ERM – Making it come alive through the use of Operational Risk Reporting and Modelling

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Agenda

- Amlin’s Risk Management Framework and operational risk
- Modelling methodology
- Scaling methodology and data
- Using loss event information
Risk Management Framework & where operational risk fits
Amlin’s Risk Management Framework

Framework Foundations
- Risk Policy & Risk Strategy
- Risk Standards
- Risk Appetite & Tolerances

Accountability & Ownership
- Review
- Report
- Identify
- Risk Assessment Process
- Response
- Assess

Governance
Communication
Infrastructure
Challenge

Risk Policy & Risk Strategy
Risk Standards
Risk Appetite & Tolerances

Risk Assessment Process

Risk Policy & Risk Strategy
Risk Standards
Risk Appetite & Tolerances
Risk appetite in context

- **Risk Preferences and Drivers**
  - A philosophical position is to achieve a balance of risk and maximise the benefit of Amlin’s strengths and core competencies.
  - Insurance is attractive provided good returns can be achieved in relation to the risk.
  - Liquidity risk is unattractive. Failure to pay valid claims is a major reputational threat.
  - Market risk is to enhance profitability within the limitations of matching assets to liability, maintaining liquidity and preserving the balance sheet.
  - **Operational and Credit risks are undesired consequences of operating as an insurance company. The cost/benefit of controls need to be considered.**

- **Risk Appetites**
  - A high-level statement of level of risk that Amlin is able and willing to accept.
  - An strategic articulation of what risks Amlin is prepared to take to deliver its appetite and which risks or level of risk it is unwilling to take in order to protect its balance sheet.

- **Risk Tolerances**
  - Specific levels of risk that Amlin is prepared to bear.
  - Reported to Boards and Risk Committees within ORSA.
  - Quantified and performance is tracked to ensure business operates within these boundaries.

- **Risk Limits**
  - Transactional level business controls.
How does risk assessment fit into the ‘bigger picture’ of capital management and business planning?
Modelling methodology
Business Case and philosophical position

- There is no ‘upside’ for insurers in having to hold capital against operational risks, hence there is value in controlling any increase in regulatory capital charges for operational risk capital.

- Integrating operational risk fully into Internal Model gains diversification benefits.

- Modelling can help justify return on investment for risk mitigation actions.

- Enhances perceptions of an organisation and its risk management by credit rating agencies. Influences ERM and credit ratings.
History of model development

- Amlin has been developing an Internal Model since 2001 (pre-ICA)
- Operational risk modelling has been significantly enhanced since 2010
- Drivers were:
  - Making a stronger link between capital management and risk management
  - Incentivising risk improvements and ‘loading’ for poor control environment
  - Creation of a robust SCR capital calculation for Operational Risk
  - Substantiating modelled diversification benefit
  - Solvency II compliance

<table>
<thead>
<tr>
<th>Year</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
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</thead>
<tbody>
<tr>
<td><strong>Key development</strong></td>
<td>Basic Excel-based model</td>
<td>Management engagement and challenge of outcomes</td>
<td>Moving from ‘prototype’ to ‘production’ system</td>
<td>Release risk function from ownership, to allow validation</td>
<td>Increase visibility and ownership of inputs / expert judgement</td>
</tr>
<tr>
<td><strong>Enablers</strong></td>
<td>Palisade software Joining ORIC</td>
<td>ORSA review and challenge</td>
<td>Moving stochastic simulation into Igloo Validation</td>
<td>Igloo enterprise upgrade ORIC scaling project Validation</td>
<td>Igloo web interfaces Alternative curve selection to LogNormal</td>
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</table>

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Data sources and curve fitting

Internal / External Losses

Scenario Analysis

Most Likely Outcome

Minimum Outcome

Maximum Outcome

1 in 10 yr event

1 in 50 yr event

Available external data

Amlin Distribution

Probability of Losses

Loss Distribution

Total Losses (in hundreds)

Expected Losses

Unexpected Losses

Institute and Faculty of Actuaries

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Embedding the capture of expert judgements

- Making expert judgement more visible and challengeable
  - Example – correlation grids and rationale for linkages
Embedding the capture of expert judgements

- Making expert judgement more visible and challengeable
  - Risks added or removed from model
  - Confirming risk register and model alignment

