

PUBPOL 569/ EDUC 737

Applied Regression Analysis: Focus on Education

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Class Meetings: Mondays & Wednesdays 1:00-2:30
Classroom: 1230 Weill Hall
Section: TBA

OVERVIEW

This course introduces students to the use and interpretation of multiple regression analysis and program evaluation. The topical focus will be education, using real data and addressing real policy topics such as class size, teacher certification, education finance and the payoff to education in the labor market.

GOALS

- 1) Train students to *critically consume* empirical research. We will teach you to read and understand technical, empirical studies and to judge whether they constitute a firm, evidentiary basis for policy.
- 2) Train students to *thoughtfully produce* their own empirical research. We will develop a core set of analytical tools that will allow you to conduct empirical research in a professional setting.

PREREQUISITES

A basic knowledge of statistics (hypothesis testing, t-statistics, confidence intervals) is assumed. PUBPOL 529 is sufficient.

GRADING

In-class Quizzes (6) 30%

Quizzes will test material from both the reading and lectures. Quizzes cannot be made up, so plan your schedule accordingly. Your lowest quiz score will be dropped. The quizzes are closed-book. You can consult a single index card of notes for the quizzes.

Homework Assignments (10) 40%

Homework assignments consist of data analysis and writing short essays (< 1 page) that interpret your findings. They are graded on a scale of 0 to 10. You may discuss the assignments in groups of up to four students, but *your answers must be written up individually, in your own words*. Please put the names of your study group members on your problem set. Problem sets should be typed and uploaded to the course website for grading

Final Exam 30%

The exam has been scheduled by the Registrar for Dec 11, 4-6 pm. You can consult a single index card of notes for the exam.

READING

You are expected to read the assigned articles and chapters closely before class.

There are two texts:

- 1) Stock and Watson, *Introduction to Econometrics* (1st or 2nd edition), available for purchase.
- 2) Angrist and Pischke, *Mostly Harmless Econometrics*. This manuscript, to be published by Princeton University Press in 2009, is available on the course website.

We will read other articles on education. For your convenience, I will link to these items on the course website. If a link is broken, notify me but in the meantime use the information on the syllabus to find the article (e.g., on Google Scholar). *You are responsible for obtaining the readings*. Get the readings in your hands (or laptop) far enough in advance that you are not derailed by any transitory technical difficulties.

DATA ANALYSIS SOFTWARE

We will be using Stata, a software program used widely by policy analysts. We will provide links to online Stata tutorials and offer Stata training in sections. Stata is available in the Ford School computer lab. It is also available for sale, and I recommend buying it so that you can use it freely and often.

COURSE SCHEDULE

9/3/2008 Lecture: Overview, Introductions and Expectations

Patterson, Kevin (2002). "[What Doctors Don't Know \(Almost Everything\)](#)." *New York Times Magazine* (May 5).

Traub, James (2002). "[Does It Work?](#)" *New York Times Education Life* (November 10), p. 24.

Angrist, Joshua (2004). "[American Education Research Changes Tack](#)." *Oxford Review of Economic Policy* 20:2, pp. 198-212.

9/8/2008 Lecture: Causal Inference

Angrist, Joshua and J.S. Pischke (forthcoming). *Mostly Harmless Econometrics*. Princeton University Press. Ch 1 & 2. Available under Resources on course website.

Paul W. Holland (1986). "[Statistics and Causal Inference](#)." *Journal of the American Statistical Association* 81:396 (Dec), pp. 945-960.

9/10/2008 Lecture: Randomized Trials

Mosteller, Frederick (1995). "[The Tennessee Study of Class Size in the Early School Grades](#)." *The Future of Children* 5:2.

