University of Maryland
Master of Professional Studies Program in Applied Economics

Empirical Analysis III: Econometric Modeling and Forecasting

ECON 645
Spring 2018
Class Meets: Monday 6:45-9:30pm (15 min break sometime between 7:45-8:30pm) at 1400 16th St. NW, suite 140

Instructor: Cristina Tello-Trillo   TA: Hidehiko Matsumoto
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Pre requisites: ECON 644

Course description: This course covers empirical strategies for applied micro research. Our agenda includes regressions and instrumental variables, differences-in-differences, regression discontinuity designs, panel data and limited dependent.

Course Objectives: This is a course in applied econometrics, emphasizing the implementation of modern econometric techniques to analyze concrete economic problems, using real data and recent econometric software. Though not a theoretical course, we will introduce some basic theory and concepts to motivate an appropriate use of the methods. At the end of the course, you should:

- Understand, evaluate and analyze economic data.
- Understand and interpret statistical evidence from economic data: build, estimate and interpret your own econometric models for concrete economic problems.
- Apply empirical evidence to assess economic arguments
- Communicate economic ideas to a broader audience; you will be able to write professional reports/papers using econometric methods.
- Use STATA software for econometric and statistical analysis.
- Understand empirical papers in the field of economics and gain sense of what makes an empirical paper convincing.

Textbooks and Software:

Required:
- Introductory Econometrics: A Modern Approach, 5th edition, Jeffrey M. Wooldridge. (2013)
- Data Management Using STATA: A practical Handbook, Michael N. Mitchell (2010)
- Copies of the syllabus, lecture notes, problem sets and other relevant documents will be made available through the course website.
- We will use STATA for the empirical analysis. You can order a student version which is discounted. Information on how to order STATA is available on the last page of this syllabus.

Recommended:
- Microeconometrics using STATA, Cameron and Trivedi (2009)
- Mostly Harmless Econometrics: An Empiricist's Companion, Angrist and Pischke (2009)

Office Hours: Before and after class by appointment.

The TA office hours are posted on the program's general ELMS page. Hide will also send weekly reminders via ELMS announcement every Sunday evening.

Grading:

- Midterm Exam: 25%
- Final Exam: 25%
- Problem sets 1-4: 15% each (l will drop each student's lowest Pset grade)
- Online Discussion Sessions: 5%

The problem sets will include theoretical problems and empirical assignments. You will have a week to solve each problem set. I encourage you to discuss the problems with your classmates. From my experience as a student, you can learn a great deal from your fellow students. However, after discussing problems, you should solve the problems on your own. Joint assignments will not be graded.

Final Course Grades

Students' grades on each component of the course will be weighed according to the scale above to calculate their numerical course grade. The numerical course grades will be translated into letter grades as follows:

93-100 A
90-92 A-
80-89 B+
70-79 B
60-69 B-
50-59 C+
40-49 C
30-39 C-
20-29 D+
10-19 D
0-9 F

A+'s are reserved for students at the very top of the class' grade distribution.

Online Discussions:

I will post a question/series of questions relevant to the course material every *Thursday at 11am.* The discussion will be open until *Friday at 11pm* for you to comment/respond. I will check in twice a day to participate/respond/redirect. Your participation in these discussions directly impacts your grade.

Tentative Course Outline:

- Feb 26: Introduction, Endogeneity, Omitted Variable Bias, Instrumental Variables (Wooldridge Chapter 3.3, 9.4, 9.5, 15.1)
- Mar 5: More instrumental variables and 2SLS (Wooldridge Chapter 15.1-15.5; continued use of do-files and log-files, Acock, Ch. 4, reading and writing data files, Mitchell Ch. 2, data cleaning, Mitchell Ch. 3)
- Mar 12: Panel Data I (Wooldridge Chapter 13, 14.1 & creating variables, first half of Mitchell, Ch. 5) **(Pset #1 Due)**
- Mar 19: Panel Data II (Wooldridge Chapter 14.1-14.3 & 8 and Mitchell Chapter 6)
- Mar 26: Natural Experiments and Difference-in-Differences **(Pset #2 Due)**
- Apr 2: Midterm & Regression Discontinuity
- Apr 9: Regression Discontinuity Design
- Apr 16: Limited Dependent Variables I **(Pset #3 Due)** (Wooldridge Chapter 7.1, 7.5, 17.1)
- Apr 23: Limited Dependent Variables II
- Apr 30: Intro to Time Series I (Wooldridge Chapter 10-12) **(Pset #4 – Part I Due)**
- May 7: Intro to Time Series II (Wooldridge Chapter 10-12)
    - May 12 6:45pm **(Pset #4 – Part II Due)**
- May 14: Final Exam

Deadlines: All problem sets are to be submitted electronically as STATA log files on ELMS and are due before class on Monday at 6.45pm.[1] Since answers are posted on ELMS the same day, late submissions are not acceptable.

