Risk and Uncertainty Aversion in the Rank-dependent Utility

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Which lottery is preferred, X or Y? The Quiggin-Yaari Rank-dependent Utility (RDU) model replaces expected utility, the common index for comparison of lotteries, by another functional, where expectation is taken with respect to a distortion of the distribution of the lottery. Thus, a decision maker is characterised by two functions, a utility function U that distorts wealth and a probability perception function f that distorts probability: the random prize X is assigned a value $EU(X)$ where expectation is taken as if the survival function of X was not $P(X > t)$ but $f(P(X > t))$. E.g., f below (above) the diagonal corresponds to pessimism (optimism). Choquet capacities go a step beyond, devoid of the "objective" distribution to be distorted, and integrate with respect to $\nu\{\omega|X(\omega) > t\}$, where the capacity ν is minimally assumed to be a non-decreasing set function, not necessarily additive.

As is well known, von-Neumann & Morgenstern risk averters are those with concave U. Could an individual with non-concave U be averse to risk on account of being pessimistic enough? Under RDU or Choquet, aversion to dispersion (à la Bickel & Lehmann or Quiggin, to be described, somewhat stricter than second degree dominance) takes an interesting form (Chateauneuf, Cohen, Grant, Quiggin, Meilijson): the characterisation compares an index of "pessimism" defined purely in terms of f or ν to an index of "greediness" defined purely in terms of U, and aversion to dispersion is the result of being at least as pessimistic as greedy. This generalises Arrow & Pratt like statements under v-N & M, in the sense that linear f has index of pessimism 1, and greediness is 1 for concave U and strictly above 1 otherwise.