

ECON4136 – Provisional Lecture Plan

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November 12, 2012

Course content

This course introduces core microeconomic methods and the principles of causal inference. We will cover instrumental variables, elementary panel data models, and limited dependent variable models. Causal inference and program evaluation methods will cover both experimental and quasi-experimental approaches.

The emphasis will be on developing a solid understanding of the underlying econometric principles of the methods taught, as well as on their empirical application.

Students will also be introduced to statistical computing with Stata, a statistical package for data analysis, data management, and graphics

Learning outcomes

Knowledge outcomes:

The course develops knowledge of both the formal and practical aspects of important microeconomic methods. The successful student will be able to understand when to apply a method, how to apply this method and the method's limitations. This also covers model specification and being able to correctly interpret estimation results. Mastering the course's content will allow students to understand much of the applied microeconomic literature, and to perform basic econometric analyses themselves.

Skills:

Basic skills in using Stata in performing various analyses on economic data will be developed through exercises and examples in the textbook. Students are supposed to be able to interpret Stata output.

Literature

Jeffrey M. Wooldridge, *Econometric Analysis of Cross Section and Panel Data*, 2nd Edition.
Chapters 4, 5, 10, 13, 15, 16, 17, 20, 21

+ Handouts

Prerequisites

Econ 4150 or equivalent. Statistics 2 or equivalent recommended.

Exam

A 3-hour written school exam.

Exam resources

Open-book exam, where all written and printed resources are allowed. A calculator is recommended.

Lectures

Lecture 1 — Ordinary Least Squares

4.1 Overview of the Single-Equation Linear Model 53

4.2 Asymptotic Properties of Ordinary Least Squares 55

4.3 Ordinary Least Squares Solutions to the Omitted Variables Problem 65

4.4 Properties of Ordinary Least Squares under Measurement Error 76

Lecture 2-3 — Instrumental Variables

5.1 Instrumental Variables and Two-Stage Least Squares 89

5.2 General Treatment of Two-Stage Least Squares 98

5.3 IV Solutions to the Omitted Variables and Measurement Error Problems 112

6.1 Estimation with Generated Regressors and Instruments 123

6.2 Control Function Approach to Endogeneity 126

6.3.1-6.3.2. Some specification tests 129

21.4 Instrumental Variables Methods 937

Lecture 4 — Basic Panel Data Models

- 10.1 Motivation: Omitted Variables Problem 281
- 10.2 Assumptions about the Unobserved Effects and Explanatory Variables 285
- 10.3 Estimating Unobserved Effects Models by Pooled Ordinary Least Squares 291
- 10.4 Random Effects Methods 292
- 10.5 Fixed Effects Methods 300
- 10.6 First Differencing Methods 315
- 10.7 Comparison of Estimators 321
- Problems 334

Lecture 5 — Experiments

- 21.1 Introduction 903
- 21.2 A Counterfactual Setting and the Self-Selection Problem 904

Lecture 6/7 — Maximum Likelihood

Handout Tore Schweder (to be published on the ECON4136 webpage)

Lecture 8 — Binary Response Models

- 15.1 Introduction 561
- 15.2 Linear Probability Model for Binary Response 562
- 15.3 Index Models for Binary Response: Probit and Logit 565
- 15.4 Maximum Likelihood Estimation of Binary Response Index Models 567
- 15.5 Testing in Binary Response Index Models 569
- 15.6 Reporting the Results for Probit and Logit 573

Lecture 9 — Multinomial and Ordered Response Models

- 16.1 Introduction 643
- 16.2.1-2 Multinomial Response Models 643
- 16.3.1-2 Ordered Response Models 655
- Problems 663

Lecture 10 — Censoring & Truncation

17.1 Motivation and Examples 667

17.2 Useful Expressions for Type I Tobit 671

17.3 Estimation and Inference with the Type I Tobit Model 676

17.4 Reporting the Results 677

19.1 Introduction

19.2.1 Binary censoring

19.3 Overview of sample selection

19.4.1 When can sample selection be ignored? Linear models

19.6 Incidental truncation

Lecture 11 — Matching Methods

21.3 Methods Assuming Ignorability (or Unconfoundedness) of Treatment 908

Lecture 13 — Difference-in-Differences

6.5 Pooled Cross Sections and Difference-in-Differences Estimation 146

Lecture 12 — Regression Discontinuity Design

21.5 Regression Discontinuity Designs 954