FEB22009 Introductory Seminar
Case Studies Econometrics and Operations Research

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This document contains information about the set-up and content of the courses

- FEB22009 Basiswerkcollege Case Studies Econometrie en Operationele Research (Bachelor Econometrie en Operationale Research)
- FEB22009X Introductory Seminar Case Studies Econometrics and Operations Research (International Bachelor Econometrics and Operations Research)
- FEB22009S Basiswerkcollege Case Studies Econometrie en Operationele Research (Pre-Master Econometrics and Management Science)
- FEB22009XS Introductory Seminar Case Studies Econometrics and Operations Research (International Pre-Master Econometrics and Management Science)

For the most part, the set-up and content of the four courses is identical. The main difference is that students taking the courses FEB22009 and FEB22009X need to complete all three cases, whereas students taking the courses FEB22009S and FEB22009XS only need to complete the case that is relevant for the Master programme in which they intend to enroll after completing the pre-master programme. Specifically:

- Students in the pre-master for the MSc in Quantitative Finance or the pre-master for the MSc in Econometrics only need to do the first case.
- Students in the pre-master for the MSc in Quantitative Marketing only need to do the second case;
- Students in the pre-master programme for the MSc in Operations Research and Quantitative Logistics only need to do the last case;

Other differences are indicated in this document whenever applicable.

If you have any questions about the set-up of the course, please post them on the forum on Blackboard.

Contents

1 Course aims

The Introductory Seminar Case Studies Econometrics and Operations Research has multiple aims:

- Learning how to approach and analyze a practical economic decision problem;
- Translating the problem into a mathematical or statistical model;
- Implementing / Analyzing the model using suitable software;
- Interpreting the results obtained, and translating these into practical implications;
- Presenting research findings in writing;
- Working in teams.

1.1 Major tracks

The introductory seminar is also intended to give an impression of the four different major tracks within the bachelor programme in econometrics (as well as the subsequent tracks within the MSc programme in Econometrics and Management Science). For this reason multiple short cases are studied, where each focuses on one (or two) of the four major tracks. In addition, at the end of the course a special session is organized, where more detailed information is provided about the different major tracks.

2 Course structure

2.1 Skills in writing

In parallel to the cases, you should work on a skills-in-writing course. This course is a self-study course with online assessment. Students in FEB22009(S) follow the book "Zelf leren schrijven voor economie en bedrijfskunde" and use the accompanying web site[1] to complete the exercises. Students in FEB22009X(S) use the book "Academic writing skills" with accompanying web site[2]. All exercises must be individually completed by the end of the seventh week. Note that *failure to complete the skills-in-writing course by week seven means that you will fail the entire course*!

[1] `www.zelflerenschrijven-eb.nl`

[2] `www.academicwritingskillscourse.com`

2.2 Cases

During this seminar you will study three different cases. Each case takes about two weeks and has a different team of supervisors. The cases are independent of each other and are based on the different major tracks within the bachelor programme in econometrics:

1. Case 1: Quantitative Finance and Econometrics (Andreas Pick)
2. Case 2: Quantitative Marketing (Richard Paap)
3. Case 3: Operations Research (Dennis Huisman and Adriana Gabor)

The cases are studied in teams of four students. The composition of the teams is the same for all three cases, see Section 3.1.

Note that students taking the courses FEB22009 and FEB22009X need to complete all three cases, whereas students taking the courses FEB22009S and FEB22009XS only need to complete the case that is relevant for the Master programme in which they intend to enroll after completing the pre-master programme (see page 1).

2.3 Schedule

The precise schedule is published in a separate document. In general, however, the set-up of each of the three cases is as follows:

- A case starts with an introductory meeting, in which the case supervisor sketches the economic decision problem that will be studied, and the main research questions that need to be answered. This may also include an introduction to the relevant econometric techniques and/or software packages that need to be used for the case.
- Two or three days after the introductory session each team needs to submit a research proposal of two pages maximum, containing the plan of attack for the case, which should lead to satisfactory answers to the main research questions. Specific requirements for the research proposals may vary between the cases and will be indicated during the case introduction meetings and in the case descriptions. The research proposal will be discussed with the case supervisor during a short (team-wise) meeting at the end of the first week.
- For each case, computer labs have been reserved on three or four (almost) complete days to guarantee that you can access the relevant software. It is highly recommend to use this possibility to work on the case. The lab sessions are unsupervised. Note that the cases are rather extensive and may require time in addition to the lab sessions.

- During one of the days with lab sessions each team has a compulsory meeting of 15 minutes with the supervisor. The main goal of the meeting is to discuss the team's research proposal. Questions, problems, and other issues concerning the case can also be discussed. The exact schedule of the meetings will be made available through Blackboard. Attendance is compulsory for all team members.
- An additional, voluntary consultation meeting is available halfway through the case period. In case you would like to make use of this possibility, please prepare this meeting in advance to use the available time efficiently.
- Each team writes a report for each of the three cases – see Section 4 for further information about the structure and content of this report.

