ECO2843H F / ECO439H1 F
Methods for Empirical Microeconomics

University of Toronto

Department of Economics
Fall 2020

Course Description

This course is directed at graduate students and undergraduate students intending to attend graduate school. The focus is on practical aspects of 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: 150 St. George Street, #305

Office Hours: Thursday, 10:00am to 11:00am

Meetings

Most lectures are Thursdays, 11:10 to 1:00, online (Zoom). We will also make use of the Friday time slot, to accommodate student presentations later in the semester. I expect Friday sessions will start in November. I will post a Zoom link on Quercus prior to each class.

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 Quercus).

I will post the slides from my lectures on the Quercus website. I tend to use Quercus 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 caveat:

The answer requires a one or two-line response. 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**

Research Project Proposal – a 40-minute class presentation (allow time for questions / discussion) with slides. Students should work in pairs or groups of 3. We unfortunately do not have enough time for students to do individual projects. I can help to play match-maker, especially given that we're all online this year.

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);
- potentially conduct preliminary data analysis (descriptive work, background work to show the validity of the strategy, etc.)
    - 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%)**: Paper - students will hand in a research 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.

Look to papers published in *AER: Insights* or *AER: Papers and Proceedings* (both journals publish short papers) for an example of structure, length, etc.

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

• The due date for the paper is **Thursday December 10 at 1:00pm**. Details of the assignment itself will be provided early in the semester. Submissions will be hard copy only.

• The goal is to replicate the process academics go through when putting together a research project. Part of the grade 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. It will be a take-home exam to be submitted on Quercus. You'll get 24 hours to complete the exam.

Planned Coverage

We will follow the material outlined in Angrist & Pischke 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. September 10: Introductory Material
2. September 17: The Regression Model

Angrist and Pischke, Chapter 1, 2, 3, Sections 3.1 and 3.2

3. September 24: 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. October 1: 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. October 8: Regression Discontinuity/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. October 15: 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. October 22: 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. October 29: 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).

I expect presentations will take place each Thursday and Friday, starting November 5th.