

G53.xxx
Quantitative Research in Political Science III
Fall, 2007
Nathaniel Beck
Email: Nathaniel.Beck@nyu.edu
Website: <http://www.nyu.edu/classes/nbeck/longdata/longdata.html>

The course is continuation of Quantitative Research in Political Science, II.. Thus it begins with an extended treatment of time series and time-series-cross-sectional data, along with a more extended treatment of spatial data analysis. Attention then turns to modern Bayesian methods and ideas. There is room at the end of the course for topics of interest to the class to be covered.

I assume you have the Politics Department basic series of quantitative courses, that is, Quantitative Analysis I and II. This implies that the course is not suitable for first year students.

The seminar is a mix of very hands-on practical discussion of estimation issues (it is taught in the lab), a discussion of relevant articles in political science, some discussion of asymptotic theory and some learning via Monte Carlo methods. This is very much a seminar, so audience participation is not optional.

The course is designed modularly. The modules and associated texts are laid out below. I have not put a timetable in this document. Very specific assignments will be on the course web site (thus allowing a dynamic syllabus). Unfortunately, there are no ideal readings for the course. I have assigned a few books which I think work for one or more modules. I provide notes on most material. I also point you to notes of colleagues that I trust. Since I think that Greene's *Econometric Analysis* (5th Ed.) is a common and useful text, I have also made specific references to it in the on-line syllabus. But I also like the treatment in Johnston and DiNardo's *Econometric Methods* (4th Ed.), so I also make references in the on-line syllabus to that text. You do not need to read both, and you could use another favorite text in place of either.

We will discuss relevant political science literature as it relates to the various modules. For each module discussion leader(s) will be chosen (voluntarily or by draft). Each will choose one relevant article of interest to them and each discussion leader should be prepared to lead a short discussion of the relevant literature. We will focus on why the author did what he or she did, how the model was specified, was the methodology appropriate, was the report of results adequate and what should the author have really done. For each article, the leader will submit an approximately three page written report similar to what is wanted in the discussion; this is due one week after the discussion. Depending on class size, I anticipate that everyone will submit three of four of these reports. They are graded like the exercises (and submitted in the same manner, see below).

There will be exercises due approximately every two weeks. Because it is important that I read the exercises quickly to see what I have not taught well, and to deal with any issues while the issue is still fresh in our minds, late exercises are not accepted (other than for good cause). All exercises will be posted on the class web site.

The grading is based approximately half on the final paper and half on the exercises.

Outline

O. Week 1 – Introductory issues

A. Time-series (3 weeks)

1. Time-series and difference equations; the notation of time-series (lag polynomials); the statistical properties of single time series, including stationarity and non-stationarity, the univariate analysis of a single time-series (ARIMA models)
2. The econometrics of single equation stationary time-series
3. Non-stationary time-series, unit roots and cointegration
4. Vector autoregression and related friends; heteroskedasticity, parameter stability
5. Model selection, cycles, Kalman filtering and non-linear models

B. Time-series—cross section data and panel data (5 weeks)

- 1 Analysis of continuous dependent variable TSCS data
- 2 Analysis of panel data
- 3 Stochastic parameter models
- 4 Multilevel models
- 5 Binary dependent variable models

C. Spatial models (2 weeks)

- 1 Introduction to spatial analysis
- 2 Spatial analysis for comparative politics

D. Bayesian Methods (3 weeks)

1. Bayesian Theory
2. Applications of Bayesian methods
3. Bayesian Computations (MCMC)

There are many good books and articles, I have chosen some that I want everyone to read; those with interests should read more widely

For time-series, the required readings are:

Enders, Applied Econometric Time Series, 2nd (a good intro to the nuts and bolts of time-series, if you have the 1st ed. already you do not need the new edition)

Greene, Econometric Analysis, 5th Ed. (chs. 10, 12, 19 and 20)

Johnston and DiNardo, Econometric Methods, 4th Ed. (ch. 7-9)

There are lots of other fine books of differing levels and coverage, e.g.

Hendry, Dynamic Econometrics

Hamilton, Time Series Analysis

For TSCS data, we will use:

Hsiao, Analysis of Panel Data, 2nd (if you have the 1st ed., you are probably okay)

Beck, Katz and Plumper, ms.

For panel data we will use the Hsiao book. Another good book is:

Baltagi, The Econometric Analysis of Panel Data, 2nd

For spatial methods we will use

Gleditsch and Ward (ms)

For Bayesian methods we will use

Gill, Bayesian Methods for the Social Sciences