Specification Tests for Temporal Heterogeneity in Spatial Panel Data Models with Fixed Effects*

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Abstract

We propose score type tests for testing the existence of temporal heterogeneity in slope and spatial parameters in spatial panel data (SPD) models, allowing for the presence of individual-specific and/or time-specific fixed effects (or in general intercept heterogeneity). The SPD model with spatial lag effect is first treated in detail by first considering the model with individual-specific effects only, and then extending to the model with both individual and time specific effects. Two types of tests (*naive and robust*) are proposed, and their asymptotic properties are presented. These tests are then fully extended to an SPD model with both spatial lag and spatial error effects. Monte Carlo results show that the robust tests have much superior finite and large sample properties than the naive tests. Thus, the proposed robust tests provide reliable tools for identifying possible existence of temporal heterogeneity in regression and spatial coefficients. Empirical illustrations of the proposed tests are given.

Key Words: Spatial panels, Fixed effects, Time-Varying Covariate Effects, Time-Varying Spatial Effects; Change Points.

JEL Classification: C10, C13, C21, C23, C15

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