Quantitative Methods in International Relations

SA.600.907
Johns Hopkins SAIS Europe

Instructor:
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Course Info:
Spring 2016
Day: Fri/Sat (2^{nd} week cycle)
Time: 17:30-19:50 (Fri) / 11:00-13:20 (Sat)
Room Number: tba

Course Description

This is a quantitative reasoning course meant to provide students with a thorough introduction to the use of statistical methodology in the empirical study of international relations (IR). The nature of the course is twofold. First, technically, the course discusses the statistical concepts and techniques most commonly used to analyze quantitative data. We will start from the basics and will gradually move to more sophisticated methods, including linear regression and models of limited dependent variables. Second, substantively, the course teaches students how to confront questions and assess analyses in modern IR research. Combining the technical and the substantive approaches will allow students to develop a familiarity with IR datasets as well as with some of the most important applied works in modern IR studies.

The course will focus more on the practicalities of IR data analysis rather than on the underlying mathematics. While we will address the more abstract foundations of statistical concepts, we will generally do so in an applied manner. During the course, students will acquire hands-on statistical experience using the **R** statistical computing environment. Through homework assignments and a final research project, students will become familiar with the statistical analysis of IR data, and learn how to produce and communicate statistical results related to IR questions. In order to ensure that students get the most from the course, some prior knowledge of statistics is assumed. Therefore, having fulfilled the statistics requirement is a prerequisite for the course.

The course has three objectives. First, by the end of the semester, students will have become smart consumers of IR research. They will have the ability to read an applied IR article, understand the empirical analysis and assess the statistical inferences. Second, the emphasis on practical implementation will put students on the road to becoming producers of systematic knowledge. They will acquire the capacity to conduct intelligent analyses of IR data in response to theoretical questions. Finally, the completion of homework and a final research project will let students become familiar with the basics of practical statistical analysis. This will be a useful foundation for future quantitative work.

Grading Policies

Evaluations of student performance will be based on small homework assignments, class presentations, two exams, and a research project. Homeworks will be checked, but will be graded based on completion. Students are encouraged to work together on the homework (not on the exams or research project), but are expected to turn in their own, independent write-up. Final grades will be calculated in the following way:

- Homework/Presentations: 15%
- Midterm: 25%
- Research Project: 30%
- Final Exam: 30%

Research Project

During the semester, all students are expected to complete a research project. This will be a short research paper (approximately 10 pages), in which students pose an empirical question about international relations, describe an appropriate research design, and finally, carry out and interpret an analysis. In addition to the research paper, students will be expected to turn in their data, as well as the code used to generate the analysis, to ensure replicability of the results. The project will be evaluated on the thoroughness of the research design and its appropriateness with respect to the question being investigated. We will discuss the research project in more detail during the course.

Students are welcome to formulate their own research questions or to replicate a published work. In the latter case, the student will be expected to add some value to the analysis. In either case, students are strongly encouraged to discuss their ideas with the instructor in advance, or to submit potential topics for feedback. A formal proposal, accompanied by the relevant data, is due on the day of the midterm, and the final paper is due on the last day of class. Unless arrangements for extenuating circumstances are agreed upon in advance, late work will incur a penalty of one letter grade (10%) per day.

Readings

Readings will generally be a combination of statistical and substantive works, which will address the material that we will cover for the week. While both types of readings will be useful, the latter are especially important. We will spend a portion of the class examining the substantive readings in terms of their implementation of the week's concept, as well as on their own terms, as IR pieces. Each week, one student will be assigned to lead class discussion for each of the required substantive readings. Slides and a class handout are strongly encouraged. Students are expected to have done the readings before coming to class. The following book is required and will serve as our primary statistical text:

Gujarati, Damodar N. 2009. *Basic Econometrics* (Fifth Edition). New York, NY: McGraw-Hill.

Software

In examining data during this course, we will use make use of the **R** language. Using **R** for data analysis has a number of advantages. First and foremost, the software is free. Students can download their own copy of **R** for Windows, OS X, or Linux by going to `http://cran.r-project.org/mirrors.html` and selecting the appropriate version. Second, writing your own statistical code forces you to think carefully about the statistical assumptions that underlie your modeling decisions, in a way that using a point-and-click interface would not. Finally, if you find yourself needing to change software in the future, it is much easier to transition from **R** to more user-friendly statistical software (such as Stata or SPSS) than the other way around. We will talk more about **R** during the course.

Students are encouraged to take a look at the official introduction to R and keep it handy throughout the course as a reference guide. It can be found at `http://cran.r-project.org/doc/manuals/R-intro.pdf`. Another useful guide is Verzani's *Simple R: Using R for Introductory Statistics*. available at `http://cran.r-project.org/doc/contrib/Verzani-SimpleR.pdf`.

