Political Science 206: Political Research Methods II

Spring 2009

Garrett Glasgow
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Office Hours: Mondays and Wednesdays, 2-3:30pm or by appointment
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http://www.polsci.ucsb.edu/faculty/glasgow/ps206.html
Class meets Tuesdays, 3-5:50pm in Ellison 3841 (Movie Poster Room)

1 Course Objectives

This course will finish covering linear regression models, and also cover statistical models with categorical or limited dependent variables. These models are some of the most common in political science, since many phenomena we attempt to explain are categorical or limited in nature. Examples include vote choice, deciding on a political party to identify with, campaign contributions (can never be less than zero), a country deciding on war or peace, and voter turnout. I assume a basic knowledge of linear regression and statistics. You will learn about the linear probability model (and its flaws), logit and probit models (for binary choices, such as yes/no decisions), ordered logit and probit (for ordered outcomes, such as an ideology scale), multinomial and conditional logits (for multiple unordered categories, such as a multicandidate election), and if there is time tobit models (for censored data, such as campaign contributions), and event count models (for the number of occurrences of some phenomena in some time frame, such as the number of wars a country has had this decade).

2 Course Requirements

Grades will be based on two components:

- Homework assignments designed to give you hands-on experience with implementing the methods discussed in class and with using Stata or R, software packages that will allow you to estimate the models we discuss in class. These homeworks will typically consist of reading a journal article that uses the method we are currently studying, using Stata or R to estimate a model using the method, and a 2-3 page write-up of the results. (50%)
- A take home final exam. This exam will be much like the homeworks — one part will be reading and correctly interpreting the statistical models used in journal articles, and one part will be estimating the appropriate statistical model for a series of problems and writing up the results. (50%)

3 Required Textbook

- Long, J.S. (1997). *Regression Models for Categorical and Limited Dependent Variables*, Thousand Oaks: Sage Publications.

I will hand out additional readings in class.

4 Course Outline (Tentative)

- **Week 1**: Review of regression analysis. The linear probability model. Theoretical foundations of discrete choice models.
- **Week 2**: Derivation of the logit and probit models for binary dependent variables. Identification restrictions and alternative distributional assumptions such as scobit.
- **Week 3**: Estimation of discrete choice models. Maximum likelihood estimation. Numerical methods and simulation.
- **Week 4**: Interpretation of discrete choice models. Predicted probabilities and log-odds ratios.
- **Week 5**: Hypothesis testing and goodness of fit. Wald, likelihood ratio, and Lagrange multiplier tests. Pseudo-R2 and percent correctly predicted.
- **Week 6**: Discrete choice models for ordinal dependent variables. Ordered logit and probit models.
- **Week 7**: Discrete choice models for nominal dependent variables. Multinomial logit and conditional logit.
- **Week 8**: The independence of irrelevant alternatives (IIA) assumption. Tests of the IIA assumption. Nested logits.
- **Week 9**: Mixed logits and multinomial probits.
- **Week 10**: Heteroskedastic discrete choice models and other advanced specification issues.