



Executive Master of Public Management

Course Title: Informed Consumption of Quantitative Research

Name of Convenor: Mark Kayser

Syllabus Version 2.0 as of 18.10.2010

1. General Information

Date	4 November – 6 November, 2010
Venue	Room 3.32
Convenor	Mark A. Kayser
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Office Hours	By appointment. Email Dayna Sadow (sadow@hertie-school.org).

2. Learning objectives of the course

The type of social outcomes that are studied in public and non-profit administration are usually determined by a complex set of factors. It is consequently difficult to understand the effect of a given policy or change in a specific factor on outcomes. Experimental scientists solve this problem with careful laboratory controls that let only a single factor vary. Most social scientists and policy analysts do not have the luxury of a controlled laboratory setting and must analyse pre-existing observational data in which multiple variables change. Statistical tools such as multiple regression are well suited to this type of data but when misapplied, they can give misleading results. This course trains participants in recognizing the proper use and abuse of methods in quantitative research.

Methods such as multiple regression are popular in all types of social analysis from business to government because they can isolate and estimate the magnitude of a single effect on an outcome when several potentially causal variables are at play. This precision cannot be offered by alternative methods such as case studies or uncontrolled comparison. Also unlike many alternative methods, regression can quantify the degree of uncertainty in its estimates.

Effective managers increasingly need to understand multiple regression results in social analyses and research reports. Most critically, they must be able to discern properly designed and estimated models from flawed work. And when they suspect a flaw, it is of great advantage to understand whether and how it likely biases results. Participants will complete this course with an enhanced ability to know when to believe the numbers.

3. Overview of the course

	Day 1:	Day 2:	Day 3:
9-11 h	<i>Introduction and Research Design</i>	<i>Introduction to Regression</i>	<i>10. Workshop: Predicting Bias</i>
11-13 h	<i>More Research Design</i>	<i>Pitfalls that Bias Estimates, Pt 1</i>	<i>11. Workshop When and when not to believe the results</i>
<i>Lunch break</i>			
14-16 h	<i>Descriptive Statistics</i>	<i>Pitfalls that Bias Estimates, Pt 2</i>	
16-18h	<i>Statistical Inference</i>	<i>Pitfalls that Undermine Inference</i>	
18-20h		<i>Speaker: Robert Stemmler</i>	

3. Lecturers and guests

- Robert Stemmler, Knowledge Specialist/Research Team Leader, McKinsey, and EMPM Alumnus, will lead a discussion on the use of quantitative methods in public management.

4. Requirements, Grading & Deadline

Assignment 1, due 17 Jan 2011	40% of final course grade
Assignment 2, due 17 Jan 2011	40% of final course grade
Participation	20% of final course grade

In addition to course participation, grading will be based on two take-home assignments, both due on the 17th of January, 2011. Each assignment will be based on an actual research manuscript that the students will critique using the skills they have gained in this course. The assignments themselves will be short “referee reports” on the quality and flaws of the manuscripts.

5. Primary Books Used

- (1) Allison, Paul D. 1999. *Multiple Regression: A Primer*. Thousand Oaks, CA: Pine Forge Press.
- (2) Huff, Darrell. 1954. *How to Lie with Statistics*. New York: W.W. Norton & co.
- (3) Geddes, Barbara. 2003. *Paradigms and Sand Castles*. Ann Arbor, MI: University of Michigan Press.

- (4) Kellstedt, Paul M. and Guy D. Whitten. 2009. *The Fundamentals of Political Science Research*. New York, NY: Cambridge University Press.
- (5) King, Gary, Robert O. Keohane and Sidney Verba. 1994. *Designing Social Inquiry: Scientific Inference in Qualitative Research*. Princeton, NJ: Princeton University Press.
- (6) Meier, Kenneth J., Jeffrey L. Brundney and John Bohte. 2009. *Applied Statistics for Public and Nonprofit Administration, 7th ed.* Belmont, Calif.: Thompson-Wadsworth.
- (7) Pollock, Philip H. 2009. *The Essentials of Political Analysis, 3rd ed.* Washington, DC: CQ Press.
- (8) Rowntree, Derek. 2000 [1981]. *Statistics without Tears: An Introduction for Non-Mathematicians*. London: Penguin Books.

6. Detailed Schedule

Session 1	Day 1 Introduction and Research Design
Lecturer	Mark Kayser
Content	Advantages of Quantitative Methods, Hypotheses, Causality, Experiments and Quasi Experiments, Measurement, Operationalization, Threats to Internal and External Validity.
Core Readings	<ul style="list-style-type: none"> • Drezner: How to Read Research Papers? <i>Foreign Policy</i>. 9 July 2010. Drezner blog. • Meier et al. "Statistics and Public and Nonprofit Administration." Part of Ch.1, pp. 3-7. • Rowntree. "Statistical Inquiry." Ch. 1, pp. 13-23. • Meier et al. "Research Design." Ch.3.
Optional Readings	<ul style="list-style-type: none"> • Mark Franklin. 2008. "Quantitative Analysis." In <i>Approaches and Methodologies in the Social Sciences</i>. Ch. 13. Pp. 240-62. • King et al. Ch3 (Causal inference, mechanism, rival mechs, multiple causality, falsifiability).

