



Cass Business School
CITY UNIVERSITY LONDON

The Joys of Disagreeing

Culture, Uncertainty, Modelling

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The Actuarial Network at Cass, 17 November 2015

Acknowledgments

- IFoA Working Party on Model Risk (Phase 1)
 - A Aggarwal, MB Beck, M Cann, T Ford, D Georgescu, N Morjaria, AD Smith, Y Taylor, AT, L Witts, I Ye
 - M Thompson, IIASA
- *Model Risk: Daring to Open the Black Box*
 - Winner of the 2015 Peter Clark Prize
 - *Taming Uncertainty: The Limits of Quantification*
- Literature (starting points)
 - Thompson et al (1990), *Cultural Theory*
 - Verweij (2011), *Clumsy Solutions for a Wicked World*

Structure

1. Risk & culture

- Cycling helmets
- Party politics
- Climate change

2. Models

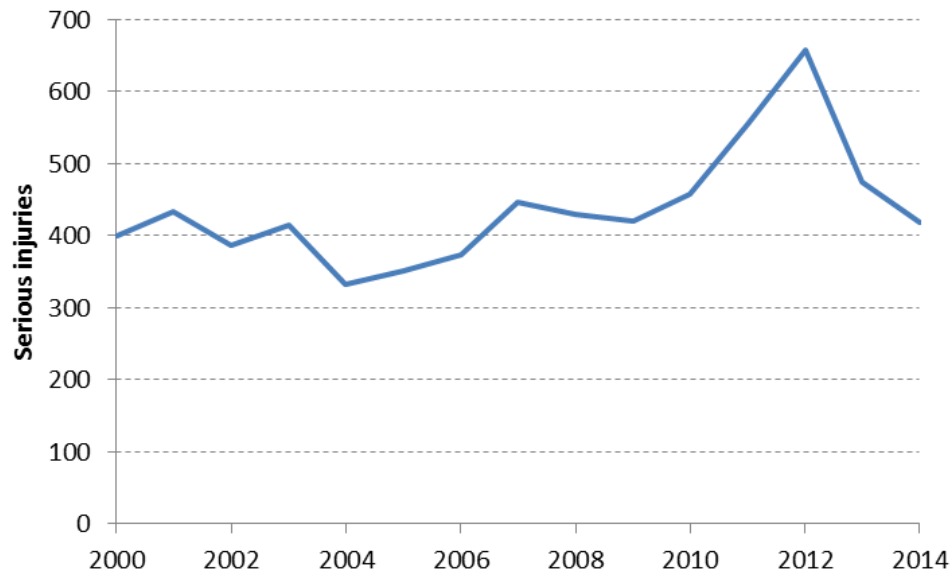
- Uncertainty
- Governance
- Regulation

London



London

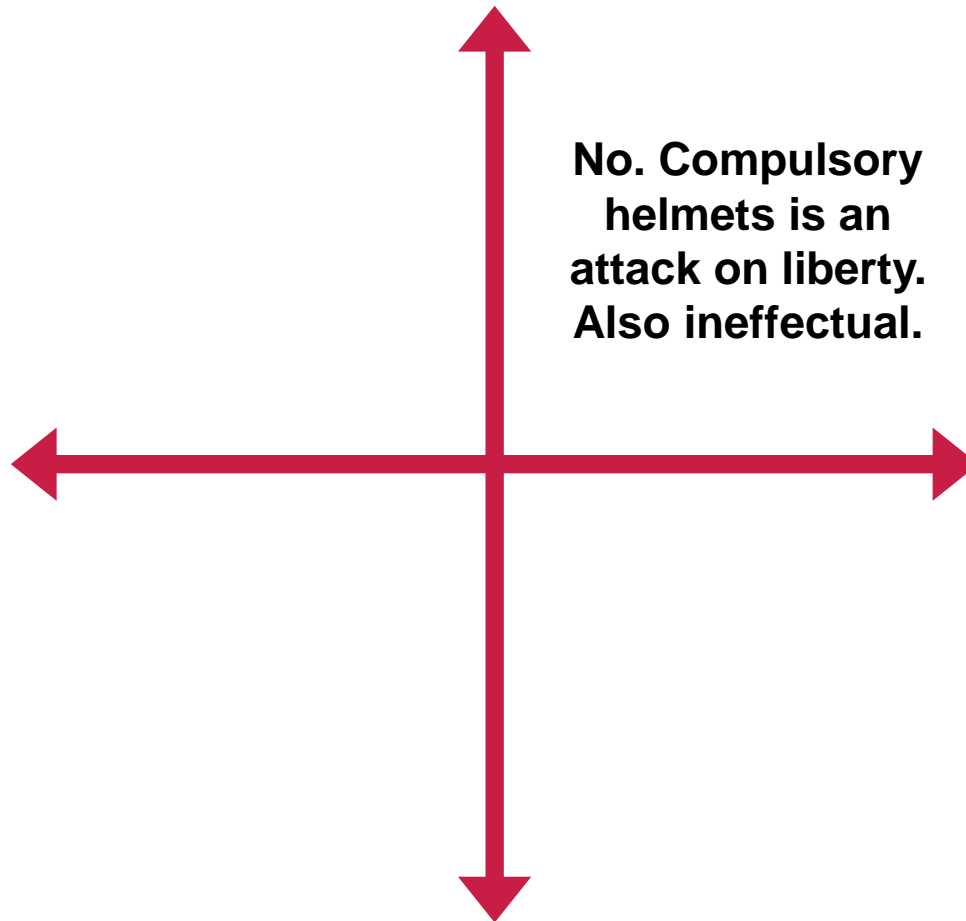
- Nr of London cycling journeys approximately doubled over the last 15 years
- 10-20 cyclists killed each year



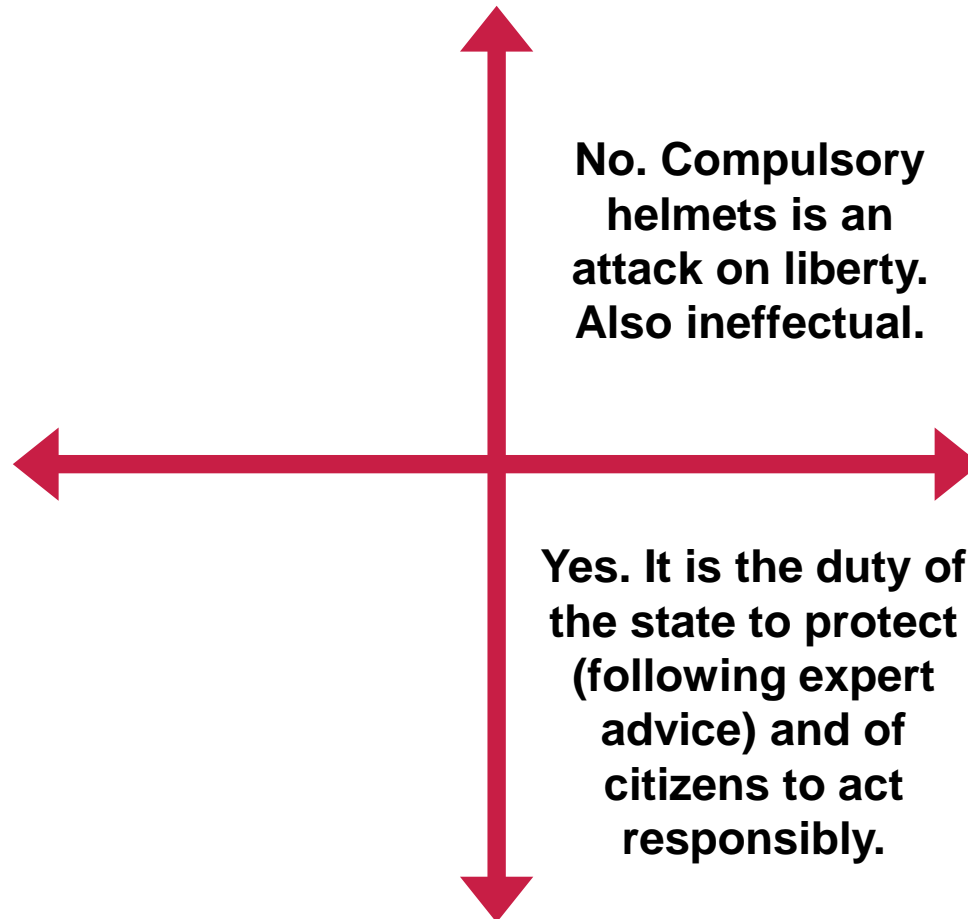
A question

- Studies have shown that, in the case of a fall, cycling **wearing a helmet reduces the risk** of serious head injury to the cyclist
- Should wearing a cycling helmet be **compulsory**?

