

WWS 508b: Econometrics and Public Policy – Basic

Spring 2005

lecture: Wed 2.30 - 5.30 pm (*Wallace 004*)
lab: Thurs 4.30 - 6.00 pm (*tba*)

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Prerequisite: WWS 507b

This course provides a thorough examination of statistical methods employed in the formulation and evaluation of public policy, with particular emphasis on regression models. Regression models are frequently employed in research across the social sciences, subjecting theoretical claims about the relationships between variables to empirical test against observed data. We begin by discussing situations that violate the assumptions underlying the OLS (ordinary least squares) regression model, the consequences for estimation and inference, and how to detect and correct for these violations, restoring our ability to draw valid inferences. In the second part of the course we extend the basic regression model to deal with more complex situations, including dummy independent variables, non-linearity and non-additivity (interaction effects), dichotomous dependent variables, and simultaneous equations. Finally, we close by discussing the many uses of experiments in policy formulation and evaluation, examining the virtues of experimentation in overcoming or bypassing some of the methodological problems considered during the semester.

This class will differ markedly from typical courses in econometrics, statistics and methodology. I will minimize mathematical presentation and formal proofs, emphasizing instead intuitive understanding of the concepts, and practical mastery of the methods. My goal is that students will be able to choose and employ the appropriate tools for a particular research problem, to understand the limitations of the techniques (including the conditions under which they break down), and to interpret the empirical results obtained in an appropriate and fluent manner.

Recommended Texts:

Damodar N. Gujarati. 2003. *Basic Econometrics*, 4th ed. New York, NY: McGraw-Hill.

Lawrence C. Hamilton. 2004. *Statistics With STATA* (updated for Version 8). Pacific Grove, CA: Duxbury.
(www.stata.com/bookstore)

Assessment:

Final grades will be based upon two components:

- (1) Homework assignments: five assignments at 10 points each.....50%

The homework assignments will involve computer calculations, interpretation, and presentation of results. Each assignment will require students to handle actual data on a real public policy problem. You will need to choose the appropriate statistical tool(s) for addressing the problem that confronts you, and to interpret your empirical results correctly and fluently, mindful of the limitations of the various techniques, and of potential threats to validity.

- (2) Examinations.....50%

There will be a midterm test on March 9th, and a final in the examination period. The midterm test (25%) will examine all topics covered up to that point, and the final exam (25%) will cover the remainder of the material.

CLASS SCHEDULE

- 31st Jan: Introduction and overview
- 2nd Feb: (1) Multicollinearity: nature, consequences, detection, remedies
- 9th Feb: (2) Heteroscedasticity: nature, consequences
(3) Heteroscedasticity: detection, remedies
- 16th Feb: (4) Autocorrelation: nature, consequences
(5) Autocorrelation: detection, remedies
- 23rd Feb: (6) Functional forms, non-linearity
(7) Misspecification: omitting relevant variable, including irrelevant variable, wrong functional form
- 2nd Mar: (8) Measurement error, reliability and validity, scaling
(9) Dummy independent variables
(10) Dummy independent variables, continued
- 9th Mar: Midterm exam
- 23rd Mar: (11) Non-additivity, interaction effects
(12) Non-additivity, interaction effects, continued
Read: Robert Friedrich. 1982. "In Defense of Multiplicative Terms in Multiple Regression Equations." *American Journal of Political Science* 26: 797-833.
- 30th Mar: (13) Dichotomous dependent variables, the Linear Probability Model
Read: John Aldrich and Forrest Nelson. 1984. *Linear Probability, Logit, and Probit Models*. Beverly Hills, CA: Sage.
- 6th Apr: (14) Logit (Aldrich & Nelson)
(15) Probit (Aldrich & Nelson)
- 13th Apr: (16) Simultaneous equations
(17) Identification, instrumental variables
- 20th Apr: (18) Two-Stage Least Squares, path analysis
- 27th Apr: (19) Experimental designs and methods
(20) Experimental designs and methods, continued