

Econometrics
220:322:03
Monday and Wednesday 4:30 PM - 5:50 PM in HH-A7
Final Exam: May 9, 2014 at 4 PM
Prof. Paczkowski

Spring, 2014

January 16, 2014



My office hours are:

Monday/Wednesday 2:30 PM - 4:00 PM

and by appointment

Office Hours Location:

Student Activity Center (SAC) on George St. CAC

732-932-7363

The best place to find me is before class in the classroom. I can also be reached by email at

paczkows@economics.rutgers.edu

Please feel free to see me with any questions. *Do not wait until the end of the semester!*

You can also reach me via the Economics Department's secretary in New Jersey Hall. You can leave a message for my mail box, but this is the least effective way to reach me.

1 Course Objectives

Econometrics is the application of a specific method in the general field of economic science in an effort to achieve numerical results and to [falsify] economic theorems. It consists in the application of mathematical economic theory and statistical procedures to economic data in order to establish numerical results in the field of economics and to [falsify] economic theorems.

G. Tintner, Econometrics (1952)

This quote by Tintner, one of the pioneers of econometrics, summarizes the thrust of this course: to use both mathematical and statistical tools to analyze data to falsify economic theories. Economic theories, like those in any science, offer little value to the advancement of the science or help in policy formulation if they contradict reality. The theories must be tested with data. Don't be misled, however, into believing that this is just an academic issue. The testing of theories and the use of econometrics is very important in the business, government, and legal sectors as examples used in this course will illustrate. This course is concerned with general methodologies for testing economic theories and obtaining numerical results in a wide range of areas.

1.1 General Objectives

The general objectives for the course are to...

1. provide you with a more detailed introduction to statistical concepts than normally acquired in a basic statistics course;
2. provide you with an understanding of data analysis applicable to economic problems;
3. provide you with the basics of econometric analysis focusing on the least squares methodology for single explanatory and multiple explanatory variables;
4. provide you with an understanding of the issues and pitfalls involved in testing theories;
5. expose you to the use of a computer package for analyzing data;
6. allow you to apply the techniques learned in the course to lab assignments;
7. make policy recommendations (private and public) based on econometric evidence.

1.2 Specific Objectives

Specific objectives are to instruct you in...

1. the formulation and specification of an empirical economic model;
2. data collection, interpretation, organization, and analysis for economics;

3. fundamental statistical and probability concepts used in econometric analysis;
4. the desirable properties of estimators;
5. the key Classical Assumptions of econometrics and their significance;
6. the principle of least squares analysis;
7. the properties of least squares estimators;
8. the interpretation of key statistics and diagnostics typically generated by software;
9. the effects of the violations of the Classical Assumptions;
10. the verification of the Classical Assumptions;
11. the correction of Classical Assumptions violations;
12. the identification of special situations such as endogeneity;
13. the existence of a "regression family" for a handling a host of real world problems including non-linearities;
14. extensions to the "regression family" to handle important special cases such as discrete choice problems;
15. the use of econometric software in a lab setting.

1.3 Departmental Objectives

The Economics Department has established its own department-wide objectives for Econometrics 322:

Students who successfully complete Econ 322 should be comfortable with basic statistics and probability. They should be able to use a statistical/econometric computer package to estimate an econometric model and be able to report the results of their work in a non-technical and literate manner. In particular a student who successfully completes Econ 322 will be able to estimate and interpret linear regression models and be able to distinguish between economic and statistical importance. They should be able to critique reported regression results in applied academic papers and interpret the results for someone who is not trained as an economist.

No matter which econometrics section you are in, the course material will be fundamentally the same.

1.4 Course Emphasis

Emphasis is on a combination of the mathematical development of econometric tools and their application to data. The applications are in lab sessions in which you will be instructed in using an econometrics computer package and asked to solve problems using that package. The problems consist of a combination of exercises to...

1. analyze data both graphically and statistically;
2. estimate equations and test assumptions of the estimates;
3. recommend policy;
4. manipulate features of the computer package.

1.5 At the End

At the end of the semester, you will be expected to...

1. address all the Leading Questions from Lecture 2;
2. manipulate features of a computer package;
3. interpret econometric software output;
4. identify problems with an estimated econometric model;
5. identify and apply fixes to an econometric model if a problem exists;
6. answer a major question about an estimated econometric model: *Does it make sense?*.

