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Bayesian Estimation of optimal portfolio: Theory and Practice

Theodoros Theologitis*

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Abstract

In this thesis, we consider the estimation of the weights of the minimum variance portfolio from a Bayesian point of view. Standard methods, which are based on determining sample moments, contain estimation errors which are not taken into consideration in the investment process. This often leads to a false asset allocation and might cause extreme risks to the investor. The Bayesian framework accounts for those errors by treating the parameters as random variables. Four different prior models will be used and compared through their posterior distributions and the point estimates of their posterior means. A simulation study is performed in order to test the point estimates of the posterior means through the L_2 deviations from the means of a true model. The data are generated from the multivariate normal distribution. In an empirical study we analyze the posterior distributions of the weights under all considered models through a domestic portfolio. Given the posterior distributions we can make probabilistic statements for the weights by creating the credible intervals and calculating posterior probabilities.

*Postal address: Mathematical Statistics, Stockholm University, SE-106 91, Sweden. E-mail: theologitis.t@gmail.com. Supervisor: Taras Bodnar.