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

PADM-GP 2902: REGRESSION AND INTRODUCTION TO ECONOMETRICS
Spring 2014
Professor Daniel L. Smith

FACULTY INFORMATION
Email: daniel.smith@nyu.edu
Twitter: @dansmithphd (Course-related tweets: #PADM2902)
Office: Puck 3046
Office Hours: Wednesdays, 11 a.m. – 12:30 p.m. or by appointment

PREREQUISITE: CORE-GP 1011 or waiver

LECTURES
Section 2: Tuesdays 11:00 a.m. – 12:40 p.m., Global Center for Academic & Spiritual Life 269
Section 3: Tuesdays 6:45 – 8:25 p.m., Meyer 102

RECITATIONS (PADM-GP 290)
You are required to register for a recitation section, and you must attend that section when you choose to attend. You are not required to attend, however. Each recitation will primarily discuss the learning objectives of the problem set that is due the following week. In addition, they will allow time for follow-up questions from the week’s lecture as well as questions about Stata.

Section 2: Tuesdays 8:35–9:35 p.m., Tisch LC11. Hani Kfouri, hk1650@nyu.edu
Section 3: Wednesdays 12:30–1:30 p.m., Tisch LC11. Davin Reed, dkr238@nyu.edu
Section 4: Thursdays, 8:35-9:35 p.m., 194 Mercer St. #305. Suvam Paul, sp1491@nyu.edu

TUTORING
We also offer free tutoring in “The Study,” Room 3024 in the Puck Building, 10–11 a.m.
Thursday, Friday, and Saturday each week.

COURSE DESCRIPTION
Multiple regression (econometrics) is the core statistical technique used by policy and finance analysts in their work. In this course, you will 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 causal arguments.

In addition, employing one dataset for computer exercises, you will compute the statistics covered in this course using Stata, an econometric statistical package, and interpret the output. Finally, with a group of your classmates, you will do a project that involves estimating your own regression model and applying the techniques we learn in class.
COURSE REQUIREMENTS AND GRADING

1. (20%) Problem sets and computer exercises (100 points each)
   Problem sets and computer exercises must be submitted at the beginning of the class for which they are listed in the Course Schedule below; no late or e-mailed assignments will be accepted. Solutions will be posted to NYU Classes Wednesdays after assignments are due, and graded assignments will be returned to your student mailbox by the next class. Please be sure to type your mailbox number on your submissions. Also, for Stata output, submit only the last “run” of the analysis.

2. (35%) Exam (100 points)
   An in-class exam will be given during Class 10 (see Course Schedule below). You may bring a non-graphing calculator and two pages (single-sided) of notes.

3. (45%) Group Regression Project (100 points)
   In groups of four to five, conduct a regression analysis, present your results, and write a paper. (Note: All group members will complete peer evaluations that will factor into grades.)

   a) By Class 2 I will send a Google form by which you will submit a ranking indicating which datasets on NYU Classes you most and least prefer to use. Based on the results, I will assign you to groups.

   b) Your group will meet with me the week of Class 3 or 4 to discuss the project, including at least one specification that will be estimated.

   c) Your group will read chapter 11, “Running Your Own Regression Project,” in the course text.

   d) Ideally, you will discuss your progress with me during office hours throughout the semester.

   e) Your group will meet with me again by Class 11 to discuss your two tables: descriptive statistics and results.

   f) You will present the results of your project during one of the last three class sessions (using PowerPoint). Note: All students are expected to attend each day of presentations.

   g) You will write an 8-10 page paper, including two tables, organized into five sections as directed below. Feedback from your presentation should be incorporated into the paper. The paper is due in my mailbox on the 3rd floor of the Puck Building by noon Friday, May 16.
Paper Outline

I. 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 to someone.)

II. Data: Describe your sources, and discuss the descriptive statistics that are presented in Table 1.

III. 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 this model? (Usually OLS with fixed effects.)

IV. Results: Discuss the results that are presented in Table 2.

V. Conclusions: What does your model say about your goal or issue? What is the next step in this research?

Appended at end of paper:

i. Table 1 (with title): Descriptive statistics of all the variables in your model(s).

ii. Table 2 (with title): Results of your models, presented in four or five columns.

iii. Final Stata output (log file) of results.

COURSE MATERIALS


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

You should purchase this software here to obtain a student discount: http://www.stata.com/order/new/edu/gradplans/campus-gradplan/

The least-cost option is a six-month license ($69), though we recommend an annual license ($98) if you plan to enroll in Estimating Impacts in Policy Research (PADM-GP.2875) or the Research Capstone. Stata software is not platform-specific. You can use the installation DVD or downloaded executable file to install it on Macs, PCs, and machines running Linux/Unix.

