1. Introduction

ECON8011 Microeconometrics

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Introduction

- This course provides a detailed treatment of microeconometric analysis, the analysis of individual-level data on the economic behavior of individuals or firms.
- Usually regression methods will be applied to cross-section or panel data.
- The data are often discrete or censored, in which case nonlinear methods such as logit, probit, and Tobit models are used. This leads to statistical inference based on more difficult asymptotic theory.
- Distributional assumptions for such data become critically important. One response is to develop highly parametric models that are sufficiently detailed to capture the complexities of data, but these models can be challenging to estimate.

- Economic studies often aim to determine causation rather than merely measure correlation, despite access to observational rather than experimental data. This leads to methods to isolate causation such as instrumental variables, simultaneous equations, measurement error correction, selection bias correction, panel data fixed effects, and differences-in-differences.

- Microeconomic data are typically collected using cross-section and panel surveys, censuses, or social experiments. Survey data collected using these methods are subject to problems of complex survey methodology, departures from simple ran- dom sampling assumptions, and problems of sample selection, measurement errors, and incomplete, and/or missing data.

Aspects of Microeconometrics

- Discreteness and Nonlinearity
- Greater Realism and Information
- Microeconomic Foundations
- Disaggregation and Heterogeneity

Discreteness and Nonlinearity

- Microeconometric data are usually at a low level of aggregation.
- Disaggregation brings to the forefront heterogeneity of individuals, firms, and organizations that should be properly controlled.
- Linear functional forms turn out to be simply inappropriate.
- Usually individual and firmlevel data cover a huge range of variation, both in the cross section and time series dimensions.
- Limited dependent variables.

Greater Realism and Information

- Macroeconometrics is sometimes based on strong assumptions; the representative agent assumption is a leading example.
- Quantitative analysis founded on microdata may be regarded as more realistic than that based on aggregated data.
- Microeconometric data are often derived from household or firm surveys, typically encompassing a wide range of behavior, with many of the behavioral outcomes taking the form of discrete or categorical responses.
- Independent observations on thousands of cross-sectional units.

Microeconomic Foundations

- Structural approach $\rightarrow$ dependence on economic theory and emphasis on causal inference.
- Microdata sets provide a more promising environment for the structural approach, essentially because they permit greater flexibility in model specification.
- Endogeneity and Exogeneity

Disaggregation and Heterogeneity

- It is sometimes said that many problems and issues of macroeconometrics arise from serial correlation of macro time series, and those of microeconometrics arise from heteroskedasticity of individual-level data.
- As the data become more disaggregated the importance of controlling for interindividual heterogeneity increases.
- Many variables that reflect interindividual heterogeneity, such as gender, race, educational background, and social and demographic factors, are directly observed and hence can be controlled for.
- In contrast, differences in individual motivation, ability, intelligence, and so forth are either not observed or, at best, imperfectly observed.

- The simplest response is to ignore such heterogeneity, that is, to absorb it into the regression disturbance. $\rightarrow$ increases the unexplained part of the variation.
- One approach for handling heterogeneity is to treat it as a fixed effect and to estimate it as a coefficient of an individual specific 0/1 dummy variable.
- A second approach to modeling unobserved heterogeneity is through a random effects model that assumes assumes that one or more regression parameters, often just the regression intercept, varies randomly across the cross section.

- Observational Data
- Experimental Data

Observational Data

- Survey Data
- Simple Random Samples
- Multistage Surveys
- Biased Samples
- Bias due to sample Selection

Types of Observational Data

- Cross-section data
- Repeated cross-section data
- Panel or longitudinal data

Experimental Data

- Observational and experimental data are distinct because an experimental environment can in principle be closely monitored and controlled.
- This makes it possible to vary a causal variable of interest, holding other covariates at controlled settings.
- Social Experiments vs. Natural experiments