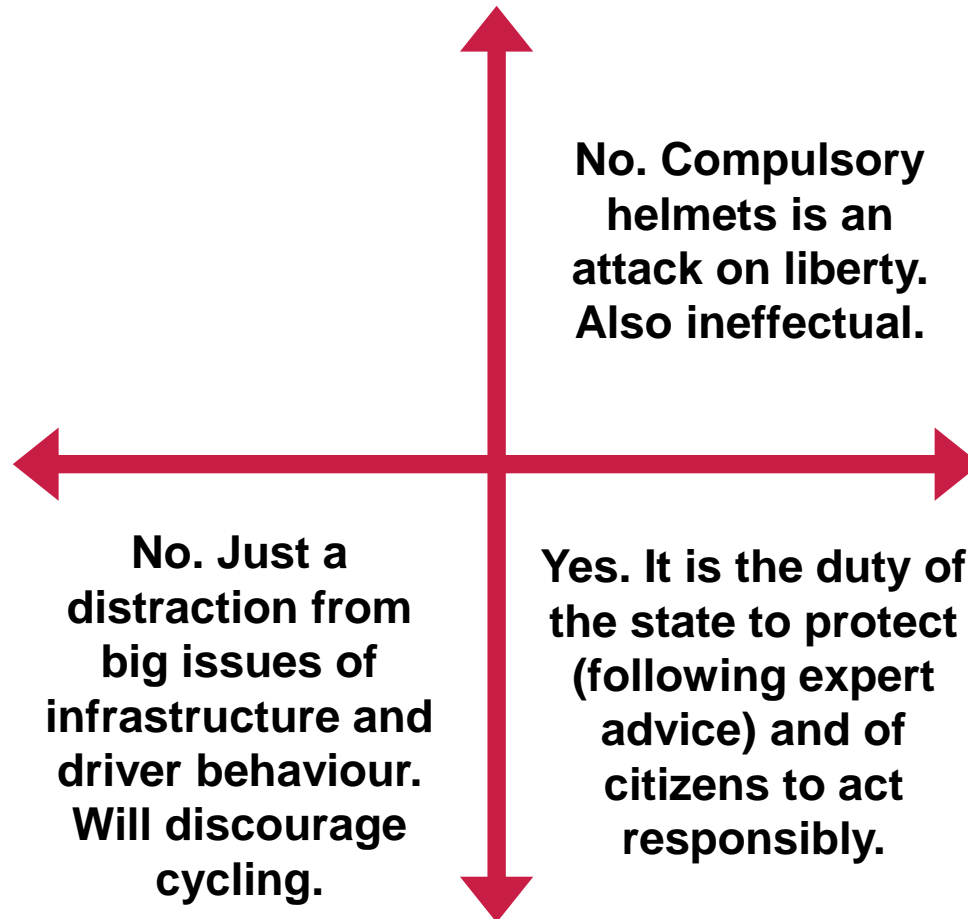
Responses



Responses



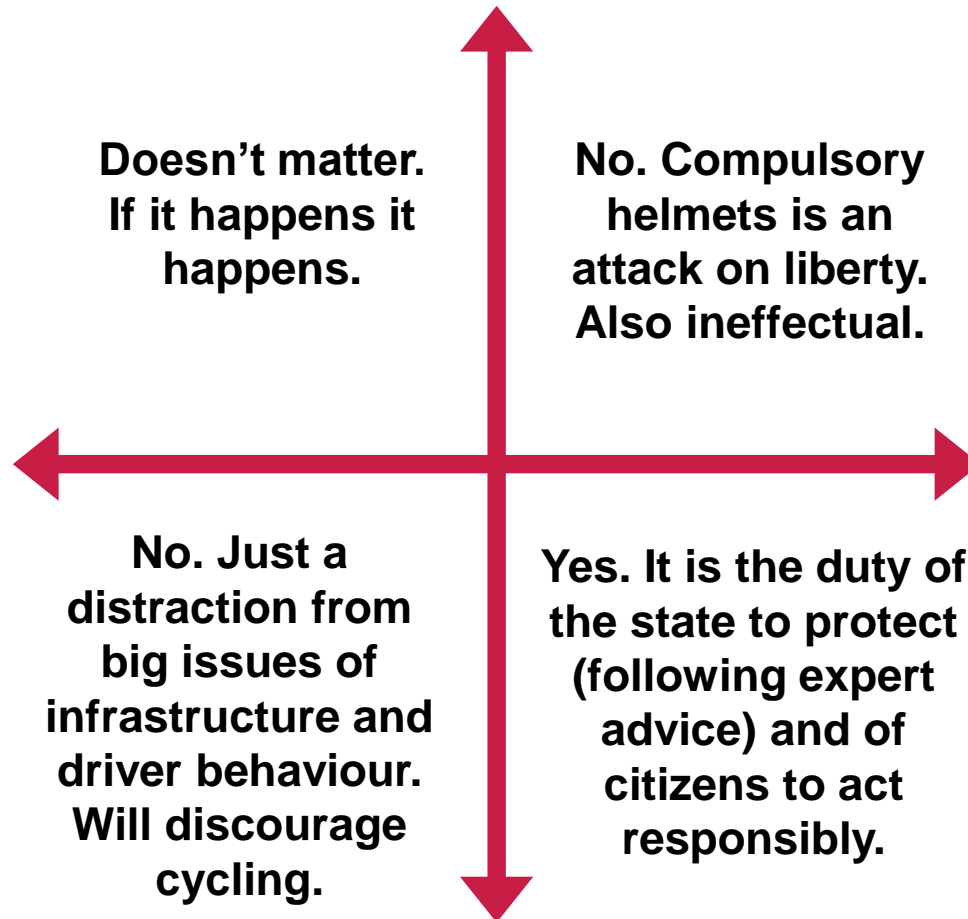
Responses



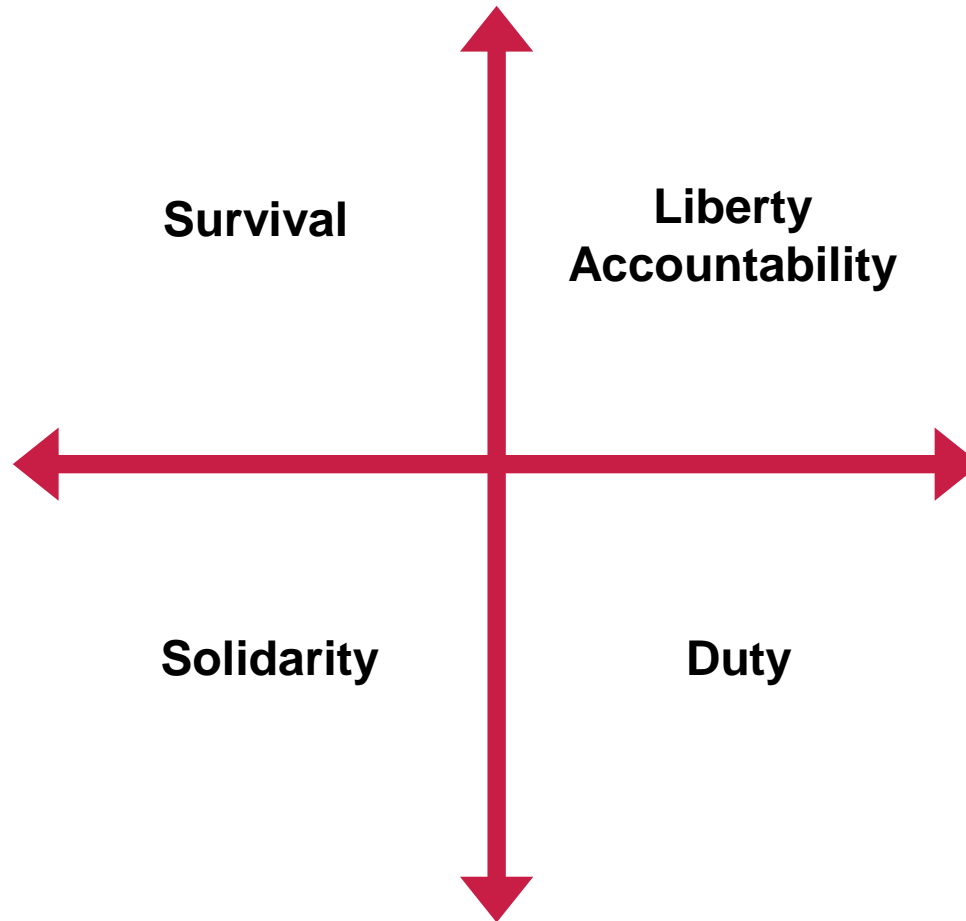
Copenhagen



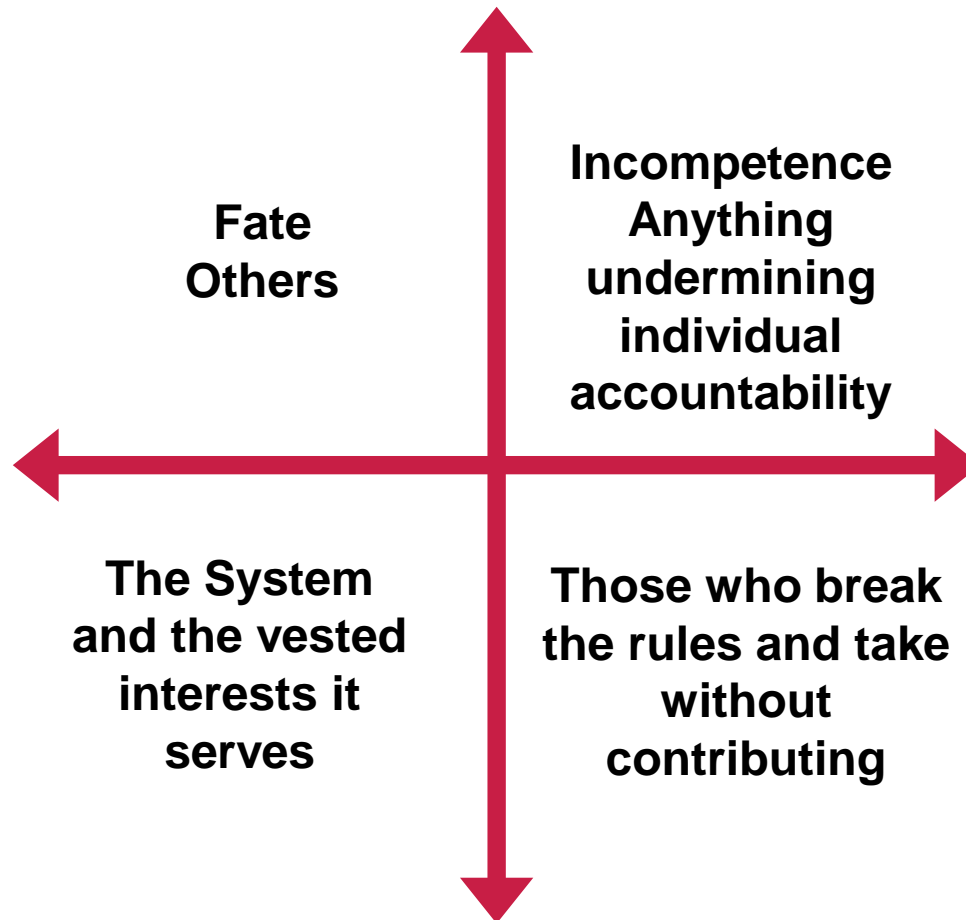
Responses



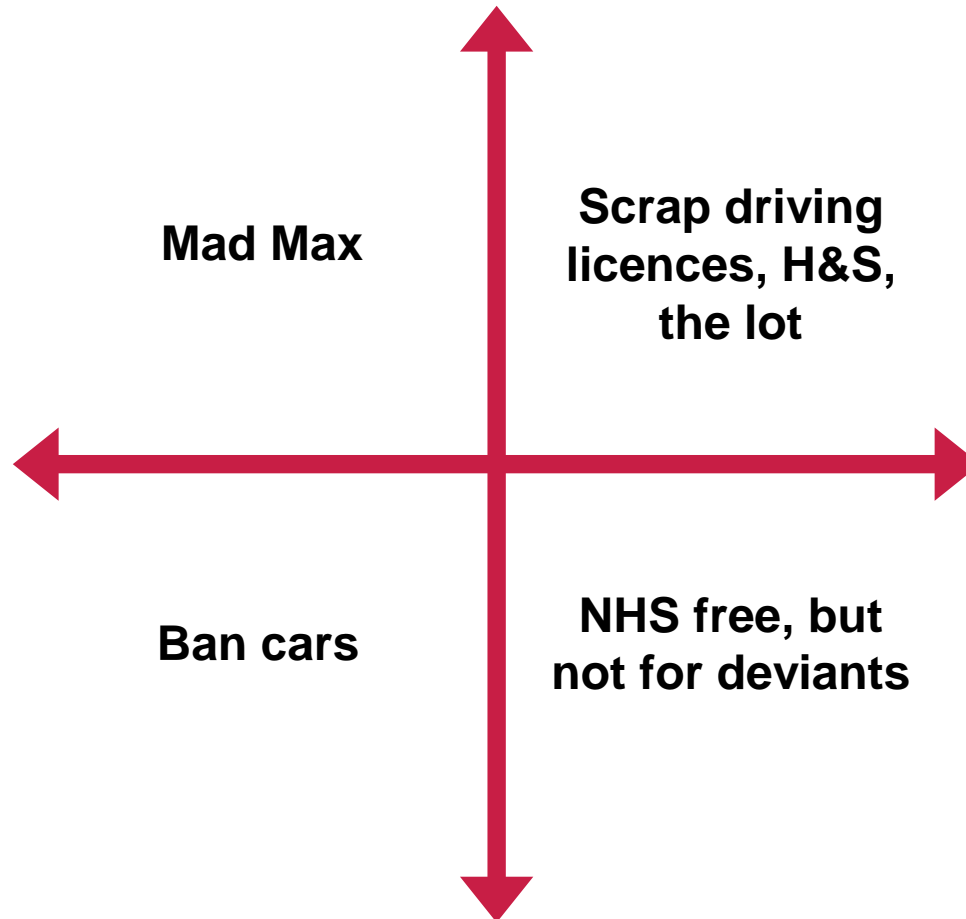
Values



Blame



Dystopias



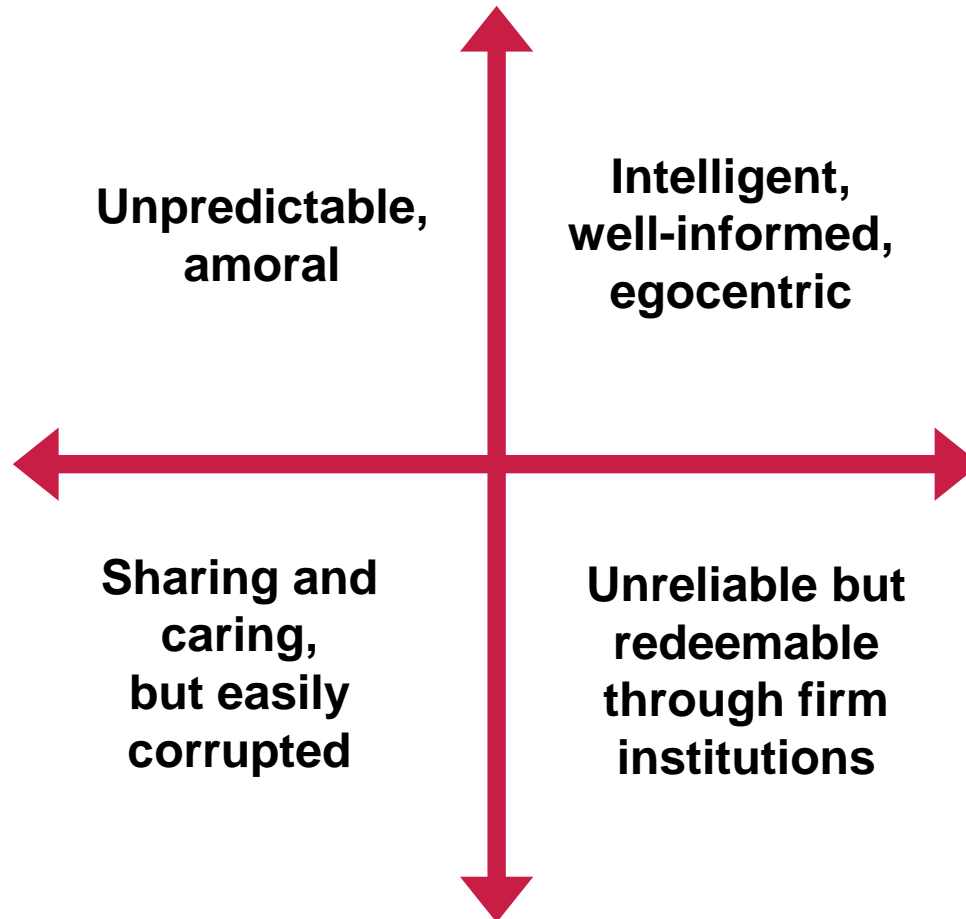
Questions

- What **values** underlie different responses?
- Who do we **blame** when something goes wrong?
- How do we view **human nature**?
- How do we want to **organise** society?
- How should we deal with **big risks**?

