Preferences in Mean-Risk Portfolio Optimization

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Abstract:

Solving the portfolio selection problem relies on models for preference between random variables representing portfolio returns. Choosing a specific model is itself a problem because each type of models assumes a different vision on choice under risk, different theoretical basis with strengths and weaknesses, and different degrees of computational tractability. In this paper, we present a new *Mean-Risk* model of portfolio selection. Its novelty consists in using of a new risk measure based on the modified loss distribution function.

The contribution of this paper is twofold.

Firstly, we propose a risk measure defined using the modified loss distribution according to the investor's risk and loss aversion preferences and establish its properties. A portfolio selection model in the *Mean-Risk* framework using the risk measure previously defined is proposed. Equivalent formulations of the model generating the same efficient frontier are given.

Secondly, the advantages of the new approach are investigated using real world data from New York Stock Exchange. The differences and similarities between the efficient frontier of the proposed model and the classical *Mean - Variance* and *Mean - Conditional Value at Risk* frontiers are quantified and interpreted. The investor's benefits of using the proposed model are assessed: out-of-sample experiments show that the efficient portfolios obtained by using the new model exhibit lower risk levels (at the same return levels) and an increased satisfaction compared to the classical *Mean-Risk* models.