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[1] If some exercises need to be done by hand, students need to scan (or take high quality photos) the solutions and submit them electronically.

University of Maryland Policies

Course Website: Copies of the course syllabus, your grades, and other relevant links and documents will be posted on the course's ELMS/Canvas website. You can access the site via www.elms.umd.edu. You will need to use your University of Maryland "directory ID" and password.

Email: Email is the primary means of communication outside the classroom, and I will use it to inform you of important announcements. Students are responsible for updating their current email address via http://www.testudo.umd.edu/apps/saddr/ AND for paying attention to messages I send to the class via ELMS. Failure to check email, errors in forwarding email, and returned email due to "mailbox full" or "user unknown" will <u>not</u> excuse a student from missing announcements or deadlines. I will do my best to respond to email within 36 hours.

Contact Hours: Three credit courses at the University of Maryland require a minimum amount of contact between instructors and students. Our courses' 12 weekly 3-hour meetings only satisfy 80% of the university's contact requirement. The other 20% is satisfied by weekly mandatory and graded online contact. In principle, the contact hours requirement could be satisfied by scheduling 3 additional 150-minute meetings per term, or 6 additional 75-minute meetings, or 10 additional 45-minute meetings. But in practice the contact hours requirement is satisfied by the weekly online discussions. The weekly online discussions are a more flexible way to ensure that our program's courses in DC provide the same level of student-instructor contact as the traditional 15-week, face-to-face, version of the same course when it is taught on campus in College Park.

Work Load: Mastering the material covered in this course requires a significant amount of work outside of class.   Students should expect to spend more time outside of class than in class – typically at least twice as much time. The courses in our DC program are 12-week courses that cover all the same material as a traditional semester-long 3-credit course (15 weeks). The compressed schedule makes it possible to complete our degree in just 15 months if you take 2 courses each term. But the compressed schedule also implies an accelerated pace with an average of 25% more work per week in a given course (15/12 = 1.25). The normal full-time load in a master's program is 3 courses per semester, or 6 courses per year. The weekly work load when taking 2 of our courses per term is equivalent to the load from 2.5 "normal" 15-week courses - so 2.5/3.0=83% of a full-time load. Students who take 2 courses per quarter in our program complete 8 courses per year. So over the course of a year, taking 2 courses per quarter in our program is equivalent to 133% of a full-time load (8/6 = 1.33).

Academic Integrity: The University of Maryland has a nationally recognized Code of Academic Integrity, administered by the Student Honor Council. This Code sets standards applicable to all undergraduate and graduate students, and you are responsible for upholding these standards as you complete assignments and take exams in this course. Please make yourself aware of the consequences of cheating, fabrication, facilitation, and plagiarism. For more information see www.studenthonorcouncil.umd.edu.

Student Conduct: Students are expected to treat each other with respect. Disruptive behavior of any kind will not be tolerated. Students who are unable to show civility to one another or myself will be referred to the Office of Student Conduct. You are expected to adhere to the Code of Student Conduct.

Excused Absences: The University of Maryland's policy on excused absences is posted here: http://www.president.umd.edu/administration/policies/section-v-student-affairs/v-100g
    Please note:
    If you miss any class meetings for any reason, you are still responsible for all material covered during the meeting you missed. It is your responsibility – not the instructor's – to get yourself caught up in the course. Instructors routinely facilitate things by posting lecture notes, etc.
    If you need to miss an exam or other graded course requirement because of illness, injury, or some other emergency: Follow doctor's orders and get documentation. Get in touch with the instructor as soon as you're able – preferably prior to missing the exam or deadline. Communicate with the instructor to make up the course requirement as soon as possible. You are entitled to recover before you make up the course requirement, but you are not entitled to extra days to study beyond the time the doctor's note says you're incapacitated. If you are incapacitated for more than a week or so beyond the end of the term, your grade in the course will be an "Incomplete". In such cases you must negotiate a plan with your instructor for completing the course requirements. Once you make up the course requirement the instructor will change your "I" to the appropriate letter grade.

