

# ECO 2803H1S Methods for Empirical Microeconomics

University of Toronto

Department of Economics  
Winter/Spring, 2014

## Course Description

This course is directed at graduate students conducting research in the “applied micro” fields, especially (but not exclusively) labour, development, and public economics. While it has a labour course number, this is not purely a labour economics course: it is a course in empirical modelling and applied econometrics. The tools covered in the course, however are central to those used in empirical labour economics, as well as other applied microeconomics fields like development and public economics. The focus will be on the identification of casual relationships using regression-based analysis. Empirical examples will be drawn from recent work in labour, development, and public economics.

## Instructor

Instructor: Professor Gustavo J. Bobonis  
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Office: 150 St. George Street, #304

## Office Hours:

- ▶ Thursdays, 4:00 to 5:00
- ▶ Fridays, 1:00 to 2:00

## Meetings

Most lectures are Thursdays, 11:10 to 1:00, in GE100. We will also make frequent use of the Friday time slot (10:10 to 11:00, GE 100), especially to accommodate student presentations later in the semester. I will announce ahead of time whether we will be using the Friday slot in a particular week.

## Readings

The core lecture material is based on:

Joshua D. Angrist & Jörn-Steffen Pischke, *Mostly Harmless Econometrics: An Empiricist's Companion*, Princeton University Press, 2009.

This can be purchased from various online booksellers.

In addition to the textbook, a central part of the course will be selected journal articles

that illustrate the various empirical strategies and methods that we will be discussing. The articles will be drawn broadly from empirical microeconomic fields, and the course will therefore have “economic content” in addition to the focus on applied econometrics. A more complete list of the readings is listed below. Most articles will be available through Blackboard.

## Website

The course website (on Blackboard):

<http://homes.chass.utoronto.ca/~bobonis/ECO2803H1S-2014.html>

I will post the slides from my lectures on the Blackboard website. In addition, I will provide links to the assigned journal articles. I tend to use Blackboard extensively as a means of communication with the class, so I recommend you check the announcements regularly.

## Email Policy

Please feel free to email me questions or comments pertaining to the course, with the following proviso:

*The answer requires a one or two-line response (maximum). It is my experience that email is an inefficient way to discuss economics. Questions that require more than one or two-line answers are more appropriate for office hours.*

I will normally reply to emails within 24 hours, except on weekends.

## Evaluation

A solid understanding of the various empirical strategies, and how they are implemented in “real research” is a key objective of the course. As such, a detailed understanding of important/illustrative papers in the field is an excellent way to acquire this understanding. There are two main components to the graded course work:

- **Term Assignment (60%):** A detailed summary, replication, and critical review of an assigned article. This will be comprised of:
  - A short (20 minute) class presentation, built around 10 to 12 Powerpoint slides. The presentations are made in the second-half of the semester;
  - A 15 to 20 page paper that:
    - Provides a critical evaluation of the paper in light of the course material, and
    - Replicates its key empirical findings using data from the online archive. Students are assumed to be (relatively) proficient in STATA in order to conduct the replication exercise.

- The due date for the paper is **[ONE WEEK AFTER THE FINAL EXAM] at 9:00 am**. Details of the assignment itself will be provided early in the semester.
- **Final Exam (40%)**: The exam will be offered during the exam period at the end of the semester.

## Planned Coverage

We will follow the material outlined in Angrist & Pischke very closely:

1. Introduction to the “Experimental Ideal” for understanding causality and credible research design (Chapters 1 and 2);
2. Detailed review of Ordinary Least Squares and Regression analysis (Chapter 3);
3. Instrumental Variables (Chapter 4);
4. Panel Data and Differences-in-Differences (Chapter 5);
5. Regression Discontinuity Design (Chapter 6);
6. Issues with Standard Errors (Chapter 8).

## Preliminary List of Readings

The following is a list of the key parts of of the text, and associated journal articles that we will be (mostly) covering in class (or that are discussed in some detail in Angrist and Pischke). The articles that form the basis of the assignment will be ADDED to this list (and they are required readings for the entire class).

In addition to the presentation in Angrist and Pischke, a more dense, but clear and comprehensive discussion of the course material is provided by:

Guido Imbens and Jeffrey Wooldridge (2009): “Recent Developments in the Econometrics of Program Evaluation,” *Journal of Economic Literature*, 47:1, pages 5-86.

