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

PADM-GP. 2902 MULTIPLE REGRESSION AND INTRODUCTION TO ECONOMETRICS
Summer 2015

Faculty
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Office hours: 665 Broadway, Suite #805
Time: Wednesday, 5:30-6:30pm

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Menbere Shiferaw
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Recitation/Tutoring: TISC LC19
Time: Thursday 6:00pm-8:00pm

LECTURE
Location: GCASL 269
Time: Monday and Wednesday 6:45pm-8:25pm

RECITATIONS (PADM-GP. 2902)
You are required to register for recitation. Attendance at the first two sessions is required, and attendance thereafter is optional but recommended. In other recitations you will go over problem sets and computer exercises due the following week. You will also have a chance to ask questions about topics covered in class, and problem sets already submitted, and Stata in general.

PREREQUISITE: CORE-GP. 1011 or equivalent

COURSE DESCRIPTION
Multiple regression (econometrics) is the core statistical technique used by policy and finance analysts in their work. In this course, you learn the theory and practice of econometric analysis. Specifically, you will learn 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 casual arguments.

In addition, you will use one dataset throughout the course to compute the statistics discussed in class using Stata, an econometric statistical computer package. In these assignments you will think about how results reflect econometric concepts. Finally, you will complete a group project in which you use a dataset provided by the professor and employ techniques learned in class to estimate your own regression model.

OTHER CLASS INFORMATION

- NYU Classes: You will need to have access to NYU Classes found under "Academics" on your NYU Home site (http://home.nyu.edu/). All announcements and class-related documents (problem sets, computer exercises, databases, solutions, optional exercises, class notes, etc.) will be posted here.
- Class notes/PowerPoint: Lecture notes will be posted on NYU Classes by the night before class. You should bring these notes to class with you, as they will serve as a template for you to take notes during class.
- Absences: Please see your professor immediately if you have any conflicts with scheduled assignments and/or exams, or if you anticipate being absent due to religious observances.
- Academic integrity: NYU Wagner policies on academic integrity will be *strictly enforced* in this class. You can find the school's official statement on academic integrity here. You are encouraged to study and work together on problem sets, but all submitted work must be that of the individual student. Any plagiarized work will be given a zero and will not be dropped from the final grade. Additionally, we will notify Wagner administration, and there may be additional action taken.
- Accommodations: Any student requiring an accommodation due to a chronic psychological, visual, mobility, and/or learning disability, or who is Deaf or Hard of Hearing, should register with and consult with the Moses Center for Students with disabilities at 212-998-4980, 726 Broadway, 2nd floor (www.nyu.edu/csd). Of course, we are happy to provide any and all accommodations recommended by the Moses Center.

COURSE REQUIREMENTS AND GRADING

1. ***Assignments (20%)***

Throughout the course you will complete eight problem sets and seven computer exercises.

Problem sets and computer exercises must be submitted in class as noted in the course schedule below. Problem sets must be submitted at the beginning of class in hard copy. Computer exercises will be discussed in the appropriate lecture. As a general rule **no late assignments or emailed assignments will be accepted.**

At the end of the semester, the lowest two problem set grades will be dropped (note that a grade of zero will not be dropped). The remaining six problem set grades will be averaged along with the computer exercise grades, and this score will contribute 20% to your final course grade. Problem Sets and Computer exercises will be graded for completion of the entire exercise. You should try to obtain correct answers, however, as this will help you on the midterm. **Copying others or previous semesters will result in a zero**.

Solutions will be posted to NYU Classes after the problem set or computer exercise is due. Please write your Wagner mailbox number on your submissions, and indicate if you do not have a mailbox. For problem sets, submit your answers on the answer sheet provided for each set, and make sure your

answers are legible. For Stata problems, please submit your latest (clean) run, not all the erroneous ones that might precede that one! Graded assignments will be returned to you in class.

2. ***Exam (35%)***

An in-class exam will be given on July 15 (see course schedule below). You may bring a non-graphing calculator and two pages (single-sided) of notes that you will hand in with your test. Note, however, that being overly dependent on your notes will not serve you well on the exam.

3. ***Project (45%)***

In a group of four or five students, conduct a regression analysis, present your results, and write a paper. (NOTE: All group members will complete peer evaluations that will factor into grades).

