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Faculty Syllabi

Fall 2015

ECON 375

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Economics 375D: Applied Econometrics

Fall 2015   *Professor Turner*

Class time: MWF 9:20 – 10:10, 209 Persson, led by Bob Turner
Lab Section: Thursdays 4:00 – 6:00, 209 Persson, led by Brad Miles

Professor Turner's Office: 228 Persson, ext. 7529
Office Hours: Mon. 2:30 – 4:00, Tues. 2:15 – 3:15, Fri. 10:15 – 11:00, or by appointment
Email: rturner@colgate.edu
Course Website: All course materials and assignments will be posted on Moodle.

Text: *Introductory Econometrics: A Modern Approach* (5th edition) by Jeffrey M. Wooldridge (South-Western/Cengage Learning, 2012) is available at the bookstore. Supplemental readings will be posted on Moodle.

Course Description:
        Econometrics is a set of techniques that allows the measurement and analysis of economic phenomena and the prediction of future economic trends. It is an important applied tool in almost all of the subfields of economics and is used to provide quantitative answers to research questions. However, the importance of econometrics extends far beyond the discipline of economics. These tools are also used in finance, marketing, and management along with other social science disciplines such as political science and sociology.
        In this course the study of applied econometrics is organized into two main sections. In the first, we cover the basics of regression analysis, the most important econometric technique, including necessary background material in statistical theory. In the second section, you will be introduced to more advanced techniques used regularly by applied economists, including instrumental variables estimation, panel data techniques, limited dependent variable models, and time series econometrics. Applications from both macro and microeconomics will be used throughout. Labs will provide opportunities for learning by doing, based on data sets from a variety of fields of economics.

Course Objectives:
This course is an introduction to empirical analysis in economics. It covers a set of basic econometric tools that can serve as a starting point for analyzing data; it will also introduce some more advanced techniques. By the end of the course students will be able to
- recognize the econometric techniques appearing in most economics journal articles and be able to understand their results
- use SAS and Stata to produce econometric results using a variety of techniques and then correctly interpret those results
- identify and correctly deal with some of the basic problems that arise in empirical analysis in social science research
- present a summary of empirical research in oral and written forms

As the title of the course implies, the focus is on the application of econometric techniques rather than their underlying theory. However, enough theory will be presented to ensure that techniques are applied in a statistically appropriate manner. The objective will be for students to form an intuitive understanding of the principles of statistical analysis as they apply to the analysis of observational data.

Graded Assignments:

Assignment	*Value*
Midterm 1: Thursday, October 1, 7 – 9 PM in 109 Persson	20%
Midterm 2: Thursday, October 29, 7 – 9 PM in 109 Persson	20%
Final Exam: Friday, December 18, 3 – 5 PM in 209 Persson	25%
Final Draft of Final Project – due Friday, November 20, 4:00 PM	15%
Final Econometrics Project – due Friday, December 11, 4:00 PM	10%
Lab Attendance and Lab Reports	10%

Grading Standards: Grades are based on the following description:

A	All parts of the assignment are completed correctly, or with at most a few minor mistakes, plus there is something exceptional, for example particularly thorough or insightful answers
B	All parts of the assignment are completed correctly, or with at most a few minor mistakes, but the answers aren't particularly thorough or insightful
C	One or at most a very few parts of the assignment are incomplete, or there are at most a few substantial mistakes and/or several minor mistakes
D	Several parts of the assignment are incomplete and/or there are several substantial mistakes; some of the assignment is completed and done well, however
F	Much of the assignment is incomplete or done incorrectly

Lectures: Although this is not a discussion-based class, you will learn the material much better if you are actively engaged in class. Therefore I expect you to ask and answer questions as I describe and explain the course material. I expect you to read the relevant textbook materials and other assigned materials before class so that you can participate intelligently. The articles I will assign and post on Moodle will be used to provide examples; therefore you need only skim them to get an idea of their topic before class, rather than reading them in detail.

Attendance Policy: Although attendance is not mandatory and I will not call the roll, many years of evidence suggests that those who regularly attend and pay attention in class will do much better in the course. **If field trips, team travel, music or theater performances, or other commitments are in conflict with scheduled examinations, labs, or presentations in this course, please inform me as soon as possible.**

Labs: There will be a weekly lab session run mostly by Brad Miles '16, though sometimes I will be present as well. Labs will teach you how to use computer software for econometric analysis and give you hands-on experience using the methods described in lectures. Lecture and lab are complements, not substitutes, so labs are a required component of this course. Lab attendance will be recorded and lab reports will be graded by Brad using the grading standards shown above. You must turn in SAS or Stata code with your report.

Sample Problems: Sample problems will be posted periodically. These are to help you prepare for the exams. They will not be graded. Answers will be posted before exams but you should work on the problems (I recommend you form study groups) before looking at the answers.

Academic Dishonesty: "Briefly stated, Colgate University defines academic dishonesty as any attempt to misrepresent one's performance on any academic exercise submitted for evaluation…Colgate University recognizes four forms of academic dishonesty: Cheating, Fabrication (of data or sources), Facilitating Academic Dishonesty, and Plagiarism" (Source: Colgate University's Academic Honor Code). All students are expected to abide by the Colgate Honor Code, which can be found at http://www.colgate.edu/offices-and-services/deanofthecollege/academichonorcode.

