

# Introduction

## Your Teachers



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## Class Schedule

### *Lecture:*

Tuesday 3:10pm - 6:00pm

Wednesday 9:10am - 12:00pm

### *Practica:*

Friday 9:10am - 10am (Economics Groups A and B)

Friday 10:10am - 11:00am (Finance)

▶ [Google Calendar](#)

## Course Homepage

There is a course homepage with slides, handouts and additional readings:

- <http://www.schmidheiny.name/teaching/upf/econometrics/>  
(username: upf, password: )

Please send emails directly to

[kurt.schmidheiny@upf.edu](mailto:kurt.schmidheiny@upf.edu)

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and not through the intranet.

## **What this course is about**

- Basic micro-econometric tools
- Basic panel data tools
- Basic time series tools

## **Challenge of this course: Heterogeneity**

This is a large class with students from very different backgrounds and with very different goals.

## Heterogenous Backgrounds

Some of you ...

- ... have studied econometrics on a advanced level
- ... have never studied econometrics
  
- ... have strong formal training
- ... have weak formal training
  
- ... have performed sophisticated own empirical projects
- ... have never run a regression

## Heterogenous Goals

Some of you ...

- ... want to do empirical research in their PhD
- ... want to a purely theoretical PhD
  
- ... want to use quantitative analysis in their work
- ... want to become deciders
  
- ⇒ Some disappointment is inevitable.
- ⇒ We are positive that each of you will be challenged in some dimension.

## What you can expect from this course

- Applied Econometrics
- Critically read empirical research papers
- Do empirical research in your work or in your PhD
- Have a clear intuition about identification strategies
- A good preparation for the follow-up econometrics courses

## What you cannot expect from this course

- This course is *not* an introduction to *theoretical econometrics*  
⇒ You will not be able to develop new econometric methods.
- This course is *not* an introduction to a *statistical software*  
⇒ We will not show you how to click on sophisticated econometric methods which you don't understand.

## Part I: Microeconometrics (40 hours)

1. Causal effects and the logic of randomized experiments
2. Linear regression:
  - estimation
  - small and large sample properties
  - hypothesis testing
  - omitted and irrelevant variables
  - functional form
  - heteroscedasticity
  - clustering

#### 4. Instrumental variable estimation:

- estimation
- identification
- weak instruments

#### 5. Panel data:

- fixed effects
- random effects

#### 6. Maximum likelihood estimation

#### 7. Binary choice: probit and logit

Module 1: Monte Carlo simulation

Module 2: The bootstrap

## Part II: Time Series Econometrics (20 hours)

1. Stationary and Non-stationary Processes
2. Autoregressive and Moving Average Processes
3. Likelihood Methods for ARMA Processes: Estimation, Asymptotics and Hypothesis Testing
4. Vector Autoregressions: Definition, Impulse response functions, Variance decompositions and Estimation
5. Generalized Method of Moments

## Level of the course

The level of this course is *between introductory and advanced* textbooks.

It is introductory concerning ...

- ... its topics
- ... its mathematical rigor (most of the times)

It is advanced concerning ...

- ... matrix notation
- ... its mathematical rigor (in some few cases)

It is almost perfectly the level of Greene (2007), *Econometric Analysis*, Pearson. A textbook that we do NOT recommend.

## Introductory textbooks

- ▶ Stock, James H. and Mark W. Watson (2007)  
Introduction to Econometrics, 2nd ed.  
Pearson Addison-Wesley
- ▶ Wooldridge, Jeffrey M. (2009)  
Econometrics: A Modern Approach, 4th ed.  
South-Western Cengage Learning
- ▶ Harvey, Andrew C. (1993)  
Time Series Models, 2nd ed.  
MIT Press

## Advanced textbooks (Microeconometrics)

- ▶ Cameron, A. Colin and Pravin K. Trivedi (2005)  
Microeconometrics: Methods and Applications  
Cambridge University Press
- ▶ Davidson, Russell and James G. MacKinnon (2004)  
Econometric Theory and Methods  
Oxford University Press
- ▶ Hayashi, Fumio (2000)  
Econometrics  
Princeton University Press
- ▶ Wooldridge, Jeffrey M. (2002)  
Econometric Analysis of Cross Section and Panel Data  
MIT Press

## Advanced textbooks (Time Series)

- ▶ Enders, Walter (2003)  
Applied Econometric Time Series  
Wiley.
- ▶ Hamilton, James (1994)  
Time Series Analysis  
Princeton University Press.

## Companion textbooks

- ▶ Angrist, Joshua D. and Jörn-Steffen Pischke (2009)  
Mostly Harmless Econometrics: An Empiricist's  
Companion  
Princeton University Press
- ▶ Kennedy, Peter (2008)  
A Guide to Econometrics, 6th ed.  
Blackwell Publishing

## Handouts

There are handouts for all topics of the course.

These handouts are ...

... very brief

... not self-contained

... intended to be a useful companion for your life after this course

⇒ You will *absolutely need* to work with one or more textbooks

## Statistical Software

- I will use *STATA 11*
- There is a "A Quick Guide to Stata for Windows" on the course homepage
- Stata 10 is available in the LEEX computer lab
- Older versions are available in the other computer labs

Two alternatives:

- Use another statistical package. Please check with us if it covers all methods we use. For example, *R* yes, *SPSS* no
- Program all econometric methods in a matrix algebra language. We will support you using *Matlab* or *Stata Mata*.

## Problem Sets

There will be 9 problem sets.

- They will be graded
- You may work in groups
- Hand-in individually
- They will be discussed with your TA in the "practica" class
- There will not be solutions
- They count for 25% of the final grade

## Practica

There is a weekly 1 hour practica class.

There are three groups: 1 MSc Finance, 2 MSc Economics

Problem Sets will typically be distributed on Wednesday, are due for Tuesday next week at 3pm and will be discussed the following Friday.

Your TAs:

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*Bruno Caprettini*

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## Exam

There will be a written final exam in December

- Counts for 75% of final grade
- Some theoretical questions
- Many applied questions: interpretation of Stata output