

The Rich Domain of Uncertainty: Source Functions and Their Experimental Implementation

Peter P. Wakker (joint with Mohammed Abdellaoui, Aurélien Baillon, & Laetitia Placido; and with Roy Kouwenberg & Steven Dimmock)

Abstract

Since Keynes (1921) & Knight (1921) we know that uncertainties in economics usually come with no objective statistical probabilities. If then still probabilities are used to model such uncertainties, they have to be subjective (de Finetti 1931; Savage 1954). However, Ellsberg (1961) showed that in most cases no subjective probabilities can be assigned (ambiguity). We need new models for beliefs and decisions. Only at the end of the 1980s, people succeeded in developing such models (Gilboa & Schmeidler), at first theoretical and normatively motivated. They assumed expected utility for known probabilities and focused on ambiguity aversion.

We investigate ambiguity descriptively. Ambiguity is measured extensively in experimental and behavioral economics nowadays, with predictors investigated in regressions. One number is commonly taken to capture ambiguity, being an index of ambiguity *aversion*. This index mostly is the alpha from the alpha maxmin model for multiple priors. The ambiguity aversion index is then treated similarly as the index of risk aversion. We propose generalizations:

1. Ambiguity should depend on the source of uncertainty (=events generated by a common mechanism and with a uniform degree of ambiguity). Tractability is to be maintained though.
2. There is so much ambiguity seeking that it should be incorporated into models.
3. We need nonexpected utility also for known probabilities.

We introduce a theoretical model of sources that can give exact predictions and ambiguity premiums. We demonstrate its tractability in an experiment where we get tractable graphs of source functions that fully capture ambiguity. Surprisingly, we can revive subjective probabilities in agreement with Ellsberg's paradoxes and ambiguity.

Finally, I report on a recent survey over N=1,935 households, investigating the impact of ambiguity on household portfolio choices. In particular, we investigate the nonparticipation paradox of households investing less in stocks than any rational theory can explain.

Paper link: <http://people.few.eur.nl/wakker/pdfspubl/sources.pdf>