

UC San Diego
Winter 2006
Class: T-Th 9:30-10:50 (Center 101)

Professor Eli Berman
elib@ucsd.edu , 534-2858
OH: T-Th,10:50-11:45,EC 218

TAs: Kevin Novan knovan@ucsd.edu
 Will Peterman wbpeterm@ucsd.edu
 Karmen Suen ksuen@econ.ucsd.edu

Economics 120B Econometrics

The course aims to prepare students for practical empirical research in an academic or business setting. It introduces three major ideas in econometrics: quantifying uncertainty using confidence intervals, using regression to infer causal relationships, and using regression for prediction. The course covers exotic concepts with strange names, such as heteroskedasticity and instrumental variables. It provides the standard tools necessary to perform and to read empirical research.

The prerequisite is one of EC 120A, Math 183 or ECE109. Students without the prerequisite are welcome to attend the first few classes but must get permission to register.

The material is fairly well covered in *Introduction to Econometrics*, by Jim Stock and Mark Watson, which is *required* reading and is available at the bookstore. Another helpful text is *Introductory Econometrics*, by Arthur Goldberger.

Part of the course involves learning to use a software package called *Stata*. Students have access to *Stata* in the computer lab. Individual copies of *Small Stata* can be purchased at <http://www.stata.com/order/schoollist.html>. (A one year lease is available for \$45). *Stata* is essential for solving problem sets.

Evaluation: There will be a midterm exam (worth about 35% of the grade) on Thursday February 9, a final (about 45%) on Friday, March 24 (8-11AM), and three or four problem sets (worth 20% together). No other exams are planned. Exams may be proctored using video. Problem sets are a good way to prepare for exams.

Written work: The “Buckley” waiver makes it much easier to return your written work, by allowing us to put it in a public place rather than having you meet with the TA. Please read the attached waiver. If you feel comfortable with it then sign and return it to a TA.

Disabilities will be accommodated. Please refer to OSD policy on what we do to help. <http://www-senate.ucsd.edu/manual/appendices/app3.htm> .

If you have any questions please feel welcome to come chat in office hours.

COURSE OUTLINE:

1. Introduction: Why Study Econometrics?

Who needs data anyway? If you had some, what would you do with it? Econometric models, parameter estimates, prediction and the testing of economic theories. Getting good data:

Experimental vs. nonexperimental data. Cross-sections, Time-Series, Panels.

Reading: Stock & Watson - Chapter #1.

2. Probability and Statistics: A quick review

Probability, random variables, the normal distribution and the central limit theorem, inference, confidence intervals and hypothesis testing. Asymptotics of the sample mean. Using *Stata*.

Reading: Chapters #2 and #3.

3. Simple Regression (one regressor)

Fitting a line through a cloud of points. Least squares, unbiased estimates, consistent estimates, confidence intervals, hypothesis testing, omitted variable bias, R^2 .

Reading: Chapter #4.

{Review and midterm about here}

4. Multiple Regression: Estimation

The second explanatory variable, interpreting coefficients, efficiency & heteroskedasticity, omitted variable bias.

Reading: Chapter #5.1-5.4.

5. Causal Inference and Random Assignment

Random assignment vs. omitted variable bias. Reading: Ch #11.1-11.4.

6. Multiple Regression: Inference

Confidence intervals (CI) for parameters, CI for predictions, hypothesis testing, single (t) vs. multiple (F) tests. Etiquette for reporting results.

Reading: Chapters #5.5-5.13.

7. Sources of Bias: measurement error, sample selection, simultaneity and omitted variables

Omitted Variable Bias again, Measurement Error, Fixed Effects, Sample Selection, Simultaneity.

Reading: Chapter #7.2, 7.3.

8. Identification and Instrumental Variables

Causal inference again, instrumental variables vs. omitted variable bias, two-stage least squares, natural experiments.

Readings: Chapters #10, #11.5-11.8;

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

STUDENT CONSENT FOR RELEASE OF STUDENT INFORMATION
(Buckley Waiver)

I hereby authorize the UCSD Economics Department to return my graded final examination/research paper by placing it in a location accessible to all students in the course. I understand that the return of my examination/research paper as described above may result in disclosure of personally identifiable information, that is not public information as defined in UCSD PPM 160-2, and I hereby consent to the disclosure of such information.

Quarter _____ Course _____ Date _____

Instructor _____

Student ID# _____

Print Name _____

Signature _____
