



Institute  
and Faculty  
of Actuaries

## Model Risk: Daring to open up the black box

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Members of the Model Risk Working Party

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### Introduction

- Working Party objectives
- What is model risk?
- Model risk versus other risks
- Model risk culture
- Model risk management framework
- Benefits for model owners
- Real life examples
- Opportunity for your views and comments

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## Working party objectives

- Raise industry awareness and understanding of model risk
- Develop framework for measurement and management of model risk
- Foster good practice around governance and control of models
- Final output to be delivered to an Institute Sessional Meeting in Q1 2015

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## Model risk

- What is a model?
- Risk of adverse consequences from decisions based on incorrect or misused model outputs and reports
- Can lead to financial loss, poor business and strategic decision making, or damage to reputation
- Two main causes:
  - Model has fundamental errors and produces inaccurate outputs
  - Model may be used incorrectly or inappropriately

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## Model risk

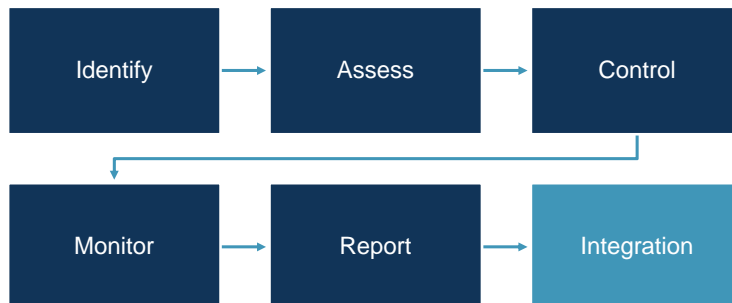


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## Model risk versus other risks

- Model risk should be managed like any other risk:



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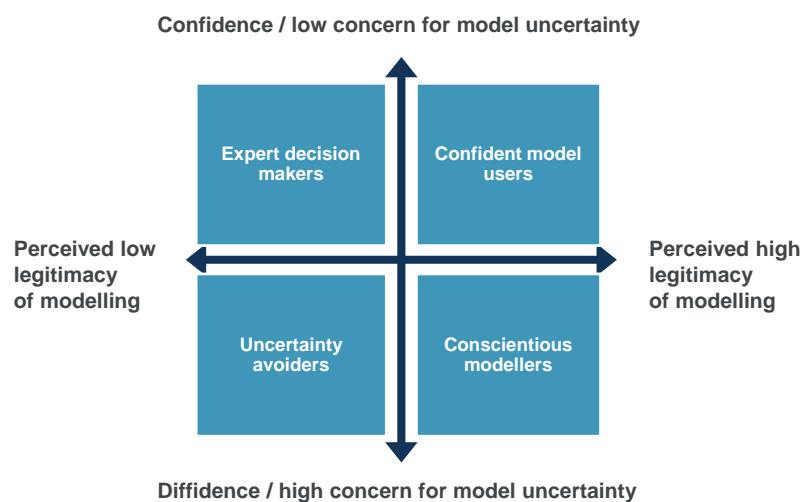
## Model risk versus other risks

- Specific attributes that make it challenging to manage:
  - Quantitative risk, but hard to quantify!
  - ‘Use’ risk is unique to model risk
  - Already build in prudence into calculations
  - All models are wrong, so focus should be on fitness for (original) purpose
  - Range of models in use, even within a single organisation
  - Needs to be tailored to the organisation
  - Cannot eliminate model risk

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## Model risk culture



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## Model risk management framework



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## Ownership



- Owner - model developer or the model user?
- Risk own the framework, but model owners responsible for managing their model risks
- Formal governance around model risk:
  - Clear committee structure
  - Regular reporting on the model risk profile
  - Cross over between financial and operational aspects

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## Inventory



- Log all models
- Capture key information
  - Owner, use, materiality assessment, changes, etc
  - Model hierarchy and dependencies
- Maintain log
- Will immaterial models become material in future?

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## Risk appetite



- The amount and type of risk that an organisation is willing to take in order to meet their strategic objectives
- Articulate appetite statements or tolerances:
  - Cumulative model errors
  - Model developments
  - Outstanding validation reports
  - Internal audit issues

