Pol Sci 5000	Spring 2018
	M 2:00 – 4:00PM
Panel Data	Seigle 208

Instructor:
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Seigle 251
Office Hours: Mondays, 4:30–5:30pm
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Purpose

Time series and time-series-cross-sectional (panel) data is very common throughout political science and much ink has been spilled in recommendations about the best way to model it. In this course, we will consider the basic econometrics behind dealing with panel data and how it applies to political science research. Most of this course will focus on the linear model and the strengths on weakness of ordinary least squares, but we will also consider the question of unobserved heterogeneity in non-linear panel models. Our studies will include classical (least squares, GMM, and ML estimation) and Bayesian approaches.

Course Requirements

Evaluation is based on three components: problem sets, presentations a final paper. There will be about 5 problem sets given over the course of this semester, which will be weighted equally to make up 70% of the final grade. Students will take turns presenting on the required readings, these presentations will compose 10% of the final grade. The paper will make up the remaining 20% of the grade and is due at the end of our official final exam time.

Problem sets

Problem sets will be a combination of theoretical problems and applied data analysis. They will be emailed to the students along with any required data

and are should be submitted before midnight on their due date. A submitted problem set should be in the form of a zip file that contains

- A pdf write up that answers any questions and presents data results in a professional manner (proper tables and figures)

- Extensively commented R code that produces all the results and figures in your write up

- Extensively commented stan code (for Bayesian problems).

Unless specifically told to, you should not use pre-programmed estimation routines for coefficients or standard errors. It is good to practice implementing routines from scratch.

Texts

No textbooks are officially required, but I strongly recommend you own a quality econometrics textbook such as Greene or Woolridge. You should be able to find all the required articles using Google Scholar or JSTOR.

Presentations

Student presentations be roughly 10-20 minutes with (again roughly) the following form:

1. Present the main points of the article

2. Work through any important results/derivations

3. Restate the main applied points (i.e., what should we do or not do in situations)

4. Worked example(s) in R using either real or simulated data if feasible to illustrate the main applied points

   - These can be examples taken directly from the paper. You don't need to make up new ones.

5. Q&A from fellow students

The paper

Each student will be required to write an article-length research paper using that use techniques from this class. This paper does not need to be original/unique to this class, but if you are using it for another seminar, please be sure that you have permission from that professor. Ideally, this paper will be an early draft of a third-year paper, dissertation project, or future article. A short one-page proposal is due in February that should identify a research question, one or more testable hypotheses, data sources, and maybe some summary statistics if available. A draft of the paper is due in April. Once drafts are submitted, all students will receive all the drafts and asked to prepare feedback on them as if you are a conference discussant. On the last day of class, students will present their projects and receive everyone's feedback.

Academic Integrity

Please be familiar with the University's academic honesty policies (url: `https://wustl.edu/about/compliance-policies/academic-policies/undergraduate-student-academic-integrity-policy/`). Violations will be handled with the utmost seriousness. Violators will be referred to the academic integrity office.

Course Schedule

22 January: Course introduction, syllabus, review of the linear model

1. No readings

29 January: No class

1. No readings

5 February: Heteroscedasticity and serial correlation (problem set 1 distributed)

1. King, Gary and Margaret E. Roberts. 2015. "How Robust Standard Errors Expose Methodological Problems They Do Not Fix, and What to Do About It." *Political Analysis*

12 February: Time series II (problem set 1 due)

1. DeBoef, Suzanna and Luke Keele. 2008 "Taking Time Seriously." *American Journal of Political Science.* 52(1): 184-200.

2. Grant, Taylor and Matthew J. Lebo. 2016. "Error Correction Methods in Political Time Series." *Political Analysis.* 24(1): 3-30.

3. Keele, Luke, Suzanna Linn, and Clayton McLaughlin Webb. 2016. "Treating Time with All Due Seriousness." *Political Analysis.* 24(1): 31-41.

4. Enns, Peter K., Nathan J. Kelly, Takaaki Masaki, and Patrick C. Wohlfarth. 2016. "Don't jettison the general error correction model just yet: A practical guide to avoiding spurious regression with the GECM." *Research and Politics.* 1-13.

