Reserving Seminar
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Catastrophe development and uncertainty
Market trends
Actuarial Function reporting
Questions/discussion
Catastrophe development and uncertainty

2017 Catastrophe experience
Harvey, Irma and Maria

Source: NASA
HIM Ultimate Development

Market Ultimate By Period

- HIM Gross
- HIM Net
- KRW Gross
- KRW Net

HIM Ultimate £bn

Development Quarter

1 2 3 4 5

Market Ultimate £bn

HIM Incurred Development

Gross Incurred US Hurricane Development

- Hurricane Katrina
- Hurricane Ike
- Hurricane Irma
- Hurricane Rita
- Hurricane Sandy
- Hurricane Wilma
- Hurricane Harvey
- Hurricane Maria
- Historical Gross Development

Development Months

% developed

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Incurred To Ultimate Development

Paid To Ultimate Development
Catastrophe / Large Loss Uncertainty – Approaches used

- Model multiple events together given common reinsurance arrangements
- Scenario based approaches
- Discussion with Exposure management to determine adverse scenarios
- Lean on syndicate estimates and scenarios
- Flexing assumptions
- Measure deterioration against return period in capital model
- Use capital model to assess deterioration
- Benchmarking - historical catastrophe development

Catastrophe / Large Loss Uncertainty – Considerations

- Set out the Uncertainty for the loss
- Link to the capital model, what is the return period for the deterioration?
- Validate the selection using historical data or other benchmarks
- Consult with exposure management, underwriters, claims
- Is it appropriate to set out and consider the limits?
- Document the work!
- Decide on the adverse scenario / stress
- Describe the rationale for the scenario
- Don’t solely rely on information provided

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2017 was not an exceptional CAT year

Even though losses were higher than average

- 2017 was not an exceptionally poor year for CAT losses
- but did not have the support of strong attritional performance
- Underwriting performance worsening

<table>
<thead>
<tr>
<th>Year</th>
<th>UW loss UK£ bn</th>
<th>UW profit ex - CAT</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005</td>
<td>1.4</td>
<td>3.2</td>
</tr>
<tr>
<td>2011</td>
<td>1.2</td>
<td>3.8</td>
</tr>
<tr>
<td>2017</td>
<td>3.4</td>
<td>1.1</td>
</tr>
</tbody>
</table>

- Attritional loss ratios have been climbing steadily for several years

Source: Lloyd's market results, 31 December 2017 (previous losses indexed). Claims translated at rate of exchange prevailing at date of event.
The “cycle” will not solve profitability challenges
Rate changes following recent headline catastrophe events

<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
<th>Loss (bn)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1992</td>
<td>Hurricane Andrew</td>
<td>$25.9bn</td>
</tr>
<tr>
<td>2001</td>
<td>9/11</td>
<td>$24.9bn</td>
</tr>
<tr>
<td>2005</td>
<td>Hurricane Katrina</td>
<td>$64.7bn</td>
</tr>
<tr>
<td>2008</td>
<td>Hurricane Ike</td>
<td>$13.6bn</td>
</tr>
<tr>
<td>2012</td>
<td>Hurricane Sandy</td>
<td>$19.0bn</td>
</tr>
<tr>
<td>2017</td>
<td>Harvey/Irma/Maria</td>
<td>$90.0bn</td>
</tr>
</tbody>
</table>

Source: Guy Carpenter, Insurance Information Institute, Deloitte analysis

Updating Expectations
What questions should a (reserving) actuary expect to answer

- **Change in loss ratio in absence of unexpected experience is a change in reserving basis**
  - Why has it been made?
  - Is it the right amount?
  - Is there a different level of uncertainty?
  - Have other assumptions been updated consistently (patterns etc.)?
  - How has it been communicated?
  - How has it been fed-in to other areas – pricing, business planning, reinsurance, capital?

- **Being wrong is a learning opportunity and actuaries are key to taking this**
  - Why was the effect/trend/outcome/claims source/level of inflation/reinsurance response/… not anticipated?
  - Could another policy/binder/class/account be affected?
  - How much better/worse could it get?
  - How does it impact the assumption setting process?
  - Who has ownership of the assumption(s) made?
  - Can you disclaim responsibility for this?
  - Will you lose credibility if the answer is always the same?
Market AvsE and ULR movements for 2015 & prior and 2016 YoA
Diagnostics used to identify any change in reserving basis

Initial Expected Loss Ratios Expectations
Are a key input to reserving, pricing and business planning

