PADM-GP 2902

Multiple Regression and Introduction to Econometrics

Summer 2022

INSTRUCTOR INFORMATION

Spenser Gwozdzik
Email: sg5727@nyu.edu
Office Hours: By Appointment, please email

TEACHING COLLEAGUE

Jo Alkhafaji-King
Email: jk7317@nyu.edu
Office Hours: By Appointment, please email

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.

VIRTUAL LECTURES: Monday and Thursday, 4:55PM – 6:35PM

ZOOM CLASSROOM NORMS

You are expected to participate in each class with your Zoom audio and video on. Please review Wagner's Zoom in the Classroom series about classroom etiquette, participation, and more. If you are unable to participate with video on, please let us know.

VIRTUAL RECITATION: Monday and Thursday, 6:45PM – 7:45PM

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

- discuss the learning objectives of the problem set and computer exercises due the following class
- review the answers to the problem set and computer exercises due that day
- learn additional STATA commands (as time allows)

The first recitation on Monday May 23 will include a STATA tutorial/refresher.

NYU BRIGHTSPACE

You need access to NYU Brightspace: https://brightspace.nyu.edu/. All announcements, and class-related documents will be posted here. Required submissions including problem sets and computer exercises are to be submitted via the Assignment tab.

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 since you have all signed an Academic Oath and are bound by the academic code of the school. 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!

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

COURSE REQUIREMENTS AND GRADING

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

PROBLEM SETS AND COMPUTER EXERCISES (20%)

There are 14 total problem sets and computer exercises, named for the class in which they're due. We will drop the lowest 4 from your grade (with the final computer exercise required because of its importance for the final project), so each of the 10 problem sets/computer exercises that counts will be worth 2 points of your final grade. Due to this flexibility we will not ordinarily accept late assignments; please contact us if you have extenuating circumstances.

Problem sets/computer exercises will be graded for completion, not correctness, but we encourage students to take these assignments seriously as they're good preparation for the exam.

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 (see course schedule on the following page). You may use a non-graphing calculator, your textbook, and anything from NYU Classes. You many not consult any other person or anything on the internet.

GROUP PROJECT (45%)

In groups of 4 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, **May 26th**.
- Contact us to meet with your group during the week of **June 6th** to discuss the project, including at least one specification that will be estimated.
- Read Chapter 11, "Running Your Own Regression Project", in the course text.
- Contact us to meet with your group during the week of **June 27th** to discuss the project, including reviewing descriptive statistics and initial results.
- Present your results during class **July 11th** and **July 14th** to get feedback.
- Write an 8–10-page paper, including two tables, organized as follows (tables do not count in the page limit):
    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).

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/SE. 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 6month 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/teaching-and-learning-services/instructional-tools/virtual-computer-lab.html o Here's a review on how to use STATA on the VCL:

        https://nyu.app.box.com/s/zp39zryd56u1rbnxxit61ylpqiez3yuq

Lecture power points, datasets for the final project, problem sets, computer exercises, assignment solutions, STATA review materials, and exam review materials are all available on Brightspace.

Week	Class		Date	Lecture	Reading	Due BEFORE Class
1	1	M	5/23	OLS Bivariate Regression Model with Error Term	Ch.1 Ch. 2.1, 2.3-2.6	Student Info Form
	2	Th	5/26	OLS Multiple Regression and Assumptions about Error Term	Ch. 2.2 Ch. 4	Project Form PS2
2		M	5/30	NO CLASS – MEMORIAL DAY		
	3	Th	6/2	Hypothesis Testing in Multiple Regression Context	Ch. 3.1, 3.2 Ch. 5	PS3 CE3
3*	4	M	6/6	Functional Form Part I: Polynomials and Dummy Variables	Ch. 6 Ch. 3.3 Ch. 7.1, 7.2, 7.4	PS4
	5	Th	6/9	Functional Form Part II: Interactions and Logarithmic Transformations	Ch. 7.2, 7.3, 7.5, 7.6	PS5 CE5
4	6	M	6/13	Multicollinearity and Autocorrelation	Ch. 8 Ch. 9	PS6 CE6
	7	Th	6/16	Heteroskedasticity	Ch. 10	PS7 CE7
5		M	6/20	NO CLASS – JUNETEENTH		
	8	Th	6/23	Panel Data Estimation Part I	Ch. 16	PS8 CE8
6**	9	M	6/27	Panel Data Estimation Part II; Introduction to Linear Probability Models	Ch. 13	PS9 CE9+
	10	Th	6/30	Introduction to Experimental and QuasiExperimental methods; Exam Review		
7		M	7/4	NO CLASS – INDEPENDENCE DAY OBS.		

	11	Th	7/7	EXAM		
8	12	M	7/11	GROUP PRESENTATIONS		Presentation
	13	Th	7/14	GROUP PRESENTATION		Presentation
9	14	M	7/18	FINAL PAPER DUE		Final Paper

* Schedule first group meeting to prepare for final project/paper.

** Schedule second group meeting to prepare for final project/paper.

[+]
  May not be skipped as one of the 4 lowest problem set scores dropped.