An Experimental Elicitation of Utility and Loss Aversion under Prospect Theory

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Abstract

Utility has been a controversial concept throughout the history of economics, with interpretations shifting over time. After Bentham's (1789) intuitive discussions, the marginalist revolution of around 1870 and the ordinal revolution at the beginning of the 20th century significantly deepened our understanding (Blaug 1962). Nowadays, utility is commonly interpreted in an ordinal sense, which means that it is based solely on observable choice. Its measurement (i.e. elicitation) remained however a "tricky issue".

Under expected utility, different methods for measuring risky utility, that should yield the same utilities, exhibited systematic discrepancies (Karmarkar 1978; Hershey and Schoemaker 1985). It led some authors working on risky versus riskless utility to abandon the classical approach. For example, Krzysztofowicz and Koch (1989) and McCord and de Neufville (1984) suggested that nonexpected utility theories will better accommodate the discrepancies between marginal utility and risk attitude than nonlinear transformations between risky and riskless utility.

Since the 1980s, many models that deviate from expected utility have been proposed (Camerer 1995; Starmer 2000). Popular examples are rank-dependent utility (Gilboa 1987; Quiggin 1982; Schmeidler 1989; Yaari 1987) and prospect theory (Tversky and Kahneman 1992). On the domain considered in this paper, two-outcome prospects with known probabilities, rank-dependent utility and prospect theory agree. These models assume nonadditive probability weighting. They provide better empirical predictions than expected utility and explain the discrepancies between different utility measurements (Abdellaoui, Barrios and Wakker 2003). Several authors have suggested that utility measurement can be improved through prospect theory (Bayoumi and Redelmeier 1999; Bleichrodt, Pinto, and Wakker 2001; Krzysztofowicz and Koch 1989).

Prospect theory assumes that utility for money is concave for gains, and convex for losses. Moreover, it supposes that losses loom larger than gains. Nevertheless, we do not have any "straightforward" experimental confirmation of these assumptions (Tversky and Kahneman 1992, Abdellaoui 2000, Bleichrodt and Pinto 2000, Abdellaoui, Barrios and Wakker 2003). This paper reports experimental evidence allowing the observation of the shape of the utility function for gains and losses, and the measurement of the degree of asymmetry between gains and losses (loss aversion). Our experiments also allow a comparison between utilities obtained under Prospect Theory and utilities elicited under expected utility. Over all, the elicited utilities exhibit concavity for gains and convexity for losses. Concavity and convexity are however more pronounced under expected utility than under prospect theory.

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