

Statistical Inference for the Beta Coefficient

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Abstract

The beta coefficient plays a crucial role in finance as a risk measure of a portfolio in comparison to the benchmark portfolio. In the paper, we investigate statistical properties of the sample estimator for the beta coefficient. Assuming that both the holding portfolio and the benchmark portfolio consist of the same assets whose returns are multivariate normally distributed, we provide the finite-sample and the asymptotic distributions of the sample estimator for the beta coefficient. These findings are used to derive a statistical test for the beta coefficient and to construct a confidence interval for the beta coefficient. Moreover, we show that the sample estimator is an unbiased estimator for the beta coefficient. The theoretical results are implemented in an empirical study.

Keywords: Beta coefficient, sampling distribution, test theory, Wishart distribution

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