Econometrics (I)

Fall 2025
Department of Economics, National Chung Cheng University

Instructor: 洪以儒 (Yi-Ju Hung)
Lecture: Tuesday & Thursday 10:10-12:00, College of Management 336
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Course Description

This course aims to provide students with an understanding of and experience with the key methods economists use to quantify the relationships among variables. A major goal is to prepare students to carry out statistical analysis themselves. We will focus on multivariate regression and causal inference. Topics will include functional form, heteroskedasticity, serial correlation, omitted variables and simultaneity bias, and instrumental variables. We will consider several types of data, including cross-sectional data, time series data, and panel data. Practical as well as theoretical issues will be discussed in how to distinguish correlations from causal effects.

A large part of this syllabus follows the course structure of the Introductory Econometrics lectured by Vittorio Bassi and Jeffrey Weaver at the University of Southern California. I appreciate their generosity in sharing this material with me.

Readings

Required: *Jeffrey M. Wooldridge, "Introductory Econometrics: A Modern Approach"*

Note that you do NOT need to purchase the latest version of the textbook (7^{th} edition); any edition after the 4^{th} edition is fine

Supplementary: If you are interested in learning more, an excellent book is *Causal Inference, The Mixtape* by Scott Cunningham. It will cover some more advanced methods and tools for causal inference. You can find it *here*).

TA Sessions

During the weekly TA sessions, the TAs will instruct you on how to use Stata, which is necessary for completing the problem sets. You will also be tested on your knowledge of Stata during the exams. The TAs will also review important concepts from class and

problem sets.

The computer program Stata will be used extensively in the TA session. The program has good help facilities and guides available for free on the Internet. UCLA maintains an excellent website devoted to Stata (https://stats.oarc.ucla.edu/stata/). During the TA session, the TA will guide you to go over some key commands and exercise questions using Stata. Other popular sources for learning Stata include Statalist and StackOverflow.

Evaluation

1. Problem sets: 30%
2. Quiz: 20%
3. Midterm exams: 30% (15% each)
4. Final exam: 20%

Quiz: There are quizzes every one or two weeks. Most of the questions will be multiple-choice. It aims to help you review what we have learned in the previous week.

Problem Sets: Problem sets will include both analytical problems and empirical problems that involve computing. **I do not accept late problem sets.** You are permitted to work in groups on the problem sets, but you must do all your own computing and write up your own answers. You must indicate the name of group members on your assignment.

Topics

In this course, we will cover the following topics:

1. Review: Fundamentals of Probability
2. OLS Estimation
3. Multiple Regression
4. Statistical Inference
5. Functional Forms
6. Directed Acyclic Graph

7. Potential Outcomes Causal Model
8. Panel Data
9. Difference-in-Differences

Additional Resources

Here are some useful resourses (but not required) for this course or future courses related to econometrics and applied microeconomics.

Econometrics: Introduction to Econometrics by Stock and Watson is another good textbook; however, it is at a slightly lower level to Introductory Econometrics by Wooldridge. Mastering Metrics and Mostly Harmless Econometrics by Angrist and Pischke emphasis on the applications tools we develop in this course. Mostly Harmless Econometrics is more advanced but is an excellent material for graduate school.

Stata: Microeconometrics Using Stata: Revised Edition by Cameron and Trivedi provides an in-depth overview of econometrics with Stata. Statistics with Stata by Hamilton is also a good guide to Stata. UCLA and Princeton offer Stata guides, including tutorials, detailed help files, and web videos.