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Prior Impact on Optimal Portfolio Selection

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Abstract

In this thesis we solve the problem of optimal portfolio selection from the Bayesian perspective. We consider four priors: the diffuse, the conjugate, the hierarchical, and the objective-based prior. For the diffuse and the conjugate prior we use the stochastic representation in order to draw samples from the posterior predictive distribution. For the hierarchical and the objective-based prior we derive the conditional posterior distributions, of the parameters of the asset returns, in order to draw samples from the posterior predictive distribution. An extensive comparison study is performed via Monte Carlo simulation in order to assess the performance based on the suggested performance measures. The Bayesian efficient frontier, the set of optimal portfolios, is constructed and compared to the sample efficient frontier, which is known to be overoptimistic, and the population efficient frontier. Theoretically and using real data from the Stockholm market we show that most of the Bayesian approaches outperform the frequentist approach.

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