

Introduction to Econometrics

Business School, Nanjing University

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Instructor:	Zhaopeng Qu (曲兆鹏)	GSI:	Zixin Zhou(周子莘) Jing Bu(卜京)
Phone:	+86-8362-1349(O)	Wechat ID	
Email:	qu@nju.edu.cn	Public Email:	jl2017f@126.com
Office:	安中楼 2021 (Gulou Campus)	Location:	逸 B-313(Xianlin Campus)
Course Website	Course Web	Time:	Monday 9: 00-12: 00 am

Course Description

This course introduces students to modern causal inference methods for analyzing data in economics and other social sciences. The goal is to help student develop a solid theoretical background in introductory level econometrics, the ability to implement modern techniques and to critique empirical studies in economics and other social sciences. Specifically, we will learn **six** modern econometric research design techniques that aim to credibly estimate causal effects:

- **Randomized Controlled Trial(RCT)**
- **Regression(OLS)**
- **Decomposition(WD)**
- **Instrumental Variables(IV)**
- **Regression Discontinuity Designs(RDD)**
- **Differences-in-Differences(DID)**

At the end, students mastering tools will use at least one of them to finish an empirical research project.

Evaluation

- 出勤率 (Participation) (10%)
- 作业 (Homework) (20%)
- 期末考试 (Final exam) (40%)
- 研究计划 (Group project) (30%)

Textbooks

Econometrics

- James H. Stock and Mark W. Watson, *Introduction to Econometrics*, 3rd Edition, Addison-Wesley, 2012.
- Jeffrey M. Wooldridge, *Introductory Econometrics: A Modern Approach*, 5th Edition, South-Western College, 2013.
- Joshua Angrist and Jorn-Steffen Pischke, *Mastering 'Metrics: The Path from Cause to Effect*, Princeton press, 2015.
- Joshua Angrist and Jorn-Steffen Pischke, *Mostly Harmless Econometrics: An Empiricist's Companion*, Princeton press, 2008.

Computing Softwares: Stata and R

- 任意一本关于 Stata 或者 R 操作的中文书

Additional Readings

- Steven D. Levitt and Stephen J. Dubner, *Freakonomics: A Rogue Economist Explores the Hidden Side of Everything*, 2005. (中译本《魔鬼经济学》斯蒂夫·列维特和斯蒂芬·都伯纳著, 广东经济出版社, 2006 年 1 月。)
- Steven D. Levitt and Stephen J. Dubner, *SuperFreakonomics: Global Cooling, Patriotic Prostitutes, and Why Suicide Bombers Should Buy Life Insurance*, 2009. (中译本,《超爆魔鬼经济学》, 斯蒂夫·列维特和斯蒂芬·都伯纳著, 中信出版社, 2010 年 1 月。)
- Ian Ayres, *Super Crunchers: Why Thinking-By-Numbers is the New Way To Be Smart*, 2007. (中译本《超级数字天才》, 伊恩·艾瑞斯著, 中国青年出版社, 2008 年 1 月。)
- Raymond Fisman and Edward Miguel, *Economic Gangster: Corruption, Violence and the Poverty of Nations*, 2008. (中译本《经济黑帮: 腐败、暴力的黑帮经济学》, 中信出版社, 2010 年 8 月)
- Abhijit V. Banerjee & Esther Duflo, *Poor Economics A Radical Rethinking of the Way to Fight Global Poverty*, 2011.(中译本:《贫穷的本质: 我们为什么摆脱不了贫穷》, 中信出版社。)
- Angus Deaton, *The Great Escape: Health, Wealth, and the Origins of Inequality*, 2015.(中译本:《逃离不平等: 健康、财富及不平等的起源》, 中信出版社。)
- 涂子沛,《大数据: 正在到来的数据革命, 以及它如何改变政府、商业与我们的生活》, 广西师范大学出版社, 2012 年 7 月。

Schedule

Week	Topic	Date	
1	Introduction	9/6	
2	Causal Inference and Experimental Method(I)	9/13	
3	Causal Inference and Experimental Method(II)	9/20	
4	Regression(I)	9/27	
5	Regression(II)	10/4	
6	Regression(III)	10/11	
7	Regression(IV)	10/18	
8	Regression(V)	10/25	
9	Decomposition(I)	11/1	
10	Decomposition(II)	11/8	
11	Instrumental Variable(I)	11/15	
12	Instrumental Variable(II)	11/22	
13	Regression Discontinuity(I)	11/29	
14	Regression Discontinuity(II)	12/6	
15	Difference in Differences(I)	12/13	
16	Difference in Differences(II)	12/20	
17	Final Review	12/27	

