

Reserving seminar – all this and solvency too?
Derek Newton



Communicating Uncertainty

23 November 2011

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Agenda

- Uncertainty
- Reserving uncertainty
- Communicating uncertainty
- Communicating reserving uncertainty

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Uncertainty is the natural condition....

- “Only one thing is certain – that is, nothing is certain. If this statement is true, it is also false.” *Ancient Paradox (and Pliny the Elder)*
- “In this world nothing can be said to be certain, except death and taxes.” *Benjamin Franklin*
- “Would anything but a madman complain of uncertainty? Uncertainty and expectation are the joys of life” *William Congreve*
- “Without a measureless and perpetual uncertainty, the drama of human life would be destroyed.” *Winston Churchill*
- “Without the element of uncertainty, the bringing off of even, the greatest business triumph would be dull, routine, and eminently unsatisfying.” *J. Paul Getty*
- “Uncertainty is the refuge of hope.” *Henri Frederic Amiel*

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...but uncertainty is not necessarily welcome

- “Doubt is not a pleasant mental state, but certainty is a ridiculous one.” *Voltaire*
- “What men want is not knowledge, but certainty” *Bertrand Russell*
- “Investors don’t like uncertainty” *Kenneth Lay*
- “Certum ex incertis”

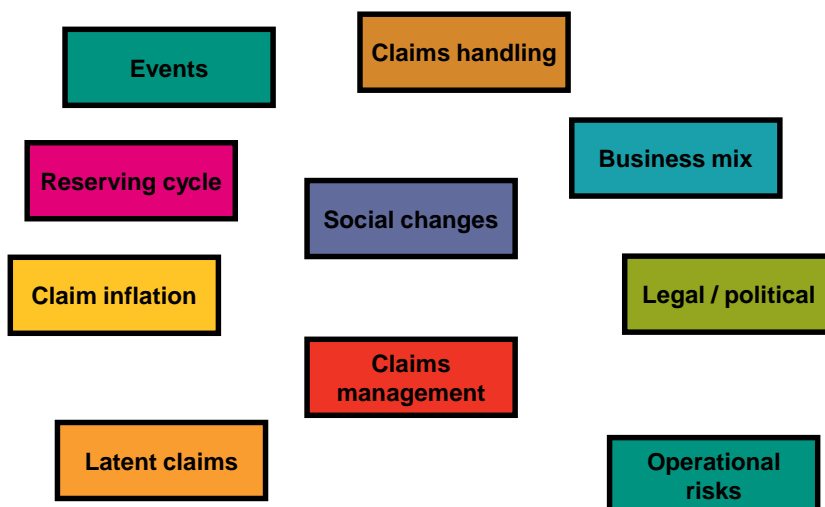
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What is “reserving uncertainty”?

- Types/sources of reserving risk
 - **Process Risk** : the randomness of future outcomes given a *known* distribution of possible outcomes.
 - **Parameter Risk** : the potential error in the estimated parameters used to describe the distribution of possible outcomes, assuming the process generating the outcomes is *known*.
 - **Model Risk** : the chance that the model used to estimate the distribution of possible outcomes is incorrect or incomplete
 - **Future Systemic Risk** : the chance of future outcomes being materially affected by unforeseen trends or shifts away from historic patterns

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Uncertainty in claims



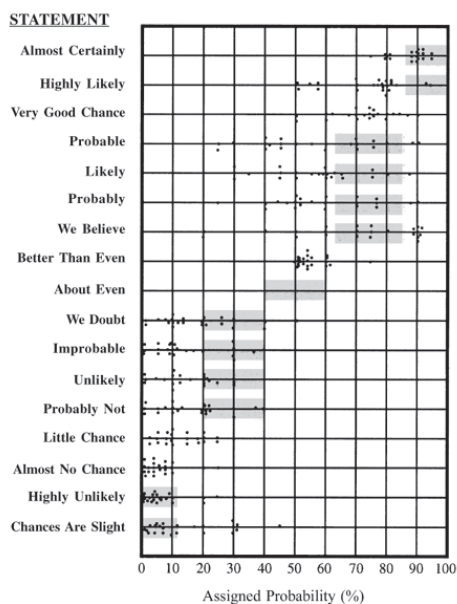
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Communicating uncertainty

- Why? Because....
 - it assists stakeholder make more effective decisions
 - it manages expectations
 - not to do so is misleading.
- However, it is hard because...
 - of human nature
 - language is imprecise

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Communicating uncertainty



From *Psychology of Intelligence Analysis*
by Roger Heuer

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Communicating uncertainty

- Why? Because....
 - it assists stakeholder make more effective decisions
 - it manages expectations
 - not to do so is misleading.
- However, it is hard because...
 - of human nature
 - language is imprecise
 - statistical probability is not understood.

