Topics in Advanced Methodology
Political Science 306
Fall 2007

Class Time: Tuesday & Thursday 10:55-12:10
Classroom: 177 Schaeffer
Instructor: Fred Boehmke
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Course description

This class will introduce you to a variety of statistical techniques relevant to political science. The objective is for you to become familiar enough with them to understand how, when and why to use them. Emphasis will therefore be on empirical applications and a large portion of class time (probably about 40% of classes) will be devoted to hands-on use and interpretation of these methods in the computer lab. The class will require you to know or learn how to use Stata since almost all of our applications can be done using it and many of them essentially require it (unless you want to write your own code…). I will also assume familiarity with linear algebra, calculus and probability theory, but we will likely review these topics a bit as necessary.

The three main topics this semester are discrete choice analysis, models for event count data and duration analysis. Additional and related topics will be covered as necessary. The main tool through which you will familiarize yourself with these methods is Monte Carlo analysis, which will be presented in the first and second weeks. Many of your homework assignments and an in-class presentation will involve Monte Carlo analysis.

Grades will be based on five parts: class participation during discussion sessions (15%), homework assignments (35%), three in-class short-answer quizzes (15%) and a final project involving a poster presentation (25%) and the circulation of replication materials (10%) at the end of the semester.

Course Requirements

1. Class participation.

   Class time will be divided between lectures, discussion and computer work - you will be assigned readings that explain and apply the methods we cover. You are expected to complete the reading before class and come prepared to discuss it. For substantive material, this implies the ability to answer the following questions: 1) What is the central research question?

2) What is the method used to test that hypothesis? and 3) What is the advantage of using that method?

2. Homework.

   The best way to learn the material is to use the models. I will assign homework on a weekly to bi-weekly basis. Most of the assignments will specify a model and ask you to run a Monte Carlo analysis that involves generating data and then estimating the parameters using a few different assumptions (both correct and incorrect). When you turn in the homework, I want you to upload an electronic copy of your Stata program file and an appropriate graphical or tabular representation of the results to ICON. Late homework will lose ten percent of the total value per week unless prior arrangements are made.

3. Quizzes

   There will be three in-class quizzes. These will take about 15-30 minutes and will involve short-answer questions asking to explain the way different methods work. The emphasis will be explanation through words not equations, though some of the latter may be needed for clarity.

4. Final Project

   a. Poster Presentation.

      At the end of the semester (exact date TBA, but probably the Friday of the penultimate week of classes), class members will present the results of their research project to the department in poster format. Guidelines for poster presentations are included on the Department's *Resources for Graduate Students* web page; additional materials may also be circulated. The focus of the poster should involve either 1) the application of a suitable, advanced method to a substantive research question; 2) the theoretical development of a new method; or 3) a detailed investigation of existing methods using Monte Carlo analysis, with a critique of current studies.

      Posters must also meet the following criteria (adapted to the three options as appropriate):

      i. No fewer than 8 and no more than 12 panels (page equivalents).
      ii. One page must explain why the primary method allows an improvement over previous studies or how the primary method permits appropriate testing of novel hypotheses.
      iii. One page must present a graphical (or tabular, but only if necessary) interpretation of the main result.
      iv. One page must indicate the primary hypothesis being tested.
      v. One page must clearly indicate the data and/or methods employed.

      You must upload a copy of your poster to ICON by the end of the semester for grading purposes.

   b. Replication Materials.

You will submit a complete set of replication materials through ICON at the end of the semester. These files must allow anyone to replicate your results without consulting you and should run on any computer with Stata installed. You should use comments liberally to help users follow your code. At a minimum, your replication matericals should include:

i. The Stata do-file that you used to construct your data set so that others can see your coding decisions.
ii. Your final data set (you do not need to supply the original, raw data set(s)).
iii. A Stata do-file to run all the analysis in your poster, including the creation of the quantities of interest in the interpretation slide.

General Topics to be Covered

I will pick out a few papers from the current topic each week and expect you to read them, but the ones I do not assign will also be useful if you are interested in that area or want to see some empirical applications.

1. Discrete Choice Analysis.
2. Count Models.
3. Duration Analysis.
4. Monte Carlo Analysis.

Books

There are two books assigned for the class. Both are on reserve at the library, but I highly recommend ordering a copy for yourself.

Long, J. Scott. Regression Models for Categorical and Limited Dependent Variables. United States of America: Sage Publications.

