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A mean-CVaR-skewness portfolio optimization model based on asymmetric Laplace distribution.

Summary: In the presence of uncertainty of asset returns, choosing an appropriate risk measure and determining the optimal weights of assets in a portfolio remain formidable and challenging problems. In this paper, we propose and study a mean-conditional value at risk-skewness portfolio optimization model based on the asymmetric Laplace distribution, which is suitable for describing the leptokurtosis, fat-tail, and skewness characteristics of financial assets. In addition, skewness is added into the portfolio optimization model to meet the diverse needs of investors. To solve this multi-objective problem, we suggest a simplified model with exactly the same solution. This modified model greatly reduces the complexity of the problem. Therefore, the mean-conditional value at risk-skewness model can be correspondingly solved. In order to illustrate the method, we provide an application concerning the portfolio allocation of 19 constituent stocks of S&P 500 index using our model. We show that this model could make important contributions to research on investment decision making.

Keywords: conditional value-at-risk; skewness; asymmetric Laplace distribution; mean-CVaR-skewness model
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