



Institute
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of Actuaries

Beyond 'Model Risk'

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*Thanks to the IFoA Working Party on Model Risk

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Expertise
Sponsorship
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Progress
Community
Sessional Meetings
Education
Working parties
Volunteering
Research
Shaping the future
Networking
Professional support
Enterprise and risk
Learned society
Opportunity
International profile
Journals
Supportin

What is model risk?

(Federal Reserve, SR Letter 11-7, 2011)

*[T]he potential for **adverse consequences from decisions** based on **incorrect or misused model outputs** and reports.*

Model risk occurs primarily for two reasons:

- The model may have **fundamental errors** and may produce **inaccurate outputs** when viewed against the design objective and intended business uses. [...]*
- The model may be used incorrectly or inappropriately.*



How are internal models used *in practice*?

- 31 detailed interviews with London Market practitioners
 - CROs, Chief Actuaries, Capital Modellers, Underwriters, INEDs
 - Consultants
 - Regulators
- Headline themes
 - Use of internal model in decision making
 - Model uncertainty
 - Solvency II



Today's focus

- Insurer perspectives
 - Different companies and role profiles
 - Attitudes typical across organisations
- Quotes
 - Model complexity, uncertainty, decision making
- Reflections
 - The dual role of models
 - Confidence building



The push to complexity

*“As soon as you start mentioning **limitations...** frequently this is used as an **excuse** by people to ignore the model.*

*The question then becomes: “well how granular do we want the model to be”? And that’s now becoming a challenge because as the appetite increases and senior management becomes more educated in this... **they get more interested and they want more out of this tool...** it means the model needs to give more but in order to give more **you need to have more granularity.**”*



Uncertainty: modeller perspectives

*“The correct assumption could be anywhere between here and there. **We’ve picked one because we have to pick one...** there’s no right or wrong answer for anything we’re doing...*

***But how materially could capital change** or could profit change if we use this end of the scale or that end of the scale?”*



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*“If you were to take those 10% [correlations] and move them to 5% it would reduce x million pounds of our capital. So the question is **why 10% and not 5%, what’s the difference?**”*



Uncertainty: views from the top

*“Right, first of all, I would question whether different sensible models could give different answers... A different actuary might well say, no, I want to simulate this slightly differently. **I can't feel that we would actually come up with an answer which is dramatically different to that which we had.**”*



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“I think you can only be prepared for what's gone before... You've got to keep going 'as if', you've got to keep going 'as if'. Because, let me give you one... What if aliens land on earth?”



Decision making

*“We need to have a view. The fact is, this stuff, if we don’t control it, it’s going to sink the company... I think I wanted the [risk] tolerance stuff to **spark a debate, but management** and risk people, they like red, amber, green charts – **they like clear, defined lines.**”*



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*“If we think we’ve got a good model we should ... it should inform decisions. It should be **one of the pieces of information** that you have to hand when you make a decision.”*



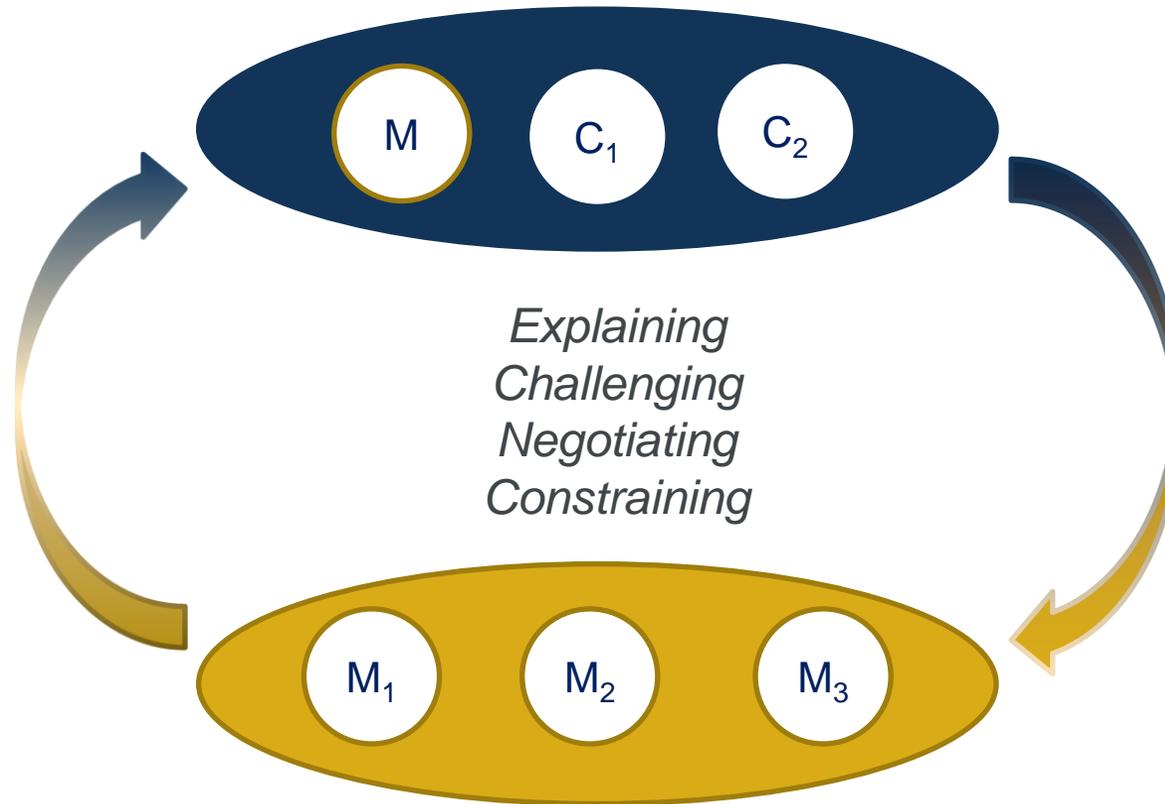
Reflecting on the dual role of models

- A **representation** of the world
 - Modeller perspective (mostly)
 - Key concerns: accuracy, validity, parameter sensitivities
 - Uncertainty: model one of many plausible alternatives
 - Model as an *object* of control
- A **tool** to intervene in the world
 - Management perspective (mostly)
 - Key concerns: relevance, clarity, market realism
 - Uncertainty: model one of many inputs in the decision process (e.g. a constraint)
 - Model as an *instrument* of control



Confidence building

Model-as-tool / multiple decision criteria



Model-as-representation / multiple models



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Too much confidence?

- Model complexity
 - Increase confidence by increasing granularity
 - Resource constraint stated as only break to the process
 - What about information constraints?
- Uncertainty communication
 - Ambiguity less welcome as one travels up the hierarchy
 - Modellers are trusted experts, but not given primacy
 - What is lost in the process? What incentives are created for actuaries?

