

# Uncertainty Averse Mean Variance Utility

Xiangyu QU <sup>1</sup>

<sup>1</sup> Université de Paris 2

The classic Mean variance utility of Markowitz has been widely used both in economics and finance. This model is justified by expected utility maximization with quadratic utility function. In recent years, this approach is heavily criticized both theoretically and empirically for at least two reasons. The first reason is that quadratic utility function displays increasing risk aversion, which is not a plausible assumption for individual behavior. The second reason is that expected utility hypothesis could not address the ambiguity aversion, which is frequently observed in practices.

This paper proposes a new model of decision under uncertainty deemed uncertainty averse mean variance utility, or UAMV, which can properly address the two problems above. In this model, an uncertain prospect, or Savage act, is assessed according to (a) a baseline expected-utility evaluation, and (b) an adjustment that reflects the individual's perception of ambiguity and her attitudes toward it. The adjustment is a function of the variance of its utility profile. The key elements of the UAMV model are a baseline probability and the adjustment variance, which represent individual's attitude toward ambiguity. A behavioral characterization of the UAMVU model is provided.

Furthermore, we solve the corresponding portfolio allocation problem based on UAMV. In the problem with a risk-free, a risky and an ambiguous prospects, we find that optimal portfolio depends on the adjustment variance. The tractability of the enhanced mean variance utility makes our model especially well suited for various portfolio allocation problems under ambiguity.