

Applied Microeconometrics
Chapter 1

Introduction

Definition of microeconometrics

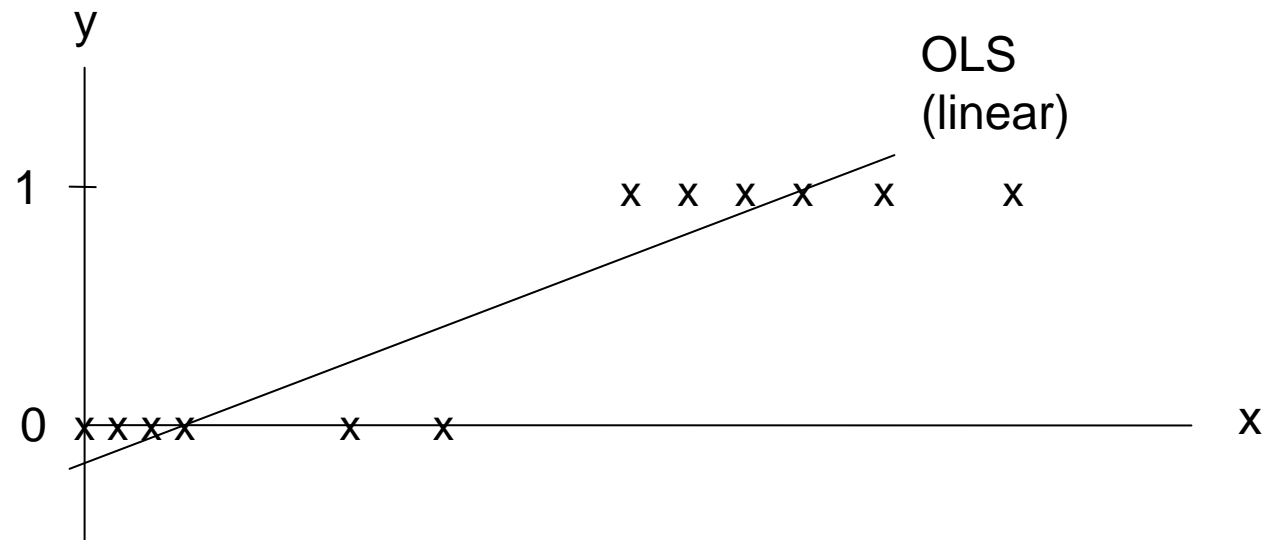
- Econometric analysis of individual-level (disaggregate) data ...
 - firms / establishments
 - households / individuals
- ... although many techniques of microeconometrics can also be applied with grouped data
- Microeconometrics is used to estimate relations derived from hypotheses on individual behaviour

Definition of microeconometrics

- Individual decisions are inherently discrete, while the corresponding aggregates are smooth
 - choices may be discrete (e.g., modes of transport)
 - in a given observation period, the individual may not participate in the activity
 - observed variables have limited ranges of variation
 - examples: labour supply, consumer demand for particular goods
- Hence, individual-level data often imply a deviation from linearity

Example: the voting decision

- Choice variable: voting yes-no $y \in \{0,1\}$
- Explanatory variable: household income $x \in \mathbb{R}^+$



- Nonlinear estimation (e.g. by maximum likelihood) is more appropriate than OLS

Advantages of microeconometrics

- **Greater information content**
 - A typical survey contains information on 1000's of households
 - Compare this to the typical time series with 40-50 data points: inference will be much more robust
 - But high information content means that individual-level data exhibit a large degree of variation
 - They require an appropriate way to deal with individual heterogeneity
- **Lack of aggregation bias**

Some reasons for aggregation bias

- In the example of product demand, not all goods are bought by all consumers
- Estimating a demand model on aggregate data implies the assumption of a “representative consumer” buying some of all goods
- In this context, price or income elasticities estimated from aggregate data correspond to fundamental microeconomic parameters only under very stringent assumptions
- Similar example: wage elasticity of labour supply

Course outline

1. Introduction
2. Models with binary dependent variables
3. Ordered and multinomial models
4. Models with limited dependent variables
5. Selectivity models
6. Programme evaluation
7. *Duration models*
8. *Panel data models*

Main textbooks:

Cameron, A.C. and Trivedi, P.K. (2005). *Microeconometrics: Methods and Applications*, Cambridge University Press.

Wooldridge, J.M. (2002). *Econometric Analysis of Cross Sectional and Panel Data*, MIT Press.

Still useful:

Ronning, G. (1991), *Mikroökonomie*, Springer Verlag.

Maddala, G.S. (1983), *Limited-dependent and Qualitative Variables*, Cambridge University Press

Some general econometrics textbooks contain chapters on microeconomic techniques, such as

Greene, W.H. (2008), *Econometric Analysis*, 6th edition, Prentice Hall.

Specific references will be provided in each chapter

Common sources for microeconomic data

- Survey data

household panels (e.g. SOEP)

firm or establishment surveys (e.g., IAB-Betriebspanel)

- Census data

e.g., Mikrozensus, US Population Census

- Administrative data

public use files, scientific use files, e.g. Beschäftigtenstichprobe des IAB (IABS)

non-anonymised data (e.g. Beschäftigtenstatistik)

Types of data used for microeconometrics

- **Cross-sectional data**

Individuals are sampled once at a particular point of time t_1

- **Repeated cross-sections**

Sampling is repeated over several points of time t_1, t_2, \dots , but different units are sampled each time

- **Longitudinal data**

Sampling occurs once at time t_1 and the same units are interviewed at subsequent points of time t_2, t_3, \dots

Main advantages of longitudinal data: (1) unobserved heterogeneity may be accounted for (2) they allow for the estimation of dynamic relationships

Some common problems with microeconomic data

- **Biased sampling**
 - Response-based sampling (e.g., interview among commuters using conducted on the train)
 - Survey non-response
 - Sample attrition
 - Length bias (short durations are under-sampled)
- **Missing data or mismeasurement**
 - Item non-response
 - Imperfect recall, deliberate misreporting, misinterpretation of questionnaire, carelessness ...