

PUBPOL 639/ EDUC 794 Fall 2011

Quantitative Methods for Program Evaluation: Focus on Education

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GSI: Francie Streich, fstreich@umich.edu
Office Hours: Mondays 1:30-2:30 pm, Thursdays 10:00-11:00 am

Class Meetings: Mondays & Wednesdays 2:30-4, 1230 Weill Hall
Thursdays 5:30-7:00, 1230 Weill Hall

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. The goals of the class are to:

- 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.

PREREQUISITE

Introductory statistics (hypothesis testing, t-statistics, confidence intervals) at the level of PUBPOL 529 or EDUC 793. We'll have a diagnostic quiz to check your statistical foundations.

READING

Read the assigned articles and chapters closely before class (see class participation, below). Get the readings early enough that you are not derailed by any technical difficulties.

Textbooks

- 1) Stock and Watson, *Introduction to Econometrics* (1st, 2nd or 3rd edition; syllabus references are to 2nd edition).
- 2) Angrist and Pischke, *Mostly Harmless Econometrics*.

Articles

We will read papers and reports on education. I will link to these on the course website. If a link is broken, notify me but use the information on the syllabus to find the article (e.g., on Google Scholar). *You are responsible for obtaining the readings.*

GRADING

In-Section Quizzes (7) 25%

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 may consult a single index card of notes during the quizzes.

Homework Assignments (10) 30%

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 are encouraged to discuss the assignments in groups of up to three students, but *your answers must be written up individually, in your own words*. List your study group members on your problem set. Problem sets should be typed and uploaded to the course website.

Class Participation 15%

During each class, I will ask questions of randomly-selected students. This is intended to encourage democratic participation and discourage napping. Names will be drawn from the class list using a random number generator. The questions will be based on the reading assignments, problem sets and lectures.

Final Exam 30%

The exam has been scheduled by the Registrar for Friday Dec 16, 1:30-3:30 pm. You may consult a single index card of notes during the exam.

DATA ANALYSIS SOFTWARE

We will program in Stata, a software program used widely by policy analysts. We provide links to online Stata tutorials and offer training in sections. Stata is available in the Ford School computer lab. It is also available for purchase. I recommend you buy it so that you can use it freely and often, the best way to learn any language.

LAPTOP POLICY/TAKING NOTES

To keep us focused on the class and on each other, we will keep laptops closed. I will distribute copies of overhead slides for you to take notes on. If you want to store all class material on your laptop (I do!), transcribing your handwritten notes after lecture is a great a way to nail the material. I will post a PDF of the slides after lecture to facilitate this process.

Syllabus may be updated as the course progresses. Online version is authoritative.

WEEK 1

Wed 9/7 Lecture 1: Overview, Introductions and Expectations

Readings

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.

Thurs 9/8 Section – *Required* Diagnostic Quiz

WEEK 2

Mon 9/12 Lecture 2: Causal Inference

Readings

Mostly Harmless Econometrics. Ch 1 & 2.

Paul W. Holland (1986). "[Statistics and Causal Inference](#)." *Journal of the American Statistical Association* 81:396, pp. 945-960. Sections 1-4, 8-9.

Wed 9/14 Lecture 3: Causal Inference

Thurs 9/15 Section – Quiz 1

WEEK 3

Mon 9/19 Assignment 1 due noon
Lecture 4: Randomized Trials

Readings

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)

Wed 9/21 Lecture 5: Observational Analysis & Introduction to Bivariate Regression

Readings

Stock and Watson Ch. 4.1-4.4, Appendix 4.1

Thurs 9/22 Section – Quiz 2

WEEK 4

Mon 9/26 Lecture 6: Bivariate Regression & Testing Hypotheses

Readings

Stock and Watson Ch 4.5; 5.1-5.2

Tues 9/27 Assignment 2 due noon

Wed 9/28 Lecture 7: Dummy Variables, Heteroskedasticity

Readings

Stock and Watson Ch 5.3

Thurs 9/29 Section

WEEK 5

Mon 10/03 Lecture 8: Measures of Fit, Interpreting Output

Tues 10/04 Assignment 3 due noon

Wed 10/05 Lecture 9: Introduction to Multiple Regression

Readings

Stock & Watson Ch 5.7, 6.1-6.6

Thurs 10/06 Section – Quiz 3

WEEK 6

Mon 10/10 Lecture 10: Multiple Regression

Tues 10/11 Assignment 4 due noon

Wed 10/12 Lecture 11: Multiple Regression & Hypothesis Tests

Readings

Stock & Watson Ch. 7.1

WEEK 7

Mon 10/17 NO CLASS

Wed 10/19 Lecture 12: Causality and Multiple Regression

Readings

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

Thurs 10/20 Section – Quiz 4

WEEK 8

Mon 10/24 Lecture 13: Multiple dummies, multicollinearity

Readings

Stock & Watson Ch. 6.7

Tues 10/25 Assignment 5 due noon

Wed 10/26 Lecture 14: Nonlinear Relationships: Polynomials

Readings

Stock & Watson Ch. 8 through 8.2

Thurs 10/27 Section

WEEK 9

Mon 10/31 Lecture 15: Nonlinear Relationships: Polynomials

Readings

Stock & Watson Ch. 8 through 8.2

Tues 11/01 Assignment 6 due noon

Wed 11/02 Lecture 16: Nonlinear Relationships: Logs

Readings

Stock & Watson Ch. 8 through 8.2

Thurs 11/03 Section – Quiz 5

WEEK 10

Mon 11/07 Lecture 17: Interaction Terms

Readings

Stock & Watson Ch. 8.3-8.5

Tues 11/08 Assignment 7 due noon

Wed 11/09 Lecture 18: Interaction Terms

Readings

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.

Thurs 11/10 Section

WEEK 11

Mon 11/14 Lecture 19: Fixed Effects

Readings

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)

Tues 11/15 Assignment 8 due noon

Wed 11/16 Lecture 20: Fixed Effects

Thurs 11/17 Section – Quiz 6

WEEK 12

Mon 11/21 Lecture 21: Fixed Effects, Panel Data

Readings

Angrist & Pischke, Ch 5.2

Tues 11/22 Assignment 9 due noon

Wed 11/23 NO CLASS (Happy Thanksgiving)

WEEK 13

Mon 11/28 Lecture 22: Binary Dependent Variables: Linear Probability Model

Readings

Stock & Watson Ch. 11.1-11.2

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.

Wed 11/30 Lecture 23: Binary Dependent Variables: Probit and Logit

Readings

Stock & Watson Ch. 11.4-11.5

Thurs 12/01 Section – Quiz 7

WEEK 14

Mon 12/05 Lecture 24: Instrumental Variables

Readings

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.

Tues 12/06 Assignment 10 due noon

Wed 12/07 Lecture 25: IV in Randomized Trials

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

Distribute reading for final exam.

Thurs 12/08 Section

WEEK 15

Mon 12/12 Final Lecture

Fri 12/16 Final Exam, 1:30PM - 3:30PM
