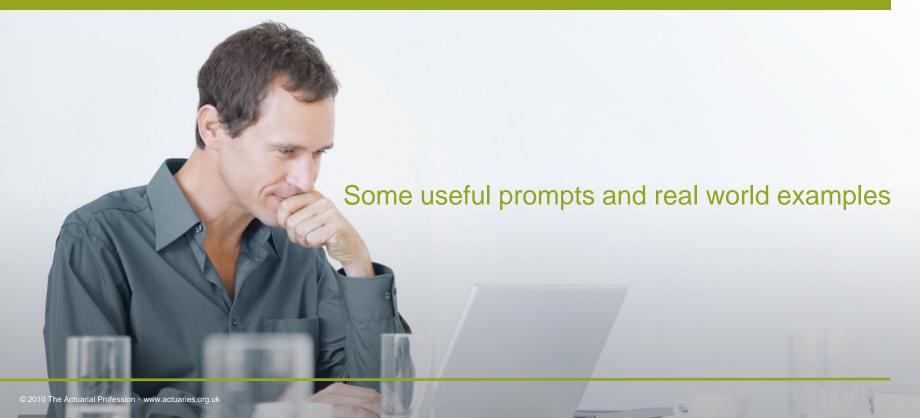


making financial sense of the future

## Practical Issues of a Model Review

**Andrew Hancock** 



- **►** Introduction
- ➤ What does model validation look like?
- ► What do I need to consider
- ► Where is the market?
- ► Practical issues
- ► Example findings

Please note these slides are based on an individual's views and should not be relied upon by anyone for any purpose....

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#### A high level view

- ▶Q1: Which results are being validated and are in-scope?
- ► Q2: Is the methodology fit for purpose?
- ▶Q3: Is the data used in the model fit for purpose?
- ▶ Q4: Are the parameters selected reasonable?
- ► Q5: Is the governance of the internal model appropriate?
- ► Q6: Is the process for validating the model on an ongoing basis appropriate?

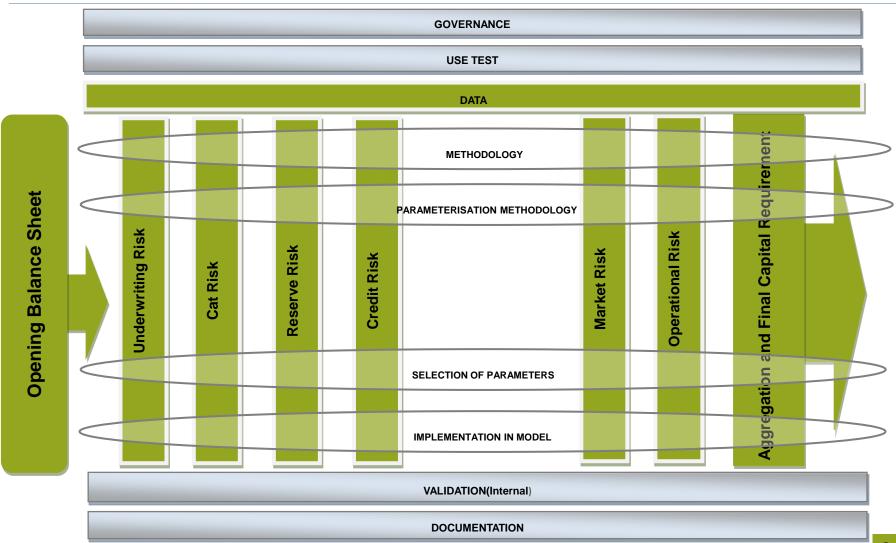
►Q7: Finally, are the results produced by the internal model reasonable and fit for purpose?

