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**Course Information**

<b>Course name:</b>	Financial Econometrics
<b>Credits</b>	4 EC / 112 hours
<b>Time period</b>	Semester 1 / Block 1
<b>Instructor(s)</b>	Jonas Meier, REC E5.32, j.c.meier@uva.nl

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**Objectives:**

Statistical and econometric models are used in various parts of modern portfolio theory and international finance. Therefore, a working knowledge of these models is indispensable for a reliable quantitative assessment of these issues. This course develops skills for the econometric analysis of macroeconomic and financial data, with a particular emphasis on regression theory and time series analysis. The methods taught will enable students to read and interpret empirical literature, which is required for many subjects in international finance.

Upon completing this course, students will have:

- Familiarity with the linear regression model, including the ability to test for any deviation from its assumptions, and to find proper solutions;
- A working knowledge of several extensions of the basic model, in particular, panel data and time series models (e.g. AR, MA, ARMA);
- Ability to carry out an empirical project: interpreting estimation and testing results (e.g. from a regression package like Python) and building a satisfactory empirical model;
- Ability to judge the corresponding estimation and testing results from empirical literature.

**Contents:**

- Estimation and testing in the simple and multiple linear regression model
- Violation of classical assumptions: autocorrelation, heteroskedasticity, specification errors, endogeneity, instrumental variables estimation;
- Prediction and forecasting, testing for structural change;
- Panel data models;
- Time series models: dynamic regression models, ARIMA models, Box-Jenkins analysis.

**Format:**

Six lectures of 3.5 hours per week. Each lecture will be a mix of new material, discussing exercises, and live presentations in Python.

**Study material:**

- Brooks, C. (2019), *Introductory Econometrics for Finance*. Cambridge University Press, 4th edition. ISBN13: 9781108436823 (60 EUR);
- Tao, R. and Brooks, C. (2019), *Python Guide to Accompany Introductory Econometrics for Finance 4<sup>th</sup> edition*. Cambridge University Press. (Freely available from book's resources website: [https://www.cambridge.org/download\\_file/1004256](https://www.cambridge.org/download_file/1004256));
- Additional material (slides, articles, data-sets, assignments), to be made available via Canvas.

**Schedule:**

Week 1	<p><b>The classical linear regression model</b></p> <ul style="list-style-type: none"> <li>• <i>Read:</i> Brooks, Chapters 1 to 3 (Sections 1.5–1.7 and Chapter 2 may be used as mathematics and statistics refreshers)</li> <li>• <i>Exercises:</i> 3.5–3.8</li> </ul>
Week 2	<p><b>Multiple regression</b></p> <ul style="list-style-type: none"> <li>• <i>Read:</i> Brooks, Chapter 4</li> <li>• <i>Exercises:</i> 4.2, 4.4, 4.6, 4.8</li> <li>• <i>Assignments:</i> Assignment 1</li> </ul>
Week 3	<p><b>Model assumptions and diagnostic tests</b></p> <ul style="list-style-type: none"> <li>• <i>Read:</i> Brooks, Chapter 5 (skip 5.5.3–5.5.4 and 5.12–5.14)</li> <li>• <i>Exercises:</i> 5.3–5.7</li> <li>• <i>Assignments:</i> Hand in Assignment 1</li> </ul>
Week 4	<p><b>Introduction to time-series analysis</b></p> <ul style="list-style-type: none"> <li>• <i>Read:</i> Brooks, Chapter 6 (skip 6.9) and Sections 8.1 and 8.2</li> <li>• <i>Exercises:</i> 6.3, 6.8, 6.9, 8.2, 8.3</li> <li>• <i>Assignments:</i> Assignment 2</li> </ul>
Week 5	<p><b>Simultaneity and instrumental variables</b></p> <ul style="list-style-type: none"> <li>• <i>Read:</i> Brooks, Sections 7.1 to 7.9</li> <li>• <i>Exercises:</i> 7.1 (b)–(d), 7.2 (skip the ILS part in question (d))</li> <li>• <i>Assignments:</i> Hand in Assignment 2</li> </ul>
Week 6	<p><b>Panel data</b></p> <ul style="list-style-type: none"> <li>• <i>Read:</i> Brooks, Sections 11.1 to 11.7</li> <li>• <i>Exercises:</i> 11.1, 11.2</li> </ul>

**Assessment:**

- Group assignments (25%);
- Proctored two-hour examination: written, closed book, open questions (75%)

Students can bring a “cheat sheet” to the exam (1 double sided A4 page, handwritten). The group assignment consists of a written report on an empirical project to be done in Python.



In order to pass the course, the final exam grade must be 5.0 or higher and the weighted course average must be 5.5 or higher. In the case of a resit, the results obtained for partial assignments will remain valid. The resit covers the same material and has the same format as original examination.

If the student does not receive a pass grade for the course in the current study year, the student has to take the whole course again in the next year. This includes attending all lectures, group assignments and the final exam.

**Examination date:**

Tuesday October 25<sup>th</sup>, 19:00–21:00