



Econ 401/604 - Applied Econometrics
Sabancı University, Faculty of Arts and Social Sciences

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Office Hours: by email appointment

Lectures: Monday 12:40 - 13:30
Tuesday 13:40 - 15:30

Course Overview

The purpose of this course is to familiarize students with state of the art econometric methods used in current research for empirical analysis of micro data. The course will underline the challenges in inferring causality in social scientific research and focus on credible identification of causal parameters of interest. The emphasis will be on applications of the empirical modeling tools to real world problems through discussions of several policy relevant topics.

Prerequisites

Econ 301 – Econometrics

Study Materials

References given below in the course outline are the core reading material. There is no required textbook for the course. Students are referred to the following optional texts that cover some of the materials that will be discussed in class.

Colin Cameron and Pravin K. Trivedi, *Microeconometrics: Methods and Applications*, 2005, Cambridge University Press

Jeffrey Wooldridge, *Introductory Econometrics*, Thomson, Third or fourth edition

Jeffrey Wooldridge, *Econometric Analysis of Cross Section and Panel Data*, MIT Press, 2002

Requirements and Grading

This is an online course that will be taught as synchronous-live sessions. We may use either Google Meet or Zoom. Video recordings of the lectures will be posted on SuCourse+. The course involves in class discussions and presentations. Students are expected to participate to all of the classes.

The course will cover papers that discuss the empirical methods and their applications. Students will be expected to read the assigned papers before class, write critical reviews, and get involved in the discussions. Therefore full participation to class activities is expected.

The evaluation for the course will be based on the tasks associated with weekly readings, applied exercises in Stata, and a research paper. The details for these tasks are provided below following the course outline.

For Stata software resources: <https://www.stata.com/links/resources-for-learning-stata/>

Grading: Participation in discussions (15%), paper presentations (15%), critical reviews and applied exercises (30%), research paper (40%).

Note that course content, requirements and policies are subject to change at the discretion of the instructor.

Rules of Conduct

The definition for scholastic dishonesty is given in the rules and regulations of the Sabancı University. In the case of scholastic dishonesty, no credits will be given for that particular work. Cheating during written work will result in an F for the course. All incidents of scholastic dishonesty will be reported to FASS for disciplinary action.

Course Outline

The readings will be selective from the listed papers below.

I. Causality

Taubes, Gary. 2007. Do We Really Know What Makes Us Healthy? New York Times Magazine 16 September 2007.

Silberman, Steve. 2009. Placebos Are Getting More Effective. Drugmakers Are Desperate to Know Why. Wired Magazine 24 August 2009.

Does Trade Promote Growth?, Oatley, T., Debates in International Political Economy, Chp. 11.

Paul W. Holland. 1986. Statistics and Causal Inference. Journal of the American Statistical Association 81(396): 945-60.

II. Randomized experiments

Burtless, Gary (1995). The Case for Randomized Field Trials in Economic and Policy Research, Journal of Economic Perspectives, Volume 9, Number 2, Spring 1995—Pages 63-84.

Harrison, Glenn and John A. List. 2004. Field Experiments. Journal of Economic Literature, XLII: 1013-1059.

Angrist, J. Bettinger, E. Bloom, E. King, E. and Kremer, M. ,(2002), Vouchers for Private Schooling in Colombia: Evidence from a Randomized Natural Experiment. American Economic Review, 92, 1535-1558

Micheal Kremer and Edward Miguel, "Worms: Identifying Impacts on Education and Health in the Presence of Treatment Externalities," *Econometrica*, 2004, 72 (1), 159-217

Chattopadhyay, R. and Duflo, E. 2004. Women as Policy Makers: Evidence from a Randomized Policy Experiment in India. *Econometrica*, Vol. 72, No. 5: 1409-1443.

Kremer, M. Randomized Evaluations of Educational Programs in Developing Countries: Some Lessons

Bertrand, Marianne and Sendhil Mullainathan. 2004. Are Emily and Greg More Employable than Lakisha and Jamal? A Field Experiment on Labor Market Discrimination. *American Economic Review* 94(4): 991-1013.

III. Selection on observables

Regression

*J. Angrist and A. Krueger, "Empirical Strategies in Labor Economics" Chapter 23 in O. Ashenfelter and D. Card, eds., *The Handbook of Labor Economics*, Volume III, North Holland, 1999. (up to 2.3)

Geiser, Saul and Maria Veronica Santelices. "Validity Of High-School Grades In Predicting Student Success Beyond The Freshman Year: High-School Record vs. Standardized Tests as Indicators of Four-Year College Outcomes." Center for Studies in Higher Education Research and Occasional Paper Series CSHE.6.07, 2007

Freedman, David. "Statistical Models and Shoe Leather." *Sociological Methodology*, 1991, 21, 291–313.

Lalonde, Robert. "Evaluating Econometric Evaluations of Training Programs with Experimental Data." *American Economic Review*, 1986, 76, 604–620.

Scheiber, Noam. "Freaks and Geeks: How Freakonomics is Ruining the Dismal Science." *The New Republic*, 2007, April 2, 27–31.