Plural Rationality Theory

- Four distinct *rationalities* and *ways of life*
 - Each tied to ways of organising
 - Each with a supporting cast of beliefs
 - Each rational in its own terms
- Viability
 - Dominance of a single rationality is unviable
 - Organisations (people!) are complex
 - Consensus is impossible
 - Elegant failures & clumsy solutions

Human nature

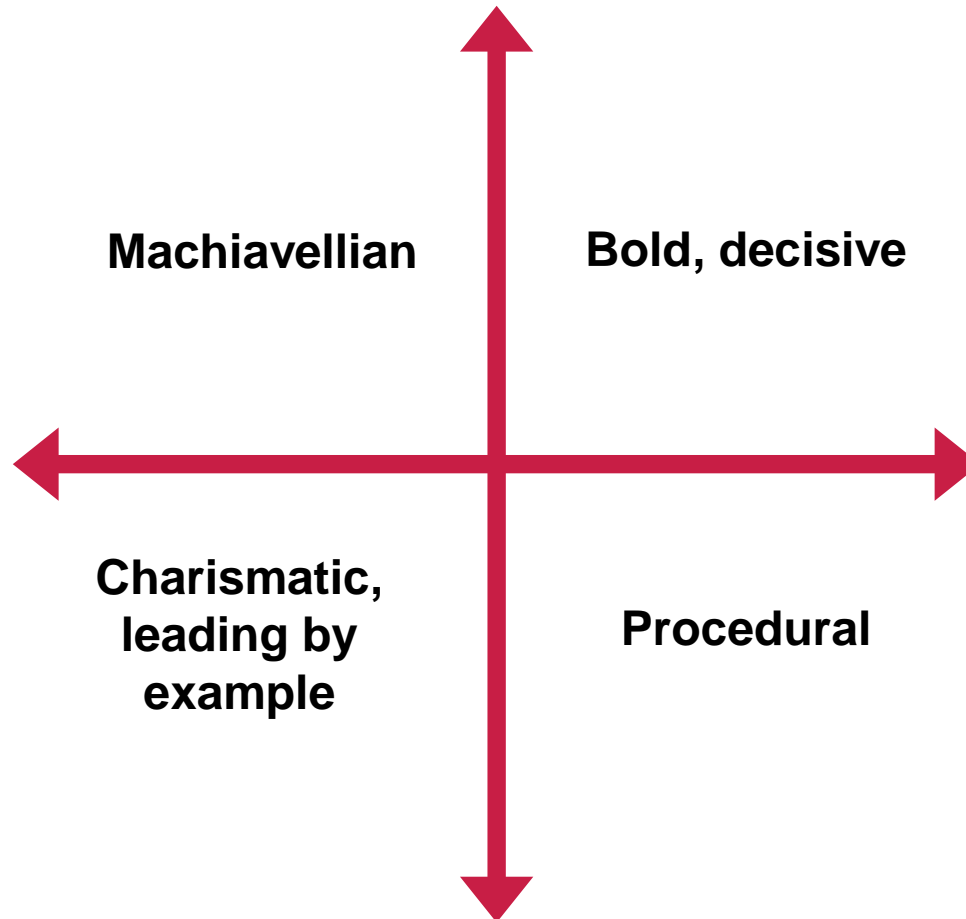


Party politics



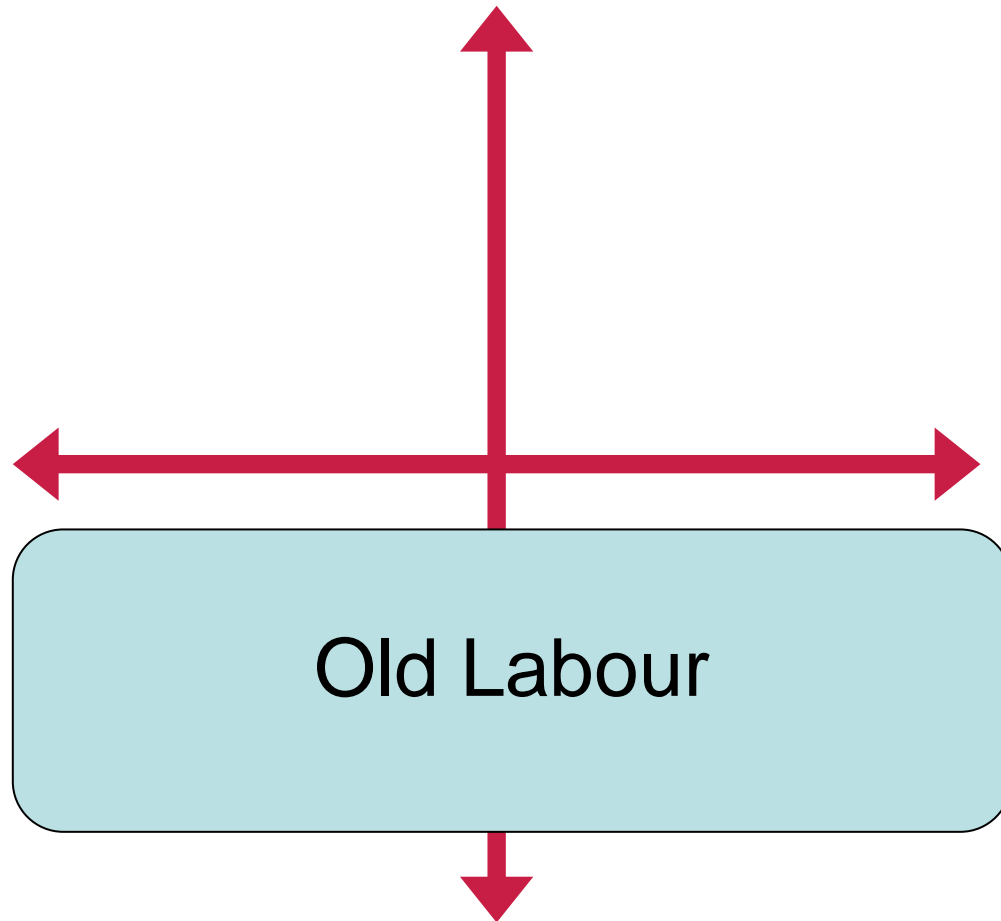
Leadership style

Verweij (2011)

