Econometric Methods
(Econometrics I)

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Winter Term 2023/2024

Econometrics courses at CAU

Basic:

- Econometric methods (Carstensen)
- Time series econometrics (Carstensen)
- Bayesian econometrics (Carstensen)

"Micro":

- Microeconometrics (Carstensen/Jensen)
- Panel econometrics (Carstensen/Titova) — probably discontinued
- Labor econometrics (Jensen)
- Causal inference in economics (Ruhose)

"Macro" and forecasting:

- Multivariate time series analysis and forecasting (Carstensen)
- Applied business cycle analysis and forecasting (Boysen-Hogrefe)
- Applied time series analysis (Haas)
- Macroeconometrics (Carstensen)

Seminars:

- Seminar in econometrics with topics such as "Forecasting in a data-rich environment" (Carstensen)

Other interesting courses:

- Univariate time series analysis (NN)
- Statistical computing (NN) — probably discontinued
- Statistical learning (Heinrich)
- Multivariate methods (Jensen)
- Spatial econometrics (Niebuhr)
- Financial econometrics courses: see QBER (Haas)

Outline of this Course

The lecture covers important estimation and inference techniques for cross-sectional data and introduces into the use of the econometric software package Stata.

A. Review: conditional expectations, linear projections, OLS basics
B. Basic asymptotic theory: convergence in probability, convergence in distribution, limit theorems for random samples
C. Linear Models
    1. The Single-Equation Model and OLS Estimation
    2. Instrumental Variables Estimation of Single-Equation Models
    3. Additional Single-Equation Topics
D. Nonlinear Models
    1. M-Estimation
    2. Maximum Likelihood Estimation
    3. Binary response models
    4. Generalized Method of Moments Estimation

Prerequisites

- Math: calculus, Taylor approximation, matrix algebra.
- Statistics: random variables, expectation, distribution functions, estimators, tests.
- Econometrics: Bachelor knowledge of OLS and its matrix algebra, t-tests, F-tests

Organization
(always check OLAT and Univis for details or possible changes!)

- **Register in OLAT course "Econometrics I / Econometric Methods (Winter 2023/24)". All lecture slides, tutorial questions etc can be found in OLAT. Preferably activate e-mail notifications.**
- Lecture (2 hours), Kai Carstensen, Friday 14:15 - 15:45, in class
- Does anyone prefer hybrid?
- Tutorial (2 hours) and computer tutorial (1 hour)

Exam

Written exam

- at the end of the semester
- date see Univis

Voluntary take home assignment

- approximately after half of the semester
- combination of theory and programming
- allows to earn up to 6 bonus points for the exam

Readings

Main textbook (we follow it closely and use the same notation):

Wooldridge, J.M. (2010), Econometric Analysis of Cross Section and Panel Data, 2nd ed., MIT Press.

Also recommended:

Greene, W.H. (2012): Econometric Analysis, 7th ed., Pearson.