

Apply Generalized Pareto Distribution to Estimate VaR

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Abstract

In order to calculate the capital requirements as required by financial regulator, we must be estimated Value at risk (VaR). In this talk, we use the three traditional methods: Historical simulation, Bootstrap, and Monte Carlo, and two Generalized Pareto Distributed (GPD) models to estimate VaR. In two GPD models, we consider both traditional GPD model and Poisson-GPD model. One drawback of the traditional GPD model is overestimated VaR. In order to solve this problem, we consider the Poisson-GPD model with a matching prior.

In case studies, we use those methods to estimated VaR of several stock market index data. All data are provided for years between 2005 and 2014. We can observe Poisson-GPD model is less overestimation phenomenon than traditional GPD model. In back-testing, Poisson-GPD model also has less limit point than Historical.

關鍵詞：Value at risk、Generalized Pareto Distributed、Poisson-GPD model、stock market index