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Towards the Optimal Reserving Process

Neil Bruce, Katherine Laidlar, Gregory Overton

10 October 2013

Agenda

1. Background to the working party
2. Scope of the reserving process and some key issues we believe need to be addressed/discussed in future
3. Actual vs. Expected

1. Background
Focus of the working party

- Produced by the “Towards the Optimal Reserving Process” (TORP) working party
- TORP considers:
  - Governance and design of reserving processes
  - Reserving methods and their strengths / weaknesses
  - Best practice in documentation / housekeeping
- Long term aim is to identify how to make the reserving process more efficient
- Working party mission is to suggest best practice for reserving
- Aim to assist actuaries explain to stakeholders the benefits of re-engineering the reserving process

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1. Background
Practical approach

- The working party has noted the extremely broad potential scope of the “reserving process”
- Idea is to focus on particular areas in series, whilst also having an eye on efficiencies to be gained in the wider process
- Feedback suggested AvE is an area many people are thinking of as a step towards optimal reserving

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1. Background
TORP members

- Alastair Lauder
- Alexander Crosby
- Anthony Wright
- Cameron Heath
- Camilla Bennett
- Gregory Overton
- Jinita Shah
- Joe Ryan
- Katherine Laidlar
- Keith Taylor
- Marios Argyrou
- Neil Bruce (Chair)
- Sylvie LeDelliou
- Tim Jenkins

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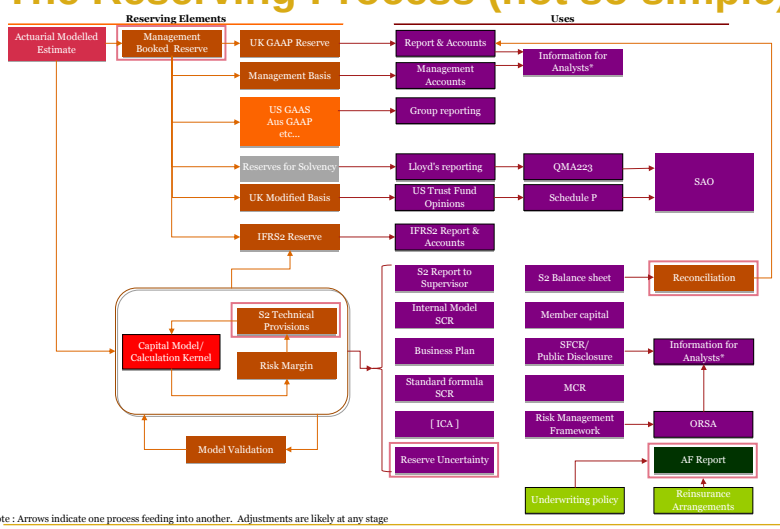
2. Scope and issues
The Reserving Process (not so simple)



Note : Arrows indicate one process feeding into another. Adjustments are likely at any stage

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2. Scope and issues
Features of the Optimal Process

- There are many! Particularly key are:
  - Consistent understanding of reserving philosophy and policy
  - Data accurate, complete, timely and at an appropriate level of detail
  - Process automated wherever possible – allowing resource to be focussed on judgement not routine tasks
  - Diagnostics embedded to help target resources effectively and identify where previous assumptions may not be appropriate
  - Detailed and summary documentation tailored to various audiences and populated directly from working papers
- Will never reach the ideal process, but useful to have in mind