#### The 6 model tests – Solvency II view

- ► Use test do you believe the model?
- ► Statistical quality standards is it a sensible model?
- ► Calibration does it produce an SCR?
- ► Validation have you checked it?
- ► External models don't forget these ought to be sensible too!
- ▶ Documentation have you written any of this down?
- ► P+L Attribution is your business plan really a mean?
- ► Governance the 8<sup>th</sup> horseman of the apocalypse

#### Implementation?

#### A Practical view



#### Who is going to do it?

#### **Board**

#### Strategy, risk appetite and policy

#### 1<sup>st</sup> Line Risk Ownership

#### Design team and other users of the model

Delegated authority from the board to develop and implement the internal model, measure and manage business performance, develop and implement internal control and risk management framework and ensure that the business is managed within the agreed risk appetite

#### 2<sup>nd</sup> Line Risk Control and Monitoring

#### Risk management committee and risk management function

Provides objective oversight

Key responsibilities include:

- Design and deployment of overall internal model governance framework
- Development and monitoring of policies and procedures
- Monitoring adherence to framework and strategy

#### 3rd Line Independent Assurance

Audit committee, supported by Internal Audit and external experts where required

Provides independent and objective assurance over the effectiveness of corporate standards and business compliance, including assurance that the risk management process is functioning as designed and identifies improvement opportunities

1 <sup>st</sup> line	Users and builders of the model	Responsible for testing the model as it is built, and carrying out process and control checks when the model is run
2 <sup>nd</sup> line	Risk Management function	Responsible for the design and implementation of the internal model, for its testing and validation, and for preparing summary reports on its performance (L1, Art 44)
3 <sup>rd</sup> line	Internal audit	Responsible for the adequacy and effectiveness of the internal model control environment (L1, Art 47). L3 guidance suggests possibility of their involvement in other validation areas.

- Model validation activity can take place in all three lines of defence, but it needs to be independent
- The independent report on the internal model could be prepared by Risk Management (but it would need to demonstrate sufficient independence) or by Internal Audit

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#### What do I need to consider?

Validation is a significant under taking

Time needed for validation = time needed to build and run model...

Who owns the validation report?
Who is writing the report?
Legal entity versus Group

Where are the validation gaps and how do I plug them?

How do the issues raised feed into the model change process?

Documentation and validation - cultural change

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## Where is the market?

#### Lloyd's syndicates

Draft validation reports submitted so initial questions about validation process have been covered. Sections are often incomplete or blank. In smaller entities, independence and separation of duties can be an issue.

#### **London Market**

Similar position to Lloyd's, often have a syndicate within the Group. May be slightly further behind in terms of rolling out validation across the organization. Depends on lead regulator.

#### Retail (UK)

Larger groups are still grappling with the organizational challenge of validation. Different skill sets and depths within different countries, and also determining the role of Group.

#### Europe

Mainly large groups going for approval, serious and significant challenge by regulators across Europe. To the extent that some companies have dropped out of model approval. Even where there has been significant validation, regulators have challenged details and demanded more validation.

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#### **Practical issues**

#### Documentation, documentation!

#### Common failings of documentation:-

- ▶ Doesn't exist!
- ► Too short
- ► Too long
- ▶ Doesn't explain why
- ► Patchwork no structure and no links between documents (e.g. Between validation policy and model change)
- ▶ Difference styles/parties
- ► Written for regulator rather than use
- ➤ Out of sync with actual model

#### **Practical issues**

#### Top 10 methodology/parameterization

- 1. Definitions of risks (UW/Reserve/Market/Credit)
- 2. Linking closing provisions to experience during the year
- 3. Justifying aggregation capital modeller versus regulator
- 4. Conversion to 1 year volatility
- 5. Modelling an SII balance sheet (and reconciling)
- 6. Reconciling an SII P+L
- 7. Ownership and challenge of Cat models
- 8. Results by SF risk type
- 9. Ownership and challenge of ESG's
- 10. Risk margin methodology

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## **Example findings**

- ► Mis-match between UW and reserve risk definition
- ► Incorrect discounting and allowance for investment income
- ► Missing risks e.g. Currency risk, DB pension funds or "unusual" assets
- ► Parameter error missing
- ▶ Data processed incorrectly random ordering of columns
- ► Not allowing for future RI program purchase or paying twice
- ► Opening balance sheet doesn't match actual balance sheet

## **Example finding - continued**

- ► Correlations go missing
- ► Attritional volatilities lower than reserve volatilities
- ► Inappropriate complexity
- ► Too much time "tweaking" and not enough documenting and validating what's already there
- ► Timelines don't have enough slack for run issues and review
- ►IT issues (hardware and software)

## A final thought...

## TAS — M!?

## **Questions?**

# Thank you