Nonparametric Dynamic Panel Data Models: Kernel Estimation and Specification Testing

Associate Professor Su Liangjun
School of Economics
Singapore Management University

Date: 27 October 2011 (Thursday)
Time: 1.30pm – 2.30pm
Venue: MAS Executive Classroom 1, MAS-03-06
School of Physical and Mathematical Sciences

Motivated by the first differencing method for linear panel data models, we propose a class of iterative local polynomial estimators for nonparametric dynamic panel data models with or without exogeneous regressors. The estimators utilize the additive structure of the first-differenced model, the fact that the two additive components have the same functional form, and the unknown function of interest is implicitly defined as a solution of a Fredholm integral equation of the second kind. We establish the uniform consistency and asymptotic normality of the estimators. We also propose a consistent test for the correct specification of linearity in typical dynamic panel data models based on the L² distance of our nonparametric estimates and the parametric estimates under the linear restriction. We derive the asymptotic distributions of the test statistic under the null hypothesis and a sequence of Pitman local alternatives, and prove its consistency against global alternatives. Simulations suggest that the proposed estimators and tests perform well in finite samples. We apply our new methods to study the relation between economic growth, initial economic condition and capital accumulation and find the nonlinear relation between economic growth and initial economic condition.

Key words: Additive models, Dynamic panel data models, Fredholm integral equation, Iterative estimator, Linearity, Local polynomial regression, Specification test.

Speaker Biography
Dr. Liangjun Su is an associate professor of economics at the School of Economics, Singapore Management University. His main research interests include econometric theory and nonparametric econometrics. He publishes papers on top international journals in economics and statistics. After he received his Ph.D. in economics from the University of California at San Diego in 2004, he returned to China and taught at the Guanghua School of Management, Peking University for four consecutive years. He moved to Singapore in June 2008. He was nominated as an Associate Editor for Econometric Theory starting in January 2010. He is a recipient of the Lee Kuan Yew Fellowship for Research Excellence at SMU in 2011.

Host: Prof Pan Guangming, Division of Mathematical Sciences, School of Physical and Mathematical Sciences