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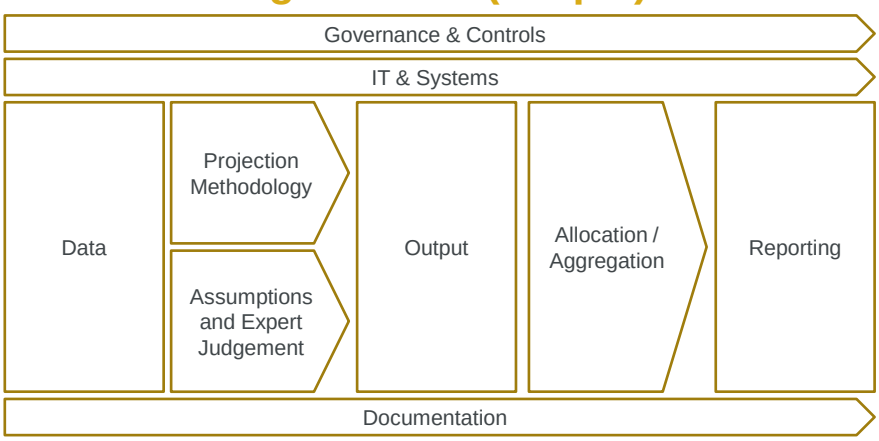
The Reserving Process (simple)



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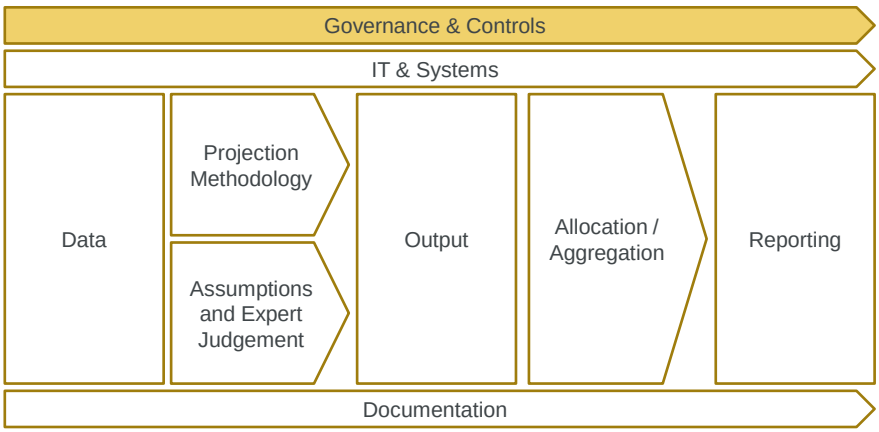

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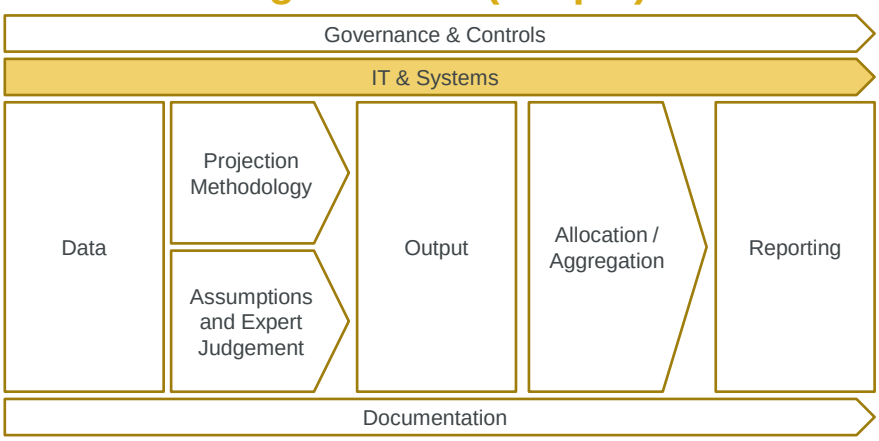

