Bayesian Inference of Buffered Threshold Autoregressive Conditional Heteroskedastic Models

Buu-Chau Truong and Cathy W. S. Chen
Department of Statistics, Feng Chia University, Taiwan

Abstract

This paper considers a buffered threshold autoregressive heteroskedastic model with an integrated buffer zone that allows the model to switch regimes as well as GARCH-type conditional variance for modelling mean and volatility asymmetries. Estimation and diagnostic checks are performed via an adaptive Markov Chain Monte Carlo sampling scheme. The proposed Bayesian method allows simultaneous inference for all unknown parameters, including threshold values and a delay parameter. We also perform Bayesian testing model adequacy and model selection for the buffered threshold heteroscedastic model. The proposed methodology is illustrated using both simulated and basis (the price differential between stock and future) series. The results show that in terms of the posterior odds ratio, this new collection of models are more suitable to describe some real data sets than classical threshold heteroskedastic models.

Keywords: Asymmetry; Bayesian methods; GARCH model; diagnostic checking, Markov chain Monte Carlo; threshold model.