4. **Required: Computer Exercises and Dataset** (download from *NYU Classes*). See the Course Schedule below for when assignments are due in class.

**NYU Classes**
You will have access to the class site, found under “Academics” on your NYU Home site (https://home.nyu.edu/) or at https://newclasses.nyu.edu. All announcements and class related documents (class notes, computer exercises, datasets, problem sets, self-assessment quizzes, video tutorials, etc.) will be posted here. If you have not activated your NYU net account or have forgotten your password, you can activate or change your password at http://start.nyu.edu. You must activate your account in order to access course materials and announcements on *NYU Classes*.

**CLASS NOTES**
Before each class, class notes will be available on *NYU Classes*. *You should carefully review these notes in advance, print them, bring them to class, and use them to organize your note-taking.*

**STATA TUTORIALS**
In addition to video tutorials posted to *NYU Classes*, we will offer two *optional* in-person tutorials:

1. Friday, January 31st, 5:30–7 p.m., Meyer 121
2. Friday, February 7th, 5:30–7 p.m., Meyer 121

The dates, time, and location of the tutorials are based on course enrollment and room availability. *We recommend that you bring to these sessions a laptop with Stata installed, and we ask that students who bring a laptop to these sessions allow their classmates without a laptop to follow along with them.*
**SUMMARY OF COURSE GRADING**
1. 20% Problem Sets and Computer Exercises
2. 35% Exam
3. 45% Group Regression Project

**COURSE SCHEDULE** (S = Studenmund text; B = Baum text)

<table>
<thead>
<tr>
<th>WEEK</th>
<th>Mon</th>
<th>Tue</th>
<th>READING</th>
<th>DUE IN CLASS</th>
<th>RECITATION</th>
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<tbody>
<tr>
<td>1</td>
<td>1/27</td>
<td>1/28</td>
<td>S Chs. 1 &amp; 2 (34-38 &amp; 46-57)</td>
<td>See &quot;Class Topics&quot; below.</td>
<td>Problem Set Class 2</td>
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<td>B Ch. 1</td>
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<td>2</td>
<td>2/3</td>
<td>2/4</td>
<td>S Chs. 2 (39-45) &amp; 4</td>
<td>Problem Set Class 2</td>
<td>Problem Set Class 3</td>
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<td>B Ch. 2 (2.1.1-2.1.13; 2.2.1-2.2.4)</td>
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<td>3</td>
<td>2/10</td>
<td>2/11</td>
<td>S Chs. 3 &amp; 5 (not including appendix)</td>
<td>Problem Set Class 3</td>
<td>Problem Set Class 4</td>
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<td>B (3.9.1; 4.3.1-4.3.4; 4.6 stop at 4.6.1)</td>
<td>Computer Exercise Class 3</td>
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<td>2/17</td>
<td>2/18</td>
<td>NO CLASS: PRESIDENTS’ DAY*</td>
<td>Problem Set Class 5</td>
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<td>2/25</td>
<td>S Chs. 6 &amp; 7 (207-213, 218-220, 223-226); Appendix Ch. 5</td>
<td>Problem Set Class 4</td>
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<td>S Ch. 7 (213-218, 220-223, 226-232)</td>
<td>Problem Set Class 5</td>
<td>Problem Set Class 6</td>
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<td>3/11</td>
<td>S Chs. 8 &amp; 9</td>
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<td>Problem Set Class 7</td>
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<td>B (5.2.9, 7.1.2, all of 7.2)</td>
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<td>3/18</td>
<td>NO CLASS: SPRING BREAK</td>
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<td>4/8</td>
<td>S Ch. 13</td>
<td>Problem Set Class 9</td>
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<td>B Ch. 9 through 9.1.3</td>
<td>Computer Exercise Class 9</td>
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<td>4/14</td>
<td>4/15</td>
<td>EXAM</td>
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<td>4/21</td>
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<td>S Ch. 14 (396-97) &amp; Table 11-2</td>
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<td>PAPERS DUE IN PROFESSOR SMITH'S MAILBOX BY 12 NOON</td>
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* Monday, February 17 is Presidents’ Day; classes do not meet. To keep the sections in sync, the Tuesday sections will not meet February 18. Instead, they will meet Tuesday, May 13 (Reading Day).
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 newschools9810.dta, Class 3 Exercise 2014.do, and Computer Exercises all one file.doc from *NYU Classes*. Optionally, watch the Stata tutorial videos. Print and bring Class 1 Handout.doc to class.

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; random effects estimation

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

Class 10: **Exam**

Class 11: **Qualitative Dependent Variables; Simultaneous Equation Models**

Class 12-14: **Presentations**

May 16: **Papers Due in Professor Smith’s Mailbox (Puck, 3rd Floor) by 12 noon.**