ECON 255: Econometrics
Spring 2008

Pierre Ly
Dodd Annex 7
Phone: 597-3368
Email: pierre.ly@williams.edu

Office hours:
Tue and Fri: 10 am - noon
and by appointment

Teaching Assistants: Lily Li (Lily.Y.Li@williams.edu) and Gordon Phillips (Gordon.i.phillips@williams.edu)

Course information on the web: http://www.williams.edu/go/blackboard

Course Objectives

Econometrics is the application of statistical methods to economic problems. In this course, we will develop and use basic and advanced econometric techniques. By the end of the course, you should:
(1) Understand the theory behind basic and more advanced econometric techniques. Modern software has made complicated econometric analysis very easy to do, and an understanding of the underlying theory is extremely important.
(2) Have proficiency using Stata (a statistical software package). Once you know how to use Stata, learning how to use another software later if you need to (such as SPSS) will not be difficult. After successful completion of this course, you will be able to add a line to your resume: you will have very good data analysis skills, something many employers are looking for.
(3) Be able to implement original research using the empirical techniques you have learned.
(4) Present your findings to an audience

The focus of the course is cross-sectional and panel data analysis. Students interested in time series should consider Econ 367, for which Econ 255 is a pre-requisite.

Pre-requisites

Students are expected to have a working knowledge of basic statistics (Stat 101 or equivalent) before taking the course. No prior experience with statistical software packages is required.

Textbooks and other resources

The (required) text is Jeffrey M. Wooldridge, *Introductory Econometrics: A Modern Approach*, 3rd edition, Thomson Southwestern, 2006.
A useful (optional) additional reference is a book by Peter Kennedy, *A guide to econometrics* (now in its 5th edition, but previous ones are great too). Read the customer reviews on Amazon and you'll understand why I recommend it. It focuses on econometric theory in an intuitive way and the author does a great job. The 4th edition is available in electronic form,

from the Williams library electronic books collection, so you can even just read it for free on your computer if you are interested.

A number of professional research papers will be posted on blackboard, and we will discuss them throughout the semester.

Computer resources

Stata is available in both PC and Mac versions, and should be installed on all lab computers. In addition, it is key-served software, so you can use it in your room on a computer connected to the network. It can be downloaded from http://cf.williams.edu/oit/software/index.cfm (choose Stata 9, not Stata/SE 9). If you have any difficulty installing Stata on your computer, the student help desk at x3088 should be able to help you.

I will post a handout for you to start playing with Stata right away. I will also post links to useful online resources.

Study Group

I will hold an optional evening "study group" meeting once a week, about an hour long (schedule to be posted in the next couple of days). The study group will review the material recently covered in lecture and work through extra practice problems. We will not discuss problem set problems at the study group; you should attend the TA session for help with the problem sets.

TA Sessions

The TAs for this course are Lily and Gordon. Optional TA Sessions will be held (schedule to be posted this weekend). You are expected to attempt the assignments before coming to the TA session and bring questions.

Group research Project

In groups of 3, you will develop an original empirical research project. The result of this project will be a paper about 15 pages long (including tables and references). The paper should include a review of existing literature related to your work. More detailed guidelines will be provided in the next few days. Please start thinking about group formation!

Academic honesty

The Honor Code applies to all work submitted and exams taken in this class. You may collaborate on the problem sets, however as noted above, the work you turn in should be written up independently. You may also collaborate in studying or preparing for the exams, but the written exam should be your work alone.

Grading

Grades will be based on attendance and participation, problem sets, two midterm exams, and a research project. Your overall grade will be determined according to the following scheme:

Problem sets	10%
Exam 1	30%
Exam 2	30%
Group research project	
Presentation	10%
Paper	20%

Exams 1 and 2 will be held in the evening. The schedule will be posted in the next few days (don't worry; you have some time until exam 1!)