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Communicating reserve uncertainty: we start from here

- All reserve estimates are uncertain – we know that but do all of the stakeholders?
- Uncertainty has a high potential impact on financial results
- Stakeholders are unlikely to appreciate hearing about uncertainty
- *Certum ex incertis*
- Actuaries are supposedly poor communicators
- We have standards

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Communicating reserve uncertainty: TAS R

- *“An aggregate report shall indicate the nature and extent of any material uncertainty in the information it contains.*
- *Uncertainty may concern the results of calculations, assumptions on which information is based or other aspects. It may arise from random variations, lack of information or other sources. The extent of any material uncertainty may itself be subject to uncertainty.*
- *There are many ways of indicating the extent of uncertainty, such as:*
 - *giving a range, measure of the value at risk or other statistical calculation;*
 - *showing the numerical consequences of changes in assumptions;*
 - *presenting the outcomes of scenarios, possibly including extreme scenarios; and*
 - *describing the uncertainty and explaining why it has not been quantified.”*

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Communicating reserve uncertainty: questions

- What do you want to say?
- To whom do you want to say it?
- What do the stakeholders want / expect to hear?
- What do the stakeholders already know?
- How will the stakeholders use your advice?
- By what means is communication with them most effective?

Then....

- Explain that there is uncertainty
- Explain its nature and causes
- Explain its magnitude

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Communicating reserve uncertainty: explaining the magnitude

- In words
 - In everyday English
 - Take care with words expressing possibilities / probabilities.
- In numbers
 - “Reasonable ranges”
 - Percentiles
 - Historic
- In pictures
 - Graphs and plots

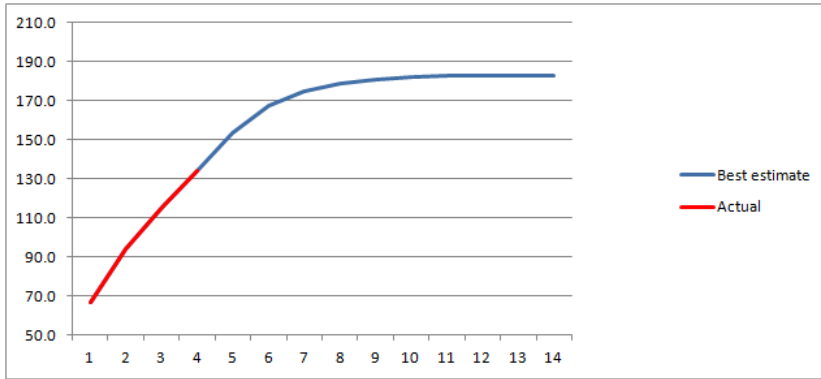
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Communicating reserve uncertainty: explaining the magnitude



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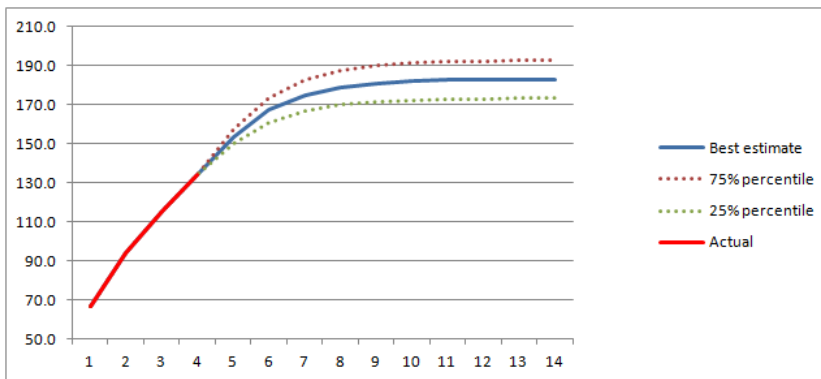
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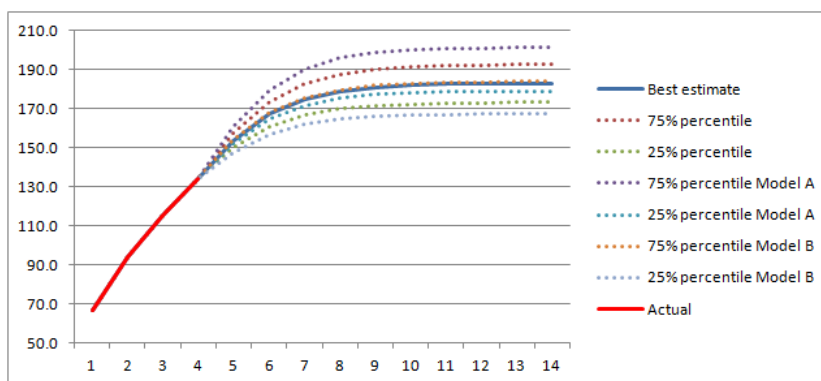
Communicating reserve uncertainty: explaining the magnitude



