

Disciplines: Operations and Information Systems

1 Title

Econometrics – Multivariate Empirical Analysis

2 Faculty

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Onsite support: tbd., PhD candidate, ESMT

3 Outline

3.1 Issues

This course covers important methods used in the multivariate analysis of data. The course revisits basic concepts of the linear regression model and its properties and covers selected advanced topics such as the analysis of duration data and (quasi) experimental designs as well as methods to deal with the problems of endogeneity and sample selection. The theoretical basis of these methods is discussed but the focus of the course is on the application of the methods to data sets. Applications will be studied with the help of data provided by the lecturers and with reference to recent publications.

After the course, participants will...

- have a basic understanding of the theoretical underpinnings of multiple regression models.
- be able to apply regression methods to the investigation of economic relationships and processes.
- understand the econometric methods, approaches, ideas, results and conclusions met in the majority of economic books and articles.
- be aware of common pitfalls and mistakes to avoid when conducting regression analysis.
- be able to use the software program STATA to carry out empirical analysis based on regression analysis.

3.2 Course format

The course will consist of a combination of lectures, exercise sessions, and a final exam. Lecturers will use recent journal articles as well as book chapters to teach the participants common regression methods. Participants are advised to carefully read the assigned materials before the class.

4 Administration

4.1 Schedule

Day I (10.4.2013)

10:00 – 10:30	Arrival of participants, reception, check-in and introduction
10:30 – 12:00	Introduction and overview – 1 st steps with STATA
13:00 – 14:30	Recap: Basic concepts from statistics (random variable, statistical inference, point estimators and statistical simulation)
14:45 – 16:15	Recap: multiple regression analysis, the OLS-estimator and interpretation of coefficients
16:45 – 18:15	Exact and asymptotic properties of the OLS estimators, statistical inference in regression models

Day II (11.4.2013)

09:00 – 10:30	Functional form, qualitative information and dummy-variable approach, and transformations in multivariate analyses
11:00 – 12:30	Diversions from the classical model: heteroscedasticity, omitted variables and endogeneity
13:30 – 15:00	Review Session I: Endogeneity (Angrist 1990, Angrist/ Lavy 1999)
15:30 – 17:00	Probability models: Probit and Logit (Harhoff/Reitzig 2004)

Day III (12.4.2013)

09:00 – 10:30	Models for survival times – accelerated failure time and hazard rates
11:00 – 12:30	Exercise session I: The Duration of Patent Examination at the European Patent Office (Harhoff/ Wagner 2009).
13:30 – 15:00	Panel data estimation
15:30 – 17:00	Exercise session II: Applying Panel Data Estimators

Day IV (13.4.2012)

09:00 – 10:30	(Quasi) experiments in econometrics
11:00 – 12:30	Exercise session III: Difference-in-Difference estimators
13:30 – 15:00	In-class exam
15:30 – 16:00	Wrap-up & Feedback

4.2 Location

ESMT European School of Management and Technology

Room: tbd.
Schlossplatz 1
10178 Berlin
www.esmt.org

4.3 Max. number of participants

The number of participants is limited to 20.

4.4 Cost

The course fee amounts to EUR 600,--.

5 Content

The course covers several important methods and approaches of econometric analysis. The derivation and proofs of basic formulas and models are presented which allows students to understand principles of econometric theory. The main emphasis of the course is on the economic interpretations and applications of considered econometric models. The methods selected are increasingly used in applied research by management scholars. In addition to standard cross section models we cover selection and duration models as well as experimental designs in econometrics.

Participants will be actively involved with computer exercises in this course using the STATA econometrics program. Throughout the course they will use STATA to implement a series of econometrics exercises designed to provide experience with various tests and estimation procedures. The instructions for these exercises and the data required for their implementation will be sent to participants weeks prior to the course.

6 Prerequisites

The course requires basic skills in statistics and multivariate data analysis techniques. Concepts such as mean values, standard deviations and covariance matrices should be familiar to the participants. In addition, a basic understanding of regression analysis and testing procedures is helpful but not an essential requirement for understanding the contents.

Participants should be prepared to use their own laptops during the course in order to directly follow important parts of the course related to the application of important concepts to data set using the statistical software STATA. Therefore, an installation of STATA version 10.0 or higher is required. In Germany, student versions of STATA can be obtained from DPC (<http://www.dpc-software.de>) for about 100 EUR.

7 Course Material

7.1 Essential Reading Material

Angrist, J. (1990): Lifetime Earnings and the Vietnam Era Draft Lottery: Evidence from Social Security Administrative Records, *The American Economic Review*, Vol. 80 (3), 313–336.

Angrist, J. and Lavy, V. (1999): Using Maimonides' Rule to Estimate the Effect of Class Size on Scholastic Achievement, *The Quarterly Journal of Economics*, Vol. 114(2), 533–575.

Chenhall, R. H./ F. Moers (2007): The Issue of Endogeneity within Theory-Based, Quantitative Management Accounting Research, *European Accounting Review*, 16, 173–196.

Harhoff, D./ Reitzig, M. (2004). Determinants of Opposition against EPO Patent Grants – The Case of Biotechnology and Pharmaceuticals, *International Journal of Industrial Organization*, Vol. 22 (4), 443–480.

Harhoff, D./ Wagner, S. (2009): The Duration of Patent Examination at the European Patent Office, *Management Science*, Vol. 55 (12), 1969–1984.

Imbens, G. / Wooldridge, J. (2009): Recent Developments in the Econometrics of Program Evaluation, *Journal of Economic Literature*, 47, 5–86.

We also ask the participants to familiarize them with STATA before the course starts. There are excellent tutorials available online at

<http://www.stata.com/links/resources-for-learning-stata/>

<http://www.ats.ucla.edu/stat/stata/>

<http://www2.lse.ac.uk/methodology/tutorials/Stata/home.aspx>

<http://www.princeton.edu/~otorres/Stata/>

7.2 Additional Reading Material

Gujarati, D. (2008). *Basic Econometrics*, Mcgraw–Hill Higher Education, 4th ed.

Kennedy P. (2003). *A Guide to Econometrics*. MIT Press, 5th edition.

Angrist, J. D. and J. S. Pischke (2009): *Mostly Harmless Econometrics: An Empiricist's Companion*, Princeton Univ Pr.

Kiefer, N. (1988): Economic Duration Data and Hazard Functions, *Journal of Economic Literature*, Vol. 26(2), 646–679.

Stock, J./ Watson M. (2004): *Introduction to Econometrics*, Addison Wesley, 2nd edition.

Wooldridge, J. (2009). *Introductory Econometrics: A Modern Approach*. South Western College Publishing.

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

If applicable: Further literature will be sent to the participants weeks prior the starting date of the course.

8 To Prepare

All participants are required to read the essential reading material prior to the course.

9 Assessment

A 90-minute in-class exam will be offered at day IV.

10 Credits

The course (including the exam) is eligible for 6 ECTS.