ECO 2803H1S
Methods for Empirical Microeconomics

University of Toronto

Department of Economics
Winter 2018

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: Arthur Blouin
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Office Hours: Monday, 12:00p to 1:00p

Meetings

Most lectures are Thursdays, 11:10 to 1:00, in SS 1086. We will also make use of the Friday time slot, 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.

Website

The course website (on Blackboard).

I will post the slides from my lectures on the Blackboard website. 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 (35%)**: **Presentation**

MA students have the option of either the MA Students category or the PhD students category. PhD students have no option, they have to do the PhD students assignment.

Those MA students choosing the MA student option can not co-author on their projects. Anyone doing the PhD option can co-author.

MA Students: A detailed summary and critical review of an assigned article. This will be comprised of a short (20-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 a paper in light of the course material.

PhD Students: Research Project Proposal - a 20-minute class presentation (with time at the end for questions and discussion) built around 10-12 slides. The presentation 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
    - how preliminary the analysis is, depends on when the presentation takes place

– presentations earlier in the term will have a lower bar. The tradeoff is that while presentations later in the year should be more developed, fewer revisions will be expected in the final submission of Assignment #2.

• **Term Assignment 2 (35%)**: A Research Proposal (MA) / Paper (PhD) - students will hand in a research proposal / paper 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 data analysis.

All students must meet with me to discuss the research proposal by 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.

• The goal is to replicate the process academics go through when putting together a research project. Part of the grade (for the PhD option) will include your ability to take-on comments or concerns that are brought up during the presentation, and revise the analysis/discussion accordingly.

• **Final Exam (30%):** 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, with some recent innovations:

1. Introduction to the "Experimental Ideal" (Chapters 1 and 2);
2. Detailed review of Ordinary Least Squares and Regression analysis (Chapter 3);
3. Matching (Chapter 3.3);
4. Instrumental Variables (Chapter 4);
5. Regression Discontinuity and Regression Kink Designs (Chapter 6);
6. Panel Data and Differences-in-Differences (Chapter 5);
7. Machine Learning
8. 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 denser, 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.

Imbens, Guido W. (2000). "The Role of the Propensity Score in Estimating Dose-Response Functions." *Biometrika*, 87, 706–710.

Lechner, Michael (2002a). "Programme Heterogeneity and Propensity Score Matching: An Application to the Evaluation of Active Labour Market Policies." *Review of Economics and Statistics*, 84, 205–220.

Lechner, Michael (2002b). "Some Practical Issues in the Evaluation of Heterogeneous Labour Market Programmes by Matching Methods." *Journal of the Royal Statistical Society, Series A*, 165, 59–82.

Abadie, Alberto, and Javier Gardeazabal (2003). "The Economic Costs of Conflict: A Case Study of the Basque Country." *American Economic Review*, 93(1), 113-32.

Abadie, Alberto, Alexis Diamond, and Jens Hainmueller (2010). "Synthetic Control Methods for Comparative Case Studies: Estimating the Effect of California's Tobacco Control Program." *Journal of the American Statistical Association*, 105(490), 493-505.

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, Regression Kink Designs, and Bunching

Angrist and Pischke, Chapter 6

RDD

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*.

Imbens, Guido W., and Karthik Kalyanaraman (2012). "Optimal Bandwidth Choice for the Regression Discontinuity Estimator." *Review of Economic Studies*, 79(3), 933-959.

RKD

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.

Bunching

Saez, Emmanuel (2010). "Do Taxpayers Bunch at Kink Points?" *American Economic Journal: Economic Policy*, 2, 180-212.

Kleven, Henrik J., and Mazhar Waseem (2013): "Using Notches to Uncover Optimization Frictions and Structural Elasticities: Theory and Evidence from Pakistan," *Quarterly Journal of Economics*, 128, 669-723.

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. Machine Learning

Mullainathan, Sendhil, Jann Spiess (2017). "Machine Learning: An Applied Econometric Approach" *Journal of Economic Perspectives,* 31(2), 87-106.

Kleinberg, Jon, Himabindu Lakkaraju, Jure Leskovec, Jens Ludwig, Sendhil Mullainathan (forthcoming). "Human Decisions and Machine Predictions." *Quarterly Journal of Economics,* qjx032.

Varian, Hal (2014). "Big Data: New Tricks for Econometrics" *Journal of Economic Perspectives*. 28(2), pp. 3-28.

8. Issues with Standard Errors

Angrist and Pischke, Chapter 8

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

Bertrand, Marianne, Esther Duflo, Sendhil Mullainathan (2004). "How Much Should We Trust Difference-in-Difference Estimates?" *Quarterly Journal of Economics*, 119(1), 249-75.

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), 238-249.

Cameron, A. Colin, and Douglas L. Miller (2015). "A Practitioner's Guide to Cluster-Robust Inference," *Journal of Human Resources*, 50(2), 317-73.

Imbens, Guido W., and Michal Kolesar (2012). "Robust Standard Errors in Small Samples: Some Practical Advice." NBER Working Paper No. 18478.

Ibragimov, Rustam, and Ulrich K. Müller (2014). "Inference with Few Heterogeneous Clusters." *Review of Economics and Statistics* (forthcoming).