

Abstract

“The Stochastic Volatility Model: an alternative to GARCH”

The stochastic volatility (SV) model was first introduced by Taylor (1986). One advantage of the stochastic volatility model is that the latent variance structure h_t of the time series is random. The process h_t is not deterministic as in GARCH and can be interpreted as an information process directing the time series. Estimation and statistical inference on the SV models can be greatly facilitated by adopting a Bayesian framework and applying the so called Markov chain Monte Carlo technique. We illustrate the usefulness of the SV model by incorporating threshold type nonlinearity into the basic SV model. This enables us to capture possible asymmetries in both the mean and variance structure of the time series. Forecasts of volatility and Value at Risk can also be obtained by sampling from suitable predictive distributions. Simulations demonstrate that apparent variance asymmetry documented in the literature can be due to the neglecting of mean asymmetry. Strong evidence of the mean and variance asymmetries was detected in U.S. and Hong Kong data. Asymmetry in variance persistence was also discovered in the Hong Kong stock market.