



**Quantitative Methods for Policy
Analysis**

MSPP-GP 2905.001

Wednesday 2:00 pm – 3:40 pm

Location: Silver 403

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Office Hours

Wednesday 3:45 pm-4:45 pm

By appointment: <https://tinyurl.com/y4rsjqfp>

Course Modality

This course will be run as a flipped class. Lecture content is available online along with the slides and Stata examples. Students will be required to view the lectures, respond to discussion questions, and complete Stata exercises online **before** the live session. In-person class time will be spent focusing on those questions and issues that students flagged as unclear or benefitting from more discussion. After class, you will have a lab with our TA and have another chance to over any questions.

Course Description and Objectives

The goal of this course is to provide students with an introduction to key methods of quantitative policy analysis. We develop the statistical toolkit of regression analysis, reviewing the bivariate regression model and then continuing with multiple regression, and explore how these methods are applied to policy analysis in five benchmark techniques: randomized trials, direct regression analysis, instrumental variables, regression discontinuity, and difference in differences. We emphasize the distinction between regression as a statistical tool and the additional context knowledge (and occasionally assumptions) that are required to address causal policy questions.

Approach

The focus will be on learning to use the methods discussed. This involves a counterpoint between methods discussion and application. The methods discussion will lean on basic statistical concepts, but the emphasis will be on the intuition and ideas. The applications will be based on analysis of real and realistic policy-relevant data.

Grading

The course will be evaluated through class participation (15 points), five problem sets (12 points each), and a midterm exam (25 points). The class participation grade will be awarded on a check grading scheme, for responding to online questions for asynchronous content and attending and participating in live sessions. All problem sets will make use of Stata, so please ensure you are familiar with how to access this program at NYU.

Required Books

James Stock and Mark Watson (SW below), **Introduction to Econometrics**, Pearson Addison Wesley.

Joshua Angrist and Jörn-Steffen Pischke (MM below), **Mastering ‘Metrics**, Princeton UP.

Schedule

8 September, Class 1: Introduction to causality and review of the bivariate regression model

15 September, Class 2: Randomized controlled trials: **Assigned:** PS1.

22 September, Class 3: Multiple regression: estimation and interpretation

29 September, Class 4: Multiple regression: hypothesis testing. **Due:** PS1.

6 October, Class 5: Multiple regression: challenges **Assigned:** PS2.

13 October, Class 6: Dummy variables

20 October, Class 7: Direct regression analysis of policy: possibilities and perils. **Due:** PS2.

27 October, Class 8: Midterm

3 November, Class 9: Multiple regression: functional form

10 November, Class 10: Instrumental variables. **Assigned:** PS3.

17 November, Class 11: Regression Discontinuity. **Assigned:** PS4. **Due:** PS3.

24 November, Class 12: Introduction to panel data.

1 December, Class 13: Difference-in-differences: using policy variation.

Due: PS4. **Assigned:** PS5

8 December, Lecture 14 Class 14: Introduction to time series and forecasting

Due 17 Dec : PS5.

Readings

All required and many optional readings are on the NYU Classes site.

Class 1: Causality and the Treatment Effect, Review of Bivariate Regressions

Required:

- MM, Introduction.
- SW, Chapters 1, 4, and 5
- Holland, P. (1986), “Statistics and Causal Inference” (with discussion), *Journal of the American Statistical Association*, 81, 945-970. **Advanced reading: skim non-technical portions.**

Optional:

- DiNardo, John, “Interesting Questions in Freakonomics,” *Journal of Economic Literature*, Volume 45, No. 4, pp. 973-1000.
- Whitehurst, Grover, and Matthew Chingos, “Class Size: What Research Says and What it Means for Policy,” *Brown Center for Education at Brookings*, Working Paper, 2011.
- Andersson, Federik, Harry Holzer, and Julia Lane (2008), “Temporary Help Agencies and the Advancement Prospects of Low Earners”, NBER Working Paper No. 13434.
- Autor, David H. and Susan N. Houseman, “Do Temporary Help Jobs Improve Labor Market Outcomes for Low-Skilled Workers? Evidence from ‘Work First.’” *American Economic Journal: Applied Economics* 2(3): July 2010, pp. 96-128.

