

Estimating the Markov Switching Almost Ideal Demand Systems: a Bayesian approach

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Abstract

Allais and Nichèle (2007) proposed a Markov-switching almost ideal demand system (MS-AIDS) model by extending the idea of Hamilton (1989). This model enables us to determine when the regime shifts occurred and to estimate parameters characterized across the different regimes. Moreover, degree of belongingness to each of the regimes and transitions between regimes are quantified by the probabilities. In this paper, we propose the Bayesian estimation for MS-AIDS model and illustrate the applicability of our proposed method. The Bayesian estimation has some important advantages. First, Bayesian estimation enables us to avoid the singularity problem suggested in Hamilton (1990, 1991). Second, our proposed Bayesian estimation ensures that transition probabilities have to lie between zero and one. Third, Bayesian estimation is able to avoid the messy calculations entailed in the score functions of log-likelihood. In the empirical study on the Japanese meat market, we found that our Bayesian estimation improves the mean squared errors for all meat products over the maximum likelihood estimation, while successfully capturing the regime shifts of meat demand coinciding with the timing of Bovine Spongiform Encephalopathy (BSE) cases in Japan and U.S.

Keywords: Bayesian estimation, Gibbs sampler, Markov switching model,
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