

Open forum: Model risk

Introductory remarks

- Vijay Krishnaswamy
Partner and Head of Enterprise
Risk Management
- London: 5 December 2012

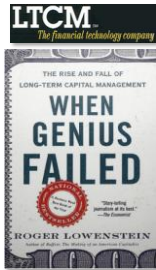
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Topics

- Motivation
- Basics
- 3 Themes
 - “Fit-for-purpose”
 - Drivers and mitigants
 - Alternatives
- Financial example

Caveat: Although some of what I say is based on my model governance experience at the FSA, nothing that I say should be construed as necessarily representing the FSA's views.

Model risk disasters



May 20, 2008 11:36 pm

Moody's error gave top ratings to debt products

By Sam Jones, Gillian Tett and Paul J Davies in London

Moody's awarded incorrect triple-A ratings to billions of dollars worth of a type of complex debt product due to a bug in its computer models, a Financial Times investigation has discovered.

REUTERS



Motivational material

VAR & ST Model Internal Audit report 2006

Lehman Brothers
Detailed Findings and Management Action Plans

Value at Risk (VaR)

Significance: Control Concerns

Data Quality and Completeness

1. Implement controls to validate data accuracy and completeness.

The feeds into LehmanRisk have not been validated to ensure that appropriate data elements are captured to calculate VaR. Based on the sample of feeds reviewed, we identified one instance where the maturity date for listed options was not properly reflected in the feed, leading to an incorrect VaR calculation.

In addition, although controls exist within the feeds to identify when the complete population of trades has not been received, we noted that the break reports are inaccurate and there is no follow up performed on the breaks identified.

Management Action Plan

The issue with AMM has been resolved. We will design a validation for all data feed in Lehman Risk to detect similar issues in the future.

Plan Owner

Garg, Sandeep
Sabbineni, Prasad

Plan Date

11/30/2007

EXTINCT

RAFT Project Under Review

Source: Valukas report

What is a “model”?

Simplified version of reality; tool for a purpose

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What is a “model”?

Form

“Compound”

Simplified version of reality; tool for a purpose

Intricacy

>Regulated

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What is “model risk”?

But would you try to go to war with this...?



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FFP: Do you understand “purpose”?

- Q: What is the purpose of your mobile phone?

Purpose is also about how you “use” the tool

220v/110v



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Is there such a thing as a “bad” model?

Electric tools



- ... or just poor usage of a given model?

How do you avoid “purpose drift”?

- When is a model **not** fit-for-purpose?

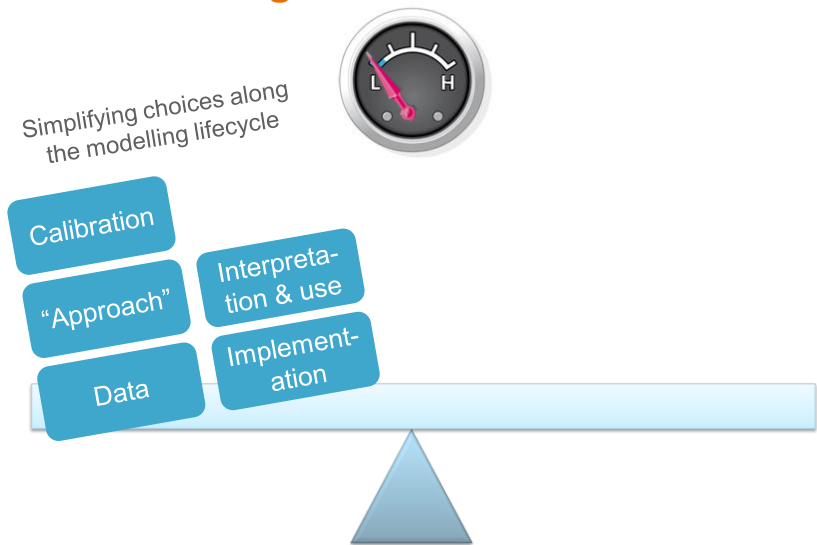
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Drivers and mitigants



