

TIME SERIES MODELING IN POLITICS, PART II

Polit Sci 786

Fridays, 12-2 EST/11-1 CST

Spring 2002, March 29th-May 17th,

No class on April 26th due to the MPSA meeting in Chicago. We will be getting the ITV participants together for pizza.

Electronic Classrooms: IL (Room 103, 508 S. 6th Street); OSU (3136 Derby Hall); MN (Rarig Hall); WISC (The Pyle Center).

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This course considers statistical techniques to evaluate social processes occurring through time. The emphasis throughout the course will be on application, rather than on statistical theory. However, the focus of most lectures will be statistical theory. We examine a number of important topics in time series analysis including “reduced form” methods (granger causality and vector autoregression), unit root tests, near-integration, fractional integration, cointegration, and error correction models. Time series regression is also reviewed, (including pooling cross-sectional and time series data).

I expect students to have a firm grounding in probability and regression analysis and to bring to the course some interesting questions about the dynamics of political processes. The course builds upon the basics of time series analysis module taught by John Freeman. Homework will revolve as much as possible around the time series you are interested in understanding. To that end, students will need to gather time series data for analysis during the first week of class (this data need not be used for the full term, though that would make your life easier). The length of the series should be at least 40 time points; longer series are better than shorter ones.

Required Texts

Students should purchase the following books, which are available at campus or online bookstores.

Enders, Walter. 1995. *Applied Econometric Time Series*. New York: John Wiley & Sons, Inc.

Enders, Walter. 1996. *RATS handbook for Econometric Time Series*. New York: John Wiley & Sons, Inc. ISBN: 0-471-14894-6

Software

Regression Analysis and Time Series (RATS) is the statistical package that will be used. The RATS Handbook (available for purchase) and the RATS manual (available in each department) will be very useful for completing the data analysis assignments. The RATS/Estima website is: <http://www.estima.com/>

Recommended Texts

Other books that will be used during the course and/or serve as excellent references include:

Chatfield, C. 1989. *The Analysis of Time Series: An Introduction, Fourth Edition*. New York: Chapman and Hall.

Goldberg, S. 1958. *Introduction to Difference Equations*. New York: John Wiley and Sons, Inc.

Gottman, R.E. 1981. *Time Series Analysis: A Comprehensive Guide for Social Scientists* NY: Cambridge University Press.

Gujarati, Damodar. 1995. *Basic Econometrics, 3rd Edition*. New York: McGraw-Hill

Hamilton, J.D. 1994. *Time Series Analysis*. Princeton, NJ: Princeton University Press.

Huckfeldt, R. Robert, C.W. Kohfeld, and T.W. Likens. 1982. *Dynamic Modeling: An Introduction* Beverly Hills, CA.: Sage.

Maddala, G.S., and In-Moo Kim 2000. *Unit Roots, Cointegration, and Structural Change*. Cambridge, MA: Cambridge University Press.

McCleary, R. and R.A. Hay, Jr. 1980. *Applied Time Series Analysis for the Social Sciences* Beverly Hills, CA.: Sage.

Mills, Terence C. 1990. *Time Series Techniques for Economists*. New York: Cambridge University Press.

Patterson, K.D. 2000. *Introduction to Applied Econometrics: A Time Series Approach*. New York: Palgrave.

Pindyck, R.S. and D.L. Rubinfeld. 1991. *Econometric Models and Economic Forecasts Third Edition*. NY: McGraw-Hill. ISBN: 0-07-050098-3

Requirements and Expectations

Students are expected to do all the assigned reading and to attend all classes. Students are expected to complete two data analysis papers (about 8-10 pages). Assignments will be docked one full letter grade for each week that the assignment is overdue. Students are urged to use their own time series data for the papers. More specifically, it is hoped that students can not only

master time series methods in the course, but also perform their own research over the course of the quarter, hopefully with the goal of eventually submitting the paper for presentation at a conference or for publication. The instructor will work closely with students to ensure that this happens, while maintaining high expectations.

Course Outline and Reading Assignments

I. “Reduced Form” Methods

REQUIRED

Enders, Walter. 1995. *Applied Econometrics Time Series*. New York: John Wiley & Sons, Inc. Chapter 5, sections 4 to 11.

