POL-GA 1250
Quantitative Political Analysis I
Fall 2014

Professor Bernd Beber
Department of Politics
19 West 4th Street, Room 414
Phone: 212-992-8621
bernd.beber@nyu.edu
Office hours: Thursdays, 10am-12pm

TA: Renard Sexton
renard.sexton@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 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. 435. 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 Fridays, 10am-12pm, in the third floor computer lab and will be led by the TA for the course, Renard Sexton.

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 24 and will be due on September 29. 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 (or similar) 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 textbooks for this course:

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

- Jeffrey M. Wooldridge, *Introductory Econometrics: A Modern Approach*, 5th edition, Cengage Learning.

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 of materials we cover in this course include:

- 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.

- John Fox, *Applied Regression Analysis and Generalized Linear Models,* 2nd edition, Sage, which focuses on applications and hands-on advice.

- William H. Greene, *Econometric Analysis*, 7th edition, Prentice Hall, with much more comprehensive coverage of derivations in matrix notation.

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 12 (I don't think there's one for Stata 13 yet). Again, you can also find a tremendous amount of useful information online.

Schedule

September 22: Introduction to data analysis. Summarizing univariate data.
Readings: Wackerly et al., ch. 1

September 24 and September 29: Probability fundamentals.
Readings: Wackerly et al., ch. 2
Lab (September 27): Introduction to LaTeX.

October 1 and 6: Discrete and continuous probability distributions.
Readings: Wackerly et al., ch. 3 and 4
Lab (October 4): Introduction to Stata I.

October 8: Maximum likelihood. Multivariate probability distributions.

Readings: Wackerly et al., ch. 9.7 and ch. 5
Lab (October 11): Introduction to Stata II.

October 13: Columbus Day, no class.

October 15: The Central Limit Theorem. Estimation and properties of point estimators.
Readings: Wackerly et al., ch. 7
Lab (October 18): Introduction to Stata III.

October 20 and 22: Confidence intervals. Hypothesis testing.
Readings: Wackerly et al., ch. 8 and 10
Lab (October 25): Confidence intervals and bootstrapping.

October 27: Associations between variables. Introduction to the linear model. Review.
Lab (November 1): Graphs and regression basics.

OCTOBER 29: IN-CLASS MIDTERM EXAM

November 3 and 5: Derivation of ordinary least squares (OLS) estimates. Gauss-Markov assumptions. Unbiasedness.
Readings: Wooldridge, ch. 2 and 3
Lab (November 8): Post-estimation commands and local regression.

November 10 and 12: Variance of OLS estimates. Efficiency. Sampling distribution of OLS coefficients.
Readings: Wooldridge, ch. 2 and 3
Lab (November 15): Hypothesis tests and model fit.

November 17: Hypothesis tests in the linear model. Goodness of fit.
Readings: Wooldridge, ch. 4
No lab (November 22)

November 19 and 24: Indicator variables. Interactions. Misspecification. Outliers. Missingness.
Readings: Wooldridge, ch. 6, 7, and 9
Lab (November 29): Regression diagnostics.

November 26: Thanksgiving, no class.

December 1: Non-spherical errors. Generalized least squares.
Readings: Wooldridge, ch. 8

December 3: Introduction to latent choice models.
Readings: Wooldridge, ch. 17
Lab (December 6): Review.

December 8: Review.

DECEMBER 10: 24-HOUR TAKE-HOME FINAL DISTRIBUTED.