

# EC320 Econometrics

## (Fall 2019)

Seminar Leader: Israel Waichman  
Course Times: Tue 10:45-12:15 Thu 10:45-12:15  
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Office hours: Tue 13:00-14:00, Thu 13:00-14:00

### Course Description

Econometrics is the application of statistical methods to analyze economic data. Hence econometrics is essential to every branch of applied economics. In particular, econometrics methods are used to estimate economic relationships, test economic theories, and evaluate policies. The main objective of the course is to introduce students to basic econometrics techniques and to show them how to use these techniques to analyze empirical data. Another important objective is to develop the students' critical thinking about statistical inference (what can and cannot be inferred from the data). Finally, the course will enable students to apply their knowledge in analyzing field data. To this end, some of the classes are devoted to work with a statistical package. At the end of the course, students will have to demonstrate their econometrics skills by analyzing field data and presenting it to the class in a research workshop.

### Learning Outcomes

- Introduce students to the problem of causal inference
- Introduce students to basic econometrics techniques
- Show economics applications of econometrics analysis
- Enable students to conduct basic econometric analysis using Stata (or an equivalent statistical package)
- Devolve critical thinking about statistical inference

### Requirements

#### Prerequisites

Students taking this course should have already successfully completed the courses "Statistics," "Mathematics for economics," and "Principles of Economics."  
This course can be viewed as a follow up to the Statistics course.

#### Textbooks

For this course, we will use the following textbook:

- "Introduction to Econometrics" by James H. Stock and Mark W. Watson (updated third edition, Pearson Education Limited)

Another excellent reading (especially good to develop intuition is):

- "Mastering Metrics: The path from cause to effect" By Joshua D. Angrist and Jörn-Steffen Pischke (Princeton University Press)

Required readings are mostly from these two books (other editions of the Stock and Watson book may be used as well, but the course will refer to the edition specified here). There are other sources that will be discussed in class. In this respect, another excellent textbook is

- “A guide to econometrics” by Peter Kennedy (Wiley-Blackwell)

**It is essential that you will repeat at home the material that we cover in class** (including solving again all the exercises that we did in the classroom).

### Attendance

Attendance at ALL classes is expected. More than two absences (that is absences from two sessions of 90 minutes) in a semester will significantly affect the grade for the course.

### Use of cell/mobile phones

The use of cell phones is not allowed during the classes. Please leave your cell phone in your bag during the classes.

### Calculators

Please bring a simple scientific calculator to the classes. You may need these calculators for the classes and for the quizzes and exams (graphical calculators are not allowed in quizzes/exams). Please note that the use of a calculator in your smart phone is not allowed in this course.

### Computer requirements

The students will be required to bring their laptops to some of the classes.

### Assessment

Assessment will be based on attendance, preparation for classes, regular and active participation, handing in group problems sets, as well as a mid-term (60 minutes) which is planned to be conducted at the end of week 10 (TBA), and a final empirical work where students will have to apply what they have learned to analyze data.

## **Grade breakdown**

- Seminar participation, possible quizzes 20%
- Mid-term exam 30% (planned: at the end of week 10)
- Final empirical work 50% (20% presentation; 20% final written work; and 10% being a discussion or answering questions regarding other's pair study).

### Final empirical work

As part of the course each pair of students will conduct an independent (empirical) research project. The aim of the research project is to use field data to answer a well-defined research question. The research project requires the students to obtain and analyze a relevant data set (from an online source or to get the data, e.g., conduct a survey). The students will have to present their project in a research workshop to be held in the final 3 weeks of the semester (with a possible 3 hour session in the completion week) and also to write a final research paper.

Important dates:

- **Due date: 27.9.2019.** Find a research question, look for a data set. Should be confirmed by me by this date.
- **Due date: 25.10.2019.** First part of the paper: including introduction, motivation, research question, description of the data and apply simple sample statistics. About a four-page paper to be handed in by this date.
- **Start from week 11-12 (if required we will have a 3-hour session in completion week)** we will conduct a research workshop which will include 2-3 presentations of the project. Each pair will held a 20-minute presentation. This will be followed by a 5-10 minutes discussion (lead by the discussants).
- **Due date: 20.12.2019.** The final paper (consisting of the first part submitted in October, and on the presentation) should be submitted by this date.

#### Policy on Late Submission of empirical work

Please note the policy from the Student Handbook on the submission of essays: *essays that are up to 24 hours late will be downgraded one full grade (from B+ to C+, for example). Instructors are not obliged to accept essays that are more than 24 hours late. Where an instructor agrees to accept a late essay, it must be submitted within four days of the deadline and cannot receive a grade of higher than C. Thereafter, the student will receive a failing grade for the assignment.*

## Schedule and Course structure

Classes start on Tuesday Sep 3 and run until Thursday December 12, with fall break planned for Oct 28 – Nov 1. Completion week will take place on December 16–20. Note also that *classes missed due to federal holidays will not be rescheduled.*

The following course structure is provisional in order to allow for flexibility. It is the students' responsibility to keep themselves informed of any changes to the schedule provided here. An up-to-date schedule will be maintained by the course management in our Google classroom system. Lecture slides and problem sets will be posted in Google classroom. Please sign in for the course, password will be given in the first class.

In particular, a tentative schedule is as follows:

#### **Week 1:**

- Introduction: causal inference

#### **Weeks 2-4:**

- Review of probability
- Review of statistics
- Applications using Excel/Stata

#### **Weeks 5-6:**

- The simple linear regression model
- (i.e., estimation the coefficients, goodness of fit, least square assumptions, non linear transformations, etc.)

- Applications using Stata

**Week 7-8:**

- The multiple regression model (e.g., estimation and interpretations of the coefficients, goodness of fit, relaxing assumptions of the model: multicollinearity, heteroskedasticity, etc.)
- Applications using Stata

**Week 9-10:**

- Hypothesis tests and confidence intervals in a multiple regression.
- Applications using Stata

**Week 11:**

- Further topics (e.g., instrumental variables, etc.)

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