2 What the Course Is and Is Not

This is not a math or statistics course per se. It is an economics course. It is somewhat of a hands-on course in the sense that you will be given lab assignments and asked to do calculations.

3 Prerequisites and Background

Please note the following prerequisites...

3.1 Course

The prerequisites listed in the course description are...

1. 220:102 & 103
2. 640:135 & 960:21

3.2 Math/Statistics Requirement

Econometrics is a subset of statistics which is a subset of mathematics. Consequently, there is no way this course can be taught without the use of math. The math, however, is at the algebra level with the use of some elementary calculus. An Appendix in the textbook contains an excellent review of the essential math you will need for this course. Please review this material within the first week of the semester.

3.3 What You Should Know

Since econometrics is a subset of statistics, you should already understand the basics of statistical methods and theory including...

1. elementary probability theory;
2. elementary distributions such as the normal and t distributions;
3. hypothesis testing and confidence intervals.

Several Appendices in the textbook review the essential statistical material you will need for this course. Please plan to spend the first several weeks reviewing these Appendices.

3.4 Background Reviews

Ample review, however, is given so that you will not be disadvantaged if you do not have a good background in these topics. New topics usually not introduced in a one-semester statistics course are reviewed as necessary.

4 Textbook

The textbook is:

Principles of Econometrics
4th Edition
Hill et al.
Publisher: J. Wiley & Sons

The book should be available through the University bookstore.

4.1 Workbook

There is no workbook.

4.2 Book Notation

Please be aware that there are notation differences between my lectures and the book. You are expected to identify these and make the necessary translations. This is your responsibility.

4.3 Textbook Reading Assignments

You will be told the textbook reading assignments as we progress through the lectures. For the most part, we will cover as much of the textbook as possible. You are expected to read these assignments and be prepared for class discussions.

5 Lecture Notes Online

I am against putting lecture notes online. However, as a courtesy, notes will be made available on Sakai. The online notes are not meant to replace your responsibility to attend class and take notes.

6 Calculators

Since numerical calculations will be done in class, you will need a calculator with the usual functions. You can use a calculator for the exams, however, you will not get any credit (i.e., you will get a zero) for merely writing down an answer from the calculator. For any credit at all, you must show that you know how to do the problem, not that you know how to use a calculator. You will not be allowed to use a cellphone, smartphone, iPad, tablet, or any PDA that has a calculator. They do not have the functionality to do the required work.

7 Labs and Software

An important part of learning econometrics is applying it to a set of problems in a lab using an econometric software package.

7.1 Labs

There are approximately seven (7) lab sessions in which you will be asked to solve problems using an econometrics package. The lab sessions are designed to familiarize you with an econometrics software package so you can apply the techniques learned in the course to real data. You will be asked to...

1. enter data;
2. graph data and some key measures;
3. specify an econometric model with associated statistical hypotheses;

4. estimate an econometric model;
5. interpret various diagnostics;
6. determine if a statistical problem exists with the estimates;
7. apply appropriate corrections to estimated models;
8. write an interpretation of the results and answer several questions.

You are expected to write comprehensive answers to all questions. Simple one-word answers will not suffice.

7.2 Lab Manual

A comprehensive lab manual is available through Sakai.

7.3 Software

The software we will use this semester is GRETTL, which is freely available online at

<http://gretl.sourceforge.net/>

A list on the left side of that web page will direct you to the download area for your type of computer (PC or MAC). Download and install the software for your own use.

7.4 Software Tutorial

An excellent online (eBook) tutorial on GRETTL can be found at...

<http://www.learneconometrics.com/gretl/ebook.pdf>

The software will be demonstrated in class as part of the lectures. The lab manual also contains tutorials on how to use GRETTL.

8 Exams

There will be three (3) exams: two (2) hourly exams and a final.

8.1 Schedule

The final exam has a definite date and time. The hourly exam dates are APPROXIMATE.

8.1.1 Hourly Exam Schedule

The two hourly exams will be APPROXIMATELY...

Exam	Approximate Date
1	February 12
2	April 2

Do not plan to be away or miss class for any reason based on these APPROXIMATE dates since the actual dates depends heavily on how fast we cover material. There will be no make-up for a missed exam. No exceptions – No excuses. Please note the word APPROXIMATE.