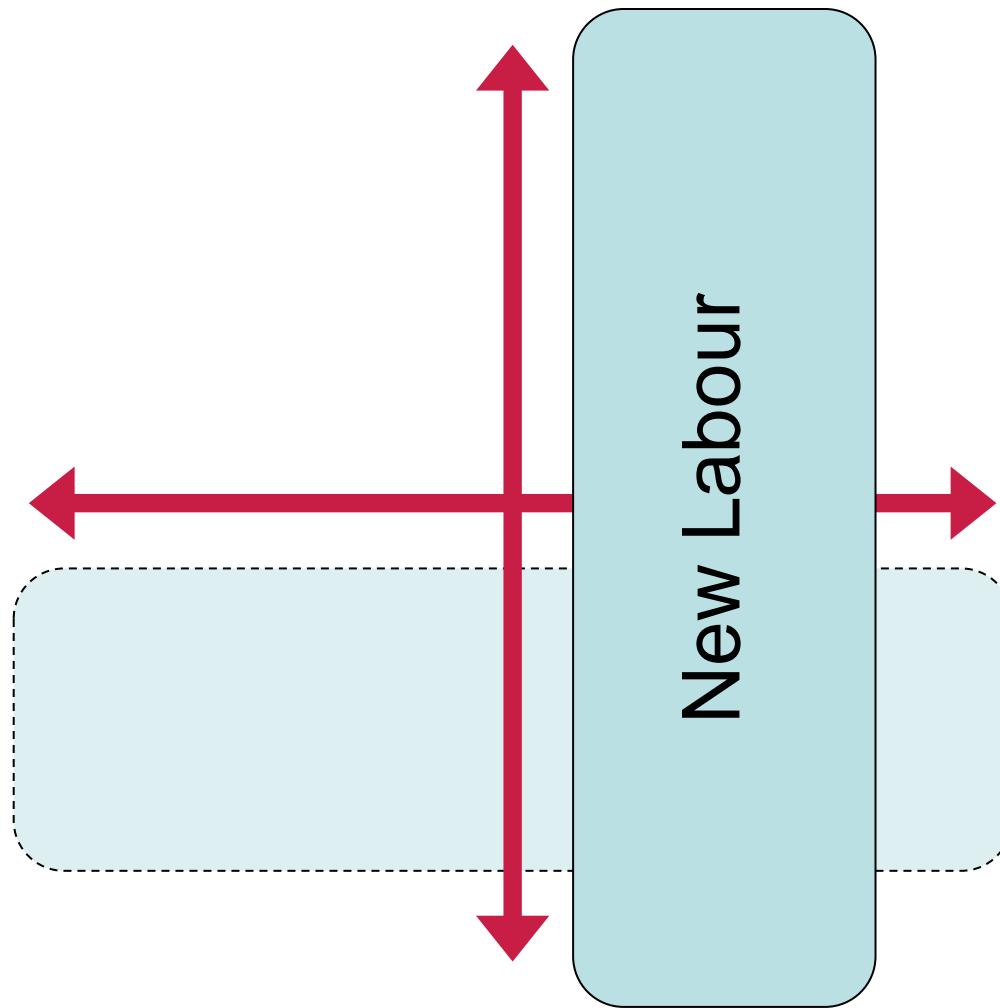




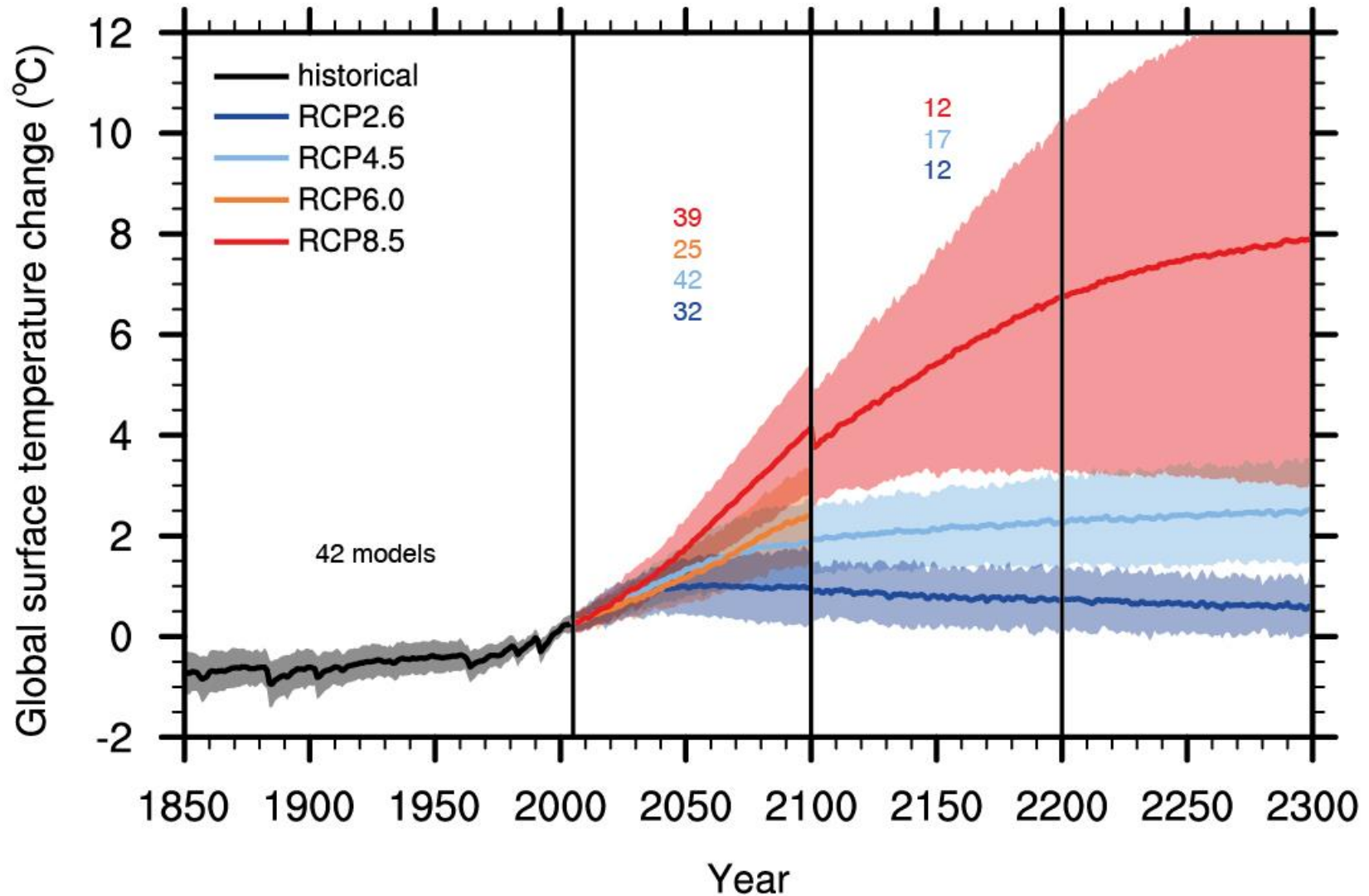
Coalitions



Coalitions



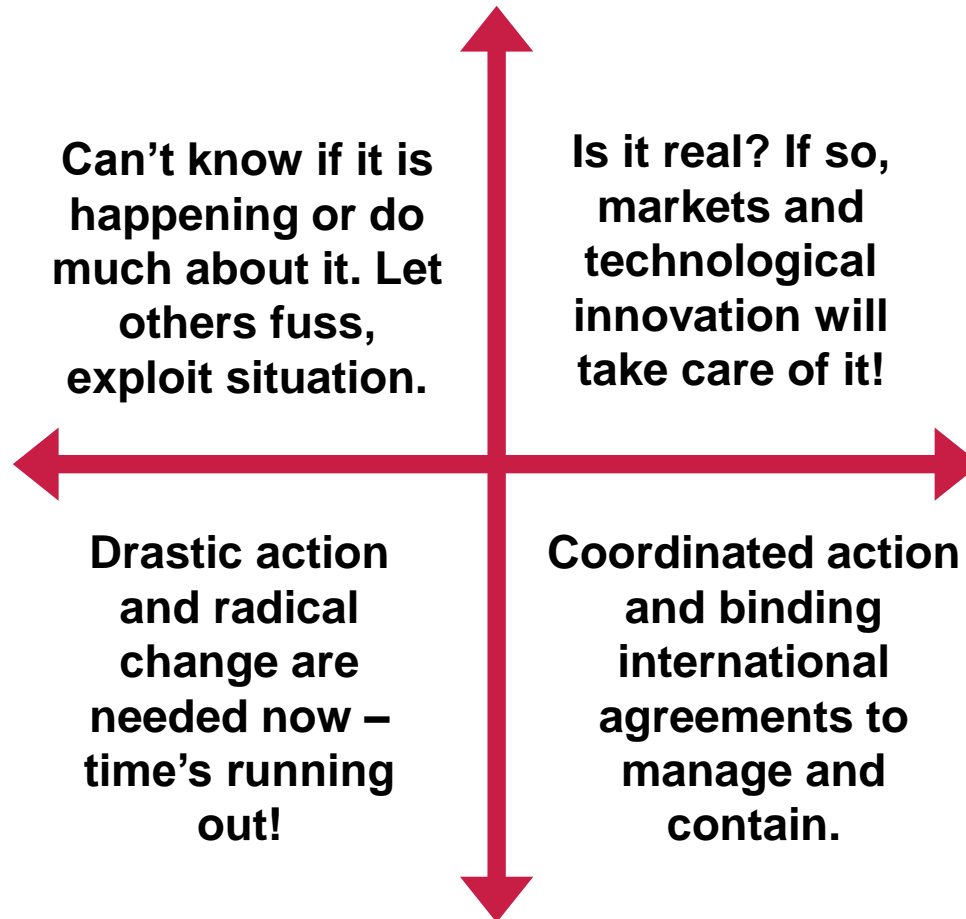
What to do about climate change?



(source: IPCC)

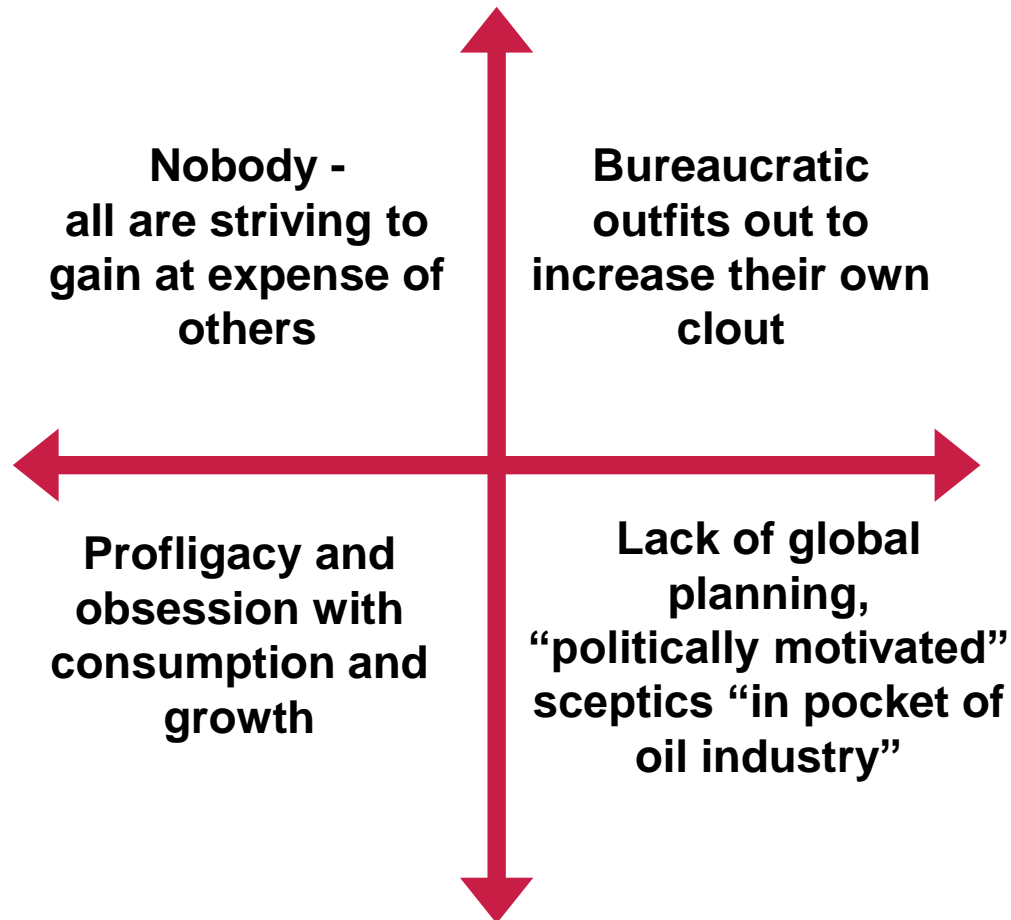
What to do about climate change?

Verweij (2011)



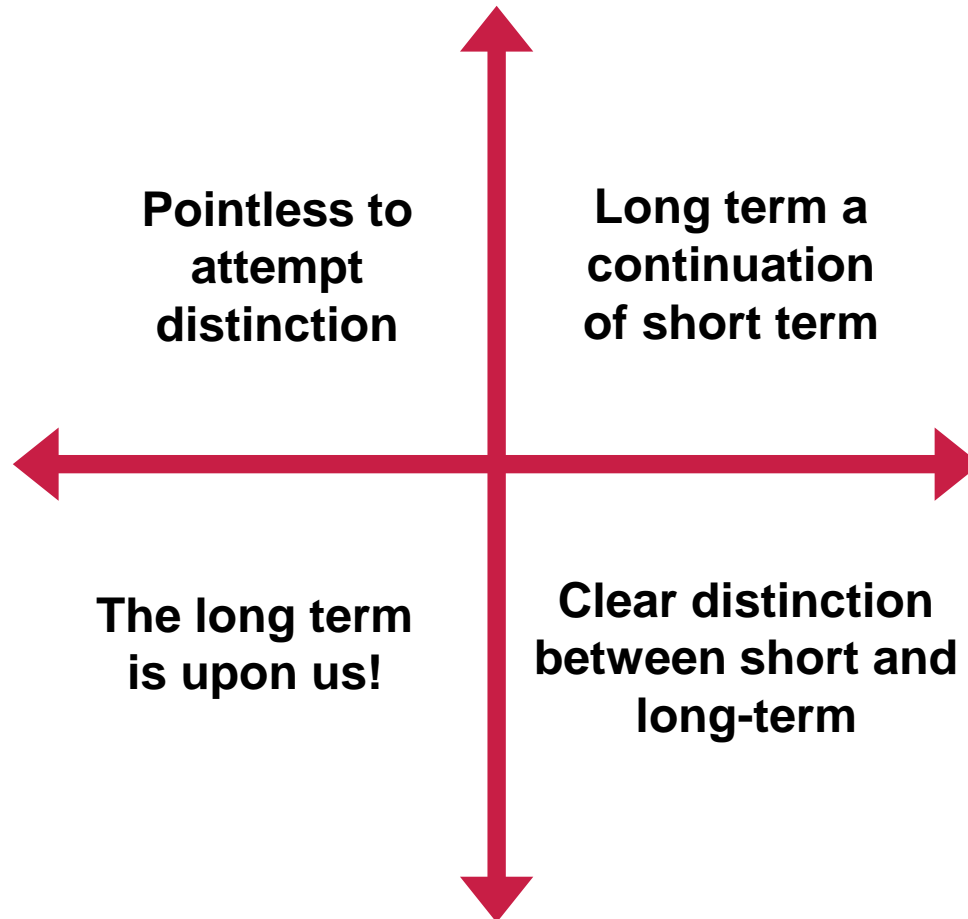
Blame

Verweij (2011)



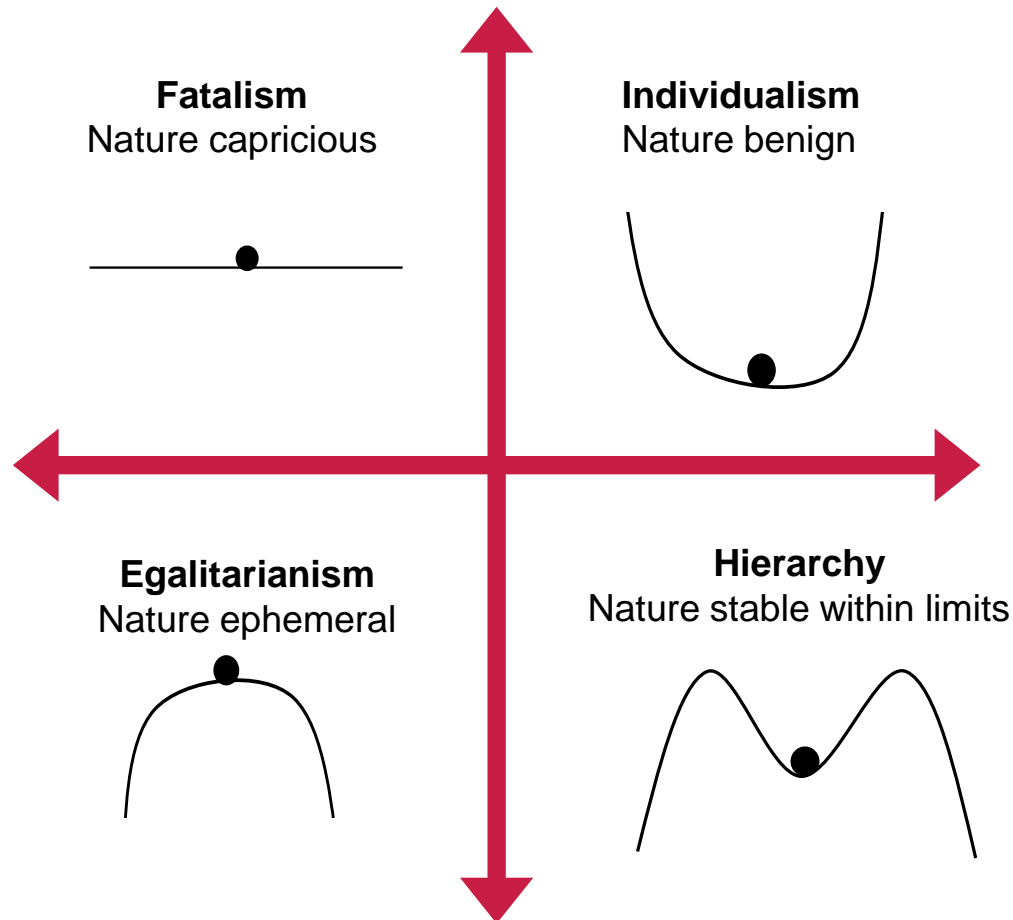
Time

Douglas et al. (2003)



Myths of nature

Holling (1973), Thompson et al (1990)



