Linear Regression Techniques in Comparative Politics

POSC 269, Sec. 1001, Spring 2007, W 1:00-4:00 p.m., Prof. Barrington, office: 452 WWP / 478 WWP
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Overview. This course is designed to give you an introduction to linear statistical analysis, focusing extensively on OLS regression. By the end of the semester, you will be able to estimate an OLS regression model, understand the math underlying the OLS regression coefficient, and have a basic understanding of the strengths and limitations of OLS versus other quantitative techniques commonly used by political scientists.

We will begin the semester by considering the question of quantitative research in comparative politics. While some comparativists conduct statistical analysis of survey data and comparative political economists often conduct time series analysis, comparative politics remains a field in which sophisticated quantitative techniques are the exception rather than the rule. We will then spend two weeks on the basics of statistical relationships between two variables, including correlation. The bulk of the semester will examine the technique of OLS regression. The course will end with a brief discussion of the "next level" of statistical analysis, beyond OLS, that you will be expected to understand if you continue on in a good Ph.D. program.

Requirements. Course requirements include attending class every week, participating in class discussions, completing the required short assignments on time, and completing a research paper by the end of the semester that involves the use of OLS regression. In addition to the regular class discussions, there will be a number of "lab" sessions that will involve you working on a computer to prepare a data set for the estimation of an OLS regression model. We will be using SPSS for these activities. While less sophisticated than other software packages like STATA, SPSS is more than adequate for OLS estimations and is quite user-friendly.

Although the paper must use OLS, it will also include the basics of a quality research paper. Following the introduction, you will have an extensive literature review that identifies a gap in the existing literature that your paper addresses. There must also be a meaningful methods section laying out and justifying the methods that you use. There must be a results and discussion section Note: I take plagiarism on research papers *very* seriously; do not put yourself in a position to find out. While you are encouraged to work together this semester, work that you portray as your own must indeed be your own. Academic dishonesty also includes plagiarizing from yourself, by lifting key text from other papers you have or are turning in for other graduate courses.

There are only two books that you are required to purchase: (1) Eric A. Hanushek and John E. Jackson, *Statistical Methods for Social Scientists*

Finally, since we will be doing "lab" work using SPSS, you may want to pick up one of the several books that cover estimating regression models using SPSS. In addition to the SPSS handbook for a recent version of SPSS, these include Babbie, Halley, and Zaino's *Adventures in Social Research: Data Analysis Using SPSS 11.0/11.5 for Windows* (Thousand Oaks, CA: Pine Forge Press, 2003) and Robert Ho, *Handbook of Univariate and Multivariate Data*

Part II: The Nuts and Bolts (and Math!) of OLS Regression

Week 3 (Jan. 31): Bivariate and multivariate OLS regression models.

Readings:

Kahane, ch. 1, ch. 2 (pp. 20-30 only).
Hanushek and Jackson, ch. 2.
*David A. Freedman, *Statistical Models: Theory and Practice* , ch. 2.
***Michael P. Allen, *Understanding Regression Analysis* (New York: Plenum Press, 1997), chs. 4-6 (pp. 16-30).
***Ethridge, ch. 12 ("Multivariate Analysis: Statistics of More Than Two Variables").
Excerpt 15. Oliver, "City Size and Civic Involvement in Metropolitan America."
Excerpt 16. Mutz, "Mass Media and the Depoliticization of Personal Experience."

Question for consideration: What are the advantages and limitations of bivariate regression analysis?

Question for consideration: What exactly does the unstandardized regression coefficient represent?

Week 4 (Feb. 7): Regression analysis using dummy variables.

Readings:

Hanushek and Jackson, ch. 4 (pp. 101-108).
Kahane, ch. 5 (pp. 83-92 only).
*Lowell W. Barrington, "Examining Rival Theories of Demographic Influences on Political Support: The Power of Regional, Ethnic, and Linguistic Divisions in Ukraine," *European Journal of Political Research*, vol. 41, no. 4 (2002): 455-491.
**Richard Wike and Nilanthi Samaranayake, "Where Terrorism Finds Support in the Muslim World: That May Depend on How You Define It - and Who Are the

Week 7 (Feb. 28): Calculating statistical significance of an individual coefficient.

Readings:

Hanushek and Jackson, ch. 4 (pp. 75-79 only).

*Michael P. Allen, *Understanding Regression Analysis* (New York: Plenum Press, 1997), chs. 13-14.

*David Freedman, Robert Pisani, and Roger Purves, *Statistics*, 1st ed. (New York: W. W. Norton, 1978), ch. 29.

Question for consideration: Look at Hanushek and Jackson's discussion of standardized coefficients (pp. 78-79). Why do they argue that the unstandardized coefficient is superior to the standardized coefficient for a particular variable?

Lab Session #3: In SPSS, estimate an OLS regression model and create a table of the results. Focus on making the statistical significance *and* the substantive significance of each coefficient easy for a reader to understand.

Week 8 (Mar. 7): Calculating statistical significance of sets of coefficients and comparing alternative specifications of a model.

Readings:

Hanushek and Jackson, ch. 5 (pp. 124-131 only).

*Chris Achen, "What Does 'Explained Variance' Explain?: Reply," *Political Analysis*, vol. 2 (1980): 173-184.

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

Question for consideration: Why is comparing alternative specifications of the same general model using the same data really the only time that the (adjusted) R^2 statistic is especially helpful?

Part IV: Problems in the Estimation of an OLS Linear Regression Model

Week 9 (Mar. 21): Model misspecification.

Readings:

Hanushek and Jackson, ch. 4 (pp. 79-86 only).

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***Frederick G. Conrad and Michael F. Schober, "Clarifying Question Meaning in a Household Telephone Survey," *Public Opinion Quarterly*, vol. 64, no. 1 (Spring 2000): 1-28.

***George D. Gaskell and Daniel B. Wright Colm A O'Muircheartaigh, "Telescoping of Landmark Events: Implications for Survey Research," *Public Opinion Quarterly*, vol. 64, no. 1 (Spring 2000): 77-89.

Question for consideration:

Question for consideration: What is autocorrelation, and why is it a particular problem in time series analysis?

Question for consideration: Why isn't everyone a Bayesian?

<u>Week 15 (May 2): Structural equations modeling and conclusion</u>.
Hanushek and Jackson, chs. 8-9.
*Lowell Barrington, "Economic Calculations, Cultural Perceptions, or General Outlooks on Life?: What Shapes Views of the 'Ethnic Other' in Kazakhstan." *Journal of Central Asian Studies*, forthcoming, December 2006.
*Lowell W. Barrington and Erik S. Herron, "Understanding Public Opinion in Post-Communist States: The Effect of Statistical Assumptions on Substantive Results," *Europe-Asia Studies*, vol. 53 (2001): 573-594.
*Larry M. Bartels, "Five Approaches to Model Specification," *The Political Methodologist*, vol. 3 no. 2 (1990): 2-6.

Recommended Reading:
*Kennedy, ch. 10 (sections 10.1-10.4 [basic text, general notes, and technical notes for those sections]).

Question for consideration: Do Barrington and Herron make a compelling case for not mixing together attitudinal and demographic explanatory variables in an OLS model? If one is convinced that demographic and attitudinal variables fall at different stages of the "causal funnel," why would a SEM approach make more sense than OLS?

FINAL PAPER DUE: Thursday, May 10, 5:00 p.m. (in my department mailbox).