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A Semiparametric Model for Heterogeneous Panel Data with Fixed Effects

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Abstract

This paper develops methodology for semiparametric panel data models in a setting where both the time series and the cross section are large. Such settings are common in finance and other areas of economics. Our model allows for heterogeneous nonparametric covariate effects as well as unobserved time and individual specific effects that may depend on the covariates in an arbitrary way. To model the covariate effects parsimoniously, we impose a dimensionality reducing common component structure on them. In the theoretical part of the paper, we derive the asymptotic theory for the proposed procedure. In particular, we provide the convergence rates and the asymptotic distribution of our estimators. In the empirical part, we apply our methodology to a specific application that has been the subject of recent policy interest, that is, the effect of trading venue fragmentation on market quality. We use a unique dataset that reports the location and volume of trading on the FTSE350 companies from 2008 to 2011 at the weekly frequency. We find that the effect of fragmentation on market quality is nonlinear and non-monotonic. The implied quality of the market under perfect competition is superior to that under monopoly provision, but the transition between the two is complicated.

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