

Econ 372, PP 482: Analysis of Microeconomic Data I

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Class Time: 10:30- 11:50 M,W room 289A

Course Objectives: To introduce students to methods of analyzing microeconomic data.

Readings: You should buy copies of the texts:

A. Colin Cameron and Pravin K. Trivedi, (CT). *Microeconometrics: Method and Applications*

Joshua D. Angrist and Jörn-Steffen Pischke “*Mostly Harmless Econometrics: An Empiricists’s Companion*

These books are available on Chalk:

Angus Deaton, *The Analysis of Household Surveys: A Microeconomic Approach to Development* [on Chalk]

Stephen Pudney, *Modelling Individual Choice: The Econometrics of Corners, Kinks, and Holes* [on Chalk]

James J. Heckman, Robert J. Lalonde and Jeffrey A. Smith (HLS). 1999. “The Economics and Econometrics of Active Labor Market Programs,” in *Handbook of Labor Economics*, Volume 3, eds. Orley Ashenfelter and David Card. Amsterdam: North-Holland.

Grades:

I will assign grades for this the course on the basis of homework assignments given through the term, a midterm, and final.

Homeworks	40%
Midterm	30%
Final	30%

Tentative Schedule:

September

- 26 Data, sampling, stratification, and weights
- 28 Sampling, stratification, and weights

October

- 3 Nonresponse and attrition
- 5 Combining data from multiple sources
- 10 Proxy variables and measurement error: theory
- 12 Proxy variables and measurement error :examples
- 17 Proxy variables and measurement error : IRT
- 19 Binary choice and IPW
- 24 Binary choice and IPW
- 26 Matching
- 31 Matching

November

- 2 Matching
- 7 Support and the regression discontinuity design
- 9 Experiments
- 14 Identification with observational data and exclusion restrictions
- 16 IV estimation
- 21 IV estimation
- 23 Control functions
- 28 Control functions
- 30 Control functions

December

- x Final, 12:00 to 4:00 in 289B

Readings:

1. Sampling, Missing Data, and Attrition

Core Readings:

Deaton, 1.1 to 1.2 and 1.2 to 1.4; 2.1 to 2.2
 Pudney, Chapter 1
 CT, chapters, 24 and 27.

Dan Black, Yu-Chieh Hsu, Seth Saners, and Lowell Taylor. “Black-White Mortality Differences by State of Birth: Estimates that Combine Census and Vital Statistics Data”

Christopher Bollinger and Barry Hirsch. “Match Bias in the Earnings Imputations in Current Population Survey: The case of Imperfect Matching” *Journal of Labor Economics* July 2006 24(3) 483-520.

David Brownstone and Robert Valletta. “The Bootstrap and Multiple Imputations: Harnessing Increased Computer Panel for Improved Statistical Test” *Journal of Economic Perspectives* 15(4) 129-41.

Lee Lillard, James P. Smith, and Finis Welch. “What Do We Really Know about Wages? The Importance of Nonreporting and Census Imputation” *Journal of Political Economy* June 1986 94(3:1) 489-506.

Jeffrey M. Wooldridge. “Inverse Probability Weighted Estimation for General Missing Data Problems” *Journal of Econometrics* 141(2) December 2007 1281-1301.

Supplemental readings:

Joel Horowitz and Charles Manski. “Censoring of Outcomes and Regressors due to Survey Nonresponse” *Journal of Econometrics* 84 1998 37-58.

Gary King, James Honaker, Anne Joseph, and Kenneth Scheve. “Listwise Deletion is Evil: What to do About Missing Data in Political Science” Unpublished paper, Harvard, July 13, 1998.

Donald B. Rubin. *Multiple Imputations for Nonresponse in Sample Surveys*. New York: Wiley, 1987.

Jeffrey M. Wooldridge “Inverse probability weighted M-estimation for sample selection, attrition, and stratification” *Portuguese Economic Journal* 1 2002 117–139.

Jeffrey M. Wooldridge. “Asymptotic Properties of Weighted M-Estimators for Variable Probability Samples” *Econometrica* 67(7) November 1999 1385-1406.

