200625 - AE - Econometric Analysis

Coordinating unit: 200 - FME - School of Mathematics and Statistics
Teaching unit: 1004 - UB - (ENG)Universitat de Barcelona
Academic year: 2018
Degree: MASTER'S DEGREE IN STATISTICS AND OPERATIONS RESEARCH (Syllabus 2013). (Teaching unit Optional)
ECTS credits: 5
Teaching languages: Spanish

Teaching staff
Coordinator: ERNEST PONS FANALS
Others: Primer quadrimestre:
       ERNEST PONS FANALS - A

Opening hours
Timetable: Hours to be arranged

Prior skills
The course assumes a level of knowledge of statistics similar to what you can assume as prior access to the master. Students should be familiar with the concepts of hypothesis testing and statistical significance in a lineal model framework. Concepts necessary to follow the course can be found for example in the text "Practical Regression and Anova using R " available on the R website (http://cran.r-project.org/doc/contrib/Faraway-PRA.pdf).

Degree competences to which the subject contributes

Specific:
5. CE-1. Ability to design and manage the collection of information and coding, handling, storing and processing it.
6. CE-2. Ability to master the proper terminology in a field that is necessary to apply statistical or operations research models and methods to solve real problems.
7. CE-8. Ability to discuss the validity, scope and relevance of these solutions and be able to present and defend their conclusions.

Transversal:
3. EFFECTIVE USE OF INFORMATION RESOURCES: Managing the acquisition, structuring, analysis and display of data and information in the chosen area of specialisation and critically assessing the results obtained.
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Teaching methodology

Own teaching of the subject is based on the use of teaching resources listed below:

- Lectures attending classes (main agent: teacher)
- Practical classes in the computer lab classroom-based (main actors: website)
- Independent work of students (main actors: students).

Students to submit the contents of a theoretical nature of the lesson, complete with practical exercises in the keynote sessions.

In practical computer sessions are designed to bring students to use theoretical concepts studied in previous classes. To perform this task students will follow a guided practice.

Learning objectives of the subject

It is expected that once the course is completed, students are able to master the basic econometric methods and techniques as well as the vocabulary and concepts of econometrics own. In addition to identifying the problems that can be treated with econometric tools, raise them properly and incorporates the results of econometric analysis to the process of decision making.

All this leads to in the work plan of the course the fundamental theoretical aspects of Econometrics with other more applied those combined. In this sense, one of the objectives to consider when teaching the course syllabus is to find the balance between formalism in the development of content and applicability from free software known to students as R.

Specifically, it is intended that students have fundamental knowledge regarding the use of econometric models adapted to each of the following situations: models for time series models to panel data models with qualitative dependent variables and models for spatial data.

Study load

<table>
<thead>
<tr>
<th>Total learning time: 125h</th>
<th>Hours large group: 30h</th>
<th>24.00%</th>
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<tbody>
<tr>
<td></td>
<td>Hours medium group: 0h</td>
<td>0.00%</td>
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<tr>
<td></td>
<td>Hours small group: 15h</td>
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<td></td>
<td>Guided activities: 0h</td>
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<td>Self study: 80h</td>
<td>64.00%</td>
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# Content

## ECONOMETRIC MODELS

<table>
<thead>
<tr>
<th>Learning time: 9h</th>
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<tbody>
<tr>
<td>Theory classes: 6h</td>
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<tr>
<td>Laboratory classes: 3h</td>
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**Description:**
1.1. Concept and Content
1.2. The standard model of multiple linear regression
1.3. Inference and Prediction
1.4. Econometric Models specification
1.5. Stages in econometric research

## TIME SERIES ECONOMETRIC MODELS. UNIT ROOTS

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<tr>
<td>Laboratory classes: 3h</td>
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**Description:**
2.1. Introduction.
2.2. Unit root tests.
2.3. Cointegration concept.
2.4. Cointegration tests.
2.5. Modelling cointegrated series using cointegration error models.

## ECONOMETRIC MODELS FOR PANEL DATA

<table>
<thead>
<tr>
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<tr>
<td>Theory classes: 6h</td>
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<td>Laboratory classes: 3h</td>
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**Description:**
3.1. Panel data and non observable effects (individual and temporary).
3.2. Static models: Alternative estimators and comparison of methods.
3.3. Dynamic models: implications for new static estimators and estimators.
3.4. Applications
The evolution model assessment will be the subject of ongoing evaluation. Given the empirical nature of the course, the assessment is based on two types of activities:

A. The practical activities. Throughout the semester performing a set of activities that will be announced at the beginning of the course (50%) will be proposed.

B. A final test (50%)

### Bibliography

**Complementary:**


**Others resources:**

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<table>
<thead>
<tr>
<th>ECONOMETRIC MODELS FOR LIMITED DEPENDENT VARIABLE</th>
<th>Learning time: 9h</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description:</td>
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<td>Laboratory classes: 3h</td>
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<table>
<thead>
<tr>
<th>ECONOMETRIC MODELS FOR SPATIAL DATA</th>
<th>Learning time: 9h</th>
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<tr>
<td>Description:</td>
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<td>Laboratory classes: 3h</td>
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**Qualification system**

The evolution model assessment will be the subject of ongoing evaluation. Given the empirical nature of the course, the assessment is based on two types of activities:

A. The practical activities. Throughout the semester performing a set of activities that will be announced at the beginning of the course (50%) will be proposed.

B. A final test (50%)

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Learning time:

- Theory classes: 6h
- Laboratory classes: 3h

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4.1. Binary choice model.
4.2. Logit and probit models.
4.3. Multinomial models.
4.4. Count data models.

5.1. Definition of spatial autocorrelation.
5.2. Causes and consequences of spatial dependence in a regression model
5.3. Contrast and estimation with spatial dependence.
5.4. Definition of spatial heterogeneity.
5.5. Causes and consequences of spatial heterogeneity in a regression model.
5.6. Contrast and estimation with spatial heterogeneity.