Freeman, J. 1983. “Granger Causality and the Time Series Analysis of Political Relationships” *American Journal of Political Science*, 327-358.

Freeman, J. Williams, and T. Lin. 1989. “Vector Autoregression and the Study of Politics” *American Journal of Political Science*, 842-877.

Recommended

Freeman, J. and Alt. 1994. “The Politics of Public and Private Investment in Britain” *The Comparative Political of the Welfare State* Hicks and Janoski Eds. NY: Cambridge Press, 136-168.

Goldstein, J. and J. Freeman. 1990. *Three Way Street: Strategic Reciprocity in World Politics* Chicago: University of Chicago Press.

Gujarati, Damodar. 1995. *Basic Econometrics, 3rd Edition*. New York: McGraw-Hill, 746-53.

Hamilton, J.D. 1994. *Time Series Analysis*. Princeton, NJ: Princeton University Press. Chapters 10-11.

Mills, Terence C. 1990. *Time Series Techniques for Economists*. New York: Cambridge University Press. Chapter 14.

Williams, J. 1990. “The Political Manipulation of the Macroeconomic Policy” *American Political Science Review* 84:3, 767-795.

II. Unit Roots, Near Integration, and Fractal Integration

REQUIRED

- Box-Steffensmeier, Janet M., and Renee M. Smith. 1998. "Investigating Political Dynamics Using Fractional Integration Methods" *American Journal of Political Science*, 42(April), 2: 661-89.
- Box-Steffensmeier, Janet M., and Renee M. Smith. 1996. "The Dynamics of Aggregate Partisanship" *The American Political Science Review* 90, 3: 567-80.
- DeBoef, Suzanna, and Jim Granato. 1997. "Near-Integrated Data and the Analysis of Political Relationships." *American Journal of Political Science*, Vol. 41, No. 2. (April): 619-40.
- Enders, Walter. 1995. *Applied Econometrics Time Series*. New York: John Wiley & Sons, Inc. Chapter 6.
- Freeman, John, Jude C. Hays, Helmut Stix. 2000. "Democracy and Markets: The Case of Exchange Rates." *American Journal of Political Science*, (October).
- Freeman, John, Daniel Houser, Paul M. Kellstedt, and John T. Williams. 1998. "Long-Memored Processes, Unit Roots, and Causal Inference in Political Science." *American Journal of Political Science*, Vol. 42, No. 4. (Oct.): 1289-1327.
- Brooks, Chris, Melvin J. Hinich, and Robert E. Molyneux 1999. "Episodic Nonlinear Event Detection: Political Epochs in Exchange Rates." in *Political Complexity*, ed., Diana Richards. University of Michigan Press.

Recommended

- Durr, R. "What Moves Policy Sentiments?" *American Political Science Review* 87:1, 158-172.
- Hamilton, J.D. 1994. *Time Series Analysis*. Princeton, NJ: Princeton University Press. Chapters 15-20.
- Maddala, G.S., and In-Moo Kim 2000. *Unit Roots, Cointegration, and Structural Change*. Cambridge: Cambridge University Press.

III. ARCH, GARCH, FIGARCH, and Changes in Regime

REQUIRED

- Brehm, John and Paul Gronke. 2001. "History, Heterogeneity, and Presidential Approval: A Modified ARCH Approach." *Electoral Studies*. forthcoming.

Caldeiera, Greg and Christopher J. W. Zorn. 1998. "Of Time and Consensual Norms in the Supreme Court." *American Journal of Political Science* 42: 874-902.

Enders, Walter. 1995. *Applied Econometrics Time Series*. New York: John Wiley & Sons, Inc. Chapter 3 and Sections 6 in Chapter 4.

Maestas, Cherie and Robert R. Preuhs. 2000. "Modeling Volatility in Political Time Series." *Electoral Studies* 19: 95-110.

Recommended

Maddala, G.S., and In-Moo Kim 2000. *Unit Roots, Cointegration, and Structural Change*. Cambridge: Cambridge University Press.