2. Measurement problems and measurement error

Core Readings:

CT, chapter 26.

Dan Black, Seth Sanders, and Lowell Taylor. “Measurement of Higher Education in the Census and CPS” *Journal of the American Statistical Association* September 2003 98(463) 545-54.

Dan Black and Jeff Smith. “Estimating the Returns to College with Multiple Proxies for Quality” *Journal of Labor Economics* 24(3) July 2006 701-28.

Christopher Bollinger. “Measurement Error in Human Capital and the Black-White Wage Differential” *Review of Economics and Statistics* August 2003 578-85.

John Bound, Charles Brown, and Nancy Mathiowetz. "Measurement Error in Survey Data" *Handbook of Econometrics, Volume 5*. Edited by J Heckman and E Leamer, 2001.

James Heckman and Paul LaFontaine. "The American High School Graduation Rate: Trends and Levels"

Zvi Griliches. "Economic Data Issues" *Handbook of Econometrics, Volume 3*. Edited by Z. Griliches and M.D. Intriligator. Amsterdam: Elsevier Science Publishers BV, 1986

Klaas Sijtsma. "On the Use, the Misuse, and the Very Limited Usefulness of Cronbach's Alpha" *Psychometrika* 74(1) March 2009 107-20.

Klaas Sijtsma and Brian W. Junker. "Item Response Theory: Past Performance, and Future Expectations" *Behaviormetrika* 33(1) 2006 75-102.

Supplemental readings:

John M. Barron, Mark C. Berger, and Dan A. Black. "How Well Do We Measure Training?" *Journal of Labor Economics* July 1997 507-28

Dan Black, Mark Berger, and Frank Scott. "Bounding Parameter Estimates with Non-Classical Measurement Error" *Journal of the American Statistical Association* 95(451) September 2000 739-48.

Christopher R. Bollinger. "Measurement Error in the CPS: A Nonparametric Look" *Journal of Labor Economics* 16 1998 576-594.

Christopher R. Bollinger. "Bounding Mean Regressions When a Binary Regressor is Mismeasured" *Journal of Econometrics* 73 1996 387-99.

John Bound, Charles Brown, Greg J. Duncan, and Willard L. Rodgers. "Evidence on the Validity of Cross-sectional and Longitudinal Labor Market Data" *Journal of Labor Economics* 12 July 1994.

John Bound and Alan Krueger. "The Extent of Measurement Error in Longitudinal Earnings Data: Do Two Wrongs Make a Right?" *Journal of Labor Economics* 9(1) January 1991 1-24.

David Card. "The Effect of Unions on Wage Structure: A Longitudinal Analysis" *Econometrica* 64(4) July 1996 957-79.

Greg J. Duncan and Daniel H. Hill, "An Investigation of the Extent and Consequences of Measurement Error in Labor-Economic Survey Data" *Journal of Labor Economics* 3(4) October 1985 508-532.

Harley Frazis and Mark Loewenstein. "Estimating Linear Regressions with Mismeasured, Possibly Endogenous, Binary Explanatory Variables" *Journal of Econometrics* 117(1) November 2003 151-78.

James Heckman, Jora Stixrud, and Sergio Uzu. "The Effects of Cognitive and Noncognitive Abilities on Labor Market and Social Behavior" *Journal of Labor Economics* 24(3) July 2006 411-82.

Paul W. Holland and Paul R. Rosenbaum. “Conditional Association and Unidimensionality in Monotone Latent Variable Models” *Annals of Statistics* 14(4) (December 1986. 1523-1543

Brian W. Junker. “Conditional Association, Essential Independence and Monotone Unidimensional Item Response Models” *Annals of Statistics* 21(3) September 1993. 1359-1378

Brian W. Junker and Jules L. Ellis. “A Characterization of Monotone Unidimensional Latent Variable Models” *Annals of Statistics* 25(3) June 1997 1327-1343

Darren Lubotsky and Martin Wittenberg “Interpretation of Regressions with Multiple Proxies” *Review of Economics and Statistics* August 2006 88(3) 549-62

Willard Rodgers, Charles Brown, and Greg J. Duncan. “Errors in Survey Reports of Earnings, Hours Worked, and Hourly Wages.” *Journal of the American Statistical Association* 88 December 1993 1208-1218.

