TI1702: ECONOMETRICS II

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Short subject description: This course focuses on drawing inference from cross-sectional and panel data using techniques that are frequently used in applied econometric research.

Course contents: Many empirical questions in economics require estimating causal parameters. Regression models provide correlations which only have a causal interpretation if the zero conditional mean assumption holds. This assumption is often violated, for example when there are omitted variables, non-random sampling, reverse causality or measurement errors in regressors. In this course we discuss methods dealing with these confounding factors. In particular, we consider limited dependent variable models, instrumental variables estimation and panel data models. We introduce the potential outcomes model, which is the most general model for defining treatment effects such as average treatment effect, average treatment effect on the treated, quantile treatment effects and local average treatment effects. The emphasis of the course is on identification, estimation and interpretation rather than a thorough treatment of the asymptotic properties of the estimators. During the course applications of the different methods are discussed, mainly in the fields of labor economics, health economics, and the economics of education.

Course objective: The key objective of the course is applying microeconometric techniques rather than deriving econometric and statistical properties of estimators. After the course student should be able to decide about the appropriate model, apply the estimation method correctly, and they should be able to interpret the estimation results.

Literature: Recommended: Cameron, A.C. and P. Trivedi. Microeconometrics: Methods and Applications, Cambridge University Press (CT)
Other Literature: Huntington-Klein, N. The Effect: An Introduction to Research Design and Causality, theeffectbook.net (H)
Cunningham, S. Causal Inference: The Mixtape, Yale Press (C)

Grading: Sit-in written exam (85%) and take-home assignments (15%). There are 5 take-home assignments that involve related empirical exercises and are handed out at the start of each week. Students can work in teams of at most two students when solving the take-home assignments. The solutions should be returned via Canvas no later than Sunday evening, 11.59pm.

Schedule: Lectures will be streamed, but not recorded. The zoom links will be communicated via Canvas.

Week 1:

Lecture 1 (Hans Bloemen): Tuesday 4 January 13:30: Limited Dependent Variables (Binary Choice Models, Censored Regression Model).

Lecture 2 (Hans Bloemen): Friday 7 January 9:30: Selection Models, Instrumental variables, Hausman Test, Weak Instruments.

Workgroup 1 (Stanislav Avdeev): Friday 7 January 14:00

Reading:

1. CT, Chapter 14: Binary Outcome Models (only 14.1-14.3)
2. CT, Chapter 16: Tobit and Selection Models (only 16.1-16.3, 16.5-16.7)
3. CT, Chapter 4.6: Median and Quantile Regressions
4. CT, Chapter 4.8: Instrumental Variables
5. H, Chapter 19: Instrumental Variables
6. C, Chapter 7: Instrumental Variables

Week 2:

Lecture 3 (Hans Bloemen): Monday 10 January 13:30: Panel Data (Fixed effects, Random effects, Mundlak).

Workgroup 2 (Stanislav Avdeev): Tuesday 11 January 16:30

Reading:

1. CT, Chapter 21: Linear Panel Models: Basics
2. H, Chapter 16: Fixed Effects
3. C, Chapter 7: Panel Data

Week 3:

Lecture 4 (Bas van der Klaauw): Monday 17 January 13:30: Potential Outcomes (Treatment Effects, Experiments, Power Analysis).

Workgroup 3 (Stanislav Avdeev): Tuesday 18 January 16:30

Reading:

1. CT, Chapter 2.7: Potential Outcomes Framework
2. H, Chapter 10: Treatment Effects
3. C, Chapter 4: Potential Outcomes Causal Model

Week 4:

Lecture 5 (Bas van der Klaauw): Monday 24 January 13:30: Treatment Evaluation with Instrumental Variables (LATE, Power Analysis with Partial Compliance).

Workgroup 4 (Stanislav Avdeev): Tuesday 25 January 16:30

Reading:

1. CT, Chapter 25: Treatment Evaluation (only 25.1-25.3, 25.7)
2. H, Chapter 19.2.2 Instrumental Variables and Treatment Effects

Week 5:

Lecture 6 (Bas van der Klaauw): Monday 31 January 13:30: Difference-in-Difference Methods.

Workgroup 5 (Stanislav Avdeev): Tuesday 1 February 16:30

Reading:

1. CT, Chapter 22.6: Difference-in-Differences Estimator and Chapter 25.5: Difference-in-Differences Estimators
2. H, Chapter 18: Difference-in-Differences
3. C, Chapter 9: Difference-in-Differences
4. C, Chapter 10: Synthetic Control

Week 6:

Lecture 7 (Bas van der Klaauw): Monday 7 February 13:30: Regression Discontinuity and Regression Kink Designs.

Workgroup 6 (Stanislav Avdeev): Tuesday 8 February 16:30

Workgroup 7 (Stanislav Avdeev): Thursday 10 February 15:00

Reading:

1. CT, Chapter 25.6: Regression Discontinuity Design
2. H, Chapter 20: Regression Discontinuity
3. C, Chapter 6: Regression Discontinuity

Exam Monday 21 February 09:30