Course: Qualitative research methods

Teaching hours: 30h

Prerequisites: The course is primarily open to all PhD students at Gdansk University of Technology.

This course is compulsory for PhD students assigned to Economics&Finance and Management&Quality tracks at Doctoral School of GUT

Course outline

Content
The purpose of this course is to introduce PhD students to quantitative methods that economist use to evaluate empirical relationships and test economic theory. This course brings together theoretical knowledge and empirical application of econometrics methods by analyzing economic data using a statistical software, *Stata*. The approach taken in this class follows the learning process that would allow students to start developing the knowledge and skills necessary to conduct an independent quantitative research. Throughout the course students will learn how to evaluate already existing research and, at the end of the course, examine in depth an article published in economic journal and replicate its empirical results with the provided data. It begins with basics of economic research questions, then we move forward to discuss sources and types of economic data. The course will focus on issues that are needed to understand regression analysis, such as the theory of probability as well as three types of statistical methods: estimation, hypothesis testing, and confidence intervals. Further, it is explained about regression estimation, measure of fit, assumptions, the distribution of the regression estimators, and statistical inference in the linear regression model. Students will complement our understanding of linear regression with nonlinear regression functions and interactions between independent variables as well as introduce an extension to the OLS regression, specifically instrumental variables regression; discuss the issue of external and internal validity of regression analysis. The course ends up by deliberating about the causal effects in economics by examining the notions of experiments and quasi-experiments.

General topics coverage:
1. Economic questions and data.
2. Probability distributions and random sampling.
3. Statistical Methods: estimation, hypothesis testing, confidence intervals.
4. The linear regression with a single regressor: estimation, measure of fit, OLS assumptions.
5. Regression with multiple regressors: estimation, measure of fit, OLS assumptions, the distribution of the OLS estimators, multicollinearity.

6. Hypothesis tests and confidence intervals in multiple regression.
7. Extensions of multiple regression model: nonlinear regression functions and interactions between independent variables.
8. Instrumental Variable Regression.
9. What makes a study that uses regression reliable or unreliable? Internal and external validity.
10. Causal effects, experiments and quasi-experiments.

Teaching mode

There will be 30 hours of laboratories, to be completed during the first and/or second semesters of PhD programme. The teaching method is basically exercises combined with active discussion and students participation, and specific tasks to be completed using dedicated software (mostly *Stata*). During the course students will be asked to think critically, analyse and interpret the results of their work. There will be 4 short quizzes in the beginning of each class except the first and last one. *Stata* exercises conducted during the class need to be send via email to the teacher at the end of each class. Students will also be provided some journal articles from which students will choose one and replicate its empirical results (students will start replication during the last lab sessions and have 2 weeks to finish it after this course).
The course is entirely delivered in English.

Examination

A wide range of formative feedback from your tutor, questions and practical individual and group exercises will be used by tutors to aid learning as will exercises to encourage the researchers' abilities in critical and reflective learning. The exact nature of these assessment devices will be at the discretion of the tutor.

Fundamental readings:

1. Stock, J.H. and Watson, M.W. (2015). *Introduction to Econometrics (updated third edition)*, Pearson Education.
2. Acock, A.C. (2018). *A Gentle Introduction to Stata, Sixth Edition*, Stata Press.
3. Wooldridge, Jeffery M. (2013). *Introductory Econometrics: A Modern Approach*, Thomson Higher Education (5th edition).
4. Kennedy, Peter. (2008). *A Guide to Econometrics.* Wiley-Blackwell.
5. Angrist, J. D. and Pischke J. (2009) *Mostly Harmless Econometrics: An Empiricist Companion*. Princeton University Press.
6. Hamilton L.C. (2013). Statistics with Stata: Version 12, Cengage
7. Frankfort-Nachmias, C., and D. Nachamias, (2015) *Research methods in the social sciences*. Worth Publishers.
8. Cameron, A.C. and Trivedi, P.K. (2010). *Microeconometrics Using Stata*. Stata Press.