A PRIMER ON PANEL DATA ANALYSIS

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Course syllabus SS 2022

Lecture: 2 ECTS – 6 units à 90 min.
Lectures take place: 17.6.2022 and 8.7.2022

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Motivation

Panel data (sometimes referred to Longitudinal data or Cross-sectional time-series data) have observations on the same cross-sectional units (like firms, individuals) in several different chronologically ordered time periods (like years).
Scholars, practitioners, and students have been interested in Panel data modeling because these data offer more variation and allow to explore more issues than do cross-sectional or time-series data alone. E.g., compared to pure cross-sectional data, Panel data allow to identify causal effects under weaker assumptions, because the time-ordering of events is (better) known. This enables the researcher to investigate how an event changes the outcome. Panel data also allow to study individual trajectories; this is not possible with pure time series data, given that more than one individual exists. Furthermore, panel data allow to distinguish cohort and age effects and the study of transitions into and out of states (e.g., unemployment). Nowadays, a large number of panel data sets are made available by private and public organizations.

Objectives

This lecture on applied econometrics focusses on the specification and the estimation of models based for panel data. Firstly, we discuss the most important properties of this kind of data. Based on this, we, secondly, review the standard linear regression models and their application to panel data sets including pooled OLS, Fixed effects and Random effects models. We then, thirdly, extend these models to dynamic models based on GMM and system GMM estimators and provide the most important specification tests. In the "Stata lab" students can learn how to practically implement all presented estimators in Stata.

References (further references are given in the course)

Roodman, D. (2009): How to do xtabond2: An introduction to difference and system GMM in Stata. *Stata Journal*. 9 (1):86–136.
Wooldridge, J.M. (2001): Econometric Analysis of Cross Section and Panel Data, The MIT Press.

Course outline

1. Introduction
    a. Panel data - properties
    b. Data sources
    c. Literature
2. Basic models
    a. Pooled OLS
    b. Fixed effects models
    c. Random effects models
3. Dynamic models
    a. GMM estimator (Arellano-Bond); specification tests
    b. System-GMM estimator (Arellano-Bover); specification tests
4. Stata lab
    a. Excercises
    b. Solutions
5. Students' choice: Assignment or (presentation of an) own project on panel data analysis