

ECONOMETRICS

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Course Material Developed by Department of Economics,
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Week 1

Introduction

Content

- Subject and methods of econometrics
- Examples
- Relationship with other disciplines
- Course material, examination
- Eviews software

Econometrics

- Application of statistical methods in the analysis of economic data
 - 1930: Econometric Society
- Four steps of econometric analysis
 - Economic model → empirically testable model
 - Data collection (cleaning and transformation of data)
 - Estimation of the model and its verification on observed data
 - Forecasting, decision support

Research questions in econometrics

Searching for causal relationships Ex. 1, 2

More than the statistics discipline

correlation \neq causal relationship

There may be a common unobservable cause in the background

Thought experiment

Natural experiment vs. Non-experimental situation

Forecasting. **Example**

A causal relationship is not necessarily searched

Impact analysis, decision support. **Example**

Data

Cross-sectional data

Aggregate data, e.g. data for different countries in a given year

Individual level data (microdata), e.g.

Labour force survey of Hungarian Statistical Office (economic activity, employment)

Wage survey of National Employment Office (wages)

Household budget survey of the Hungarian Statistical Office (consumption, income)

Administrative databases (NAV, ONYF, OEP)

Time series (e.g. evolution of macrodata in time)

Panel: cross section and time series as well

(country panel, panel from microdata)

Example I. minimum wage and unemployment

Standard model: employment is reduced by increasing the minimum wage

But e.g. Card and Krueger (1994)

Time series: the trend of employment growth was reduced after the minwage increase

Causal relationship?

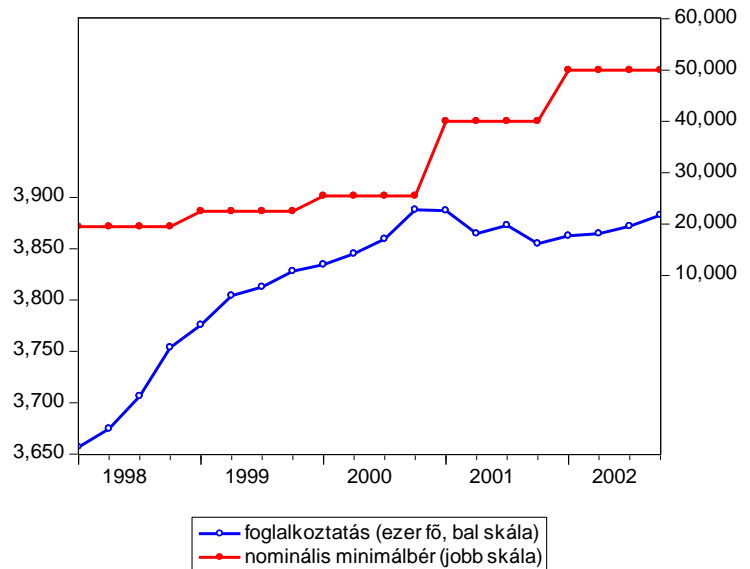
Meanwhile:

Decreasing external demand,

Stronger real exchange rate

individual / company level wage / employment data are needed

More data, personal characteristics, easier identification



Example II.

do more policemen reduce crime?

Thought experiment: two identical towns, more policemen in one of them. Is the crime rate smaller there?

Problem: endogeneity (or simultaneity)

A simple regression is not enough, there may be a reverse relationship: more policemen if the crime rate is higher

Possible exogenous shock (natural experiment)

More policemen in election years → is the crime rate lower?

see Levitt (1997)

but: common sense and a knowledge of institutional details is always important!

Other example for endogeneity: effect of education

on wages

Example III. forecasting stock prices

Can tomorrow's stock price be predicted by today's one?