Matching

*Krueger, Alan. "How Computers Have Changed the Wage Structure: Evidence from Micro Data." *Quarterly Journal of Economics*, 1993, 108, 33–60.

*DiNardo, John and Jorn-Steffen Pischke. "The Returns to Computer Use Revisited: Have Pencils Changed the Wage Structure Too?" *Quarterly Journal of Economics*, 1997, 112, 291–303.

Angrist, Joshua, D, (1998), "Estimating the Labor Market Impact on Voluntary Military Service Using Social Security Data on Military Applicants", *Econometrica*, (66) , 248-288.

Card, David (1991): "The Impact of the Mariel Boatlift on the Miami Labor Market," *Industrial and Labor Relations Review*, 43: 245-257.

Currie, Janet and Duncan Thomas, "Does Head Start Make a Difference?," *American Economic Review* 85(3):341-364.

Heckman, James J., Hidehiko Ichimura and Petra Todd (1997), "Matching as an Econometric Evaluation Estimator: Evidence from Evaluating a Job Training Programme," *Review of Economic Studies* 64(4):605-654.

Propensity score methods

Rosenbaum, Paul and Donald Rubin. "Reducing Bias in Observational Studies Using Subclassification on the Propensity Score." *Journal of the American Statistical Association*, 1984, 79, 516–524.

Rosenbaum, Paul R. and Donald B. Rubin (1983) "The central role of the propensity score in observational studies for causal effects," *Biometrika*, Vol. 70, No. 1, pp. 41-55.

*Caliendo, Marco and Sabine Kopeinig (2008), "Some practical guidance for the implementation of propensity score matching," *Journal of Economic Surveys*, Vol. 22, No. 1, pp. 31-72.

Petra Todd (1999), "A practical guide to implementing matching estimators," manuscript.

Arceneaux, Kevin, Alan Gerber, and Donald Green. "Comparing Experimental and Matching Methods Using a Large-Scale Voter Mobilization Experiment." *Political Analysis*, 2006, 14, 37–62.

*Shadish, William, M. H. Clark, and Peter Steiner. "Can Nonrandomized Experiments Yield Accurate Answers? A Randomized Experiment Comparing Random and Nonrandom Assignments." *Journal of the American Statistical Association*, 2008, 103, 1334–1356.

Millimet, Daniel and Rusty Tchernis. "On the Specification of Propensity Scores, With Applications to the Analysis of Trade Policies." *Journal of Business and Economic Statistics*, 2009, 27, 397–415.

*Dehejia, Rajeev and Sadek Wahba. "Causal Effects in Non-Experimental Studies: Reevaluating the Evaluation of Training Programs." *Journal of the American Statistical Association*, 94, 1999, 1053–1062.

Smith, Jeffrey and Petra Todd. "Does Matching Overcome LaLonde's Critique of Non-experimental Methods?" *Journal of Econometrics*, 2005, 125, 305–353.

Dehejia, Rajeev (2005), "Does matching overcome LaLonde's critique of nonexperimental estimators? A Postscript," manuscript.

IV. Selection on unobservables

IV methods

IV estimator

Angrist, Joshua. "Lifetime Earnings and the Vietnam Era Draft Lottery: Evidence from Social Security Administrative Records." *American Economic Review*, 1990, 80, 313–336.

Angrist, Joshua and Alan Krueger, "Instrumental Variables and the Search for Identification: From Supply and Demand to Natural Experiments." *Journal of Economic Perspectives*, 2001, 15, 69–86.

Heterogeneous Treatment Effects

Angrist, Joshua, Guido Imbens, and Donald Rubin. "Identification of Causal Effects Using Instrumental Variables." *Journal of the American Statistical Association*, 1996, 91, 444–455.

2SLS and Weak Instruments

*Angrist, Joshua and Alan Krueger. "Does Compulsory School Attendance Affect Schooling and Earnings?" *Quarterly Journal of Economics*, 1991, 106, 979–1014.

*Bound, John, David Jaeger, and Regina Baker. "Problems With Instrumental Variables Estimation When the Correlation Between the Instruments and the Endogenous Explanatory Variable Is Weak." *Journal of the American Statistical Association*, 1995, 90, 443–450.

Small, Dylan and Paul Rosenbaum. "War and Wages: The Strength of Instrumental Variables and Their Sensitivity to Unobserved Biases." *Journal of the American Statistical Association*, 2008, 103, 924–933.

Linear panel Data Models – Fixed effects and difference-in-differences

Abadie, Alberto, and Javier Gardeazabal, (2003), "Economic Costs of Conflict: A Case Study of the Basque Country," *American Economic Review* 93, 113–132.

Currie, Janet and Duncan Thomas. "Does Head Start Make a Difference?" *American Economic Review*, 1995, 85, 341–364.

Ashenfelter, Orley, and Michael Greenstone. "Using Mandated Speed Limits to Measure the Value of a Statistical Life." *Journal of Political Economy*, 2004, 112(1), S226–67.

