Applied Panel Data Econometrics (SS21) (6 KP)

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Classes: Due to special circumstances created by the Coronavirus pandemic, the course will start with virtual classes on the 13.04.2021. In order to be invited to the virtual meeting participants have to be enrolled on studip.uni-goettingen.de. The slides and videos for each topic will be weekly uploaded on Studip. Participants are expected to prepare for the exam using the slides and the references (books and articles) indicated for each topic. Every week there will be two sessions to cover the material on the slides (Tuesday 12:30 to 14:00) and (Wednesday 10:30 to 12:00), including Q&A. If eventually classes go back to the room, these will be in ZHG.101. The material will be covered in half semester, notice that there are two sessions each week.

Tutorials: Wednesdays from 12:15 to 13:45. First virtual session on the 14.04.2021. If classes eventually go back to the room, the tutorials would take place in WiSoRZ MZG 6.111: WiSo-RZ CIP-Pool 6.Etage. The first tutorial will be a short introduction to STATA. For access to STATA, please go to https://www.uni-goettingen.de/de/511106.html. Exercise sheets will be posted online (Studip) before the tutorial and the STATA solutions will be discussed during the tutorial. Register in Studip for “Übung zu Applied Panel Data Econometrics” and download the PDF with more details on the schedule and evaluation of the tutorial.

Program

Introduction
This course aims to study panel data econometric techniques in an intuitive and practical way and to provide the skills and understanding to read and evaluate empirical literature and to carry out empirical research. Empirical evaluation of economic models is an important feature of the study and application of economics. The course is concerned with the application of econometric methods, with little emphasis on the mathematical aspects of the subject (which may be studied in other modules). The computer software package STATA will be used for practical work. Previous knowledge of intermediate econometrics is required.
Organization of the Course and Evaluation:

Organization: 2 hours lecture and 2 hours tutorials (practical work in STATA).

Evaluation: Stata Assignment 30% and final exam 70%.

- Assignment: Deadlines for submitting the assignment: August 8th.
- Final Exam: on 28/07/2021 from 10:00 to 12:00 (Room to be determined, if the circumstances allow it. Otherwise, new arrangements will be announced during the classes and on Studip).

Outline of the course:

Linear Panel Data Models

1. Static Linear Panel Data Models
   1.1 Introduction to Panel Data
   1.2 Assumptions
   1.3 Estimation and Testing
      1.3.1 Pooled OLS
      1.3.2 Random Effects Estimation
      1.3.3 Fixed Effects Estimation. Testing for Serial Correlation
      1.3.4 First-Differencing Estimation
   1.4. Comparison of Estimators and Testing the Assumptions
   1.5 Correlated Random Effects (CRE) or Mundlak’s Approach

2. Endogeneity and Dynamics in Linear Panel Data Models
   2.1. Introduction
   2.2 Chamberlain’s Approach
   2.3. RE and FE Instrumental Variables Methods
   2.4. Hausman and Taylor Models
   2.5. First Differencing and IV
   2.6. Dynamic Panel Data Models. Estimation under Sequential Exogeneity

3. Special Topics
   3.1 Heterogeneous Panels
   3.2 Random Trend Models
   3.3 General Models with Specific Slopes
   3.4 Robustness of Standard Fixed Effects Estimators
3.5 Testing for Correlated Random Slopes

Non-linear Panel Data Models

4. Panel Data Models for Discrete Variables
   4.1 Introduction. Binary Response Panel Data Models with Strictly Exogenous Variables
   4.2 Linear Probability Model
   4.3 Fixed versus Random Effects
   4.4 Other issues: Endogenous explanatory variables/Selection Bias

References

Main Textbook


Other Textbooks

Baltagi, B.H. (2013), Econometric Analysis of Panel Data, John Wiley and Sons, Chichester (5th ed.)

Journal Articles

Linear Models


Non-linear Models


Prerequisites

1. Classical Linear Regression Model, Finite and Asymptotic Properties of the LS Estimator
2. Heteroskedasticity and Autocorrelation
3. Endogeneity, IV and GMM
5. Cross-sectional Limited Dependent Variables Models (Probit, Logit, Tobit)
Basic References:

- **Introductory Econometrics: A Modern Approach** 4th edition by Jeffrey M. Wooldridge, South-Western College Publishers (2008, 865pp) --- This textbook contains a comprehensive treatment of undergraduate econometrics. The book is a bit more technical than some other undergraduate texts (like Stock and Watson's "Introduction to Econometrics"), but most of the advanced mathematics is left as optional material. Wooldridge explains concepts very clearly. The topic coverage goes well beyond the multiple regression model, hitting important topics like binary-choice models, panel-data models, and forecasting techniques. Examples are abundant throughout the text, and many end-of-chapter exercises (based on real datasets) provide students the opportunity to fully absorb the book's material.

- **Econometric Analysis** 67th edition by William H. Greene, Prentice Hall (2013, 1229pp) --- Greene's *Econometric Analysis*, now in its 6th edition, has long stood as a prominent choice among first-year graduate econometrics textbooks. The book covers an amazing number of different topics, ranging from finite sample to asymptotic, cross-sectional to time-series, frequentist to Bayesian, and so on. The appendices themselves are extremely valuable, serving as review material on linear algebra and statistical theory (without having to reference other sources for these topics). Additional resources: book website, datasets, solutions manual.

- **Introduction to Econometrics** 3rd edition by James H. Stock and Mark W. Watson, Addison-Wesley (2012, 827pp) --- This textbook by Stock and Watson is an excellent option for a student's first exposure to econometrics. The book is extremely well written, with interesting empirical examples used to motivate the importance of econometrics to the field of economics. The book is primarily targeted for a less theoretical course in econometrics, but there are several chapters (particularly in Part V of the book) that could be used in a more formal course. Additional resources: book website, sample chapter (from 1st edition), lecture slides, also available in a brief edition.


- **Introduction to Econometrics** 3rd edition by Christopher Dougherty, Oxford University Press (2007, 480pp) --- book website, datasets, lecture slides (from Prof. Dougherty), Google preview.
