

Spatial and Spatio-Temporal Error Correction, Networks and Common Correlated Effects

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Abstract:

The authors provide a way to represent spatial and temporal equilibria in terms of error correction models in a panel setting. This requires potentially two different processes for spatial or network dynamics, both of which can be expressed in terms of spatial weights matrices. The first captures strong cross-sectional dependence, so that a spatial difference, suitably defined, is weakly cross-section dependent (granular) but can be non-stationary. The second is a conventional weights matrix that captures short-run spatio-temporal dynamics as stationary and granular processes. In large samples, cross-section averages serve the first purpose, and the authors propose the mean group, common correlated effects estimator together with multiple testing of cross-correlations to provide the short-run spatial weights. The authors apply this model to the 324 local authorities of England and show that our approach is useful for modelling weak and strong cross-section dependence, together with partial adjustments to two long-run equilibrium relationships and short-run spatio-temporal dynamics. This exercise provides new insights on the (spatial) long-run relationship between house prices and income in the UK.