2.4 Supervision / Questions

The supervisors are available for questions and discussion during the case introduction meeting, the compulsory meeting, and the voluntary consultation hours. Other than that, the cases should be analyzed independently. You can to ask general questions, for example, to clarify certain aspects of the case. Questions such as "Is this the right solution?" should be avoided and, in any case, will not be answered, and this includes questions to other staff members. Should it become apparent that the work is based on outside help then the grade will be lowered accordingly. Please post questions on the Blackboard discussion forum and the relevant case supervisors will reply as soon as possible (emails will generally not be answered). Questions about the set-up of the course should also be posted on the Blackboard discussion forum.

2.5 Submitting research proposals and final reports

All relevant documents for the cases (description, data sets, academic papers) will be made available through Blackboard. Blackboard will also be used for submitting the research proposals and final reports. Both should be in PDF format.

Research proposal

The research proposal for each of the three cases should be submitted via the "Content" section on Blackboard. Go to "Content" and choose the relevant case. Next it is possible to upload a file. Indicate your team number under "Comments". Check whether everything has been filled out correctly and whether the correct file has been attached, and then *Submit*. Please note that the option "Save as Draft" does not submit anything!

The document should have the following name: two letters indicating the case (OR for Operations Research; QM for Quantitative Marketing, and FE for Quantitative Finance and Econometrics) followed by the team number and `RP.pdf`. For example, the research proposal of team 12 for the case Quantitative Marketing has the name `QM12RP.pdf`.

Final report

The final report should be submitted via Blackboard just as the research proposal. The document should have the following name: two letters indicating the case (OR for Operations Research; QM for Quantitative Marketing, and FE for Quantitative Finance and Econometrics) followed by the team number and `FR.pdf`. For example, the final report of team 3 for the case Operations Research has the name `OR3FR.pdf`.

3 Working in teams

3.1 Team formation

The cases are studied in teams of four students. The composition of the teams is the same for all three cases. It is possible to indicate your preferences for (a maximum of three) fellow team members by sending an e-mail to the course coordinator, before Friday, 2 May, 14:00h. In case all four team members have common preferences, a single e-mail on behalf the team is sufficient (but please clearly indicate in your e-mail that you are writing on behalf of the complete team). If you do not send an email (or are included in one) you will be allocated to a team by the course coordinator.

3.2 Availability and compulsory attendance

The Introductory Seminar is one of several courses in the bachelor programme in econometrics where you need to work in teams. As indicated in the study guide, we expect that you are available to work on the cases during the complete block of seven weeks (for FEB22009 and FEB22009X) or during the complete period of the relevant case (for FEB22009S and FEB22009XS).

Attendance is compulsory at (i) the introduction meetings for all three cases, (ii) and the team meeting with the case supervisor to discuss the research proposal. Failure to attend will result in a deduction of 0.5 from the final grade for each missed introduction session or meeting. As lab sessions are unsupervised, they are neither compulsory nor will attendance be registered.

3.3 Problems

The research projects are conducted in teams, which implies that the work will have to be divided efficiently and cooperation among the team members will have to be optimal in order to obtain the best possible results. In some (rare) instances not everyone makes an equal contribution.

- Report "free-rider" behavior as soon as possible to the case supervisor and the course coordinator via email.
- In case of problems, it is possible that all team members are invited individually to discuss the cooperation within the team and the content of the case with the supervisors. On the basis of these interviews individual grades will be determined.
- In case of extreme "free-rider" behavior, individual students can be expelled from the course or can be asked to take an additional, oral exam. For the grading of subsequent cases it will be taken into account that the relevant team has a reduced size.

4 Reports

Reports may be written in Dutch or English for FEB22009 and FEB22009S and must be written in English for FEB22009X and FEB22009XS. The maximum length of the reports is the equivalent of 4000 words. Using standard LaTeX page layout and 11pt font, this will implies a maximum of 10 pages including cover page and references. Tables and Figures count for the word-equivalent space they occupy. Font size should be such that the text is readable without a magnifying glass (we recommend 11pt), and page margins should not be set too narrow (we recommend using standard LaTeX formating).

Reports should be in line with common rules and practice in scientific publishing (see below). You are strongly encouraged to write your report using LaTeX. A LaTeX template can be found on Blackboard. The report should always be submitted in PDF format.

Much of the following will be practiced in the skills-in-writing course. Still, a few points on writing reports are below.

