Applied Regression Analysis, Part I

SOPP 5089 – Winter 2017

Instructor: Dr. Michael Dorsch, Associate Professor

School of Public Policy, Central European University

No. of credits: 2

Course e-learning site: CEU Moodle

Time and location: Monday 15:30 – 17:10, location TBD

Contact: 327 3000 / ext. 2751, dorschm@spp.ceu.edu

Office hours: Thursday 15:30 – 16:30 (or by appointment), Okt6*7, 239

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).

Part 1 – Winter 2017 – 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. Time permitting, non-linear regression models and other more advanced regression techniques will also be introduced.

Part 2 – Spring 2017 (TBC) – introduces some advanced topics in regression analysis: models with limited dependent variables, panel data analysis, the evaluation of causal relationships, and generating professional-quality tables. The core of the second part is devoted to reading, analyzing, and discussing quantitative public policy research of interest to class participants. Students make presentations of published research (academic or technical policy reports) that highlights a specific technique of regression analysis and pursue original quantitative

research that relates to one of the following: (i) passion projects, (ii) research projects for other courses, (iii) MA thesis proposals, or (iv) any independent research interest involving the quantitative evaluation of some contemporary public policy issue.

Primary learning objectives

1. Interpret the output produced by the software Stata when performing regression analysis of a data set.

2. Assess the validity of an econometric study/report.

3. Discuss econometric output within the context of analytical policy making/evaluation.

Requirements and evaluation

Homework 1	January 23	10 %
Homework 2	February 6	10 %
Homework 3	February 20	10 %
Homework 4	March 6	10 %
Homework 5	March 20	10 %
Homework presentation	periodically	10 %
Final exercise	March 27	40 %

Grading scale

93	$\leq$	A	$\leq$	100
86	$\leq$	A $-$	$<$	93
79	$\leq$	B $+$	$<$	86
72	$\leq$	B	$<$	79
65	$\leq$	B $-$	$<$	72
58	$\leq$	C $+$	$<$	65
0	$\leq$	F	$<$	58

Online resources

Moodle site for the course

Web site companion to the textbook

Getting Started in Data Analysis Using Stata 10 from Princeton University

The official *Introduction to R*

Many tutorials on R, listed in the category "Contributed Documentation"

Primary textbook

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

Additional sources

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).

Course outline (subject to change)

1. Introduction (weeks 1 – 2)

01/09: Overview of econometrics and introduction to Stata

– S & W chapter 1

01/16: Review of probability and statistics

– S & W chapters 2 and 3

2. Linear regression model (weeks 3 – 6)

01/23: Simple linear regression – estimation

- **–** Homework 1 due
- **–** S & W chapter 4

01/30: Simple linear regression – hypothesis testing

- **–** S & W chapter 5

02/06: Multiple linear regression – estimation

- **–** Homework 2 due
- **–** S & W chapter 6

02/13: Multiple linear regression – hypothesis testing

- **–** S & W chapter 7

3. Further topics in regression analysis (weeks 7 – 10)

02/20: Non-linear regression – quadratic and logarithmic functions

- **–** Homework 3 due
- **–** S & W chapter 8

02/27: Non-linear regression – interaction terms

- **–** S & W chapter 8

03/06: Assessing regression studies

- **–** Homework 4 due
- **–** S & W chapter 9

03/13: Limited dependent variables

- **–** S & W chapter 11

4. Wrapping up (weeks 11 – 12)

03/20: Loose ends

- – Homework 5 due
- – Professor research presentation

03/27: In-class final exercise