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## Materiality

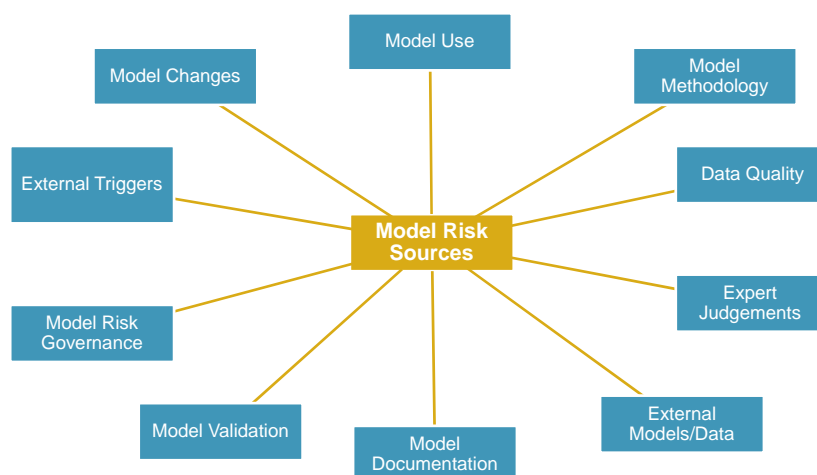


- Should consider all models across the business
- Practical limit on number of models
- How sensitive are results?
- Do results influence decision-makers?
- Criteria depends on the model:
  - reserves, capital, price, assets, liabilities, sales, premiums, etc

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## Risks



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## Governance standards



- Model risk policy
- Documentation standards
- Data quality requirements
- Expert judgement process
- Validation requirements
- Model change process
- Model understanding

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## Reporting



- All model owners assess how managing risks / operating controls on periodic basis
- Reporting presented to model governance committee:
  - Model risk profile against appetite
  - Model inventory monitoring
  - Material model developments (made and planned)
  - Objective model validation outcomes
  - Management actions to address prior breaches
  - Emerging model risks

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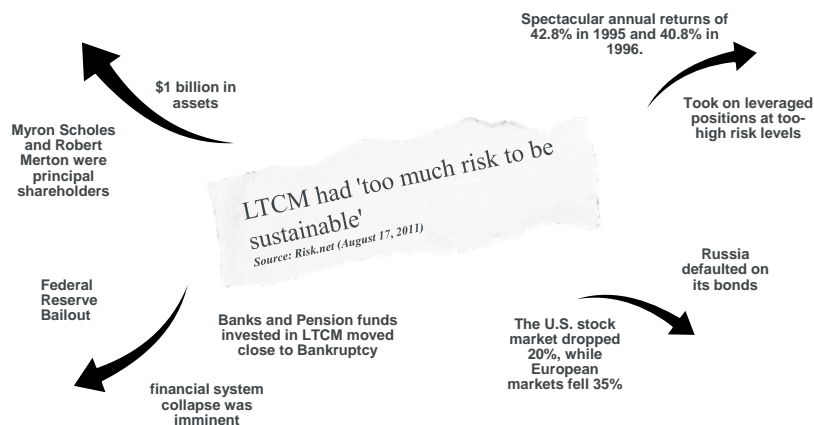
## Benefits for model owners

- Documented processes – understood and carried out more quickly
- More confidence in the model results due to governance surrounding:
  - Model changes, validation, overall model risk governance.
- Model results better used by the business
- Differences between the model and the real world identified more easily
- Feedback loops lead to improvements

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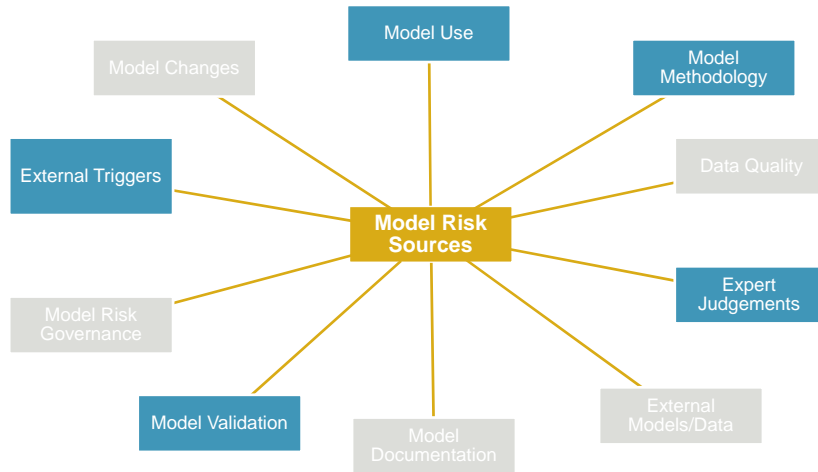
## Case Study 1



