

# ECON0021: Microeconometrics

- Lecturer in week 6 - 10: Prof. Aureo de Paula
- Lecturer in week 12 - 16: Dr. Andrei Zeleneev
- Tutorial lecturer: Matthew Nibloe

## 1 Aims and Objectives

The aim of this course is to develop student's knowledge of econometric methods to analyze individual-level data (microdata). The use of microdata is increasingly common in economics, and the datasets used are increasingly complex. Micro-econometric analysis can help empirically answer important policy questions. This course starts by studying core policy evaluation methods, then covers various extensions, and finally reviews limited dependent variable models. Throughout the course, emphasis will be placed on (a) agents' choice and selection into treatment and (b) heterogeneities in treatment impact. Related to these keywords, the lectures are designed to answer the following questions:

- (a) What are appropriate econometric techniques to measure policy impact when *assignment* to the policy (treatment) is not random?
- (b) What is the econometric framework to measure policy impact when the policy impact is *heterogeneous* among the individuals?

## 2 Teaching

Teaching will consist of three main elements:

1. **Asynchronous teaching materials** may be posted in advance to weekly lessons on Moodle. Whenever those are posted, those will introduce the material in the following in person session.
2. **Weekly live lectures** will take place each week during the 10-week term. The lectures will be in person. Live sessions will comprise about two hours per week in total. Please refer to the timetable for the venue. All lectures will be recorded. The recordings will become available on Moodle shortly after the lecture. Note that some lectures build on the material covered in the asynchronous teaching materials, so it is important that you watch any videos made available before attending the lectures.
3. There will be six **tutorials**. These tutorials will take place always on Mondays. Please check your schedule for the timing of your tutorial group. The tutorials will not be recorded, so it is important that you make every effort to attend all tutorials.

**Course materials** (slides, problem sets, answer keys, etc.) will be uploaded on Moodle. For those who want to quickly review how to use Stata, a Stata tutorial is also available on Moodle.

### 3 Assessment

- **The final mark for this course is solely based on a final exam in the third term.** This exam is likely to be a timed open-book remote exam (date TBC). Affiliate students may take the exam in the beginning of January (date TBC).
- **There will be at least four assignments given throughout the term, which are mandatory and will be graded, but will not be counted for the final grade.** Students have to submit at least three out of four problem sets to be allowed to take the exam. The assignments will include both analytical problems and empirical problems that will require the use of statistical software such as Stata. The coursework must be submitted online via **Turnitin**.

### 4 Course Outline

#### Part I: Identification and Estimation of Treatment Effects

(\* indicates particularly relevant text)

Lecture 1: Basic Concepts of Causal Inference and Randomized Experiments

- Angrist and Pischke (2009, Ch. 2)\*
- Glewwe and Todd (2022, Ch. 3)\*
- Wooldridge, Jeffrey M. (2010, Ch. 21.1 and 21.2)
- Bitler, M., J. Gelbach and H. Hoynes (2006 AER)

Lecture 2: Regressions and Matching

- Angrist and Pischke (2009, Ch. 3.1-3.3)\*
- Glewwe and Todd (2022, Ch. 13)\*
- Wooldridge, Jeffrey M. (2010, Ch. 21.3)
- Blundell and Costa Dias (2009 JHR)\*
- LaLonde (1986, AER)\*
- Problem Set 1

Lecture 3: Instrumental Variables and Control Function Methods for Selection on Unobservables

- Angrist and Pischke (2009, Ch. 4-4.1.2, 4.4, 4.6.1)\*
- Glewwe and Todd (2022, Ch. 15, 16)\*
- Wooldridge, Jeffrey M. (2010, Ch. 21.4)
- Blundell and Costa Dias (2009 JHR)\*
- Heckman, Ichimura and Todd (1997 REStud)
- Heckman and Navarro (2004 REStat)
- Angrist and Krueger (1991 QJE)

Lecture 4: Methods for Repeated Cross-Sections and Panel Data

- Angrist and Pischke (2009, Ch. 5-5.3)\*
- Glewwe and Todd (2022, Ch. 12)\*
- Blundell and Costa Dias (2009)\*
- LaLonde (1986, AER)\*
- Problem Set 2

Lecture 5: Regression Discontinuity Designs

- Angrist and Pischke (2009, Ch. 6)\*
- Glewwe and Todd (2022, Ch. 14)\*
- Wooldridge, Jeffrey M. (2010, Ch. 21.5)
- Blundell and Costa Dias (2009, JHR)\*

- Angrist and Lavy (1999, QJE)\*
- Kostol and Mogstad (2014 AER)

- Problem Set 3

## **Part II: Limited Dependent Variable Models and Their Applications. Welfare Analysis and Demand Estimation**

Lecture 6: Review of Basic Concepts in Statistics, Maximum Likelihood Estimation

- Practice Problem Set (warm-up questions, no need to hand in)

Lecture 7: Binary Choice Models

- Problem Set 4 (Due date TBA)

Lecture 8: Discrete Choice Models with Random Utility, Welfare Analysis

Lecture 9: Multinomial Choice Models

Lecture 10: Topics in Demand Estimation

- Problem Set 5 (Due date TBA)

## **5 Textbooks and Supplementary Reading**

There are a number of textbooks that would be useful references for this course (\* indicates more advanced references). Further references and related literature will be referenced in each set of slides.

1. \*Angrist, J. and Pischke, J-S. 2009. Mostly Harmless Econometrics: An Empiricist's Companion. Princeton University Press.
2. Angrist, J. and Pischke, J-S. 2014. Mastering 'Metrics: The Path from Cause to Effect. Princeton University Press.
3. \*Cameron, A. Colin and Trivedi, Pravin K. 2005. Microeconometrics: Methods and Applications. Cambridge University Press.
4. \*Cameron, A. Colin and Trivedi, Pravin K. 2009. Microeconometrics Using Stata. Stata Press.
5. \*Glewwe, Paul and Todd, Petra. 2022. Impact Evaluation in International Development. World Bank Group.
6. \*Hansen, Bruce E. 2021. Econometrics. Unpublished Manuscript (available online).
7. \*Train, Kenneth. 2003. Discrete Choice Methods with Simulation. Cambridge University Press.
8. Stock, James H. and Watson, Mark W. 2003. Introduction to Econometrics. London: Addison Wesley.
9. Wooldridge, Jeffrey M. 2009. Introductory Econometrics: A Modern Approach. 4th edition.
10. \*Wooldridge, Jeffrey M. 2010. Econometric Analysis of Cross Section and Panel Data. MIT Press.