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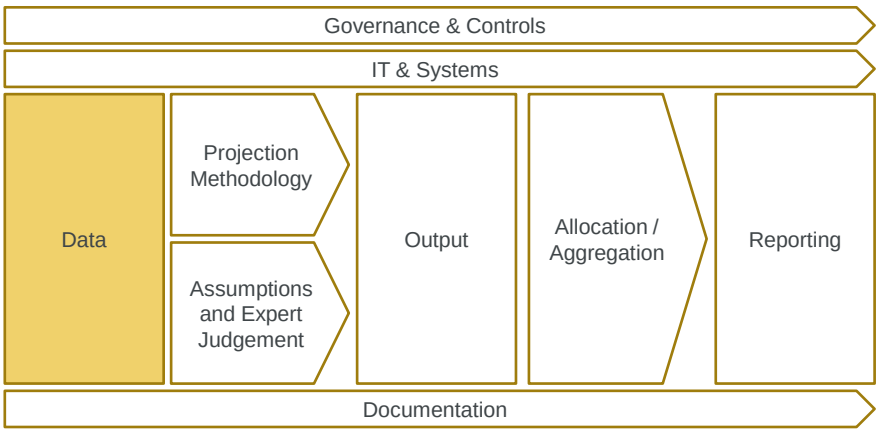

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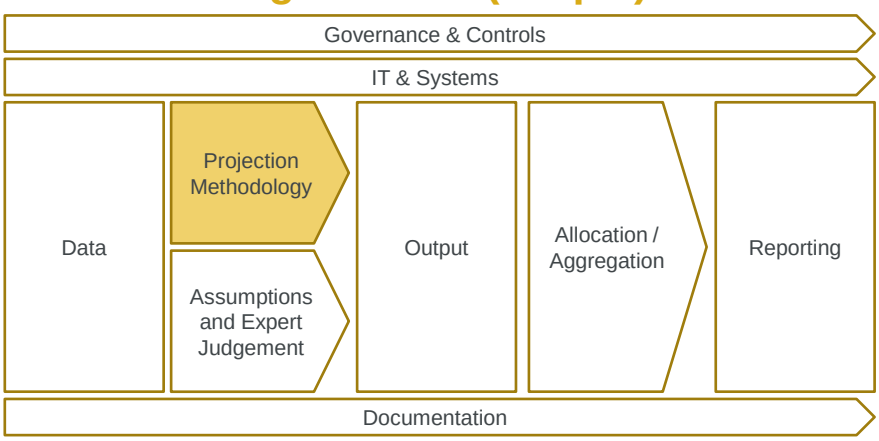

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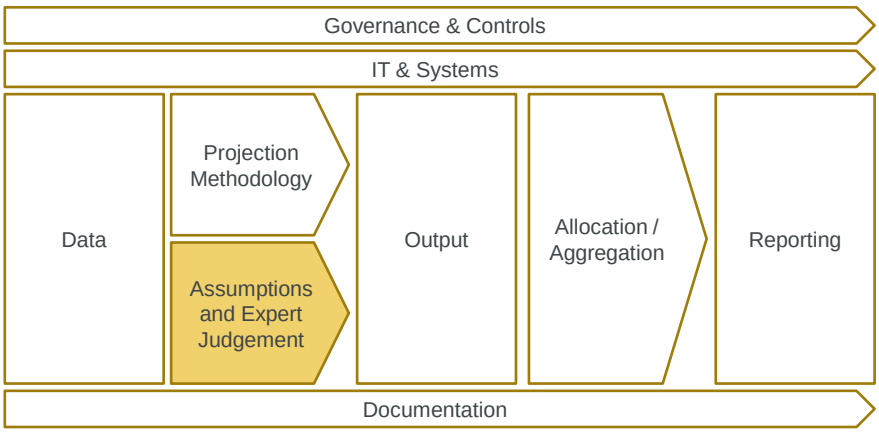