- Do you check how right they were?
- How right should you expect them to be?
- Do you know why they've been wrong -- individually/systematically?
- How right do users expect them to be?
- What is the feedback loop?
- What input should the “actuarial skillset” bring?
Initial Expected Loss Ratio Expectations

Are a key input to reserving, pricing and business planning

- Systematic bias – As many points start below as above, the average movement is 1.0(03)
- Emerging trends – Mix of older/newer years above/below the line
- Unanticipated impacts – No clear calendar year effects

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ULR progression

- Systematic bias – Slightly more points above than below, the average movement is 1.0(40)
- Emerging trends – Most recent years all started above initial selection, and deteriorated from there
- Unanticipated impacts – Trend that initial position is insufficient in recent years

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Initial Expected Loss Ratio Expectations

Are a key input to reserving, pricing and business planning

- Systematic bias – Slightly more points above than below, the average movement is 1.0(40)
- Emerging trends – Most recent years all started above initial selection, and deteriorated from there
- Unanticipated impacts – Trend that initial position is insufficient in recent years

We can (readily) update reserving assumptions. Where else should there be an impact?

Actuarial Function Reporting – A way out of any silo?
Actuarial Function has two sides for Lloyd’s…

Market and Society levels

**Reports received from the market**

- Two submissions per year
- Self-assessment template of requirements met, reviewed by Lloyd’s

**Report produced by the Lloyd’s Actuarial Function**

- Overview of internal Actuarial Function work and outcome from Syndicate report reviews
- (Voluntary) completion of self-assessment template for confidence on compliance

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…Primary purpose of each side is the same

Actuarial Function has two sides for Lloyd’s

The Actuarial Function is required to inform the board of the key findings from their work and recommendations to address these

It is a key route for Actuarial work to influence the business

The Actuarial Function Report does not:

- Have a primarily regulatory audience, it is for the board
- Provide sign-off for business plans/reinsurance purchase – it provides an opinion on these for the board to consider
- Include all of the actuarial work undertaken in the year – this is too long!

Our message has been consistent in recent reviews…but we haven’t seen much action
Is it a user issue?
We have found NEDs to be an engaged and valuable group

• We held our first NED forums last year
• We had to hold two sessions due to demand
• NEDs should be informed by the Actuarial Function

As an internal Actuarial Function we have tried to practice what we preach…users are the best judge of our success

Actuarial Function Primarily seeks to inform users
A user’s view – Jon Hancock, Lloyd’s Performance Management Director

Lloyd’s has lots of information and analysis underlying business plan consideration

The Actuarial Function view provides:
• Independent perspective
  • Focus on data and past performance, the art of the possible grounded in reality
  • Clear links to analysis
• Limitations of data and reliance clearly highlighted
  • Maybe more is possible, but *explicitly* what is being assumed compared to history in plans
• Appropriate timing of conclusions to be able to influence as decisions are being made
Actuarial Function Primarily seeks to inform users
A user’s view – Jon Hancock, Lloyd’s Performance Management Director

The actuary is right . . .
. . . now discuss!

The function is the key driver of ‘Lloyd’s loss ratios’
How reliable are your loss ratio picks?
What loss ratios are agreed for plans?
How much capital is charged?

Your Board has access to better data than we do
We rely on it
We rely on you to use it

You will get better outcomes by using your actuarial data
They have the context
They understand the initiatives

If the packs are not understandable . . .
change the packs!

My request last week of the Boards . . .
. . . own your plans

What the NEDs want

<table>
<thead>
<tr>
<th>WHY?</th>
<th>Embedded in business</th>
<th>Messaging</th>
<th>Engagement</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Not just statement of facts</td>
<td>• No surprises in documentation</td>
<td>• Write the exec summary first</td>
<td>• Be willing to take on feedback</td>
</tr>
<tr>
<td>• Planning vs actual</td>
<td>• Review of loss ratios over time for the underwriting opinion</td>
<td>• Conclusions first then method</td>
<td>• Be open to train board members</td>
</tr>
<tr>
<td>• Is it important? Tell us</td>
<td>• Careful of working in a silo</td>
<td>• Do you have to duplicate?</td>
<td>• Responsive to recommendations</td>
</tr>
<tr>
<td></td>
<td>• Have opinions</td>
<td>• Articulate uncertainty / limitations</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Turn recommendations into actions</td>
<td>• Is this a report for the Regulator or the board?</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Issues regularly flagged in a different format to the Actuarial Function Report</td>
<td>• Robust opinions are important</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Clarity – insight vs evidence</td>
<td></td>
</tr>
</tbody>
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