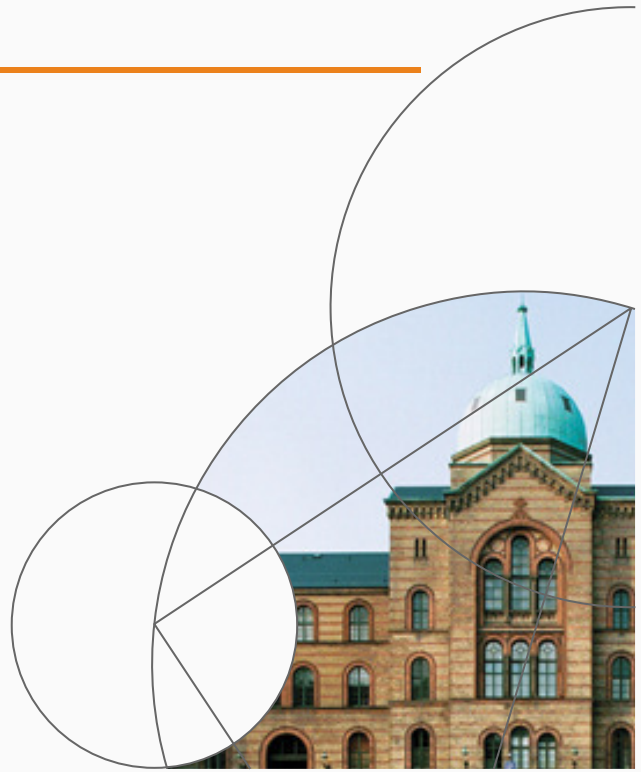
Course Introduction

Advanced Microeconometrics

Anders Munk-Nielsen

2022



Practical info

Practical information

- **Lecturers:** Theory, background, intuition
  - Anders Munk-Nielsen (me)
  - Jesper Riis-Vestergaard Sørensen
- **"Office" hours:** Fridays until 14.00 until 11.00 with Anders in 25.0.10.
  - Please email in advance or follow from the lecture.
- **Exercise classes:** Hands-on experience with real data and *Python*.
  - Instructor: Sophie Caroline Köppe Bindslev
- **Projects:** 3 major hand-ins
  - **Groups:** highly suggested – coding alone is tough
  - **Peer-feedback:** can be used to improve project
- **Exam:** Portfolio
  - 48 hour take-home with new data
  - 1 of the 3 projects is selected randomly for assessment

Lecturers

	Anders	**Jesper**
Research	Cars and drugs	Econometric theory
PhD from	Sunny Copenhagen	Rainy Los Angeles
Strength	Talks fast	Very smart
Spirit animal	Mantis Shrimp	Pomeranian
Music for coding	Viking death metal	K-pop
Callsign	Munken	Mr. Dish
Favourite sport	Wheelchair rugby	Formula 1
Specialty	Coffee roasting	People roasting

Projects

- **3 major hand-ins**
- **New dataset**
- **Contents:** Theoretical questions, estimation tasks, some more open-ended "real" questions
  - Similar to exercise problem sets...
- **Groups:** we suggest 2–3 people
  - E.g. form during first ex. classes
  - Those without a group: come talk at lecture 16 Sept. and get matched!
  - **Important:** coding alone is unnecessarily hard!
- **Peer-feedback:** can be used to improve project

Peer feedback

- **Proven**, successful tool for learning
  - Reading/listening: 5-20% retention
  - Practical use: 25-75%
  - Teaching others: 75-90%
- Learn to **reverse-engineer the grading process**
  - Going from student to teacher gives an "aha" moment...
  - ... learn to think like your thesis censor will!
- Learn **critical thinking**
  - Students blindly accept teacher feedback
  - ... with peer feedback, you guys are super critical and engage in discussion! $\Rightarrow$ learning!
- Giving and receiving feedback is a **general life skill**
  - Demanding: for us and for you
  - Relevant for your future (both thesis and work)

The Projects

- **Research question:** General formulation, more than one way of approaching it...
  - ... but not very many given the models you encounter.
  - Important learning objective: How to structure an empirical project.
    - Finding vs. following a path.
- **Typically,** many doubt their chosen approach.
  - Yet most end up doing the same thing.
- **Limited lecturer feedback** $\Rightarrow$ we can "give points" for more stuff at the exam.