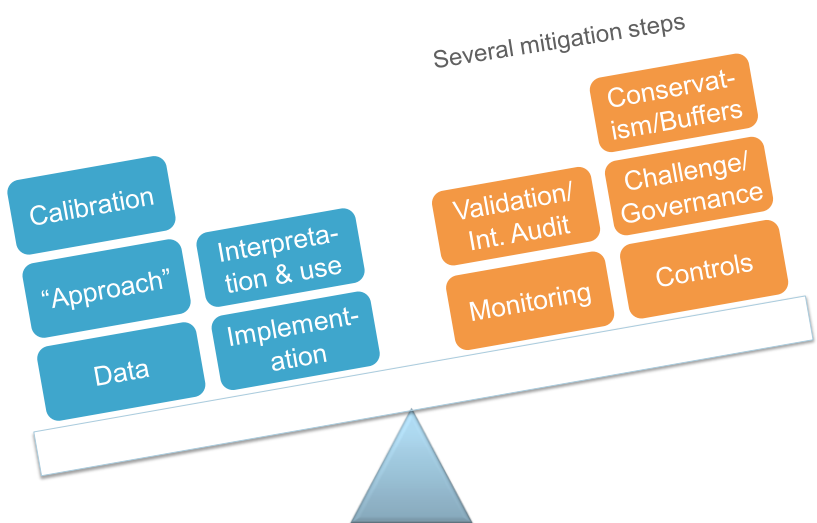
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Drivers and mitigants



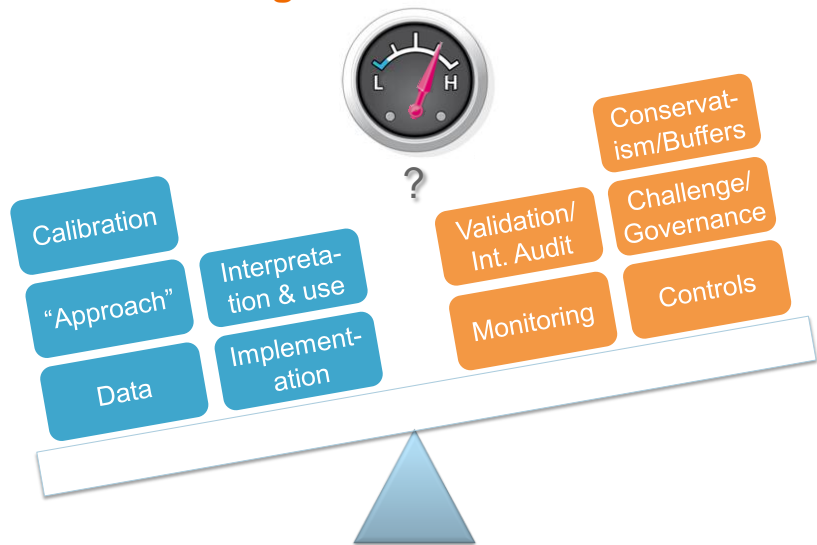
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Drivers and mitigants



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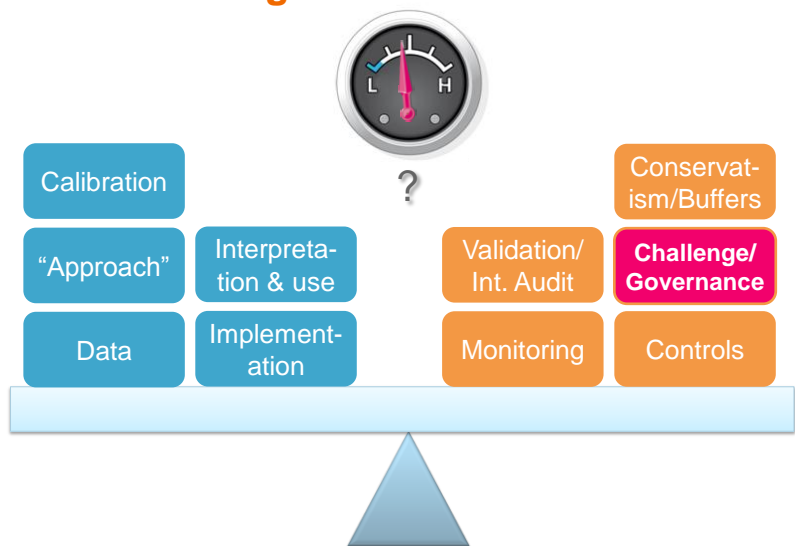
Drivers and mitigants



