

NEW YORK UNIVERSITY
ROBERT F. WAGER GRADUATE SCHOOL OF PUBLIC SERVICE

**PADM-GP 2902: MULTIPLE REGRESSION AND INTRODUCTION TO ECONOMETRICS
SPRING 2023**

INSTRUCTOR INFORMATION

Kaitlyn O'Hagan Email: koh210@nyu.edu Office Hours: By Appointment, please email LECTURES: Thursday, 10:00AM – 11:40AM LOCATION: 238 Thompson Street, Room 269	Matías Morales Email: mim313@nyu.edu Office Hours: By Appointment, please email LECTURES: Thursday, 6:45PM-8:25PM LOCATION: GCASL, Room 361
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TEACHING COLLEAGES (TC)

Lydia Ruddick-Schulman Email: lbr2544@nyu.edu Recitation: Mondays 12:30PM-1:30PM Office Hours: Tuesdays 12PM-1PM (every other week)	Adelaide Currin Email: acc7905@nyu.edu Recitation: Tuesdays 8:35-9:35PM Office Hours: Fridays 1PM-2PM (every other week)
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TC-led recitations and office hours are virtual.

COURSE DESCRIPTION

Multiple regression is the core econometric technique used by policy and financial analysts. In this course, you learn how to use and interpret this critical statistical method. Specifically, you learn how to build and estimate multiple regression models, how to evaluate whether regression coefficients are biased, whether standard errors (and thus t statistics) are valid, and whether regressions used in policy and finance studies support causal arguments.

In addition, employing one consistent dataset for all your computer exercises, you perform statistical analyses discussed in class using Stata, an econometric statistical package, and you see how the results reflect econometric concepts. Finally, with a group of your classmates and project datasets provided by your professor, you do a project that involves estimating your own regression model and applying the techniques we learn in class.

PREREQUISITE: CORE-GP 1011 or equivalent

COURSE LEARNING OBJECTIVES

- Understand what an Ordinary Least Squares (OLS) regression does and why it is useful.
- Write and interpret mathematical equations representing various regression models.
- Interpret regression results as they are typically represented in statistical software packages, policy and finance papers, and academic articles.

- Use Stata and regression techniques to suggest answers to important policy questions.
- Think critically about the assumptions underlying your (or another analyst's) interpretation of regression output and test whether these assumptions hold.
- Conduct a research project in which you formulate, estimate, write about, and present an econometric model.
- Understand the statistics that underlie research in your field of interest.

RECITATIONS (Virtual):

Attendance is optional but highly recommended. In these sessions you:

- review the answers to the problem set and computer exercises due the previous week
- discuss the learning objectives of the problem set and computer exercises due the following class

The TCs also offer one hour of office hours per week (see course schedule).

There are no problem sets or computer exercises due in the first week of class, so the first week of classes there will be a STATA tutorial/refreshers during the recitation on Monday January 23 (12:30-1:30PM) and during TC office hours on Friday January 27 (1:00-2:00PM).

COURSE MATERIALS

REQUIRED: A.H. Studenmund, *Using Econometrics: A Practical Guide*. ISBN: 9780134182742

- Unfortunately, the text is not available electronically from NYU Libraries (though you can ask them to scan a limited number of pages/chapters for you).

REQUIRED: STATA/BE. You can purchase this and install it on your personal computer or use it from NYU's virtual lab.

- Purchase: Use this link to obtain a student discount. The least expensive option is a 6-month license. If you are planning to take Estimating Impact, Advanced Empirical Methods, or the Research Capstone you may want to consider an annual or perpetual license. <https://www.stata.com/order/new/edu/profplus/student-pricing/>
- Virtual Lab: You can log into NYU's virtual computer lab (VCL) here: <https://www.nyu.edu/life/information-technology/instructional-technology-support/instructional-technology-tools-and-services/virtual-computer-lab.html>
 - Here's a review on how to use STATA on the VCL: <https://nyu.app.box.com/s/zp39zryd56u1rbnxxit61vlpqiez3yuq>

REQUIRED: [NYU BRIGHTSPACE](#). All announcements and class-related documents (lecture power points, datasets for the final project, problem sets, computer exercises, assignment solutions, STATA review materials, and exam review materials) are available on Brightspace. Problem sets and computer exercises are to be submitted via Assignments in Brightspace.

