

Bayesian Analysis of Multivariate Stochastic Volatility and Dynamic Models

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ABSTRACT

We consider a multivariate regression model with time varying volatilities in the error term. The time varying volatility for each component of the error is of unknown nature, may be deterministic or stochastic. We propose Bayesian stochastic search as a feasible variable selection technique for the regression and volatility equations. We develop Markov Chain Monte Carlo (MCMC) algorithms that generate a posteriori restrictions on the elements of both the regression coefficients and the covariance matrix of the error term. Efficient parametrization of the time varying covariance matrices is studied using different modified Cholesky decompositions. We propose a hierarchical approach for selection of the volatility equation's variance components.

We extend the results of the first in order to apply the stochastic search algorithm to dynamic model settings. We develop a MCMC algorithm that performs a stochastic model selection for the coefficients and the covariance matrix of the latent process of a dynamic model, thus making the choice of the best model only based on probabilistic considerations.