Stock & Watson, Chs. 1 & 3 (to review t-tests, p-values, confidence intervals, hypothesis testing, all of which we will use in class today)

9/12/2008 Assignment 1 due 5:00PM

9/15/2008 Quiz
Lecture: Observational Analysis & Introduction to Bivariate Regression

Stock and Watson Ch. 4.1-4.4, Appendix 4.1

9/17/2008 Lecture: Bivariate Regression: Testing Hypotheses

Stock and Watson Ch 4.5; 5.1-5.2

9/19/2008 Assignment 2 due 5:00PM

9/22/2008 Lecture: Dummy Variables, Heteroskedasticity

Stock and Watson Ch 5.3

9/24/2008 Lecture: Measures of Fit, Interpreting Output

9/26/2008 Assignment 3 due 5:00PM

9/29/2008 Quiz
 Lecture: Introduction to Multiple Regression

Stock & Watson Ch 5.7, 6.1-6.6

10/1/2008 Lecture: Multiple Regression

10/3/2008 Assignment 4 due 5:00PM

10/6/2008 Lecture: Multiple Regression & Hypothesis Tests

Stock & Watson Ch. 7.1

10/8/2008 Lecture: Causality and Multiple Regression

Angrist & Pischke Ch 3 through 3.2.3 (skim very technical stuff, just get the gist)

10/10/2008 Assignment 5 due 5:00PM

10/13/2008 Quiz
 Lecture: Multiple dummies, multicollinearity

Stock & Watson Ch. 6.7

10/15/2008 Lecture: Joint Hypothesis Tests

Stock & Watson Ch. 7.2

10/17/2008 Assignment 6 due 5:00PM

10/22/2008 Lecture: Interpreting Regression Tables

Stock & Watson Ch. 7.6

10/27/2008 Quiz
 Lecture: Logs

Stock & Watson Chs. 8.1-8.2

10/29/2008 Lecture: Logs and Polynomials

10/31/2008 Assignment 7 due 5:00PM

11/3/2008 Lecture: Interaction Terms

Stock & Watson Ch. 8.3

Glewwe, Paul, Michael Kremer, Sylvie Moulin, and Eric Zitzewitz (2004). "[Retrospective vs. Prospective Analyses of School Inputs: The Case of Flip Charts in Kenya](#)." *Journal of Development Economics* 74, pp. 251-78.

11/5/2008 Lecture: Interaction Terms

11/7/2008 Assignment 8 due 5:00PM

11/10/2008 Quiz
Lecture: Fixed Effects, Panel Data & Natural Experiments

Currie, Janet and Duncan Thomas, (1995). "[Does Head Start Make a Difference?](#)" *American Economic Review* 85(3): 341-364.

Angrist & Pischke Ch 5 (through 5.1)

11/12/2008 Lecture: Differences in Differences; Pooled Cross Sections

Angrist & Pischke, Ch 5.2

11/14/2008 Assignment 9 due 5:00PM

11/17/2008 Lecture: Binary Dependent Variables: Linear Probability Model

Dynarski, Susan (2003). "[Does Aid Matter? Measuring the Effect of Student Aid on College Attendance and Completion](#)." *American Economic Review* 93:1, pp. 279-288.

Dynarski, Susan (2008). "[Building the Stock of College-Educated Labor](#)." *Journal of Human Resources* (Summer).

11/19/2008 Quiz
 Lecture: Instrumental Variables

Angrist & Pischke, Ch 4 (through 4.1.2)

Stock & Watson Ch 12.1-12.3

Angrist, Joshua and Alan Krueger (1991). "[Does Compulsory Schooling Attendance Affect Schooling and Earnings?](#)" *Quarterly Journal of Economics* 106:4, pp. 979-1014.

11/21/2008 Assignment 10 due 5:00PM
 Section: Probit and Logit

Stock & Watson Ch. 11.1-11.3

11/24/2008 Lecture: IV in Randomized Trials

Krueger, Alan (1999). "[Experimental Estimates of Education Production Functions.](#)" *Quarterly Journal of Economics* 114:2, pp. 497-532.

12/1/2008 Lecture: Regression Discontinuity

Angrist & Pischke Ch. 6

Angrist, Joshua and Victor Lavy (1999). "[Using Maimonides' Rule to Estimate the Effect of Class Size on Scholastic Achievement.](#)" *Quarterly Journal of Economics* 114:2 (May), pp.533-575.

12/3/2008 Lecture: Catch-Up

12/8/2008 Lecture: Wrap-up

12/11/2008 Final Exam, 4:00PM - 6:00PM