For more details, refer to chapter 10 in (Dieleman and Krishnaswamy) "Managing Illiquid Assets"

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Drivers and mitigants



For more details, refer to chapter 10 in (Dieleman and Krishnaswamy) "Managing Illiquid Assets"

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Governance relies on 3 lines of defence



Avoiding group-think requires fresh thinking and “cultural translation”

Range of outcomes	Alternative models / schemes / views	Sensitivities
Assumptions in terms of business scenarios	Several scenarios	Reverse stress testing
Operating limits	“Measurement”	Pictures and interpretation

For more detail, refer to chapter 10, “Managing Illiquid Assets”, Dieleman and Krishnaswamy

“Cultural translation”...



Source: Fawlty Towers, British Comedy series

Avoiding group-think requires fresh thinking and “cultural translation”

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Real-life example



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Financial example

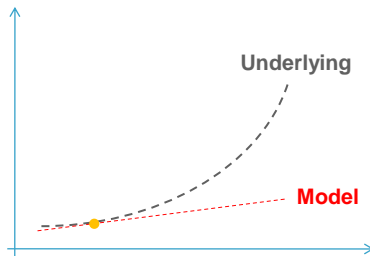
Assumption

“We assume that the [NAV] change from a [1] bp change in interest rates can be applied to a [200] bp shock by multiplying by [200]”

➤ “So what’s missing?”

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Financial example

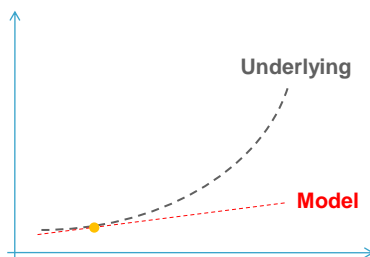


▶ “Linear Extrapolation risk”

1. Materiality?
2. Scenarios?
3. Risk appetite?

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Financial example



▶ “Linear Extrapolation risk”

1. Materiality?
2. Scenarios?
3. Risk appetite?

Outcomes (example)

Fit-for-purpose*
upto [5] bps
shocks but no
further

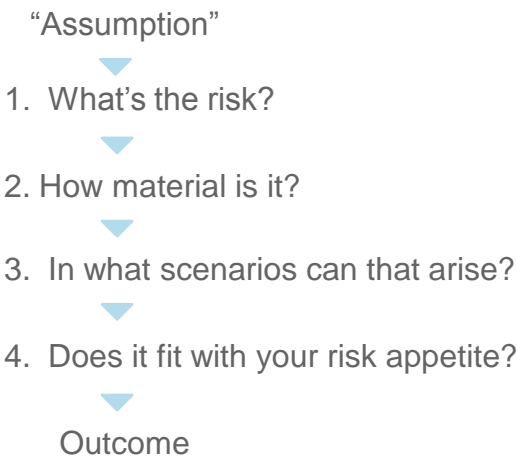
... and can be
used beyond that
only with
prominent caveats

Not fit-for-purpose
and a new model
needs to be built

* i.e. can only be used if the limit and conditions are satisfied

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Framework



Recap









Range of outcomes	Alternative models / schemes / views	Sensitivities
Assumptions in terms of business scenarios	Several scenarios	Reverse stress testing
Operating limits	"Measurement"	Pictures and interpretation





Some (provocative) comments

- Models are everywhere in the financial world and yet model risk does not get enough attention...
- If a model is not used, there is no model risk?
- More can be less: Data history needs understanding and needs to be complemented by blue-sky thinking!
- When your model governance committee approves the assumptions of a model, they are also rejecting alternative assumptions used by other models?
- Shouldn't models have "operating limits/ specifications" just like engineering products?
- Do you think measuring model risk can be useful? How?

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