

ROBUST MULTIVARIATE ESTIMATES OF LOCATION AND SCATTER APPLIED TO THE OPTIMUM PORTFOLIO SELECTION PROBLEM.

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Abstract

The optimum portfolio selection is at the core of utility maximization problems and, accordingly, it has been extensively investigated during the past decades. Nowadays, although there are various methodologies available to portfolio managers, the most widely adopted one still relies on the mean-variance approach, mainly because of its mathematical tractability. However, it is well known that mean-variance optimum portfolios can be heavily distorted due to estimation error caused by the non-robustness of the mean and covariance estimates (e.g. sample mean and covariance matrix of asset returns). Usually, these portfolios are composed by counterintuitive and/or extreme asset weights, are very unstable and sensitive to new information, and tend to perform poorly out of the sample. Practical consequences are: excessive transaction costs due to rebalancing policies and lack of adherence with investors views. In this work we address this issue replacing the sample estimates of location and scatter as inputs in the portfolio problem by their robust counterparts. We propose the use of the high breakdown point, affine equivariant MVE, MCD, S and Stahel-Donoho estimators and compare the performance and stability of respective portfolios through the recent financial crisis.