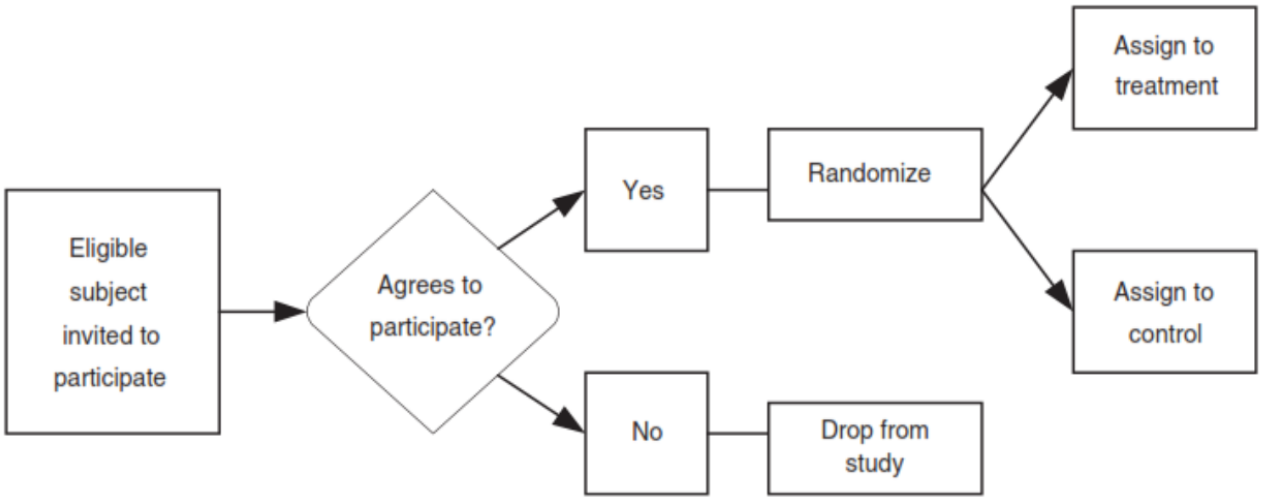
Social Experiments

- In social sciences, data analogous to experimental data come from either social experiments, obtained from "laboratory" experiments on small groups of voluntary participants that mimic the behavior of economic agents in the real-life counterpart of the experiment.

- The central feature of the experimental methodology involves a comparison between the outcomes of the randomly selected experimental group that is subjected to a **treatment** with those of a **control** group.

Features of Social Experiments

- Random assignment
- Randomized trials



Natural Experiments

- A natural experiment occurs when a subset of the population is subjected to an exogenous variation in a variable, perhaps as a result of a policy shift, that would ordinarily be subject to endogenous variation.
- Suppose that there is an exogenous intervention that changes x. Examples of such external intervention are administrative rules, unanticipated legislation, natural events such as twin births, weather-related shocks, and geographical variation.
- Difference-in-differences

Turkish Micro Data

- TURKSTAT has two types of micro data, Type A and Type B.
- Type A: dataset which is allowed to access to the Data Research Centers (VAM) in the buildings of the TURKSTAT Presidency in Ankara and in the offices of Istanbul, Ärzmir, Adana, Antalya, Gaziantep, Van, Erzurum and Zonguldak Regional Offices but not allowed to go outside.
- Type B: No limitation in access.

TURKSTAT TYPE B MICRO DATA

- Hanehalki Isgucu Arastirmasi (2000-2021)
- Hanehalki Butce Arastirmasi (1994, 2002-2019)
- Hanehalki Bilisim Teknolojileri Kullanimi (2004-2022)
- Zaman Kullanimi Arastirmasi (2006, 2014-2015)
- Gelir ve Yasam Kosullari Arastirmasi (Kesit:2006-2021) (Panel:2006-2021)
- Yasam Memnuniyeti Arastirmasi (2003-2018-2021)
- Kazanc Yapisi Arastirmasi (2006, 2010, 2014, 2018)
- Kuresel Yetiskin Tutun Arastirmasi (2008, 2012)
- Turkiye Saglik Arastirmasi (2008, 2010, 2012, 2014, 2016, 2019)

- Genel Nufus Sayimi (Yuzde 5 Orneklem) (1985, 1990, 2000)
- Saglik Hizmetleri Memnuniyet Arastirmasi (2006)
- Aile Yapisi Arastirmasi (2006, 2016)
- Turkiye Ozurluler Arastirmasi (2002)
- Ozurlulerin Sorun ve Beklentileri Arastirmasi (2010)
- Calisan Cocuklar Arastirmasi (2012,2019)
- Turkiye'de Kadina Yonelik Aile Ici Siddet Arastirmasi (2008,2014)
- Girisimlerde Mesleki Egitim Arastirmasi Mikro Veri Seti (2010)
- Yetiskin Egitimi Arastirmasi Mikro Veri Seti (2007, 2012, 2016)