**Advanced Econometrics TA session 1**

**Zeyang Chen**

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## 0. Basic Information for TA Session

### 0.1 TA


- Stata: 陈泽阳 chenzeyang@pku.edu.cn
- Homework: 王宇晴 yuqingwang@pku.edu.cn


### 0.2 Materials

- Software: Stata14 (Mac and Windows)
- Data
    - Address: econometrics_2019@126.com
    - Password: gsm112

## 1. Overview and Roadmap of Econometrics

### 1.1 Data Structure

- Cross-sectional data
- Time-series data
- Panel data (a.k. cross-sectional time-series data, longitudinal data)
- Pool cross-sectional data

### 1.2 Assumptions of OLS: Y=Xβ+ε

- Random sampling
- Linear in parameters
- No perfect collinearity
- Homoscedasticity
- Normality
- Conditional mean zero: E(ε|X)=0
    - Omitted variables (see appendix)
        - ✧ $R^2$ and adjusted $R^2$
    - Measurement error (see appendix)
    - Simultaneity bias: E(ε|Y)≠0 (solution: instrumental variable)

### 1.3 Identification Strategy

- Experiment (lab / field / lab in the field)
- Difference-in-difference (DID)

- Regression Discontinuity (RD)
- Propensity Score Matching (PSM)
- ...

### 1.4 Statistical inference

- T value
- P value
- Confident interval
- Power and sample size (see appendix)

## 2. Introduction to Stata

### 2.1 Interface

### 2.2 Operating Mode

- Click: there is always one command behind one click
- Command: command varlist if/in, options
- Dofile

### 2.3 Stata code in dofile

Let’s move to stata! ☺

### 2.4 Tips

- Make your dofile readable
- Organize your folder
- Always learning by doing

## 3. Recommendations

### 3.1 Books

- Introductory Econometrics: A Modern Approach (Jeffrey M. Wooldridge)
- Econometric Analysis (William H. Greene)
- Econometric Analysis of Cross Sectional and Panel Data (Jeffrey M. Wooldridge)
- Mostly Harmless Econometrics: An Economist's Companion (Angrist and Pischke)
- 高级计量经济学及 Stata 应用（第二版）（陈强）

### 3.2 Notes

- Lian Yujun dofiles
- Code and data, Gentzkow and Shapiro

### 3.3 Websites

- The stata forum: https://www.statalist.org/
- StackExchange: https://stats.stackexchange.com/questions/
- 经管之家：https://bbs.pinggu.org/
- 中国大学慕课《面板数据分析与 Stata 应用》：https://www.icourse163.org

### 3.4 Wechat accounts

- Stata and Python 数据分析
- Stata 连享会
- 计量经济学及 Stata 应用

### 4. Requirements for Homework

本学期一共三次作业，每次 10 分，总共 30 分，计入期末总分。

每次作业分为两部分：证明部分与上机部分。注意事项如下：

- 证明部分：手写或打印均可。推荐手写。
- 上机部分：
  - 回归或检验结果（回归需要输出表格，检验可以使用截图或用 logout 命令输出）
  - stata 源代码，放在附录
- 证明部分与上机部分一齐以纸质版上交，不接受电子版。

禁止抄袭解答与 Stata 代码，否则一律 0 分。

每次作业会在课后发至公邮，作业批改结束后会公示每次作业分数，作业答案不会公布。