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Risk to Entity | Risk Description
---|---
4710 AUL | Non-compliance with UDD requirements
4655 AUL | Breach of prudential regulatory requirement
4693 AUL | Breach of regulatory requirements - regulatory administration and implementation of regulatory change
4692 AUL | Breach of regulatory requirements - customer treatment - delegated underwriting
4691 AUL | Breach of regulatory requirements - customer treatment - post sale
4690 AUL | Breach of regulatory requirements - customer treatment - pre sale and sale
4602 AE | Pension Liability
4636 AE | Changes in the (broker) distribution chain
4744 ARK | Slow Settlement of Premiums From Brokers
4719 ARK | Non-compliance with sanctions regimes applying to Amlin companies
4721 ARK | Breach of financial crime legislation by Amlin Companies - including fraud, anti-money laundering
4720 ARK | Breach of Data Protection rules and requirements
4722 ARK | Failure to obtain required licence
4723 ARK | Breach of regulatory requirements - customer treatment pre sale and sale
4724 ARK | Breach of regulatory requirements - customer treatment post sale
4725 ARK | Breach of regulatory requirements - customer treatment - delegated underwriting
4726 ARK | Breach of regulatory requirements - regulatory administration and implementation of regulatory change
4727 ARK | Breach of client money rules
4728 ARK | Breach of prudential regulatory requirements
4776 ARK | Breach of anti bribery and corruption law/regulations
Validation process

- Using Validation process to drive model improvement and use
- Positive inputs from:
  - Back-testing – do loss events appear in line with model outputs?
  - Data quality review and sign-off
  - Sensitivity analysis – is the model responding intuitively?
  - Management review and challenge of model results - extremely valuable process
  - Stress testing using operational risk scenarios
  - Methodology – adoption of scaling tools and improvements in curve fitting

<table>
<thead>
<tr>
<th>Year of Event</th>
<th>Number of Events</th>
<th>Total Value of losses (GBPk)</th>
<th>Maximum Value of single loss (GBPk)</th>
<th>Average value of loss (GBPk)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>34</td>
<td>2,334</td>
<td>0,600</td>
<td>680</td>
</tr>
<tr>
<td>2012</td>
<td>58</td>
<td>6,682</td>
<td>4,930</td>
<td>110</td>
</tr>
<tr>
<td>2013</td>
<td>39</td>
<td>10,531</td>
<td>10,000</td>
<td>270</td>
</tr>
<tr>
<td>2014</td>
<td>5</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Average (excluding 2014)</td>
<td>44</td>
<td>6,515</td>
<td>10,000</td>
<td>353</td>
</tr>
</tbody>
</table>

Results for Mean exposure (GBPk) Median exposure (GBPk)

- Q1 2013: Mean = 12,361, Median = 7,080
- Q1 2014: Mean = 13,826, Median = 7,964
Use of scaled data
Scaled data project

• ORIC was asked by its members to create a scaled data capability to support benchmarking and modelling.
• The aim was to produce a practical tool for members whilst establishing a robust and defendable methodological basis, which could be subject to independent scrutiny and validation.
• This had also to be balanced with protecting member’s data anonymity.

• The tool was delivered in mid-2014.
• The process has been subject to independent validation by an external consultancy.
Scaling methodology

- ‘Expected Shortfall methodology’ – conditional VAR* approach
- Uses the log of the losses to decrease the range while still keeping the proportionality of the data (& mathematical reasons)
- Considers average log loss above specified percentile (from 0 to 100)
- → increasing the percentile X will move the probability more towards the tail events
Scaling range selection

- Looking at the relationship between the generated scaling factors across all percentiles (non-life):

- Most stable relationship (with sufficient variation) is found towards the tail.
Uses of scaled external loss data

• External loss databases have only been around for the last 10-15 years and hence scaling methodologies are still in the initial stages of development.
• Because of this, the current industry effort is on a combination of loss data and other factors such as scenario analysis and BEICFs, rather than pure statistical modelling.
• Modelling focus is on tail distribution, as it is a key driver of the capital figure.
• Current uses for scaled data in the industry include:
  - Direct input into capital models, in combination with internal data;
  - Benchmarking for scenario analysis;
  - Informing tail-shape for LDA or scenario-based models (indirect input).
Scaled Outputs: what does it look like?
Encouraging loss event data capture and use
1. Where do I find the template?

