Case Study: Informing Reinsurance Decisions

GIRO40 October 2013
Paul Kaye

Reinsurance decision making influences

- Capacity requirements
- Risk Understanding
- Risk Appetite
- Theoretical solutions
- Market Appetite

Decision
Reinsurance decision making influences

- Capacity requirements (line size) depend on business opportunities and strategy

- Nature of risks assumed depends on risk appetite combined with ability to transfer unwanted or excess risk to reinsurers
Risk appetite is at the cornerstone of all opportunities and constraints

- Gross risk understanding and net risk appetite give steer as to what solutions will be effective in theory
Reinsurance decision making influences

- Reinsurers’ risk comfort and appetite will dictate which theoretical solutions are available at attractive terms (if at all)

Role of models in reinsurance buying

Measuring risk
- Data sources?
- Key assumptions and results sensitivity
- Validation

Evaluating options in context of Risk Appetite
- Structure
- Pricing
- Metrics?

Explaining risks to facilitate transfer
- Evidence
- Thought process
Risk Appetite and use of models

<table>
<thead>
<tr>
<th>Risk Appetite drivers</th>
<th>Use of Internal Models</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Capital</td>
<td></td>
</tr>
<tr>
<td>Survivability</td>
<td><strong>High</strong> (e.g. 1 in 200)</td>
</tr>
<tr>
<td>Sustainability</td>
<td><strong>Medium</strong> (measurement?)</td>
</tr>
<tr>
<td>2. Earnings volatility</td>
<td><strong>Low</strong> (scenario focus)</td>
</tr>
<tr>
<td>3. Market size</td>
<td><strong>Not applicable</strong></td>
</tr>
<tr>
<td>4. Risk confidence</td>
<td><strong>Not applicable</strong></td>
</tr>
</tbody>
</table>

Models cannot respond to all risk appetite drivers

**Tolerance v Appetite**

- **Aversion** *n.* a feeling of intense dislike
- **Tolerance** *n.* the act or capacity of enduring
- **Resilience** *n.* the ability to recover from misfortune
- **Appetite** *n.* a desire or liking for something
- **Objective** *n.* something worked toward or striven for
- **Reward** *n.* a satisfying return or result

**Tolerance**
Undesirable risk that is tolerated

**Appetite**
Desirable risk, subject to the reward being adequate

**Illustration**
- You are prepared to **Tolerate** a loss of 100
- Your preferred lowest retention is 50
  - Lower inappropriate from reputational perspective
  - Lower not available in reinsurance markets
- 50 xs 50 protection is available...
  1. Modelled 100% loss ratio
  2. Modelled 10% loss ratio
  3. Modelled 70% loss ratio

**When would you buy? What is your Appetite?**
Three types of uncertainty

- **Aleatory**
  - Uncertainty (variability) inherent in the process itself
  - Parameter *sometimes* has one value and *sometimes* another

- **Epistemic**
  - Uncertainty due to incomplete knowledge
  - Parameter has either one value or another (i.e. not random)

- **Operational**
  - Human factors: not Aleatory or Epistemic
  - E.g. deliberate simplification, modelling process error, misinterpretation...

Progression of model use

- **Back of an Envelope**
  - Unsophisticated
  - Uncertainty often intelligently considered

- **Model Awe**
  - Sophisticated
  - Uncertainty often overlooked

- **Model Use Maturity**
  - Sophisticated
  - Intelligent consideration of uncertainty

Uncertainty understanding key to intelligent model use
  - How should non-aleatory uncertainty influence decision making?
  - What are the implications for risk appetite – articulation and use?
Key Sources of Uncertainty

Decision making in practice - examples

<table>
<thead>
<tr>
<th>Limit</th>
<th>Retention</th>
</tr>
</thead>
</table>
| - Difficulties quantifying exposure  
  - Clash potential  
  - Cat model confidence  
  - Buying more protection where greater uncertainty | - Value beyond direct capital benefits  
  - Increasing retention levels even where modelled loss ratio > 100%  
  - Aggregate covers: modelling and risk appetite guidance limitations |

<table>
<thead>
<tr>
<th>Pro rata v XL</th>
<th>Price</th>
</tr>
</thead>
</table>
| - Capacity requirements and risk appetite constraints overriding issues  
  - Reinsurer appetite has strong influence over terms | - Different perspectives of cedant and reinsurers  
  - View of risk  
  - Risk appetite |
Informing Reinsurance Decisions

Models have a key role in reinsurance decision making…

…but intelligent use requires intelligent engagement with broader issues:

- Risk understanding and confidence
- Risk appetite (and limitations in articulation)
- Market appetite – what do reinsurers want to provide?