Evaluation of Value at Risk estimates using Extreme Value Theory

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Abstract

Value at Risk (VaR) is a risk measure that quantifies the maximal loss we may incur under normal market conditions, given a confidence level and a fixed time horizon. Due to this intuitive interpretation and its applicability VaR has become the most widely used risk measure today. In this thesis we will compare one day ahead VaR forecasts from an AR(1)-GARCH(1,1) time series model with either normal or t distributed innovations with the corresponding models where the Peak-Over-Threshold (POT) method has been used in order to model the tails of the innovations. For further comparisons we also include an unconditional model where the VaR estimates are the quantile estimates based on the General Pareto Distribution. By using several backtest procedures on historical daily log-returns for five stock indices we find that the models made using the POT method outperforms the other included models at the higher confidence levels.

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