School Closings and Delays: Information regarding official University closing and delays can be found on the campus website and the snow phone line: (301) 405-SNOW (405-7669). Since our program is an evening program in downtown Washington, DC, rather than a day program in College Park, we do not always cancel classes on the same days as the College Park campus. The program director will always announce cancellation information to the program as an announcement on the program's ELMS/Canvas site. This will generally be done by 1:00 p.m. on days when weather or other factors are an issue.

UMD Counseling Center: Sometimes students experience academic, personal and/or emotional distress. The UMD Counseling Center in Shoemaker Hall provides comprehensive support services that promote personal, social, and academic success. The cost of these services is covered by the fees you already paid when you registered for classes, and there is no additional charge if you use the services. Proactively explore the range of services available, including the Counseling Service, Accessibility and Disability Service, Learning Assistance Service, and the Testing Office, all described at http://www.counseling.umd.edu/

Students with Disabilities: The University of Maryland does not discriminate based on differences in age, race, ethnicity, sex, religion, disability, sexual orientation, class, political affiliation, or national origin. Reasonable accommodations will be arranged for students with documented disabilities. Students who have an accommodations letter from the Accessibility and Disability Service (ADS) should meet with me during the first few weeks of the semester to discuss and plan for the implementation of your accommodations. If you require reasonable accommodations but have not yet registered with ADS, please contact the Accessibility and Disability Service at 301-314-7682 or adsfrontdesk@umd.edu.

Academic Progress: The graduate school requires that students maintain a GPA of at least 3.0. Students whose cumulative GPA falls below 3.0 will be placed on academic probation by the graduate school. Students on academic probation must ask the program's director to petition the graduate school if they want to remain in the program. The petition must include a plan for getting the student's

GPA up to at least 3.0. Students who do not live up to their plan can have their enrollment in the program terminated without having earned the degree. Note: a grade of "B" corresponds to a GPA of 3.0. A grade of "B-" corresponds to a GPA of 2.7.

Building Access: The door to the building at 1400 16th Street is unlocked on weekdays until 7:00 p.m. Students who arrive after 7:00 p.m. or on weekends will find the door locked. The building's security guard is stationed at a desk just inside the door until 11:00 p.m. and will let you in. You can also call the phone on the security guard's desk by dialing (202) 328-5158. If the security guard is off duty or happens to be away from his or her desk when you arrive, you can go around to the other door at 1616 P Street and pick up the black phone to the right of that door. You will be connected to the company that handles security for our building. If you tell them you are with the University of Maryland, they should ask you for a password. When you tell them the password, they will be able to unlock the door for you. You can get the password from the program coordinator, the TA, or the program director. Please note: the building security staff are not able to buzz you in at the 1400 16th Street door. You have to go around to the 1616 P Street door to be buzzed in.

Laptop Computer Requirement: Completing some of this course's requirements will require a laptop computer (not a notebook or a tablet!) with at least 1 GB of RAM and at least 5 GB of free space available on the hard-drive. We recommend laptops with a 15-inch screen. Screens smaller than 13 inches are probably not practical.

Purchasing Stata: Students in our program must purchase Stata. Stata offers different "flavors" and different lengths of licensing. Price varies according to these two factors. We do not recommend Small Stata since it is too limited for the coursework in our program. Stata/IC is the least expensive and sufficient version for your coursework. With a single-user license, you can install Stata on up to three computers. Description of all the flavors are given here:

http://www.stata.com/products/which-stata-is-right-for-me/

You can obtain Stata at discounted rates through the Campus GradPlan, in which University of Maryland, College Park is a participating institution. To benefit from the discounted prices, click on the link below and pick the Stata version you would like to buy.

(Note: Disregard the warning at the top which states that you must be a faculty or staff member. That is not correct.)

http://www.stata.com/order/new/edu/gradplans/campus-gradplan/

Through the Campus GradPlan you can buy either an annual ($125 for Stata/IC) or a perpetual license ($198 for Stata/IC). The perpetual license does not expire and is the most cost effective option assuming that you will stay in the program for at least 15 months. There are also upgrade discounts provided to perpetual license holders. During the checkout process you will be asked to verify your "@umd.edu" email address.

If you wish to buy a 6-month license ($75 for Stata/IC), you need to order it as a regular student using the following link:

http://www.stata.com/order/new/edu/gradplans/student-pricing/

During the checkout process you will be asked to upload a copy of your student ID or another document as a proof of your enrollment.