3. Binary choice models and IPW

Core Readings:

CT, chapter 14.

DiNardo, John, Nicole M. Fortin, and Thomas Lemieux,. “Labor Market Institutions and the Distribution of Wages, 1973-1992: A Semiparametric Approach” *Econometrica* 64(5) September 1996 1001-44

James J. Heckman “Discrete Dependent Variable Models” Class notes [on Chalk]

Hirano, Keisuke, Guido Imbens, and Gert Ridder. “Efficient Estimation of Average Treatment Effects using the Estimated Propensity Score” *Econometrica* 71(4) July 2003 1161-89.

Joel Horowitz and N.E. Savin. “Binary Response Models: Logits, Probits and Semiparametrics” *Journal of Economic Perspectives* 15(4) Autumn 2001 43-56.

Supplemental readings:

J. Aitchison and C. G. G. Aitken, 1976. “Multivariate Binary Discrimination by the Kernel Method” *Biometrika* 63(3) 413-20.

Dan Black, Amelia Haviland, Seth Sanders, and Lowell Taylor. “Gender Wage Disparities among the Highly Educated” *Journal of Human Resources* Summer 2008 42(3) 630-59.

Dan Black, Amelia Haviland, Seth Sanders, and Lowell Taylor. “Why Do Minority Men Earn Less? A Study of Wage Differentials among the Highly Educated” *Review of Economics and Statistics* May 2006 88(2) 300-13.

Matias Busso, John DiNardo, and Justin McCrary. “New Evidence on the Finite Sample Properties of Propensity Score Matching and Reweighting Estimators” IZA Working Paper 3998 February 2009.

Markus Frolich. “Finite-Sample Properties of Propensity-Score Matching and Weighting Estimators” *Review of Economics and Statistics* 86(1) February 2004 77-90.

Qi Li and Jeffrey Racine, 2007. *Nonparametric Econometrics: Theory and Practice* Princeton, NJ: Princeton University Press.

Min-Chiang Wang and John Van Ryzin, 1981. “A Class of Smooth Estimators for Discrete Distributions” *Biometrika* 68(1) 301-9.

4. Matching and Selection on Observables

Core Readings:

HLS, 1950-61.

James J. Heckman “Matching” Class notes [on Chalk]

Keisuke Hirano, Guido Imbens, and Gert Ridder. “Efficient Estimation of Average Treatment Effects using the Estimated Propensity Score” *Econometrica* 71(4) July 2003 1161-89.

Jeffrey A. Smith and Petra Todd. “Does Matching Overcome LaLonde’s Critique of Non-experimental Estimators” *Journal of Econometrics* 125(1-2) 2005 305-53

Supplemental readings:

Alberto Abadie and Guido Imbens, 2008. “On the Failure of the Bootstrap for Matching Estimators” *Econometrica* 76(6) 1537-57.

Dan Black and Jeffrey Smith. “How Robust is the Evidence on the Effects of College Quality? Evidence from Matching” *Journal of Econometrics* August 2004 121(1-2) 99-124

Matias Busso, John DiNardo, and Justin McCrary. “Finite Sample Properties of Semiparametric Estimators of Average Treatment Effects” Unpublished paper, University of Michigan, September 19, 2008.

Rajeev Dehejia and Sadek Wahba “Causal Effects of Nonexperimental Studies: Reevaluating the Evaluation of Training Programs” *Journal of the American Statistical Association* 94(448) December 1999 1053-62.

James J. Heckman, Hidehiko Ichimura and Petra E. Todd. “Matching as an Econometric Estimator” *Review Economic Studies* 65(2) April 1998 261-94.

James J. Heckman, Hidehiko Ichimura and Petra E. Todd “Matching As An Econometric Estimator: Evidence from Evaluating a Job Training Program” *Review of Economic Studies* 64(4) 1997 487-36.

