Flexible fat-tailed vector autoregression

Sune Karlsson and Stepan Mazur

Örebro University School of Business, Sweden

Abstract

We propose a general class of multivariate fat-tailed distributions which includes the normal, t and Laplace distributions as special cases as well as their mixture. Full conditional posterior distributions for the Bayesian VAR-model are derived and used to construct a MCMC-sampler for the joint posterior distribution. The framework allows for selection of a specific special case as the distribution for the error terms in the VAR if the evidence in the data is strong while at the same time allowing for considerable flexibility and more general distributions than offered by any of the special cases. As fat tails can also be a sign of conditional heteroskedasticity we also extend the model to allow for stochastic volatility. The performance is evaluated using simulated data and the utility of the general model specification is demonstrated in applications to macroeconomics and finance.

Keywords

Mixture of normals, Elliptically contoured distribution, Mixture distributions, Stochastic volatility, Markov Chain Monte Carlo.

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