### 1. Introductory Material

Angrist and Pischke, Chapters 1 and 2

### 2. The Regression Model

Angrist and Pischke, Chapter 3, Sections 3.1 and 3.2

### 3. Matching

Angrist and Pischke, Chapter 3, Section 3.3

LaLonde, Robert (1986): “Evaluating the Econometric Evaluations of Training Programs with Experimental Data,” *American Economic Review* 76, September, pp. 604-620.

Ashenfelter, Orley (1978): “Estimating the Effect of Training Programs on Earnings,” *The Review of Economics and Statistics* 60, pp. 47-57

Ashenfelter, Orley, and David Card (1985): "Using the Longitudinal Structure of Earnings to Estimate the Effect of Training Programs on Earnings," *The Review of Economics and Statistics* 67, pp. 648-66

Dehejia, Rajeev, and Sadek Wahba (1999): "Causal Effects in Nonexperimental Studies: Re-evaluating the Evaluation of Training Programs," *JASA* 94.

Smith, Jeffrey, and Petra Todd (2001): "Reconciling Conflicting Evidence on the Performance of Propensity Score Matching Methods," *American Economic Review* 91, May.

Hirano, Keisuke, Guido W. Imbens, and Geert Ridder (2003): "Efficient Estimation of Average Treatment Effects Using the Estimated Propensity Score," *Econometrica* 71:4, 1161–1189.

Smith, Jeffrey, and Petra Todd (2005a): "Does Matching Overcome LaLonde's Critique of Nonexperimental Estimators?" *Journal of Econometrics*, 2005(1-2).

Dehejia, Rajeev (2005): "Practical Propensity Score Matching (Response to Smith and Todd)," *Journal of Econometrics*, 2005(1-2).

Smith, Jeffrey, and Petra Todd (2005): "Practical Propensity Score Matching (Rejoinder to Dehija)?" *Journal of Econometrics*, 2005(1-2).

Dehejia, Rajeev (2005): "Does Matching Overcome LaLonde's Critique of Nonexperimental Estimators? A Postscript (Response to Smith and Todd Rejoinder)," Unpublished Manuscript.

Crump, Richard, Joseph Hotz, Guido Imbens, and Oscar Mitnik (2009): "Dealing with Limited Overlap in the Estimation of Average Treatment Effects," *Biometrika*, 96, pages 187-199.

#### 4. Instrumental Variables

Angrist and Pischke, Chapter 4

Angrist, Joshua (1990): "Lifetime Earnings and the Vietnam Era Draft Lottery: Evidence from Social Security Administrative Records," *American Economic Review*.

Angrist, Joshua, and Alan Krueger (1991): "Does Compulsory Schooling Attendance Affect Schooling and Earnings?" *Quarterly Journal of Economics* 106.

Imbens, Guido, and Joshua Angrist (1994): "Identification and Estimation of Local Average Treatment Effects," *Econometrica*, Vol. 62, No. 2, pp. 467-475.

Angrist, Joshua (1998): "Estimating the Labor Market Impact of Voluntary Military Service Using Social Security Data on Military Applicants," *Econometrica*.

Bound, John, David Jaeger, and Regina Baker (1995): "Problems with Instrumental Variables when the Correlation Between the Instruments and Endogenous Variable is Weak," *Journal of the American Statistical Association*.

Card, David (1999): "The Causal Effect of Education on Earnings," Chapter 30 in Ashenfelter, Orley, and David Card (eds.) *Handbook of Labor Economics*, Volume 3.

Oettinger, Gerald (1999): "An Empirical Analysis of the Daily Labor Supply of Stadium Vendors," *Journal of Political Economy*, 107(2).

Deaton, Angus (2010): "Instruments, Randomization, and Learning about Development," *Journal of Economic Literature*, 48, pages 424-455.

Imbens, Guido (2010): "Better LATE than Nothing: Some Comments on Deaton (2009) and Heckman and Urzua (2009)," *Journal of Economic Literature*, 48, pages 399-423.

