Cross Section Econometrics Syllabus [ECON 407/PUBP 615]

Fall 2019

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Class Time:	MW 3:30 - 4:50pm
Classroom:	ISC 1111

Course Summary

In this course we will explore econometric techniques for testing microeconomic theories at the individual or firm level. With the advent of computers and associated data on economic behavior, the past few decades has seen an explosion of applied economic research using a wide range of techniques for this type of data- termed cross section data and cross section econometrics. In this course, you will learn about these techniques, will learn to be an educated consumer of econometric research, and will apply these techniques to real data. We will also derive many of the properties of the statistical techniques used in this course, but primarily at the end of the course you will

- Understand the strengths and weaknesses of cross section techniques
- Know how to test the validity of modeling assumptions
- Know the proper econometric technique for a wide variety of Cross-Section settings

Logistics

- **Office Hours** : T 4:00 - 6:00pm or by appointment. I am here to help so please come with questions.
- **Asking Questions**: Substantive questions about course material or coding in Stata (or R) must be submitted to the Cross Section issue tracker at https://gitlab.com/robhicks/econ407. Before using the issue tracker, you must create an account on gitlab (free). Use your William and Mary email address so that I can add you to the user list. Part of Problem Set 1 requires you to file an issue at this site, so create your account ASAP once you receive an invite from me.
- **Email Policy** : For other types of questions like setting up meetings, grade questions, logistical issues, etc., I will respond to emails but only if they contain the tag `[ECON407]` or `[PUBP615]` in the subject line or you use the email exactly as specified above. If not, the google will likely delete your email. Substantive questions about course material/coding issues will be ignored so please direct those to gitlab.
- **Grades**: Your grade will be based on five exercises (1 @ 5% and 4 @ 10% each), one mid-term (25%), a final exam (30%).
  - The **problem sets** will consist of a mix of theoretical and practical econometrics. In each (after the first one), you will be given a dataset and will need to conduct an econometric analysis thinking critically about which technique to employ as well as key tests that should be run. Your document should include clear interpretations of your results, tables with clear variable names, and be well-formatted with code, tables, and writeup combined in a convenient (for me) way. You will be responsible for posting to the blackboard assignment a `markstat` (for `stata`) or `Rmarkdown` (for `R`) file that **completely** generates your analysis: a flowing narrative containing code, writeup, and results. For any part of the problem sets requiring hand-written math excercises, you can turn those in on paper. Early on in class, I will demo how this works for `stata`. The handout for reproducible research can be found here and is produced by this stata source code in `stata` using `markstat`. Also, a markstat screencast is available on youtube for showing the workflow that I demonstrated in class.
  - The **mid-term** is scheduled for Oct 16 just after fall break. Unfortunately, I can't reschedule either the mid-term or the final the exam, so if this time doesn't work for you please drop the course.

Important Dates

Date	Item
Aug 28	First day of class

Date	Item
Friday, September 6	Last day to add/drop
Monday, October 28	Last day to withdraw
Oct 12 - 15	Fall Break
Oct 16	Mid-Term
Nov 27 - Dec 1	Thanksgiving
Dec 4	Last day of this class
Dec 18 W (9am - 12pm)	Final Exam

Policy on Late Assignments

- Final Exam: University policy will not allow me to reschedule the final exam (see the Dean of Students for exceptions).
- Course assignments must be turned in on time. Late work will be accepted for up to two additional days (with Saturday and Sunday counting as 1 day in total) with a letter grade deduction for each late day. After two days, late assignments will not be accepted. See below for some examples:

Due Date	Turned in	Your Grade	Your Grade after Penalty
Tuesday	Thursday	A	C
Thursday	Saturday or Sunday	A	C
Tuesday	Friday	A	F (not accepted)
Thursday	Monday	A	F (not accepted)

Hardcopy Policy

For all problem sets, in addition to the required files you must post to blackboard, you will be responsible for turning in a hardcopy version (in readable form from markstat output) of your work at the end of class. You may give it to me in person, put it in my box in Tyler Hall, or slide it under my door in Tyler Hall 252. Should you not give it to me in person and the work goes missing, you remain responsible for getting me your work on time to avoid late assignment penalties.

