

Bayesian Variable Selection of Global Vector Autoregressive Models in Financial time series

Feng-Chi Liu¹

¹Department of Statistics, Feng Chia University, Taichung, Taiwan

Abstract:

With the increasing frequency of international trade and cross-border financial flows, the relationships among financial markets have become increasingly close. This research thus employs a global vector autoregressive (GVAR) approach to assess the dynamic correlations of stock index returns and considers the identification problem of GVAR models. We treat the identification problem of the VAR by considering restrictions on the VAR coefficients and adopt a Bayesian variable selection method to simultaneously estimate the model parameters and identify the possible subsets of variables. For the purpose of finding possible subsets of variables, we propose a coding method and a visualized approach. For illustration purposes, we consider a hot issue of the dynamic relationships among the returns of some important stock market indices. We further employ three time periods of datasets, the global financial crisis of 2007-2009, the expansion period after global financial crisis from 2011 to 2015, and the COVID-19 pandemic period of 2020-2021, to investigate the dynamic changes of the relationships among the considered indices.

Keywords:

Global vector autoregressive model; Stochastic search variable selection; Bayesian inference; Markov chain Monte Carlo sampling.