COURSE REQUIREMENTS AND GRADING

- 20% Problem Sets and Computer Exercises
- 35% Midterm Exam
- 45% Regression Project

Students are expected to attend all of the lectures and actively participate. Please email your instructor if you are unable to attend class due to extenuating circumstances.

PROBLEM SETS AND COMPUTER EXERCISES (20%)

There are 15 total problem sets (PS) and computer exercises (CE), named for the class in which they're due. We will drop the lowest two from your grade. Due to this flexibility we will not accept late assignments; please contact me if you have extenuating circumstances. **You must complete PS 9 and CE 9; these cannot be dropped from your grade.**

Problem sets/computer exercises are graded for completion, not correctness. Students should take these assignments seriously as they're good preparation for the exam and final project.

For the STATA code and output for computer exercises, submit the log file with the last "run" of the analysis as a PDF. Please submit written answers to computer exercises and problems sets as a Word file.

MIDTERM EXAM (35%)

An exam will be given during Class 11 on April 20th (see course schedule on the following page). You may use a non-graphing calculator and two pages (single-sided) of notes.

GROUP PROJECT (45%)

In groups of 4-5 you will conduct a regression analysis, present your results, and write a paper. Note all group members will complete peer evaluations that will factor into grades.

- Fill out Project Data Preference Form by EOD Thursday, **February 2nd**.
- Read Chapter 11, "Running Your Own Regression Project", in the course text.
- Once groups have been assigned, meet with your group as soon as possible to plan the paper. Teams must email me the question you propose to answer and at least one specification that will be estimated by Thursday, **March 2nd**.
- Contact your instructor to meet with your group during the week of **March 20th** to discuss the project. You should have descriptive statistics and initial results.
- Present your results during class **April 27th** or **May 4th** to get feedback.
- Write an 8–10-page paper, including two tables, organized as follows (tables do not count in the page limit). **DUE THURSDAY MAY 11**. We also ask students to submit a group evaluation form, to help ensure that all group members participate equally in the final project.

FINAL PROJECT OUTLINE

1. Introduction: What is the goal of your regression study? Why is it interesting? Why do we care? (This does not have to be momentous, but you should explain why the results could be interesting or valuable.)
2. Data: Describe your sources and discuss the descriptive statistics in Table 1.
3. Model and Empirical Strategy: What is your model (equation) and how does it achieve the goal of your analysis? Why are the specific variables used and measured as they are? Do you have any prior expectations about the signs of coefficients? How will you estimate the model? (Usually OLS with fixed effects.)
4. Results: Discuss the Results presented in Table 2.
5. Conclusions: What does your model say about your goal or issue? What is the next step in this research?
6. Appendix:
 - i. Table 1 (with good, descriptive title): Descriptive statistics of all the variables in your model(s).
 - ii. Table 2 (with good descriptive title): Results of your models, presented in 4-5 columns.
 - iii. Final annotated Stata log file of your results (note this should be “clean”, i.e. contain no errors).

ACADEMIC INTEGRITY

Academic integrity is a vital component of Wagner and NYU. Each student is required to abide by Wagner’s Academic Code. Plagiarism of any form will not be tolerated. Every student is expected to maintain academic integrity and is expected to report violations to us. If you are unsure about what is expected of you, please ask.