Grade Discrepancies and Grade Questions

I am happy to discuss questions you have about your grade on class assignments. Any questions you have regarding a potential grade change on an assignment must be cleared up within 1 week of receiving your work back from me. The only exception to this policy is if I made an arithmetic or data entry error in adding your score up and entering it into blackboard. I will not entertain grade questions at the beginning of or following a class. These need to be handled in my office.

Course Materials

All course materials are available on my website for this course at the links listed below. I will **only** be using blackboard for posting grades and problem set solutions.

Links
Syllabus (this document)
Lecture Notes
Presentations and Course Google Drive Site

Links

Data Found at https://rlhick.people.wm.edu/econ407/data

Book

I am no longer requiring any books for this class. However, there are two I highly recommend particularly if you plan on attending graduate school in Economics or Political Science. First is Greene's Econometric Analysis. Second is this one by Wooldridge which is recommended but not required. Both of these books are expensive and you can find older editions at less than half the price. For your convenience, beside each topic is the relevant parts of Greene and Wooldridge although these readings are not required.

Computing, Computers, and the Class

We will make extensive use of `Stata` (or if you optionally decide to use it, `R`). For `stata` you may want to buy your own copy of the software (through the *Grad Plan* at https://www.stata.com) and the cost is around $100. Alternatively, a College-owned version can be run remotely on a Unix machine (`stat.wm.edu`) from your laptop through X11 or other means. If you decide to go this route, know that the setup is time consuming and you will likely need assistance from IT. If you plan on using `stat.wm.edu`, please deal with these logistics during the first week of class. Additionally, there are computer labs around campus (e.g. Morton 240) where `stata` is accessible. `R` is free for you to install on as many machines as you like, is open-source, and is also available on lab computers.

We will make some use of the main computer in the classroom for much of what we do together in class. The data for course examples and problem sets will be available on the web for the duration of the course, but you should have archival copies and working backups of all of the programs you have written to take the data from raw to final form. All computer work you do in this class must self-generate the full analysis and write-up using `markstat` or `Rmarkdown` as described on the first day of class.

Acceptable Collaboration and Automatic Plagiarism Scanning

Finally, I want to define acceptable collaboration. In this course, I want you to think for yourself in applying these techniques. Using resources outside of class and properly citing it, is perfectly with-in bounds. Taking `.do` files from your fellow classmates or off of the web and treating them as your own work is not acceptable. Receiving assistance at every critical modeling step is also not acceptable. Asking a classmate about clarification of stata syntax (e.g.- I forgot how to ask for robust standard errors, could you help me with that?), is fine.

Be aware that all assignments submitted to blackboard are automatically scanned by `Turnitin` and are compared against the assignments for all current and past Cross Section classes as well against information from the web.

Class Schedule

Topic	Approx. Duration	Summary & Notes	Book
Introduction	5 weeks	Linear Algebra Intro/ Review	Green Appendix
		Stata Intro/Review	Supplemental Notes
		Review of Regression	Greene 3,4
		Review of Endogeneity	Green 12,13.5,13.5.5
Panel Data	3 weeks	Fixed Effects	Green 9-9.7
		Random Effects	Wooldridge 10
Maximum Likelihood	1 week	Intro to Maximum Likelihood	Green 16

Topic	Approx. Duration	Summary & Notes	Book
Discrete Dependent Variables	1 week	Binomial Logit and Probit	Green 23
Truncation & Censoring	2 weeks	Tobit and Heckman	Green 24
Simulation and Bootstrap	1 week	Simulating standard errors	TBA
Other Maximum Likelihood models (as time allows)		Multinomial Logit and Probit Negative Binomial and Poisson	Green 25

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