ECON 0021: Microeconometrics

Term 1, 2020-2021

- Lecturer in week 6 - 10: Dr. Anne Brockmeyer, a.brockmeyer@ucl.ac.uk
  Student feedback & consultation sessions on zoom: Fridays 10:30-11:30 (Fridays 11:00-12:00 in the weeks I teach F2F)
- Lecturer in week 12 - 16: Dr. Andrei Zeleneev, a.zeleneev@ucl.ac.uk
  Student feedback & consultation sessions on zoom: TBC
- Tutorial lecturer: Michele Giannola, michele.giannola.12@ucl.ac.uk
  Student feedback & consultation sessions on zoom: TBC

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** for each of the ten weeks of term will be posted on Moodle by Monday 11:55 pm (starting Oct 5). These materials are primarily videos which correspond approximately to a one-hour lecture.
2. **Weekly live lectures** will take place each Friday during the 10-week term, 9:30-10:30 am. The lectures will be on zoom, except in weeks 6, 8, 12 and 14 (i.e., Oct 9, Oct 23, Nov 20, Dec 4), when the live lecture will be held face-to-face. The F2F lectures will take place in Wilkins Building (main building), Jeremy Bentham Room. All lectures will be both live-streamed and recorded. The links to the live event/live stream will be posted on moodle. The recordings will become available on moodle shortly after the lecture. Note that the material in the Friday lectures builds on the material covered in the asynchronous teaching materials, so it is important that you watch the videos before attending the Friday lecture.

3. There will be seven **tutorials**. These tutorials will take place on zoom, always on Mondays, on the following dates: 19/10/2020, 26/10/2020, 02/11/2020, 23/11/2020, 30/11/2020, 07/12/2020, 14/12/2020. Please check your schedule for the timing of your tutorial group. All tutorials will be live on zoom and the links will be posted on moodle. The tutorials will not be recorded, so it is important that you make every effort to attend all seven 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 will be a three-hour open-book remote exam, to be complete in a 24h period (date TBC). Affiliate students may take the exam in the beginning of January (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)*
- Wooldridge, Jeffrey M. (2010, Ch. 21.1 and 21.2)
- Bitler, M., J. Gelbach and H. Hoynes (2006)

Lecture 2: Regressions and Matching
- Angrist and Pischke (2009, Ch. 3.1-3.3)*
- Wooldridge, Jeffrey M. (2010, Ch. 21.3)
- Blundell and Costa Dias (2009)*
- LaLonde (1986)*
- Problem Set 1 (no need to hand in)

Lecture 3: Instrumental Variables
- Angrist and Pischke (2009, Ch. 4-4.1.2, 4.4, 4.6.1)*
- Wooldridge, Jeffrey M. (2010, Ch. 21.4)
- Blundell and Costa Dias (2009)*
- Angrist and Krueger (1991)

Lecture 4: Methods for Repeated Cross-Sections and Panel Data
- Angrist and Pischke (2009, Ch. 5-5.3)*
- Blundell and Costa Dias (2009)*
- LaLonde (1986)*
- Problem Set 2 (Due date: Friday, October 23)

Lecture 5: Regression Discontinuity Designs
- Angrist and Pischke (2009, Ch. 6)*

- Wooldridge, Jeffrey M. (2010, Ch. 21.5)
- Blundell and Costa Dias (2009)*
- Angrist and Lavy (1999)*
- Kostol and Mogstad (2012)
- Problem Set 3 (Due date: Friday, October 30)

Part II: Limited Dependent Variable Models and Their Applications, Topics in Program Evaluation

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 Model
- Problem Set 4 (Due date TBA).

Lecture 8: Discrete Choice Models with Random Utility, Multinomial Logit Model

Lecture 9: Applications of Random Utility Models, Demand Estimation

Lecture 10: Topics in Program Evaluation, Synthetic Control Methods
- 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. *Train, Kenneth. 2003. Discrete Choice Methods with Simulation. Cambridge University Press.
6. Stock, James H. and Watson, Mark W. 2003. Introduction to Econometrics. London:Addison Wesley.
7. Wooldridge, Jeffrey M. 2009. Introductory Econometrics: A Modern Approach. 4th edition.
8. *Wooldridge, Jeffrey M. 2010. Econometric Analysis of Cross Section and Panel Data. MIT Press.