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Political Science 405
Winter Quarter, 2007
Office Hours: By appointment

Introduction to Regression Analysis

This course is an introduction to the mainstay of quantitative empirical work in political science, the linear regression model. We begin by putting the regression model in context by discussing causation, generalization, and quasi-experimentation. We then introduce the basic two-variable regression model, discuss its assumptions, and learn how to test hypotheses with it. This is followed by the presentation of the multiple regression model and then an exploration into common pitfalls of regression analysis. If time permits, we will cover various extensions including dichotomous choice models (e.g., vote for the incumbent or not), multinomial choice models (e.g., vote choice in multi-candidate elections), duration models (e.g., the stability of coalition governments), and so on. We also will spend some time on how to best present results from regression models.

A pre-requisite for this course is successful completion of Introduction to Probability and Statistics (PS 403). There will be occasional homework assignments that will involve using a statistics program (e.g., Stata) to analyze data. Students are expected to learn how to use a program on their own. There will be a take-home final exam. Students also may be asked to occasionally present specific articles and/or ideas to the class. Grades will be based on the homework assignments (60%), the final exam (30%), the occasional presentations (5%), and participation (5%).

The textbook is: Gujarati, Damodar N. 2003. *Basic Econometrics*. 4th Edition. Boston: McGraw Hill. It is available at the Norris bookstore. There also will be various articles that are available via JSTOR or will be made available for photocopy.

The class meets on Wednesdays from 2:00pm-4:00pm in Scott Hall 212. Students are expected to attend all classes, to complete all assigned readings and assignments on time, and to actively participate. The schedule of topics and/or assigned readings is tentative and may change as the course proceeds. Any changes will be announced in class or via e-mail.

Topics and Assigned Reading

January 3 Causation, Generalization, and Quasi-Experimentation (Math/Stat Review)

Gujarati Introduction

Cook, Thomas D., and Donald T. Campbell. 1979. *Quasi-Experimentation: The Design and Analysis Issues for Field Settings*. Boston: Houghton Mifflin. Chapters 1-3.

Holland, Paul W. 1986. "Statistics and Causal Inference." *Journal of the American Statistical Association* 81: 945-960.

Achen, Christopher H. 1986. *The Statistical Analysis of Quasi-Experiments*. Berkeley: University of California Press. Chapters 1-2.

David Collier and James Mahoney. 1996. "Insights and Pitfalls: Selection Bias in Qualitative Research." *World Politics* 49: 430-451.

Druckman, James N. 2005. "Experiments" in Samuel J. Best and Benjamin Radcliff, eds., *Polling America: An Encyclopedia of Public Opinion*, Volume 1, pages 209-214. Westport, CT: Greenwood Publishing Group.

Grant, J. Tobin. 2005. "What Divides Us?: The Image and Organization of Political Science." *PS: Political Science and Politics*.

January 10 Regression Terminology, Two-Variable Regression, and OLS Estimation (Math/Stat Review)

Gujarati Chapters 1-2; Chapter 3, pages 58-76.

January 17 OLS Estimation (cont.), and OLS Assumptions (Math/Stat Review)

Gujarati Chapter 3, pages 58-76 (review), 79-80.

January 24 Standard Errors, Normality Assumption, Confidence Intervals, and Hypothesis Testing

Gujarati Chapter 3, pages 76-79; Chapter 4; Chapter 5, pages 119-139.

January 31 Multiple Regression Notation, Assumptions, Estimation, R^2 , and Miscellaneous/Catch-up (if necessary)

Gujarati Chapter 7, pages 202-211, 212-215, 217-223; Chapter 8, pages 267-273.

King, Gary. 1986. "How Not to Lie with Statistics." *American Journal of Political Science* 30: 666-687.

Luskin, Robert C. 1991. "Abusus Non Tollit Usum: Standardized Coefficients, Correlations, and R^2 s." *American Journal of Political Science* 35: 1032-1046.

King, Gary. 1991. "'Truth' Is Stranger than Prediction, More Questionable than Causal Inference." *American Journal of Political Science* 35: 1047-1053.

February 7 Specification Bias, Dummy Independent Variables, and Interactions

Gujarati Chapter 7, 215-217; Chapter 9, 297-312; Chapter 13, pages 506-524.

Friedrich, Robert. 1982. "In Defense of Multiplicative Terms in Multiple Regression Equations." *American Journal of Political Science* 26: 797-833.

Kam, Cindy, and Robert Franzese. 2003. "Modeling and Interpreting Interactive Hypotheses in Regression Analysis: A Brief Refresher and Some Practical Advice." Unpublished Manuscript, University of Michigan.

February 14 Multicollinearity and Heteroscedasticity,

Gujarati Chapters 10-11.

Farrar, Donal E., and Robert R. Glauber. 1967. "Multicollinearity in Regression Analysis: The Problem Revisited." *The Review of Economics and Statistics* 49: 92-107.

February 21 No Class

February 28 Autocorrelation, Maximum Likelihood Estimation, and Dummy Dependent Variables

Gujarati Chapter 4, pages 112-117; Chapter 7, pages 246-247, Chapter 12; Chapter 15, pages 580-615.

Aldrich, John H., and Forrest Nelson. 1984. *Analysis with a Limited Dependent Variable: Linear Probability, Logit, and Probit Models*. Sage Series on Quantitative Analysis.

March 7 Review of Other Models (e.g., probit, count, duration, ordered probit, multinomial logit, panel data, simultaneous equations, etc.), and Presenting Results

Gujarati Chapter 15, pages 616-635; Chapter 16; Chapter 18, pages 715-724.

Selection of the following articles:

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.

King, Gary, James E. Alt, Nancy E. Burns, and Michael Laver. 1990. "A Unified Model of Cabinet Dissolution in Parliamentary Democracies." *American Journal of Political Science* 34: 846-871.

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

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

Green, Donald Philip and Jonathan S. Krasno. 1988. Salvation for the Spendthrift Incumbent: Reestimating the Effects of Campaign Spending in House Elections. *American Journal of Political Science* 32: 884-907.

Jacobson, Gary. 1990. "The Effects of Campaign Spending in House Elections: New Evidence for Old Arguments." *American Journal of Political Science* 34.

Green, Donald Philip and Jonathan S. Krasno. 1990. Rebuttal to Jacobson's "New Evidence for Old Arguments." *American Journal of Political Science* 34: 363-372.

King, Gary, Michael Tomz, and Jason Wittenberg. 2000. "Making the Most of Statistical Analyses: Improving Interpretation and Presentation." *American Journal of Political Science* 44: 347-361.

Tomz, Michael, Jason Wittenberg, and Gary King. 2003. "Clarify." Version 2.1 Cambridge, MA: Harvard University, June 1. <http://gking.harvard.edu/clarify/>.

King, Gary. 2005. "Publication, Publication." *PS: Political Science and Politics*.

March 14 Finals Week