

McMaster University
DeGroot School of Business
Financial Econometrics I, MFIN 701

Course Outline

Prof. John M. Maheu

2022

Office: DSB-305
Office Hours: TBA or by appointment
Phone: 905-525-9140 ext. 26198
Class Times: C01 Tues 2:30-5:20, KTH 109
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Course Description:

This course introduces students to the theory and application of econometric techniques for testing economic and financial theory and forecasting. It covers the basic tools of estimation and inference in the framework of the linear regression model. The main topics include specification of an econometric model, hypothesis testing, model selection, forecasting, time-series models and maximum likelihood estimation.

Grading:

20% Assignments
30% Project, due end of term, exact date TBA
50% 2 Term tests each 25%: Feb 28 and April 11
Late assignments or term project will have 10% deducted per day late.

Conversions:

At the end of the course your overall percentage grade will be converted to your letter grade in accordance with the following conversion scheme.

Letter grade	Percent
A+	90 - 100
A	85 - 89
A-	80 - 84
B+	75 - 79
B	70 - 74
B-	65 - 69
F	00 - 64

Course Textbook:

Econometric Analysis, by William H. Greene, seventh edition, Prentice Hall

The text is available at the campus bookstore for purchase. Problem sets and examples of computer code will be posted on the class website.

Computer Assignments:

Students will complete computer assignments using R (or equivalent, Ox, Gauss, Matlab etc) econometric package. A personal version of R can be obtained free of charge from <http://cran.r-project.org/>. See the course website for links to R including downloading and documentation. Rstudio is an R interface that can be used to program and run R jobs from. It can be downloaded at <https://www.rstudio.com/>. Computer programming applications will be discussed extensively in class along with theory. Students can work together on the computer programming and model estimation but the *final write-up of an assignment should be done independently*. If plagiarism is detected University rules will be enforced. **Assignments must have a detailed write-up of results and be separate from computer output.**

Term Project:

Students are required to complete an applied econometric project based on a finance topic of their choice. Please feel free to discuss the suitability of your topic with me. In selecting a topic it may be helpful to look at current and past periodicals on econometrics in the library or online through the library web page. Some suggested sources are:

1. *Journal of Financial Econometrics*
2. *Journal of Business and Economic Statistics*
3. *Journal of Empirical Finance*
4. *Review of Economics and Statistics*
5. *Journal of Applied Econometrics*

Your paper can be completely original or you can base it on existing work using a different dataset and changing and/or expanding the analysis.

The term paper should consist of an Introduction, Model Description, Results, and Conclusion with References included. **The main text should be 10 pages or less.** All mathematical equations should be written properly in the text. As an example, consider the AR(1) model,

$$y_t = \mu + \phi y_{t-1} + \epsilon_t, \quad \epsilon_t \sim N(0, \sigma^2),$$

where μ , ϕ , and σ^2 , are parameters to be estimated.

Data sources should be included, along with footnotes, and correct citations. Using someone's idea or writings without a citation is plagiarism and University rules will be enforced. Your paper should be self contained. Finally, you should hand in a copy of your paper, and a disk with your computer code, the dataset and a file of your printout.

Topics to be covered:

1. Review of some statistical concepts: common distributions, change of variables formula, sampling distribution, unbiasedness, consistency, law of large numbers, central limit theorem. Appendix C and D.
2. Linear regression model: ch 2,3,4
3. Hypothesis tests: ch 5
4. Dummy variables, time trends and structural change: ch 6
5. Testing for autocorrelation and heteroskedasticity: ch 9.5, 20.7
6. Generalized least squares: ch 9, 20.8,20.9
7. SUR model: ch 10.2
8. Maximum likelihood estimation: ch 14
9. Time-series models and nonstationary data: ch 20,21
10. Two-stage least squares: ch 8.1-8.5

Chapters refer the to textbook. Students should be familiar with most of the matrix results in Appendix A of the textbook.

Academic Dishonesty:

It is the student's responsibility to understand what constitutes academic dishonesty. Please refer to the University Senate Academic Integrity Policy at the following URL:

<http://www.mcmaster.ca/policy/Students-AcademicStudies/AcademicIntegrity.pdf>

This policy describes the responsibilities, procedures, and guidelines for students and faculty should a case of academic dishonesty arise. Academic dishonesty is defined as to knowingly act or fail to act in a way that results or could result in unearned academic credit or advantage. Please refer to the policy for a list of examples. The policy also provides faculty with procedures to follow in cases of academic dishonesty as well as general guidelines for penalties. For further information related to the policy, please refer to the Office of Academic Integrity at:

<http://www.mcmaster.ca/academicintegrity>

Missed Academic Work

Late assignments will not be accepted. No extensions are available except under extraordinary circumstances. Please discuss any extenuating situation with your instructor at the earliest possible opportunity.

Potential Modifications to the Course:

The instructor and university reserve the right to modify elements of the course during the term. The university may change the dates and deadlines for any or all courses in extreme circumstances. If either type of modification becomes necessary, reasonable notice and communication with the students will be given with explanation and the opportunity to comment on changes. It is the responsibility of the student to check their McMaster email and course websites weekly during the term and to note any changes.

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http://www.copyright.mcmaster.ca/Access_Copyright_Agreement

Student Accessibility Services:

Student Accessibility Services (SAS) offers various support services for students with disabilities. Students are required to inform SAS of accommodation needs for course work at the outset of term. Students must forward a copy of such SAS accommodation to the instructor normally, within the first three (3) weeks of classes by setting up an appointment with the instructor. If a student with a disability chooses NOT to take advantage of an SAS accommodation and chooses to sit for a regular exam, a petition for relief may not be filed after the examination is complete. The SAS website is:

<http://sas.mcmaster.ca>