

Program Evaluation Methods

Manuel Arellano

2014-15

Program

1. Empirical approaches, potential outcomes, and causality
 - 1.1. Structural and treatment effect approaches.
 - 1.2. Descriptive analysis vs. causal inference.
 - 1.3. Potential outcomes and causality.
2. Social experiments
 - 2.1. Experimental testing of welfare programs in the US.
 - 2.2. Employment effects of job and earnings subsidies.
 - 2.3. Experimental evaluation of labor histories.
 - 2.4. Using experiments and models for ex ante evaluation.
3. Matching
 - 3.1. Exogeneity, matching, and multiple regression.
 - 3.2. Methods based on the propensity score.
 - 3.3. The common support condition.
 - 3.4. Quantile treatment effects
4. Instrumental variables
 - 4.1. Instrumental variable estimation using natural experiments.
 - 4.2. Interpreting IV estimates when effects are heterogeneous.
 - 4.3. Local average treatment effects and marginal treatment effects.
 - 4.4. Estimating the distributions of potential outcomes.
 - 4.5. The econometric selection model.
5. Regression-discontinuity
 - 5.1. Identification from discontinuities in assignment rules.
 - 5.2. Parametric and semiparametric estimation methods.
 - 5.3. Financial aid offers and college enrollment decisions.
6. Differences in differences and synthetic controls
 - 6.1. Comparisons based on policy changes.
 - 6.2. Identifying the average treatment effect for the treated.
 - 6.3. Changes in the distribution of effects vs. changes in means.
 - 6.4. Synthetic control methods.

Readings

Lesson 1: Empirical approaches, potential outcomes, and causality

- General

- 1) Angrist, J. and A. Krueger (2000): “Empirical Strategies in Labor Economics”, *Handbook of Labor Economics*, O. Ashenfelter and D. Card (eds.), North Holland, 1277-1366.
- 2) Heckman, J. J. (2001): “Micro Data, Heterogeneity, and the Evaluation of Public policy: Nobel Lecture”, *Journal of Political Economy*, 109, 673-748.
- 3) Meyer, B. (1995): “Natural and Quasi-experiments in Economics”, *Journal of Business and Economic Statistics*, 13, 151-161.

- Potential outcomes and causality

- 1) Holland, P. W. (1986): “Statistics and Causal Inference”, *Journal of the American Statistical Association*, 81, 945-970.
- 2) Rubin, D. B. (1974): “Estimating Causal Effects of Treatments in Randomized and Nonrandomized Studies”, *Journal of Educational Psychology*, 66, 688-701.

Lesson 2: Social experiments

- 1) Banerjee, A. and E. Duflo (2009): “The Experimental Approach to Development Economics”, *Annual Review of Economics*, 1, 151-178.
- 2) Duflo, E., R. Glennerster, and M. Kremer (2008): “Using Randomization in Development Economics Research: A Toolkit”. In T.P. Schultz and J. Strauss (eds.): *Handbook of Development Economics*, Vol. 4, 3895-3962.
- 3) Card, D. and D. R. Hyslop (2005): “Estimating the Effects of a Time-Limited Earnings Subsidy for Welfare-Leavers”, *Econometrica*, 73, 1723-1770.
- 4) Ham, J. C. and R. J. LaLonde (1996): “The Effect of Sample Selection and Initial Conditions in Duration Models: Evidence from Experimental Data on Training”, *Econometrica*, 64, 175-205.
- 5) LaLonde, R. J. (1995): “Evaluating the Econometric Evaluations of Training Programs with Experimental Data”, *American Economic Review*, 76, 604-620.
- 6) Moffitt, R. A. (2004): “The Role of Randomized Field Trials in Social Science Research: A Perspective from Evaluations of Reforms of Social Welfare Programs”, *American Behavioral Scientist*, 47(5), 506-540.
- 7) Schorfheide, F. and K. I. Wolpin (2012): “On the Use of Holdout Samples for Model Selection”, *American Economic Review: Papers and Proceedings*, 102(3), 477-481.
- 8) Todd, P. E. and K. I. Wolpin (2006): “Assessing the Impact of a School Subsidy Program in Mexico: Using a Social Experiment to Validate a Dynamic Behavioral Model of Child Schooling and Fertility”, *American Economic Review*, 96, 1384-1417.