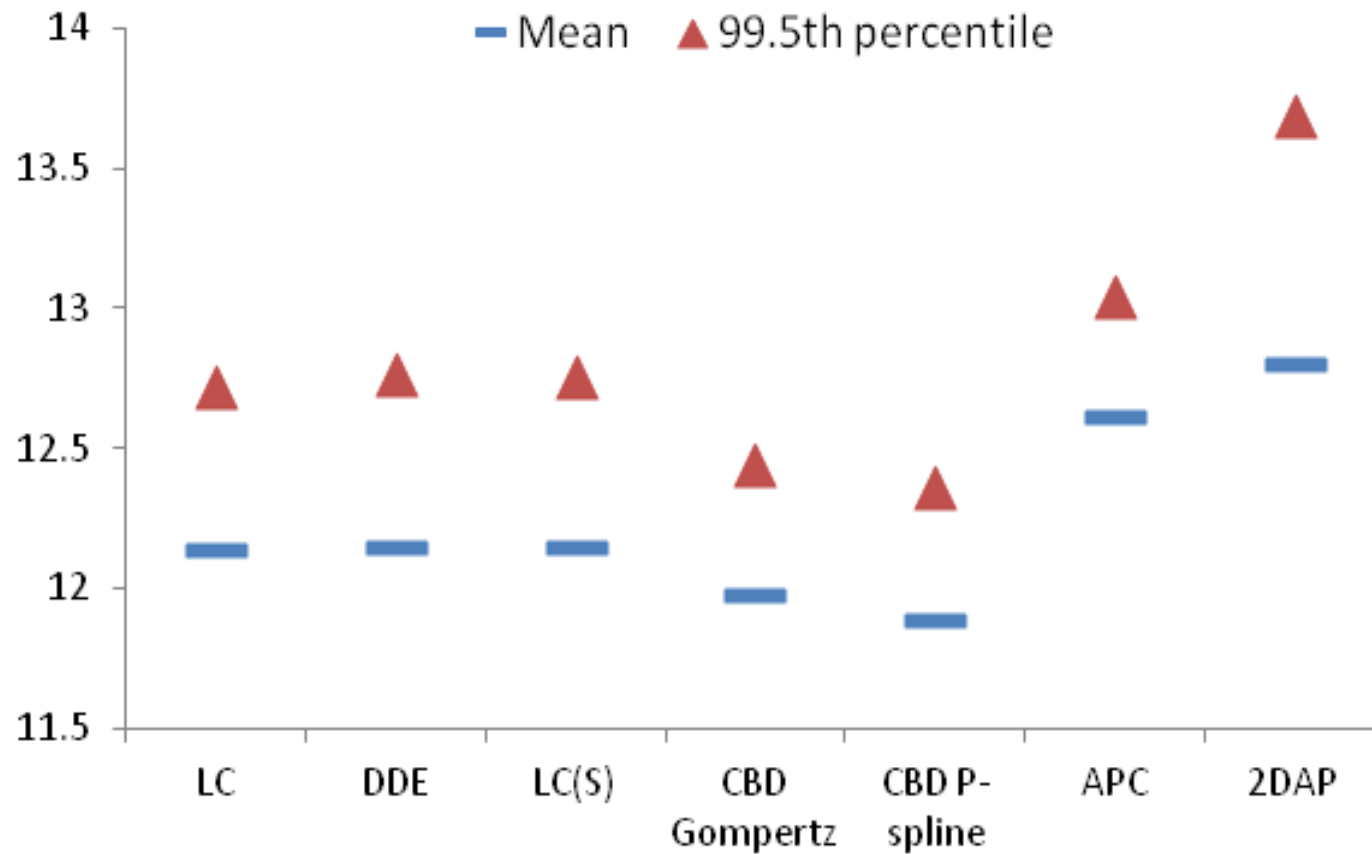
Who is right?

Verweij (2011)

- We don't know – uncertainty!
- What we **do** know is that Kyoto hasn't delivered
 - Elegant failure
- Implicit assumptions
 - Leave it to the experts
 - International governance and binding agreements
 - Measures will be costly
 - Sceptics are morally compromised
- A hard sell for some...

Sensitivity of annuity value to model choice

(Richards et al, 2013)



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.

- Implicit assumptions
 - Models drive decisions
 - Decision criteria agreed upon
 - “All risk is model risk”

From nature to models

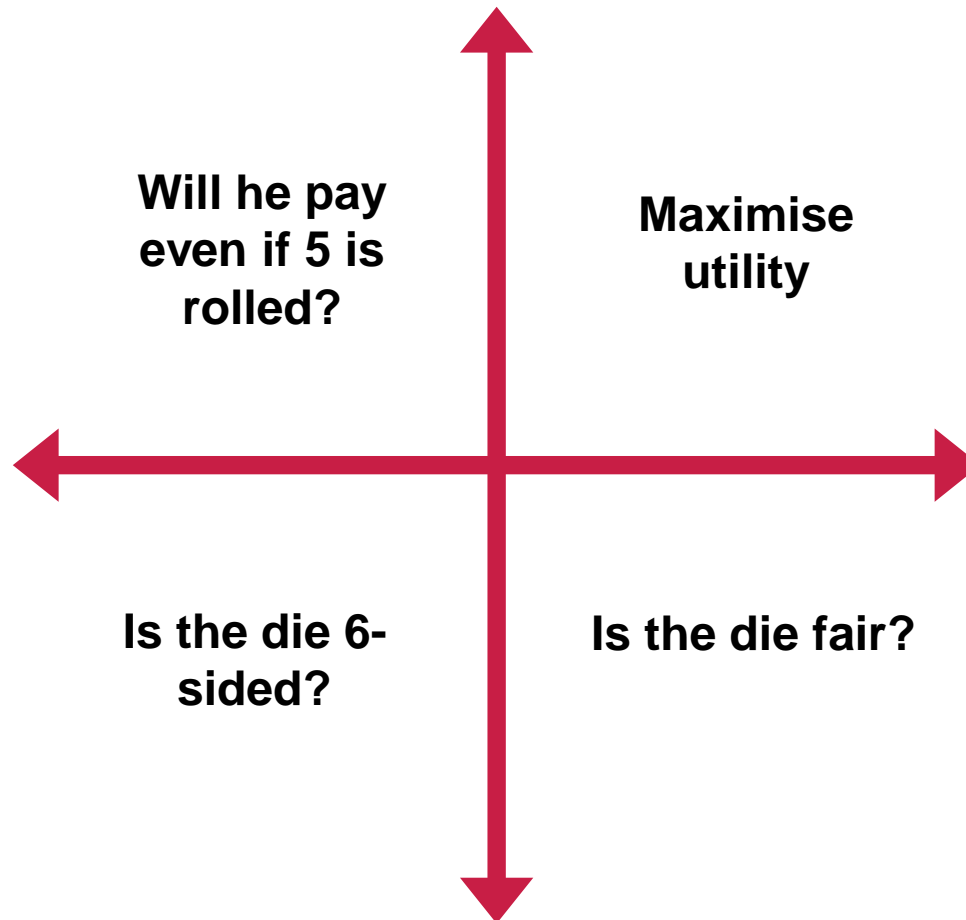
- Contesting **nature**
 - Disagreement about how the world is
 - Simple representations of nature
- Contesting **models**
 - Disagreement about whether/how nature can be known
 - Complex representations of nature
- What survives of plural rationality theory?

A game of dice

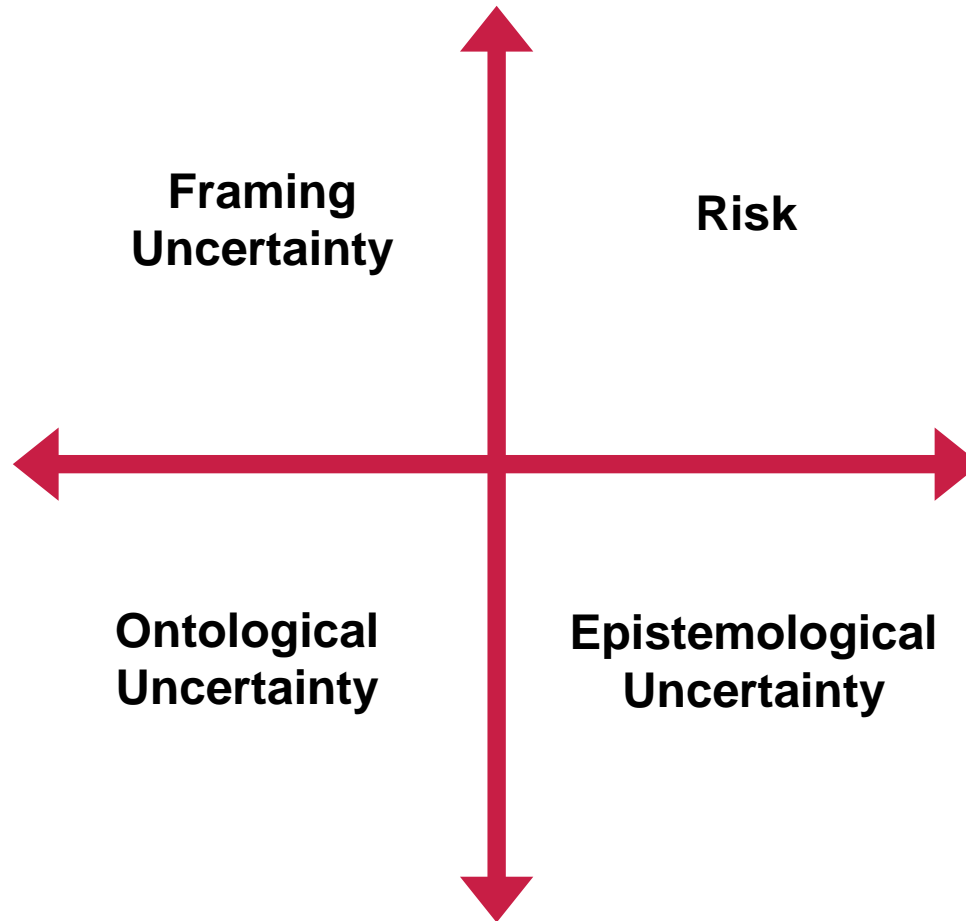
- If I roll a 5, I give you £10m
- Otherwise you give me £1m
- Should you take the bet?
 - **How** will you decide?