James J. Heckman, Hidehiko Ichimura, Jeffrey A. Smith, and Petra Todd. 1998. “Characterizing Substitution Bias Using Experimental Data” *Econometrica* (66:5) September 1998 1017-98.

Jinyong Hahn. “On the Role of the Propensity Score in Efficient Semiparametric Estimation of Average Treatment Effects.” *Econometrica* 66(2) March 1998 315-331.

Guido W. Imbens. “Nonparametric Estimation of the Average Treatment Effects Under Exogeneity: A Review” *Review of Economics and Statistics* (86:1) February 2004 4-29.

Robert LaLonde. “Evaluating the Econometric Evaluations of Training Programs with Experimental Data,” *American Economic Review* 76(4): 604-620.

Qi Li and Jeffrey Racine, 2007. *Nonparametric Econometrics: Theory and Practice* Princeton, NJ: Princeton University Press.

Qi Li, Jeffrey Racine, and Jeffrey Wooldridge. “Efficient Estimation of Average Treatment Effects with Mixed Categorical and Continuous Data” *Journal of Business and Economic Statistics* 27(2) April 2009 206-223.

Wang-Sheng Lee, “Propensity Score Matching and Variations on the Balancing Test” unpublished paper University of Melbourne. October, 2009.

Jeffrey Racine, and Qi Li. . “Nonparametric Estimation of Regression Functions with Both Categorical and Continuous Data” *Journal of Econometrics* 119(1) March 2004 99-130.

Paul Rosenbaum and Donald Rubin. “The Central Role of the Propensity Score in Observational Studies for Causal Effects” *Biometrika* 70(1) April 1983 41-55.

5. Support issues and regression discontinuity design

Core Readings:

HLS, 1969-72.

Thomas Cook. “‘Waiting for Life to Arrive’: A History of Regression-Discontinuity Design in Psychology, Statistics, and Economics” *Journal of Econometrics* 142(2) 636-54.

Guido Imbens and Thomas Lemieux. “Regression Discontinuity Designs: A Guide to Practice” *Journal of Econometrics* 142(2) 2008. 615-635.

Lee, David S. and Lemieux. "Regression Discontinuity Designs in Economics" *Journal of Economic Literature* 48(2): 281-355

Supplemental readings:

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

Rafael Lalive. "How do Extended Benefits Affect Unemployment Duration? A Regression Discontinuity Approach" *Journal of Econometrics* 142(2) 2008 785-806.

David Lee. "The Electoral Advantage to Incumbency and Voters' Valuation of Politicians' Experience: A Regression Discontinuity of Elections to the House" *Journal of Econometrics* 142(2) 2008 675-97.

6. Experiments and identification with observational data

Core Readings:

HLS, 1899-1914.

Joshua D. Angrist and Jörn-Steffen Pischke. "The Credibility Revolution in Empirical Economics: How Better Research Design is Taking the Con out of Econometrics" *Journal of Economics Perspectives* 24(2) Spring 2010: 3-30.

Susan Clampet-Lundquist and Douglas Massey. "Neighborhood Effects on Economic Self-Sufficiency: A Reconsideration of the Moving to Opportunity Experiment" *American Journal of Sociology* 114(1) July 2008 107-43.

James J. Heckman. "Randomization as an Instrumental Variable" *Review of Economics and Statistics* May 1996 336-340.

Jens Ludwig, Jeffrey B. Liebman, Jeffrey R. Kling, Greg J. Duncan, Lawrence F. Katz Ronald C. Kessler, and Lisa Sanbonmatsu" "What Can We Learn about Neighborhood Effects from the Moving to Opportunity Experiment?" *American Journal of Sociology* 114(1) July 2008 144-88.

A. D. Roy "Some Thoughts on the Distribution of Earnings" *Oxford Economics Papers* (3:2) June 1951 135-146.

7. Instrumental variables estimation

Core Readings:

HLS, 1961-69.

