Portfolio Selection with Active Risk Monitoring

Authors : Marc S. Paolella, Pawel Polak

Abstract : The paper proposes a framework for large-scale portfolio optimization which accounts for all the major stylized facts of multivariate financial returns, including volatility clustering, dynamics in the dependency structure, asymmetry, heavy tails, and non-ellipticity. It introduces a so-called risk fear portfolio strategy which combines portfolio optimization with active risk monitoring. The former selects optimal portfolio weights. The latter, independently, initiates market exit in case of excessive risks. The strategy agrees with the stylized fact of stock market major sell-offs during the initial stage of market downturns. The advantages of the new framework are illustrated with an extensive empirical study. It leads to superior multivariate density and Value-at-Risk forecasting, and better portfolio performance. The proposed risk fear portfolio strategy outperforms various competing types of optimal portfolios, even in the presence of conservative transaction costs and frequent rebalancing. The risk monitoring of the optimal portfolio can serve as an early warning system against large market risks. In particular, the new strategy avoids all the losses during the 2008 financial crisis, and it profits from the subsequent market recovery.