Identification of structural shocks in Bayesian VEC models with two-state Markov-switching heteroskedasticity

Justyna Wróblewska,* Łukasz Kwiatkowski†

Abstract

We develop a Bayesian framework for cointegrated structural VAR models identified by two-state Markovian breaks in conditional covariances. The resulting structural VEC specification with Markov-switching heteroskedasticity (SVEC-MSH) is formulated in the so-called B-parametrization, in which the prior distribution is specified directly for the matrix of the instantaneous reactions of the endogenous variables to structural innovations. We discuss some caveats pertaining to the identification conditions presented in the literature on stationary structural VAR-MSH models, and provide a valid condition ensuring the unique identification through the two-state heteroskedasticity. To enable the posterior inference in the proposed model, we design an MCMC procedure, combining the Gibbs sampler and the Metropolis-Hastings algorithm. The methodology is illustrated both with a simulated as well as real-world data examples.

Keywords: cointegration; structural VEC models; structural VAR models; stock price fundamentals;

---

*Cracow University of Economics, Department of Econometrics and Operational Research, Rakowicka 27, 31-510 Kraków, Poland

†Cracow University of Economics, Department of Econometrics and Operational Research, Rakowicka 27, 31-510 Kraków, Poland