Description of the project

Bayesian Optimal Portfolio Selection

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The aim of the project is to study the optimal portfolio choice problem from the Bayesian perspectives. It is remarkable that the Bayesian approach is potentially more attractive than the application of the methods of the frequentist statistics since (i) it can employ useful prior information about quantities of interest; (ii) it accounts for the estimation risk and for the model uncertainty when an optimal portfolio is constructed; (iii) it facilitates the use of fast, intuitive, and easily implementable numerical algorithms in order to simulate complex quantities.

In this project the optimal portfolio weights and the characteristics of optimal portfolios will be estimated from the viewpoint of Bayesian statistics and the findings will be subsequently applied to actual problems in portfolio theory. A special attention will be devoted to the choice of the prior distribution for model parameters which reflects the attitude of investors to the estimation risk and sheds light on the corresponding changes in the optimal portfolio composition. Several priors will be considered which account for the available information about the portfolio structure. Finally, the performance of the chosen priors will be compared with each other via an extensive Monte Carlo study.