Box-Steffensmeier, Janet M. and Bradford S. Jones. *Event History Modeling: A Guide for Social Scientists.* Cambridge University Press. (*planned for April 2004.*)

These books are also good to have around for reference and will be useful for topics covered in the class. The first four of them are also on course reserve at various libraries on campus.

Long, J. Scott and Jeremy Freese. 2001. *Regression Models for Categorical Dependent Variables Using Stata*. College Station, Texas: Stata Press.

Maddala, G.S. 1983. *Limited Dependent and Qualitative Variables in Econometrics*. Cambridge: Cambridge University Press.

Cameron, A. Colin and Pravin K. Trivedi. 1998. *Regression Analysis of Count Data*. Oxford: Oxford University Press.

Mooney, Christopher. 1997. *Monte Carlo Simulation.* Thousand Oaks, CA: Sage Publications.

Greene, William. 1999. *Econometric Analysis*. Upper Saddle River, NJ: Prentice-Hall, fourth edition.

Gould, William and William Sribney. 1999. *Maximum Likelihood Estimation With Stata*. College Station, TX: Stata Press.

King, Gary. 1989. *Unifying Political Methodology: The Likelihood Theory of Statistical Inference.* Ann Arbor: The University of Michigan Press.

Introduction

Long, Chapter 1.

King, Gary. 1991. "On Political Methodology." *Political Analysis* 2: 1-29.

Beck, Nathaniel. 1999. "Political Methodology - A Welcoming Discipline." Political Methodology Electronic Paper Archive.

Nagler, Jonathan. 1995. "Coding Style and Good Computing Practices" (in Verification/Replication). *PS: Political Science and Politics* 28 (3): 488-492.

King, Gary. 1986. "How Not To Lie With Statistics: Avoiding Common Mistakes in Quantitative Political Science." *American Journal of Political Science* 30: 666-687.

Christopher Z. Mooney; George A. Krause. 1997. "Of Silicon and Political Science - Computationally Intensive Techniques of Statistical Estimation and Inference." *British Journal of Political Science* 27 (1): 83-110.

Mooney, Christopher. 1997. *Monte Carlo Simulation.* Thousand Oaks, CA: Sage Publications.

Discrete Choice Analysis: Logit and Probit

Long, Chapters 3-4.

Discrete Choice Analysis: Ordered Logit and Probit

Long, Chapter 5.

Gelpi, Christopher F. and Michael Griesdorf. 2001. "Winners or Losers? Democracies in International Crisis, 1918-94." *American Political Science Review* 95: 633-647.

Tolbert, Caroline J.; Ramona McNeal, and Daniel A. Smith. 2003. "Enhancing Civic Engagement: The Effect of Direct Democracy on Political Participation and Knowledge." *State Politics and Policy Quarterly* 3 (1): 23-41.

Winship and Mare. 1984. "Regression Models with Ordinal Variables." *American Sociological Review* 49:512-525.

McKelvey, William, and William Zavoina. 1975. "A Statistical Model for the Analysis of Ordinal Level Variables." *Journal of Mathematical Sociology* 4:103-120.

Discrete Choice Analysis: Multinomial Logit and Probit

Long, Chapter 6.

Lacy, Dean, and Barry C. Burden. 1999. "The Vote-stealing and Turnout Effects of Ross Perot in the 1992 US Election." *American Journal of Political Science* 43:233-255.

Whitten, Guy D., and Harvey D. Palmer. 1996. "Heightening Comparativists' Concern for Model Choice: Voting in Great Britain and the Netherlands." *American Journal of Political Science* 40:231-260.

Alvarez, R. Michael and Jonathan Nagler. 1998. "When Politics and Models Collide: Estimating Models of Multiparty Elections." *American Journal of Political Science* 42:55-96.

Quinn, Kevin M; Andrew D. Martin; and Andrew B. Whitford. 1999. "Voter Choice in Multi-Party Democracies: A Test of Competing Theories and Models." *American Journal of Political Science* 43 (4): 1231-1247.

Bennett, D. Scott and Timothy Nordstrom. 2000. "Foreign Policy Substitutability and Internal Economic Problems in Enduring Rivalries." *Journal of Conflict Resolution* 44 (1): 33-61.

Bennett, D. Scott, and Allan Stam. 2000. "A Universal Test of an Expected Utility Theory of War." *International Studies Quarterly* 44: 451-480.

Dow, Jay K. and James W. Endersby. 2004. "Multinomial probit and multinomial logit: a comparison of choice models for voting research." *Electoral Studies* 23: 107–122.

