Barcelona GSE
Kurt Schmidheiny

Empirical Methods for Applied Analysis: Introduction

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Your Teacher

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Class Schedue

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

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 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 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 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.

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 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

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.

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

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

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

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*.

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 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