Session 2	Day 1 More Research Design
Lecturer	Mark Kayser
Content	Sample Selection, Selecting on the dependent variable, Selecting on the independent variable, Non-random sampling, Data mining
Core Readings	<ul style="list-style-type: none"> • King et al. "Determining What to Observe," Ch4, pp. 115-49. • Huff. "The Sample with the Built-in Bias," Ch 1, pp. 11-26. • Huff. "The Little Figures that are Not There. Ch. 3, pp. 37-52. (Small Samples and probability).
Optional Readings	<ul style="list-style-type: none"> • Geddes Ch.3. How the Cases you Select Affect the Answers You Get. Pp. 89-129. (Selection bias and selection on the DV).

Session 3	Day 1 Descriptive Statistics
Lecturer	Mark Kayser
Content	Levels of measurement, central tendency, central limit theorem, variance, distributions, skew
Core Readings	<ul style="list-style-type: none"> Rowntree. Ch. 2, 3 & 4. "Describing our Sample", "Summarizing our Data", and "The Shape of a Distribution."
Optional Readings	<ul style="list-style-type: none"> Meier. Ch. 4-6, "Descriptive Statistics," pp. 57-110. Huff. Ch. 2. "The Well-Chosen Average," pp. 27-36. Huff. Ch. 5, "The Gee-Whiz Graph." (Scale and truncation in graphs and bar charts)

Session 4	Day 1 Statistical Inference
Lecturer	Mark Kayser
Content	Z-scores, standard normal probabilities, t-scores, confidence intervals, inference with proportions
Core Readings	<ul style="list-style-type: none"> Rowntree. Ch 5, "From Sample to Population", Rowntree. Ch 6, "Comparing Samples" Rowntree. Ch 7, "Further Matters of Significance."
Optional Readings	<ul style="list-style-type: none"> Huff. Ch. 4. "Much Ado about Practically Nothing." (Statistical v Substantive significance) Greenhalgh, Trisha. 1997. How to read a paper: Statistics for the non-statistician. II: "Significant" relations and their pitfalls. <i>British Medical Journal</i> 315 (442). Meier. Ch 11-14. "Inferential Statistics"

Session 5	Day 2 Interpretation of Regression
Lecturer	Mark Kayser
Content	Correlation, bivariate regression, OLS, hypothesis testing, controlling for a third variable, multiple regression
Core Readings	<ul style="list-style-type: none"> Pollock. Ch. 8.2 (pp. 1-17 & p.21) "Correlation and Linear Regression." <i>The Essentials of Political Analysis</i>. Allison. Ch. 1. "What is Multiple Regression?" Allison. Ch. 2. "How do I Interpret Multiple Regression Results?"
Optional Readings	<ul style="list-style-type: none"> Huff. Ch. 8. Post-hoc rides again. Rowntree. Ch. 8. "Analyzing relationships."

Session 6	Day 2 Pitfalls that Bias Regression Results, Part 1
Lecturer	Mark Kayser
Content	OLS assumptions, practical pitfalls, omitted variable bias, predicting the direction of bias, functional form (interactions, polynomial regression, logs)
Core Readings	<ul style="list-style-type: none"> Allison. Ch. 3. "What Can Go Wrong with Multiple Regression?" Allison. Ch. 6. "What are the Assumptions of Multiple Regression?"
Optional Readings	<ul style="list-style-type: none"> Meier Ch. 19. "The Assumptions of Linear Regression." Kellstedt and Whitten. OLS Assumptions. Pp. 177-82. Kellstedt and Whitten. "What Happens When We Fail to Control for Z?" pp. 188-193.

Session 7	Day 2 Pitfalls that Bias Regression Results, Part 2
Lecturer	Mark Kayser
Content	Endogeneity bias, trended data, outliers, sampling
Core Readings	<ul style="list-style-type: none"> Pollock. Interactions. 189-92 Meier. Polynomial Curve-fitting. pp. 404-409. Kellstedt and Whitten. Outliers. Pp. 220-225. Kellstedt and Whitten. Autocorrelation in Time-Series. Pp. 233-42.

Session 8	Day 2 Pitfalls that Undermine Regression Inference
Lecturer	Mark Kayser
Content	Type I and type II error, low variance on the independent variables, multicollinearity, heteroskedasticity, correlated errors.
Core Readings	<ul style="list-style-type: none"> Pollock. Multicollinearity. Pp. 193-94. Kellstedt and Whitten. Multicollinearity. 225-232. Allison. What is Homoscedasticity? Pp. 125-128.

Session 9	Day 2 Guest Speaker
Lecturer	Robert Stemmler, McKinsey.
Content	A discussion: Quantitative methods in public management
Readings	None

Session 10	Day 3 Workshop: Predicting Bias, Interpreting Logs
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Lecturer	
Content	Predicting Bias
Readings	None

Session 11	Day 3 Workshop: When and when not to believe the results
Lecturer	
Content	When and when not to believe the results
Readings	None