

PHILOSOPHICAL DISAGREEMENT

Heisenberg

Causality law has it that if we know the present, then we can predict the future.

Be aware: in this formulation, it is not the consequence, but the premise, that is false. As a matter of principle, we cannot know all determining elements of the present.

(Memorial Solvay Conference, Brussels 1962)

Einstein

I am at all events convinced that He does not play dice.

(Letter to Max Born, 1926)

INTRINSIC UNCERTAINTY AND MODELS

Because of the complexity, it is extremely difficult for even the most capable ecologists to study a forest ecosystem in its full detail, and so they develop simplified concepts about the workings of the ecosystem, focusing on a few components and their interactions that are thought to be particularly significant. This conceptualization of the ecosystem web of interactions is called a model. To be sure, different ecologists may perceive the interactions differently, weigh the participation of the different components differently and, therefore, develop different models. Because of the complexity, the ecosystem is imperfectly understood and uncertainty about how it all hangs together is attendant.

RISK AND UNCERTAINTY

The decision maker would act as if she chooses the action that maximizes a weighted average of the worst expected utility and the best expected utility, where best and worst are calculated by comparing expected utilities using the different probability distributions. The weight placed on the worst outcome would be influenced by concern of the individual about the magnitude of associated threats, or pessimism, and possibly any hunch about which probability might be more or less plausible. It is an explicit embodiment of “aversion to uncertainty”, sometimes called “aversion to ambiguity”, and is an expression of the “precautionary principle”.

CENTRAL RESULT FOR DECISIONS UNDER UNCERTAINTY

There exists a closed and convex set P of probability distributions on the set X of possible events, and a generalized von Neumann – Morgenstern function u on X with real numerical values, such that the preferences of the decision-maker on the events may be formulated as the following weighted sum:

$$\alpha \min_{\mu \in P} E_{\mu}[u(x)] + \\ + (1 - \alpha) \max_{\mu \in P} E_{\mu}[u(x)]$$

where the endogenous variable α is between 0 and 1, and appears as the uncertainty (or ambiguity) aversion index

SCIENTIFIC UNCERTAINTY AND CONFUSION

Credible science can be translated directly
into political power

Since 1995, at least, controversy has been
primarily partisan rather than scientific; it
has been deliberately prolonged by powerful
interests seeking to generate uncertainty
and doubt

Edwards (2010)

2004 Presidential Campaign

THE STRAIGHT TALK MEMO

The scientific debate remains open. Voters believe that there is no consensus about global warming within the scientific community. Should the public come to believe that the scientific issues are settled, their views about global warming will change accordingly. Therefore you need to continue to make the lack of scientific certainty a primary issue in the debate.

Frank Luntz (2002)

EPILOGUE : THE TROJANS, CASSANDRA AND THE HORSE

Blind with frenzy, we site the accursed creature on top of our sacred citadel. Then Cassandra, who, by the god's decree, is never to be believed by Trojans, reveals our future fate by her lips. We unfortunate ones for whom that day is our last, clothe the gods' temples, throughout the city, with festive branches.

Aeneid, Book II (Relation of the last days of Troy, by Aeneas to Dido)