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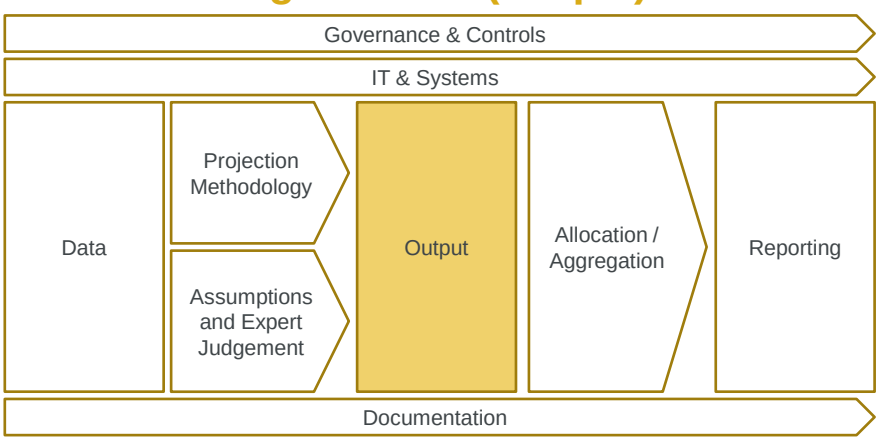

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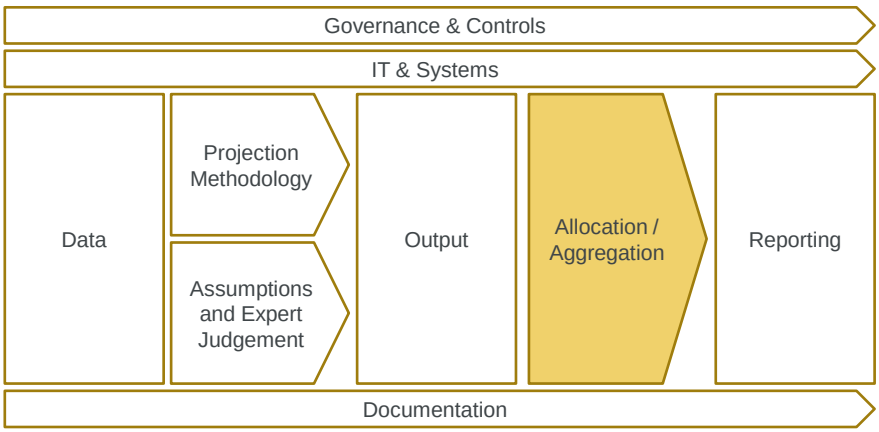

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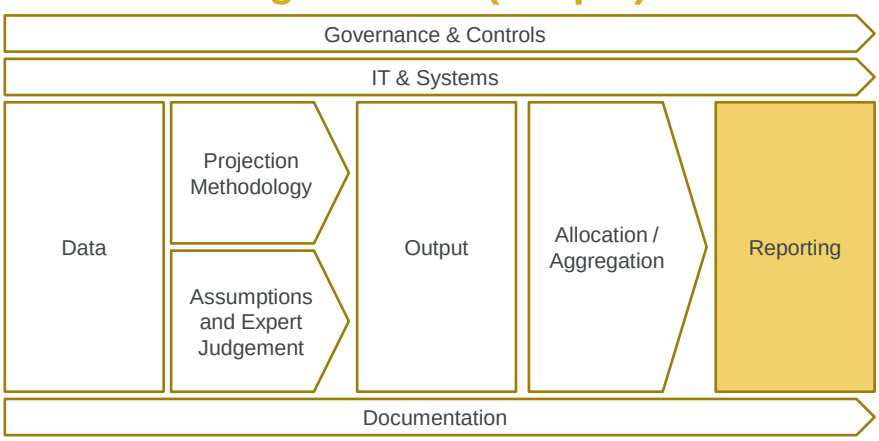

