EC402: LECTURES ON PANEL DATA
LENT TERM 2011

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Office hour: Wednesday 4:00-5:30

Course objectives: This course consists of 15 hours of lectures, and 5 hours of classes, focusing on applied econometric techniques for both static and dynamic models using panel data, including identification of causal relationships using 'differences in differences' and propensity score matching. The objectives of the course are to teach you the underlying econometric theory for evaluating the properties of different estimators, and to give you some practice in utilising these estimation techniques on real data to study economic questions.

Course requirements: In addition to the lectures, there will be five classes that cover assigned technical exercises and computer exercises that illustrate applications of the techniques. These five sets of technical and computer exercises are required to be handed in for grading. I assume that you have taken an introductory course in econometrics and understand elementary matrix algebra, which I will use throughout the lectures.

Books: My lecture notes will be available on Moodle. There is no single textbook for this course. The most useful books, which you should consider buying, are:

Joshua Angrist and Steve Pischke, *Mostly Harmless Econometrics* (Princeton University Press, 2010)

Jeffrey Wooldridge, *Econometric Analysis of Cross Section and Panel Data* (MIT Press, 2002). Relevant chapters for these lectures are 10, 11 and part of 18.

Schedule of Lectures

Lecture 1: Causal Relations/Endogeneity in Non-Experimental Settings

Angrist and Pischke: Chapter 1, pp. 1-24
Wooldridge: pp. 247-256

Lecture 2/3: Identifying Treatment Effects by Modelling Selection, Difference-in-Differences, and Propensity Score Matching

Angrist and Pischke: Chapter 3, pp. 51-68 (Optional: 68-91), and Chapter 5, pp. 221-243
Wooldridge: Chapter 6, pp. 128-132 and Chapter 18, pp. 614-621

Lectures 4/5: Pooled OLS, Fixed Effect and First Difference Estimators

Wooldridge: Chapter 10, pp.265-274, 278-284

Lecture 6: Random Effects Estimator

Wooldridge: Chapter 10, pp. 256-265

Lecture 7: Hausman Test: Fixed v. Random Effects

Wooldridge: Chapter 10, pp. 284-291

Lecture 8: Fixed Effects with Time-Invariant Variables: Hausman-Taylor Model

Wooldridge: Chapter 10, pp. 325-328

Lecture 9: Measurement Error with Fixed Effects: IV and Long Differences

Wooldridge: Chapter 11, pp. 311-314

Lecture 10: First Differences with Instrumental Variables

Wooldridge: Chapter 10, pp. 279-284

Lectures 11: Dynamic Models with Panel Data

Wooldridge: Chapter 10, pp. 299-305

Lectures 12/13: Arellano-Bond Estimator

Wooldridge: Chapter 10, pp. 305-314

Lecture 14/15 (provisional): Generalised Method of Moments (GMM)

Wooldridge: Chapter 8, pp. 183-194

Schedule of Class Assignments

Class 1: Wooldridge: Chapter 18, Problems 18.1, 18.3
Others to be added

Class 2: Wooldridge: Chapter 10, Problems 10.1, 10.2, 10.3, 10.4 (a-c only), and computer exercise 10.10

Class 3: Wooldridge: Problem 10.14, and computer exercises 10.8 and 10.12

Class 4: Wooldridge: Chapter 11, Problems 11.2, 11.6, 11.16 (a-c only), and computer exercise 11.12

Class 5: Wooldridge: Problem 11.1 and computer exercise 11.15