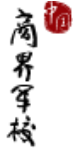




**PHBS**

北京大学汇丰商学院



# Econometrics I Module 2, 2023

## Course Information

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**Classes:**

Lectures: Mon & Thu 13.30-15.20

Venue: TBA

**Course Website:**

## 1. Course Description

### 1.1 Context

Course overview: Empirical studies using Linear regressions

Prerequisites: Statistics and Linear algebra

### 1.2 Textbooks and Reading Materials

*Introduction to Econometrics* Stock J. and Mark Watson, 3<sup>rd</sup> edition

*In-class lecture notes.*

## 2. Learning Outcomes

### 2.1 Intended Learning Outcomes

Learning Goals	Objectives	Assessment (YES with details or NO)
1. Our graduates will be effective communicators.	1.1. Our students will produce quality business and research-oriented documents.	Yes
	1.2. Students are able to professionally present their ideas and also logically explain and defend their argument.	Yes

2. Our graduates will be skilled in team work and leadership.	2.1. Students will be able to lead and participate in group for projects, discussion, and presentation.	NA
	2.2. Students will be able to apply leadership theories and related skills.	NA
3. Our graduates will be trained in ethics.	3.1. In a case setting, students will use appropriate techniques to analyze business problems and identify the ethical aspects, provide a solution and defend it.	NA
	3.2. Our students will practice ethics in the duration of the program.	Yes
4. Our graduates will have a global perspective.	4.1. Students will have an international exposure.	NA
5. Our graduates will be skilled in problem-solving and critical thinking.	5.1. Our students will have a good understanding of fundamental theories in their fields.	Yes
	5.2. Our students will be prepared to face problems in various business settings and find solutions.	Yes
	5.3. Our students will demonstrate competency in critical thinking.	Yes

## **2.2 Course specific objectives**

To be an econometric thinker, not software operator.

## **2.3 Assessment/Grading Details**

Quizzes (TBA, 30%), Midterm (Dec 25, 30%) and Final Exam (40%)

## **2.4 Academic Honesty and Plagiarism**

It is important for a student's effort and credit to be recognized through class assessment. Credits earned for a student work due to efforts done by others are clearly unfair. Deliberate dishonesty is considered academic misconducts, which include plagiarism; cheating on assignments or examinations; engaging in unauthorized collaboration on academic work; taking, acquiring, or using test materials without faculty permission; submitting false or incomplete records of academic achievement; acting alone or in cooperation with another to falsify records or to obtain dishonestly grades, honors, awards, or professional endorsement; or altering, forging, or misusing a University academic record; or fabricating or falsifying of data, research procedures, or data analysis.

All assessments are subject to academic misconduct check. Misconduct check may include reproducing the assessment, providing a copy to another member of faculty, and/or communicate a copy of this assignment to the PHBS Discipline Committee. A suspected plagiarized document/assignment submitted to a plagiarism checking service may be kept in its database for future reference purpose.

Where violation is suspected, penalties will be implemented. The penalties for academic misconduct may include: deduction of honour points, a mark of zero on the assessment, a fail grade for the whole course, and reference of the matter to the Peking University Registrar.

For more information of plagiarism, please refer to *PHBS Student Handbook*.

## **3. Topics, Teaching and Assessment Schedule**

### Part I: Introduction

#### (1) Econometric Modelling

(2) What econometrics can and cannot do?

(3) Forecasts

*Ex 2.27; Ex 14.5.*

## Part II Linear Regression: Theory

(1) Standard assumptions and possible violations (5.4;6.5,18.1)

(2) Parameter Estimation: OLS, Measures of fit (4.3; 6.2-6.4,18.1, Apdx 6.3, 18.7), properties of OLS (Apdx 18.5;5.5).

*EX 4.4, 4.12, 17.6, 18.4, 18.7, 18.17, 6.1-6.5*

(3) Sampling distribution of OLS: Finite sample (5.6; Apdx 18.4), Large sample (18.2; Apdx 18.3;6.6;4.5), HSK robust standard error (18.2); HAC standard error (15.4).

*Ex 17.4*

(4) Hypothesis Testing: Test for individual coefficients (5.1;7.1); Test for several coefficients jointly (7.2;7.3;18.3;18.4).

*EX 5.5; 5.8; 5.9; 7.1-7.6;7.8(ignore part c),7.9,7.11,18.2;18.13;*

(5) Generalized least squares (18.6): weighted least squares (17.5); quasi-differencing (15.5).

*Ex 17.8, 17.13.*

## Part III: Model Construction

(1) Model Misspecifications: Omitting variable bias (6.1;9.2); Sample selection bias; Simultaneous equation bias (9.2); Inconsistent beta due to endogeneity; inconsistent standard error due to non-spherical error (9.2, p368-9).

(2) Modelling strategy: Top-down approach; Bottom-up approach; theory-guided vs data mining.

(3) Generated Regressors: Dummy Variables; Nonlinear X (8.2); interaction term (8.3);

## Part IV: Maximum Likelihood Estimation (Chapter 11)

(1) Asymptotic Theorem of MLE: Uniform LLN and Central Limit Theorem

(2) Information matrix equality

(3) Related Model Diagnostic Tests: Wald, LM and LR tests. (Chow test, Omitted Variable)

(4) Durbin Watson Test and LM test for serial correlation

LM test for Heteroskedasticity and White's Test

## Part IV Time series Regression

(1) Univariate Time series model: ARMA(p,q) (14.2,14.3, Apdx 14.2; Apdx 14.3; Apdx 14.4)

*Ex 14.1; 14.7; 14.9; 14.11*

(2) Stationary time series vs Nonstationary time series characterized by unit roots (16.3);  
Spurious regression (14.6)

*Ex 14.6; 14.3.*

(3) Time series Regressions: Distributed Lag Models (15.1-15.5); ADL models; (16.1).

*Ex 14.4; EX 15.1; 15.2; 15.4; 15.10;*

(4) Nonstationarity due to break: QLR test (14.7). *Ex 14.2;*

## **Miscellaneous**

***Classroom discipline: No laptop computer, No mutter. Cheating in any form will result in F. Every absence without permission will receive one step downgrade. For example, once, from B+ to B, twice from B+ to B- etc.***