

Time: Monday 4 – 7 pm
Place: JEN 214

Professor: Dhaval Dave
Office: AAC 195
Office Hours: Monday 1:00 – 2:00 pm
Tuesday 2-00 – 3.00 pm
Other times By appointment

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Course Web Page: On Blackboard

COURSE DESCRIPTION

This course will introduce the student to a wide range of micro-econometric models commonly used in data analyses and empirical research within academia, business, and policy analysis, with a focus on three broad aims. First, we will learn and discuss the interpretation of the parameters and the various advantages, limitations, and assumptions underlying each estimator. Second, we will develop and study each estimation method with an emphasis on application, seeing how each method is used in practice, and on implementation, learning how to apply each estimation method within a statistical software package. Third, the focus is on deriving causal effects based on observational data.

LEARNING OBJECTIVES

The course objectives are to provide students with:

1. A firm understanding of the potential outcomes framework, and the challenges confronted in deriving causal inferences due to endogeneity and selection on unobservables.
2. A firm understanding of, and the ability to identify and appropriately apply, a range of estimation techniques useful for addressing endogeneity and selection bias.
3. A firm understanding of and the ability to identify and appropriately apply estimation techniques useful for analyzing:
 - Panel data
 - Limited and categorical outcomes

- Count / discrete outcomes
 - Selection effects
 - Treatment effects
4. Familiarity in reading, presenting, and critiquing applied papers
 5. Competency in STATA in order to estimate and apply the techniques learned in the course

Upon completion of the course, students should be able to formulate a research question, assemble sample data, assess empirical challenges, identify and estimate appropriate models to address the challenges, generate inferences, and effectively communicate this process and the results in an empirical research paper.

TEXTS

We will use selected chapters and material from the following texts, in addition to journal articles. Readings from 2-4 and journal articles will be posted on Blackboard.

1. Joshua D. Angrist & Jörn-Steffen Pischke, *Mostly Harmless Econometrics: An Empiricist's Companion*, Princeton University Press, 2009.
Denoted "AP".
2. James Stock & Mark Watson, *Introduction to Econometrics*, Addison Wesley, 3rd Edition, 2011.
Denoted "SW".
(This is an undergraduate-level text for a refresher on multivariate regression modeling and provides a less advanced and introductory treatment of some of the concepts.)
3. Marno Verbeek, *A Guide to Modern Econometrics*, Wiley, 2nd Edition, 2004.
Denoted "MV".
4. Jeffrey M. Wooldridge, *Econometric Analysis of Cross-Section and Panel Data*, MIT Press, 2nd Edition, 2010
Denoted "JW".

Additional reference (not required)

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

SOFTWARE

A standard statistical software package such as STATA will be required and used throughout the course. We will learn how to estimate each of the techniques using STATA. Assignments and the empirical research paper are expected to be completed using STATA.

GRADING

STATA-based Assignments	20%
Article Presentation	20%
Midterm Exam	20%
Empirical Research Paper - Report	30%
Empirical Research Paper - Presentation	10%

Assignments

Problem sets will be posted on the Blackboard site, and will consist of data analyses and applications/interpretations/diagnostics of the microeconomic methods. They will require the use of STATA.

Article Presentation

Each student will present and lead the discussion on at least one applied journal article that utilizes the microeconomic methods we will learn in the course. The presentation should summarize the article, including the data, empirical challenges encountered, and the reasons underlying the choice of the econometric methods, as well as include a critique of the article. Presentations will be scheduled alphabetically.

Midterm Exam

There will be one in-class midterm exam, which will test basic understanding of the concepts and material that we cover in class.

Empirical Research Paper

The paper is due on the final day of class (May 4th). The paper will address some particular research question in empirical microeconomics or any business discipline. It should formulate and state the research question, identify and assemble the data for the analyses, identify and apply the appropriate econometric methods (which must comprise at least one of the methods that we cover in this course), and discuss the results and any limitations of the analyses. Students will present their paper to the class on the final day.

TENTATIVE COURSE OUTLINE

WEEK 1-2 Introduction & Foundations

- Maximum likelihood estimation
- Refresher on multivariate regression modeling & OLS
- Binary outcomes: OLS vs. Logit vs. Probit
- Expected outcomes framework and counterfactuals
- Endogeneity and selection bias
- Identification problem & observational data

Matching methods / propensity score
Introduction to STATA

Readings: AP Chs. 1-2, 3 (omit 3.4.1 & 3.4.3)
SW Chs. 1, 4-9 (Refresher on multivariate regression models)
MV Ch. 2
Guo, Barth and Gibbons (*Children and Youth Services Review*, 2006)

WEEK 3 Panel Data Methods

Pooled cross sections & longitudinal data structures
Fixed effects vs. random effects
Differenced models
Hausman test
Dynamic linear models
Non-standard standard errors
Clustering and serial correlation within panels

Article Presentation

Readings: AP Ch. 5 (p. 221-227)
SW Ch. 10
MV Ch. 10
JW Ch. 10
Cerem Yoruk "Job Satisfaction of Young Employees: Do Supervisors' Age, Gender and Race Matter?", 2014 *EEJ Conference Paper*.
M. Moh'd, L. Perry, and J. Rimbey "The Impact of Ownership Structure on Corporate Debt Policy: A Time-Series, Cross-Sectional Analysis," *The Financial Review*, 85-98, Vol. 33, 1998.