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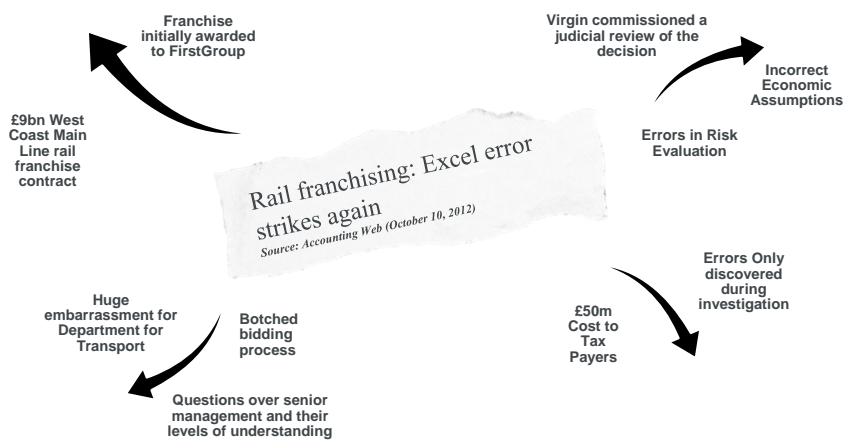
## Case Study 1 - Risks



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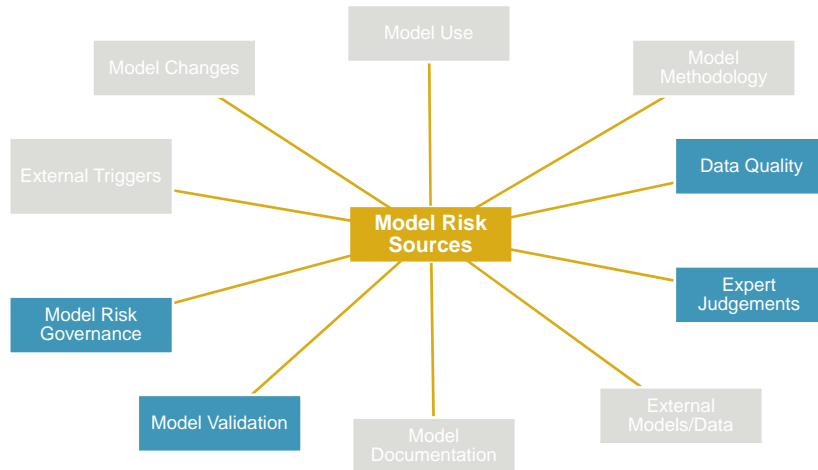
## Case Study 2



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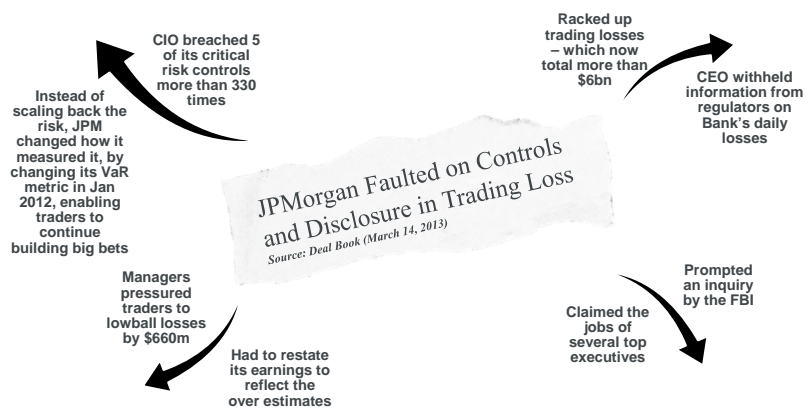
## Case Study 2 - Risks



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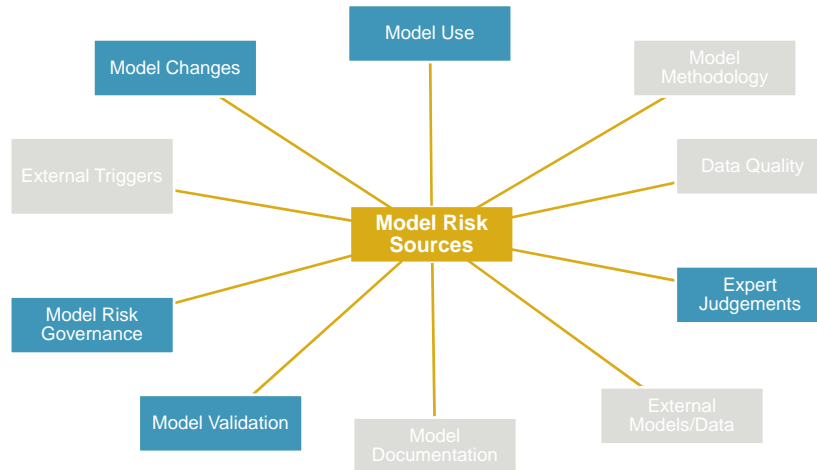
## Case Study 3



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## Case Study 3 - Risks



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## Recap

- Working Party objectives
- What is model risk?
- Model risk versus other risks
- Model risk culture
- Model risk management framework
- Benefits for model owners
- Real life examples

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**Questions**



**Comments**

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 presenters.