Policies regarding problem sets

There will be 9 problem sets. They are due in class according to the schedule of due dates below (given in the schedule of lectures). You may work with other students on problem sets, however you must write up your answers on your own, and in your own words. It is a violation of the Honor Code to copy another student's problem set. In addition, I recommend that you work by yourself as much as possible. Although the problem sets count for only 10% of your grade, thoroughly understanding them is crucial to understanding the material. In order for you to develop proficiency in data analysis, all problem sets will include empirical exercises to be done using the computer. **Late problem sets will not be accepted.** The lowest grade of the nine will be dropped. *Thus, you can miss 1 problem set for any reason without any penalty.*

Schedule of classes and readings

Lecture 1: Friday Feb 1
Introduction
Syllabus
NB: look at App. A on your own ASAP, to make sure you have the (rather small) math prereqs.

Lecture 2: Monday Feb 4
Stat Review
Wooldridge:
App. B.1, B.2

Lecture 3: Friday Feb 8
Stat review
Wooldridge:
App B.3- B.4

Lecture 4: Monday Feb 11
Estimation
Stat review
Wooldridge:
App B.4- B.5
Group selection due

Lecture 5: Friday Feb 15
Estimation
Chapter from "Probability for dummies": sampling distributions and the CLT

Lecture 6: Monday Feb 18 (President's Day to be rescheduled) **problem set 1 due**
Estimation
Wooldridge:
App C.1-C.4

Lecture 7: Friday Feb 22
Simple Regression
Wooldridge:
Ch. 2.1-2.3
Description of group research topic due (Have a good idea of potential data sources for it then)

Lecture 8: Monday Feb 25
Simple and Multiple Regression
Wooldridge:
Ch. 2.4-2.5,3.1

Lecture 9: Friday Feb 29 **(problem set 2 due)**
Multiple regression
Wooldridge: Ch. 3.2-3.3

Lecture 10: Monday March 3
Multiple Regression
Wooldridge:
Ch. 3.4-3.5
Group project's data set due (you need to give me an excel or Stata file with your data set ready, along with a document describing your data source, variables, and preliminary research questions. By then, you will have a better idea of what research questions you can address based on the data you have found)

Lecture 11: Friday March 7 **(Problem set 3 due)**
Inference
Wooldridge:
App. C.5-C.6, Ch. 4.1-4.2

Lecture 12: Monday March 10
Inference
Wooldridge:
Ch. 4.3-4.4

Lecture 13: Friday March 14 **(Problem set 4 due)**
Inference
Wooldridge:
Ch. 4.5-4.6

Lecture 14: Monday March 31
Issues in multiple regression
Wooldridge:
Ch. 6.1-6.3

Lecture 15: Friday April 4 **(Problem set 5 due)**
Binary independent variables
Wooldridge:
Ch. 7.1-7.4

Lecture 16: Monday April 7
A binary dependent variable (the linear probability model)
Wooldridge:
Ch. 7.5-7.6
Outline of preliminary group project due on TUESDAY APRIL 8. This must include a review of relevant literature, well defined research questions, a thorough description of your data (with descriptive statistics of your variables of interest) and of your econometric methodology (equation(s) to be estimated? Why? Are you comparing different cases? etc.)

Lecture 17: Friday April 11 **(Problem set 6 due)**
Heteroskedasticity
Wooldridge:
Ch. 8.1-8.3

Lecture 18: Monday April 14
Issues in OLS
Wooldridge
Ch. 9.3-9.4

Lecture 19: Friday April 18 **(Problem set 7 due)**
Panel data/natural experiments/ difference in differences
Wooldrige
Ch 13.1-13.3

Lecture 20: Monday April 21
Natural experiments/ difference in differences (continued)
Wooldrige
Ch 13.1-13.3
Evening presentations to be scheduled that week. You will have to email me your presentation the day before you present. There will be three sessions. You only have to attend the one in which you present. I expect you to be an active discussant of your peers' research during that session. They will do the same for yours, and this will help you for the final draft.

Lecture 21: Friday April 25
Panel Data/ fixed effects
Wooldridge:
Chapter 14.1

Lecture 22: Monday April 28 **(Problem set 8 due)**
Instrumental variables
Wooldridge
Ch. 15.1-15.2

Lecture 23: Friday May 2
Instrumental variables
Wooldridge
Ch. 15.3-15.4
Research paper due (this deadline is non-negotiable)

Lecture 24: Monday May 5 **(Problem set 9 due)**
Instrumental variables
Wooldridge
Ch. 15.3-15.4
Concluding remarks

Friday May 9