Econometrics SoSe 2021
4 SWS + 2 SWS

Christopher Walsh (lectures) and
Maxime Faymonville (exercises)

Course presentation
TU Dortmund University

5. February 2021
Audience:
- Compulsory for Master Econometrics.
- Voluntary for Master Data Science, Master Statistics and Bachelor Statistics.

Organization:
- Course will be taught in **english**.
- 4 SWS (Lectures) + 2 SWS (Exercise Class)
- Course will be run via the university’s e-learning platform moodle.
- To register for the course, or if you have questions email me: walth@statistik.tu-dortmund.de.
- Maxime Faymonville will teach the exercise classes: faymonville@statistik.tu-dortmund.de
**Econometrics:**
- Statistical analysis/modelling for economic data or to answer economic questions.
- Often problem is to estimate causal relationships from observational data.
- Many applied subfields in: Health Economics, Labour Economics, Education Economics, Environmental Economics, Macroeconomics, Financial Economics, ... 

**Focus in our course:**
- Provide the theoretical principals needed to study more advanced methods.
- Microeconometric setting: Cross-sectional and panel data.
- **No** time series! There is a separate course for this.
Prerequisites:

- There are no formal prerequisites, but:
  
  (i) The course will mainly cover theory. For this it would be good, if you have some previous knowledge of:
      - Classical Linear Regression (incl. matrix notation)
      - Asymptotic Theory (incl. stochastic convergence concepts, LLN, CLTs)
  
  (ii) Some exercise questions will be applied. To answer these you will need some knowledge of the software programme R.
Tentative course overview

- Review of the classical linear regression model
  - Interpretation
  - Finite-sample theory
  - Asymptotics
- Generalizations to the classical linear regression model:
  - Allow for heteroskedasticity
  - Allow for endogeneity (instrumental variable methods)
- System of linear equations and linear panel data models
- M-estimation, Maximum Likelihood (MLE) and Generalized Method of Moments (GMM)
- Time permitting - outlook to further topics.

Lectures:
- There will be two lectures per week. Time, place and exact format are TBD.

Exercises:
- There will be one exercise class per week. Time, place and exact format are TBD.
- You will be expected to hand in your solutions every week. These will be graded and returned. Exact procedure is TBD.

Exam:
- Written exam at the end of term.
- Eligibility to exam will depend on results on exercises/mid-terms. Exact procedure is TBD.