IV. Cointegration and Error Correction

REQUIRED

Clarke, Harold D., and Marianne C. Stewart. 1994. "Prospections, Retrospections, and Rationality: The "Bankers" Model of Presidential Approval Reconsidered." *American Journal of Political Science*, Vol. 38, No. 4. (Nov): 1104-23.

DeBoef, Suzanna. 2000. "Modeling Equilibrium Relationships: Error Correction Models with Strongly Autoregressive Data." 9:1 (October): 78-94.

Enders, Walter. 1995. *Applied Econometrics Time Series*. New York: John Wiley & Sons, Inc. Chapter 6.

Murray, Michael P. 1994. "A Drunk and Her Dog: An Illustration of Cointegration and Error Correction" *The American Statistician* 48:37-9.

Ostrom, Charles W. and Renee M. Smith. 1993. "Error Correction, Attitude Persistence and Executive Rewards and Punishments: A Behavioral Theory of Presidential Approval" *Political Analysis* 4, J. Freeman, Ed. Ann Arbor: University of Michigan Press, 127-184.

Recommended

Beck, Nathaniel. 1993. "The Methodology of Cointegration" *Political Analysis* 4, J. Freeman, Ed. Ann Arbor: University of Michigan Press, 237-248.

Durr, Robert. 1993. "An Essay on Cointegration and Error Correction Models" *Political Analysis* 4, J. Freeman, Ed. Ann Arbor: University of Michigan Press, 185-228.

- Durr, Robert. 1993. "Of Forest and Trees" *Political Analysis* 4, J. Freeman, Ed. Ann Arbor: University of Michigan Press, 255-258.
- Engle, R.F. and Clive W.J. Granger. 1987. "Cointegration and Error Correction: Representation, Estimation, and Testing" *Econometrica* 55:251-276.
- Engle, R.F. and Clive W.J. Granger. 1991. *Long Run Economic Relationships: Readings in Cointegration*. New York: Oxford University Press.
- Greene, William H. 1993. *Econometric Analysis, 2nd Edition*. Sections 19.3 - 19.6.
- Krause, George A. 1997. "Voters, Information Heterogeneity, and the Dynamics of Aggregate Economic Expectations." *American Journal of Political Science*, Vol. 41, No. 4. (Oct.): 1170-1200.
- Rajmaira, Sheen, and Michael D. Ward. 1990. "Evolving Foreign Policy Norms: Reciprocity in the Superpower Triad." *International Studies Quarterly*, Vol. 34, No. 4. (Dec.): 457-75.
- Smith, Robert. 1993. "Error Correction, Attractions, and Cointegration" *Political Analysis* 4, J. Freeman, Ed. Ann Arbor: University of Michigan Press, 249-254.
- Williams, John. 1993. "What Goes Around, Comes Around: Unit Root Tests and Cointegration" *Political Analysis* 4, J. Freeman, Ed. Ann Arbor: University of Michigan Press, 229-236.

V. Time Series Regression, Part One: Principles

REQUIRED

- Pindyck, R.S. and D.L. Rubinfeld. 1991. *Econometric Models and Economic Forecasts Third Edition*. NY: McGraw-Hill. Sections 6.2 and 9.1.
- Wood, B. Dan. 2000. "Weak Theories and Parameter Instability." *American Journal of Political Science*, Vol. 44, No. 3. (July).

Recommended

- Beck, N. 1985. "Estimating Dynamic Models is not Merely a Matter of Technique" *Political Methodology* 11:1-2, 71-90.
- Beck, Nathaniel. 1991. "Comparing Dynamic Specifications: The Case of Presidential Approval" *Political Analysis* Vol.3, J. Stimson, Ed. 51-88.
- Box-Steffensmeier, Janet M. and Tse-Min Lin. 1995. "A Dynamic Model of Campaign Spending in Congressional Campaigns" *Political Analysis* Vol.6, J. Freeman Ed.

Grier, K. B. 1989. "On the Existence of a Political Monetary Cycle" *American Journal of Political Science* 33:2, 376-389.

Gujarati, Damodar. (1995) *Basic Econometrics, 3rd Edition*. New York: McGraw-Hill, Chapter 17.

