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Messaging and Framing Uncertainty – Findings from the MUQ Working Party

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Tim Jordan, MPS; Keith Brown, AXA and Jinnan Tang, Insight Risk Consulting

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Agenda

- Introducing the framework
- Practical case study
- The reserve uncertainty framework
- Summary and questions



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Introducing the framework

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Percentiles – caveat emptor

- Ultimates are estimates, and some practitioners illustrate this point by adding percentiles to show the range
- **Percentiles also have to be estimated**



- Percentiles are often more uncertain than the point estimate and frequently have no mention of their own accuracy
- We recommend you to **think of the user** and **use qualitative methods** and not to rely solely on percentiles



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Framework aims

- Promoting **development of best practice** in measuring and communicating reserve uncertainty; by
- Supporting the generation of wider risk considerations
 - Breaking the problem down and structuring the thought process



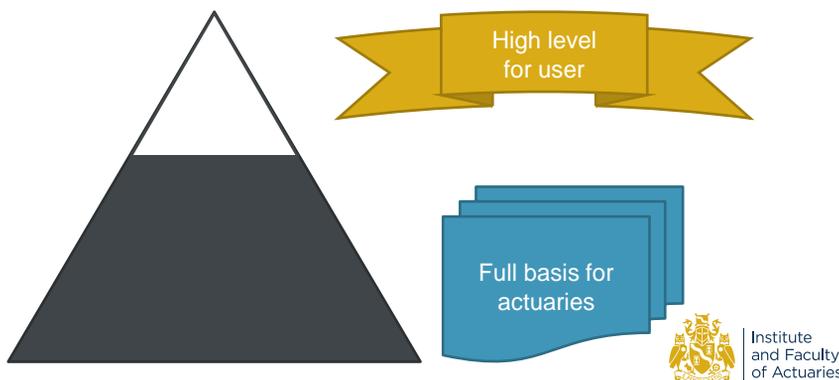
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One framework, two levels

- A skilled actuary will undertake comprehensive analysis and then communicate the material elements



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Framework uses

By the actuary

- **Base structure** for their own internal framework
 - Record of areas considered
 - Governance and validation
 - Consistency, with little change needed from year-to-year
- **Articulation tool**
 - For example, to support communication to stakeholders
- **Pooling knowledge** and developing best practice in the profession
- **Training tool**

By the user

- **Awareness** of areas of uncertainty
- Provides **inspiration** for users to ask their actuaries powerful questions



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Case Study

It's over to you...

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Case Study



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David Supergrad

- David identifies that there could be more than one possible “Oblong” rate to be announced
- Using his emerging “Expert Judgement” he assigns a probability to a range of possible outcomes for the new Oblong rate
- He calculates the uplift to reserves required at each potential Oblong rate
- He works out that based on a probability-weighted average, the uplift required is **£21.2m**, but the uncertainty is such that the answer could be as high as £50m

Oblong Rate	Probability	Uplift to Reserve Required
2.5% (unchanged)	10%	£0m
..		
1.0%	40%	£14m
0.5%	10%	£21m
0.0%	25%	£29m
-0.5%	10%	£38m
-0.75%*	0.0000001%	£44m
-1.0%	5%	£50m

* In Motorville, the widely used Oblong tables are currently published at 0.5% intervals



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Martha Wiseperson?



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Case Study – The Results!

James is presented with two best estimates and uncertainties

David Supergrad

- Best Estimate of the uplift required is £21.2m
- Maximum uplift required is likely to be £50m

Martha Wiseperson

- Best estimate of the uplift required is £34m
- This figure is highly uncertain and may be significantly higher
- It has been discussed with experts in the business
- There are a number of key assumptions to be aware of

“Bloody actuaries – is it £21.2m or £34m – one’s nearly twice the other!”

Don’t tell me it can be one of a range of results, I’ve heard that one before!”