Discrete Choice Analysis: Heteroskedastic Probit

Alvarez, R. Michael and John Brehm. 1995. "American Ambivalence Towards Abortion Policy: A Heteroskedastic Probit Method for Assessing Conflicting Values." *American Journal of Political Science* 39:1055-1082.

Clark, David H. and Timothy Nordstrom. 2005. "Democratic Variants and Democratic Variance: How Domestic Constraints Shape Interstate Conflict." *The Journal of Politics* 67 (1): 250–270.

Count Models: Poisson Regression

Long, Chapter 8, Sections 1 and 2.

King, Gary. 1988. "Statistical Models for Political Science Event Counts: Bias in Conventional Procedures and Evidence for the Exponential Poisson Regression Model." *American Journal of Political Science* 32: 838-863.

Wang, T. Y. 1998. "Arms Transfers and Coups d'Etat: A Study on Sub-Saharan Africa." *Journal of Peace Research* 35 (6): 659-675.

Eyerman, Joe and Robert A. Hart, Jr. 1996. "An Empirical Test of the Audience Cost Proposition: Democracy Speaks Louder than Words." *The Journal of Conflict Resolution* 40 (4): 597-616.

Count Models: Negative Binomial Regression and the GEC Model

Long, Chapter 8, Section 3.

King, Gary. 1989a. "Variance Specification in Event Count Models: From Restrictive Assumptions to a Generalized Estimator." *American Journal of Political Science* 33: 762-784.

Bercovitch, Jacob and Gerald Schneider. 2000. "Who Mediates? The Political Economy of International Conflict Management." *Journal of Peace Research* 37 (2): 145-165.

Mitchell, Sara McLaughlin and Will H. Moore. 2002. "Presidential Uses of Force during the Cold War: Aggregation, Truncation, and Temporal Dynamics." *American Journal of Political Science* 46 (2): 438-452.

Shields, Todd G. and Chi Huang. 1995. "Presidential Vetoes: An Event Count Model." *Political Research Quarterly* 48(3): 559-572.

Wahlbeck, Paul J.; James F. Spriggs; Forrest Maltzman. 1998. "Marshalling the Court: Bargaining and Accommodation on the United States Supreme Court." *American Journal of Political Science* 42(1): 294-315.

Clark. 2003. "Can Strategic Interaction Divert Diversionary Behavior? A Model

of U.S. Conflict Propensity." *Journal of Politics* 65 (4): 1013-1039.

Krain, Matthew. 1997. "State-Sponsored Mass Murder: The Onset and Severity of Genocides and Politicides." *The Journal of Conflict Resolution* 41 (3): 331-360.

Mayer, Kenneth R.. 1999. "Executive Orders and Presidential Power." *The Journal of Politics* 61 (2): 445-466.

Maltzman, Forrest and Lee Sigelman. 1996. "The Politics of Talk: Unconstrained Floor Time in the U.S. House of Representatives." *The Journal of Politics* 58 (3): 819-830.

Count Models: Hurdle, Zero-Inflated and Seemingly Unrelated Count Models

Long, Chapter 8, Sections 4-7.

King, Gary. 1989b. "Event Count Models for International Relations: Generalizations and Applications." *International Studies Quarterly*, Vol. 33(2): 123-147.

Duration Analysis: Introduction

Long, Chapter 9, Section 4.

Box-Steffensmeier, Janet M. and Bradford D. Jones. 1997. "Time Is of the Essence: Event History Models in Political Science." *American Journal of Political Science* 41: 1414-1461.

Beck, Nathaniel L. 1997. "Modeling Space and Time: The Event History Approach." In *Research Strategies in the Social Sciences*, ed. Scarbrough and Tannenbaum. Oxford University Press.

Allison, Paul D. 1984. *Event History Analysis: Regression for Longitudinal Event Data.* Sage University Paper Series on Quantitative Applications in the Social Sciences, series no. 07-046. Beverly Hills and London: Sage Publications.

Duration Analysis: Discrete Time Models

Berry, Frances Stokes and William D. Berry. 1990. "State Lottery Adoptions as Policy Innovations: An Event History Analysis." *American Political Science Review* 84: 395-415.

Mooney, Christopher Z. and Mei-Hsien Lee. 1995. "Legislative Morality in the American States: The Case of pre-Roe Abortion Regulation Reform." *American Journal of Political Science* 39: 599-627.

Volden, Craig. 2003. "States as Policy Laboratories: Experimenting with the Children's Health Insurance Program." Political Methodology Electronic Paper Archive.

