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Applied Time Series and Panel Data Econometrics

Master's Elective (with Tutorial) in the Winter Semester 2017/18, Course-Number 22-30.100

Course Description

In order to answer big macroeconomic questions of our time, we find that a lot of data is available as time series or panel data sets. Examples are series quarterly consumption and investment data, daily exchange rate series or income per capita panel data sets of a global sample of countries over the last decades. In this course we will (i) study the econometric tools which are used to analyze such data and (ii) apply them to real world data with the help of the statistical software Stata.

Course Goals

Course participants will get to know the most important econometric methods used for the analysis of time series and panel data in both research and applied work. While they will become familiar with the econometric theory, the focus will be on practical applications. Thanks to numerous examples and implementations using Stata, course participants will be well-equipped to conduct their own empirical project.

Course Settings

Lectures Monday (weekly), 10:15-11:45, Room WiWi 0029:
16.10., 23.10., 30.10., 06.11., 13.11., 20.11., 27.11., 04.12., 11.12., 18.12., 08.01, 15.01., 22.01., 29.01.

Tutorials Wednesday (bi-weekly), 12:15-13:45, Room WiWi 2101/2105:
18.10., 01.11., 15.11., 29.11., 13.12., 10.01., 24.01.

Course Materials

- **Lecture Slides** The lecture slides will be made available on STiNE.
- **Problem Sets** Problem sets will be posted on STiNE several days before the tutorial, giving course participants the opportunity to solve them prior to attending the tutorial. In the tutorial the solutions will be discussed.
- **Take-Home Project** At the end of the course a project assignment will be posted on STiNE. It will involve applying the econometric methods learned to real-world data.

Course Language

The course language is English.

Course Prerequisites

Course participants are assumed to have a solid background in math, statistics and econometrics from their undergraduate studies. Furthermore, knowledge of the course material of the first semester master's course 'Applied Econometrics' is required.

Grading

In order to pass the course, students must pass both a written exam and a take-home project. The exam will make up 80% of the final grade and the project 20%.

Exam Dates:
First Date: Monday, February 2018, TBA
Second Date: Monday, March 2018, TBA

The project assignment for the take-home project will be posted at the end of the course. Course participants have to send their completed take-home projects to melanie.krause@wiso.uni-hamburg.de by Wednesday, 28 February 2018.

Course Literature

There is no book which covers the whole content of the course. However, the time series topics in this course tend to follow Verbeek (2012) and the panel data topic Baltagi (2012).

- Verbeek (2012), "A Guide to Modern Econometrics", Fourth Edition.
- Baltagi (2013), "Econometric Analysis of Panel Data", Fifth Edition.
- Kirchgässner, Wolters and Hassler (2013), "Introduction to Modern Time Series", Second Edition.

- Adkins and Hill (2011), "Using Stata for Principles of Econometrics", Fourth Edition.
- Hamilton (1994), "Time Series Econometrics", First Edition.

In addition, a bibliography of quoted articles and books will be put online for each topic covered.

Course Structure

Block I: Univariate Time Series

- Stationary ARMA Models: Specification, Estimation and Prediction
- Application to the Persistence of Inflation
- Unit Root Processes: Specification and Tests
- Application to Purchasing Power Parity
- Modeling Volatility in Financial Market Time Series - ARCH and GARCH models
- Application to Stock Market Returns

Block II: Multivariate Time Series

- ARDL Models and Error-Correction Models
- Cointegration: Theory and Tests
- Vector Autoregression Models
- Applications to Money Demand, Inflation and Exchange Rates

Block III: Panel Data Models

- Static Panels with Fixed Effects and Random Effects
- Dynamic Panels and the Nickell Bias
- GMM Estimation in Dynamic Panels: Arellano-Bond, Blundell-Bond and Arellano-Bover
- QML Estimation in Dynamic Panels
- Incorporating Spatial Effects in Panel Data Models
- Various Examples and Applications

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