Topics in Applied Econometrics

Summer 2012

Instructor: Yinghua He

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Location: TBD.

Course Summary This course mainly covers structural approaches to empirical studies. It focuses on three topics: (1) treatment effects and policy evaluation; (2) static discrete choice models; and (3) dynamic discrete choice models. The objective of the course is to familiarize students with these econometric methodologies. At the end of the course, students are expected to know how to interpret the results in an empirical study, how to provide constructive criticism, and how to carry out an empirical research project. Classes will be run as a mixture of lecture and reading group.

Course Requirements

1. Textbook: There is no required textbook. I recommend the "What's New in Econometrics?" (WNiE) Lectures by Imbens and Wooldridge, which are available at the NBER website.

2. There will be one problem set assigned.

3. One referee report will be assigned. You will need to complete the referee report along with a cover letter summarizing your analysis. One of the goals is learn how to read papers for the purpose of providing **constructive** criticism.

4. An in-class presentation of your research proposal is required.

The research proposal will consist of: a clearly defined question; motivation of why the question is interesting in economics; a synthesis of relevant background literature focusing on the points most germane to the question at hand; an overview of the data to be used to analyze the question; preliminary results; and a discussion of next steps.

Steps in the development of the research proposal: A list of 2-3 possible research questions, each with a paragraph explaining why it is interesting, should be handed in no later than **July 26**. Meetings with the instructor will be arranged on July 27 to discuss the choice of research topics. You must provide a synthesis of the literature, identify a data set, and produce a table of means of relevant variables by **August 13**. The proposal will be presented during the last meeting of the class, **August 21**.

Grading The grading will be based on: The development of a research proposal (30%); problem sets (20%); a referee report (20%); and class participation (15%). Another 5% will be

awarded if your advisor and/or other faculty members participate in your final presentation. The remaining 10% will be rewarded based on the instructor's subjective evaluation of your performance during classes. **No late assignment will be accepted.**

Schedule The class meets at the following times:

1. July 24, 3-5pm
2. July 25, 2-5pm
3. July 26, 2-5pm – Discussion of assigned papers; List of research questions due
4. July 27, 2-5pm – A problem set will be assigned
5. August 13, 2-5pm – Preliminary research proposal due
6. August 15, 2-5pm – Discussion of assigned papers
7. August 16, 2-5pm – Problem set due
8. August 17, 2-5pm
9. August 20, 2-5pm – Discussion of assigned papers
10. August 21, 2-5pm – Presentation of research proposals

Course Outline

Papers with * will be discussed during the class meetings.

1 July 24: Introduction

1.1 Identification, Estimation, Consistency, and Inference

Manski, Charles F. 1986. "Analog Estimation of Econometric Models," in R. F. Engle and D. McFadden (ed.), Handbook of Econometrics. North-Holland: Elsevier, Volume 4, Chapter 43, 2559-82.

1.2 Interpretation of Estimation Results: Causal Effect

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

Freedman, David A. 1991. "Statistical Models and Shoe Leather." Sociological Methodology, 21, pp. 291-313.

Angrist, Joshua D. and Alan B. Krueger. 1999. "Empirical Strategies in Labor Economics," In Handbook of Labor Economics, ed. O. Ashenfelter and D. Card, 1277-366. Amsterdam: Elsevier.

Einav, Liran and Jonathan Levin. 2010. "Empirical Industrial Organization: A Progress Report." Journal of Economic Perspectives, 24(2), pp. 145-62.

1.3 Carrying out An Empirical Research Project

Wooldridge, Jeffrey, 2008. Introductory Econometrics: A Modern Approach, 4th Edition, Chapter 19, South-Western College Pub.

1.4 Computation, Simulation, and Numerical Methods

Lecture notes.

Judd, Kenneth L. 1998. Numerical Methods in Economics. Cambridge: MIT Press.

Train, Kenneth. 2009. Discrete Choice Methods with Simulation. Cambridge: Cambridge University Press.

Gourieroux, Christian and Alain Monfort. 1997. Simulation-Based Econometric Methods. Oxford: Oxford University Press.

2 July 25 and 26: Treatment Effect and Policy Evaluation

2.1 Overview

WNiE Lecture 1.

