Reserving seminar – all this and solvency too?
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Communicating Uncertainty

23 November 2011

Agenda

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

...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”
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.

Uncertainty in claims

- Events
- Claims handling
- Reserving cycle
- Business mix
- Social changes
- Legal / political
- Claim inflation
- Claims management
- Operational risks
- Latent claims
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

Communicating uncertainty

From Psychology of Intelligence Analysis by Roger Heuer
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.

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
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.”

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
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
Communicating reserve uncertainty: explaining the magnitude

### Indicative percentile

<table>
<thead>
<tr>
<th>Wording ‘below’ percentile</th>
<th>75%</th>
<th>90%</th>
<th>95%</th>
<th>99%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fairly likely that the outcome will lie below this estimate</td>
<td>Likely that the outcome will lie below this estimate</td>
<td>Very likely that the outcome will lie below this estimate</td>
<td>Extremely likely that the outcome will lie below this estimate</td>
<td></td>
</tr>
<tr>
<td>Wording ‘above’ percentile</td>
<td>Reasonable chance that the outcome could lie above this estimate</td>
<td>Possible but unlikely that the outcome will lie above this estimate</td>
<td>Possible but very unlikely that the outcome will lie above this estimate</td>
<td>There is a possibility, albeit remote, that the outcome will lie above this estimate</td>
</tr>
</tbody>
</table>

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

Communicating reserve uncertainty: further reading

- P/C Actuarial Communication on Reserve Ranges and Variability of Unpaid Claim Estimates Issue Brief published by the American Academy of Actuaries (September 2008)
- Psychology of Intelligence Analysis Heuer, R.J. (Jr) (1999)
Questions or comments?

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