## 5. Panel Data and Differences-in-Differences

Angrist and Pischke, Chapter 5

Card, David (1990): "The Impact of the Mariel Boatlift on the Miami Labor Market," *Industrial and Labor Relations Review*, 1990.

Ashenfelter, Orley, and Alan B. Krueger (1994): "Estimates of the economic returns to schooling from a new sample of twins," *American Economic Review* 84, (5) (December 1994): 1157-73.

Card, David (1996): "The effect of unions on the structure of wages: A longitudinal analysis," *Econometrica* 64, (4) (July 1996): 957-79.

Duflo, Esther (2001): "Schooling and Labor Market Consequences of School Construction in Indonesia: Evidence from an Unusual Policy Experiment," *American Economic Review*, 91(4), 795-813.

## 6. Regression Discontinuity

Angrist and Pischke, Chapter 6

Lee, David, and Thomas Lemieux (2010): "Regression Discontinuity Designs In Economics," *Journal of Economic Literature*, 48, pages 281-355.

Angrist, Joshua, and Victor Lavy (1999): "Using Maimonides' Rule to Estimate the Effect of Class Size on Scholastic Achievement," *Quarterly Journal of Economics*, pp. 533-575.

Lee, David (2008): "Randomized experiments from non-random selection in U.S. House elections," *Journal of Econometrics*.

Lemieux, Thomas, and Kevin Milligan (2008): "Incentive effects of social assistance: A regression discontinuity approach," *Journal of Econometrics*.

DiNardo John, and David Lee (2004): "Economic impacts of new unionization on private sector employers: 1984-2001," *Quarterly Journal of Economics* 119(4): 1383-441.

## 7. External Effects

Angrist and Pischke, Chapter 4, Section 4.6.2

Manski, Charles F. (1993): "Identification of Endogenous Social Effects: The Reflection Problem," *Review of Economic Studies*, pp. 531-542.

Moffitt, Robert (2001), "Policy Interventions, Low Level Equilibria, and Social Interactions," In *Social Dynamics*, eds. S. Durlauf and P. Young. MIT Press, 2001.

Acemoglu, Daron, and Joshua Angrist (2001): "How large are human-capital externalities? Evidence from compulsory schooling laws," In *NBER Macroeconomics Annual 2000.*, eds. Ben S. Bernanke, Kenneth Rogoff eds, 9-59. Volume 15. Cambridge and London: MIT Press.

Moretti, Enrico (2004): "Workers' education, spillovers, and productivity: Evidence from plant-level production functions," *American Economic Review* 94, (3) (June 2004): 656-90.

Miguel, Edward, and Michael Kremer (2004): "Worms: Identifying impacts on education and health in the presence of treatment externalities," *Econometrica* 72(1): 159-217.

Bandiera, Oriana, Iwan Barankay, and Imran Rasul (2005): "Social preferences and the response to incentives: Evidence from personnel data," *Quarterly Journal of Economics* 120, (3) (August 2005): 917-62.

Mas, Alexandre, and Enrico Moretti (2009): "Peers at Work," *American Economic Review*, March.

Duflo, Esther, Pascaline Dupas, and Michael Kremer (2011). "Peer Effects, Teacher Incentives, and the Impact of Tracking: Evidence from a Randomized Evaluation in Kenya," *American Economic Review*, 101(5), 1739-74.

Hjort, Jonas (2013): "Ethnic Divisions and Production in Firms," Unpublished manuscript, Columbia University.

## 8. Clustering and Standard Errors

Angrist and Pischke, Chapter 8

Brent Moulton (1986): "Random Group Effects and the Precision of Regression Estimates," *Journal of Econometrics* 32, pp. 385-97.

Cameron, A. Colin, Jonah B. Gelbach and Douglas L. Miller (2008): "Bootstrap-Based Improvements for Inference with Clustered Errors", *Review of Economics and Statistics*, 90, 414-427.

Cameron, A. Colin, Jonah B. Gelbach and Douglas L. Miller (2011): "Robust Inference with Multi-way Clustering," *Journal of Business and Economic Statistics*, 29 (2), pp.238-249.

Cameron, A. Colin, and Douglas L. Miller (2013): "A Practitioner's Guide to Cluster-Robust Inference," Unpublished manuscript (for *Journal of Human Resources*).