19 February: Classic approaches to panel data I (Proposals due) (problem set 2 distributed)

1. No readings

26 February: Classical approaches to panel data II (problem set 2 due)

1. Esarey, Justin and Andrew Menger. 2017. "Practical and Effective Approaches to Dealing with Clustered Data." Unpublished Manuscript. `http://jee3.web.rice.edu/cluster-paper.pdf`.

2. Aronow, Peter M., Cyrus Samii, and Valentina A. Assenova. 2015. "Cluster-Robust Variance Estimation for Dyadic Data." *Political Analysis.* 23: 564-577

3. Plümper, Thomas and Vera Troeger. 2007. "Efficient Estimation of time-invariant and rarely changing variables in finite sample panel analyses with unit fixed effects." *Political Analysis.*15(2):124-139.

4. Greene, William. 2011. "Fixed Effects Vector Decomposition: A Magical Solution to the Problem of Time-Invariant Variables in Fixed-Effects Models?" *Political Analysis.* 19(2):135-146.

5 March: Classical approaches to panel data III

1. No readings

12 March: SPRING BREAK
19 March: Classical approaches to panel data IV (Problem Set 3 distributed)

1. No readings

26 March: Causal inference with panel data (Problem Set 3 due)

1. Blackwell, Matt. 2013. "A Framework for Dynamic Causal Inference in Political Science." *American Journal of Political Science*, 57(2): 504-519.

2. Blackwell, Matt and Adam Glynn. 2017. "How to Make Causal Inferences with Time-Series Cross-Sectional Data under Selection on Observables." Unpublished Manuscript. `http://www.mattblackwell.org/files/papers/causal-tscs.pdf`

2 April: Bayesian approaches, multilevel modeling (problem set 4 distributed)

1. Gelman, Andrew. 2006. "Multilevel (Hierarchical) Modeling: What it Can and Cannot Do." *Technometrics*. 48(3):432-435

2. Primo, David M., Matthew L. Jacobsmeier, and Jeffrey Milyo. 2007. "Estimating the Impact of State Policies and Institutions with Mixed-Level Data." *State Politics and Policy Quarterly*. 7(4): 446-459

3. Shor, Boris, Joseph Bafumi, Luke Keele, and David Park. 2007. "A Bayesian Approach to Time-Series Cross-Sectional Data." *Political Analysis*. 15:165-181.

4. Stegmueller, Daniel. 2013. "How Many Countries for Multilevel Modeling? A comparison of Frequentist and Bayesian Approaches." *American Journal of Political Science*. 57(3):748-761

9 April: Panel data with limited dependent variables (Drafts and problem set 4 due; problem set 5 distributed)

1. Green, Donald P., Soo Yeon Kim, and David H. Yoon. 2001 "Dirty Pool." *International Organization*. 55(2): 441-468

2. Beck, Nathaniel and Jonathan Katz. 2001. "Throwing the Baby Out with the Bath Water: A Comment on Green, Kim, and Yoon." *International Organization*. 55(2): 486-495.

3. Núñez, Lucas. "Partial Effects for Binary Outcome Models with Unobserved Heterogeneity." 2017. Unpublished Manuscript. `https://docs.wixstatic.com/ugd/2affed_5b8e61b62b154486bfc590cfc6c7fdca.pdf`.

16 April: Grouped binary duration data (problem set 5 due)

1. Beck, Nathaniel, Jonathan N. Katz, and Richard Tucker. 1998. "Taking Time Seriously: Time-Series-Cross-Sectional Analysis with a Binary Dependent Variable." *American Political Science Review.* 42(4):1260-1288.

2. Carter, David B. and Curtis S. Signorino. 2010. "Back to the Future: Modeling Time Dependence in Binary Data." *Political Analysis.* 18(3):271-292.

23 April: Student presentations and feedback

1. Student papers

7 May : Papers due 5:30pm

Final Disclaimer

The schedule, policies, procedures, and assignments in this course are subject to change in the event of extenuating circumstances, by mutual agreement, and/or to ensure better student learning.