LABOR ECONOMICS 250A <u>PROVISIONAL</u> SYLLABUS Empirical Methods in Labor Economics UCSD

Fall 2004

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This first of three graduate labor courses focuses on the empirical methods used in labor (and other applied microeconomics fields). The course is designed to prepare you to read and evaluate empirical work in the other 2 graduate labor courses, 250B and 250C. However, the toolkit presented in this course will be useful for research in all areas of applied micro.

This course is intended to be both more and less than a course in applied econometrics. It is "less" in that we will not concentrate heavily on deriving properties of estimators, but, instead, we will focus on presenting a practical guide to the key statistical advantages and disadvantages of each technique. It is "more" than a course in applied econometrics in that, for each technique, we will study empirical examples in considerable detail. In this way, the course also will provide an introduction to many different areas of labor research.

In weeks 1-3 (Betts) we will begin by summarizing some of the main problems affecting empirical work, such as omitted variable bias, selectivity bias, endogeneity, and measurement error. We will then cover techniques to control for **selectivity bias** including the Heckman technique and propensity score matching. We will then discuss the use of **fixed effects** as a means of reducing omitted variable bias in panel data. Finally we will survey **natural experiments** and **difference in difference models** as a means of identifying causal parameters. In each case we will emphasize benefits and pitfalls of each approach, and will cover real-world examples.

In weeks 4-6 (Antonovics) we will discuss a number of recent papers that use **regression discontinuity** to identify causal effects and we will highlight the assumptions upon which identification relies. We will then turn to an analysis of both the strengths and weaknesses of employing **social experiments** to identify causal parameters. Finally, we will examine identification using **structural estimation**. We will start by reading Heckman's overview of identification techniques in both microeconomics and macroeconomics. We will work through the detail of Hilary Hoynes' 1995 paper and discuss two cutting-edge papers that use data from social experiments to estimate/calibrate/test structural models.

In weeks 6-9 (Berman) we will examine examples in which **instrumental variables** convincingly allow identification despite the presence of some flavor of omitted variable bias. The discussion will include the ideal experimental coefficient, overidentification and small sample bias. The provisional syllabus gives an incomplete list of examples. We will choose some more based on the student's fields of interest.

Requirements for the Course

Evaluation: A short, five-page empirical paper will be assigned, in which you will be required to engage a data set of your own choosing. In week 10, students will do short, in-class presentations of their results. The overall letter grade will depend on successful completion of the empirical paper and a final exam.

Students are encouraged to enroll on a letter grade basis. Students who enroll on an S/U basis must complete the empirical paper and the in-class presentation in week 10. Note: Many students have taken either 250A or its earlier numbering, 236B, from Professor Betts in the past. By university rules, students cannot enroll in this course if they have already completed one of these courses in an earlier year. The content in this fall's course is very similar to the first three weeks of 250 in the last few years, but this year we will cover this material in greater detail. Any student who has already taken 236B or 250A for a letter grade or on an S/U basis should consult with the professors about the possibility of sitting in informally. All other students must enroll on a letter grade or S/U basis.¹

¹ Students are encouraged to enroll on a letter grade basis. Students who enroll on an S/U basis must obtain the equivalent of a B- in the course. For all students, regardless of grading option chosen, successful (and on time) completion of the empirical paper and presentation in class in week 10 will earn a grade of B- overall for the course. Performance on the final exam will boost the letter grade above a B- in proportion to the percentage grade on the final exam.

Brief Syllabus

- 1. Omitted Variable Bias, Self-Selection, Endogeneity and Measurement Error: W1 L1 (Week 1 Lecture 1) -- All
- 2. Selectivity Correction and Propensity Score Matching: W1 L2 to W2 L1 -- Betts
- 3. Fixed Effects and Omitted Variable Bias: W2 L2 Betts
- 4. Natural Experiments/Difference-in-Difference Models: W3 Betts
- 5. Regression Discontinuity: W4 Antonovics
- 6. Social Experiments: W5 Antonovics
- 7. Structural Estimation: W6 Antonovics
- 8. Causal Inference and Experiments: W7 Berman
- 9. Instrumental Variable (IV) Method: W8 Berman
- 10. Measurement Error and other Data Issues: Week 9 Berman
- 11. Student Presentations of Empirical Projects: Week 10 -- All

A More Detailed Agenda

1. Introduction to the Central Problems of Omitted Variable Bias, Self-Selection, Endogeneity and Measurement Error

Angrist, Joshua and Alan Krueger (1999), "Empirical Strategies in Labor Economics," in the *Handbook of Labor Economics*, Vol. 3A, O. Ashenfelter and D. Card, eds. Amsterdam: Elsevier Science.