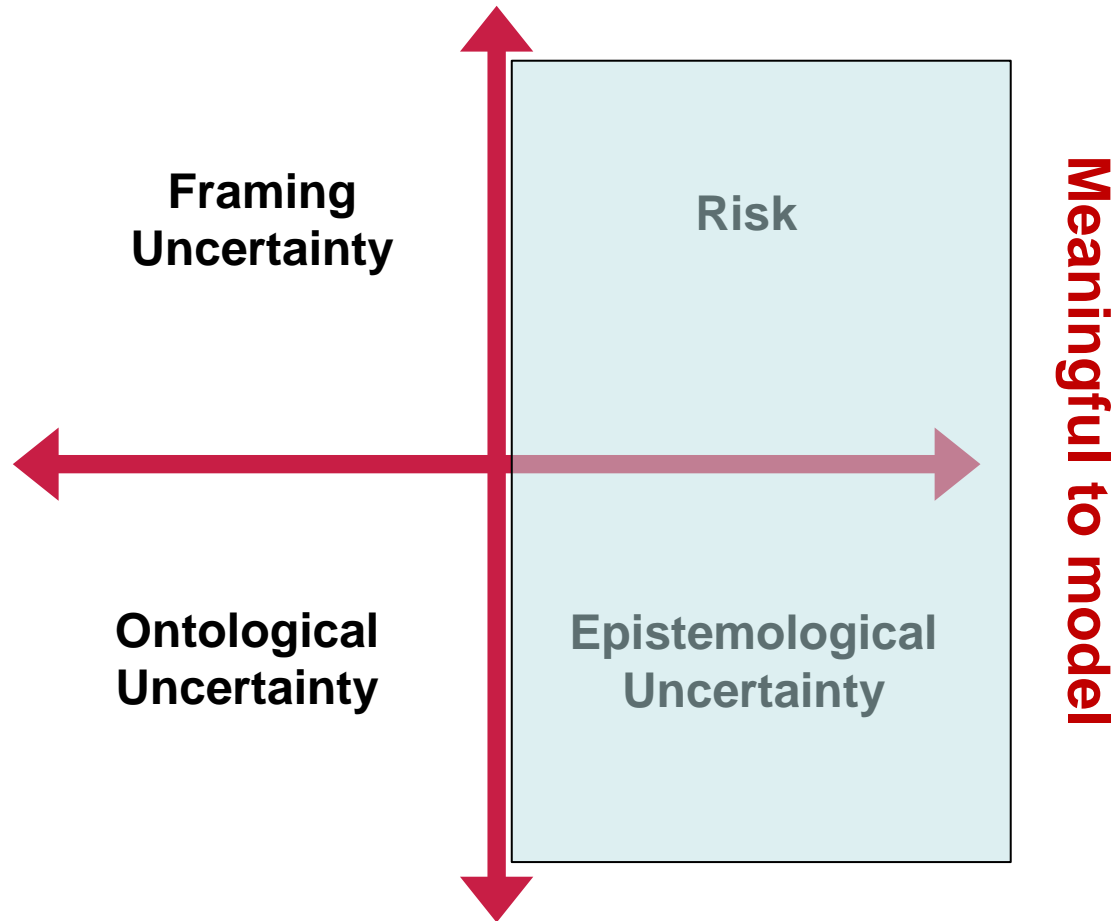
How to respond



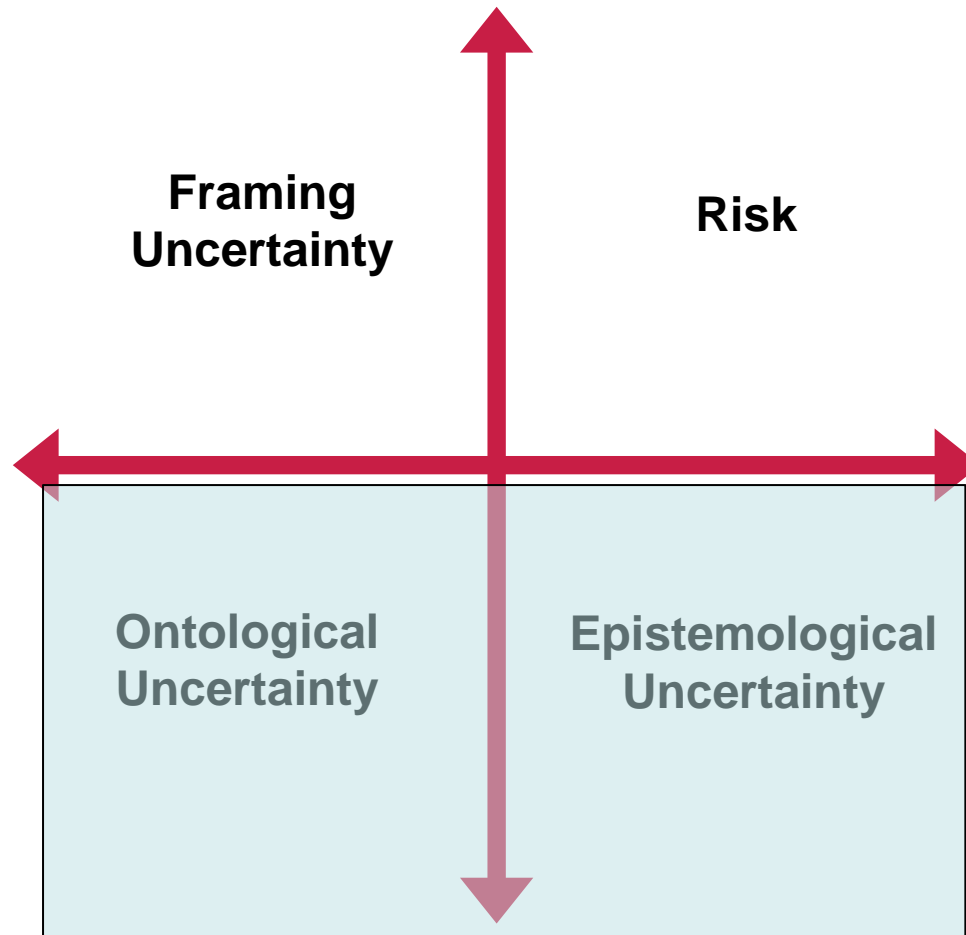
Uncertainties



Uncertainties



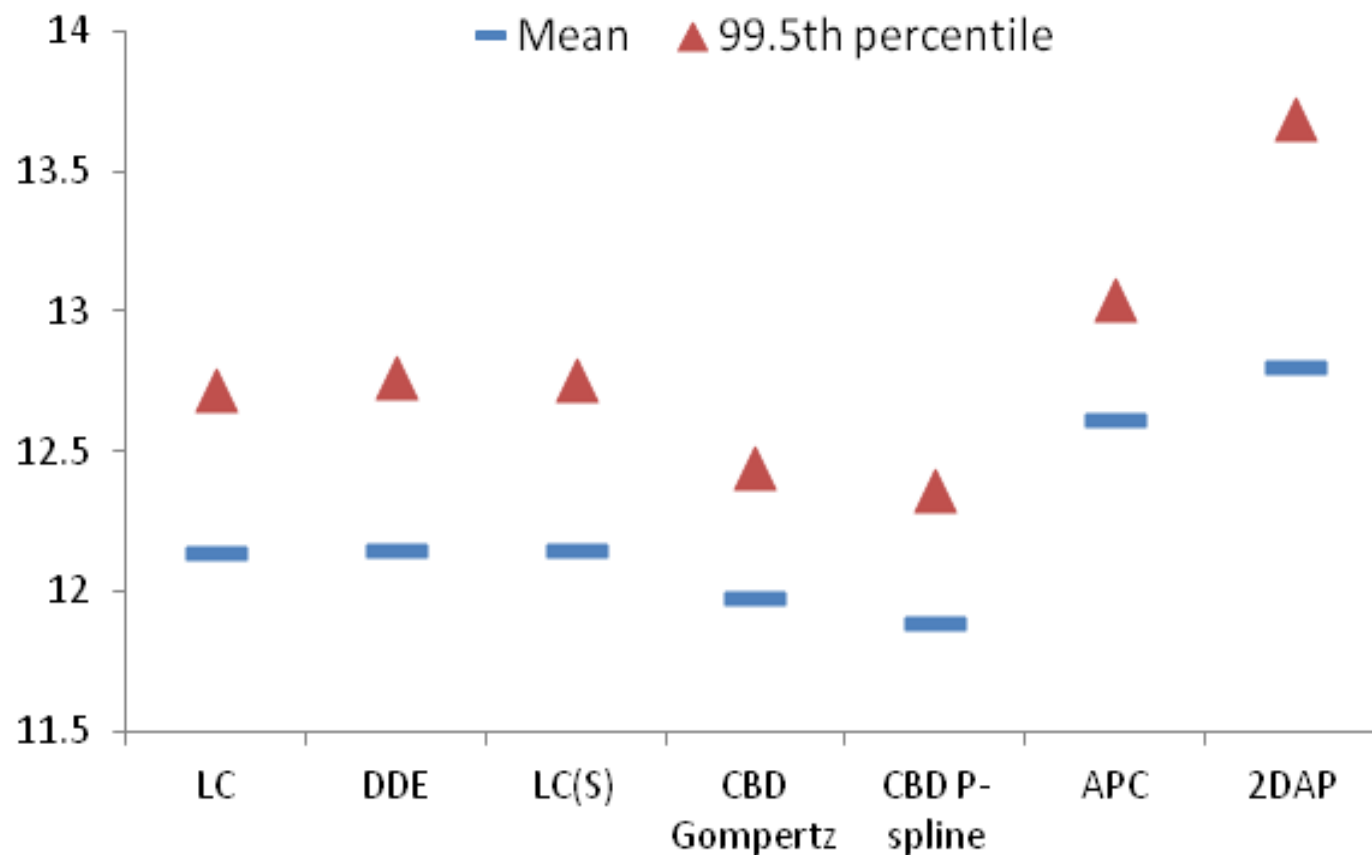
Uncertainties



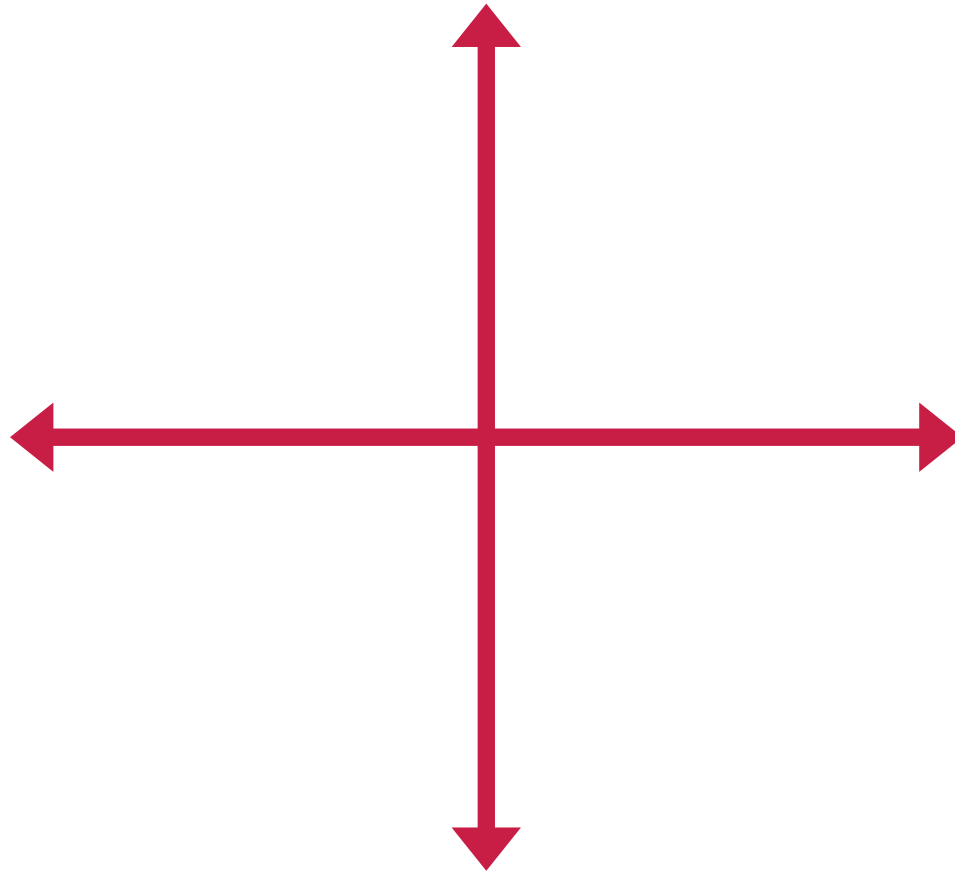
Worried about model uncertainty

Sensitivity of annuity value to model choice

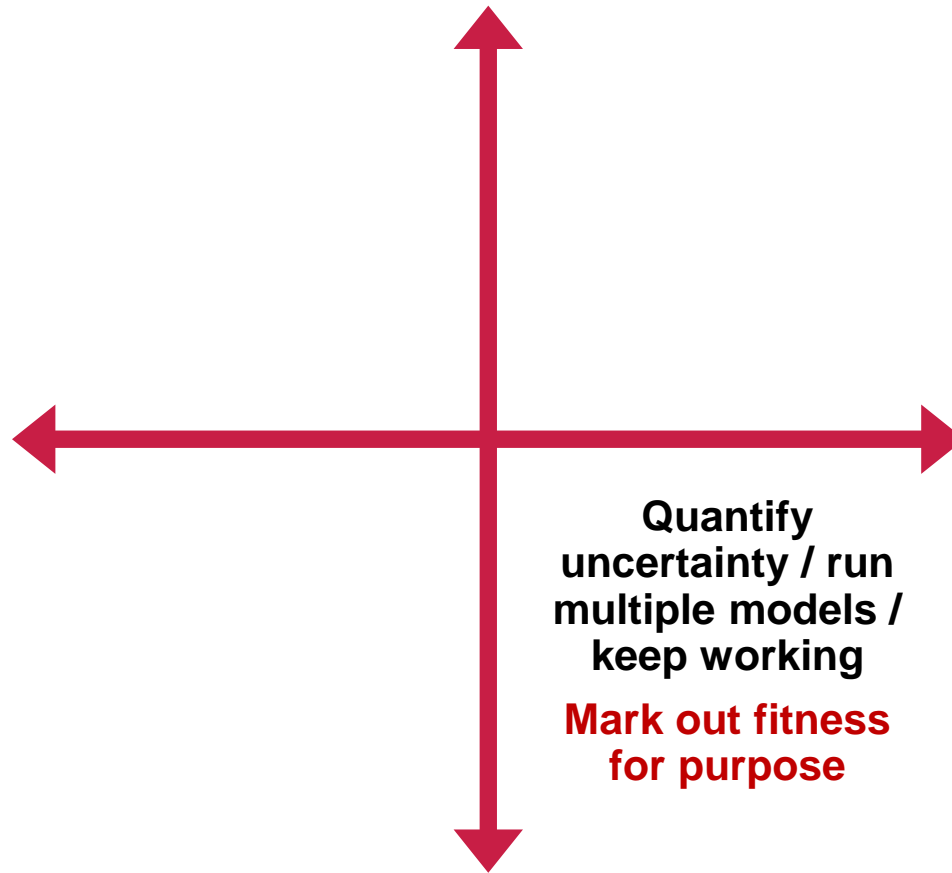
(70 year old male, discount at 3%; Richards et al, 2013)



