

Topic 1: A threshold extension of spatial dynamic panel model

we propose a threshold extension of existing dynamic panel Spatial Auto-regressive Combined (SAC) model with fixed two-way effect to analyze data sets with spatial-temporal heterogeneity. We classify multiple regimes with different parameters by a threshold variable to examine regions with different economical properties. A Bayesian estimation method along with a maximum likelihood one is put forward and compared by their Monte Carlo performance results. We find out that: (1) our Bayesian method yields more preferable estimation results, though at the expense of computation time; (2) using the proper stationary condition is compute-intensive, a simple but more restrictive condition may be preferable for large data set. We also illustrate the model using two spatial panel data set, US cigar demand data from 1963 to 1992 and Japan foreign labour data from 2008 to 2014, with proper threshold meaningful differences between regions were revealed for both of the data sets by the proposed model.

Topic 2: Spatial weight matrix estimation by LASSO

The majority of spatial econometric research relies on the assumption that the spatial structure is known, and the choice of spatial weights has been a focus of criticism of spatial econometric method. under the assumption that the weight matrix is sparse, Ahrens and Arnab Bhattacharjee (2015) proposed a two-step LASSO estimation. A simulation study shows preferable performance, but it requires good instrument variables. Build on their idea, I am trying to find a new method which does not require the instruments.