

# Advanced Econometrics

(∈ Module 07-202-1103 Advanced Econometrics and Statistics)

Lecture: Wed, 11.15-12.45, SR 6; start: Oct 11

Lab: Fri (bi-weekly), 11.15-12.45, CIP 3; start: Oct 13; instr.: Frank Simmen, MA, MSc

## Aims and scope

This part of the module provides an insight into the fundamental strands of applied econometrics. It imparts techniques that are and some that are not necessarily covered by standard introductory classes in econometrics. We motivate and develop methods for a broad range of applications and research in preparation for advanced classes. Techniques can readily be used in writing of empirical term papers and theses. We apply them to the empirics of business cycles, economic growth, and financial market problems. Specific areas of interest include tools for static and dynamic panel data analysis and frequency domain techniques for business cycle extraction and analysis. Stata will be used as software to solve problem sets in the lab. The code provided is intended to serve as a tool box for future projects.

## I Causal Effects Estimation

- I.1 Classical Linear Regression Model
- I.2 Endogeneity and Instrumental Variable Estimation
- I.3 Panel Data Models
- I.4 Quasi-Natural Experiments and Difference-in-Differences

## II Time Series Analysis

- II.1 Modeling the Stationary Part: The Short and Medium Run
  - II.1.1 Causality in the time series context: DL-models and multipliers
  - II.1.2 Filtering and descriptive business cycle analysis

II.1.3 The world of ARMA processes

II.1.4 ARCH, GARCH, and GARCH-M models

II.1.5 VAR model basics

II.2 Modeling the Stationary and Non-stationary Part: The Short and Long Run

II.2.1 Unit root and stationarity tests

II.2.2 Cointegration and error correction models

II.2.3 VEC model basics

### III Special Topics

### Grading and Material

Grades for this class will be computed from a 90 minutes final exam, consisting of 50% methodological questions and 50% questions relating to applied problems. Problem sets and data will be made available electronically.