RoboActuary
Separation of reporting and reserving
Neil Bruce (Willis Towers Watson)
Kirstin Barker (PwC)
What are we going to discuss today?

1) Looking Backwards

2) What is happening now?

3) Looking forwards
Before the UK Ogden discount rate was changed to -0.75% in 2017, in what year was the rate last changed?

H: 2001

T: 2009
Looking backwards
Something fun

When was the Bornhuetter Ferguson Method first published?

H: 1975
T: 1995
Looking backwards
Something fun

What was the primary reason for Independent Insurance’s 2001 insolvency?

H: Fraud

T: Manipulated case reserves
Looking backwards

Something fun

What proportion of recent* insurance impairments were due to under-reserving?

H: 65%

T: 45%

*P&C Insurers 1969 through to 2014, Based on JLT’s 2014 report.
Looking backwards

Something fun

Is there such a thing as a reserving cycle?

H: No

T: Yes
Looking backwards

Something fun

What does the Y axis on the below graph represent?

H: Annual change in UK actuarial average salaries

T: % change in ultimate from initial estimate, by Acc Year

22 October 2018
Looking backwards
But surely that was just the past?

IFRS 17
More products
More MI
More expense cuts
SII shortening timeline
Regulatory Intervention
Actuaries taking over finance activities
Change
Data
Now you will need to do MORE
but with LESS
Looking backwards
Where can we go from here?

Have we reached **crunch** point?
Background
What we see across the industry

The problem manifests in various different ways.

- Better management information
- Improved efficiency
- Cost control
- Better modelling
- Higher quality output
- Right mix of skills/capabilities
- Clearer reporting lines

Current environments are usually summarised by the graphic below, alongside our observations on the larger insurers.

- Best practice is end-to-end workflow automation
- A few peers are automating workflows now; others are planning to do so
- Best practice meets today’s business requirements via streamlined processes and minimal out-of-model adjustments
- Most large insurers are fundamentally redesigning models to move to best practice
- Many companies are actively transitioning to the cloud
- This transition to the cloud, combined with streamlined models and automated processing, could free up significant IT and other resources
It’s all about timing

*May be production of diagnostics only, or a sub-set of the book
Reserving or reporting?
Where does reporting start?

1. Data extraction
   - Downloads
   - Adjustments
   - Roll-forward
   - Importing data

2. Population of analysis tools
   - Reviewing diagnostics
   - Making selections
   - Peer review

3. Analysis
   - Population of warehouse
   - Reviewing diagnostics

4. Exporting
   - Population of warehouse

5. Ancillary calculations
   - Convert to reserves
   - Solvency II
   - Convert UY/AY

6. Reporting
   - Actuarial report
   - Committee packs
   - Audit/SOX compliance

7. Closedown
   - Prep for next exercise

- 1: 20%
- 2: 15%
- 3: 20%
- 4: 5%
- 5: 15%
- 6: 20%
- 7: 5%
Pros and cons
Picking the right method for you
• Reporting is not actuarial
  – Automation of the fast close outside high-level judgements
  – Build a process that recognises what the stakeholders require

<table>
<thead>
<tr>
<th>Option</th>
<th>Pro</th>
<th>Con</th>
</tr>
</thead>
<tbody>
<tr>
<td>Previous ultimates</td>
<td>• Fast reporting&lt;br&gt;• Limited actuarial involvement&lt;br&gt;• No surprises</td>
<td>• Not responding to latest data</td>
</tr>
<tr>
<td>Automatic roll-forward</td>
<td>• Fast reporting&lt;br&gt;• Uses latest data</td>
<td>• May get unexpected movements due to unexpected or incorrect data&lt;br&gt;• May require more analysis for reporting</td>
</tr>
<tr>
<td>AvE + review</td>
<td>• Uses latest data&lt;br&gt;• Has opportunity to ignore spurious or suspect data</td>
<td>• Requires actuarial review&lt;br&gt;• Slower/more resource requirements&lt;br&gt;• Potential for surprises</td>
</tr>
<tr>
<td>Previous ultimates + review</td>
<td>• Fast reporting&lt;br&gt;• Limited actuarial involvement&lt;br&gt;• No surprises</td>
<td>• Not responding to latest data other than material issues</td>
</tr>
</tbody>
</table>
Shades of blue

