Description

This course is designed as an introduction to statistics for longitudinal data – that is, data with repeated measurements on the same units over time. Such data have become increasingly widespread in political science, particularly in comparative politics and international relations. Longitudinal data offer both challenges and opportunities for the applied researcher. The current course is divided more or less in half. In the first half of the class, we’ll discuss and apply methods for data which varies both across units and over time; these include models for “panel” data, “time-series cross-sectional” data, and the like. Topics will include fixed– and random–effects models, GLS–based approaches to panel data, GEE models, random coefficient models and dynamic models with lagged dependent variables. Along the way, we’ll try, to the extent possible, to include methods for “ugly” (i.e., discrete) dependent variables. The second half of the course will focus on survival models (also known as event–history or duration models), which are used in analyzing data on time(s) to event(s).

Much of the material in this course is fairly technical. While I have tried to chose readings that present the models as clearly and with as little jargon as possible, most of the material will still require several readings to fully comprehend. While not a prerequisite, experience in statistics at the level of a linear algebra–based treatment of least–squares regression is highly advisable for those enrolled in this class. Students are also expected to have a nodding acquaintance with basic differential and integral calculus and distribution theory. Additionally, it is impossible to learn statistics by reading books or articles and attending lectures. Because of this incontrovertible fact, enrollees will be required to complete five lab exercises over the course of the semester, typically receiving the exercise in one week and turning it in the following week at the beginning of class. These exercises will be computer–based; the two preferred software packages for the class are Stata 9.0 (http://www.stata.com) and R 2.1.1 (http://cran.r-project.org), both of which will be supported by the instructor, but you are welcome to use any software you care to. The same goes for the final project, the details of which will be announced in class.

Required Text

Grading

Grading will be based on several lab exercises and a final project, as follows:

- Lab exercises: Five worth 10 percent each.
- Final Project: 50 percent.

Part One: Panel and TSCS Data Analysis

Reference Works

Some Useful Resources

- Neal Beck’s “Longitudiunal Data Analysis” course page (http://www.nyu.edu/classes/nbeck/longdata/longdata.html).
- Oxford University’s ESRC Spring School on Panel Data Analysis (http://springschool.politics.ox.ac.uk/springschool/courses_instructors_2005.asp).
- Thomas Plümper’s webpage at University of Konstanz (http://www.uni-konstanz.de/FuF/Verwiss/GSchneider/pluemper/).
- Robert Yaffee’s “A Primer for Panel Data Analysis” (http://www.nyu.edu/its/pubs/connect/fall03/yaffee_primer.html).

Class Schedule

August 22: Class Introduction and Overview
- No readings assigned.

August 29: Introduction to Panel/TSCS Models – Data, Pooling, Software, and so forth.

Required readings:


Recommended readings:

September 5: No Class.


Required readings:


Recommended readings:


Required readings:


Recommended readings / Applications:


**September 26: Models for Dynamic Panel Data.**

*Required readings:*


*Recommended readings:*


**October 3: Random Coefficient and Other Flexible Models.**

*Required readings:*


*Recommended readings:*

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**October 10: Models for Ugly Response Variables, Part I: Binary Data.**

*Required readings:*


*Recommended readings:*


**October 17: Models for Ugly Response Variables, Part II and Wrap–Up.**

*Required readings:*


*Recommended readings / Applications:*


**Part Two: Survival Analysis**

**Reference Works**


Some Useful Resources

- Essex/ISER Course, “Survival Analysis with Stata” (http://www.iser.essex.ac.uk/teaching/degree/stephenj/ec968/).
- Jan Box–Steffensmeier’s “Event History” course page (http://psweb.sbs.ohio-state.edu/faculty/jbox/Courses/ps786eh/ps786ehhome.html).
- UCLA “Survival Analysis with Stata” page (http://www.ats.ucla.edu/stat/stata/seminars/stata_survival/default.htm).

Course Schedule

October 24: Data, Descriptive Statistics, and Bivariate Analyses.

Required readings:


Recommended readings:


October 31: Parametric Survival Models.

Required readings:

Recommended readings / Applications:


November 7: Cox’s Proportional Hazards Model and Discrete–Time Models.

Required readings:


Recommended readings / Applications:


**November 14: Proportionality and Duration Dependence.**

*Required readings:*


*Recommended readings:*


**November 21: Heterogeneity.**

*Required readings:*


*Recommended readings / Applications:*


**November 28: Multiple and Competing Events.**

*Required readings:*


*Recommended readings / Applications:*