Process steps and requirements:

a) Email your professor by **June 1** with your rankings of preferred datasets. Your professor will take these preferences into account and assign you to a group. See datasets and their description in *NYU Classes>Resources>Project Descriptions and Datasets.*
b) Set up a time to meet with your professor on **June 10** to discuss the project, including at least one specification that will be estimated.
c) Read chapter 11, "Running your Own Regression Project", in the course text.
d) Present your results during class to get feedback.
e) Write an 8-10 page paper (double spaced), including two tables, organized into the five sections described below. (Note: tables do not count in the page limit).
f) Schedule a time to meet with your professor after the exam, but before presentations (July 15-22) to go over your two tables (descriptive statistics and results). Groups are also welcome to meet with your professor more regularly for additional feedback.
g) Optional- Submit a draft of your final paper if you would like feedback (July 23-24)

Paper outline

I. Introduction: What is the goal of your statistical 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 to someone).
II. Data: Describe your sources and discuss the descriptive statistics presented in Table 1.
III. Model and Empirical Strategy: what is your model (equation), and how does it address 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 the coefficients? How will you estimate this model (usually OLS with fixed effects)?
IV. Results: Discuss the results presented in Table 2.
V. Conclusions: What does your model say about your goal or issue? What is the next step in this research?

At the end of your paper, include an appendix with the following:

1. Table 1 (with title): Descriptive statistics of all the variables in your model(s)
2. Table 2 (with title): Results of your models, presented in four or five columns.
3. Final clean STATA log file or your results.

COURSE MATERIALS

1. **Required:** A. H. Studenmund, *Using Econometrics: A Practical Guide,* New York, 6th Edition, cited as S.

This book is available at the NYU Bookstore, Amazon.com, and on other websites.

2. **Required:** Stata/IC 13, purchased and loaded onto your computer by week one.

You should purchase your software here to obtain a student discount:
http://www.stata.com/order/new/edu/gradplans/gp-direct.html.
Purchase Stata/IC 13 (not Small Stata). The least-cost option is a 6-month license, at $69. If you are planning to take Estimating Impacts, Advanced Empirical Methods, or the Research Capstone, you may want to consider a one-year or perpetual license. Stata 13 is not platform-dependent and will run on either Windows or Mac operating systems.
No previous knowledge of Stata is necessary. In addition to learning Stata through the problem sets and computer exercises and in class, the Data Services Studio in Bobst (http://library.nyu.edu/dataservice/) offers short courses (tutorials) and on-site help.

3. **Recommended:** Christopher F. Baum, *An Introduction to Modern Econometrics Using Stata,* cited as BAUM. ISBN: 1597180130

4. **Required:** Computer Exercises and Data Set to download from NYU Classes. See the course schedule below for when assignments are due in class.

**By the first week of class, download the following from *NYU classes* to a folder on your computer reserved for PADM-GP 2902 work:

- newschools9810.dta;
- Problem set 1;
- Computer exercise 1 (word document and stata do file);

Watch video on using Stata (on *NYU Classes, Stata Learning Materials).*

CLASS NOTES

Before each class, class notes will be available on *NYU Classes*. *You should print them, bring them to class*, and use them to organize your notes.

COURSE SCHEDULE

DATE	CLASS	READING/MATERIALS	DUE IN CLASS
May 27 (W)	Class 1: OLS – bivariate regression model with error term	S. Chs. 1 & 2 (34-38 and 46-57)	Student information sheet
May 28 (TH)	Recitation	Stata crib sheet Computer exercise 1 Watch stata tutorial video	Download newschools9810.dta Computer_exercise_1_do_file.do & Computer_exercise_1_docx
June 1 (M)	Class 2: OLS multiple regression, assumptions	S Chs 2 (39-49) & 4 Problem set 1	
June 3 (W)	Class 3 : Hypothesis testing	S Chs 3 & 5 (*not* including appendix)	Problem set 1 Computer exercise 1
June 4 (TH)	Recitation	Problem set 2 and 3	
June 8 (M)	Class 4 : Functional form part I	S Chs 6 & 7 (207-213, 218-220, 223-226) Appendix Ch. 5	Problem set 2 Problem set 3
June 10 (W)	Instructor available	Instructor available to answer questions about projects. Scheduling a meeting is mandatory.	
June 11 (TH)	Recitation	Problem set 4 Computer exercise 2	
June 15 (M)	Class 5 : Functional form part II	S Ch. 7 (213-218, 220-223, 226-232)	Problem set 4 Computer exercise 2
June 17 (W)	Review	No new material.	
June 16 (TH)	Recitation	Problem set 5 Computer exercise 3	
June 22 (M)	Class 6: Multicollinearity and Autocorrelation	S Chs 8 & 9	Problem set 5 Computer exercise 3
June 24 (W)	Class 7: Heteroskedasticity	S Chs 10	
June 25 (TH)	Recitation	Problem set 6 and 7 Computer exercise 4 Computer exercise 5	
June 29 (M)	Class 8: Panel Data I	S Ch 16	Problem set 6 Computer exercise 4
July 1 (W)	Instructor available to answer questions about projects or assignments due next week		
July 2 (TH)	NO RECITATION (Happy 4th of July!)		
July 6 (M)	Class 9: Panel Data II and Introduction to LPM		Problem set 7 Computer exercise 5

