Evaluating Social Programs: Econometric Cost-Benefit Analysis

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Course Description:

This part of the course will develop econometric methods that can be used for evaluating effects of active labor market policies, such as public-sector sponsored employment and training programs, job search assistance, and job subsidy programs, on outcomes such as earnings, employment, and educational and occupational attainment. Many of the empirical methods discussed have broader application to evaluating the effects of any type of intervention.

Two important questions that we will consider are (1) Do participants in programs benefit from them? and (2) What is the social return from the program? We will consider different approaches to answering these questions that recognizeheterogeneity in how individuals respond to treatment.

A major goal is to develop an understanding of the parameters of interest in evaluation studies and of the identifying assumptions needed to justify the application of different kinds of estimators. A second important goal is to understand the behavioral implications of different kinds of identifying assumptions, which enables an informed choice of which estimator to use in a particular circumstance.

Reading List:

The main reference for the course will be the following chapter:

*Heckman, James J., Lalonde, Robert J. and Smith, James A. (1999): "The Economics and Econometrics of Active Labor Market Programs" in *Handbook of Labor Economics*, Volume 3A, eds. Orley C. Ashenfelter and David Card.

Other papers and books that will be discussed in class include:

Fan, J. (1992): "Design Adaptive Nonparametric Regression," *Journal of the American Statistical Association*, 87, 998-1004.

*Hahn, J., Todd, P. and W. Van der Klauww (2001): ''Identification of Treatment Effects by Regression-Discontinuity Design," in *Econometrica*, February, 2001.

Heckman, J., H. Ichimura, J. Smith and P. Todd (1998): "Characterizing Selection Bias using Experimental Data" *Econometrica*, Vol. 66, September.

*Heckman, J., H. Ichimura and P. Todd (1997): "Matching as an Econometric Evaluation Estimator: Evidence from Evaluating a Job Training Program" with J. Heckman and H. Ichimura, *Review of Economic Studies*, Vol. 64(4), October.

*Heckman, J. and B. Honore (1990): "The Empirical Content of the Roy Model" *Econometrica,* 58, Sept. 1990

*Heckman, J. and E. Vytlacil (2000): "Local Instrumental Variables," NBER working paper.

Roy, R. D. (1951): "Some Thoughts on the Distribution of Earnings" in *Oxford Economic Papers,* Feb. 1951, Vol. 3.

*Rosenbaum and Rubin Rosenbaum, Paul and Donald Rubin. "The Central Role of the Propensity Score in Observational Studies for Causal Effects, "Biometrika, 70, 1983, 41-55.

Silverman, B.W. (1986) *Density Estimation for Statistics and Data Analysis* (London: Chapman and Hall).

*Smith, J. and P. Todd "Does Matching Overcome Lalonde's Critique of Nonexperimental Estimators?" manuscript available on http://athena.sas.upenn.edu/~petra

Smith, J. and P. Todd "Reconciling Conflicting Evidence on the Performance of Propensity Score Matching Estimators" in *American Economic Review, Papers and Proceedings*, May 2001.

Todd, Petra "A Practical Guide to Implementing Matching Estimators" Available on http://athena.sas.upenn.edu/~petra

Outline of Topics Covered in the Course

I. Lecture 1: "The Evaluation Problem"
   a. Parameters of interest in evaluations
   b. Different Sources of Bias in Evaluation Studies
   c. Three different assumptions on the selection into-treatment process and behavioral implications

II. Lecture 2: "Conventional Estimators and Randomization"

   a. Conventional Estimators
      i. Cross-section
      ii. Before-After
      iii. Difference-in-Differences
   b. Examples
   c. How randomization helps solve the evaluation problem
      i. Advantages and disadvantages of randomized vs. observational studies
         1. randomization bias
         2. contamination bias
         3. dropout bias
         4. intention-to-treat vs. receipt of treatment

III. Lecture 3: Matching Estimators
   a. Identifying assumptions
   b. Cross-sectional vs. difference-in-difference matching
   c. Different ways of choosing matches (nearest neighbor)

IV. Lecture 4: Implementing Matching Methods
   a. Resolving common support problems
   b. Matching with longitudinal data or multiple treatments
   c. Examples from JTPA, NSW
   d. Importance of data quality and of modeling of the selection into treatment process.

V. Lecture 5: Modeling Selection: Control function Methods
   a. The Roy Model
   b. Overview of results from Heckman and Honore (1990)
   c. How do control function estimators relate to matching estimators? Why are they more general?
   d. Semiparametric control function methods
      i. The partially linear model of Robinson (1988)
      ii. Identification in these models

e. Review of results from Heckman, Ichimura, Smith and Todd (EMA, 1998) paper

VI. Lecture 6: Regression-Discontinuity and IV Estimators
a. Definition
b. Parametric vs. Nonparametric
c. Examples