Dynamic panel data models

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Course description

The course aims at providing students advanced econometric tool for the empirical analysis of dynamic panel data models. The study of microeconomic dynamics is one of the main advantages related to the availability of repeated observations over time. Theoretical development of the methods will be complemented by the discussion of empirical analysis on real data.

At the end of the course, the students are expected to be able to carry out their own analysis of dynamic models for panel data.

Prerequisite: knowledge of estimation methods in a cross-sectional context is required (ordinary least squares and instrumental variable estimator), as well as basic knowledge of the fixed effect model for panel data econometrics.

Software: working knowledge of R and/or Stata is preferable.

Course outline

1. Generalized method of moments (GMM) estimator
2. GMM in the context of dynamic panel data models
3. Model diagnostics and assessment
4. Challenges in empirical research
5. Alternative estimation strategies (if time allows…)

Student evaluation

Student assessment will be based on the development of an empirical project. The project can be carried out in small groups (max. 2 students per group). Students will be required to prepare a presentation to discuss the analysis. During the presentation students will be evaluated on the basis of their knowledge of the topics, the presentation of the analysis, and the use of specific language.

List of references

Ahn, S. C., Schmidt, P. (1995). Efficient estimation of models for dynamic panel data. *Journal of Econometrics* 68(1):5–27.

Arellano, M., Bond, S. (1991). Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations. *The Review of Economic Studies* 58(2):277–297.

Blundell, S., Bond, S. (1998). Initial conditions and moment restrictions in dynamic panel data models. *Journal of Econometrics* 87(1):115–143.

Software

Roodman, D. (2009b). How to do xtabond2: An introduction to difference and system GMM in Stata. *The Stata Journal* 9(1):86–136.

Croissant, Y., Millo, G. (2008). Panel Data Econometrics in R: The plm Package. *Journal of Statistical Software*, 27(2), 1–43.

Additional readings

Anderson, T., Hsiao, C. (1981). Estimation of dynamic models with error components. *Journal of the American Statistical Association* 76(375):598–606.

Anderson, T., Hsiao, C. (1982). Formulation and estimation of dynamic models using panel data. *Journal of Econometrics* 18(1):47–82.

Arellano, M., Bover, O. (1995). Another look at the instrumental variables estimation of error components models. *Journal of Econometrics* 68(1):29–51.

Blundell, R., Bond, S., Windmeijer, F. (2001). Estimation in dynamic panel data models: Improving on the performance of the standard GMM estimator. In Baltagi, B.H., Fomby, T.B. and Hill, R.C. (eds.), Nonstationary Panels, Panel Cointegration, and Dynamic Panels, Vol. 15, pp. 53–91, Bingley: Emerald Group Publishing Ltd.

Hansen, L. P., Heaton, J., Yaron, A. (1996). Finite-Sample properties of some alternative GMM estimators. *Journal of Business & Economic Statistics* 14(3):262–280.

Holtz-Eakin, D., Newey, W., Rosen, H. S. (1988). Estimating vector autoregressions with panel data. *Econometrica* 56(6):1371–1395.

Roodman, D. (2009a). A note on the theme of too many instruments. *Oxford Bulletin of Economics and Statistics* 71(1):135–158.

Windmeijer, F. (2005). A finite sample correction for the variance of linear efficient Two-Step GMM estimators. *Journal of Econometrics* 126(1):25–51.

References: alternative estimation strategies

Hsiao, C., Pesaran, M. H., Tahmiscioglu, A. K. (2002). Maximum likelihood estimation of fixed effects dynamic panel data models covering short time periods. *Journal of Econometrics* 109(1):107–150.

Kiviet, J. F. (1995). On bias, inconsistency, and efficiency of various estimators in dynamic panel data models. *Journal of Econometrics* 68(1):53–78.