Measuring Uncertainty Qualitatively (MUQ) Working Party
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History - GIROC UK Reserving Survey

**Practitioners**
- Personal lines Reserving Actuaries
- London Market Reserving Actuaries

**Stakeholders**
- Ratings agencies
- Regulatory bodies
- Other Stakeholder Groups (CRO Forum, CFO forum etc.)
- Investment analysts
- Executive and non-executive directors/Senior management
GIROC UK Reserving Survey - Conclusions

No appetite for new reserving methods
- Chain ladder and BF still King

Rise of diagnostics

Overall positive feeling

Increased recognition and understanding at board level

Communication
- Not the issue it once was
- Greater engagement from senior management
- Reserving actuaries embedded in companies
- More detailed and explanatory reporting
- Reserving work being fed back into strategic decisions

But…

Uncertainty
- both measurement and communication

Reporting

- Practice varies considerably from actuary to actuary
- GIROC recommending more to be done on sharing best practice
Survey results
Measuring uncertainty

Survey results
‘Other’ methods

• Benchmark CoVs (coefficient of variance)
• Uncertainty around development factors
• Frequency/severity – stochastic methods
• Tails
Survey results
Measuring Uncertainty

London Market
- "Bootstrap"
- Capital Model
- Scenarios
- Alternative reserving method
- Other

Personal lines
- "Bootstrap"
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Sizeable minority actively do not bootstrap at all
25% 20%

Survey results
Communication of uncertainty

Percentiles
Ranges
Probability of adequacy
Highlighting areas of risk
More explanation in reports
Coordination with other working parties

GIROC working parties
- Pragmatic Stochastic Reserving working party
- The Good Actuarial Report
- Herd Mentality
- Measuring Uncertainty With Professionalism
  - Framing
  - Modelling
  - Reporting

MUQ
Measuring Uncertainty Qualitatively

**Remit**
- Consider all areas of uncertainty outside of “bootstrap”* methods
- *Not specifically focussing on communication

**Aim**
Stage 1:
- Gather current thinking and what has been done to date
- Collate in one easily accessible place

* “Bootstrap” - a generic term to incorporate stochastic chain ladder methods such as ODP bootstrap, also includes Mack method
MUQ workstreams

- ‘Other’ methods from the survey
- GLMs on aggregate triangles
- Individual claims reserving

Effectiveness of methods
- Data uncertainty

Uncertainty framework
- Expert judgement
- Language

What we can learn from elsewhere
- Australia
- US
- Ireland

An Australian perspective
Uncertainty
Prudential requirements for an Appointed Actuary

Risk margin at 75% probability of sufficiency

Consideration of gross uncertainty

Sensitivity/scenario analysis

Qualitative description of the key risks and uncertainties

Risk Margin Requirement in Australia
Some history

Historically 2002 2008

Implicit risk margins by adopting conservative assumptions, but no accounting requirement

Explicit risk margin requirement

Actuaries Institute’s new framework for assessing risk margins

Insurance liability provision to include a risk margin that is at least the greater of:

- A value which provides an insurance liability provision with a 75% probability of sufficiency; and
- One-half of a standard deviation above the mean.
Determining risk margins – ‘Bolt-on’ approach
Determine mean estimate and risk margin separately

- Determine coefficient of variation (CoV)
- Apply dependency structure across class of business
- Assume a distribution
- Risk margin at 75% (and test against half the CoV)

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Sources of uncertainty
What could cause the valuation estimate to be wrong?

- **Independent risk (random/process error)**
  - Inherent volatility associated with the insurance process
  - Randomness compromising the ability to select correct parameters

- **Internal systemic risk (parameter & model error)**
  - Uncertainty arising from the model being an imperfect representation of real life

- **External systemic risk**
  - Uncertainty arising from future systemic trends external to the modelling process (e.g., economic, legal, natural peril events etc)

Quantitative modelling techniques (e.g., bootstrap/mack) are backwards looking and will only look at independent risk and past episodes for external systemic risk

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Sources of uncertainty
Internal systemic risk – how wrong could the actuary get it?

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‘New’ Framework
Internal systemic risk – how wrong could the actuary get it?

1. Qualitative assessment of risk indicators
   - Specification (model) error
     - Models used
     - Subjective adjustments
   - Parameter selection error
     - Ability to detect trends, stability
     - Uncertainty in superimposed inflation
   - Data error
     - Timeliness and reliability
     - Revisions to past data

2. Score and weight risk indicators
   - Qualitative ‘balanced scorecard’ approach
     - Rank aspects of the modelling from worst to best practice

3. Calibrate to CoV
   - Convert score to quantitative measure by using CoV mapping scale
   - Significant amount of judgement

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‘New’ Framework
External systemic risk – non random risks outside the modelling process

- Economic and social risks
- Legislative, political and claims inflation risk
- Claim management process change risk
- Event risk
- Latent claim risk
- Recovery risk
Representing uncertainty
Further requirements

- Sensitivity analysis
- Scenario analysis
- Qualitative description of the key risks and uncertainties
- Consideration of gross uncertainty

CHECKLIST

- Are you adequately capturing all sources of uncertainty?

- Does the Board have appropriate understanding?

- New approaches to estimating and reporting
MUQ - Get involved

Still open to new volunteers
- via IFoA volunteering pages, or email Sarah

Share your thoughts and experiences with us
- Particularly if you have experience of
  - Benchmark CoVs
  - Uncertainty around dev factors
  - Tails
  Or any alternative methods

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Questions

Comments

Expressions of individual views by members of the Institute and Faculty of Actuaries and its staff are encouraged.
The views expressed in this presentation are those of the presenter.