Honor Code

In all courses and all student activities at SAIS, students are expected to adhere to the rules and spirit of the school's Honor Code, which are detailed in the Student Handbook and posted on-line. In this course, although it is certainly acceptable for students to study together and to work together on homework assignments, all write-ups should be completed independently. All examinations are 'closed book,' meaning that no notes may be used during the examination nor may outside sources be consulted during the exam. The course requires a written research paper and students should be especially careful to understand what constitutes plagiarism and to avoid it. SAIS makes available to both faculty and students a software program known as Turnitin, which uses a very large data base to identify possible plagiarism. Students are encouraged to use the software as a self-checking mechanism to avoid inadvertent, but inappropriate inclusion of source material. Violation of the Honor Code in an assignment or activity will almost invariably result in failing that assignment and possibly more severe sanctions, including but not limited to course failure, depending on the specific circumstances.

Course Outline

Session 1

Theme: Intro to **R** and Common IR Datasets

Substantive goal: Why Quantitative Methods to Study IR?

- Readings:
  - Gujarati Ch. 1, 2
  - Bueno de Mesquita, Bruce. 2002. "Domestic Politics and International Relations." *International Studies Quarterly.* 46(1), 1-9.

  - Braumoeller, Bear F. and Anne E. Sartori. 2004. "The Promise and Perils of Statistics in International Relations." In *Models, Numbers, and Cases: Methods for Studying International Relations*, ed. Detlef F. Sprinz and Yael Volinsky-Nahmias. Ann Arbor: University of Michigan Press, pp. 129-151.

- HW 1: Exploring Data in **R**

Session 2

Theme: OLS and Linear Regression (I) – Set up and Assumptions

Substantive goal: Operationalizing IR Concepts and Thinking about Linear Variables.

- Readings:
  - Gujarati Ch. 3 (+ Skim Gujarati Appendix A)
  - Singer, J. David. 1972. "The 'Correlates of War' Project: Interim Report and Rationale. " *World Politics* 24(2): 243-270.
  - Grandud, Christopher and Mark Hallerberg. 2015. "When all is said and done: Updating 'Elections, Special Interests, and Financial Crisis'." *Research and Politics* 2(3): 1-9.

Session 3

Theme: OLS and Linear Regression (II) – Estimation and Interpretation

Substantive goal: Testing Models and Interpreting Linear Relationships in IR.

- Readings:
  - Gujarati Ch. 7, 8
  - Jensen, Nathan M. 2003. "Democratic Governance and Multinational Corporations: Political Regimes and Inflows of Foreign Direct Investment." *International Organization* 57(3): 587-616.
  - Bush, Sarah Sunn and Jamal, Amaney A. 2015. "Anti-Americanism, Authoritarian Politics, and Attitudes about Women?s Representation: Evidence from a Survey Experiment in Jordan." *International Studies Quarterly* 59, 34-45.

- HW 2: Regression analysis

Session 4

Theme: OLS and Linear Regression (III) – Application and Presentation of Results

Substantive goal: Assessing IR Theories through Linear Models.

- Readings:

- Blaydes, Lisa and Mark A. Kayser. 2011. "Counting Calories: Democracy and Distribution in the Developing World." *International Studies Quarterly* 55, 887-908
- Gray, Julia and Jonathan B. Slapin. 2013. "Exit Options and the Effectiveness of Regional Economic Organizations." *Political Science Research and Methods* 1(2): 281-303.
- Ziller, Conrad. 2014. "Societal Implications of Antidiscrimination Policy in Europe." *Research and Politics* 1(4): 1-9.

Session 5

Theme: Regression with Binary Dependent Variables (I) – Set-Up and Estimation

Substantive goal: Testing Binary Models and Interpreting Non-Linear Relationships.

- Readings:
  - Gujarati Ch. 15
  - Thacker, Strom C. 1999. "The High Politics of IMF Lending." *World Politics* 52: 38-75.
  - Leblang, David. A. 1999. "Domestic Political Institutions and Exchange Rate Commitments in the Developing World." *International Studies Quarterly* 43(4): 599-620.
  - Neumayer, Eric. 2002. "Do Democracies Exhibit Stronger International Environmental Commitment? A Cross-Country Analysis." *Journal of Peace Research* 39(2): 139-164.
  - Fearon, James D. and David D. Laitin. 2003. "Ethnicity, Insurgency, and Civil War." *American Political Science Review* 97(1): 75-90.
- HW 3: Logit/Probit Analysis

Session 6

Theme: Regressions with Binary Dependent Variables (II) – Application and Presentation of Results

Substantive goal: Assessing IR Theories through Non-Linear Models.

