GMM for Panel Data using Stata

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Abstract

This course will focus on Generalised Method of Moments (GMM) estimators for dynamic panel data models, and their implementation using Stata.

The main emphasis will be on methods for panels where the cross-section dimension is large and the time-series dimension is small. This will cover estimation using equations in first-differences (or related transformations) to eliminate unobserved, time-invariant, individual-specific 'fixed' effects; and extensions which incorporate additional moment conditions for the untransformed equations in levels, using instrumental variables that are orthogonal to the individual effects. Inference and specification testing will also be covered.

Hands-on computer classes will demonstrate the implementation of these methods using the xtabond and xtabond2 commands in Stata.

Applications to micro production functions and cross-country growth models will also be discussed.

Required Reading

Bond, S.R. (2002) 'Dynamic panel data models: a guide to micro data methods and practice', *Portuguese Economic Journal*, 1, 141-162

This provides an overview of the material that will be covered in the course. An almost identical working paper version can be found at:

http://cemmap.ifs.org.uk/docs/cwp0902.pdf

Background Reading

The principal original papers are:

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

Arellano, M. and Bover, O. (1995), ‘Another look at the instrumental variable estimation of error-components models’, *Journal of Econometrics*, 68, 29-52

Blundell, R.W. and Bond, S.R. (1998), ‘Initial conditions and moment restrictions in dynamic panel data models’, *Journal of Econometrics*, 87, 115-143

A comprehensive textbook treatment can be found in:

Arellano, M. (2003), *Panel Data Econometrics*, Oxford University Press

Other textbook treatments include:

Baltagi, B.H. (2001), *Econometric Analysis of Panel Data*, 2nd edition, Wiley

Hsiao, C. (2003), *Analysis of Panel Data*, 2nd edition , Cambridge University Press

Wooldridge, J.M. (2001), *Econometric Analysis of Cross Section and Panel Data*, MIT Press

The applications are covered in:

Blundell, R.W. and Bond, S.R. (2000), ‘GMM estimation with persistent panel data: an application to production functions’, *Econometric Reviews*, 19, 321-340 (http://www.ifs.org.uk/publications.php?publication_id=2722)

Bond, S.R., Hoeffler, A. and Temple, J. (2001), ‘GMM estimation of empirical growth models’, CEPR Discussion Paper no. 3048 (http://www.cepr.org/pubs/new-dps/dplist.asp?dpno=3048)