Abstract

This project discusses the application of three financial models: Black-Scholes model, stochastic volatility model without leverage effect and stochastic volatility model with leverage effect for fitting equities data and making inferences on it.

To estimate posterior distribution of parameters involved in the models, Bayesian approach is adopted to incorporate historical information. Based on estimated posterior distribution, this project evaluates sensitivity of volatility to changes in parameters of prior distribution. Furthermore, predictive density function is proposed and predictive capability of different models is tested in this project.

To deal with the sampling from posterior distribution, Markov Chain Monte Carlo (MCMC) methods are employed in order to obtain independently and identically distributed samples.

Three real indices as proxy of equites data are analyzed to examine the consistency of interested models.