

Fulbright Economics Teaching Program
Academic Year 2010-2011

Fall semester

(04/10/2010 - 21/01/2011)

Quantitative Methods

Teaching team

Instructors: Cao Hao Thi, Dinh Cong Khai
Co-instructors: Le Thi Quynh Tram, Nguyen Khanh Duy

Class Meeting Time

| | |
|-----------|----------------|
| Monday | 08:30 to 10:00 |
| Wednesday | 08:30 to 10:00 |
| Friday | 08:30 to 10:00 |

Office hours

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|--------------------|-------------------------|
| Cao Hao Thi: | Monday 17:15 – 19:15 |
| Dinh Cong Khai: | Wednesday 15:00 – 18:00 |
| Le Thi Quynh Tram: | Thursday 14:30 – 17:30 |
| Nguyen Khanh Duy: | Tuesday: 16:30 – 17:30 |
| | Wednesday: 7:30 – 8:30 |
| | Friday: 7:30 – 8:30 |

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.

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 require 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 03 December 2010. A draft project report must be submitted on 17 December 2009 and the final report on 17 January 2011.

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*, 2nd 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*, 5th edition, by Ramu Ramanathan, Harcourt College Publishers, 2003. 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*, 3rd 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 4th edition of the book.) ((Abbreviation: DG3))

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.

Software

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

SPSS (Statistical Package for Social Sciences) for Windows by Dr. Vo Van Huy, Vo Thi Lan, and Hoang Trong.

Schedule

APPLIED STATISTICS

Week 1

Monday 04/10/2010

Cao Hao Thi

Descriptive Statistics

Measures of central tendency: mean, median, and mode

- MBB2, Chapter 2

Problem Set 1 Distributed

Wednesday 06/10/2010

Cao Hao Thi

Descriptive Statistics

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

- MBB2, Chapter 2

Friday 08/10/2010

Le Thi Quynh Tram

Review

Week 2

Monday 11/10/2010

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

Wednesday 13/10/2010

Cao Hao Thi

Conditional Probability

Conditional probability
Bayes' rule

- MBB2, Chapter 3, Sections 3.4-3.5

Friday 15/10/2010

Le Thi Quynh Tram

Review

Week 3

☐ **Monday 18/10/2010**

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

☐ **Wednesday 20/10/2010**

Cao Hao Thi

Probability Distributions: Continuous Distributions

Uniform distribution

Normal distribution

- MBB2, Chapter 5

☐ **Friday 22/10/2010**

Le Thi Quynh Tram

Review

Week 4

☐ **Monday 25/10/2010**

Cao Hao Thi

Sampling

Sampling distribution

The central limit theorem

- MBB2, Chapter 6

Problem set 3 Due; Problem set 4 Distributed

☐ **Wednesday 27/10/2010**

Dinh Cong Khai

Statistical Estimation

Point estimation

Confidence Intervals

- MBB2, Chapter 7

☐ **Friday 29/10/2010**

Le Thi Quynh Tram

Review

Week 5

☐ **Monday 01/11/2010**

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

☐ **Wednesday 03/11/2010**

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 05/11/2010**

Le Thi Quynh Tram

Review

Week 6

☐ **Monday 08/11/2010**

Cao Hao Thi

Lab Practice: Introduction to Statistical Software Packages

Problem set 5 Due

☐ **Wednesday 10/11/2010**

Cao Hao Thi

Introduction to the Term Project

☐ **Friday 12/11/2010**

Cao Hao Thi

Review for Mid-term Exam

ECONOMETRICS

Week 7

☐ **Monday 15/11/2010**

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 6 Distributed

☐ **Wednesday 17/11/2010**

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

☐ **Friday 19/11/2010**

Nguyen Khanh Duy

Review

Week 8

☐ **Monday 22/11/2010**

Mid-term Exam

☐ **Tuesday 23/11/2010**

Exam for the Economic Degree Conversion Program

Week 9

☐ **Monday 29/11/2010**

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

Problem set 6 Due; Problem set 7 Distributed

☐ **Wednesday 01/12/2010**

Cao Hao Thi

Introduction to Eviews (Class Demo)

☐ **Friday 03/12/2010**

Nguyen Khanh Duy

Review

Proposal of Term Project Due

Week 10

☐ **Monday 06/12/2010**

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

☐ **Wednesday 08/12/2010**

Dinh Cong Khai

Multiple Regression: Estimation (Continued)

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

☐ **Friday 10/12/2010**

Nguyen Khanh Duy

Review

Week 11

☐ **Monday 13/12/2010**

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

☐ **Wednesday 15/12/2010**

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

☐ **Friday 17/12/2010**

Cao Hao Thi

Review

First Draft of Term Project Due

Week 12

☐ **Monday 20/12/2010**

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

☐ **Wednesday 22/12/2010**

Dinh Cong Khai

Functional Form

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

☐ **Friday 24/12/2010**

Nguyen Trong Hoai

Empirical Study

Week 13 (27/12/2010 - 2/1/2011): No Classes

Week 14

- Monday 03/01/2011** **Cao Hao Thi**
Empirical Study & Modeling Strategy
Problem set 10 Due; Problem set 11 Distributed
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- Wednesday 05/01/2011** **Dinh Cong Khai**
Qualitative Independent Variables (Dummy Variables)
 - RR5, Chapter 7
 - DG3, Chapter 15
-

- Friday 07/01/2011** **Nguyen Khanh Duy**
Review

Week 15

- Monday 07/12/2009** **Nguyen Trong Hoai**
Empirical Study
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- Wednesday 09/12/2009** **Dinh Cong Khai**
Limited Dependent Variable
 - DG3, Chapter 16
-

- Friday 11/12/2009** **Cao Hao Thi**
Final Review
Problem set 11 Due
Final Draft of Term Project Due

Week 16

- Monday 17/01/2011**
Term project Presentation

- Friday 21/01/2011**
Final exam