

## Discussion of paper

"Decision-Making under Radical Uncertainty: An Interpretation of Keynes' Treatise"

I found this to be an interesting, stimulating and thoughtful paper.

Revisiting Keynes' work from a current perspective seems valuable and worthwhile.

My only issue with the paper is that I am unsure, in many places in the paper, as to the various meanings of the uncertainty terms that are being employed. I read this paper as a Bayesian Statistician with many years of experience in uncertainty quantification, and I find that the examples in the paper are not always clear in this regard.

Just for concreteness, let's look at a quote from near the beginning of the paper.

"But suppose that such a gambler visits Hong Kong for the first time.

According to the usual theory of rationality they should still estimate the probabilities of the horses winning, compare them with the bookmaker's odds and then gamble just as they would with the same set of probabilities and odds in the UK. Anything else would be 'inconsistent'. This theory is 'mathematical' in the sense that it involves mathematical operators, but is it reasonable?"

My understanding of the usual theory of rationality is that the rational individual uses all available information in order to make probability judgements about uncertain events. In this case, the bookmaker's odds contain information as to the likely outcomes of the race, and these should be factored into the probability judgements that are made. At that point, only if a favourable bet is judged to arise, then it is rational to make that bet. (Usually, this won't be the case, without additional relevant information, as bookie's odds are set favourably to the bookie, on each outcome.) This makes me wonder what the author means by the usual theory of rationality.

Further, I don't understand the phrase "estimate the probabilities of the horses winning". Does the author mean by this that there are true but unknown values for these probabilities that we must try to estimate? This does not seem plausible to me as each race that the horse enters has a different collection of competing horses so that there is not, even in principle, a limiting frequency that we can appeal to. While the idea of a subjective probability for a horse winning the race is clear (it's just a judgement), the idea of true but unknown probability which we must "estimate" for a horse race is far less clear.

These issues arise through the paper. At many stages in the paper, I am unclear as to whether the author uses a probabilistic concept as representing the orthodox view within economics, or the orthodox view within the wider uncertainty quantification community (where so-called "radical" uncertainties are habitually quantified) or whether this is a Keynesian view of the concept, or a historical view current at the time of Keynes, or whether this is the author's view, or even whether the probabilities referred to are intended as properties of the world or as modelling constructs with indeterminate relation to the world.

As much of this paper concerns the relevance of Keynesian ideas to current practice, greater clarity would be very helpful in understanding the arguments that are being made. Of course, much of this conceptual vagueness is endemic to the field, and total clarity may be very hard to achieve, but some efforts in this direction would, in my view, greatly enhance the message and the value of this paper.