Econ 318(02): Introduction to Econometrics  
Autumn 2011

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Office hours Monday: 11:30-12:00. Thursday: 12:00-1:30 or by appointment.

Meetings  
The class will meet two times a week, Monday and Thursday 3:30-4:45 pm, room CP61 Waleed building.

Textbook  

Description of the course  
The course Introduction to Econometrics (Econ 318-02) is a course in introductory econometrics. It is offered by the economics department and designed to provide you with the theoretical tools and practical experience necessary to do some applied research. You should have some prerequisite in statistics and algebra for this course. We will review some essential background in probability and statistics in the classroom whenever it is necessary.

This course enables students to acquire the quantitative tools needed to make economic studies in business or the basic tools to check the validity of some theories in business and test some important hypothesis in their fields.

Accordingly, the focus is on implementation of some elementary statistical techniques in their applications. It will be useful, initially, to introduce many theoretical concepts in order to apply them in practical work. The course structure is described below.

You will be actively using Eviews econometrics software with computer exercises in this course, which will be available in the Lab Computers. It is also possible to purchase proper version of Eviews (see www.eviews.com). Throughout the course you will implement some Eviews routines to series of applied exercises. These exercises are designed to provide you with experience to run various tests and estimation procedures and to analyse various type of data and economic problems. Some of the data required for these implementations are provided to you regularly on the course site or directly emailed to you. In addition to these practical trainings, you will have to complete an applied econometrics project within a group of three or four students.

Evaluation  
Your grade in this course will be based on three components. There will be midterm exams and a final exam, each counting towards 25% of the course grade. The individual econometrics project counts towards 25% of your final grade. The remaining 25% of the grade is based on the econometrics lab exercises 15%, attendance, and participation 10%.

You should respect the deadline of each assignment. No assignment will be accepted after the deadline date. You may work on these exercises in teams of three or four students and submit
one set of results and answers for the group. Incomplete exercises will only receive lower credit. Working problems and doing the computer exercises are both essential to learn econometrics and to succeed on the exams.

**Instructions for assignments**

1. The students will form groups of three or four for the practical work.
2. Students cannot change group once the group is formed.
3. Any work submitted late will receive a score of zero. This note will be valid for all group members regardless of the reason for the delay.
4. Write the name of the group on the first page.
5. Staple all pages in the left corner.

**Instructions for Econometrics Project**

Throughout your training in economics, you have experience with theoretical and/or empirical relations among economic variables. With some data at hand, you can construct a model and run some regression analysis to estimate the parameters of interest. You can also use your regression model to perform statistical tests on these parameters, or to perform a forecasting exercise on assumed levels of the explanatory variables.

Your project is to construct an econometric model with a meaningful functional relation that is interesting to you. You should collect the relevant data, and estimate the. I can help you to avoid some problems related to the data and find ideas for your possible projects.

The most important part of the project is the estimation and testing using tools presented in the course. You should submit the relevant computer output with your paper.

The write-up your project, you should follow these steps:

- Overview of the research question and elaborate the hypotheses to be tested.
- Review of the literature in the subject.
- Link your work to the existing empirical work in the area
- Data used
- Justify the specification of your model
- Interpretation of estimation results; estimated outputs and summary results (diagnostic testing)
- Make your conclusions

The paper project is due on Monday, December 5. Be sure to include all supporting Eviews outputs and routines.

**Logistics**

Attending the course and paying attention to the details is very important. Most of the techniques are explained and interpreted in many similar but different ways in the classroom. Participation in the classroom will give extra points that will be added to your final score.

You must turn off your cell phone before stepping into the class. Otherwise, you will lose ½% of your score each time your cell rings during class. You have to come on time. If you are late for more than 7 minutes, please do not enter the classroom.

The department schedules the Exams to specific dates. These dates cannot be changed or be subject to negotiations. Grading system is as specified below; however, students who maintain a B average or above (including the project) may opt for accepting their grades as their final grades and do not take the final 2.
No medical excuses are valid except if they are from the AUC clinic and at most after 48 hours from the end of the illness. Only hospitalization reasons are accepted in exam dates. There is no tolerance for academic dishonesty (see a list of what could fall under academic violation and the actions taken at [www.aucegypt.edu/resources/acadintegrity/](http://www.aucegypt.edu/resources/acadintegrity/)).

**Grading system**
- A  > 92%
- A-  > 88%
- B+  > 84%
- B   > 80%
- B-  > 75% and so on.

**Course outline**

**Lecture 1: Introduction**
- Why econometrics is a very important field
- Econometric Methodology
- In Applied Economics: Determinants of wages and consumption etc...
- In Finance: CAPM model
- In Marketing: models of market shares

**Lecture 2: Matrix algebra**
- Use of matrices in econometrics
- Matrix operators
- Rank, determinant and inverse of a matrix
- The trace operator
- Projection matrices
- Extremum of a function

**Lecture 3: Statistical Background**
- Distinction between population and sample
- Variable(s) random(s): continuous or discrete
- Probability density
- Moments of a distribution
- Mode, median, range
- Linear independence of random variables
- The laws of statistical distribution
  - (a) Normal and standard normal.
  - (b) Chi-care
  - (c) Fisher
  - (d) Student

**Lecture 4-5: What is regression in econometrics**
- Variables and parameters
- Parametric versus nonparametric analysis
- Types of variables: Continuous, discrete, censored, stock variables and flow variables etc...
- data types and their origins
  (a) cross-sectional data
  (b) Time series
  (c) Panel

Lecture 6: The simple regression model (the error term)

Lecture 7: The multiple regression model

Lecture 8: Estimation by OLS

Lecture 9-10: Assumptions of the Classical Linear Regression Model and the Gauss-Markov Theorem
  (a) Unbiased estimator
  (b) Efficient estimator
  (c) Best Linear Unbiased Estimator (BLUE)

Lecture 11-12: Goodness of Fit and Test of Significance (ANOVA, T-stat, p-value...)

Lecture 14: Midterm Exam

Lecture 15: Confidence intervals

Lecture 16: Multiple testing: F-test

Lecture 17: Selection criteria of explanatory variables
  - Marginal Contribution of an Explanatory Variable
  - Statistical versus Economic Significance

Lecture 18: Forecasting

Lecture 19: Functional form and transformation of variables: linear, log, logistic etc...

Lecture 20: Elasticity and Log-Log transformation

Lecture 21: Nonlinear regression and nonlinear least square (NLS)

Lecture 22: Qualitative variables: dummy variables
  - Introduction: Examples of use
  - Interpretation of the qualitative variable (dummy)
  - Cross-media effects
  - Structural Change
    (a) Change of one parameter
    (b) Change of several parameters
(c) Change all the parameters

**Lecture 23**: Multiple regression: matrix form

**Lecture 24-25**: Structural equations model: Structural end reduced forms

**Lecture 26**: Tests of specification

**Final Exam**: Saturday, December 17 from 11:30 to 1:30