

## IWH-DPE/CGDE First-Year Course

### Econometrics

**Work load:** 150 hours / 6 ECTS

**Lecture:** Bi-weekly, 15 x 90 minutes / in person at IWH

**Begin:** 10.10.2022

**Time:** Mondays 09:30–11:00 and 11:30-13:00

#### I. Introduction (Day 1)

1. Review of Linear Models and Asymptotic Theory

**Date:** 10.10.2022

**Time:** 09:30–11:30

**Lecturer:** Dr André Diegmann, IWH

#### II. Estimation Methods for Non-linear Models (Day 2)

2. Maximum-likelihood Estimation
3. Bayesian Estimation and Inference

**Date:** 24.10.2022

**Lecturer:** tbd

#### III. Binary, Categorical and Limited Dependent Outcomes (Day 3)

4. Models for Binary and Categorical Outcomes
5. Models for Limited Dependent Variables

**Date:** 07.11.2022

**Lecturer:** tbd

#### IV. Causal Inference (Day 4 and Day 5)

6. Instrumental Variables
7. Regression Discontinuity

**Date:** 21.11.2022

**Lecturer:** Dr Matthias Mertens, IWH

8. Matching

**Date:** 05.12.2022

**Time:** 09:30–11:00

**Lecturer:** Professor Xiang Li, PhD, IWH and Martin Luther University Halle-Wittenberg

9. Differences-in-Differences

**Date:** 05.12.2022

**Time:** 11:30–13:00

**Lecturer:** Professor Dr Felix Noth, IWH and Otto von Guericke University Magdeburg

**V. Time Series (Day 6 and Day 7)**

10. Time Series I

**Date:** 19.12.2022

**Lecturer:** Professor Dr Malte Rieth, Martin Luther University Halle-Wittenberg

11. Time Series II

**Date:** 09.01.2023

**Lecturer:** Professor Dr Malte Rieth, Martin Luther University Halle-Wittenberg

**VI. Special Topics (Day 8)**

12. Empirical Methods in Lab and Field Experiments

**Date:** 23.01.2023

**Time:** 09:30–11:00

**Lecturer:** Professor Dr Sabrina Jeworrek, IWH and Otto von Guericke University Magdeburg

13. Machine Learning Methods for Economics and Finance

**Date:** 23.01.2023

**Time:** 11:30–13:00

**Lecturer:** Professor Dr Melina Ludolph, IWH and Otto von Guericke University Magdeburg

## Venue

Halle Institute for Economic Research (IWH) – Member of the Leibniz Association, Kleine Maerkerstrasse 8, 06108 Halle (Saale), conference room (ground floor). In case of tightened COVID-19 regulations, parts of the course may take place online via Zoom.

## Problem sets

There will be eight assignments throughout the term. At the end of each day, the lecturer will post assignments, which are due on the day before the next lecture (11.59 pm). In order to complete the course, six problem sets (at least one from every block indicated by Roman numbers) will have to be successfully passed.

## Selected Literature

Althey, S.; Imbens, G. W. (2019): Machine Learning Methods that Economists Should Know About. *Annual Review of Economics* 11, 685-729.

Angrist, J. D.; Pischke, J.-S. (2015): *Mastering Metrics*. Princeton University Press.

Angrist, J. D.; Pischke, J.-S. (2009): *Mostly Harmless Econometrics: An Empiricist's Companion*. Princeton University Press.

Cameron, A.C.; Trivedi, P.K. (2005): *Microeconometrics, Methods and Applications*, Cambridge University Press.

Gelman, A.; Carlin, J. B.; Stern, H. S.; Dunson, D. B.; Vehtari, A.; Rubin, D. B. (2013): *Bayesian Data Analysis, Third Edition*. Chapman & Hall/CRC Press.

Greene, W.H. (2017): *Econometric Analysis, 8th edition*, Pearson.

Imbens, G. W.; Rubin, D. B. (2015): *Causal Inference for Statistics, Social, and Biomedical Sciences: An Introduction*. Cambridge University Press.

Kilian, L.; Lütkepohl, H. (2017): *Structural Vector Autoregressive Analysis*, Cambridge University Press, 2017.

McElreath, R. (2020): *Statistical Rethinking. A Bayesian Course with Examples in R and Stan*. Chapman & Hall/CRC Press.

Winkelmann, R.; Boes, S. (2006): *Analysis of Microdata*. Springer.

Wooldridge, J. M. (2010). *Econometric analysis of cross section and panel data*. MIT press.

Additional lecture-specific literature will be announced separately.