Dynamic models are of interest in a wide range of economics, financial social and medical models. Consequently, dynamic panel data analysis has become increasingly popular due to its ability to take into account both short and long term effects and unobserved heterogeneity between economic agents in the estimation of the parameter estimates.

This workshop provides a rigorous overview of existing dynamic panel data analysis techniques, thus offering participants the opportunity to acquire the more advanced technical capabilities currently available for panel data analysis. Participants are provided, through a series of illustrative examples, with a theoretical and applied overview of Instrumental variable analysis (IV) and Generalized methods of moments (GMM), both of which being an important class of estimators for the estimation of dynamic linear panel data models. The course then turns to address more recent issues in dynamic panel data analysis, such as weak instruments with persistent data; instrument proliferation; gaps in the data; estimation with serially correlated errors; robust inference with multiway clustering and the finite-sample performance of estimators and tests. The course concludes by addressing the issues of: i) non-stationarity in long panels, where the time series (as opposed to cross-sectional) characteristic of the data dominates; and ii) cointegration.

During the three days, particular attention will be paid (using a combination of both official Stata and user written dynamic panel data analysis commands) to: i) evaluating which specific econometric methodology/specification is more appropriate for the analysis in hand; ii) selection of the appropriate instruments; iii) rigorous post estimation diagnostic/specification testing; and iv) the problems of inference resulted from weak-instrument bias, instrument-proliferation bias and small-sample bias. Special attention will also be given to the interpretation and presentation of results. At the end of the course, it is expected that participants are able, with the aid of the Stata routines utilized during the sessions, to correctly implement independently the methodologies and techniques acquired during the three days.

In common with TStat's training philosophy, each individual session is composed of both a theoretical component (in which the techniques and underlying principles behind them are explained), and an applied (hands-on) segment, during which participants have the opportunity to implement the techniques using real data under the watchful eye of the course tutor. Throughout the workshop, theoretical sessions are reinforced by case study examples, in which the course tutor discusses and highlights potential pitfalls and the advantages of individual techniques.
DYNAMIC PANEL DATA ANALYSIS

PROGRAM

SESSION I: PRELIMINARIES AND SIMPLE ESTIMATORS
1. The Dynamic Panel Data (DPD) Model
   • Assumptions
   • Inconsistency of basic panel data estimators (computed by `xtreg`)
   • Monte Carlo evaluation of the bias in `xtreg` procedures (`xtarsim`)
2. Consistent IV estimators
   • Anderson and Hsiao (AH) estimators
   • Stata implementation of AH: `ivregress 2sls`

SESSION II: OPTIMAL DIFFERENCE GMM ESTIMATORS (ARELLANO AND BOND, 1991)
1. Arellano and Bond (AB) Difference GMM estimators
   • Moment conditions, GMM criterion function and specification tests
2. Three Stata commands for AB: `xtabond, xtdpd, xtabond2` (Roodman, 2009a)
   • The AR(1) model
   • Higher order AR models
   • Specifying exogenous covariates
   • Specifying predetermined covariates
   • Specifying predetermined covariates and their lags: weak and strict rules
   • Specifying endogenous covariates
   • One-step and two-step estimators
   • The Windmeijer’s correction of two-step standard errors
3. Specification tests:
   • AB autocorrelation tests (`estat abond, xtanond2`)
   • Hansen-Sargan tests (`estat sargan, xtabond2`)
   • Difference-in-Hansen tests for testing subsets of instruments (`xtabond2`)

SESSION III: OPTIMAL DIFFERENCE GMM ESTIMATORS (ARELLANO AND BOND, 1998)
1. Blundell and Bond (BB) System GMM estimators
   • The issue of weak instruments with highly persistent series
   • More moment conditions from Mean stationarity: the System estimator as solution to weak instruments
2. Three Stata commands for the System estimator: `xtdpdsys, xtdpd, xtabond2`
   • Applying the system estimator to AR(p) models with exogenous, predetermined and endogenous covariates

SESSION IV: FURTHER TOPICS IN DPD
1. Reducing the instrument count
   • Instrument proliferation: detection and solutions with `xtabond2` (Roodman, 2009a and 2009b)
   • Autocorrelation of errors in the level equation
2. A transformation alternative to first-differencing: Forward orthogonal deviations
   • Sample selection in DPD
   • Ignorability of selection (al Saldon, Jimenez Martin, Labeaga, 2019)
   • Testing and correcting for selection (Semykina and Wooldridge, 2013)
   • Bias corrected LSDV in DPD
   • Approximations of the LSDV bias (Kiviet, 1995; Bruno 2005a)
   • Application through `xtlsdvc` (Bruno 2005b)

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DYNAMIC PANEL DATA ANALYSIS

SESSION V: 1. Panel unit-root tests
NON-STATIONERY PANELS
BALTAGI 2013

- The \texttt{xtunitroot} command for first-generation unit-root tests (neglecting cross-sectional dependency)
- Testing unit-root through DPD estimators
- Testing cross-sectional dependency (\texttt{xtcd})
- Second-generation unit-root tests (accommodating cross-sectional dependency: \texttt{pescadf, multipurt})

2. Panel cointegration in Stata
- Cointegration tests (\texttt{xtcointtest, xtwest, xtpedroni})
- Estimation and inference in cointegrated models (\texttt{xtpmg, xtpedroni})

COURSE REFERENCES


https://www.tstattraining.eu/training/dynamic-panel-data-analysis/
DYNAMIC PANEL DATA ANALYSIS

REGISTRATION FEES

Students*: € 870.00
Academic: € 1450.00
Non-Profit/Public Research Centres: € 1630.00
Commercial: € 1810.00

*To be eligible for student prices, participants must provide proof of their full-time student status for the current academic year.

Fees are subject to VAT (applied at the current Italian rate of 22%). Under current EU fiscal regulations, VAT will not however applied to companies, Institutions or Universities providing a valid tax registration number.

Please note that a non-refundable deposit of €100.00 for students and €200.00 for Academic, Non-Profit/Public Research Centres and Commercial participants, is required to secure a place and is payable upon registration. The number of participants is limited to 1205. Places will be allocated on a first come, first serve basis.

Course fees cover: teaching materials (handouts, Stata do files and datasets to used during the course), a temporary licence of Stata valid for 30 days from the beginning of the workshop, light lunch and coffee breaks.

To maximize the usefulness of this workshop, we strongly recommend that participants bring their own laptops with them, to enable them to actively participate in the empirical sessions.

Individuals interested in attending the workshop should return their completed registration forms by email to TStat Training (training@tstat.eu) by the 12nd November 2020.

Further details regarding our registration procedures, including our commercial terms and conditions, can be found at https://www.tstattraining.eu/training/dynamic-panel-data-analysis/