- Readings:
  - King, Gary, Michael Tomz, and Jason Wittenberg. 2000. "Making the Most of Statistical Analyses: Improving Interpretation and Presentation." *American Journal of Political Science* 44(2): 347-361.
  - Achen, Christopher H. 2005. "Let's Put Garbage-Can Regressions and Garbage-Can Probits Where They Belong." *Conflict Management and Peace Science* 22(4): 327-339.

- Midterm Review

Session 7

Midterm Exam

- Paper Topics Due

Session 8

Theme: Regressions with Polytomous Dependent Variables

Substantive goal: Assessing IR Theories through Multinomial Models.

- Readings:
  - Davis, Christina L. 2004. "International Institutions and Issue Linkage: Building Support for Agricultural Trade Liberalization." *American Political Science Review* 98(1): 153-169.
  - Piazza, James A. and James Igoe Walsh. 2009. "Transnational Terror and Human Rights." *International Studies Quarterly* 53: 125-148.
  - Epifanio, Mariaelisa. 2011. "Legislative response to international terrorism." *Journal of Peace Research* 48: 399-411.
  - Long, J. Scott. 2012. 'Regression Models for Nominal and Ordinal Outcomes.' Available: `http://tinyurl.com/long-polytomous`
- HW 4: Dependent Variables with Multiple Categories

Session 9

Theme: Model Specification (I) – Estimation Bias and Measurement Error

Substantive goal: Assessing IR theories when Observations are Omitted, Irrelevant or Badly Measured.

- Readings:
  - Gujarati Ch. 13
  - Hooghe, Lisbet and Gary Marks. 2004. "Does Identity or Economic Rationality Drive Public Opinion on European Integration?" *Political Science and Politics.* 3: 415-420.
  - Poast, Paul. 2012. "Does Issue Linkage Work? Evidence from European Alliance Negotiations, 1860 to 1945." *International Organization*, 66:277-310.
  - Gibler, Douglas M. and Alex Braithwaite. 2013. "Dangerous Neighbors, Regional Territorial Conflict and the Democratic Peace." *British Journal of Political Science* 43(04): 877-887.

Session 10

Theme: Model Specification (II) – Panel Data

Substantive goal: Assessing IR theories when Observations are Autocorrelated through Space and Time.

- Readings:
  - Gujarati Ch. 11-12
  - Morrow, James D., Randolph M. Siverson, and Tressa E. Tabares. 1998. "The Political Determinants of International Trade: The Major Powers, 1907-1990." *American Political Science Review* 92(3): 649-661.
  - Dafoe, Allan. 2011. "Statistical Critiques of the Democratic Peace: Caveat Emptor." *American Journal of Political Science* 55(2): 247-262.
  - Scheve, Kenneth and David Stasavage. 2012. "Democracy, War, and Wealth: Lessons from Two Centuries of Inheritance Taxation." *American Political Science Review* 106(1): 81-102.
  - Dreher, Axel and Martin Gassebner. 2012. "Do IMF and World Bank Programs Induce Government Crises? An Empirical Analysis." *International Organization.* 66(2): 329- 358.
- HW 5: Panel Data Analysis

Session 11

Theme: Model Specification (III) – Rare Events

Substantive goal: Assessing IR theories when Observations are Sparse or Infrequent.

- Readings:
  - King, Gary and Langche Zeng. 2001. "Explaining Rare Events in International Relations." *International Organization* 55(3): 693-715.
  - Jackson Wade, Sara and Dan Reiter. 2007. "Does Democracy Matter?: Regime Type and Suicide Terrorism." *Journal of Conflict Resolution* 51(2): 329-348.
  - Boyer, Mark A., Brian Urlacher, Natalie Florea Hudson, Anat Niv-Solomon, Laura L. Janik, Michael J. Butler, Scott W. Brown and Andri Ioannou. 2009. "Gender and Negotiation: Some Experimental Findings from an International Negotiation Simulation." *International Studies Quarterly* 53(1), 23-47.

Session 12

Theme: Model Specification (IV) – Selection Bias

Substantive goal: Assessing IR theories when Observations are not Random.

- Readings:
  - Fearon, James D. 1994. "Signaling Versus the Balance of Power and Interests: An Empirical Test of a Crisis Bargaining Model." *Journal of Conflict Resolution* 38(2): 236-69.
  - Savun, Burcu. 2008. "Information, Bias, and Mediation Success." *International Studies Quarterly.* 52(1): 25-47.
  - Lupu, Yonatan. 2013. "The informative Power of Treaty Commitment Using The Spatial Model to Address Selection Effects." *American Journal of Political Science* 57(4): 912-925
- HW 6: Estimating Selection Effects

Session 13

Course Wrap Up

- Research Presentations
- Research Projects Due