

Empirical Methods for Applied Analysis: Introduction

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Class Schedule

Lecture:

Monday 3:10pm - 5:00pm (23.S05)

Thursday 11.10am - 12:00pm (23.S05)

Práctica:

Thursday 12.10pm - 1:00pm (23.S05)

► [Google Calendar](#)

Your Teacher



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Course Homepage

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

<http://kurt.schmidheiny.name/teaching/bgse/empiricalmethods/>
(username: bgse, password:)

Please send emails directly to

kurt.schmidheiny@upf.edu

and not through the intranet.

About this course

Most widely used econometric tools:

OLS, IV, 2SLS, FE, RE, Probit/Logit

- What is it?
- How are they used?
- When can they be used?
- When can they not be used?
- What can go wrong?

This course is serious

Estimation is now often just a simple click away.

- Challenge is to use the right tools
- and interpret them correctly

This course enables you to ...

- judge existing research results
- perform your own research projects

This course is applied

This is not a course in theoretical econometrics

- Hands on real world data
- Hands on professional software
- Hands on relevant questions
- Hands on relevant answers

I.e.

- Hands off (most) mathematical proofs

This course deals with observational data

This course deals with Data which is non-experimental, i.e. not from experiments

- Data from surveys, public records, accounting, ...
- Traditional approach of econometrics
- Prevailing in empirical literature
- Widely used in current research

But experiments become more and more important.

Your other empirical course

"Designing and Evaluating Development Programs"

2nd Term 2011, by Ghazala Azmat (UPF)

- Methods to evaluate (development) programs
- Question driven: education, health, fertility, labor markets
- Design of study: experiment vs. observational data
- Designing experiments
- Advanced data analysis when no experiments are available or possible
- Policy lessons from published research
- Original research articles

The two courses are complementary.

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

Challenge of this course: Heterogeneity

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

Heterogenous Goals

Some of you ...

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

Outline of the Course

1. Causal effects and the logic of randomized experiments
2. Linear regression: Estimation, small and large sample properties, hypothesis testing, omitted variable bias, model selection, functional form, heteroscedasticity, autocorrelation, clustering
3. Instrumental variable estimation: Estimation, identification, weak instruments
4. Panel data: Fixed effects, random effects
5. Maximum likelihood estimation
6. Binary choice: Probit and logit

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

Level of the course

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

It is introductory concerning ...

- ... most of its topics
- ... its mathematical rigor (limited use of matrices)

It is advanced concerning ...

- ... some of its topics
- ... its mathematical rigor (we do use math)
- ... the applications

It is slightly below the level of Greene (2007), *Econometric Analysis*, Pearson. A textbook that I do NOT recommend.

Advanced textbooks (Microeconometrics)

- ▶ Cameron, A. Colin and Pravin K. Trivedi (2005)
Microeconometrics: Methods and Applications
Cambridge University Press
- ▶ Wooldridge, Jeffrey M. (2002)
Econometric Analysis of Cross Section and Panel Data
MIT 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

Statistical Software

- I will use **STATA 11**
- I assume you are familiar with Stata
- 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 me 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**.

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
- ... some handouts will come in two versions: with use of matrices and light on use of matrices

Problem Sets

There will be 7 or 8 problem sets.

- They will be graded
- They will be discussed in the "práctica" class
- They count for 25% of the final grade

Some rules:

- You may work in groups
- Hand-in **individually**
- Hand-in **printed**, do not send by email
- Not more than **4 pages A4!**
Deciding what is important is part of the exercise

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