



# Bayesian Estimation of the Efficient Frontier

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## Abstract

In the paper, we consider the estimation of the three determining parameters of the efficient frontier, the expected return and the variance of the global minimum variance portfolio and the slope parameter, from a Bayesian perspective. Their posterior distribution is derived by assigning the diffuse and the conjugate priors to the mean vector and the covariance matrix of the asset returns and is presented in terms of a stochastic representation. Furthermore, Bayesian estimates together with the standard uncertainties for all three parameters are provided as well as their asymptotic distributions are established. All obtained findings are applied to real data, consisting of the returns on assets included into the S&P 500. The empirical properties of the efficient frontier are then examined in detail.

*Keywords:* efficient frontier, stochastic presentation, Bayesian estimation, credible set, parameter uncertainty

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