# 计量1期末复习讲座

## 一、知识点总览

### Ch6: Multiple Regression

- Units of mesurement
  - Cases: y, x, log(y), log(x)
  - What is influenced?
- Beta coefficients
  - After Z-score transformation
- More function form
  - Log term
  - Quadratic term
  - Interaction term
- Adjusted R square $\bar{R}^2$
- Controlling too many variables: really necessary?

### Ch7: Quality Information

- Quality information
  - Binary (dummy) variable
  - Interpretation of coefs
- Dummy variable trap
  - Solutions?
- Multiple dummy variables
  - Multiple sets of variables
  - Ordinal variables
- Interaction effect
  - With another dummy variable
  - With numerical variable
  - DID

- Different slopes
- Hypothesis testing
    - Chow's test: F-test, two ways but same output
- LPM model
    - Interpretation
    - Shortcomings
        - Constant effect of same variable in different range
        - Heteroskedasticity
        - Abnormal value

## Ch8: Heteroskedasticity

- Heteroskedasticity
    - What will happen?
    - Robust se, t-stats and confidence intervals
- Tests (Not required)
    - Breusch-Pagan test and White test
- WLS
    - Case 1: Known variances
    - Case 2: Unknown variances
        - Step 1: Use OLS to get $u_i$
        - Step 2: Construct model of $u_i$
        - Step 3: Use estimates to construct weights
    - Biased

## Ch9&15: Endogeneity and IV

- Defination
- Reasons
    - Omitted variables
    - Measurement error in x or y
    - Sample selection biased
    - Simultaneity Bias
- Instument Variables

- Simple regression estimation
- IV Choosing
- Multiple IVs: 2SLS
- Weak IV: F-test
- Multiple endogenous variables

- Endogeneity Test
  - Comparing 2SLS and OLS
- Overidentification test
  - Only apply to multiple IVs
  - Some Chi-squared test

## Ch12&14: Intra-cluster and serial correlation

- Reason and impact
  - Data not independently sampled
  - Intra-cluster: data with group structure
  - Serial: time series data
  - Unbiased, consistent, wrong SE estimation (and everything related)
- Intra-cluster correlation
  - Cluster-Level latent variables
  - Choices of levels
- Serial correlation
  - Newey-West  standard errors (HAC SE)

# 二、往年题选讲

## 题目结构：

- 三道题
- Q1：偏证明性质，掺有一点点解释说明
- Q2：给出实证例子，应用所学知识
- Q3：要求Interpretation, 假设检验设计，Modified formula，IV设计等

## 2022

# Introductory Econometrics I – Final Exam

Yingjie Feng
School of Economics and Management
Tsinghua University

June 12, 2022

## Contents



**Notes:**

- Duration of examination: **120 minutes**.
- Please write your name and student ID clearly on the first page of the answer book.
- Use the last page of this exam question book as the scratch paper.
- Please do not open the exam paper until the proctors ask you to do so.
- Please answer *all* questions. Feel free to use either English or Chinese.
- Answers without proper justification will *not* receive (partial) credit.
- On-campus students: please turn in the exam question book and your answer book at the end of the exam.
- Online students: please upload your answers to the Web Learning Page no later than **21:15** on Jun 12.

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## 2023

# Introductory Econometrics I – Final Exam

Yingjie Feng
School of Economics and Management
Tsinghua University

June 11, 2023

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## 2024

# Introductory Econometrics I – Final Exam

Yingjie Feng
School of Economics and Management
Tsinghua University

June 20, 2024

## Contents



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