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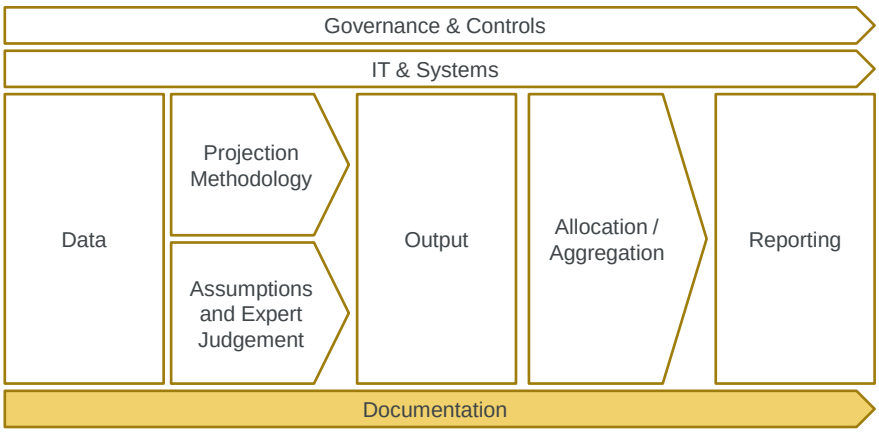

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3. A vs E
Main conclusions

- Main benefit is to allow more time for value added analyses
  - Use in early-close, fast-close or risk-based reserving approaches
- May require a cultural shift for actuaries and others
  - Being more open about assumptions and when they aren't fulfilled
- AvE should be used at all stages of the reserving process
  - Interim monitoring as well as just before and during the analysis
- Stating expectations in advance can help embedding
  - Also can assist in generating understanding of volatility
- Materiality thresholds and other pre-agreed criteria can help prevent misunderstandings or "scope creep"
  - This can be key if introducing AvE for the first time

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3. A vs E
Quick survey:

- Do you think you know what AvE is?
- Do you use one or more types of AvE within your reserving process?
- If so, are they used as a direct input into the setting of reserves at any point?
- Is it a mechanical process (rather than judgement being applied)?

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3. A vs E
Definition

- We think AvE is:
  - Develop a (series of) expectations of the behaviour of an observable quantity over a period of time in the future based on assumptions at a particular point in time
  - Compare observed experience during that period against those expectations
  - Use the results to complete a task and/or come to a conclusion
- Do you agree?

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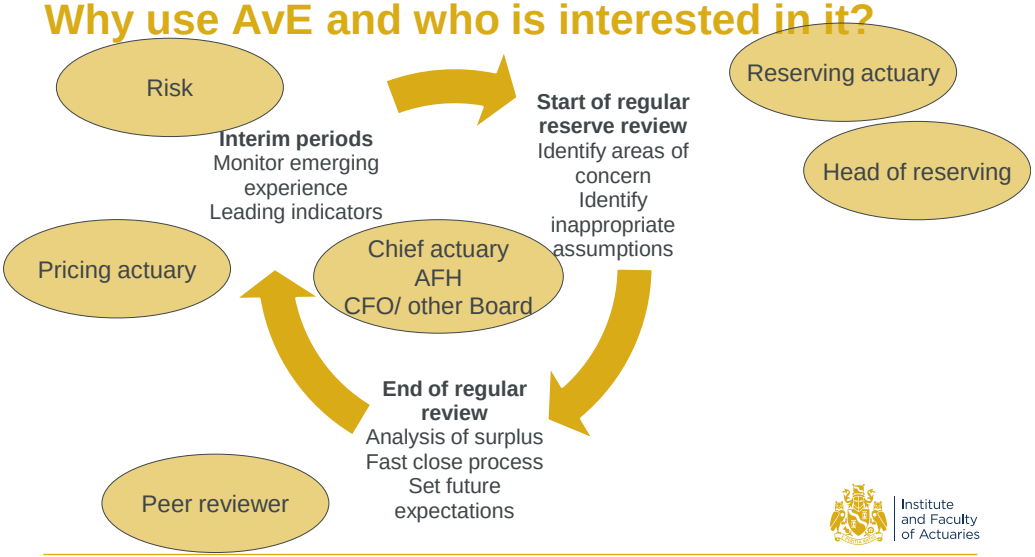
3. A vs E
Why use AvE and who is interested in it?



