Identification and Estimation of Time-Varying Nonseparable Panel Data Models without Stayers

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Abstract

This paper explores the identification and estimation of nonseparable panel data models. We show that the structural function is nonparametrically identified when it is strictly increasing in a scalar unobservable variable, the conditional distributions of unobservable variables do not change over time, and the joint support of explanatory variables satisfies some weak assumptions. To identify the target parameters, existing studies assume that the structural function does not change over time, and that there are ``stayers", namely individuals with the same regressor values in two time periods. Our approach, by contrast, allows the structural function to depend on the time period in an arbitrary manner and does not require the existence of stayers. In estimation part of the paper, we consider parametric models and develop an estimator that implements our identification results. We then show the consistency and asymptotic normality of our estimator. Monte Carlo studies indicate that our estimator performs well in finite samples. Finally, we extend our identification results to models with discrete outcomes, and show that the structural function is partially identified.