8.1.2 Final Exam Schedule

The final is already scheduled by the University. Please refer to the following table for your section:

Section	Date	Time
03	May 9	4:00 - 7:00 PM

The University posts the final exam dates and times at...

<http://scheduling.rutgers.edu/springfinals.shtml>

It is your responsibility to verify the date and time.

8.2 Your Responsibility

Although the exam dates and times are listed in this syllabus, it is your responsibility to make sure that you know exactly when the exams will be given and that you are there for them. Verify the dates! Basically – do not cut class or miss any exam announcements. Also, do not plan to leave the University before the final exam period is officially over. If school is open, then it is your responsibility to be here.

8.3 Comprehensiveness

The three (3) exams are comprehensive and will focus on grand themes and issues. They are meant to synthesize the material. The two (2) hourly exams explicitly cover only the material in the reading assignments and covered in class since the last exam. In this sense, these two (2) exams are not cumulative. They are cumulative, however, in that you are expected to know and understand previously covered material and be able to handle new material. The material builds.

8.4 Cumulative Final

The final exam is cumulative.

8.5 Exam Content

All three (3) exams will consist of...

1. questions on...
 - concepts
 - definitions
 - formulas
2. derivations
3. calculations (you must bring your own calculator)
4. short explanations/interpretations.

8.6 Exam Grading

Your exam answers are graded on completeness (just having a key word does not suffice), relevancy to the question I asked (many students do not answer my question), and neatness (points are deducted if I cannot read an answer). Short ESSAY answers are required. Essays consist of whole sentences and paragraphs correctly worded and written. Anything else is a zero. In particular, essays consisting of bullet point lists will not be accepted. Points are deducted if the answers are not in acceptable essay form. In short, it's not only what you say, but also how you say it that counts.

8.7 Makeup Exams

There are no makeups for missed exams due to tardiness or being absent. No exceptions – No excuses. A make-up exam is allowed only after prior permission is granted to miss that exam or there is a note from the University and appropriate documentation (e.g., medical, court order). It is your responsibility to notify the University of a medical or personal problem (e.g., death in the family) resulting in a missed exam. Excuses are not accepted; only proper documentation will be accepted. A make-up exam is not necessarily the same as the regular exam. Obviously, a make-up is not given for the final.

9 Grades

All exams and the labs have points.

9.1 Points

The two (2) hourly exams typically have 70 points each while the final has 100 points (it's longer because it's cumulative). The labs are typically 20 points each.

9.2 Weights

Grades are determined on a points-earned basis with the following importance weights. . .

Exam 1	25%
Exam 2	25%
Final	35%
Labs	15%

9.3 Curves

A straight curve – **no other curve** – is used. . .

90% to 100%	A
88% to less than 90%	B+
80% to less than 88%	B
78% to less than 80%	C+
70% to less than 78%	C
60% to less than 70%	D
Less than 60%	F

10 Appeals

Students occasionally feel that a grade is too low. In such a case, an appeal consisting of one (1) double spaced, typed page plus a copy of the exam or paper with my comments on it may be submitted at any time up to and including the final exam, but not beyond.

10.1 Appeal Content

The appeal should contain an argument as to why a particular grade should be changed. Not all appeals are accepted. An appeal that says, for instance, ” *But I studied hard*” or “*I worked all semester and just got a C - I deserve better*” or “*You graded me unfairly*” is not acceptable.

10.2 Appeal Reviews

Appeals are reviewed only at the end of the semester and only when it is believed that a grade may be changed. Do not ask if I reviewed an appeal at any point in the semester - the answer is “No”. Appeals are only reviewed at the end of the semester in borderline cases.

10.3 Submitting Appeals

Appeals can be submitted anytime up to and including the time you submit your final exam. You cannot submit any more appeals once you submit the final exam.

11 Final Course Grades

Final course grades will be available in the usual way. I am not allowed to email any grade information.

12 Important Dates

Key dates for you to track are:

- Last Day for Undergraduates to Drop a Course Without a "W" will be Tuesday, January 28 (and there are no refunds after Jan. 28)
- Last Day for Undergraduates to Add a Course will be Wednesday, January 29
- Absolute last day to drop a course by withdrawal will be March 24. Traditional students **MUST** maintain a minimum load of 12 credits not including the course they are withdrawing from.

13 Departmental Major Requirement

The Economics Department adopted a change in the requirements for an economics major; students now **MUST** have a **C or better** in Econometrics 322 to complete the major.

