Specification Test for Panel Data Models with Interactive Fixed Effects

Liangjun Su, Sainan Jin, Yonghui Zhang

School of Economics, Singapore Management University

Abstract

In this paper, we propose a consistent nonparametric test for linearity in a large dimensional panel data model with interactive fixed effects. Both lagged dependent variables and conditional heteroskedasticity of unknown form are allowed in the model. We estimate the model under the null hypothesis of linearity to obtain the restricted residuals which are then used to construct the test statistic. We show that after being appropriately centered and standardized, the test statistic is asymptotically normally distributed under both the null hypothesis and a sequence of Pitman local alternatives by using the concept of *conditional strong mixing* that was recently introduced by Prakasa Rao (2009). To improve the finite sample performance, we propose a bootstrap procedure to obtain the bootstrap p-values. A small set of Monte Carlo simulations illustrates that our test performs well in finite samples. An application to an economic growth data indicates significant nonlinear relationships between economic growth, initial income level and capital accumulation.

Key Words: Common factors; Conditional strong mixing; Cross-sectional dependence; Economic Growth; Interactive fixed effects; Linearity; Panel data models; Specification test.
JEL Classifications: C12, C14, C23