Multi-Stock Portfolio Optimization under Prospect Theory

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Abstract

We investigate a one-period portfolio optimization problem of a cumulative prospect theory (CPT) investor with multiple risky assets and one risk-free asset. The returns of multiple risky assets follow multivariate generalized hyperbolic (GH) skewed t distribution. We obtain a three-fund separation result of two risky portfolios and risk-free asset. Furthermore, we reduce the high dimensional optimization problem to two 1-dimensional optimization problems and derive the optimal portfolio. We show that the optimal portfolio composition changes as some of investor-specific parameters change. It is observed that the consideration of skewness of stock return distribution has considerable impact on the distribution of CPT investor's wealth deviation, and leads to less total risky investment.

Joint work with Minsuk Kwak.