Approximately a random walk

A Random Walk Down

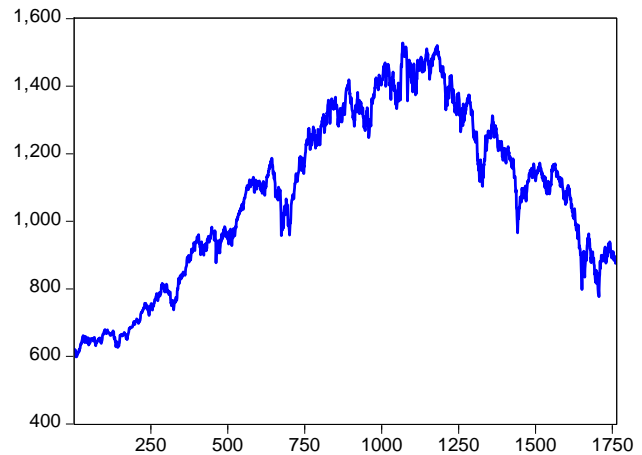
Wall Street

Can the forecast be improved by using other information?

Is the volatility predictable?

Not necessarily a structural model, a purely statistical description is useful

But be careful with them during a crisis!



Example IV. working hours and marginal tax rates

Marginal tax rate

By how much is the tax increasing when the gross income is increasing by 1 unit?

Quite high in Hungary

Questions

Does it reduce labour supply?

To what extent does the marginal tax gap between the EU and USA explain the working hours gap between the two regions?

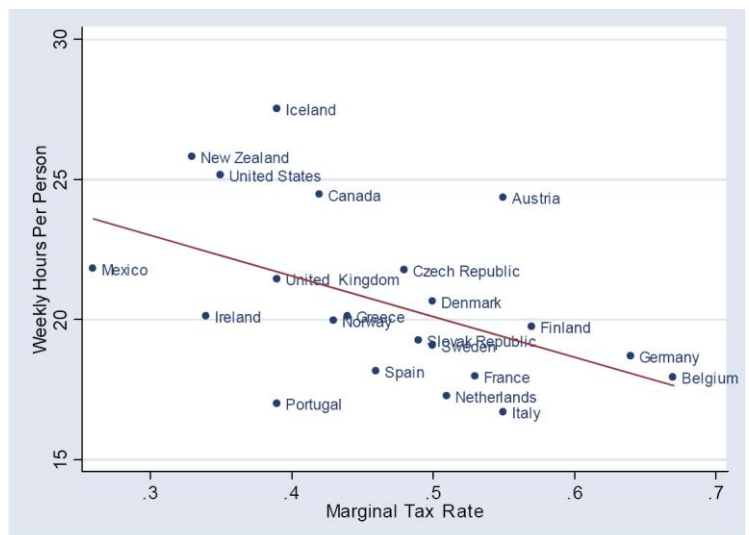
Cross sectional sample of countries but: causal relationship?

see Alesina et al. (2005)

Relevance for Hungary

Elasticity of taxable income

Incentive effects of sick-pay rules



Further examples

Macroeconomic forecasts

Marketing

Efficiency of advertising,
Estimation of demand elasticities

The knowledge of the properties of the techniques is essential for thorough analyses

Sources

Econometrica, Journal of Econometrics, Journal of Applied Econometrics
But each good journal is full of econometric analyses

Relationship with other disciplines

Probability and statistics

Multidimensional probability theory.
Theory of estimation, hypothesis testing
Gaussian, t- and F-distribution

“Statistics for economists” course

Precise discussion of the intuitive statements made there

“Mathematics for economists” course

matrices, optimisation etc.

Course material, exam

Course material

Book: G. S. Maddala, Introduction into Econometrics
Supplementary material: J. Wooldridge, Introductory Econometrics: A Modern Approach

Examination

Home assignments
Group exercises
Two ZH-s

Econometric softwares

Eviews

The softwarer of the course

User-friendly

Stata

More in-built procedures, more easily programmable

More appropriate for cross section and panel analysis

Gretl

Freely downloadable, appropriate at BA level

Not enough for panel analysis and multivariate time series modelling

Gauss, PCGive

Statistical softwares: SPSS, R, Minitab etc.