July 8 (W)	Class 10: Qualitative dependent variables. Simultaneous equations.	S Ch 14 (396-97) & Table 11-2B Ch 10 through 10.1.3	
July 9 (TH)	Recitation	Problem set 8 Computer exercise 6	
July 13 (M)	Exam Review		Problem set 8 Computer exercise 6
July 15 (W)	EXAM		
July 14 (TH)	Recitation	Computer exercise 7	
July 20 (M)	Presentations Computer exercise 7 due		
July 22 (W)	Presentations		
July 23 (TH)	Draft of final project (optional but recommended) Drafts will be accepted until Friday July 24 (NO RECITATION)		
July 27 (M)	NO CLASS (Use this time to incorporate feedback into projects)		
July 29 (W)	Instructor available to discuss projects		
July 30 (TH)	NO RECITATION		
July 31 (F)	FINAL PROJECTS DUE You have all day (until 11:59pm) to submit papers via email. Projects submitted after that deadline will have points subtracted from final grade. Each member of the group should submit the "Team Member Evaluation Form" available on NYU Classes		

CLASS TOPICS

Class 1: OLS Bivariate Regression Model with Error Term

Theoretical regression line; deterministic versus stochastic relationships; population versus sample regression line; error and residual; OLS estimators

Note:

- Purchase and install Stata/IC 13;
- Download and save, from NYU Classes:
- newschools9810.dta,
- computer_exercise_1.docx,
- computer_exercise_1_do_file.do
- Watch the video on using Stata, on NYU Classes.
- Print and bring to class: Class_1_lecture_notes.ppt

Class 2: OLS Multiple Regression and Assumptions about Error Term

Reducing bias; interpretation of coefficients; BLUE assumptions

Class 3: Hypothesis Testing in Multiple Regression Context

Significance tests; confidence intervals; F test; R^2; Adjusted R^2; interpretation of computer output

Class 4: Functional Form Part I: Polynomials and Dummy Variables

Functional form; using qualitative data (dummies); joint tests of significance; curvilinear relationships.

Class 5: Functional Form Part II: Interactions and Logarithmic Transformations

Interactions of dummies; interactions of continuous and dummy variables; continuous by continuous interactions; logarithmic transformations (percent change or elasticity transformations)

Class 6: Multicollinearity and Autocorrelation

Class 7: Heteroskedasticity

Class 8: Panel Data Estimation Part I

Pooled cross-sectional and time series data; panel data; fixed effects estimation.

Class 9: Panel Data Estimation Part II; Introduction to Linear Probability Models

Class 10: Qualitative Dependent Variables; Simultaneous Equation Models

Class 11: Exam Review

Class 12: EXAM

Class 13-14: Presentations

Fr. July 31: Papers Due by email

STUDENT INFORMATION SHEET
Bring to first class

Name_____

Name of undergraduate institution and year of graduation:

Previous experience in statistics? When?

Previous professor for statistics if Wagner?_____

Program (circle one) Health Public and Nonprofit Urban Planning International Other

Expected specialization (circle) Finance Policy Management International Other

Brief description of work experience (if any): Fulltime Part time

Specific areas of interest in public policy, finance, planning or international:

What do you hope to learn or gain from taking this course?

Other information of interest, especially to help me get to know you faster.