet Pimpernel of Actuarial Work

Simon Sheaf
Simon Brickman
Will Forster

GIRO 2005
19 October 2005