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3. A vs E
Benefits

- Quick indication of where previous assumptions hold (or not)
- Can be produced automatically
- Can use various levels to allow fast drill-down
- Good start for discussions of reserving movements
- Use for many observables/ statistics

Difficulties

- Will need interpretation
- Smaller buckets are subject to greater volatility
- May not spot offsetting trends
- May need to split out large/cat events
- Can be difficult to determine expectation and effect of deviation when using a mix of reserving methods
- Conflicting indications from different stats

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3. A vs E
What methods and which data?

- Extremely long list possible but 2 overarching types:
  - Comparing movements in development data in a period
    - Expected paid in the period vs actual paid in the period
    - Eyeballing graphically
  - Comparing previous ultimate to a new ultimate
    - Re-apply previous models to fresh data
    - Apply pre-selected models to fresh data
- Can be applied to any data type where a development assumption is used (paid incurred, premium, frequency, average cost etc)
- Can be done monthly, quarterly, annually
- E should be created/communicated at the point the ultimate is set
- Use of estimated ranges/percentiles can enhance interpretation

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3. A vs E
How can AvE be displayed?

- The presentation of the results can assist or hinder the interpretation
- Many display options are possible
- Different exhibits are suited to different analyses
- Multiple exhibits are likely to be needed for a particular “use”
- Good ones can assist in interpretation, bad ones can make results impossible to understand

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3. A vs E
Features to look for in exhibits

- Clear interpretation
- Not too crowded
- Appropriate level of granularity (class/ claim type etc)
- Showing both actual and expected
- Volatility indicators and historical ultimates are helpful
- Numerical indicators to assist in assessing materiality

– Not all exhibits need all these features depending on the users and purpose
– Speed and other operational factors may also be important
– Consistency with different reserving/reporting bases may also be an issue

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Conclusion

- We think AvE is a powerful tool to assist in making reserving more risk-responsive and efficient
- Did this work meet your needs on AvE?
- The WP is looking for next area of focus – either new issues, or ongoing problems
- Current ideas
  - Timing of reserving exercises, in particular “fast close”
  - Transforming ultimates – different reporting bases
  - Interpretation and comparison of reserve uncertainties
- Any suggestions?

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Appendix
Display methods

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Tables - Amounts of both A and E

Rese class		Actual incurred move	Expected incurred move	Delta Inc'd	Previous ultimate	Updated mechanical ultimate	Delta Calc Ult	Selected movement
Class 1	2011	1,032	965	67	14,692	13,347	(1,345)	0
…	…							
	2013	7,963	8,100	(137)	25,693	21,325	(4,368)	6,500
	…							
Class n	2012	10,586	8,400	2,186	38,200	40,346	2,146	2,000
Total	All	32,500	30,100	2,400	n/a	n/a	(1,596)	10,000

Held IBNER realised

Recent cat claim

Worse experience

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Tables - Loss Ratios or Proportions of reserves

Attritional	2008	2009	2010	2011	2012	2013	Total
Actual	62.6%	35.0%	26.8%	52.0%	39.0%	46.9%	42.0%
IELR Budget	53.5%	54.0%	49.8%	48.7%	51.2%	46.9%	49.9%
AminusE	**9.1%**	**-19.0%**	**-23.0%**	**3.3%**	**-12.3%**	**0.0%**	**-7.8%**

Catastrophe/LL	2008	2009	2010	2011	2012	2013	Total
Actual	40.0%	32.4%	83.4%	15.5%	65.0%	21.6%	42.3%
IELR Budget	22.6%	23.2%	21.6%	18.2%	17.3%	21.6%	20.2%
AminusE	**17.4%**	**9.2%**	**61.8%**	**-2.7%**	**47.7%**	**0.0%**	**22.1%**

Total	2008	2009	2010	2011	2012	2013	Total
Actual	102.6%	67.4%	110.1%	67.5%	104.0%	68.5%	84.4%
IELR Budget	76.1%	77.2%	71.4%	66.9%	68.5%	68.5%	70.1%
AminusE	**26.5%**	**-9.8%**	**38.8%**	**0.6%**	**35.5%**	**0.0%**	**14.3%**

