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

**PADM-GP 2902: MULTIPLE REGRESSION AND INTRODUCTION TO ECONMETRICS
SUMMER 2023**

INTSTRUCTOR INFORMATION

INSTRUCTOR	TEACHING COLLEAGE (TC)
Kaitlyn O'Hagan (she/her)	**Jo Alkhafaji-King** (they/them)
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Office Hours: By Appointment, please email	
Lecture: M/Th, 4:55PM – 6:35PM	Recitation: M/Th, 6:45PM-7:45PM

Lectures and recitations are virtual; see Brightspace for zoom links.

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 by 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

There are no problem sets or computer exercises due in the first class, so there will be a STATA tutorial/refresher during the recitation on Monday May 22 (6:45-7:45PM).

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/zp39zryd56u1rbnxxit61ylpqiez3yuq

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. ***Attendance will be taken during final project presentations; one point will be taken off your final grade for an unexcused absence.***

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. I will drop the lowest three from your grade. Due to this flexibility I 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.

EXAM (35%)

An exam will be given during Class 11 on Thursday **June 29th** (see course schedule at the end of the syllabus). Additional details we be provided in advance of the exam.

GROUP PROJECT (45%)

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

- Fill out the Project Data Preference Form before class on **Monday May 22nd**.
- 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. Additional guidance will be provided in class.
- By **June 19th** (but earlier if you'd like) you should email your instructor a research question with some motivation, ideas for specifications (independent variables of interest, control variables), and descriptive statistics for all variables.
- Present your results during class **July 6 or July 10** 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 JULY 13**. 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.) **You must cite at least two research reports/articles (you can cite other sources as well, such as news articles, but they do not count in the two).**
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 how are

they measured? Do you have any prior expectations (hypotheses) about the signs of coefficients? How will you estimate the model? (OLS with fixed effects.)
4. Results: Discuss the Results presented in Table 2. Interpret the coefficients of interest, including statistical significance.
5. Conclusions: What does your model say about your research question? What is the next step in this research?
6. References. Use APA format for references.
7. 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 NYU. Each student is required to abide by Wagner's Academic Code. Plagiarism will not be tolerated. Every student is expected to maintain academic integrity and is expected to report violations. If you are unsure what is expected of you, 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	HW
				(Due Before Class)	
1	M	5/22	OLS Bivariate Regression Model with Error Term	Ch.1 Ch. 2.1, 2.3-2.6	Project Form
2	Th	5/25	OLS Multiple Regression and Assumptions about Error Term	Ch. 2.2 Ch. 4	PS2
	M	5/29	MEMORIAL DAY – NO CLASS		
3	W	5/31	Hypothesis Testing in Multiple Regression Context	Ch. 3.1, 3.2 Ch. 5	PS3 CE3
4	Th	6/1	Functional Form Part I: Polynomials and Indicator Variables	Ch. 6; Ch. 3.3 Ch. 7.1, 7.2, 7.4	PS4
5	M	6/5	Functional Form Part II: Interactions and Logarithmic Transformations	Ch. 7.2, 7.3, 7.5, 7.6	PS5 CE5
6	Th	6/8	Multicollinearity and Autocorrelation	Ch. 8 Ch. 9	PS6 CE6
7	M	6/12	Heteroskedasticity	Ch. 10	PS7 CE7
8	Th	6/15	Panel Data Estimation Part I	Ch. 16	PS8 CE8
	M	6/19	JUNETEENTH – NO CLASS	Ch. 11	Project Check-in
9	Th	6/22	Panel Data Estimation Part II Linear Probability Models	Ch. 13	PS9 CE9
10	M	6/26	Intro. to Experimental & Quasi-Experimental Methods / Final Project Preparation		CE 10
11	Th	6/29	EXAM		
	M	7/3	NO CLASS		Project Check-in (as needed)
12	Th	7/6	Group Presentations		Presentation
13	M	7/10	Group Presentations		Presentation
	Th	7/13	Final Paper Due		Final Paper & Group Eval. Form