

CITY UNIVERSITY

MSc in ECONOMIC REGULATION AND COMPETITION ECM102 Quantitative Techniques for Regulation and Competition

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Overview

This module is designed to provide an introduction to statistical techniques and econometrics with special emphasis on hypothesis testing and regression analysis. Successful students will then possess the foundation to apply the techniques used in the second term, in the module *Quantitative Techniques for Regulation and Competition in Practice*.

This module is essential for those students whose professional activities lead them to collect and extract information from the data, or who need to evaluate estimates provided by others, who may be interested parties to the interpretation of data. It also meets the needs of graduates who feel they would benefit from knowledge of statistical inference and econometric tools.

Objectives

By the end of the unit, students will be familiar with the analysis of single and multivariate data sets, with and without the aid of a computer, and to apply a number of statistical and econometric techniques.

Students will learn to measure the direction and magnitude of a relationship, and forecasting the probability of events or the values of variables.

Students should acquire a good knowledge of the most commonly-used statistical functions of Excel, and a basic ability to record and modify macros.

Students should be able to build simple statistical models in order to test hypothesis on economic or other type of data. They should be able to place a real-world problem into the statistical context.

Website

The website for this course is in <http://www.city.ac.uk/economics/staff/banal-estanol/index.html>. Here you will find the course outline, announcements about material, changes in office hours, and other important information.

Teaching

The module starts on September 29th and lasts for ten weeks. In each week, there will be a three hour session comprising:

- a one-hour lecture
- a one-hour exercise period, where we will go through mathematical exercises
- a one-hour laboratory session, where we will work through problems in Excel.

Each aspect of the teaching is important. The conceptual issues dealt with in the lectures should give you a rationale for what we do in practical terms in the exercises and the computer laboratory. However, it is essential to realise that for most people “understanding” in statistics emerges from practice.

You will need to have registered and obtained a username and password to use the computing laboratory, even in week 1.

Assessment:

Assessment for the whole module (10 weeks of 3-hour weekly lecture/lab sessions) will be on the basis of a 2hr written examination plus an assessed essay to be completed by December 8th. Coursework will be set at least 4 weeks in advance of the deadline.

Textbooks

Main Reading:

The main texts for this module are:

Statistics and Econometrics – Methods and Applications, by O. Ashenfelter, P.B. Levine and D.J. Zimmerman, Johan Wiley & Sons, 2003. [Henceforth **OLZ**]

Business and Economic Statistics using Microsoft Excel, by K. Black and D. Eldredge, Prentice Hall, 2002. [**BE**]

Students who have never learnt econometrics before should find OLZ more encouraging than other textbooks, especially for the later sections of the course. It also gives a quick introduction to section 1 from an applied view. It is clear and concise and provides most of the intuition students will need to understand the course. The examples and exercises are also good. Apart from specific applications mentioned in lectures, the book defines the scope of the term’s lecture material. **It is highly recommended that you purchase it as we will be doing exercises taken from the end chapters.**

Spreadsheet programs such as Microsoft Excel allow calculations to be carried out quickly and efficiently. BE links the theory with practice. A CD-ROM accompanying the text contains software in the form of an Excel add-in which enhances Excel's statistical capabilities. Using this book will help you know which buttons to press in the lab exercises.

Further Reading:

Sometimes you just cannot get to grips with the way a particular author describes something. In such cases additional reading can help. For example:

Introduction to Econometrics by Christopher Dougherty 2nd edition, 2002 [D].

Statistics for Business and Economics Microsoft Excel Enhanced by Heinz Kohler. South Western 2002. [K]

Econometric Analysis by William H., Greene. [G]

D is an alternative to OLZ and K is an alternative to BE. Finally, G is more advanced and contains much more than we can cover in this module but it will be very useful reference for your future use.

There are several other books on econometric techniques that are appropriate for this module! Different people have different ways of learning and understanding. If you find a text that suits you, use it.

Course Outline

- 1) Data and its analysis, Random Experiment – Basic probability theory
- 2) Empirical and Theoretical distributions of random variables
- 3) Measures of central tendency, dispersion, skewness, etc.
- 4) Multivariate distributions (conditional distribution, independence and correlation)
- 5) Sampling and Sampling distributions
- 6) Point and Interval estimation, hypothesis testing (comparing sample means, etc.)
- 7) Regression Analysis: introduction
- 8) Multiple Regression Analysis and extensions
- 9) Regression Analysis: violation of the classical assumptions
- 10) Introduction to more advanced topics