

**ECO 2803H1F**  
**Methods for Empirical Microeconomics**

**University of Toronto**

**Department of Economics**  
**Fall, 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 modeling 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: Gustavo J. Bobonis  
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Office: 150 St. George Street, #304

Office Hours:  
Tuesdays, 3:30 to 4:30

### Meetings

Most lectures are Thursdays, 11:10 to 1:00, in GE106. We will also make frequent use of the Friday time slot (10:10 to 11:00, GE 106), especially to accommodate lectures early in the semester and 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):

[https://portal.utoronto.ca/webapps/portal/frameset.jsp?tab\\_tab\\_group\\_id= 2\\_1&url=%2Fwebapps%2Fblackboard%2Fexecute%2Flauncher%3Ftype%3DCourse%26id%3D\\_754283\\_1%26url%3D](https://portal.utoronto.ca/webapps/portal/frameset.jsp?tab_tab_group_id= 2_1&url=%2Fwebapps%2Fblackboard%2Fexecute%2Flauncher%3Ftype%3DCourse%26id%3D_754283_1%26url%3D)

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 1 (30%):** A detailed summary and critical review of an assigned article. This will be comprised of a short (20-25 minute) class presentation, built around 10-12 slides. The presentations are made in the second-half of the semester; and provide a critical evaluation of the paper in light of the course material.
- **Term Assignment 2 (30%):** A Research Proposal / Paper - students will hand in a research proposal that will:
  - establish a research question;
  - briefly survey an existing literature in Applied Microeconomics that addresses it;
  - describe a planned research project to address the question (data; design);
  - conduct preliminary data analysis.

All students must meet with me (during office hours) to discuss the research proposal by November 11<sup>th</sup> (Week 10).

- The due date for the proposal / 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” (Chapters 1 and 2);
2. Detailed review of Ordinary Least Squares and Regression analysis (Chapter 3);
3. Matching
4. Instrumental Variables (Chapter 4);
5. Regression Discontinuity and Regression Kink Designs (Chapter 6);
6. Panel Data and Differences-in-Differences (Chapter 5);
7. Sample Selection and Partial Identification
8. External Effects (Chapter 4.6.2)
9. Issues with Standard Errors (Chapter 8).

## Preliminary List of Readings

The following is a list of the key parts 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.

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. Regression Discontinuity and Regression Kink Designs

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*.

Guryan, Jonathan (2001). "Does Money Matter? Regression-Discontinuity Estimates from Education Finance Reform in Massachusetts." NBER Working Paper 8269.

Dahlberg, Matz, Eva Mork, Jorn Rattso, and Hanna Agren (2008). "Using a Discontinuous Grant Rule to Identify the Effect of Grants on Local Taxes and Spending," *Journal of Public Economics*, 92(12), 2320–2335.

Card, David, David Lee, Zhuan Pei, and Andrea Weber (2012). "Nonlinear Policy Rules and the Identification and Estimation of Causal Effects in a Generalized Regression Kink Design." NBER Working Paper 18564.

## 6. 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.

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.

## 7. Sample Selection and Partial Identification

Horowitz, J. and C. Manski (1998), "Censoring of Outcomes and Covariates due to Survey Nonresponse: Identification and Estimation Using Weights and Imputations," *Journal of Econometrics*, 84, 37-58.

Horowitz, J. L., and Manski, C. F. (2000) "Nonparametric Analysis of Randomized Experiments With Missing Covariate and Outcome Data" *Journal of the American Statistical Association*, 95, 77-84.

Lee, David (2009). "Training, Wages, and Sample Selection: Estimating Sharp Bounds on Treatment Effects." *Review of Economic Studies*, 76(3), 1071-1102.

## 8. 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.

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

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.

## 8. Issues with 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*).