

## **Applied Regression Analysis for Public Policy**

### **DOPP 5360 – Winter 2022**

**Instructor:** Dr. Ljubica Nedelkoska, Visiting Professor  
Department of Public Policy, Central European University

**No. of credits:** 2

**Course e-learning site:** [CEU Moodle](#)

**Time and location:** Friday, 10:50-12:30, location TBD

**Contact:** NedelkoskaL@ceu.edu

**Office hours:** Friday, 12:30-13:30 and 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**

The course builds on concepts from calculus (differentiation, integration, series, limits) and basic matrix algebra.

**Requirements and evaluation**

Homework 1 (due)	January 21	5%
Homework 2 (due)	January 28	5%
Homework 3 (due)	February 4	5%
Homework 4 (due)	February 11	5%
Homework 5 (due)	February 25	5%
Homework 6 (due)	March 11	5%
Homework 7 (due)	March 18	5%
Homework 8 (due)	March 25	5%
Mid-term exam	February 18	30%
Final exam	April 8	30%

**Grading scale**

93	≤	A	≤	100
86	≤	A –	<	93
79	≤	B +	<	86
72	≤	B	<	79
65	≤	B –	<	72
58	≤	C +	<	65
0	≤	F	<	58

**Primary textbook**

*Introduction to Econometrics – Global Edition*, James Stock and Mark Watson, 2012 (on reserve at CEU library).

**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 (on reserve at CEU library).

*An Introduction to Stata Programming*, Christopher Baum, 2009 (on reserve at CEU library).

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

*A Guide to Econometrics, 6E*, Peter Kennedy, 2008 (on reserve at CEU library).

*Essentials of Statistics for the Behavioral Sciences*, Frederick Gravetter and Larry Wallnau, 2008 (on reserve at CEU library).

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 (weeks 1 and 2)

#### **Week 1 (Jan 14): Review of probability. Introduction to Stata**

- Stock & Watson chapters 1, 2.
- Getting used to Stata. Visualizing your data.

#### **Week 2 (Jan 21): Review of statistics. Introduction to Stata**

- Homework 1 due.
- Stock & Watson chapter 3.
- Probability and statistics using Stata. Visualizing bivariate relationships.

### 2. Linear regression model (weeks 3 and 4)

#### **Week 3 (Jan 28): Linear regression with one regressor – estimation and hypothesis testing**

- Homework 2 due.
- Stock & Watson chapters 4 and 5.
- Practicing regression. Understanding linear regression output in Stata.

#### **Week 4 (Feb 4): Multiple linear regression – estimation and hypothesis testing**

- Homework 3 due.
- Stock & Watson chapters 6 and 7.
- Practicing regression in Stata.

### **3. Further topics in regression analysis** (weeks 5 – 11)

#### **Week 5 (Feb 11): Non-linear regression – quadratic regression, logarithmic regression, interaction terms**

- Homework 4 due.
- Stock & Watson chapter 8.
- Non-linear model specification and interpretation using Stata.

#### **Week 6 (Feb 18): Reading week**

#### **Week 7 (Feb 25): Mid-term exam**

- Homework 5 due.
- In-class exam.

#### **Week 8 (Mar 4): Assessing studies based on multiple regression**

- Stock & Watson chapter 9.

#### **Week 9 (Mar 11): Regression analysis with panel data**

- Homework 6 due.
- Stock & Watson chapter 10.
- Panel data using Stata.

#### **Week 10 (Mar 18): Regression with limited dependent variables**

- Homework 7 due.
- Stock & Watson chapter 11.

#### **Week 11 (Mar 25): Instrumental variable regression**

- Homework 8 due.
- Stock & Watson chapter 12.

**Week 12 (Apr 1): Publication-style graphs and tables using Stata**

- Jonathan Schwabish, [An economist's guide to visualizing data](#), *Journal of Economic Perspectives*, 28(1): 209 – 34 (2014).
- [Publication-quality graphics in Stata](#).

**Week 13 (Apr 8): Final exam**

- In-class exam.