



Universidad
Carlos III de Madrid

FACULTAD DE CIENCIAS SOCIALES Y JURÍDICAS

Studies in Finance and Accounting

ACADEMIC YEAR 2011/2012

Second Year – Spring Term

Number of Credit Points: 6
"Econometrics I"
Department of Statistics

Maria Helena Lopes Moreira da Veiga
Coordinator



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Academic Year: 2011/2012

Departamento de Estadística

Basic Studies

Credit Points: 6

Year: 2^o

Term: Spring

Coordinating Professor: Maria Helena Lopes Moreira da Veiga

COMPETENCES THE STUDENT ACQUIRES AND COVERED MATERIAL:

SPECIFIC COMPETENCES: After successfully finishing the course, the student will be able to evaluate the relations between economic variables by applying regression models. For example, the student would be able to run a regression between the returns and the volatility in a determined market. However, since real-life data rarely satisfies the underlying assumptions of the regression model, the student will also learn how to modify the model or the estimation methods in order to be able to confront the usual problems of the data analysis. To be more concrete, the course will cover the following topics: qualitative explanatory variables, heteroskedasticity, the correlation among explanatory variables, and endogeneous variables. The student will also learn how to test economic or financial theories using real-life data.

ADDITIONAL COMPETENCES:

1. Capacity to analyze and synthesize.
2. The use of computer software for the econometric analysis.
3. Solving problems.
4. Team work.
5. Critical thinking.
6. Oral and written communication.

SHORT DESCRIPTION OF THE PROGRAMME:

In this course, the fundamental concepts for being able to apply the regression to measure the relation between economic variables is taught. In particular, the following topics will be covered throughout the course.

1. Testing linear relationship between the variables contained in the model. These tests are of special interest to study whether the relation postulated by the economic theory is present in the actual data.
2. The use of dummy variables in order to introduce into the model the effect of quantitative explanatory variables or other effects that are difficult to measure.
3. Multicollinearity between the explanatory variable is a common problem in the econometric analysis. The standard techniques how to deal with this problems are covered.



4. The regression model in the presence of heteroskedasticity. It is common that the uncertainty about economic variables is not constant over time, which will be reflected in the empirical data. In these circumstances, the properties of the estimators change and it could be necessary to consider alternative estimation techniques to this problem into account.
5. Finally, the problem of endogeneity of variables is considered. In this case, the use of instrumental variables to obtain estimators with “nice” properties will be explained.

PROGRAMME

0. Motivation and review of previous concepts
1. Inference in the multiple regression model
 - 1.1 Basic concepts
 - 1.2 Sampling distributions of the OLS estimators
 - 1.3 Testing hypotheses about a single population parameter
 - 1.4 Confidence intervals
 - 1.5 Testing hypotheses about a single linear combination of parameters
 - 1.6 Testing multiple linear restrictions: the F-test
2. Multiple regression with dummy variables
 - 2.1 Describing qualitative information
 - 2.2 A single dummy independent variable
 - 2.3 Using dummy variables for multiple categories
 - 2.4 Interactions involving dummy variables
 - 2.5 A binary dependent variable: The linear probability model
3. Multicollinearity
 - 3.1 Perfect collinearity
 - 3.2 The effects of multicollinearity
 - 3.3 Indicators of multicollinearity
4. Heteroskedasticity
 - 4.1 Consequences of heteroskedasticity for the OLS estimator
 - 4.2 Robust estimation of heteroskedasticity
 - 4.3 Tests for heteroskedasticity
 - 4.4 Generalized least squares estimation
5. Endogenous Regressors
 - 5.1 Causes of endogeneity
 - 5.2 Tests for endogeneity
 - 5.3 Instrumental variables

ACTIVITIES AND METHODOLOGIES

The theoretical classes (3ECTS) will be held in a classroom using the whiteboard and audiovisual content. All overhead slides used during the classes will be made available on the webpage of the course. The collected problem sets that will have