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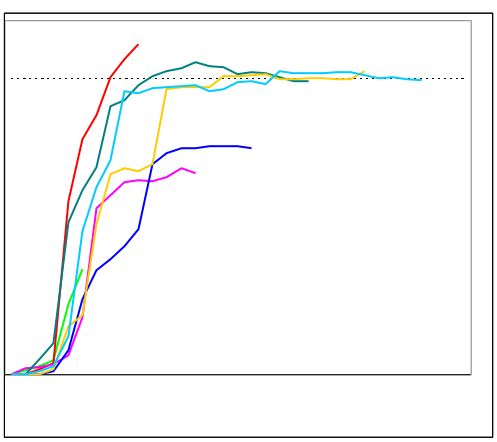
Graph – Actual only: single stat/ multi year



- Plot of incurred development as a percentage of last selected ultimate claims (dotted line = 100%)
- Looking for signs of obvious over/under reserving to assist in targetting resources
- Requires some prior knowledge for efficient interpretation

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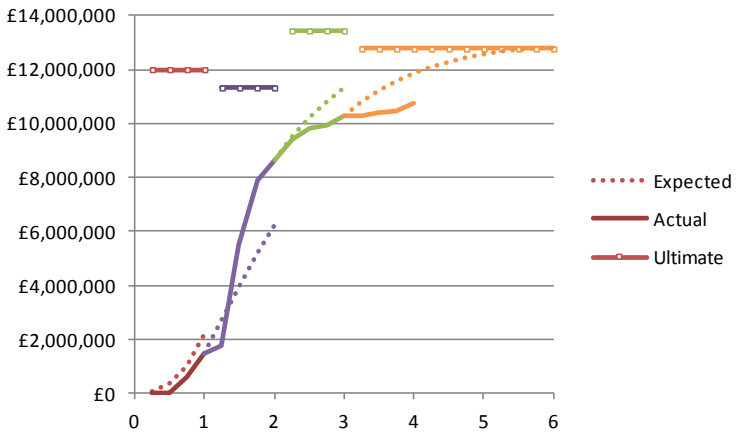
Graph – AvE: single stat/ single year/ historical



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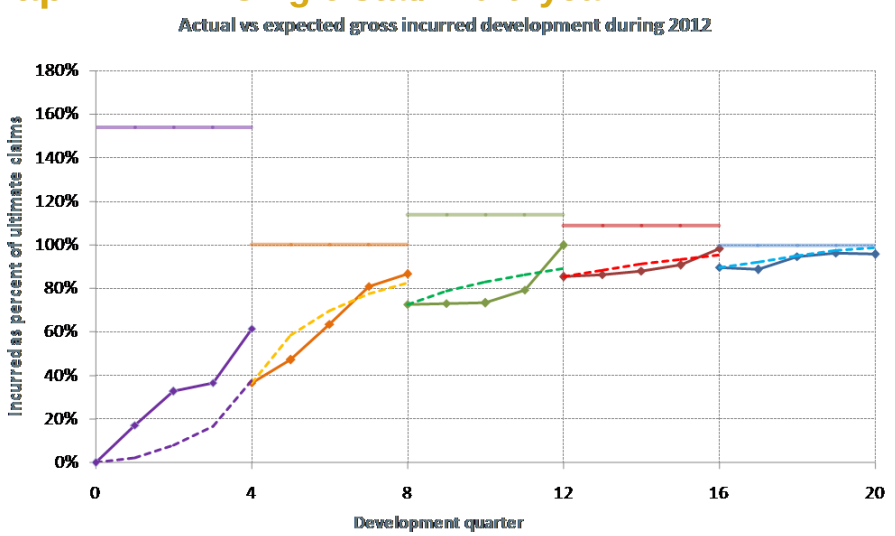
Graph – AvE: single stat/ multi year