WEEK 4-5 Difference-in-Differences (DD) Models

Simple & conditional DD estimator
Counterfactual & common trends assumption
Diagnostics & event study
Synthetic controls
Propensity-score weighted DD estimator**
Falsification / Placebo checks

Article Presentations

Readings: AP Ch. 5
SW Ch. 13
Abadie, A., A. Diamond, and J. Hainmueller. "Synthetic Control Methods for Comparative Case Studies: Estimating the Effect of California's Tobacco Control Program." *Journal of the American Statistical Association* 105 (2010): 493-505.

Card and Krueger. "Minimum Wages and Employment: A Case Study of the Fast-Food Industry in New Jersey and Pennsylvania," *American Economic Review*, 1994.

Dave, Reichman, and Corman, "Effects of Welfare Reform on Educational Acquisition of Young Adult Women," *Journal of Labor Research*, 33(2): 251-282, 2012

WEEK 6-7 Instrumental Variables (IV)

Causal inference

IV in practice & 2SLS

Diagnostics

Reduced forms, ITT vs. LATE

Endogenous Treatment Effects

Bivariate Probit

Dynamic Panel GMM Estimator (Arellano-Bond)

Article Presentations

Readings: AP Ch. 4
SW Ch. 12
MV Ch. 5
JW Chs 5, 6.2

J. Angrist, and A. Krueger. "Instrumental Variables And The Search For Identification: From Supply And Demand To Natural Experiments," *Journal of Economic Perspectives*, 15(4), 69-85, 2001.

B. Baltagi. "Dynamic Panel Data Methods," *Econometric Analysis of Panel Data*, 2008.

J. Angrist, and A. Krueger, "Does Compulsory School Attendance Affect Schooling and Earnings?" *Quarterly Journal of Economics*, 106(4): 979-1014, 1991.

Dave, Rashad, and Spasojevic "The Effects of Retirement on Physical and Mental Health Outcomes," *Southern Economic Journal*, 75(2): 497-523, 2008.

N. Doytch and M. Uctum "Does the worldwide shift of FDI from manufacturing to services accelerate economic growth? A GMM estimation study," *Journal of International Money and Finance*, 30: 410-427, 2011.

R. Fisman and J. Svensson, "Are Corruption and Taxation Really Harmful to Economic Growth?" *Journal of Development Economics*, 83: 63-75, 2007.

M. McClellan, B. McNeil, and J. Newhouse, "Does More Intensive Treatment of Acute Myocardial Infarction in the Elderly Reduce Mortality?," *Journal of the American Medical Association*, 272(11), 1994.

WEEK 8 Regression Discontinuity Design (RDD)

Sharp vs. fuzzy RDD
Fuzzy RDD as IV
Parametric / functional forms
Non-parametric local linear regression
Optimal bandwidth

Finalize topic & plan for empirical research paper
Problem Set I (Panel Data, DD/DDD, IV) Due
Article Presentation

Readings: AP Ch. 6
Imbens, Guido and Thomas Lemieux. "Regression discontinuity designs: A guide to practice." *Journal of Econometrics* 142, 2 (2008): 615-635.
Carpenter and Dobkin. "The Effect of Alcohol Consumption on Mortality: Regression Discontinuity Evidence from the Minimum Drinking Age," *American Economic Journal-Applied Economics*, 1(1): 164-182, 2009.
Card, Dobkin, and Maestas. "Does Medicare Save Lives," *The Quarterly Journal of Economics*, 124(2), 597-636.
D. Almond, J. Doyle, Jr. et al. "Estimating marginal returns to medical care: evidence from at-risk newborns," *Quarterly Journal of Economics*, 2010.
R. Hjalmarsson, "Juvenile Jails: A Path to the Straight and Narrow or to Hardened Criminality?," *Journal of Law and Economics*, 52(4): 779-809, 2009.

WEEK 9 Midterm Exam

Article Presentation

WEEK 10-11 Limited Dependent Variables

Count Data Models
Poisson regression model
Negative binomial model
Categorical outcomes
Multinomial logit
Independence of Irrelevant Alternatives
Conditional logit
Ordered probit

Article Presentations

Readings: MV Ch. 7

A. C. Cameron & P. Trivedi, "Models of Count Data"
Microeconometrics: Methods and Applications, 2005.
A. C. Cameron & P. Trivedi, "Multinomial Models",
Microeconometrics: Methods and Applications, 2005.

WEEK 12 Heckman Sample Selection

Sample selection bias
Tobit model
Heckman sample selection model
Exclusion restriction vs. functional form identification
Two-part models

Article Presentation

Readings: MV Ch. 7
Manning, W.G., Duan, N., and Rogers, W.H. "Monte Carlo Evidence on the Choice between Sample Selection and Two-Part Models,"
Journal of Econometrics, 35(1): 59-82, 1987.

WEEK 13 Heterogeneous Effects

Moderators & interactions
Quantile regression
Finite mixture models

Article Presentation

Readings: P. Deb & P. Trivedi, "Demand for Medical Care by the Elderly: A Finite Mixture Approach," Journal of Applied Econometrics, 12(3), 1997.

WEEKS 14 -15 Special Topics

Mediation analysis
Dealing with missing data & top-coding
Multiple imputations

Article Presentation

Problem Set 2 (RDD, Limited Dependent Variables, Heterogeneity) Due

Readings: Baron, R. M. and Kenny, D. A. (1986) "The Moderator-Mediator Variable Distinction in Social Psychological Research – Conceptual, Strategic, and Statistical Considerations", [Journal of Personality and Social Psychology](#), Vol. 51(6), pp. 1173–1182.
J. Gelbach, "When do Covariates Matter? And Which Ones, and How Much?", Working Paper, University of Arizona (forthcoming, Journal of Labor Economics)

Empirical Research Paper due last day of class (May 4th)
Presentations (May 4th)

**** Tentative topics may change depending on the pace of the class.**