Economics 120B
Econometrics, Winter 2013
Prof. Dahl, UC San Diego

Description: This course aims to prepare students for practical empirical research in an academic or business setting. It covers the fundamentals of regression analysis, including estimation and hypothesis testing in a multivariate framework. The course also briefly covers advanced concepts such as heteroskedasticity, fixed effects, and omitted variable bias. An emphasis will be placed on determining when causal relationships can be inferred from data.

The material can be difficult and the workload substantial, particularly for people who find math courses challenging. However, your payoff for all this work is a set of skills and analytical tools that are extremely useful and in high demand in the marketplace.

Times: Tuesdays and Thursdays, 8:00 – 9:20 am, CENTR 101
Tuesdays and Thursdays, 9:30 – 10:50 am, SOLIS 107

Instructor: Gordon Dahl
office hours: Thursdays, 11:00 am – 12:20 pm
location: ECON 324
phone: 822-0644
email: eco120b@dssmail.ucsd.edu
(Email is the preferred contact method. You must include the dssmail part of the email address.)

TAs: The TAs are a valuable resource, and I encourage you to take advantage of their help during office hours. There are no office hours the first week of class; office hour times and locations will be announced after the first week of class.

Igor Vaynman <ivaynman@ucsd.edu> Wednesdays, 11:00 - 12:00 pm SH 236

Juwon Seo <jus006@dssmail.ucsd.edu> Tuesdays, 5:00 - 6:00 pm ECON 127

Linchun Chen <lic026@ucsd.edu> Mondays, 12:30 - 1:30 pm ECON 127

Marina Kutyavina <mkutyavi@ucsd.edu> Tuesdays, 12:00 - 1:00 pm SH 238

Qihui Chen <qic005@ucsd.edu> Wednesdays, 5:10 - 6:10 pm SH 234

Roy Allen <rhallen@ucsd.edu> Wednesdays, 9:30-10:30 am ECON 116

Yi Zhan <yzhan@ucsd.edu> Fridays, 1:00 - 2:00 pm SH 234

Review Sessions:

Mondays 8:00 – 8:50 am, CENTR 115
Tuesdays 7:00 – 7:50 pm, WLH 2005

You may attend either review session, regardless of which class you are registered for. The review sessions aim to cover the same information, so you do not need to attend both. There are no review sessions or TA office hours the first week of class.

Class Web Site: ted.ucsd.edu

The class web site will contain the syllabus, lecture notes, homework assignments, and occasional class announcements. You should check it regularly.

Text: Introduction to Econometrics, 2nd Edition, by Stock and Watson (REQUIRED)
Statistics with Stata: Updated for Version 10, 7th Edition, by Hamilton (OPTIONAL)

Software: Part of the course involves learning to use a software package called *Stata*. *Stata* is essential for problem sets, so you need to be able to access *Stata* in a lab or purchase your own copy. Students have access to *Stata* in ECON 100. Individual copies of *Intercooled Stata (i.e., Stata/IC)* can be leased for six months for $65 from http://www.stata.com/order/new/edu/gradplans/gp-direct.html. *Small Stata* is not adequate for this class due to its inability to handle large datasets.

Homework: Homework is an integral part of this course, because the best way to learn econometrics is to do it. I will periodically assign problem sets throughout the semester. These assignments will be posted on the web, and it is your responsibility to check the class web page regularly.

Homework will be graded on a three-point scale. A score of 1 will be given to homework which is clearly incomplete, but has made a start towards answering some of the questions. A score of 2 will be given to homework which is largely complete, but does not answer every question in full. A score of 3 will be given to homework which is clearly well-done, and answers all of the assigned problems.

Students can work together on problem sets, although solutions must be written up and handed in separately (including any computer output). It is a good idea to attempt the problems on your own before meeting with a group. While you can collaborate with others, any homework you turn in must represent your own work.

Solution keys to the homework will be posted on the class web page. As these solutions will be comprehensive and the homework is only graded for completeness, homework will not be returned. If you want a copy of your homework, please make a copy before you turn it in.

Your answers will be due at the *beginning* of class, normally one or possibly up to two weeks after a problem set is assigned. Late problem sets will not be accepted for any reason; if you cannot attend class, you can either have a classmate turn in your homework for you, or you can turn it in to any of the TAs *before* class begins. Emailed homework will not be accepted.

You are allowed to miss one homework without penalty, as I will drop the lowest score before calculating the homework portion of your grade. The tradeoff for this benefit is that I will be strict about not accepting late homework.

Tests: There will be a midterm and a final exam. The midterm will be administered during regular class time, on Tuesday, February 12. The final exams for each class will take place according to the official final exam schedule. The class which runs from 8:00 am to 9:20 am will have their final exam on Thursday, March 21 from 8:00 – 11:00 am. The class which runs from 9:30 – 10:50 am will have their final exam on Tuesday, March 19, from 8:00 – 11:00 am. Locations for the final exam have not yet been designated. You must take both the midterm and the final exam at the time scheduled for the class you are enrolled in. There will be no make-up exams, and any conflicts or emergencies should be approved by me in advance of the exams. In case of illness or

accident at the time of the midterm – with proper documentation from a doctor or the police – the final will be weighted 90%.

Grades: The following weights will be used to determine your course grade:
Homework: 10%
Midterm exam: 40%
Final exam: 50%

Grading Policy: If you think a mistake was made in grading your exam, you may ask for a regrade. You must write out your reason for a regrade and turn it and your exam in within 10 days of when the exam is first returned to the class. Include an email address on your written explanation so we can let you know the result of the regrade. If you ask for a regrading, your whole exam is subject to regrading. This may bring to light some previously unnoticed errors, and you may end up with a lower score, not higher. Note that unless your answer is fully correct, the assignment of partial credit must be a matter for judgment, and we are unlikely to change your grade since we want to treat all class members fairly.

Cheating: Cheating will not be tolerated in this class. If you are caught cheating, helping someone else cheat, or plagiarizing on an exam or homework, you will be penalized. Having notes on your person during the exam constitutes cheating, as do other forms of cheating. One possible penalty is a failing grade in my class.

Miscellaneous: Disabilities will be accommodated; contact the office of undergraduate student affairs in Sequoyah Hall 245. For all matters regarding dropping or adding the course, waitlists etc., please contact the office of student affairs or use the online resources provided by the university.

If you have any further questions please feel welcome to email eco120b@dssmail.ucsd.edu or come talk during office hours.

COURSE OUTLINE (rough guide and subject to change):

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: Chapters #4 and #5.

4. Multiple Regression: Estimation
The second explanatory variable, interpreting coefficients, efficiency & heteroskedasticity, omitted variable bias.
Reading: Chapter #6.

5. Causal Inference and Random Assignment
Random assignment vs. omitted variable bias. Reading: Ch #13.

6. Multiple Regression: Inference and Nonlinearity
Confidence intervals (CI) for parameters, CI for predictions, hypothesis testing, single (t) vs. multiple (F) tests. Etiquette for reporting results. Modeling nonlinear functions. Interaction terms between independent variables
Reading: Chapters #7 and #8.

7. Sources of Bias: measurement error, sample selection, simultaneity and omitted variables
Omitted Variable Bias again, Measurement Error, Fixed Effects, Sample Selection, Simultaneity.
Reading: Chapters #9 and #10.