Lab/Recite Session

Week	Topic	Date	Location	Time
2	<i>Recite 1: Probability Review</i>	9/11	逸夫楼 B-303	8:00-10:00am
3	<i>Recite 2: Statistics Review</i>	9/13	逸夫楼 B-303	8:00-10:00am
4	Lab1: Introduction to Stata and R	9/18	逸夫楼 B-407	8:00-10:00am
5	Lab2: Introduction to Stata and R	9/25	逸夫楼 B-407	8:00-10:00am
7	Lab3: OLS in Stata and R	10/16	逸夫楼 B-407	8:00-10:00am
8	Lab4: OLS in Stata and R	10/30	逸夫楼 B-407	8:00-10:00am
10	Lab5: DE in Stata and R	11/8	逸夫楼 B-407	9:00-12:00am
12	Lab6: IV in Stata and R	11/22	逸夫楼 B-407	9:00-12:00am
14	Lab7: RD in Stata and R	12/6	逸夫楼 B-407	9:00-12:00am
16	Lab8:DID in Stata and R	12/20	逸夫楼 B-407	9:00-12:00am
17	<i>Recite 3: Full Review</i>	12/27	逸夫楼 B-313	9:00-12:00am

Outline

(Preliminary, to be adjusted possibly)

0.1 Introduction

- What the course is about? What is the benefit if we learn it? How to learn it?
- ***Probability and Statistics Review***
 - Stock and Watson (2012): Chapter 2-3.
 - Wooldridge (2013): Appendix A, B & C.

0.2 Causal Inference in Social Science and Randomized Experiment(I)

- Stock and Watson (2012): Chapter 1 & 13
- Angrist and Pischke (2014): Chapter 1
- Angrist and Pischke (2008): Chapter 1-2
- ***Probability and Statistics Review***
 - Stock and Watson (2012): Chapter 2-3.
 - Wooldridge (2013): Appendix A, B & C.

0.3 Causal Inference in Social Science and Randomized Experiment(II)

- Stock and Watson (2012): Chapter 1 & 13
- Angrist and Pischke (2014): Chapter 1
- Angrist and Pischke (2008): Chapter 1-2
- ***Probability and Statistics Review***
 - Stock and Watson (2012): Chapter 2-3.
 - Wooldridge (2013): Appendix A, B & C.

0.4 Regression (I): Simple OLS-Estimation

- Stock and Watson (2012): Chapter 4-5, 17
- Wooldridge (2013): Chapter 2
- Angrist and Pischke (2014):Chapter 2
- Angrist and Pischke (2008): Chapter 3

0.5 Regression (II)- Multiple OLS-Hypothesis Test

- Stock and Watson (2012): Chapter 6-7
- Wooldridge (2013): Chapter 3,
- Angrist and Pischke (2008): Chapter 3
- Angrist and Pischke (2014): Chapter 2

0.6 Regression Review (III): Multiple OLS-Estimation and Hypothesis Test

- Stock and Watson (2012): Chapter 6-7
- Wooldridge (2013): Chapter 4-5

0.7 Regression Review (IV): Nonlinear Regression Functions

- Stock and Watson (2012): Chapter 8-9
- Wooldridge (2013): Chapter 6-8

0.8 Regression Review (V): Binary Dependent Variables

- Stock and Watson (2012): Chapter 11
- Wooldridge (2013): Chapter 9 & 17

0.9 Inequality Decomposition(I)

- Fortin, Lemieux and Firpo(2010), “Decomposition Method” in the Handbook of Labor Economics , Vol(4).

0.10 Inequality Decomposition(II)

- Fortin, Lemieux and Firpo(2010), “Decomposition Method” in the Handbook of Labor Economics , Vol(4).

0.11 Instrumental Variables (I)

- Stock andWatson (2012): Chapter 12
- Wooldridge (2013): Chapter 15
- Angrist and Pischke (2014): Chapter 3
- Angrist and Pischke (2008): Chapter 4

0.12 Instrumental Variables (II)

- Stock and Watson (2012): Chapter 12
- Wooldridge (2013): Chapter 15
- Angrist and Pischke (2014): Chapter 3
- Angrist and Pischke (2008): Chapter 4

0.13 Regression Discontinuity (I)

- Angrist and Pischke (2008): Chapter 4
- Angrist and Pischke (2014): Chapter 4
- Guido W. Imbens and Thomas Lemieux (2007), “Regression discontinuity designs: A guide to practice” , Journal of Econometrics, 142(2), pp.615-635.

0.14 Regression Discontinuity (II)

- Angrist and Pischke (2008): Chapter 4
- Angrist and Pischke (2014): Chapter 4
- Guido W. Imbens and Thomas Lemieux (2007), “Regression discontinuity designs: A guide to practice” , Journal of Econometrics, 142(2), pp.615-635.

0.15 Difference in Differences (I)

- Angrist and Pischke (2014): Chapter 5
- Angrist and Pischke (2008): Chapter 5
- Stock and Watson (2012): Chapter 10
- Wooldridge (2013): Chapter 13

0.16 Difference in Differences (II)

- Angrist and Pischke (2014): Chapter 5
- Angrist and Pischke (2008): Chapter 5
- Stock and Watson (2012): Chapter 10
- Wooldridge (2013): Chapter 13

0.17 Final Review