- No adjustments
- High-level adjustments. No data update.
- AvE automatic process
- AvE with intervention
- Full reserve review
### Up-to-the-minute data or analysis

**What is the point of fast close?**

The purpose is usually to get results to senior management that:

- Contain all material issues that investors would expect to be included
- Be based on rigorous *(but not necessarily current)* actuarial analysis
- Be appropriately reviewed and signed off *(internally and externally where appropriate)*
- Only deviate from the expected position based on prior detailed analysis *(where material and justifiable)*

#### How to achieve this?

- Don’t change ultimates
- Adjust only where previous analysis has indicated significant AvE
- Allow data to flow through existing models
- Don’t fiddle!

#### What’s the problem?

- Should small/medium movements late in the quarter affect the booked position?
- Reserve uncertainty means something
- Early warnings/ exceptional events etc can always happen, but how big do they need to be and is a full reserving process going to give a better answer with limited data
Full reserving process
Fast close reporting process

- Data Warehouse Extraction
- Data Cleaning and adjustments
- Data Import
- Data Reconciliations
- IFRS17 Groupings

- TP Data

- Modelling Templates
- Dashboards
- Modelling

- A v E
- Variability
- Peer Review
- Sign-off

- Review
- Checks
- Revision

- Finalised Actuarial Best Estimates
- Reserve Committee Summaries

- Reserve Committee
- Sign-off
- Revision

- Board Meeting and Sign-off

- Business Unit Meetings

- Internal Audit
- External Audit and Independent Review

- TP & IFRS 17 Validation
- Accounting Basis and Cashflow Module
- Accident Year
- Underwriting Year
- GAAP
- S2TPs
- IFRS17

- Checks

- Checks

- Checks

- Checks

- Checks

- Checks

- Checks

- Checks

- Checks

- Checks

- Checks

- Checks

- Checks

- Checks

- Checks

- Checks

- Checks

- Checks
Fast close reporting process

Data
- Data Warehouse Extraction
- Data Cleaning and adjustments
- Data Import
- Data Reconciliations
- IFRS17 Grouping
- TP Data

Analytics
- Tool
- Bespoke
- Modelling Templates
- Dashboards
- Variability
- Peer Review
- Sign-off
- Revision

Meetings
- Business Unit Meetings
- Review
- Sign-off
- Revision

Audit / Validation
- Internal Audit
- External Audit and Independent Review
- TP & IFRS 17 Validation
- Accounting Basis and Cashflow Module
- Accident Year Underwriting Year GAAP
  - S2TPs
  - IFRS17

Outputs
- Finalised Actuarial Best Estimates
- Reserve Committee Summaries
- Reserve Committee
- Sign-off
- Board Meeting and Sign-off
- Revision

Automation
- Automation
- Automation
- Automation
- Automation
- Automation
- Automation
- Automation
- Automation
Fast close reporting process

Data

- Automated production and loading

Analytics

- Automated refresh and diagnostics production

- Manual (peer) review of diagnostics on analysis and data movements and changes to selections

Meetings

- Discussion/approval of results within meetings

Audit/validation

- Automated creation of reconciliations and audit trails

Outputs

- Automated creation of uploads and conversions
How fast is fast?
Process design vs automation

Automation
- Overnight processing of data
- Automatic population of diagnostics
- Automatic population of reserving models
- Population of exhibits
- Calculation of ancillary reserving bases

Process design
- Limited actuarial involvement in reporting calculations
- Stakeholder management
- Use of pre-analysis/ early close
Reserving or reporting?
Potential effect of automation and redesign