Class 2: Randomized trials

Required:

- MM, Chapter 1.
- Bertrand, Marianne, and Sendhil Mullainathan, “Are Emily and Greg More Employable than Lakisha and Jamal? A Field Experiment on Labor Market Discrimination,” *American Economic Review*, Volume 94, Number 4 (2004), pp. 991-1013.
- Duflo, Esther, Pasqualine Dupas, and Michael Kremer, “Education, HIV, and Early Fertility: Experimental Evidence from Kenya,” *American Economic Review*, Volume 109, Number 9, pp. 2257-97.
- Chetty, Raj, John Friedman, Nathaniel Hilger, Emmanuel Saez, Diane Whitmore Schanzenback, and Danny Yagan, “How Does Your Kindergarten Classroom Affect your Earnings? Evidence from Project Star,” *Quarterly Journal of Economics*, Volume 126, Number 4 (2011), pp. 1593-1660

Optional:

- Angrist, Joshua, and Victor Lavy, “The Effect of High School Matriculation: Evidence from Randomized Trials,” NBER Working Paper No. 9389.

- Duflo, Esther, and Emmanuel Saez, “The Role of Information and Social Interactions in Retirement Savings Decisions: Evidence from a Randomized Experiment,” *Quarterly Journal of Economics*, August 2003
- Bertrand, Marianne, Dean Karlan, Sendhil Mullainathan, Eldar Shafir, and Jonathan Zinman, “What’s Psychology Worth? A Field Experiment in the Consumer Credit Market,” working paper.
- Cox, D. R., *The Planning of Experiments*. Wiley.
- Imbens, Guido, and Donald Rubin, *Causal Inference for Statistics, Social and Biomedical Sciences*. Cambridge.

Class 3: Multiple Regression: Estimation and Interpretation

Required:

- SW, Chapter 6

Class 4: Multiple Regression: Hypothesis Testing

Required:

- SW, Chapter 7.1-7.4

Class 5: Multiple Regression: Challenges

Required:

- SW, Chapters 5.4, 7.5-7.7, and 9.

Class 6: Binary Dependent Variables

Required:

- SW, Chapter 11.
- Krueger, Alan, and Jitka Malecková, “Education, Poverty, and Terrorism: Is There a Causal Connection,” *Journal of Economic Perspectives*, Volume 17, Number 4, pp. 119-144.

Optional:

- Ladd, Helen, “Evidence on Discrimination in Mortgage Lending,” *Journal of Economic Perspectives*, Volume 12, Number 2 (1998), pp. 41-62.

Class 7: Multivariate Regression and the Analysis of Policy

Required:

- MM, Chapters 2 and 6.
- SW, Chapter 9.

Optional:

- Dale, Stacy, and Alan Krueger, “Estimating the Payoff to Attending a More Selective College,” *Quarterly Journal of Economics*, 2002.
- Krueger, Alan, “How Computers Have Changed the Wage

Structure: Evidence from Micro Data,” *Quarterly Journal of Economics* 108[1], February 1993, 33-60.

- DiNardo, John, and J.S. Pischke, “The Returns to Computer Use Revisited: Have Pencils Changed the Wage Structure Too?,” *The Quarterly Journal of Economics* 112 [1], February 1997, 291-303.

Class 8: Midterm

Class 9: Multiple Regression and Functional Form

Required:

- SW, Chapter 8.

Class 10: Instrumental Variables

Required:

- MM, Chapter 3.
- SW, Chapter 12.
- Card, David, "Using Geographic Variation in College Proximity to Estimate the Return to Schooling," NBER Working Paper. No. 4483.