Bertrand, Marianne, Esther Duflo, and Sendhil Mullainathan (2004), "How Much Should We Trust Difference in Difference Estimates?" *Quarterly Journal of Economics*, Vol. 119, No. 1, pp. 249-275.

Baker, Michael and Kevin Milligan (2008), "How does job protected maternity leave affect mothers' employment?" *Journal of Labor Economics*, Vol. 26, No. 4, pp. 655-692.

Card, David. "The Impact of the Mariel Boatlift on the Miami Labor Market." *Industrial and Labor Relations Review*, 1990, 43, 245–257.

Card, David and Alan Krueger. "Minimum Wages and Employment: A Case Study of the Fast-food Industry in New Jersey and Pennsylvania." *American Economic Review*, 1994, 84, 487–496.

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

Regression Discontinuity Methods

*Thistlethwaite, Donald and Donald Campbell. "Regression-Discontinuity Analysis: An Alternative to the Ex Post Fact Experiment." *Journal of Educational Psychology*, 1960, 51, 309–317.

*Imbens, Guido and Thomas Lemieux. "Regression Discontinuity Designs: A Guide to Practice." *Journal of Econometrics*, 2008, 142, 615–635.

Lee, David and Thomas Lemieux. "Regression Discontinuity Designs in Economics." NBER Working Paper No. 14723, 2009.

*Chay, Kenneth, Patrick McEwan, and Miguel Urquiola. "The Central Role of Noise in Evaluating Interventions that Use Test Scores to Rank Schools." *American Economic Review*, 2005, 95, 1237–1258.

McCrary, Justin. "Manipulation of the Running Variable In the Regression Discontinuity Design: A Density Test." *Journal of Econometrics*, 2008, 142, 698–714.

Angrist, Joshua and Victor Lavy. "Using Maimonides' Rule To Estimate The Effect Of Class Size On Scholastic Achievement." *Quarterly Journal of Economics*, 1999, 114, 533–575.

DiNardo, John and David Lee. "Economic Impacts of New Unionization on Private Sector Employers: 1984-2001." *Quarterly Journal of Economics*, 2004, 119, 1383–1441.

Details of courses requirements

There are two major components:

First, students will do weekly readings and carry out several applied exercises in Stata using micro data throughout the term.

- (i) All students are expected to read the papers being discussed in class. The day before paper discussion (by 10:00 pm) students will send one question about each paper assigned for that week. The question may be about the methodology or the topic the paper addresses. This will give students an incentive to read and think about the paper in advance.
- (ii) Each week, one student will be the discussion leader who will be responsible from presenting that week's paper(s) and monitoring the discussion based on the questions sent the day before. Depending on the final number of students in class the presentations may be done in teams of two. See the end of the course outline for suggested structure for the presentations.
- (iii) Students will be assigned 2 articles for which they are going to write a critical evaluation from the perspective of identification of parameters of interest (rather than just summarizing papers' arguments). These reports will be short (max 2 pages in length, 12 point font, double spaced), due before discussion of the paper in class. Late reports will not be expected.
- (iv) Applied exercises will introduce some estimators and how they are implemented in Stata using real data. Students will carry out the estimation and interpret their findings. For the estimation students can work together but each student will turn in their own version of the assignment (answers to the questions and the Stata log file).

Second, the students will write a research paper on a particular applied topic that will be announced.

- (i) The paper should include an analytic literature survey that evaluates and synthesizes the literature and draws conclusions about the size and sign of the parameter of interest. It should not be a raw summary of papers.
- (ii) The research paper should state the research question and its relationship to the existing literature.
- (iii) The paper is expected to use micro data in the analysis and discuss the issues surrounding the credible identification of parameters of interest.

The following dates will guide the paper-writing process:

1. The 9th week of classes – The review of international literature and the Turkish literature on the subject, the institutional context (max 4 page summary-excluding the reference list, 12 point font, 1.5 lines spacing)
4. The 10th week of classes– Statement of the research question you will address (max 1 page-excluding any reference list, 12 point font, 1.5 lines spacing)
5. Jan 13, 2021- 10 pm - Submit the final copy (The text of the final paper may be up to a maximum of 5 pages. The total length of the paper including the text, figures, tables and references cannot exceed 10 pages - 12 point font and 1.5 lines spacing including the tables).

You should provide the titles and full references to the articles and other sources of information in the reviews and the final research paper.

There will be a penalty of 15 points for each day the final copy is late. All papers should be submitted by email as Word or PDF files.

Suggested structure of presentations

The presentations of assigned papers will be limited to 40 minutes. You may want to structure your presentation along the following lines:

Background: Why is the topic important? What do we already know?
What are the limitations of previous work? (5 minutes)

Methods: Which econometrics methods and data are used?
What is the econometric model? (5-10 minutes)

Results: What are the main findings? (5-10 minutes)

Discussion: Critical discussion of the identification strategy. Is it convincing?
Are improvements possible? (15 minutes)

Conclusion: What have we learnt from this study? (5 minutes)