14 Attendance Policy

Attendance is taken at the beginning of each class. The attendance sheet will be collected within 10 minutes of the beginning of class and you will not be allowed to sign it after that – so you need to be in class on time.

Students are expected to attend all classes. If you expect to miss one or two classes because of illness or a family emergency, please use the University absence reporting website <https://sims.rutgers.edu/ssra/> to indicate the date and reason for your absence. An email is automatically sent to me.

You must let me know at least one week ahead of time regarding a religious holiday conflict with an exam or an assignment.

14.1 General Rutgers Policies

University religious holiday policy is at...

<http://scheduling.rutgers.edu/religious.shtml>

An interfaith calendar can be found at...

<http://www.interfaithcalendar.org/index.htm>

University attendance policy is at...

<http://sasundergrad.rutgers.edu/academics/courses/registration-and-course-policies/attendance-and-cancellation-of-class>

15 Late Submissions

There is a very strict policy regarding late submissions.

15.1 Late Papers

Late papers will not be accepted under any circumstance; they receive an automatic zero.

15.2 Where to Submit Papers

All papers must be handed to me personally in class.

15.2.1 Leaving Papers

Papers placed in my mailbox, left on my desk, or shoved under my office door will not be accepted under any circumstance; they are automatic zeros.

15.2.2 Emailing Papers

Emailed papers will **NOT** be accepted under any circumstance; they are automatic zeros.

15.3 Exceptions

There are none.

16 Laptops and Recording Devices in Class

As a general policy, you will not be allowed to use a laptop or tablet computer in class or record the class lectures in any manner, shape or form. If you must have the lecture notes with you, please print them and bring them to class.

Please note: Laptops, tablet computers and recording devices are not allowed in class. No exceptions – No excuses.

17 University Code of Student Conduct Summary

A university in a free society must be devoted to the pursuit of truth and knowledge through reason and open communication among its members. Its rules should be conceived for the purpose of furthering and protecting the rights of all members of the university community in achieving these ends.

All members of the Rutgers University community are expected to behave in an ethical and moral fashion, respecting the human dignity of all members of the community and resisting behavior that may cause danger or harm to others through violence, theft, or bigotry. All members of the Rutgers University community are expected to adhere to the civil and criminal laws of the local community, state, and nation, and to regulations promulgated by the university. All members of the Rutgers University community are expected to observe established standards of scholarship and academic freedom by respecting the intellectual property of others and by honoring the right of all students to pursue their education in an environment free from harassment and intimidation.

17.1 Academic Integrity Policy Links

Here's the link for the academic integrity policy...

http://academicintegrity.rutgers.edu/files/documents/AI_Policy_9_01_2011.pdf

There are two classes of violations: separable and non-separable. Separable offenses are major offenses including cheating on an hourly or final exam. They are "separable" because a student risks suspension. Non-separable are minor offenses like cheating on a homework. Here is a link to the Office of Student Conduct website for more information:

<http://studentconduct.rutgers.edu/academic-integrity>

18 Departmental Learning Goals

The Economics Department has established Learning Goals for its undergraduate majors. These Goals are listed on the following page. Please pay especial attention to the *Economic Numeracy* goal.

Department of Economics
Rutgers, The State University of New Jersey
February 2008

Learning Goals for Economics Majors

Economic Literacy Students who complete the major in economics should understand and be able to articulate, both orally and in writing, the core economic principles, concepts and theories that form the foundation for modern economic analysis and economic research.

Economic Numeracy Students who complete the economics major should be familiar with the tools, techniques and methods of empirical economics. They should be able to analyze data using computer applications and should be familiar with regression methods and other statistical techniques. They should be able to read and assess general interest articles on economic topics. In addition, they should be able to understand and evaluate key findings in published economic research from a wide range of sources including academic economists, public policy think tanks, and government agencies.

Economic Citizenship Upon completion of the major students should be able to apply their understanding of core concepts and quantitative tools to analyze and research real world problems and evaluate alternative economic policy proposals on microeconomic and macroeconomic issues.

Economic Scholarship Qualified majors should have an opportunity through such avenues as advanced coursework, faculty interactions, national and local competitions and honors courses and programs to utilize up-to-date methodological tools and become fully engaged in economic research and issues on the frontiers of economics.