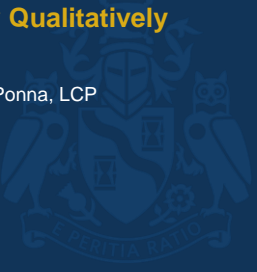


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Measuring Uncertainty Qualitatively (MUQ) Working Party

Sarah MacDonnell and Pravesh Ponna, LCP



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GIROC Reserving Survey Recommendations

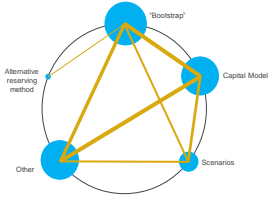
Uncertainty

- 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 variance)
- Uncertainty around development factors
- Frequency/severity – stochastic methods
- Tails

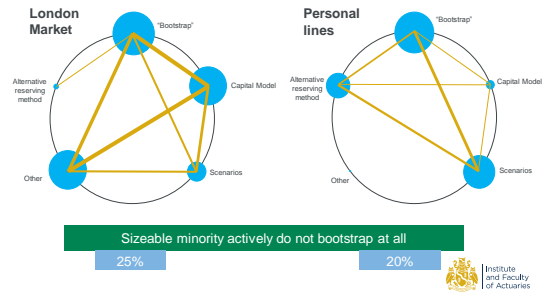
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Survey results
Measuring uncertainty



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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

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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

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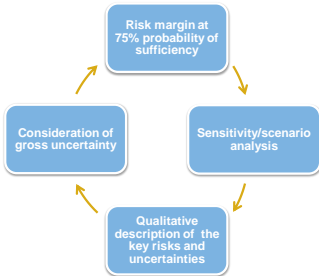
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An Australian perspective



Uncertainty

Prudential requirements for an Appointed Actuary






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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.

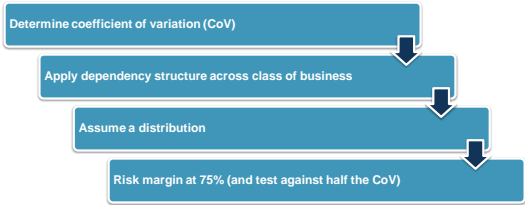


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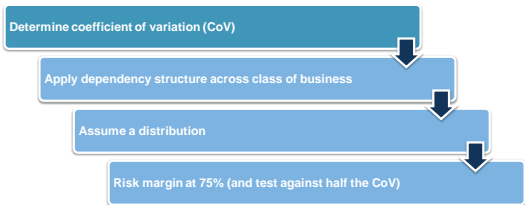
Determining risk margins – ‘Bolt-on’ approach

Determine mean estimate and risk margin separately



Determining risk margins – ‘Bolt-on’ approach

Determine mean estimate and risk margin separately



Sources of uncertainty

What could cause the valuation estimate to be wrong?

Independent risk (random/process error)	<ul style="list-style-type: none">Inherent volatility associated with the insurance processRandomness compromising the ability to select correct parameters
Internal systemic risk (parameter & model error)	<ul style="list-style-type: none">Uncertainty arising from the model being an imperfect representation of real life
External systemic risk	<ul style="list-style-type: none">Uncertainty arising from future systemic trends external to the modelling process (eg economic, legal, natural peril events etc)

Quantitative modelling techniques (eg 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?

Independent risk
(random/process error)

Internal systemic risk
(parameter & model error)

External systemic risk

- Inherent volatility associated with the insurance process
- Randomness compromising the ability to select correct parameters

- Uncertainty arising from the model being an imperfect representation of real life

- Uncertainty arising from future systemic trends external to the modelling process (eg economic, legal, natural peril events etc)

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‘New’ Framework

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

1. Qualitative assessment of risk indicators

2. Score and weight risk indicators

3. Calibrate to CoV

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

Qualitative ‘balanced scorecard’ approach

- Rank aspects of the modelling from worst to best practice

Convert score to quantitative measure by using CoV mapping scale

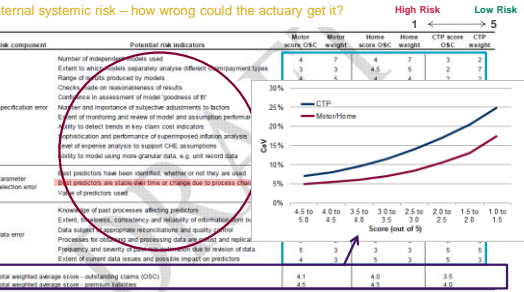
Significant amount of judgement

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‘New’ Framework

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



Source: ‘A Framework for Assessing Risk Margins’, Prepared by the Risk Margins Taskforce
<http://www.actuaries.asn.au/Library/Framework%20for%20Assessing%20Risk%20Margins.pdf>

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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 future systemic trends 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



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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

sarah.macdonnell@lcp.uk.com



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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.



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