Nonparametric Testing for Smooth Structural Changes in Panel Data Models

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Abstract: Detecting and modelling structural changes in time series models have attracted great attention while relatively little effort has been paid to the test of structural changes in panel data models despite their increasing importance in economics and finance. In this paper, we propose a new approach to testing structural changes in panel data models with cross-sectional dependence. The idea is to compare the fitted values of a time-varying parameter panel data model and a constant parameter panel data model, where the time-varying parameters are estimated by a local linear dummy variable regression and the constant parameters are estimated by a least squared dummy variable estimation. The test does not require any prior information about the alternatives of structural changes. It has an asymptotic N(0,1) distribution under the null hypothesis of parameter constancy and is consistent against a vast class of smooth structural changes as well as abrupt structural breaks with possibly unknown break points. To further gauge possible sources of structural changes, a diagnostic test is supplemented to check potential time-varying interaction while allowing for a common trend. Simulation studies show that the tests provide reliable inference in finite samples.

JEL Classifications: *C12, C14, C23*

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