

Human dimensions of climate change related risks and uncertainties

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Key messages

- Risk vs. Uncertainty \neq Objective vs. Bayesian
- Uncertainty implies incomparability: there is no globally optimum strategy.
- Assessing the human dimensions of ignorance is necessary to understand the climate change issue.

Epistemic issues: what is knowledge ?

- The problem of induction: How many observations are needed to infer a pattern ?
- Abduction is even harder.
- Classical logic is only deductive
- There are alternatives to Bayesianism (probabilistic logic)

Objective vs. Bayesian probability

- Beyond idealized symmetry, how to measure probabilities ?

- Count frequencies

Objective (frequentist)

- Ask the experts

- Look at the expert's behavior

} *Bayesian*

Precise vs. Imprecise probability the objective case

- A bag with 100 red or black marbles
- Precise: there are 30 red marbles,
 $p = 0.3$
- Imprecise: there are between 30 and 60 marbles,
 p is between 0.3 and 0.6

Precise vs. Imprecise probability the subjective case

- A prediction market for an asset that promises to pay 100 euros iff oil prices remain above \$50 in 2005.
- Precise: the asset trades at 30 euros
 $p = 0.3$
- Imprecise: I would sell at 60 euros, and buy at 30
 p is between 0.3 and 0.6

Summarizing the difference

- Objective vs. Bayesian: epistemic choice
(strong disciplinary traditions)
- Precise vs. Imprecise: attribute of information
(imprecise probabilities a newer tool)

More on the 100 marbles bag

- Randomness (risk): 30 red, 70 black
- Possibility : at most 30 red, the rest black
- Deep or Knightian uncertainty : between 30 and 60 red, the rest black
- Incompleteness: 30 red
- Vagueness: 20 red, 10 very dark red

Incomparable probabilities

- Which one is more uncertain:
 - Between 30 and 60 red marbles, the rest black
 - Between 0 and 40 red marbles, the rest black
- When expected value is a range, can you maximize expected utility ?

Human dimensions of ignorance

- Surprise
- Metaphysical
- taboos

Strategic uncertainty

- Adverse selection
- Moral hazard
- Coalition building

Key messages summary

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Conclusion: Typology of ignorance

derived from Smithson (1988)

- Epistemic
- Imperfect knowledge
 - Incompleteness and Vagueness
 - ↓
 - Knightian uncertainty
 - ↙ ↘
 - Probability – Possibility
- Human dimensions
 - Strategic
 - Taboos
 - Surprises
 - Values