Measuring Uncertainty Qualitatively (MUQ) Working Party
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GiROC Reserving Survey Recommendations

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

‘Other’ methods
• Benchmark CoVs (coefficient of variation)
• Uncertainty around development factors
• Frequency/severity – stochastic methods
• Tails
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 Block method

MUQ workstreams

Uncertainty framework
Expert judgement
Risk appetite
Language
Use of capital models
Data uncertainty
Effectiveness of methods

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

What we can learn from elsewhere
• Australia
• US
• Ireland
Risk Margin Requirement in Australia
Some History

Historically

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

2002

- Explicit risk margin requirement

2008

- Actuaries Institute 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.

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
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)

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
- Randomness compromising the ability to select correct parameters
- Uncertainty arising from future systemic trends external to the modelling process (e.g., economic, legal, natural peril events etc)

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

- Inherent instability 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 relative to the modeling process (eg economic, legal, natural peril events)

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

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

2. Score and weight risk indicators
   - Qualitative ‘balanced scorecard’ approach
   - Rank aspects of the modelling from worst to best practice
   - Convert score to quantitative measure by using CoV mapping scale

3. Calibrate to CoV
   - Significant amount of judgement

Sources of uncertainty

External systemic risk – non random risks outside the modelling process

- 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 factors external to the modelling process (eg economic, legal, natural peril events etc)

‘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.