Special Accommodations: If you need special accommodations due to documented disabilities, you should speak to me privately to discuss your specific needs. If you have not already done so, please also contact Lynn Waldman, Director of Academic Support and Disability Services, in the Center for Learning, Teaching and Research (315-228-7375). http://www.colgate.edu/centers-and-institutes/center-for-learning-teaching-and-research/academic-support-and-disability-services.

Final Project:
The course will culminate in a research project, ordinarily done in teams of 2, in which you are expected to demonstrate the ability to conduct quality empirical research in order to answer an economic question. You should think of a research question you find interesting and find a dataset that will allow you to answer that research question. (There will be a special session on finding data later in the semester.)

Your research and report should employ theoretical, analytical, descriptive, and econometric techniques in an effort to come up with the best model that investigates your particular interests. When coming up with your model, you need to use the appropriate econometric techniques to address the potential problems we have discussed throughout the semester.

Chapter 19 in Wooldridge should be helpful as you plan and write your final project.

Structure your report in the following manner (**Note the repeated reference to brevity in the outline!**):
I.   Introduction and Motivation: Keep it short but explain why a reader of your paper should be interested.
II.   Brief Literature Review (with a minimum of three academic papers cited; full bibliographic information can be given in footnotes or in a bibliography at the end of your paper): Focus on how each paper helped you figure out what variables were appropriate or what way of interpreting results would be most interesting.
III. Conceptual or Theoretical Framework: Discuss briefly the economic concepts that influence whatever your dependent variable(s) is (are).
IV.   Data Discussion and Descriptive Analysis: Briefly discuss the specific variables that you will use, how they relate to the concepts of part III, and describe your sample.
V.   Econometric Models, Estimation Methods, and Specification Testing: Describe briefly the models you estimated, the diagnostic tests you performed, and the conclusions you drew from the empirical results; you don't need to describe each set of results in detail—rather, you should describe why you made the specification choices you did on the way to finding a final model and econometric method.
VI.   Econometric Results: Give a full interpretation of your final model or models.
VII. Summary, Conclusions, and Recommendations for Interesting Future Research: Your paper should conclude, not just end. Make sure that your summary and conclusions connect to your introductory section. Briefly describe what you or someone else might do next to further analyze your research question.
VIII. Appendix with SAS and/or Stata Code: You **must** include an appendix with SAS and/or Stata code that could be used to replicate your results. This includes data creation commands as well as estimation commands.
IX.   Optional Appendix: SAS or Stata results that are important for your arguments should be imbedded in the text of your paper, either as tables or integrated into your sentences. You do not need to provide copies of SAS or Stata output, but you might want to include the relevant parts of output in an appendix.

These do not necessarily have to be formal sections of your paper; for example, your discussion of the relevant economic theory might be combined with a discussion of the variables that you use to capture the theoretical concepts, and also with a description of the values of those variables that appear in your sample.

Course Outline and Readings

TOPICS:	DATES:	Reading/Assignment: **Note that we will not cover everything in every assigned chapter. More specific reading assignments and additional readings will be posted on Moodle** *Readings may change: check regularly on Moodle*
----- *Introduction and Basic Regression Analysis* -----		
Review of Basic Regression Analysis (OLS and the Classical Model): Simple and Multiple Regressions, Confidence Intervals, Hypothesis Tests, Omitted Variables	Aug. 31 – Sept. 21	Wooldridge Chapters 1 – 5 , Appendices A – C as needed
Functional Form, Predictions, Dummy Variables	Sept. 23 – 30	Wooldridge Chapters 6 –7
MIDTERM EXAM: Thursday, October 1, 7:00 – 9:00 PM in 109 Persson Hall No class on Friday, October 2		
---------- *Advanced Topics and Extensions of the Basic Regression Model* ----------		
Heteroskedasticity, Specification Issues	Oct. 5 – 9	Wooldridge Chapters 8 – 9
OCTOBER BREAK: No class on Monday, October 12		
Panel Data Modeling	Oct. 14 – 21	Wooldridge Chapter 14 (review)
Endogeneity, Instrumental Variables, 2SLS	Oct. 23 – 28	Wooldridge Chapter 15
MIDTERM EXAM: Thursday, October 29, 7:00– 9:00 PM in 109 Persson Hall No class on Friday, October 30		
Limited Dependent Variable Models	Nov. 2 – 7	Wooldridge Chapter 17
Time Series Estimation: Distributed Lags, Serial Correlation	Nov. 9 – 20	Wooldridge Chapters 10 – 12
FINAL PROJECT FINAL DRAFT due Friday, November 20 at 4:00 PM		
THANKSGIVING BREAK: No classes on November 23 – 27		
Time Series Estimation: Stationarity, Cointegration: SETs and Review	Nov. 30 – Dec. 11	Wooldridge Chapter 18
FINAL PROJECT due Friday, December 11 at 4:00 PM		
Review	Time and place TBA	
FINAL EXAM: Friday, December 18 at 3:00 PM in 209 Persson Hall		