



Behavioural Portfolio Choices Based on a Set-Valued Scenario Approach

Massimiliano Kaucic

University of Trieste, Department of Economics, Business, Mathematical and Statistical Sciences,
Italy
massimiliano.kaucic@deams.units.it

Roberto Daris

University of Trieste, Department of Economics, Business, Mathematical and Statistical Sciences,
Italy
roberto.daris@deams.units.it

Cumulative prospect theory is a valuable paradigm for representing the behaviour of decision makers in the context of risk and uncertainty. Only recently it has been applied in finance and wealth management but revealing promising results in comparison to the classical expected utility theory and the mean-variance analysis. The solution of portfolio selection problem under prospect theory is usually obtained by means of a scenario-based technique. We extend this approach by substituting crisp scenarios with interval ones in order to handling modelling risk due to uncertainty in asset return distribution and scenario approximation. Behavioural agents are assumed to allocate their portfolios for a single period investment horizon according to an interval-valued objective function composed by a power-value function and a two-parameter probability weighting function. The resulting interval nonlinear optimization problem is solved in a computationally tractable manner via multi-objective programming, exploiting the meaning of interval-valued solutions and decision maker disposition to uncertainty.

The proposed methodology is illustrated in a numerical example with real-world data. Results show the benefits of the developed portfolio selection methodology in terms of sensitivity and robustness relative to model's parameters.

Keywords: cumulative prospect theory, portfolio selection, interval-valued function, multi-objective programming