4.1 Structure

A good way to structure your report is as follows:

- Page 1: Title, team number, names and student numbers of team members, and an abstract of about 150-200 words, providing a brief summary

- The main text consists of different sections (which should be numbered), for example:

    1. Introduction:
    provides the (theoretical and/or practical) context, goal and meaning of the research. Specifically, a short review of the relevant literature should be given, as well as a description of the main research issues/questions. The key element in the discussion of the literature should be its relation to the research described in the report. The introduction should also describe the motivation and relevance of the research. Finally, it contains a brief description of the research that is undertaken (methodology, data), as well as a brief summary of the main results and conclusions.
    2. Methodology (could be divided into multiple sub-sections):
    This gives the reader insight into the mathematical and statistical methods that have been used. The information should be detailed enough such that an interested reader would be able to replicate the research but you can assume that the reader has a basic understanding of econometrics/OR.
    3. Results:
    Provides an overview and discussion/interpretation of the results obtained. Results should also be related to existing literature (if applicable)
    4. Conclusion:
    Summarizes the research and its main conclusions, and possibly indicates some suggestions for further research.

- These sections are followed by the references, in a format that is comparable with academic journals. If you use LaTeX try working with BibTeX.

4.2 Useful things to keep in mind

- Divide the text in reasonably short paragraphs. Each paragraph should have a clear purpose in the story that you tell, while different paragraphs should be inter-connected and form a logical sequence.

- The 'Results' section should not only contain some tables with numbers and some graphs, but also a description and discussion of the results in words.

- Tables and graphs should be numbered and have a note that clearly describes their content. Ideally, this allows the tables and graphs to be understood without reading the text.

- Refer to published articles by stating the family name(s) of the authors followed by the year of publication in parentheses, e.g. Paap and Huisman (2012). It is not necesseary to include the title or any other details: these are provided in the references section. The references section should only contain those articles that actually are mentioned in the main text. References should include (at least) the initial(s) and family name of the author(s), year of publication, title of the article, name of the journal, volume number, and page numbers (in this order).

Writing style:
An important rule in academic writing is that an article or report is written for the readers and not for the authors! The authors should thus put themselves in the position of a reader, who may be less familiar with the research topic – or at least who has not conducted the research. Use active tense instead of passive – for example, write "We use a linear regression model" and not "A linear regression model is used. . . "

4.3 Some pitfalls and mistakes

The list below contains items that often went wrong in reports in previous years. Please study these carefully and use them to your advantage.

- Include a title and the authors (plus number of the team) on the first (title!) page.
- Make sure that the introduction is clear and captures the attention of the reader. Clearly describe the research problem and/or question(s).
- The literature review should be more than simply summing up previous research. Clearly indicate how your research relates to the existing literature – in what ways do you follow certain articles, and in what ways (and why) do you deviate?
- Be critical towards your own writing. Pay ample attention to grammar and spelling mistakes. Also use technical terms in a correct way. For example, it is not possible to "estimate a model" – you can only estimate parameters in a model. Significant variables do not exist; significant parameter estimates do. The 'OLS model' also does not exist; OLS is an estimation method, which can be used to estimate parameter in a linear regression model.
- Present the models and methods in a clear manner. Make sure that your notation is as simple as possible, and also uniform/consistent throughout the report. Also make sure to define all symbols that are used.

- Include all articles that are cited in the text in the references section. At the same time, the references section should not included articles that are not mentioned in the text.
- Provide a clear discussion and interpretation of the results. Make sure that you go beyond a simple description of the results.
- Tables and graphs should be numbered, have a clear title, and have a 'Note' that clearly describes their content. Ideally, this allows the tables and graphs to be understood without reading the text
- Do not blindly copy output from some software package – are all results really relevant? Do you really want to report parameter estimates up to eight decimals?
- Use the first couple of sentences of a section to explain what you are going to do or describe if this is not completely clear from the section title.
- The references section should come after the conclusion.
- Any colored graphs should be readable when printed in black-and-white.
- Use the so-called "so what?"–rule: If you cannot answer the question "so what?" following a piece of text, then it probably is redundant, or should be rewritten to convey the message more clearly.
- Start the conclusion with a brief summary of the research.

5 Assessment and grading

Grades on a 10-point scale will be given for each of the individual cases, based on the research proposals and final reports. The final course grade is the equal-weighted average of the grades for the three cases. In principle, all team members receive the same grade, but in some cases grades can differ as explained in Section 3.3.

The cases and reports will be evaluated on the following items:

- Independence / Creativity;
- Relevance, added value and originality
- Methodology (Are the methods the right ones to use in this setting? Are they clearly and correctly described?)
- Reporting (structure, language, problem description, use of literature)

- Profoundness (interpretation, robustness checks / sensitivity analysis)
- Reporting of methods (notation, consistency, clarity, completeness)
- Process (attitude, cooperation, attendance, active participation, motivation)

The following requirements should be met in order to pass the course:

- Completion of the online skills-in-writing course before the end of week seven;
- The grade for each case should be at least 4.0;
- The average grade for the three cases should be at least 5.5.