

PO906: Quantitative Data Analysis and Interpretation

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Module Outline:

Theory building and research methods are the most important tools for conducting sound research in Political Science. In this module we will mainly focus on quantitative methods to test implications of theoretical arguments. It is very important to understand which methods can and should be used under different conditions such as type of research question, scope and explanatory power of a theory and data format and availability. We will discuss different types of methods and assess advantages, disadvantages and applicability of quantitative methods to achieve various research goals. Focusing on the theory-method link this module is designed to emphasize the importance of method selection and the appropriateness of a specific method given theory, data and research goals. Large parts of the module are dedicated to quantitative research methods, especially the analysis of quantitative data by inferential statistics to enable students to conduct their own research by using quantitative tools and – more importantly – to follow the leading research in the fields of comparative politics, international relations, political economy, political behaviour and electoral studies. The module will start by reviewing basic statistical techniques, but will soon be concerned with more elaborate questions of data analysis such as specification issues, non-linear relationships, statistical approaches for limited dependent variables, time series and pooled data, and maximum likelihood estimation.

Module Aims:

By the end of the module students should

1. have a reading appreciation of representative approaches to empirical research in political science;
2. be familiar with the language associated with research techniques;
3. be sensitive to the impact of "method artefact" on social investigations;
4. be familiar with the role of computers in political research;
5. have sound econometrical skills;
6. be able to design research programmes;
7. have an increased interest in rigorous political analysis;
8. be able to analyse quantitative data with STATA and interpret the results correctly;
9. be able to follow quantitative research in leading political science journals;
10. get to know and work with more complicated statistical procedures;
11. be able to conduct sound quantitative research and testing theoretical propositions in a rigorous manner

Key Skills

On this module students will need, use and improve the following key skills:

systematic thinking: All theories and explanations in political science make assumptions about important actors, their utility function, and the structure in which social interaction takes place. The module will improve the student's ability to identify crucial assumptions and discuss how arguments are related to assumptions. In addition the module will focus on the very important link between theory and methods. The module will enable students to select the appropriate method for testing specific theoretical predictions.

transfer of ideas and arguments: Students will apply theoretical arguments to issue-areas, in which these theories have not been developed. Students will not only learn basic and more sophisticated statistical methods, they will also need to apply new methods in order to test their own theoretical arguments.

Use of statistical programs (STATA) to analyze data: students will learn in lab sessions how to use the statistical program STATA to analyze quantitative empirical data.

improving own learning and performance: Students will learn how to simplify complicated arguments to the core of the underlying logic. They will learn to formulate testable hypothesis and link these predictions to data and the econometric analysis of quantitative data.

communication: Students will use and exercise open-mindedness in oral presentation and discussion.

writing: Students will write discuss and learn how to organize research, develop arguments, test theories and write scientific texts.

interacting with others: Students will discuss controversial themes in political economy, international relations, public policy, comparative politics, and political behavior. They will also discuss the selection of specific methods to test theoretical arguments. This requires to respect others, listen carefully, argue calmly but self-confident.

Contact

Students can contact me by email. Office hours will be announced over the web and at my office door.

Basic Readings

King, Gary/ Keohane, Robert O. and Sidney Verba 1994: *Designing Social Inquiry: Scientific Inference in Qualitative Research*, Princeton University Press.

Wooldridge, Jeffrey M. 2003: *Introductory Econometrics*, South-Western. Or later edition

Kennedy, Peter 1998: *A Guide to Econometrics*, fourth or later ed., Blackwell Publishers.

Dougherty, Christopher 2002: *Introduction to Econometrics*, Second Edition, Oxford University Press.

Wooldridge, Jeffrey M. 2002: *Econometric Analysis of Cross Section and Panel Data*, MIT Press, Cambridge.

Module Outline:

Week 1: Variables, Measurement, Samples, Random Samples, Distributions, data types, data sources and data generation

Readings:

Wooldridge, Jeffrey M. 2003: *Introductory Econometrics*, South-Western, Chpts 1- 3, pp. 1 - 116.