Hamilton, J.D. 1994. *Time Series Analysis*. Princeton, NJ: Princeton University Press. Chapter 8.

Hibbs, D. 1973-4. "Problems of Statistical Estimation and Causal Inference in Time Series Regression Models" *Sociological Methodology*, Chapter 10 (especially 252-307).

Krause, George. 2000. "Testing for the Strong Form of Rational Expectations with Heterogeneously Informed Agents." *Political Analysis* 8(3): 285-305.

VI. Time Series Regression, Part Two: Simultaneous Equations

REQUIRED

Domke et al. 1983. "The Illusion of Choice: Defense in Advanced Industrial Democracies" *American Political Science Review* 77:19-35.

Pindyck, R.S. and D.L. Rubinfeld. 1991. *Econometric Models and Economic Forecasts Third Edition*. NY: McGraw-Hill. Chapter 11.

Recommended

Bound, John, David A. Jaeger, and Regina Baker. 1995 "Problems with Instrumental Variables Estimation when the Correlation Between the Instruments and the Endogenous Explanatory Variable is Weak" (Original Title: "The Cure Can be Worse than the Disease: A Cautionary Tale Regarding Instrumental Variables") *Journal of the American Statistical Association* 90 (June):443-50.

Hamilton, J.D. 1994. *Time Series Analysis*. Princeton, NJ: Princeton University Press. Chapter 9.

Jacobson, Gary. 1978. "The Effects of Campaign Spending in Congressional Elections" *American Political Science Review* 72, 469-491.

VII. Pooling Cross-Sectional and Time Series Data

REQUIRED

- Beck, Nathaniel and Jonathan Katz. 1996. "Nuisance vs. Substance: Specifying and Estimating Time Series-Cross Section Models" *Political Analysis* Vol.6, J. Freeman, Ed., Ann Arbor: University of Michigan Press.
- Beck, Nathaniel and Jonathan Katz. 1995. "What to do (and not to do) With Time Series-Cross-Section Data" *American Political Science Review*.
- Kittel, Bernard. 1999. "Sense and Sensitivities in Pooled Analysis of Political Data." *European Journal of Political Research* 35: 225-53.
- Stimson, J. 1985. "Regression in Space and Time: A Statistical Essay" *American Journal of Political Science* 29:4, 914-947.

Recommended

- Alvarez, M., P. Lange, and G. Grant. 1991. "Government Partisanship, Labor Organizations and Macroeconomic Performance" *American Political Science Review* 85:2, 539-556.
- Blais, Andre, Donald Blake, and Stephane Dion. 1996. "Do Parties Make a Difference: A Reappraisal." *American Journal of Political Science* 40:514-20.
- Burkhardt, R. and M. Lewis-Beck. 1994. "Comparative Democracy: The Economic Development Thesis" *American Political Science Review* 88:903-910.
- Hicks, A. and D. Swank. 1993. "Politics, Institutions and Welfare Spending in Industrialized Democracies" *American Political Science Review* 86:3, 658-674.
- Kittel, Bernard, and Hannes Winner. 2001. "How Reliable is Pooled Analysis in Political Economy? The Globalization-Welfare State Nexus Revisited." Max Planck Institute for the Study of Societies, Cologne, Germany.
- Mebane, W. 1991. "Problems of Time and Causality in Survey Cross Section" *Political Analysis* VII, J. Stimson, Ed., 75-96.
- Swank, D. 1992. "Politics and Structural Dependence of the State in Democratic Capitalist Nations" *American Political Science Review* 86:1, 38-54.
- Zuc, G. and W. Thompson. "The Post-Coup Military Spending Question: A Pooled Cross-Sectional Time Series Analysis" *American Political Science Review* 76:60-74.

VIII. Supplemental References not Covered in Class

Brandt, Patrick T., and John T. Williams. 2001. "A Linear Poisson Autoregressive Model: The Poisson AR(p) Model." *Political Analysis* 9:2(July): 164-84.

Brandt, Patrick T., John T. Williams, Benjamin O. Fordham, and Brian Pollins. 2000. "Dynamic Modeling for Persistent Event-Count Time Series." *American Journal of Political Science* (October): 823-43.