
KAI LIU, University of Prince Edward Island

Real-time Portfolio Optimization Under Multivariate Affine Generalized Hyperbolic Distributions

This paper focuses on the real-time portfolio optimization which captures the impacts of leptokurtic phenomenon and heterogeneous preferences in higher moments on asset allocation. To achieve this, we propose a utility maximization asset allocation framework under the multivariate affine generalized hyperbolic (MAGH) asset prices dynamics. With the investor's preference given by the exponential utility, we derive the closed-form optimal asset allocations for mixed multivariate affine Normal-Inverse-Gaussian-Normal model and mixed multivariate affine Variance-Gamma-Normal model, which cover Markowitz's mean-variance model as our special case. In addition, the optimization could be combined with dimensionality reduction methodology. The new algorithm reduces the estimation error and has real-time application. Extensive empirical studies are conducted to assess the effectiveness of the proposed asset allocation models relative to other portfolio strategies based on Markowitz's mean-variance theory and the equally weighted $1/N$ rule.