Applied Regression Analysis for Public Policy
DOPP 5360 – Spring 2023

Instructor: Dr. Ljubica Nedelkoska, Visiting Professor
Department of Public Policy, Central European University
U.S. credits: 2**, ECTS**: 4
Course e-learning site: CEU Moodle
Time: Monday, 8:50-10:30 and 10:50-12:30. **Location** C-207
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Office hours: By appointment (office B417)

Course description

This class provides an intuitive and practical introduction to applied econometrics – the practice of analyzing quantitative data with statistical methods. The primary objective is to equip students with the quantitative techniques that are essential to evidence-based policy-making and necessary for post-graduate academic research in the quantitative social sciences (economics, peace science, political science, sociology, etc).

The course covers the fundamentals of regression analysis. The course begins with a brief review of the necessary ingredients from probability and statistics. From day one, students will learn the basic functionality of the statistical software package Stata, starting with the generation of descriptive statistics and graphics. Coverage of the linear regression model and regression diagnostics constitutes the core of the course. Once a firm understanding of basic models is attained, we move on to some more advanced regression techniques, including, but not limited to, non-linear regression, models with limited dependent variables, panel data analysis, and the evaluation of causal relationships.

Primary learning objectives

1. Understand the fundamentals of regression analysis.
2. Acquire basic proficiency in the statistical software Stata, programming, creating graphs, and interpretation of statistical outcomes.
3. Learn about some advanced techniques in regression analysis.
4. Discuss econometric output within the context of analytical policy making/evaluation.
5. Assess the validity of an econometric study/report.
6. Gain experience conducting independent quantitative research.

Prerequisites

None. Knowledge of differential calculus and experience with programming languages give students a head start.

Requirements and evaluation

Homework 1 (due)	April 24	10%
Homework 2 (due)	May 8	10%
Homework 3 (due)	May 15	10%
Homework 4 (due)	May 22	10%
Class participation		20%
Exam	May 30	40%

Grading scale

	CEU Grading System					
Grade	Name	Austrian equivalent	Hungarian equivalent	Points (0-4 scale)	Points (0-100 scale)*	Credit
A	Outstanding	Excellent (1)	Jeles (5)	4	100-96	yes
A-	Excellent	Excellent (1)	Jeles (5)	3.67	95-88	yes
B+	Good	Good (2)	Jó (4)	3.33	87-80	yes
B	Fair	Satisfactory (3)	Közepes (3)	3	79-71	yes
B-	Satisfactory	Sufficient (4)	Elégséges (2)	2.67	70-63	yes
C+	Minimum Pass	Sufficient (4)	Elégséges (2)	2.33	62-58	yes
F	Fail	Insufficient (5)	Elégtelen (1)	0	57-0	no

*Erasmus Mundus joint programs that, as of academic year 2020/21, have an existing consortium agreement regulating grade conversion among the participating universities are not required to adopt the CEU scale for calculating inter-university equivalencies in the period covered by their existing framework agreement. However, the transition to the CEU conversion should be made at the earliest opportunity and no later than the next amendment of the consortium agreement.

Primary textbook

Introduction to Econometrics – Global Edition, James Stock and Mark Watson, (on reserve at CEU library, electronic and hardcopy, various editions).

Online resources

Seeing theory: A visual introduction to probability and statistics

Moodle site for the course

Web site companion to the textbook

Getting Started with Stata for Windows

Getting Started with Stata for Mac

Publication-quality graphics in Stata

Additional sources

An Adventure in Statistics: The Reality Enigma, Andy Field, 2016

Introductory econometrics: A modern approach. Wooldridge, Jeffrey M., 2015.

A Gentle Introduction to Stata, Alan Acock, 2012.

An Introduction to Stata Programming, Christopher Baum, 2009.

An Introduction to Modern Econometrics Using Stata, Christopher Baum, 2006.

A Guide to Econometrics, 6E, Peter Kennedy, 2008.

Essentials of Statistics for the Behavioral Sciences, Frederick Gravetter and Larry Wallnau, 2008.

Jonathan Schwabish, An economist's guide to visualizing data," *Journal of Economic Perspectives*, 28(1): 209 – 34 (2014).

Mostly Harmless Econometrics, Joshua Angrist and Jörn-Steffen Pischke, 2008.

Course outline

1. Introduction

Apr 17 (part I): Review of probability. Introduction to Stata
- Stock & Watson (S & W) chapters 1 and 2.
- Getting used to Stata. Visualizing your data.

Apr 17 (part II): Review of statistics. Introduction to Stata
- S & W chapter 3.
- Probability and statistics using Stata. Visualizing bivariate relationships.

2. Linear regression model

Apr 24 (part I): Linear regression with one regressor – estimation and hypothesis testing
- Homework 1 due.
- S & W chapters 4 and 5.
- Practicing regression. Understanding linear regression output in Stata.

Apr 24 (part II): Multiple linear regression – estimation and hypothesis testing
- S & W chapters 6 and 7.
- Practicing regression in Stata.

3. Further topics in regression analysis

May 2 (recorded lecture): Non-linear regression – quadratic regression, logarithmic regression, interaction terms
- S & W chapter 8.
- Stata exercises: polynomial fitting, logarithmic transformation, interaction terms.

May 8 (part I): Assessing studies based on multiple regression
- Homework 2 due.
- S & W chapter 9.

May 8 (part II): Assessing studies based on multiple regression
- KIPP Lynn Case Study.

May 15 (part I): Instrumental variable regression
- Homework 3 due.
- S & W chapters 12.
- Stata exercises: Two Stage Least Squares.

May 15 (part II): Regression with limited dependent variables
- S & W chapter 11.
- Logit and probit models in Stata.

May 30: In-class exam
- Homework 4 due.
- Final exam.