Leamer, Edward E. 1983. "Let's Take the Con out of Econometrics." American Economic Review, 73(1), 31-43.

Angrist, Joshua D. and Jorn-Steffen Pischke. 2010. "The Credibility Revolution in Empirical Economics: How Better Research Design Is Taking the Con out of Econometrics." Journal of Economic Perspectives, 24(2), pp. 3-30. [and comments in the same issue of JEP]

Imbens, Guido W. and Jeffrey M. Wooldridge. 2009. "Recent Developments in the Econometrics of Program Evaluation." Journal of Economic Literature, 47(1), 5-86.

Heckman, James J. 2010. "Building Bridges between Structural and Program Evaluation Approaches to Evaluating Policy." Journal of Economic Literature, 48(2), 356-98.

2.2 Before-After and Difference-in-Difference

WNiE Lecture 10.

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

Einav, Liran, Mark Jenkins, and Jonathan Levin. 2009. "The Impact of Information Technology on Consumer Lending." Unpublished paper, Stanford University.

Hastings, Justine S. and Richard J. Gilbert. 2005. "Market Power, Vertical Integration and the Wholesale Price of Gasoline." Journal of Industrial Economics, 53(4), 469-92.

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.

2.3 Regression Discontinuity

WNiE Lecture 3.

Hahn, Jinyong; Petra Todd and Wilbert van der Klaauw. 2001. "Identification and Estimation of Treatment Effects with a Regression-Discontinuity Design." Econometrica, 69(1), 201-09.

Imbens, Guido W. and Thomas Lemieux. 2008. "Regression Discontinuity Designs: A Guide to Practice." Journal of Econometrics, 142(2), pp. 615-35.

*Lee, David S. 2008. "Randomized Experiments from Non-Random Selection in U.S. House Elections." Journal of Econometrics, 142(2), 675-97.

2.4 Matching

Heckman, James J.; Hidehiko Ichimura and Petra Todd. 1998. "Matching as an Econometric Evaluation Estimator." Review of Economic Studies, 65(2), 261-94.

2.5 Instrumental Variable/Selection

WNiE Lecture 5.

Imbens, Guido W. and Joshua D. Angrist. 1994. "Identification and Estimation of Local Average Treatment Effects." Econometrica, 62(2), 467-75.

Angrist, Joshua D. and Guido W. Imbens. 1995. "Two-Stage Least Squares Estimation of Average Causal Effects in Models with Variable Treatment Intensity." Journal of the American Statistical Association, 90(430), 431-42.

Angrist, Joshua D.; Guido W. Imbens and Donald B. Rubin. 1996. "Identification of Causal Effects Using Instrumental Variables." Journal of the American Statistical Association, 91(434), 444-55.

Heckman, James J. and Edward Vytlacil. 2005. "Structural Equations, Treatment Effects, and Econometric Policy Evaluation." Econometrica, 73(3), 669-738.

Heckman, James J.; Sergio Urzua and Edward Vytlacil. 2006. "Understanding Instrumental Variables in Models with Essential Heterogeneity." Review of Economics and Statistics, 88(3), 389-432.

*Acemoglu, D.; S. Johnson and J. A. Robinson. 2001. "The Colonial Origins of Comparative Development: An Empirical Investigation." American Economic Review, 91(5), 1369-401.

3 July 27 and August 13 and 15: Static Discrete Choice Model

WNiE Lecture 11.

McFadden, Daniel. 2001. "Economic Choices." American Economic Review, 91(3), pp. 351-78.

Train, Kenneth. 2009. Discrete Choice Methods with Simulation. Cambridge: Cambridge University Press.

McFadden, Daniel and Kenneth Train. 2000. "Mixed Mnl Models for Discrete Response." Journal of Applied Econometrics, 15(5), pp. 447-70.

Berry, Steven T. 1994. "Estimating Discrete-Choice Models of Product Differentiation." RAND Journal of Economics, 25(2), pp. 242-62.

Berry, Steven T.; James Levinsohn and Ariel Pakes. 1996. "Automobile Prices in Market Equilibrium." Econometrica, 63(4), pp. 841 - 90.

