

**Fulbright Economics Teaching Program**  
Academic Year 2015-2016

**Fall semester**

(5<sup>th</sup> Oct. 2015 – 22<sup>nd</sup> Jan. 2016)

**Quantitative Methods**

**Teaching team**

Instructors: Cao Hao Thi, Dinh Cong Khai, Le Viet Phu  
Tutor: Hoang Van Thang

**Class Meeting Time**

Tuesday & Thursday 10:15 to 11:45  
Friday 13:30 to 15:00

**Office hours**

Cao Hao Thi: Monday 17:00 – 19:00 or email for appointment  
Dinh Cong Khai: Tuesday 16:30 – 18:00 or email for appointment  
Le Viet Phu: Thursday 15:00 – 17:00 or email for appointment  
Hoang Van Thang: Monday and Wednesday 15:30-17:00 or email for appointment

Office hours are for groups or individual to exchange ideas and discuss the course material or to need more help. The timings of the office hours are sometimes changed to help the students before the exams and before the assignments due date.

If the timings of the office hours are not convenient, please feel free to make appointments at other times during the week to meet with members of the Teaching Team via email or faculty dropbox.

**Course Objectives and Description**

The Quantitative Methods course is designed with two objectives. The first is to provide participants with the ability to analyze critically quantitative and empirical analysis done by others and to use that analysis in the design of public policy. The second is to provide students with the skills necessary to perform quantitative policy analysis on their own.

The course includes two main parts:

- Applied statistics
- Econometrics

The applied statistics module will review fundamental concepts of statistics, including descriptive statistics, basic probability, probability distributions, sampling and sample

distribution, estimation and hypothesis testing. This module provides the foundation for participants to study econometric analysis.

The second half of the course is devoted to the teaching of fundamental tools of econometrics. The module introduces the standard methods for estimating relationships among observed social and economic variables and for testing hypotheses about their relationships. Participants will learn how to use models, data, and appropriate analysis to describe the real world and to contribute to policy discussions. Participants will be introduced to the power of econometric methods while also noted about their limitations. The focus will be on formulation, estimation, testing of econometric models, and discussing policy implications from econometric findings. In addition, participants will also learn how to carry out an empirical study through a term project. The course will required the use of specialized software packages such as Eviews, SPSS and Stata.

Given its technical nature, the Quantitative Methods course is a very challenging subject for participants. It is absolutely critical that participants have to maintain a steady pace of study. Simple memorization, and last-minute studying will not help to understand well the application to the real world. Therefore, if participants encounter any problems or have any questions, make sure to seek help from the teaching team as early as possible. It is important to understand concepts and develop the ability to apply them to the solutions of various problems. This takes practice. The lectures, textbooks, handouts, problem sets, and the term project are all designed to help our participants develop these skills.

## Course Requirements

Participants are required to read the assigned readings before the class. During the course participants will have to complete problem sets, a term project, and two exams associated with the two parts of the course.

The term project must be done by groups of five to six participants. A one-page project proposal must be submitted to the teaching team for approval on **11 December 2015**. A draft project report must be submitted on **29 December 2015** and the final report on **12 January 2016**. After that the teaching team will meet each group on **14 January 2016** and **15 January 2016** to evaluate the project and each student's contribution in the group project.

Participants are encouraged to form study groups on their own to discuss the lessons, problem sets and reviews together. However, each student has to complete his/her assignments using his/her own writings.

## Grading

Applied statistics:	40%
Problem sets:	15%
Exam:	25%
Econometrics:	60%
Problem sets:	15%
Term project:	20%
Exam:	25%

## Readings

### Statistics

1. Mendenhall, Beaver, and Beaver, *A Brief Course in Business Statistics*, 2<sup>nd</sup> Edition, Thompson South-Western, 2001. (Abbreviation: MBB2)
2. Cao Hào Thi, *Thống Kê Ứng Dụng trong Kinh Doanh* (Applied Statistics in Business), 1998.

### Econometrics

#### • Required readings

**Main Textbooks.** Lectures will be drawn mostly from two textbooks, both of which are available in English and Vietnamese. Specific chapter references are given in the course outline. Additional material will be distributed at appropriate times. This material will also be part of required readings.