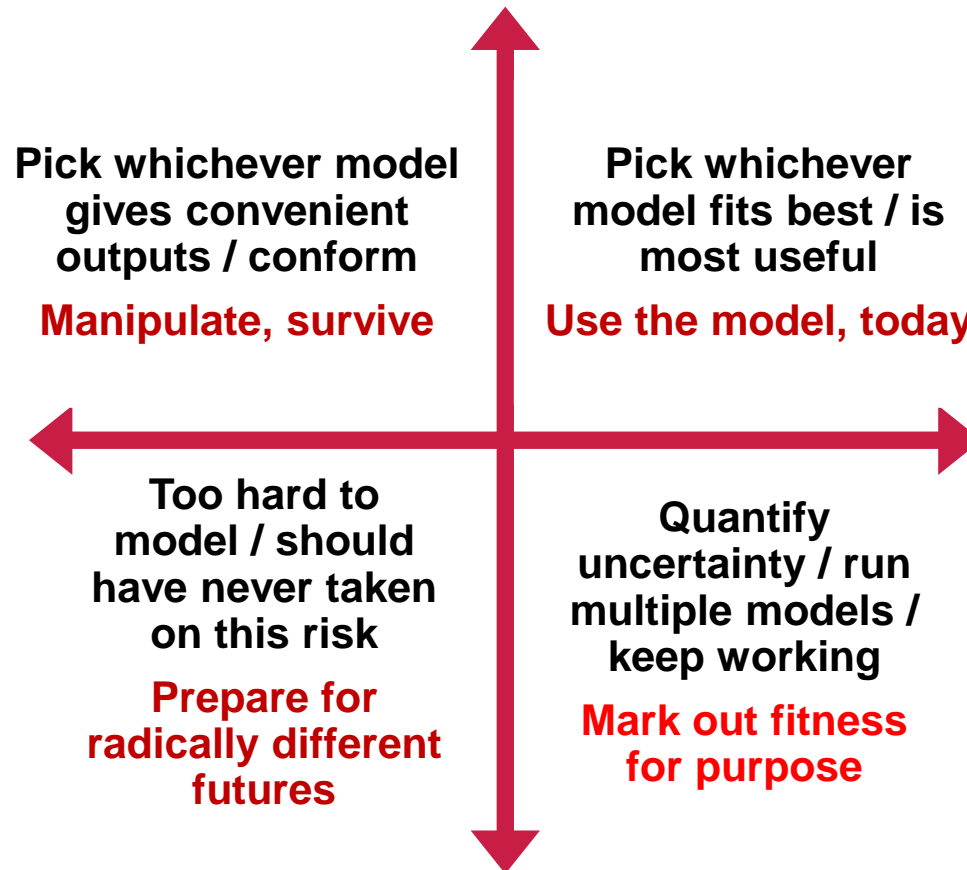
How to respond?



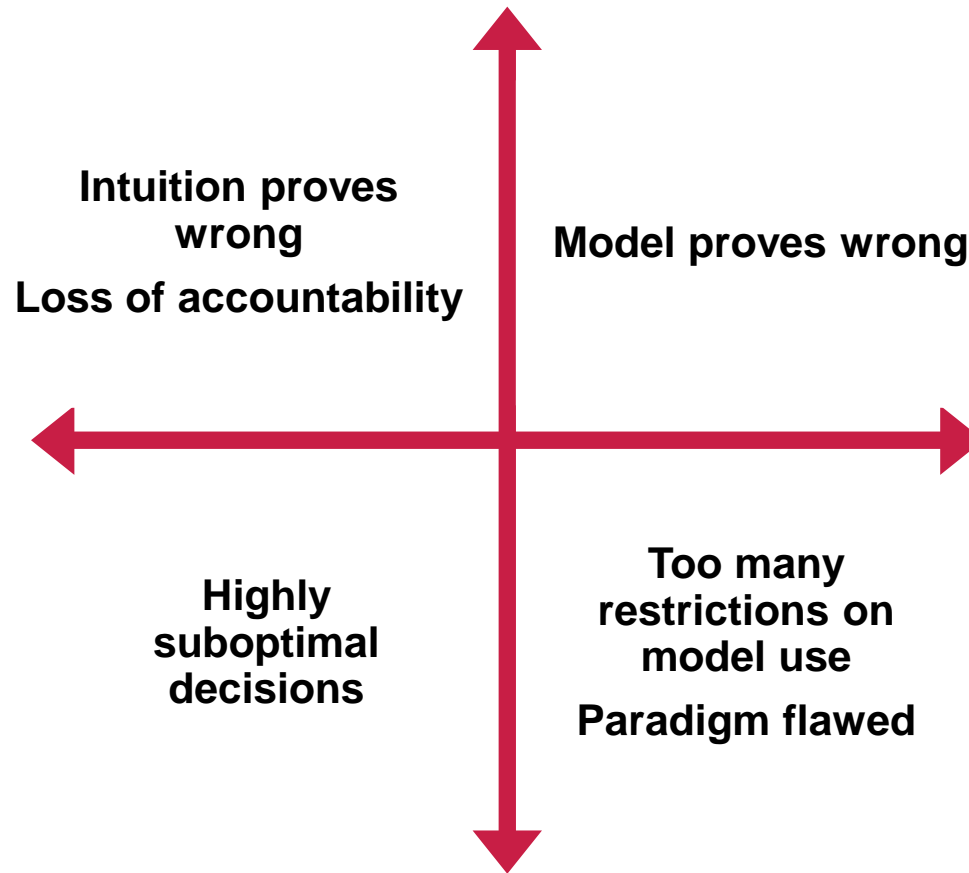
How to respond?



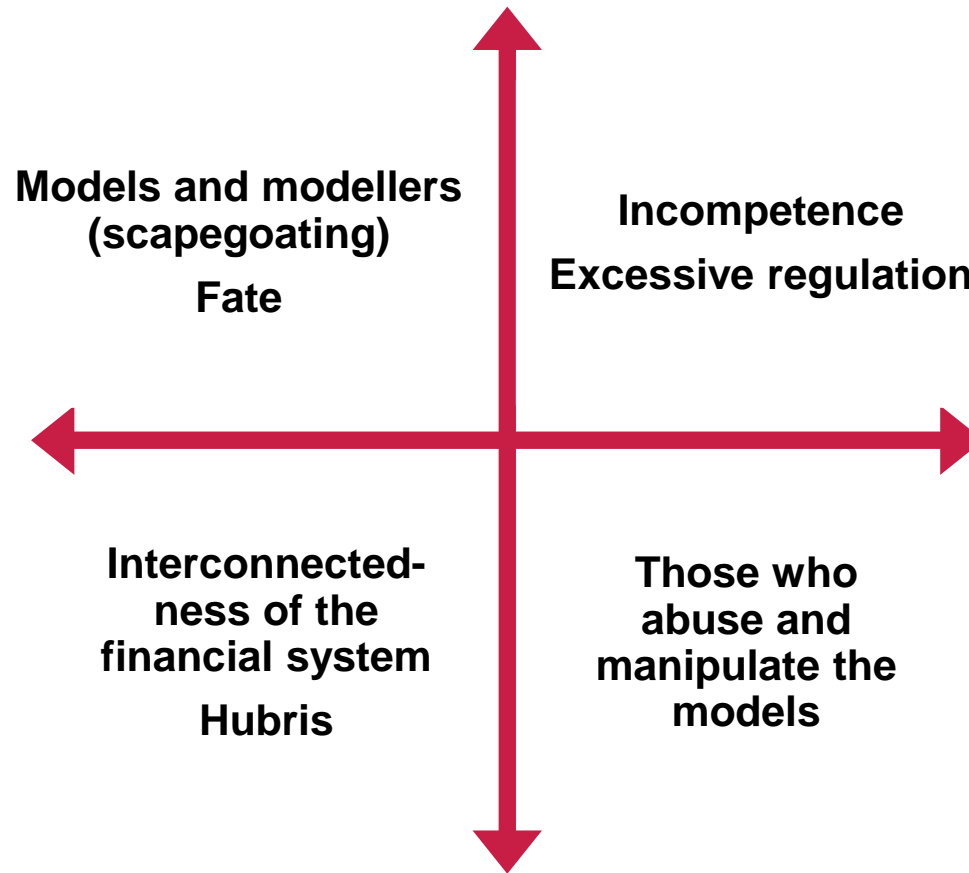
How to respond?