2. Selectivity Correction and Propensity Score Matching

- Rosenbaum, Paul and Donald Rubin (1983), "The Central Role of the Propensity Score in Observational Studies for Causal Effects", *Biometrika* 70:1, 41-55.
- Rosenbaum, Paul and Donald Rubin (1985), "Reducing Bias in Observational Studies Using Subclassification on the Propensity Score," *Journal of the American Statistical Association*, 79, pp. 516-524.
- Heckman, James (1976), "The Common Structure of Statistical Models of Truncation, Sample Selection and Limited Dependent Variables and a Simple Estimator for Such Models", *Annals of Economic and Social Measurement* 5:475-492.

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See Angrist and Krueger (1999) above. Case Study: The Returns to Education

Meyer, Bruce D. (1995), "Natural and Quasi-Experiments in Economics", Journal of Business and Economic Statistics, (13:2), pp. 151-161.

See also the Angrist and Krueger paper in Section 1.

Case Study #1: The Impact of Immigrants on Local Labor Markets Card, David (1990), "The Impact of the Mariel Boatlift on the Miami Labor Market", *Industrial and Labor Relations Review*, 43:245-257.

Case Study #2: Minimum Wages

Card, David and Alan B. Krueger (1994), "Minimum Wages and Employment - A Case Study of the Fast Food Industry in New Jersey and Pennsylvania", *American Economic Review*, (84:4), September.

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- Kennan, John (1995), "The Elusive Effects of Minimum Wages", *Journal of Economic Literature*, (33:4) (December).
- Neumark, David and William Wascher (1995), "The Effect Of New Jersey's Minimum Wage Increase On Fast-Food Employment: A Re-Evaluation Using Payroll Records", NBER Working Paper #5224. See also their article in *American Economic Review* December 2000 and reply by Card and Krueger in same issue.

Watson, Nadine (1996), Ph.D. Thesis, University of California, San Diego.

Case Study #3: TBA

5. Regression Discontinuity

- Angrist, Joshua and Alan Krueger, "Empirical Strategies in Labor Economics," in Handbook of Labor Economics, Volume 3A, North Holland, 1999, Chapter 23.
- Cook, Thomas and Donald Campbell, "The Regression-Discontinuity Design," in *Quasi-Experimentation, Design & Analysis Issues for Field Settings*, Houghton Mifflin, 1979, pp. 137-146.
- DiNardo, John and David Lee, "Economic Impacts of Unionization on Private Sector Employers: 1984-2001", NBER Working Paper 10598, July 2004
- Hahn, Jinyong, P. Todd and W. Van Der Klaauw (2001) "Identification and estimation of treatment effects with a regression-discontinuity design", *Econometrica*, Jan., 69:1, 201-209.
- Lee, David, "The Electoral Advantage of Incumbency and Voter's Valuation of Politician's Experience: A Regression Discontinuity Analysis of Elections to the U.S. House," NBER Working Paper 8441, August 2001
- Lemieux, Thomas and Kevin Milligan, "Incentive Effects of Social Insurance: A Regression Discontinuity Approach," NBER Working Paper 10541, June 2004

6. Social Experiments

- Burtless, Gary (1995) The Case for Randomized Field Trials in Economic and Policy Research," Journal of Economic Perspectives 9 (Spring), 63-84.
- Heckman, James, "Randomization as an Instrumental Variable," NBER Technical Working Paper 184, September 1995.
- Heckman, James and Jeffrey Smith, "Assessing the Case for Social Experiments," Journal of Economic Perspectives, Spring 1995, 9(2), pp. 85-110.
- LaLonde, Robert, "Evaluating the Econometric Evaluations of Training Programs With Experimental Data," American Economic Review, September 1986, 76(4), pp. 604-620.

7. Structural Estimation

Heckman, James, "Causal Parameters and Policy Analysis in Economics: A Twentieth Century Retrospective," Quarterly Journal of Economics, February 2000, 115(1), pp. 45-97
9. Instrumental Variable (IV) Method

Angrist, Joshua (1990), "Lifetime Earnings and the Vietnam Era Draft Lottery: Evidence from Social Security Records," American Economic Review, 80:3 (June).

Angrist, Joshua and Alan B. Krueger (1991), "Does Compulsory School Attendance Affect Schooling?" Quarterly Journal of Economics, 106, 979-1014.

Bound, John, David Jaeger and Regina Baker, (1995) "Problems with Instrumental Variables Estimation when the Correlation Between the Instruments and the Endogenous Explanatory Variables is Weak," Journal of the American Statistical Association, 90 (June): 443-450.

10. Measurement Error and other Data Issues

Griliches, Z. (1986) "Economic Data Issues," in Handbook of Econometrics, Volume III, (Z. Griliches and M.D. Intriligator eds.) Elsevier Science.

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