1. *Introductory Econometrics with Applications*, 5<sup>th</sup> edition, by Ramu Ramanathan, Harcourt College Publishers, 2002. This textbook has been selected because it has a strong orientation towards applications and a clear exposition of modern econometric practice. The textbook has a good website at: <http://econ.ucsd.edu/~rramanat/embook5.htm>. (Abbreviation: RR5).
2. *Basic Econometrics*, 3<sup>rd</sup> edition, by Damodar Gujarati, McGraw-Hill, 1995. This book also has a useful website at: <http://www.mhhe.com/econometrics/gujarati4> (Please note that this website is associated with the 4<sup>th</sup> edition of the book.) ((Abbreviation: DG3)
3. *Introductory Econometrics: A Modern Approach*, 2nd edition by Jeffrey M. Wooldridge, South-Western, 2002 (Chapter 17). Students can refer to STATA code to simulate for the results in the book at: <http://fmwww.bc.edu/gstat/examples/wooldridge/wooldridge.html>. (Abbreviation: JW2)

**Exercises.** Several exercises and illustrative examples will be assigned and/or discussed in class at appropriate times. The purpose is to familiarize you with the various ways in which econometric techniques have been used to investigate “real world” problems and policy issues. These exercises will be drawn from the two main textbooks plus some case studies developed from the real context of Vietnam.

#### • Optional readings

The following optional readings are available in the FETP library.

*Econometrics and Data Analysis for Developing Countries* by Chandan Mukherjee, Howard White, and Marc Wuyts. This is very basic and applied.

*Econometric Models and Economic Forecasts*, third edition, by Robert S. Pindyck and Daniel L. Rubinfeld. This is somewhat out of date but the level is accessible. It is available in English and Vietnamese.

*Econometric Methods*, third edition, by J. Johnston. This is one of the classic texts for advanced undergraduates and beginning graduate participants.

*A Guide to Modern Econometrics* by Marno Verbeek, John Wiley & Sons, 2000 (Chapter 6 & 7).  
Abbreviation: Verbeek

*Econometric Analysis* by William H. Greene, 5th edition, Prentice Hall, 2002 (Chapter 21 & 22).  
Abbreviation: Greene

## Software

*Eviews* by Quantitative Micro Systems. *Eviews Learning Scripts* will be translated into Vietnamese and distributed.

*SPSS (Statistical Package for Social Sciences)*, Hoang Trong & Chu Nguyen Mong Ngoc, Hong Duc Publication House 2008

*STATA* by StataCorp LP, 11<sup>th</sup> or later edition.

## Schedule

### APPLIED STATISTICS

#### Week 1

□ Tuesday 06<sup>th</sup> Oct. 2015

Cao Hao Thi

#### Descriptive Statistics

Measures of central tendency: mean, median, and mode

- MBB2, Chapter 2

*Problem Set 1 Distributed*

□ Thursday 08<sup>th</sup> Oct. 2015

Cao Hao Thi

#### Descriptive Statistics

Measures of variability and correlation: variance, standard deviation, covariance and correlation

- MBB2, Chapter 2

#### Week 2

□ Tuesday 13<sup>th</sup> Oct. 2015

Cao Hao Thi

#### Basic Probability

Probability concepts  
Probability properties

- MBB2, Chapter 3, Sections 3.1-3.3

*Problem set 1 Due; Problem set 2 Distributed*

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☐ **Thursday 15<sup>th</sup> Oct. 2015**

**Cao Hao Thi**

**Conditional Probability**

Conditional probability  
Bayes' rule

- MBB2, Chapter 3, Sections 3.4-3.5

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☐ **Friday 16<sup>th</sup> Oct. 2015**

**Dinh Cong Khai/Hoang Van Thang**

**Review**

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**Week 3**

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☐ **Tuesday 20<sup>th</sup> Oct. 2015**

**Cao Hao Thi**

**Probability Distributions: Discrete Distributions**

Binomial distribution  
Poisson distribution

- MBB2, Chapter 3, Sections 3.6
- MBB2, Chapter 4

*Problem set 2 Due; Problem set 3 Distributed*

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☐ **Thursday 22<sup>nd</sup> Oct. 2015**

