

**SIde Postgraduate course on:
Panel Data Econometrics: theory and applications
Bertinoro, 9-14 July 2018**

Coordinator

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Lecturers

Maria Elena Bontempi, University of Bologna
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Requirements

Basic knowledge of econometrics to a level comparable with Introductory Econometrics SIDE course. Examples of reference are represented by:
Chapt. 1, 2, 3, 4, 5, 6 Verbeek M., A guide to Modern Econometrics, 4th ed, Wiley.
or chapt. 1-6, 8, 15 in Wooldridge J. M., Introductory Econometrics, a Modern Approach, 5th ed.

Course outline, objectives and learning outcomes

The aim of the course is to provide an overview, both methodological and applied, of econometric models for panel data, where observations are available at least at two dimensions: panel datasets can be intended as both time-series cross-sectional data (CSTS) and hierarchical data with observations at higher- and lower-levels. During the course, to ease the comprehension and to introduce important topics, N will indicate individuals (cross-sections) and T will denote temporal periods (time-series). The first part of the course relates to micro panel data (where N is larger than T). After introducing the classical fixed and random effects models with emphasis to their pros and cons, we will discuss about endogeneity of explanatory variables, intended both as correlation with individual heterogeneity and as correlation with idiosyncratic shocks (due to simultaneity, measurement errors, dynamics). The instrumental variables estimator, such as the Generalized Method of Moments (GMM), is at the core of this part. The second part of the course relates to macro panel data (where T is larger than N). The main issues will be non-stationarity and cointegration, analyzed and discussed in the light of parameters' heterogeneity and cross correlated effects. At each step of the course, the methodologies will be accompanied by hands-on empirical applications with an econometric software. At the end of the course, participants will be able to critically evaluate the empirical literature based on panel data, and to model and estimate their own issue of interest, according to the problems at hand: static versus dynamic approaches, heterogeneity and clustering, exogeneity versus endogeneity of covariates, GMM, unit roots and long/short run relationships.

Reference textbooks for the course:

Wooldridge J. M., Econometric Analysis of Cross-Section and panel Data, 2nd ed, Cambridge Mass.: MIT Press.
Handouts, readings and further material will be provided before the beginning of the course and during the lectures.

Schedule of the course:

- (0) Crash course: OLS, GLS, IV, heteroscedasticity, the introduction of dynamics and the role of unit roots.
- (1) Static panels. Understanding the clustered data structure. Dealing with endogeneity (simultaneity, measurement errors). Methods: handling unobserved heterogeneity; variance decomposition at two or more levels; correlated random effects and correlated random slopes; instrumental variables (IV) in panel data models; unbalanced panels and selection bias. Application: intangible capital and productivity of firms.
- (2) Dynamic panels. Nickell's bias, and the problem of overfitting and weak instruments. Methods: alternative data transformations; first-differences and IV, GMM-DIF, -LEV, -SYS estimators, the

principal components analysis applied to the set of instruments. Applications: corporate capital structure models; investment and uncertainty relationship (the Euler and the reduced-form approach); FDI, democracy and natural resources.

(3) Heterogeneous panels. ARDL specification and Pesaran's poolability. Methods: Mean-Group (MG) and Pooled-MG estimators; demeaning and cross-correlated effects. Applications: modeling expectations and inattentiveness; R&D and productivity growth.

(4) Non-stationary panels. Integration and cointegration. Methods: first- and second-generation unit roots tests; Pedroni and Westerlund cointegration tests; PANIC and PANICCA. Applications: companies' leverage and mean reversion; fiscal policy reaction functions.

Hands-on Sessions

Theoretical lectures are associated with working sessions; during them you will receive the suggestions needed to use an econometric software and to run your own empirical analysis. The statistical analysis will be done using Stata, and help for new Stata users will be given during the lectures (it is worth to be stressed that the course is not about Stata, but it is on Panel Data Econometrics, and Stata is just a tool, like any other econometric package able to manage panel data). The data-sets and the programming files to make applied econometrics will be provided during the lectures in Bertinoro. But in Bertinoro we do not have and we cannot provide Stata software installation files or the Stata licence. So, if you would interactively use Stata during the lectures, you must have Stata pre-installed on your laptop before coming to Bertinoro. Any Stata version from 12 to 14 is ok!

Software

Participants will use their laptops with Stata already installed on them. Any Stata version from 12 to 14 is ok!

Venue and timetables

The Module will last one week and will be held in the University Residential Centre, Via Frangipane 6, 47032 Bertinoro (FC). Participants will be hosted in the Centre guest quarters, (as an exception, in case of reduced availability of rooms in the Centre, they will be accommodated in local hotels).

Lectures and tutorials will be in English, with the following schedule:

Monday to Friday: lectures 9:00-13:00, 15:00-17:00 individual hands-on sessions: 17:00-19:00.

Saturday: lectures 9:00-13:00.

Fees and Enrollment

Students, PhD students and temporary university staff: 650€

University staff: 800€

Others: 2300€

Fee includes: accommodation (usually in double room) with breakfast and lunch starting from Sunday evening.

Participants who wish to attend two or three Courses, are allowed the following reduced fees per Module

Students, PhD students and temporary university staff: 500€ per Module

University staff: 600€ per Module

Others: 1750€ per Module

Contacts

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