Optional:

- Angrist, Joshua, and William Evans, "Children and Their Parents' Labor Supply: Evidence from Exogenous Variation in Family Size," *American Economic Review* 88 (3), June 1998, pp. 450-77.
- Angrist, Joshua, and A. Krueger, "Does Compulsory School Attendance Affect Schooling and Earnings?," *Quarterly Journal of Economics* 106, November 1991.
- Angrist, Joshua, *et al.*, "Who benefits from KIPP?," *J. of Policy Analysis and Management*, Fall 2012.
- Angrist, Joshua, Victor Lavy, and Analia Schlosser, "Multiple Experiments for the Causal Link between the Quantity and Quality of Children," *Journal of Labor Economics*, Volume 28, Number 4 (October 2010), pp. 773-824.
- Angrist, Joshua, "Instrumental Variables Methods in Experimental Criminological Research: What, Why, How," *Journal of Experimental Criminology*, Volume 2, Number 1 (April 2006), pp. 23-44.

Class 11: Regression Discontinuity

Required:

- MM, Chapter 4.
- SW, Chapter 13.4
- Thistlewaite, Donald, and Donald Campbell, "Regression-Discontinuity Analysis: An Alternative to the Ex Post Facto Experiment," *Journal of Experimental Psychology*, Volume 51, Number 6 (1960).
- Carpenter, C., and C. Dobkin, "The Effect of Alcohol Consumption on Mortality: Regression Discontinuity Evidence from the MLDA," *American Economic Journal: Applied Economics* 1 (2009), 164-182.

Optional:

- Abdulkadiroglu, Atila, Joshua Angrist, and Parag Pathak, "The Elite Illusion: Achievement Effects at Boston and New York Exam

- Schools,” *Econometrica*, Volume 82, Number 1 (2014), pp. 137-196.
- Hahn, Jinyong, Petra Todd, and Wilbert Van der Klaauw, “Evaluating the Effect of an Antidiscrimination Law using a Regression-Discontinuity Design,” NBER Working Paper No. 7131 (1999).
 - van der Klaauw Wilbert. (2002) “Estimating the Effect of Financial Aid Offers on College Enrollment: A Regression–Discontinuity Approach”, *International Economic Review* 43(4): 1249–1287.
 - Trochim, William, “The Regression-Discontinuity Design: An Introduction”, manuscript.
 - Berk, Richard (2008), “Recent Perspectives on the Regression Discontinuity Design,” manuscript, Department of Statistics, University of Pennsylvania.

Class 12: Introduction to Panel Data

Required:

- SW, Chapter 10.

Class 13: Difference-in-Differences

Required:

- MM, Chapter 5.
- Card, David, “The Impact of the Mariel Boatlift of the Miami Labor Market,” *Industrial and Labor Relations Review*, Volume 43, Number 2, pp. 245-257.

Optional:

- Card, David, and A. Krueger, “Minimum Wages and Employment: A Case Study of the Fast Food Industry in New Jersey and Pennsylvania,” *American Economic Review* 90 (1994), 1397-420.
- Meyer, Bruce, Kip Viscusi, and David Durbin (1995), “Workers’ Compensation and Injury Duration: Evidence from a Natural Experiment,” *American Economic Review*, Volume 85, Number3, pp. 322-340.

Class 14: Introduction to Time Series and Forecasting

Required:

- SW, Chapter 14.

Academic Integrity

Academic integrity is a vital component of Wagner and NYU. All students enrolled in this class are required to read and abide by [Wagner’s Academic Code](#). All Wagner students have already read and signed the [Wagner Academic Oath](#). Plagiarism of any form will not be tolerated and students in this class are expected to report violations to me. If any student in this class is unsure about what is expected of you and how to abide by the academic code, you should consult with me.

Henry and Lucy Moses Center for Students with Disabilities at NYU

Academic accommodations are available for students with disabilities. Please visit the [Moses Center for Students with Disabilities \(CSD\) website](#) and click the “Get Started.” You can also call or email CSD (212-998-4980 or mosescsd@nyu.edu) for information. Students who are requesting academic accommodations are strongly advised to reach out to the Moses Center as early as possible in the semester for assistance.

NYU’s Calendar Policy on Religious Holidays

[NYU’s Calendar Policy on Religious Holidays](#) states that members of any religious group may, without penalty, absent themselves from classes when required in compliance with their religious obligations. Please notify me in advance of religious holidays that might coincide with exams to schedule mutually acceptable alternatives.