WRITING CENTER

NYU Wagner provides writing tutors free of charge to assist students—in person or online—with their writing assignments. Beyond a general expertise in writing skills, NYU Wagner Writing Tutors specialize in public policy-specific formats and can assist students at any point in their writing process—from initial concept brainstorming and mid-paper writer’s block, to first draft clarity and coherence checks and final draft line edits. Email appointments are a fantastic way to get extensive feedback on a deep read of your paper. In-person and video chat appointments are best used as a way to talk through a writing block, an organizational issue or something else. To learn more about Wagner's writing tutors and to make an appointment, visit the [Wagner Writing Center site](#).

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 at www.nyu.edu/csd and click on the

Reasonable Accommodations and How to Register tab or call or e-mail CSD at 212-998-4980 or mosescsd@nyu.edu for information. Students requesting academic accommodations are strongly advised to reach out to the Moses Center as early as possible in the semester.

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 us in advance of religious holidays that might coincide with exams to schedule mutually acceptable alternatives.

WELLNESS EXCHANGE

The Wellness Exchange is your greatest mental health resource at NYU. Call the 24-hour hotline at (212) 443-9999, chat via the Wellness Exchange app anytime, make an appointment, or arrange a same-day Urgent Counseling session to speak with a certified counselor about any day-to-day challenges or health concerns, including medical issues, stress, depression, sexual assault, anxiety, alcohol or drug dependence, and eating disorders. No concern is too big or too small. Worried about a friend? Our counselors are here for that too — in person, over the phone, or through chat. The Wellness Exchange is here for you, whatever the reason. Not sure which option is right for you? Call or chat with our counselors to discuss your options and find the right fit. Not interested in phone, chat or Urgent Counseling? Email wellness.exchange@nyu.edu.

Class	Date	Lecture	Reading (Due Before Class)	HW (Due Before Class)	Recitation	TC Office Hrs.
1	Th 1/26	OLS Bivariate Regression Model with Error Term	Ch.1 Ch. 2.1, 2.3-2.6	Student Info Form	M 1/23 Tu NONE	F 1/27
2	Th 2/2	OLS Multiple Regression and Assumptions about Error Term	Ch. 2.2 Ch. 4	PS2 Project Form	M 1/30 Tu 1/31	Tu 1/31
3	Th 2/9	Hypothesis Testing in Multiple Regression Context	Ch. 3.1, 3.2 Ch. 5	PS3 CE3	M 2/6 Tu 2/7	F 2/10
4	Th 2/16	Functional Form Part I: Polynomials and Indicator Variables	Ch. 6; Ch. 3.3 Ch. 7.1, 7.2, 7.4	PS4	M 2/13 Tu 2/14	Tu 2/14
5	Th 2/23	Functional Form Part II: Interactions and Logarithmic Transformations	Ch. 7.2, 7.3, 7.5, 7.6	PS5 CE5	M NONE Tu 2/21	F 2/24
6	Th 3/2	Multicollinearity and Autocorrelation	Ch. 8 Ch. 9	PS6 CE6 Project Check-in	M 2/27 Tu 2/28	Tu 2/28
7	Th 3/9	Heteroskedasticity	Ch. 10	PS7 CE7	M 3/6 Tu 3/7	F 3/10
	Th 3/16	SPRING BREAK – NO CLASS			NONE	NONE
	Th 3/23	Group Meetings with Instructors	Ch. 11	Project Check-in	NONE	Tu 3/21
8	Th 3/30	Panel Data Estimation Part I	Ch. 16	PS8 CE8	M 3/27 Tu 3/28	Fr 3/31
9	Th 4/6	Panel Data Estimation Part II; Linear Probability Models	Ch. 13	PS9 CE9	M 4/3 Tu 4/4	Tu 4/4
10	Th 4/13	Intro. to Experimental & Quasi-Experimental Methods / Exam Review	TBD	CE 10	M 4/10 Tu 4/11	Fr 4/14
11	Th 4/20	EXAM			M 4/17 Tu 4/18	Tu 4/18
12	Th 4/27	Group Presentations		Presentation		F 4/28
13	Th 5/4	Group Presentations		Presentation		Tu 5/2
	Th 5/11	Final Paper Due		Final Paper & Group Eval. Form		