Lesson 3: Matching

- 1) Firpo, Sergio (2007): “Efficient Semiparametric Estimation of Quantile Treatment Effects”, *Econometrica*, 75, 259–276.
- 2) Heckman, J. J., H. Ichimura, and C. Taber (1997): “Matching as an Econometric Evaluation Estimator: Evidence from Evaluating a Job Training Programme”, *Review of Economic Studies*, 64, 605-654.

- 3) Imbens, G. (2004): “Nonparametric Estimation of Average Treatment Effects Under Exogeneity: A Review”, *Review of Economics and Statistics*, 86, 4-29.
- 4) Rosenbaum, P. R. and D. B. Rubin (1983): “The Central Role of the Propensity Score in Observational Studies for Causal Effects”, *Biometrika*, 70, 41-55.
- 5) Rubin, D. B. (2001): “Using Propensity Scores to Help Design Observational Studies: Application to the Tobacco Litigation”, *Health Services & Outcomes Research Methodology*, 2, 169-188.

Lesson 4: Instrumental variables

- 1) Imbens, G. W. and J. Angrist (1994): “Identification and Estimation of Local Average Treatment Effects”, *Econometrica*, 62, 467-475.
- 2) Imbens, G. W. and D. B. Rubin (1997): “Estimating Outcome Distributions for Compliers in Instrumental Variable Models”, *Review of Economic Studies*, 64, 555-574.
- 3) Abadie, A. (2002): “Bootstrap Tests for Distributional Treatment Effects in Instrumental Variable Models”, *Journal of the American Statistical Association*, 97, 284-292.
- 4) Vytlacil, E. (2002): “Independence, Monotonicity, and Latent Index Models: An Equivalence Results” *Econometrica*, 70, 331-341.
- 5) Heckman, J. J. and E. Vytlacil (2005): “Structural Equations, Treatment Effects, and Econometric Policy Evaluation”, *Econometrica*, 73, 669-738.
- 6) Angrist, J., G. Imbens, and K. Graddy (2000): “The Interpretation of Instrumental Variable Estimators in Simultaneous Equations Models with an Application to the Demand for Fish”, *Review of Economic Studies*, 67, 499-528.

Lesson 5: Regression-discontinuity

- 1) Card, D., R. Chetty, and A. Weber (2007): “Cash-on-Hand and Competing Models of Intertemporal Behavior: New Evidence from the Labor Market”, *Quarterly Journal of Economics*, 122, 1511-1560.
- 2) Hahn, J., P. Todd, and W. van der Klaauw (2001): “Estimation of Treatment Effects with a Quasi-Experimental Regression-Discontinuity Design”, *Econometrica*, 69, 201-209.
- 3) Van der Klaauw, W. (2002): “Estimating the Effect of Financial Aid Offers on College Enrollment: A Regression-Discontinuity Approach”, *International Economic Review*, 43, 1249-1287.
- 4) Angrist, J. and V. Lavy (1999): “Using Maimonides’ Rule to Estimate the Effect of Class Size on Scholastic Achievement”, *Quarterly Journal of Economics*, 114, 533-575.

Lesson 6: Differences in differences and synthetic controls

- 1) Abadie, A., A. Diamond, and J. 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, 493-505.
- 2) Card, D. and A. Krueger (1994): “Minimum Wages and Employment: A Case Study of the Fast Food Industry”, *American Economic Review*, 84, 772-793.

- 3) Meyer, B., K. Viscusi and D. Durbin (1995): “Workers’ Compensation and Injury Duration: Evidence from a Natural Experiment”, *American Economic Review*, 85, 322-340.
- 4) Athey, S. and G. W. Imbens (2006): “Identification and Inference in Nonlinear Difference-in-differences Models”, *Econometrica*, 74, 431-497.
- 5) Bertrand, M., E. Duflo, and S. Mullainathan (2004): “How Much Should We Trust Differences-in-Differences Estimates?”, *Quarterly Journal of Economics*, 119, 249-75.