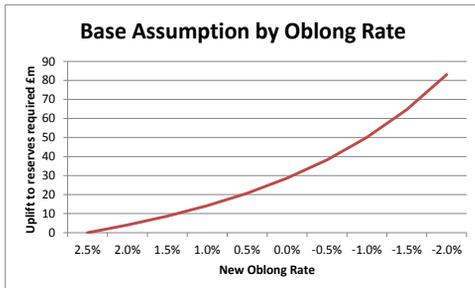
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Results - Martha

Best Estimate of Uplift required is £34m



Build-up of £34m uplift

Contributor	Uplift required
Base Assumption of 0.0%	£29.0m
Allowance for issues in claims data	£2.5m
Allowance for change in speed of settlement	£2.5m

Key Points

1. Expert input from claims team suggests new rate highly likely to be 0.0%
2. Other insurers suggesting the same
3. Assumes new Oblong rate stays the same for the foreseeable future
4. Does not allow for minimal reinsurance recoveries
5. Includes small uplift for Household Liability

Key Areas of Uncertainty

- We do not know what the Oblong Rate will be when it is announced and the uplift is highly sensitive to this
- We do not know if it will affect claimant behaviour
- Some of the information on the base claims data looks incorrect, which we have attempted to allow for



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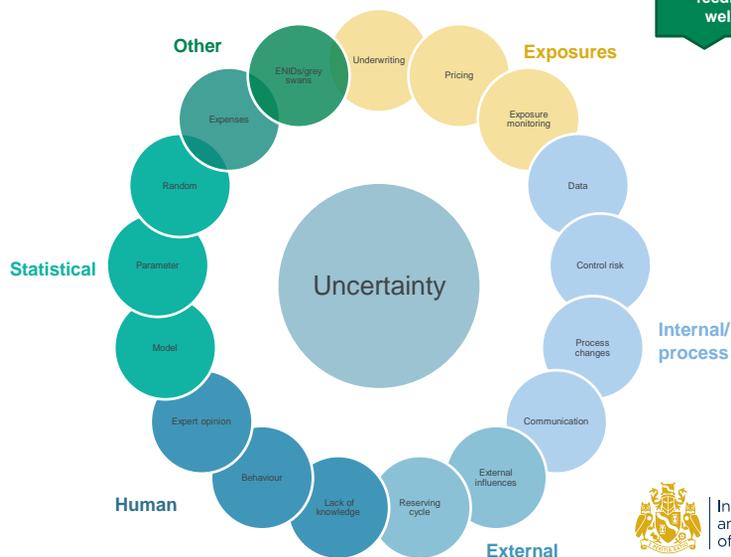
The reserving uncertainty framework

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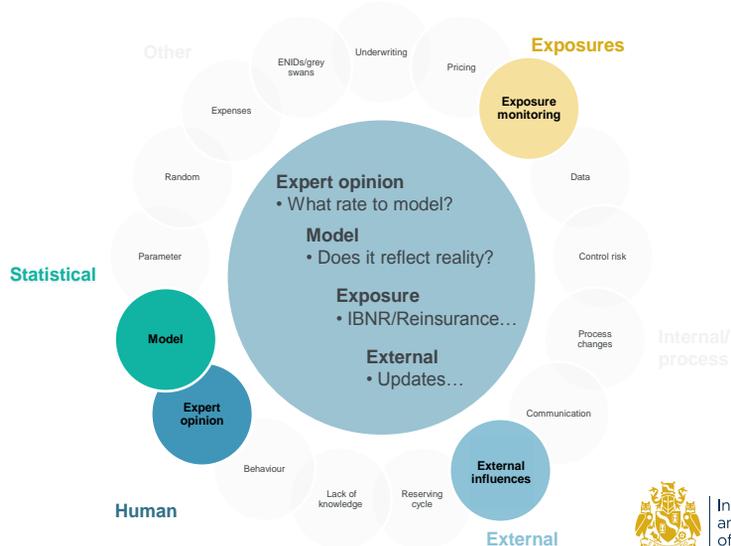


Reserve Uncertainty Framework

We want to keep improving: feedback is welcome



Framework Example – “Oblong” rate



The framework document

Reserve Uncertainty Framework
MUQ working party 2016



Reserve Uncertainty Framework
MUQ working party 2016

Table of contents for the Reserve Uncertainty Framework document, listing sections such as Introduction, Purpose, Scope, and Key objectives.

Exposures

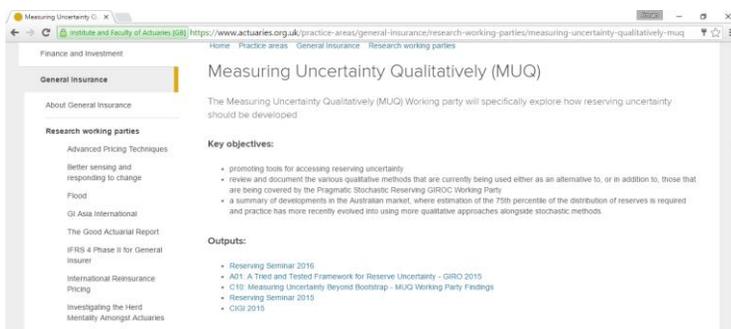
Table detailing various risk exposures including Underwriting Risk, Pricing Risk, and others, with associated questions and descriptions.



