TIME SERIES SUMMER CAMP

May 11-14, 2015
Wolf Law 304 & 330

Jennifer Wolak
wolakj@colorado.edu
my office, 306 Fleming

This workshop is an introduction to time series analysis.

Over the course of our four day workshop, we will consider the problems associated with autocorrelation, the dynamics of univariate time series, dynamic modeling of social and political trends, Granger causality, error correction models, and the challenges of analyzing time series cross-sectional data.

Given the short timeline of the course, we will not be able to cover absolutely all of the interesting aspects of time series analysis, but we will cover the basics with enough depth so that you will be able to use straightforward time series models in your own applications. Those interested in developing greater specialization in a topic are encouraged to contact me for additional background readings on any particular area.

PREREQUISITES AND EXPECTATIONS

In terms of prerequisites, you should have a basic familiarity with probability, statistics, and the classic linear model. If you have successfully completed PSCI 7085 and PSCI 7095, you should have sufficient background for the course.

Like most summer camps, your participation will be for the fun of it rather than for any course credit. Unlike most summer camps, there will be homework assignments that you are strongly encouraged to complete. Practicing the skills from the class will be the best way to master them, and I recommend that you take this opportunity to get feedback on your efforts to acquire these new skills.

READING LIST

Box-Steffensmeier, Janet M., John R. Freeman, Matthew P. Hitt, and Jon C. W. Pevehouse. 2014. *Time Series Analysis for the Social Sciences*. New York: Cambridge University Press.

We also have a handful of journal articles on our reading list. These will be accessible from the course website on D2L.

CLASS SCHEDULE

Introduction to time series

MONDAY, MAY 11, 9 A.M. – 12 P.M. {WOLF 304}

Modeling social dynamics, the challenges of time series data

- Gujarati, Damodar N., and Dawn C. Porter. 2008. *Basic Econometrics*. 5th edition. New York: McGraw-Hill. Chapter 17 (or the time series chapter from your favorite stats textbook).
- Box-Steffensmeier et al., chapter 1.

Univariate time series models

MONDAY, MAY 11, 1:30 – 3:30 P.M. {WOLF 304}

Introduction to ARIMA, intervention analysis

- Box-Steffensmeier et al., chapter 2.

Regression models for dynamic causation

TUESDAY, MAY 12, 9 A.M. – 12 P.M. {WOLF 304}

Autocorrelation, the lagged dependent variable model

- Box-Steffensmeier et al., chapter 3.
- Beck, Nathaniel. 1985. "Estimating Dynamic Models is Not Merely a Matter of Technique." *Political Methodology* 11:71-89.
- Keele, Luke, and Nathan Kelly. "Dynamic Models for Dynamic Theories: The Ins and Outs of Lagged Dependent Variables." *Political Analysis* 14:186-205.

Granger causality

TUESDAY, MAY 12, 1:30 – 3:30 P.M. {WOLF 304}

Granger causality and vector autoregression

- Box-Steffensmeier et al., chapter 4.
- Freeman, John R. 1983. "Granger Causality and Time Series Analysis of Political Relationships." *American Journal of Political Science* 27:327-358.
- *a nice application of vector autoregression*: Box-Steffensmeier, Janet M., David Darmofal, and Christian A. Farrell. 2009. "The Aggregate Dynamics of Campaigns." *Journal of Politics* 71:309-323.

Integration and cointegration

WEDNESDAY, MAY 13, 9 A.M. – 12 P.M. {WOLF 304}

Stationarity, integrated series, cointegration, error correction models

- Box-Steffensmeier et al., chapters 5 and 6.
- Murray, Michel P. 1994. "A Drunk and Her Dog: An Illustration of Cointegration and Error Correction." *The American Statistician* 48:37-39.
- De Boef, Suzanna, and Luke Keele. 2008. "Taking Time Seriously." *American Journal of Political Science* 52:184-200.
- *if you have time to spare:* Beck, Nathaniel. 1991. "Comparing Dynamic Specification: The Case of Presidential Approval." *Political Analysis* 3:51-88.

Pooled time series cross-sectional approaches

THURSDAY, MAY 14, 9 A.M. – 12 P.M. {WOLF 330}

Time meets space. Time series cross sectional models.

- Stimson, James A. 1985. "Regression Models in Space and Time: A Statistical Essay." *American Journal of Political Science* 29: 914-947.
- Beck, Nathaniel, and Jonathan N. Katz. 1995. "What to Do (and Not to Do) with Time Series Cross-Section Data." *American Political Science Review* 89:634-647.
- Beck, Nathaniel, and Jonathan M. Katz. 2011. "Modeling Dynamics in Time-Series-Cross-Section Political Economy Data." *Annual Review of Political Science* 14:331-352.