2. What should be reported…
   • Thresholds versus sharing

3. To Whom?
   • Note legal / compliance aspect before reporting!!

4. Why?
   • Avoid repeat
   • Root cause for key events
Looking for trends and step-changes

Trend Analysis of Risk Events Reported During: 01/01/2014 to 31/03/2014 -

Count by Entity

Count by Cause

Count by Key Control Failure

Count by Loss Type

Actual Net Loss Values (Various Currencies - all in millions)

Count by Near Miss Loss Quantification Type

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Actively sharing ‘lessons learnt’ between divisions

Amlin Risk Event 517 (Internal Event)
Reporting date: 15 January 2014
Event Title: Cover-holder breaches binding authority

➢ Description:
  • A cover-holder has an underwriting guide which clearly shows all the risk they can and cannot write, including risk that had previously been referred for special terms. For this particular cover-holder within the guide there was a paragraph on risks associated with writing business for flood reference postcodes.
  • At renewals the cover-holder wrote business within flood zones area without referencing to the documented underwriting guide issued to them or to the assigned terms.
  • This led to the cover-holder setting up an insurance cover for a property which was IN a flood zone postcode, and when it was affected by the floods, and a claim was made by the client – it was only then this risk which previously had special terms imposed became apparent.
  • Legal contacted the underwriter to discuss this matter. It was then understood that the cover-holder had breached their authority and not read through their guidelines.

➢ Consequence:
  • Actual, current loss of £15,000
  • A flood occurred at the risk address causing damage estimated at £460,000. Following review by legal and subsequent challenge of underwriters it has been established that had the risk been correctly referred it would have been written but with an increased flood excess of £15,000. A contribution of £15,000 is being sought from the cover-holder.

➢ Contributing factors:
  • The root cause of this issue is the cover-holder did not read through the guidelines submitted to them and making note of the requirements/terms. This shows lack of accountability held from the cover-holder.

➢ Identified or Proposed actions:
  • ACTIONS ALREADY ON ARM but IN PROGRESS: team will be carrying out a file review at the cover-holders office. Underwriter will be contacting the cover-holder to discuss this issue further.
  • They will visit the cover-holder for a file review to see if there are other similar issues to this and to give comfort this was an isolated case. This is expected to be done by April/May 2014.
Raising the profile – company staff publication

Risk News

Learning from mistakes

Amlin operates a register of potential risks facing the business. We also capture and analyse information when a risk event happens for real. When these events happen we review procedures and implement processes to ensure they don’t happen again.

Amlin Risk Event

Description: An underwriter asked for approval of a new broker through the correct process. No response was forthcoming and the underwriter initiated the new business without approval. A coverholder had written a risk which appeared to be domiciled in Mozambique. The organisation is only authorised to write risks in Mozambique if there is no local market of the risk, and if we obtain regulatory approval. There was no evidence that the risk had been authorised and the coverholder did not notify Amlin of the risk. Investigation and legal opinion ultimately determined it was a permitted risk, as it was an international risk; this was a near miss. What can we learn from this?

Actions in progress include the Underwriting guide being reviewed and changes being communicated once finalised. How many more incidents like this could we be exposed to – which may not in that case turn out to be legal?

The sharp end: learning from mistakes

Amlin operates a risk register of potential threats facing the business; we also capture and analyse information when a risk event happens for real.

Another way of trying to keep ahead is to look at other companies’ risk events. Amlin is a member of the ORIC consortium, comprising 80 insurance companies who share intelligence anonymously. This ORIC database provides examples that we can learn from. Take a look at these examples posted on the ORIC register.

Could this happen to us?

Why has it not happened to us?

What would do we if it did?

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Cost-Benefit Analysis

- For operational risk every risk mitigation investment involves a cost-benefit decision.
- This comes down to ‘Risk Appetite’.
- Does the reduction of ‘risk level’ justify the resource investment?
- But how do you measure the ‘risk level’?
  - Annualised Cost of Risk (ACOR)
  - Net Present Value (NPV)
  - Risk-adjusted Rate of Return
  - Using a capital model
- Post implementation of mitigation strategy, how do you prove that the ‘risk level’ as been reduced?

Figure 4.3 Cost of risk reduction measures
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.