Kennedy, Peter 1998: *A Guide to Econometrics*, fourth ed., Blackwell Publishers, Chpts 1 -3, pp. 1-54

Dougherty, Christopher 2002: *Introduction to Econometrics*, Second Edition, Oxford University Press, chpts 1 and 2, pp. 1-70.

Week 2: Descriptive Statistics: Measures of Central Tendency and Dispersion

Readings:

Wooldridge, Jeffrey M. 2003: *Introductory Econometrics*, South-Western, Chpts 1- 3, pp. 1 - 116.

Kennedy, Peter 1998: *A Guide to Econometrics*, fourth ed., Blackwell Publishers, Chpts 1 -3, pp. 1-54

Dougherty, Christopher 2002: *Introduction to Econometrics*, Second Edition, Oxford University Press, chpts 1 and 2, pp. 1-70.

Week 3: Relationships between variables: correlation and cross-tabs, descriptive statistics

Readings:

Wooldridge, Jeffrey M. 2003: *Introductory Econometrics*, South-Western, Chpts 1- 3, pp. 1 - 116.

Kennedy, Peter 1998: *A Guide to Econometrics*, fourth ed., Blackwell Publishers, Chpts 1 -3, pp. 1-54

Dougherty, Christopher 2002: *Introduction to Econometrics*, Second Edition, Oxford University Press, chpts 1 and 2, pp. 1-70.

Week 4: Test Theory, Test Statistics

Readings:

Kennedy, Peter 1998: A Guide to Econometrics, fourth ed., Blackwell Publishers, Chpts 4 -5, pp. 54-94

Week 5: Simple Tests (Chi², F, t), Comparison of Means and Standard Deviations

Readings:

Kennedy, Peter 1998: A Guide to Econometrics, fourth ed., Blackwell Publishers, Chpts 4 -5, pp. 54-94

Week 6: Reading Week

Week 7: Simple bivariate Linear Regressions, the OLS Principle, Parameters, components of Regression Analysis

Readings:

Wooldridge, Jeffrey M. 2003: Introductory Econometrics, South-Western, ch. 2, pp. 22-66.

Kennedy, Peter 1998: A Guide to Econometrics, fourth ed., Blackwell Publishers, ch. 3, pp. 42-54.

Dougherty, Christopher 2002: Introduction to Econometrics, Second Edition, Oxford University Press, chpts. 2-3, pp. 48-114.

Week 8: Gauss-Markov Assumptions – Full Ideal Conditions

Readings:

Wooldridge, Jeffrey M. 2003: Introductory Econometrics, South-Western, ch. 2, pp. 22-66.

Kennedy, Peter 1998: A Guide to Econometrics, fourth ed., Blackwell Publishers, ch. 3, pp. 42-54.

Dougherty, Christopher 2002: Introduction to Econometrics, Second Edition, Oxford University Press, chpts. 2-3, pp. 48-114.

Week 9: Multivariate Linear Regression, Interpretation of Regression Results

Readings:

Wooldridge, Jeffrey M. 2003: Introductory Econometrics, South-Western, ch. 3, 66-113.

Kennedy, Peter 1998: A Guide to Econometrics, fourth ed., Blackwell Publishers, ch. 3, pp. 42-54.

Dougherty, Christopher 2002: Introduction to Econometrics, Second Edition, Oxford University Press, ch. 4, pp. 114-149.

Week 10: Residuals, Standard Errors of Coefficients, Significance tests, confidence intervals

Readings:

Wooldridge, Jeffrey M. 2003: Introductory Econometrics, South-Western, ch. 4, pp. 113-162.

Kennedy, Peter 1998: A Guide to Econometrics, fourth ed., Blackwell Publishers, ch. 4, pp. 54-73.

Dougherty, Christopher 2002: Introduction to Econometrics, Second Edition, Oxford University Press, chpts. 3-4, pp. 70-149.