**Cao Hao Thi**

**Probability Distributions: Continuous Distributions**

Uniform distribution  
Normal distribution

- MBB2, Chapter 5

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☐ **Friday 23<sup>rd</sup> Oct. 2015**

**Dinh Cong Khai/Hoang Van Thang**

**Review**

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**Week 4**

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☐ **Tuesday 27<sup>th</sup> Oct. 2015**

**Cao Hao Thi**

**Sampling**

Sampling distribution  
The central limit theorem

- MBB2, Chapter 6

*Problem set 3 Due; Problem set 4 Distributed*

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☐ **Thursday 29<sup>th</sup> Oct. 2015**

**Dinh Cong Khai**

**Statistical Estimation**

Point estimation

Confidence Intervals

- MBB2, Chapter 7

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☐ **Friday 30<sup>th</sup> Oct. 2015**

**Dinh Cong Khai/Hoang Van Thang**

**Review**

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**Week 5**

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☐ **Tuesday 3<sup>rd</sup> Nov. 2015**

**Dinh Cong Khai**

**Hypothesis Testing**

Tests of Hypotheses for Population Means

Tests of Hypotheses for the Difference between Two Population Means

- MBB2, Chapter 8, Sections 8.1-8.5

*Problem set 4 Due; Problem set 5 Distributed*

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☐ **Thursday 05<sup>th</sup> Nov. 2015**

**Dinh Cong Khai**

**Hypothesis Testing**

Tests of Hypotheses for Population Proportions

Tests of Hypotheses for the Difference between Two Population Proportions

- MBB2, Chapter 8, Sections 8.7-8.8

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☐ **Friday 06<sup>th</sup> Nov. 2015**

**Cao Hao Thi/Hoang Van Thang**

**Review**

**ECONOMETRICS**

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**Week 6**

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☐ **Tuesday 10<sup>th</sup> Nov. 2015**

**Dinh Cong Khai**

**Introduction to Econometrics**

**Simple Regression: The Basic Model and OLS**

- RR5 Chapter 3, Sections 3.1 and 3.2; 3.A.3
- DG3 Chapter 2 and Chapter 3, Sections 3.1 and 3.2

*Problem set 5 due; Problem set 6 Distributed*

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☐ **Thursday 12<sup>th</sup> Nov. 2015**

**Dinh Cong Khai**

**Simple Regression: Properties of Estimators and Fitted Values**

- RR5 Chapter 3, Sections 3.3 and 3.4; 3.A.4, 3.A.6

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☐ **Friday 13<sup>th</sup> Nov. 2015**

**Cao Hao Thi**

**Review for midterm exam**

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## **Week 7**

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☐ **Tuesday 17<sup>th</sup> Nov. 2015**

**Cao Hao Thi**

**Term Project Introduction**

*Problem set 6 Due; Problem set 7 Distributed*

☐ **Thursday 19<sup>th</sup> Nov. 2015**

**Dinh Cong Khai**

**Simple Regression: Hypothesis Tests & Confidence Intervals**

- RR5 Chapter 3, Sections 3.5, 3.6, 3.8, 3.9, 3.10;
- DG3 Chapter 3, Section 3.5. Sections 3.6 - 3.8 optional.
- DG3 Chapter 5, Sections 5.1 - 5.8

☐ **Friday 20<sup>th</sup> Nov. 2015**

**Cao Hao Thi/Le Viet Phu**

**Review**

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## **Week 8**

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☐ **Monday 23<sup>th</sup> Nov. 2015**

**Cao Hao Thi, Dinh Cong Khai, Le Viet Phu**

**Midterm Exam (8:30 AM)**

**Exam for the Economic Degree Conversion Program (01:30 PM)**

## Week 9

❑ Tuesday 1<sup>st</sup> Dec. 2015

Dinh Cong Khai

### Multiple Regression: Introduction & Estimation

- RR5 Chapter 4, Sections 4.1 and 4.2
- DG3 Chapter 7, Sections 7.1 - 7.5

*Problem set 7 Due; Problem set 8 Distributed*

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❑ Thursday 3<sup>rd</sup> Dec. 2015

Dinh Cong Khai

### Multiple Regression: Estimation (Continued)

- RR5 Chapter 4, Sections 4.1 and 4.2
- DG3 Chapter 7, Sections 7.1 - 7.5

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❑ Friday 4<sup>th</sup> Dec. 2015