Joshua D. Angrist and Alan B. Krueger. “Instrumental Variables and the Search for Identification: From Supply and Demand to Natural Experiments” *Journal of Economic Perspectives* (15:4) Autumn 2001 69-85.

Joshua Angrist, Guido W. Imbens, and Donald B. Rubin. “Identification of Causal Effects using Instrumental Variables” (with discussion) *Journal of the American Statistical Association* 91 1996 444-72.

James J. Heckman. “Instrumental Variables” *Journal of Human Resources* 32:3 Summer 1997 441-62.

Supplemental readings:

Joshua Angrist and William Evans. “Children and Their Parents' Labor Supply: Evidence from Exogenous Variation in Family Size” *American Economic Review* (88:3) June 1998 450-77.

Angus Deaton. “Instruments, Randomization, and Learning about Development” *Journal of Economic Literature* 48(2) June 2010: 424-55.

Dan Black, Kermit Daniel, and Seth Sanders. “The Impact of Economic Conditions on Disability Program Participation: Evidence from Coal Boom and Bust” *American Economic Review* March 2002 92(1) 27-50.

James J. Heckman. “Building Bridges Between Structural and Program Evaluation Approaches to Evaluating Policy” *Journal of Economic Literature* 48(2) June 2010: 356-98.

James J. Heckman and Sergio Urzua. “Comparing IV with Structural Models: What simple IV Can and Cannot Identify” *Journal of Econometrics* 156(1) May 2010: 27-37.

Guido W. Imbens and Joshua Angrist. “Identification and the Local Average Treatment Effects,” *Econometrica* (62:2) March 1994: 467-476.

Guido W. Imbens. “Better Late than Nothing: Some Comments on Deaton (2009) and Heckman and Urzua (2009)” *Journal of Economic Literature* 48(2) June 2010: 399-423.

Edward J. Vytlacil. “Independence, Monotonicity, and Latent Index Models: An Equivalence Result.” *Econometrica*, 70(1) January 2002: 331-41.

8. Selection and labor force participation

Core Readings:

CT, chapter, 16.

James J. Heckman. “Shadow Prices, Market Wages, and Labor Supply” *Econometrica* 42(3) July 1974 679-94.

James J. Heckman. "Sample Selection Bias as a Specification Error" *Econometrica* (47:1) January 1979 206-248.

Casey Mulligan and Rubenstein.

Francis Vella. "Estimating Models with Sample Selection Bias" *Journal of Human Resources* 33(1) Winter 1998 127-69.

Supplemental readings:

Hyungtaik Ahn and James L. Powell. "Semiparametric estimation of censored selection models with a nonparametric selection mechanism" *Journal of Econometrics* 58 (1993) 3-29.

Mitlai Das, Whitney Newey, and Frank Vella. "Nonparametric Estimation of Sample Selection Models" *Review of Economic Studies* 70(1) January 2003 33-58.

J.P. Florens, J.J. Heckman, C. Meghir, and E. Vytlacil. "Identification of Treatment Effects Using Control Functions in Models with Continuous, Endogenous Treatment and Heterogeneous Effects" *Econometrica* 76(5) September 2008 1191-1206.

John Garen. "The Returns to Schooling: A Selectivity Bias Approach with a Continuous Choice Variable" *Econometrica* 52 September 1984 1199-1218.

James Heckman. "Varieties of Selection Bias" *American Economic Review* 80(2) May 1990 313-18.

Charles F. Manski. "Anatomy of the Selection Problem," *Journal of Human Resources* 24 Summer 1989 341-360.

Whitney Newey, James Powell, and James Walker. "Semiparametric Estimation of Selection Models: Some Empirical Results" *American Economic Review* 80(2) May 1990 324-38.

Whitney K. Newey. "Consistency of Two-step Sample Selection Estimators Despite Misspecification of Distribution" *Economics Letters* 63 1999 129-132

Whitney K. Newey. "Two-Step Series Estimation of Sample Selection Models." Unpublished paper from his web site

Randall J. Olsen. "A Least Squares Correction for Selectivity Bias" *Econometrica* 48(7) November 1980 1815-1820