  \+ *you* are choosing the path $\Rightarrow$ ownership + credit + independence.
- **Feedback:** Benefit 50% from giving and receiving! (don't over-do it)

Expectation Management

- **Preparation — lectures:**
  - Expected: read the assigned chapter,
  - Bare minimum: suggested minimal reading.
- **Preparation — exercises:**
  - Expected: read problem set + begin work on code,
  - Bare minimum: read problem set.
  - **Practice** for the problem sets – invest the time!

Course Contents

- **Part I:** linear models
- **Part II:** high-dimensional models
- **Part III:** M-estimation
- **Part IV:** non-linear models

Part I: linear models

- **Part I:** linear models
  - Estimation with / without panel data
  - More rigorous formulation
  - Frame of reference for non-linear methods
- **Part II:** high-dimensional models
- **Part III:** M-estimation
- **Part IV:** non-linear models

Part II: High-dimensional Models

- **Part I:** linear models
- **Part II:** high-dimensional models
  - Introduction to high-dimensional statistics
  - LASSO
- **Part III:** M-estimation
- **Part IV:** non-linear models

Part III: Estimation methods

- **Part I:** linear models
- **Part II:** high-dimensional models
- **Part III:** M-estimation methods
  - Numerical optimization
  - Inference with M-estimators
- **Part IV:** non-linear models

Part IV: Non-linear models

- **Part I:** linear models
- **Part II:** high-dimensional models
- **Part III:** M-estimation
- **Part IV:** non-linear models
  - Probit
  - Tobit
  - Logit
  - Likelihood for panel data (SML)
  - Quantile regression
  - Non-parametric methods

Symbolically

- **Part I:** $y_{it} = \mathbf{x}_{it}\beta + c_i + u_{it}$
- **Part II:** $y_i = \mathbf{x}_i\beta + u_{it}$, $\dim(\beta) \to \infty$ (!!)
- **Part III:** $\hat{\theta} = \arg\min_\theta N^{-1} \sum_{i=1}^{N} q_i(\theta)$
- **Part IV:** $y_i = g(\mathbf{x}_i\beta, u_{it})$

An overview of the *ion canon

Part	Topic	Parameterization non-linear	Estimation non-linear	Dimension	Numerical optimization	M-estimation (Part III)	Outcome (y_i)	Panel (c_i)
I	OLS	÷	÷	low	÷	✓	$\mathbb{R}$	✓
II	LASSO	÷	✓	high	✓	÷	$\mathbb{R}$	÷
IV	Probit	✓	✓	low	✓	✓	$\{0, 1\}$	÷
	Tobit	✓	✓	low	✓	✓	$[0; \infty)$	÷
	Logit	✓	✓	low	✓	✓	$\{1, 2, ..., J\}$	÷
	Sample selection	✓	✓	low	✓	✓	$\mathbb{R}$ and $\{0, 1\}$	÷
	Simulated Likelihood	✓	✓	low	✓	✓	Any	✓
	Quantile Regression	÷	✓	(low)	✓	✓	$\mathbb{R}$	÷
	Non-parametric	✓	(✓)	∞	÷	÷	$\mathbb{R}$	÷

Curriculum


Jeffrey Wooldridge svarede
Elise M. Kolenda @econwitheli... · 2 t.
What song always makes you cry?
Me~ Fallin' by Alicia Keys
1
2
Jeffrey Wooldridge @jmwoold... · 1 t.
The River — Springsteen
1
4