Empirical Likelihood Based Inference for Fixed Effects Varying Coefficient Panel Data Models

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Abstract

In this paper local empirical likelihood-based inference for non-parametric varying coefficient panel data models with fixed effects is investigated. First, we show that the naive empirical likelihood ratio is asymptotically standard chi-squared when undersmoothing is employed. The ratio is self-scale invariant and the plug-in estimate of the limiting variance is not needed. Second, mean-corrected and residual-adjusted empirical likelihood ratios are proposed. The main interest of these techniques is that without undersmoothing, both also have standard chi-squared limit distributions. As a by product, we propose also two empirical maximum likehood estimators of the varying coefficient models and their derivatives. We also obtain the asymptotic distribution of these estimators. Furthermore, a non parametric version of the Wilk's theorem is derived. To show the feasibility of the technique and to analyse its small sample properties, using empirical likelihood-based inference we implement a Monte Carlo simulation exercise and we also illustrated the proposed technique in an empirical analysis about the production efficiency of the European Union's companies.

Key Words: Nonparametric regression analysis; Varying coefficient panel data model; fixed effects; empirical likelihood inference.

JEL code: C14, C12, C23

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