

Identifying outliers in asset pricing data with a new weighted forward search estimator*


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ABSTRACT

The purpose of this work is to present the Weighted Forward Search (FSW) method for the detection of outliers in asset pricing data. This new estimator, which is based on an algorithm that downweights the most anomalous observations of the dataset, is tested using both simulated and empirical asset pricing data. The impact of outliers on the estimation of asset pricing models is assessed under different scenarios, and the results are evaluated with associated statistical tests based on this new approach. Our proposal generates an alternative procedure for robust estimation of portfolio betas, allowing for the comparison between concurrent asset pricing models. The algorithm, which is both efficient and robust to outliers, is used to provide robust estimates of the models' parameters in a comparison with traditional econometric estimation methods usually used in the literature. In particular, the precision of the alphas is highly increased when the Forward Search (FS) method is used. We use Monte Carlo simulations, and also the well-known dataset of equity factor returns provided by Prof. Kenneth French, consisting of the 25 Fama-French portfolios on the United States of America equity market using single and three-factor models, on monthly and annual basis. Our results indicate that the marginal rejection of the Fama-French three-factor model is influenced by the presence of outliers in the portfolios, when using monthly returns. In annual data, the use of robust methods increases the rejection level of null alphas in the Capital Asset Pricing Model (CAPM) and the Fama-French three-factor model, with more efficient estimates in the absence of outliers and consistent alphas when outliers are present.

Keywords: asset pricing, outlier detection, robust estimation, forward search.

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