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Communicating reserve uncertainty: explaining the magnitude



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Communicating reserve uncertainty: explaining the magnitude

Indicative percentile	75%	90%	95%	99%
Wording 'below' percentile	Fairly likely that the outcome will lie below this estimate	Likely that the outcome will lie below this estimate	Very likely that the outcome will lie below this estimate	Extremely likely that the outcome will lie below this estimate
Wording 'above' percentile	Reasonable chance that the outcome could lie above this estimate	Possible but unlikely that the outcome will lie above this estimate	Possible but very unlikely that the outcome will lie above this estimate	There is a possibility, albeit remote, that the outcome will lie above this estimate

- See also “large loss wording” in the 2006 advisory note

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Communicating reserve uncertainty: explaining the magnitude

- What else?
 - Imponderables
 - Scenarios
 - Glossary of terms
 - Multiple approaches
 - Explanation of quantification methods / correlation assumptions
- Communication is a 2-way process
- Feedback loops to improve effectiveness of communication
- Certainty in communication removes ambiguity and makes clearer uncertainty in the reserves.

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Communicating uncertainty: further reading

Quantification and reporting of uncertainty for GI reserving: A paper produced by the Actuarial Profession Reserving Oversight Committee.
Barlow, C., Copeman, P.J., Gibson, E.R., Hilary, N., Hilder, I., Jones, A.R. & Winter, R. (2007)

Best estimates and reserving uncertainty (presented to the GIRO 2008)
Bruce, N.A., Chen, C., Dunne, G., Hinder, I., McMurrough, T., Meyers, G., White, A. & Wright, T. (2008)

Reserving and Uncertainty
Gibson, E.R., Archer-Lock, P., Bruce, N.A., Collins, A., Dunne, G., Felisky, K., Hamilton, A., Jewell, M., Lo, J., Locke, J., Marshall, D., Nicholson, E., Thomas, L., Wilcox, S., Winer, J. & Wright, T. (2007)

A change agenda for reserving: report of the General Insurance Reserving Issues Task Force (GRIT)
Jones, A.R., Copeman, P.J., Gibson, E.R., Line, N.J.S., Lowe, J.A., Martin, P., Matthews, P.N. & Powell, D.S. (2006)

Reserving and uncertainty. A meta-study of the General Insurance Reserving Issues Task Force and Reserving Oversight Committee research in this area between 2004 and 2009

Gibson, E.R., Barlow, C., Bruce, N.A., Felisky, K.M., Fisher, S., Hilary, N.G.J., Hilder, I.M., Kam, H., Matthews, P.N. & Winter, R.

P/C Actuarial Communication on Reserve Ranges and Variability of Unpaid Claim Estimates
Issue Brief published by the American Academy of Actuaries (September 2008)

A Framework for Assessing Risk Margins: report of the Risk Margins Taskforce of the Institute of Actuaries of Australia
Marshall, K., Cowlings, S., Hodson, M., & O'Dowd, C. (2008)

Guidelines on Communicating Forecast Uncertainty
World Meteorological Organisation (2008)

Communicating Uncertainty in Weather Forecasts: a survey of the US Public
Mors, R.E., Demuth, J.L., & Lazo, J.K. (National Centre for Atmospheric Research, Boulder, Colorado) (2007)

Communicating Uncertainty in Intelligence Analysis
Rieber, S. (2007)

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Heuer, R.J. (Jnr) (1999)

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Questions or comments?

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The views expressed in this presentation are those of the presenter.