Our website

- The full framework to download
- References and our other work
- Past presentations

Type "MUQ" into the IfoA search bar



<https://www.actuaries.org.uk/practice-areas/general-insurance/research-working-parties/measuring-uncertainty-qualitatively-muq>



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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Appendix

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 Sponsorship
 Thought leadership
 Progress
 Community
 Sessional Meetings
 Education
 Working parties
 Volunteering
 Research
 Shaping the future
 Networking
 Professional support
 Enterprise and risk
 Learned society
 Opportunity
 International profile
 Journals
 Support

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Case Study



It is Christmas Eve 2017 in Motorville and all is quiet....

Then suddenly, by announcement to the Motorville Stock Exchange, the Motorville Lord Justice announces that for the first time in 13 years, they intend to issue an update to the "Oblong Rate"

Based on the preferred car shape in Motorville, the "Oblong Rate" sets the discount rate to be used in valuing the future loss elements of personal injury claims. Based on the methodology used to set the existing "Oblong Rate", an update to the rate is likely to increase the cost of the large personal injury claims significantly.

James NonActuary, CFO, BigInsCo approached David Supergrad and Martha Wiseperson, two members of his actuarial team with the following problem...

James has committed to give an indication as to the uplift required to the existing best estimate of reserves to be held for BigInsCo as at Y/E 2017 to the Board at their New Year's Eve Dinner.

What should he inform them?

James rushes off to a meeting shouting "I just need an initial guess, but first, tell me all the uncertainties I need to think about!"

Taking into account what will be important for James, put together a short list of things Martha needs to consider to come up with her response to James.

You can assume that BigInsCo writes mostly Motor Insurance with a small amount of Household business. No PPOs or structured settlements exist as settlement options in Motorville.



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Case Study



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External Influences

- What are the rates of real returns and how does this compare to the assumption in the modelling?
- Do people expect the rate to change over the longer-term and how does this fit in with the Oblong Rate setting process?
- Will the new Oblong Rate be socially acceptable and does that make it more likely it could change again before existing cases and IBNR settle?
- Will a review of methodology be announced and what does that mean?
- How will reinsurers respond?
- How is the current rate used in practice?



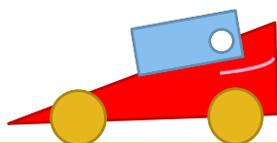
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ENID/Grey Swans

- A very low Oblong Rate may make new claim types more economically viable for claimant solicitors that were not seen in past data
- What if a different rate is introduced for the triangle-shaped cars that younger drivers tend to favour?
- Could someone find a way round the new Oblong Rate?



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Process Changes

- As claim size rises due to new rate, more negotiation on claims may take place slowing down time to settlement
- Claims teams may get overwhelmed by re-estimating existing claims (the large claims team suddenly has a lot more large claims)
- Could have “drag-through” effects on non-future loss claims in terms of settlement speed
- When will the case reserves be updated?

Data

- Existing data on large losses may not be ideal for modelling impact of oblong rate (top-down sample based vs bottom-up effect)
- How will “triangles” need to be adjusted for projection purposes?
- How to deal with Bordereau claims where limited data available?
- Have we checked the discount rate used in the case estimates is 2.5%?

Exposure Monitoring

- Is your exposure data sufficiently granular to pick up changes of mix in large loss exposed policyholders (for example, young drivers)
- Are you confident that you have captured all exposure (for example, liability in Household)
- How will your reinsurance respond?
- Does this increase chance of reinsurer default, leading to higher exposure to net losses?

Model

- Have you picked a range of relevant years (or relevant sample of claims) for your analysis of change?
- How sensitive is your result to the relevance of the sample?
- In future, will development patterns change?
- Will frequency and severity both be affected?
- Will losses simply be restated, or does out-of-court settlement mean in practice a different effective rate could be in use? What is the effective rate before the change?

Control Risk

- Lack of time for accurate modelling?
- Lack of time for appropriate peer review?
- APS X2
- Is there an appropriate audit trail?