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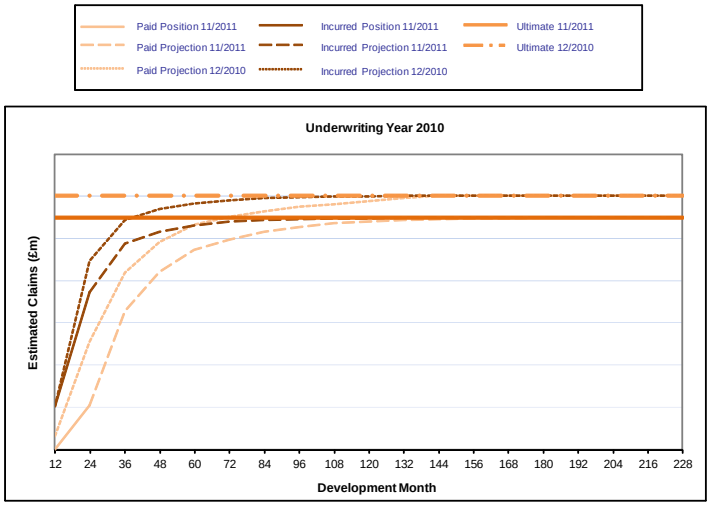
Graph – AvE: multi stat/ single year/ historical



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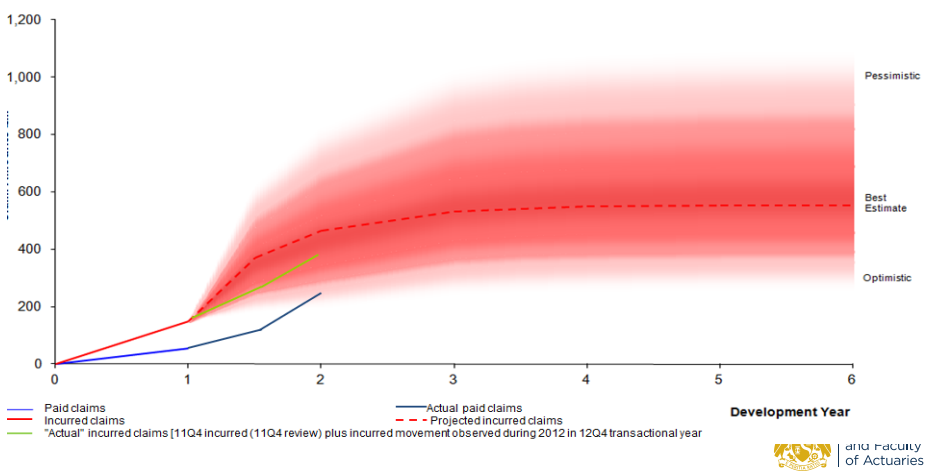
Graph – AvE: multi stat/ single year/ range



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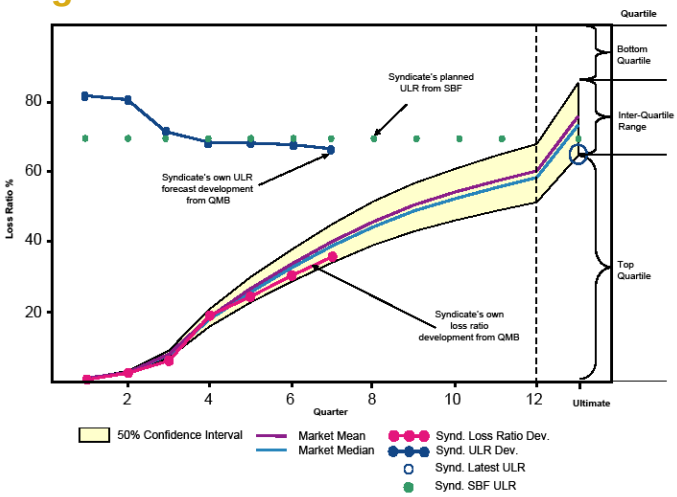
Graph – AvE: single stat/ single year/ historical/ range



Format derived by Lloyd's of London as way to feed back development for each class against expectations

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