Nevo, Aviv. 2000. "A Practitioner's Guide to Estimation of Random-Coefficients Logit Models of Demand." Journal of Economics & Management Strategy, 9(4), pp. 513-48.

Nevo, Aviv. 2010. "Empirical Models of Consumer Behavior." Annual Review of Economics, Vol. 3: 51-75

Bayer, Patrick; Fernando Ferreira and Robert McMillan. 2007. "A Unified Framework for Measuring Preferences for Schools and Neighborhoods." Journal of Political Economy, 115(4), pp. 588-638.

Hastings, Justine; Thomas Kane and Douglas Staiger. 2008. "Heterogeneous Preferences and the Efficacy of Public School Choice." Mimeo, Yale University.

*Leslie, Phillip. 2004. "Price Discrimination in Broadway Theater." The RAND Journal of Economics, 35(3), 520-41.

*Gentzkow, Matthew. 2007. "Valuing New Goods in a Model with Complementarity: Online Newspapers." American Economic Review, 97(3), 713-44.

4 August 16, 17, and 20: Dynamic Discrete Choice Model

Aguirregabiria, Victor and Pedro Mira. 2010. "Dynamic Discrete Choice Structural Models: A Survey." Journal of Econometrics, 156(1), pp. 38-67.

4.1 The Rust Approach

Rust, John. 1987. "Optimal Replacement of GMC Bus Engines: An Empirical Model of Harold Zurcher." Econometrica, 55(5), pp. 999-1033.

Hotz, V. Joseph and Robert A. Miller. 1993. "Conditional Choice Probabilities and the Estimation of Dynamic Models." Review of Economic Studies, 60(3), pp. 497-529.

Arcidiacono, Peter and Paul B. Ellickson. 2011. "Practical Methods for Estimation of Dynamic Discrete Choice Models." Annual Review of Economics.

Arcidiacono, Peter and Robert A. Miller. 2010. "CCP Estimation of Dynamic Discrete Choice Models with Unobserved Heterogeneity", Working Papers, Duke University.

*Rust, John and Christopher Phelan. 1997. "How Social Security and Medicare Affect Retirement Behavior in a World of Incomplete Markets." Econometrica, 65(4), 781-832.

4.2 The Eckstein-Kean-Wolpin Approach

Eckstein, Zvi and Kenneth I. Wolpin. 1989. "Dynamic Labour Force Participation of Married Women and Endogenous Work Experience." Review of Economic Studies, 56(3), pp. 375-90.

Keane, Michael P. and Kenneth I. Wolpin. 1997. "The Career Decisions of Young Men." Journal of Political Economy, 105(3), pp. 473-522.

Adda, Jerome; Christian Dustmann; Costas Meghir and Jean-Marc Robin. 2010. "Career Progression and Formal Versus on-the-Job Training," In IFS Working Papers. Institute for Fiscal Studies.

*Stange, Kevin M. "An Empirical Examination of the Option Value of College Enrollment." forthcoming, American Economic Journal: Applied Economics .

Discussion Questions for Papers

When reading an empirical paper, try to think about the following questions:

1. Research question

   - What is the research question (in one sentence)?
   - How does the research question relate to existing theoretical and empirical literature?
   - Why is it (not) worth asking?

2. Data

   - What are the data being used here?
   - How were they collected?
   - What are the important variables?
   - How are they defined?
   - What is the unit of observation?

3. Empirical strategy

   - What would the ideal data set look like (outcome and explanatory variables)? What empirical strategy would you use on it?
   - How is the data set in this paper different from that ideal data set?
   - What is the empirical strategy used in the paper?
   - How does identification work in this paper?
   - What are the sources of exogenous variation?
   - How much of the identification is coming from the model and how much from the data?

4. Econometric techniques

   - What econometric techniques are being used in this paper?
   - Are they appropriate?
   - What is the central estimating equation (or equations)?
   - What is assumed to be exogenous and endogenous? What is in the unobservable term?
   - What are the instruments being used? Do you think they are valid?
   - Are you worried about any of the assumptions that are needed for identification?

5. Results

   - What are the main conclusions of the author?
   - What alternative interpretations of the results are plausible?
   - Does the author test his/her conclusions against alternative interpretations or provide any practical reason why they are less likely?