POL-GA 1250
Quantitative Political Analysis I
Fall 2012

Professor Bernd Beber
Wilf Family Department of Politics
19 West 4th Street, Room 414
Phone: 212-992-8621
bernd.beber@nyu.edu
Office hours: Thursdays, 3-5pm

TA: Marko Klasnja
mk3296@nyu.edu

Overview

The aim of this course is to introduce you to the basic concepts and tools that you will need to (a) start conducting your own quantitative research, (b) understand and critically evaluate other people's quantitative work, and (c) continue to acquire more advanced tools in courses taught in this department and beyond.

Requirements

You are required to attend the two weekly lectures for this course, on Mondays and Wednesdays, 10am-11:50am, Rm. 217. You will also be required to attend a weekly lab session, where you will work with the statistical software package Stata. Lab sessions will be held on Thursdays, 10am-11am, in the 3rd floor computer lab and will be led by the TA for the course, Marko Klasnja.

Problem sets will be assigned during most weeks. I will usually assign them on Wednesdays, and they will be due the following Monday. The first problem set will be distributed on September 26th and will be due on October 1st. Problem sets must be turned in on time. Late problem sets will not receive any credit.

Please feel free to work on problem sets together with other students. However, you must write up each problem set and perform any analysis submitted as part of the problem set on your own. You can handwrite your answers until the midterm exam. After the midterm, your assignments must be typed. You're strongly encouraged to use LaTeX, but Microsoft Word in combination with the Equation Editor is also acceptable.

The problem sets will be graded on a three-point scale and count for 40% of your final grade. The midterm exam will count for 25% and the final exam for the remaining 35% of your course grade.

Readings

There are two required textbooks for this course:

- Dennis D. Wackerly, William Mendenhall III, and Richard L. Scheaffer, *Mathematical Statistics with Applications*, 7th edition, Brooks/Cole.

- John Fox, *Applied Regression Analysis and Generalized Linear Models*, 2nd edition, Sage.

These books are available at the NYU Bookstore at 726 Broadway, and I've also requested that they'll be available at the Bobst reserves desk.

Sometimes students benefit from seeing material presented in different ways by different authors, and I can recommend additional texts if you are interested. Three other popular treatments include:

- Jeffrey M. Wooldridge, *Introductory Econometrics: A Modern Approach*, 4th edition, South-Western, which is a comprehensive alternative to the Fox volume, with more extensive coverage of advanced topics such as panel data methods.

- G. S. Maddala, and Kajal Lahiri, *Introduction to Econometrics*, 4th edition, Wiley, which is similar in scope to Wooldridge, but some students find more accessibly written.

- Peter Kennedy, *A Guide to Econometrics*, 6th edition, Wiley-Blackwell, which is more concise and provides a more informal overview of some of the material covered in class.

Keep in mind that your most important source of material will be your class notes. The class does not follow any one particular book. I provide chapter references in the course outline below, but lectures may omit some of the material covered in those chapters, present it in a different order, or talk about things that aren't in the chapters at all.

There are also a number of books that can help as you learn to work with Stata and LaTeX:

- Helmut Kopka, and Patrick W. Daly, *Guide to LaTeX*, 4th edition, Addison Wesley. This is a terrific and relatively affordable introduction to LaTeX. Sometimes it can be useful to have an actual book like this in front of you as you struggle with LaTeX. Keep in mind that there are also many excellent, free introductions to LaTeX available on the web. We'll link to or post some of them on Blackboard.

- Colin Cameron, and Pravin K. Trivedi, *Microeconomics Using Stata*, Revised edition, Stata Press. A great resource and useful as a complement to the extensive documentation that comes with Stata. The book sometimes assumes that you already know a fair amount of microeconomics. A somewhat more accessible alternative is Lawrence C. Hamilton's *Statistics with Stata*, updated for Stata 10, Brooks/Cole.

Schedule

September 24: Introduction to data analysis. Summarizing univariate data.
Readings: Wackerly et al., ch. 1

September 26 and October 1: Probability fundamentals.
Readings: Wackerly et al., ch. 2
Lab (September 27): Introduction to LaTeX.

October 3 and 8: Discrete and continuous probability distributions.
Readings: Wackerly et al., ch. 3 and 4
Lab (October 4): Introduction to Stata I.

October 10: Maximum likelihood. Multivariate probability distributions.
Readings: Wackerly et al., ch. 9.7 and parts of ch. 5

Lab (October 11): Introduction to Stata II.

October 15: No class.

October 17: The Central Limit Theorem. Estimation and properties of point estimators.
Readings: Wackerly et al., ch. 7
Lab (October 18): Introduction to Stata III.

October 22: No class.

October 24 and 29: Confidence intervals. Hypothesis testing.
Readings: Wackerly et al., parts of ch. 8 and 10
Lab (October 25): Confidence intervals and bootstrapping.

October 31: Associations between variables. Introduction to the linear model.
Readings: Fox, ch. 3 and 5
Lab (November 1): Graphs and regression basics.

NOVEMBER 5: IN-CLASS MIDTERM EXAM

November 7 and 12: Derivation of ordinary least squares (OLS) estimates. Gauss-Markov assumptions. Unbiasedness.
Readings: Fox, ch. 9.1 and 9.2
Lab (November 8): Post-estimation commands and local regression.

November 14 and 19: Variance of OLS estimates. Efficiency. Sampling distribution of OLS coefficients.
Readings: Fox, ch. 6 and 9.3
Lab (November 15): Hypothesis tests and model fit.

November 21: Hypothesis tests in the linear model. Goodness of fit.
Readings: Fox, ch. 9.4
No lab (November 22)

November 26 and 28: Indicator variables. Interactions. Misspecification. Outliers. Missingness.
Readings: Fox, parts of ch. 7, 11, and 20
Lab (November 29): Regression diagnostics.

December 3: Non-spherical errors. Generalized least squares.
Readings: Fox, ch. 12 and 16.1

December 5: Introduction to latent choice models.
Readings: Fox, parts of ch. 14
Lab (December 6): Review.

December 10: Review.

DECEMBER 12: 24-HOUR TAKE-HOME FINAL DISTRIBUTED.