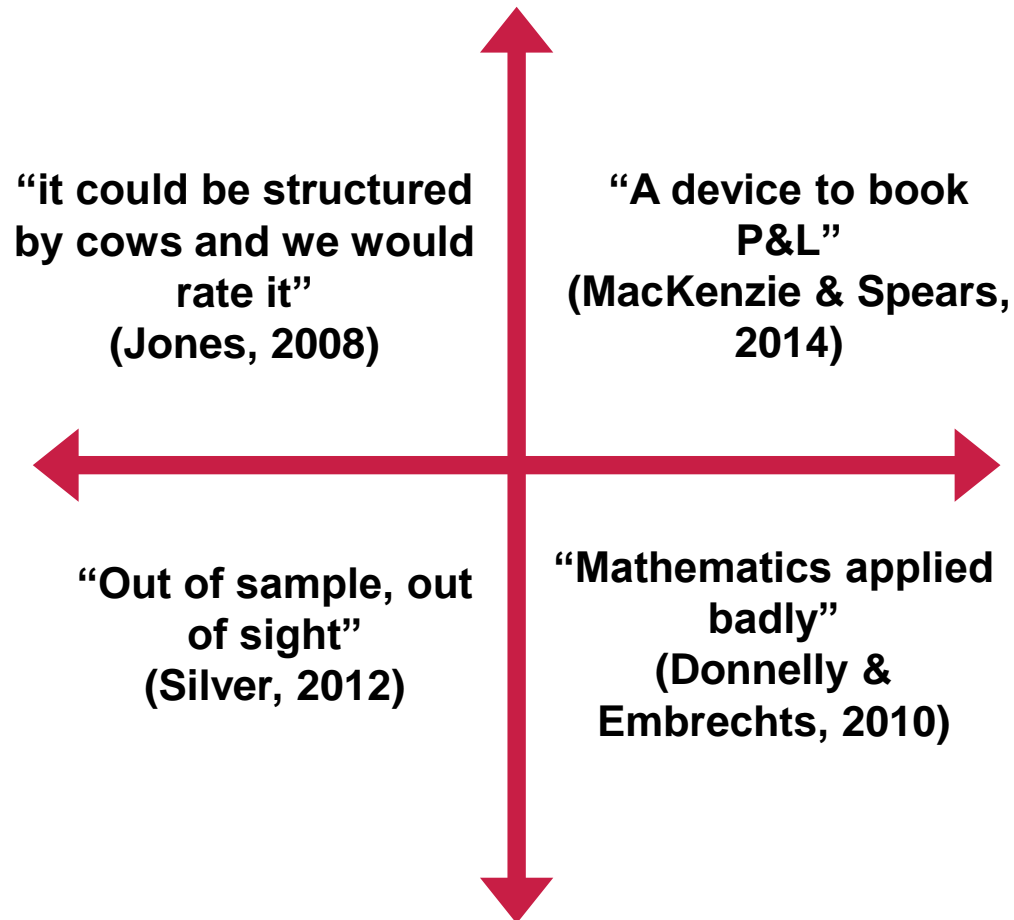
(Non-)Model Risks



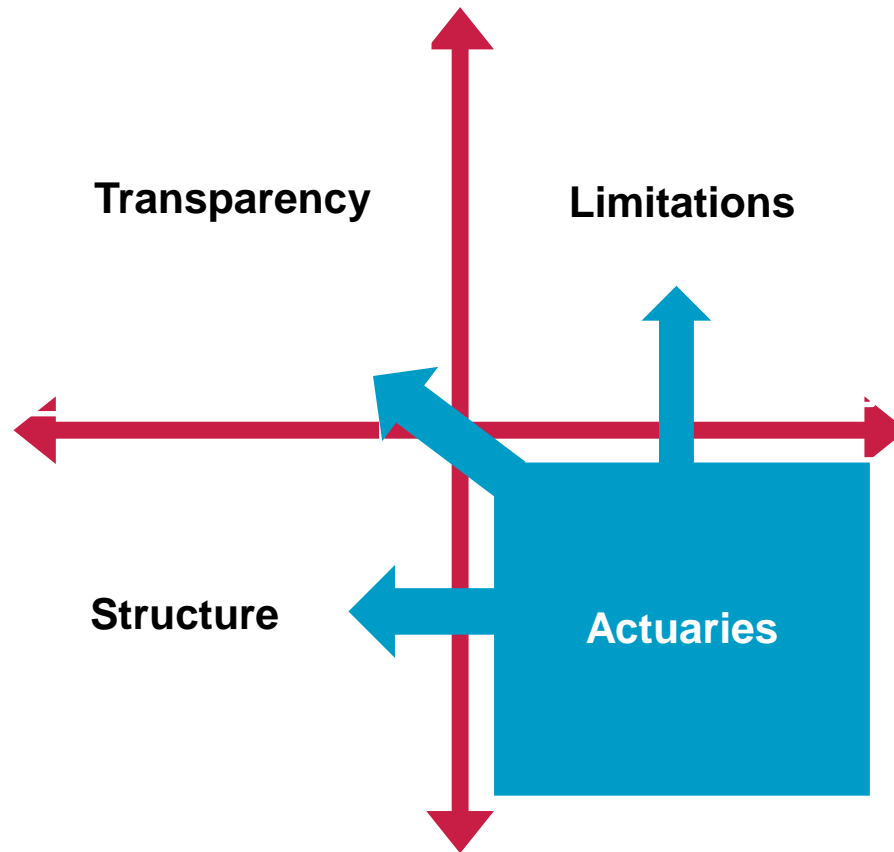
Blame



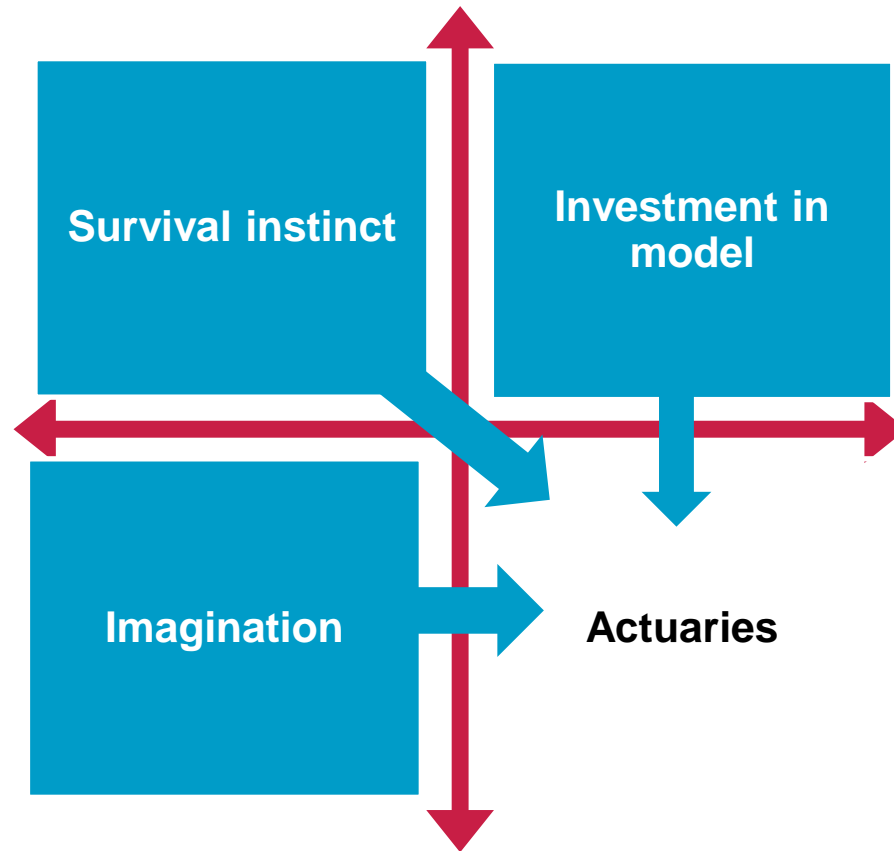
Echoes of the credit crisis



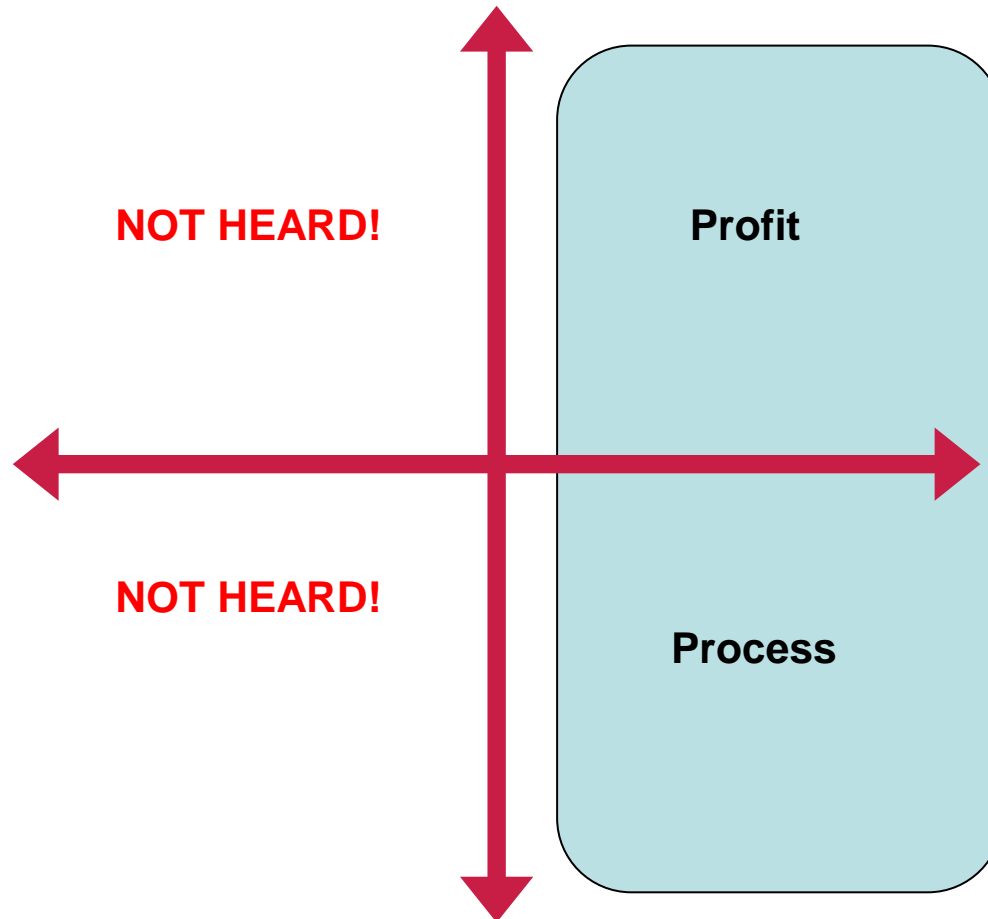
Governance: “us and them”



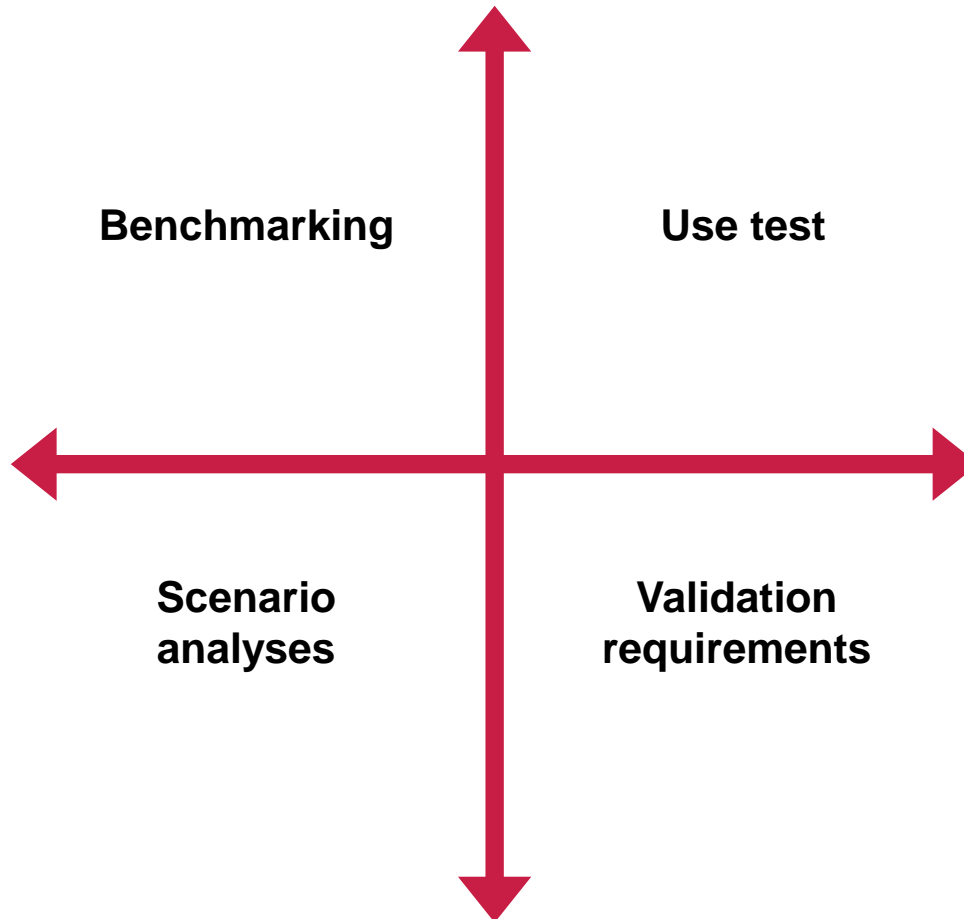
Governance: “us and them”



ERM is incomplete



Regulatory tools



The upside of uncertainty

- Uncertainty is a **resource**
 - Good people can disagree
 - ... while keeping honest
- What if we were deprived of this resource?

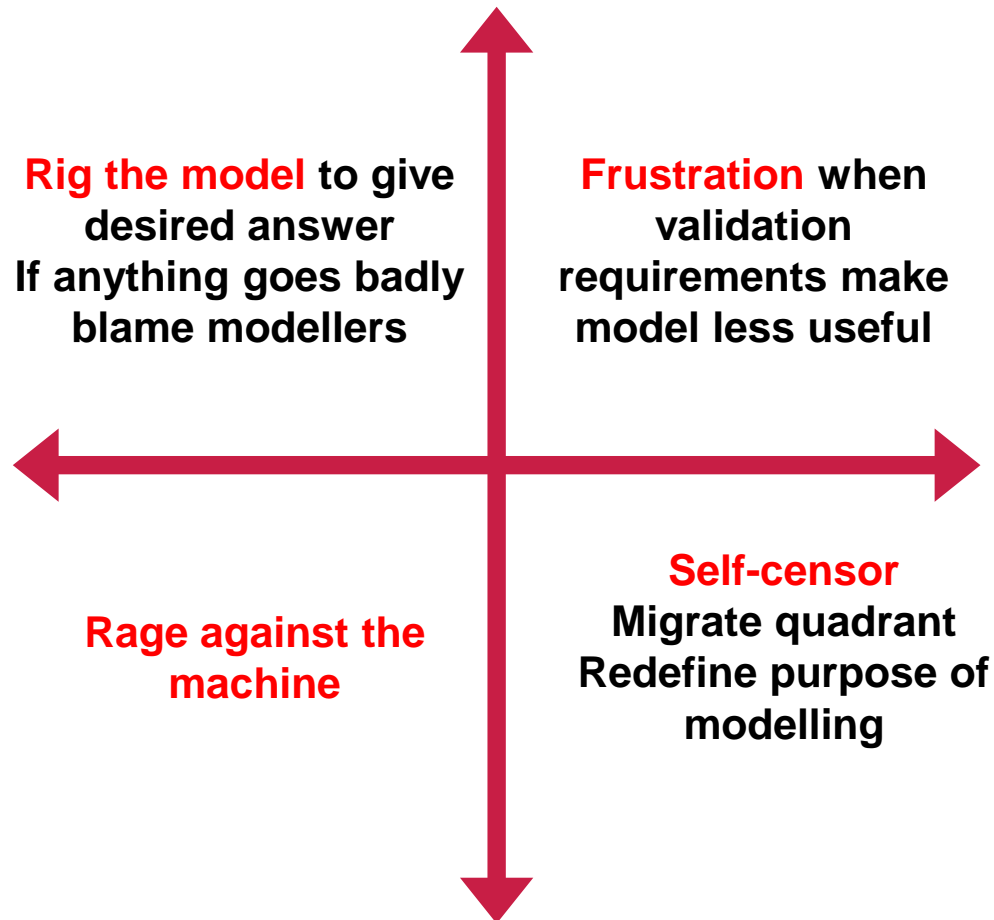
What if...

- ... we had to follow those two commands

Thou shalt use your model

Thy model shalt not be wrong

Accountability is the victim



Questions

- How should we (not) regulate road safety?
- How should we (not) regulate internal models?