Cao Hao Thi/ Le Viet Phu

### Review

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## Week 10

❑ Tuesday 08<sup>th</sup> Dec. 2015

Dinh Cong Khai

### Multiple Regression: Model Selection and Hypothesis Testing

- RR5 Chapter 4, Sections 4.3 and 4.4
- DG3 Chapter 8, Sections 8.1 - 8.5

*Problem set 8 Due; Problem set 9 Distributed*

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❑ Thursday 10<sup>th</sup> Dec. 2015

Dinh Cong Khai

### Multiple Regression: Model Selection and Hypothesis Testing (continued)

- RR5 Chapter 4, Sections 4.3 and 4.4
- DG3 Chapter 8, Sections 8.1 - 8.5

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❑ Friday 11<sup>th</sup> Dec. 2015

Cao Hao Thi/ Le Viet Phu

### Review

### Proposal of Term Project Due



## Week 11

❑ Tuesday 15<sup>th</sup> Dec. 2015

Dinh Cong Khai

**Specification Error:**

**Omission of Relevant Variables and Inclusion of Irrelevant Ones**

- RR5, Section 4.5
- DG3, Chapter 13

*Problem set 9 Due; Problem set 10 Distributed*

❑ Thursday 17<sup>th</sup> Dec. 2015

Dinh Cong Khai

**Functional Form**

- RR5, Sections 6.1 - 6.12
- DG3, Sections 6.3, 7.10, 7.11

❑ Friday 18<sup>th</sup> Dec. 2015

Dinh Cong Khai

**Qualitative Independent Variables (Dummy Variables)**

- RR5, Chapter 7
- DG3, Chapter 15

## Week 12

❑ Tuesday 22<sup>nd</sup> Dec. 2015

Le Viet Phu

**Logit and Probit models for binary dependent variable:**

- JW2, Chapter 17
- Further readings: Verbeek, Chapter 6-7; Greene, Chapter 21-22

*Problem set 10 Due; Problem set 11 Distributed*

❑ Thursday 24<sup>th</sup> Dec. 2015

No class

❑ Friday 25<sup>th</sup> Dec. 2015

No class

## Week 13

❑ **Tuesday 29<sup>th</sup> Dec. 2015**

**Le Viet Phu**

**Tobit model and censored and truncated regression model**

- JW2, Chapter 17
- Further readings: Verbeek, Chapter 7; Greene, Chapter 22

*Problem set 11 Due; Problem set 12 Distributed*

**First Draft of Term Project Due**

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❑ **Thursday 31<sup>st</sup> Dec. 2015**

**No class**

❑ **Friday 1<sup>st</sup> Jan. 2016**

**No class**

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**Week 14**

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❑ **Tuesday 5<sup>th</sup> Jan. 2016**

**Le Viet Phu**

**Lab Practice: Lessons on Stata and exploring VHLSS (1)**

*Problem set 12 Due; Problem set 13 Distributed*

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❑ **Thursday 7<sup>th</sup> Jan. 2016**

**Le Viet Phu**

**Lab Practice: Lessons on Stata and exploring VHLSS (2)**

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❑ **Friday 08<sup>th</sup> Jan. 2016**

**Le Viet Phu**

**Review**

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**Week 15**

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❑ **Tuesday 12<sup>th</sup> Jan. 2016**

**Le Viet Phu**

**Empirical Study, strategy of developing and diagnosing regression models**

*Problem set 13 Due*

**Term project due**

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☐ **Thursday 14<sup>th</sup> Jan. 2016**

**Morning: Final review**

**Cao Hao Thi, Dinh Cong Khai, Le Viet Phu**

**Afternoon: Term project presentation**

**Cao Hao Thi, Dinh Cong Khai, Le Viet Phu**

☐ **Friday 15<sup>th</sup> Jan. 2016**

**Cao Hao Thi, Dinh Cong Khai, Le Viet Phu**

**Term project presentation**

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***Week 16***

☐ **Friday 22<sup>nd</sup> Jan. 2016**

**Cao Hao Thi, Dinh Cong Khai, Le Viet Phu**

**Final exam**

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