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Robust portfolio optimization using pseudodistances

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The presence of outliers in financial asset returns is a frequently occuring phenomenon and may lead to unreliable mean-variance optimized portfolios. This fact is due to the unbounded influence that outliers can have on the mean returns and covariance estimators that are inputs in the optimization procedure. In the present paper we consider new robust estimators of location and covariance obtained by minimizing an empirical version of a pseudodistance between the assumed model and the true model underlying the data. We prove statistical properties of the new mean and covariance matrix estimators, such as affine equivariance, B-robustness and efficiency. These estimators can be easily used in place of the classical estimators, thereby providing robust optimized portfolios. A Monte Carlo simulation study and an application to real data show the advantages of the proposed approach.

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