<table>
<thead>
<tr>
<th>Process</th>
<th>Full review</th>
<th>Automation</th>
<th>Reporting process</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data extraction</td>
<td>5 FTE</td>
<td>3.5 FTE</td>
<td>0.5 FTE</td>
</tr>
<tr>
<td>Population of analysis tools</td>
<td>20%</td>
<td>5%</td>
<td>0%</td>
</tr>
<tr>
<td>Analysis</td>
<td>15%</td>
<td>5%</td>
<td>15%</td>
</tr>
<tr>
<td>Exporting</td>
<td>20%</td>
<td>50%</td>
<td>15%</td>
</tr>
<tr>
<td>Ancillary calculations</td>
<td>5%</td>
<td>5%</td>
<td>5%</td>
</tr>
<tr>
<td>Reporting</td>
<td>15%</td>
<td>5%</td>
<td>15%</td>
</tr>
<tr>
<td>Closedown</td>
<td>20%</td>
<td>25%</td>
<td>60%</td>
</tr>
<tr>
<td></td>
<td>5%</td>
<td>5%</td>
<td>5%</td>
</tr>
</tbody>
</table>

Potential effect of automation and redesign

- Downloads
- Adjustments
- Roll-forward
- Importing data
- Reviewing diagnostics
- Peer review
- Making selections
- Population of warehouse
- Convert to reserves
- Convert UY/AY
- Solvency II
- Actuarial report
- Committee packs
- Audit/SOX compliance
- Prep for next exercise

Automation:
- 5 FTE
- 3.5 FTE
- 0.5 FTE

Reporting process:
- 5%
How can I do that?  
Realising the benefits

If you don’t have to think, you don’t need an actuary:

• **Data extraction**: collating and formatting data

• **Data check and manipulation**: exception reports; reasonability checks; preparing data for import

• **Analysis tools**: population of initial data and running of basic models (and potentially initial pattern and results selection depending on your methodology)

• **Extraction of ultimate selections into a warehouse**

• **Ancillary calculations**: conversions between bases

• **Reporting**: population of standard exhibits; analysis of change, waterfall diagrams

---

**Reserving exercises**: Data checks, preliminary analysis with diagnostics and initial selections complete for initial review a day after data is available with no intervention required.

**Reporting**: no interventions required other than reaction to major events since the early close; population of all reporting bases and report exhibits a day after data available.
An example

- Perform early close to update parameters including those for reporting. Use maximum automation in production of these results (see previous slide)

- Use large loss/ event protocols including claims department watchlists just prior to quarter-end to produce any high-level adjustments (defined at a detailed level) and update warehouse with these adjustments.

- Provide pre-quarter report update based on high-level adjustments

- Automatically extract new data from core systems at quarter-close, combine with previously loaded ultimates and high-level adjustments to derive all reporting bases

- Produce automatic reconciliation report where necessary (e.g. where reporting basis depends on cashflow position – SII, IFRS 17)
Automating processes

If you don’t have to think, you don’t need an actuary:

There are many areas of standard reserving and reporting processes that can be automated – save effort where it doesn’t add value

Reporting ≠ Reserving

• Make your reporting process as slick as possible, concentrate your resources on getting the best answer

The vision

• Reserving exercises:
  Only get actuaries involved when there’s analysis to do.

• Reporting: This is the production of standard packs based on actuarial assumptions, not actuarial work itself.
Looking forwards
Where are we going next…

OR
Looking forwards

Where are we going next?

IFRS 17
More MI
Expense cuts
More data
Regulatory Intervention
SII shortening timeline
New Products
Competition
Change as the ‘new norm’

Actuaries taking over finance activities
Looking forwards
Where are we going next…

Where do we want to be?
The views expressed in this presentation are those of invited contributors and not necessarily those of the IFoA. The IFoA do not endorse any of the views stated, nor any claims or representations made in this presentation and accept no responsibility or liability to any person for loss or damage suffered as a consequence of their placing reliance upon any view, claim or representation made in this [publication/presentation].

The information and expressions of opinion contained in this publication are not intended to be a comprehensive study, nor to provide actuarial advice or advice of any nature and should not be treated as a substitute for specific advice concerning individual situations. On no account may any part of this presentation be reproduced without the written permission of the IFoA.