

A robust estimation of random effects panel data regression

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Abstract

Panel data regression models have become a general framework in empirical economics to model complex relationships between the economic variables by including unobserved individual-specific heterogeneity. Ordinary Least Squares (OLS) is one of the most commonly used techniques to estimate parameters of such models. However, OLS may produce biased and inefficient estimates in case of any departure from the model assumptions and in the presence of outliers. In this study, we propose a robust estimation strategy based on the M-estimator along with Tukey's bisquare loss function and a data-dependent tuning parameter selection algorithm to obtain efficient estimates within the random effects panel data models framework. The finite-sample performance of the proposed estimator is investigated by means of several Monte-Carlo simulations and a real-world data analysis. Our results reveal that the proposed estimator has significantly better performance over existing traditional and robust methods in the presence of outliers.

Keywords Random effects; Panel regression; Robustness.