King, Gary and Langche Zeng. 2001. "Logistic Regression in Rare Events Data." *Political Analysis* 9:137-163.

Duration Analysis: Duration Dependence in Discrete Time Models

Beck, Nathaniel, Jonathan N. Katz, and Richard Tucker. 1998. "Taking Time Seriously: Time-Series-Cross-Section Analysis With a Binary Dependent Variable." *American Journal of Political Science* 42: 1260-1288.

Duration Analysis: Parametric Continuous Time Models

Box-Steffensmeier, Janet M. and Bradford D. Jones. 1997. "Time Is of the Essence: Event History Models in Political Science." *American Journal of Political Science* 41: 1414-1461.

Beck, Nathaniel L. 1996. "Modelling Space and Time: The Event History Approach." Political Methodology Electronic Paper Archive.

Duration Analysis: Duration Dependence in Parametric Continuous Time Models

Bennett, D. Scott. 1999. "Parametric Models, Duration Dependence and Time-Varying Data Revisited." *American Journal of Political Science* 43: 256-270.

Goemans, H. E. 2000. "Fighting for Survival: The Fate of Leaders and the Duration of War." *The Journal of Conflict Resolution* 44 (5): 555-579.

Colaresi M. P. and W.R. Thompson. 2002. "Hot Spots or Hot Hands? Serial Crisis Behavior, Escalating Risks, and Rivalry." *Journal of Politics* 64 (4): 1175-1198.

Kadera, Kelly M.; Mark J.C. Crescenzi, and Megan L. Shannon. 2003. "Democratic Survival, Peace, and War in the International System." *American Journal of Political Science* 47(2): 234-247.

Senese, P.D. and S.L. Quackenbush. 2003. "Sowing the Seeds of Conflict: The Effect of Dispute Settlements on Durations of Peace." *Journal of Politics* 65 (3): 696-717.

Duration Analysis: The Cox Model

Box-Steffensmeier, Janet M.; Laura W. Arnold, and Christopher J.W. Zorn. 1997. "The Strategic Timing of Position Taking in Congress: A Study of the North American Free Trade Agreement." *American Political Science Review* 91 (2): 324-338.

Shipan, Charles R. and Megan L. Shannon. 2003. "Delaying Justice(s): A Duration Analysis of Supreme Court Confirmations." *American Journal of Political Science*

47 (4): 654-668.

Duration Analysis: Repeated Events and Competing Risks

Box-Steffensmeier, Janet M. and Christopher Zorn. 2002. "Duration Models for Repeated Events." *Journal of Politics* 64 (4): 1069-1094.

Gordon, Sanford C. 2002. "Stochastic Dependence in Competing Risks." *American Journal of Political Science* 46: 200-217.

Box-Steffensmeier, Janet M. and Suzanna De Boef. 2002. "A Monte Carlo Analysis for Recurrent Events Data." Political Methodology Electronic Paper Archive.

Duration Analysis: Additional Topics

Alt, James E.; Gary King; and Curtis Signorino. 2001. "Aggregation Among Binary, Count, and Duration Models: Estimating the Same Quantities from Different Levels of Data." *Political Analysis* 9 (1): Pp. 21–44.

Boehmke, Frederick J., Daniel Morey and Megan Shannon. 2006. "Selection Bias and Continuous-Time Duration Models: Consequences and a Proposed Solution." *The American Journal of Political Science* 50 (January 2006): 192-207.

Box-Steffensmeier, Janet M.; Dan Reiter; and Christopher Zorn. 2003. "Nonproportional Hazards and Event History Analysis in International Relations." *Journal of Conflict Resolution*.

Clark, David H. and Patrick M. Regan. 2003. "Opportunities to Fight: A Statistical Technique For Modeling Unobservable Phenomena." *The Journal of Conflict Resolution* 47 (1): 94-115.

Boehmke, Frederick J. and Brian Lai. 2007. "Empirically Modeling Strategic Behavior with a Unified Model of Crisis Outcome and Duration." Working paper.

Other Information:

Please visit the Political Science Department's Website at http://www.uiowa.esu/~polisci. It is frequently updated regarding events and procedures in our department, changes in the Schedule of Courses, plus TA and faculty hours when available. You may also find current information on pre-advising, and registration. Our Vernon Van Dyke Computing Facility (Political Science ITC) is located in Room 21 Schaeffer Hall. Available hours are listed at our website and also posted outside Room 21 Schaeffer.