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Testing for breaks in the weighting matrix

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Abstract

A weighting matrix, **W**, say, connecting pairs of observation sites, is a key element in the specification of many spatial models. Typically this matrix is fixed a priori by the investigator, which is seldom satisfactory. Recent proposals advocate a more data-driven approach in which **W** may be estimated. Where panel data are available it may be possible not only to estimate **W** but also to test its constancy through time. When the time dimension of the panel is large there is a non-negligible risk of breaks in model parameters, including possibly the weights. Ignoring such breaks when they are present will produce at best inefficient parameter estimates, and in most cases, biases. The paper focuses on the stability of **W** by adapting to the spatial panel context tests for the constancy of covariance matrices developed in the multivariate statistics literature. Information provided by these tests is a prerequisite for a satisfactory analysis of models in which **W** appears. The utility of our approach is illustrated by two case studies of the contemporary Spanish economy.

Keywords: *Weights matrix; Estimation of W; Structural breaks; Tests of equality.*

JEL classification: C4, C5, R1.

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