Instructor: Minjoon Lee
Email: minjoon.lee@carleton.ca
   • (Please include “Econ 5055” in the subject line.)
Office: D892 Loeb Building
Office Hours: Wednesday 1:05 PM – 3:00 PM (Tentative)

Schedule
Lectures: Friday 8:35 AM – 11:25 AM (UC 378)

Prerequisities
Econ 5027 or equivalent, or by permission of the department.

Course Description
This course applies time-series econometric techniques to financial time-series data. The first half of this course covers general time-series models including ARMA and GARCH, focusing on applying them to financial data. The second half covers topics that are more specific to the financial market such as models for high-frequency data, market structure, and risk measurement. There will be a heavy emphasis on implementing estimations using actual financial data.

Resources

1) Textbook (required)
Additional readings may be assigned during the term.

2) CULearn
This course will make use of CULearn. I will post materials including lecture slides, additional reading assignments, and answer keys to the problem sets. I will also use CULearn to send announcements to the class as needed. Please make sure that you are set up on CULearn prior to the course start date.
3) Computer Program

Students are highly encouraged to use Matlab in applying the covered models to financial data, but Students can also choose to use Stata instead. Both programs are available under the university-wide license.

Course Outline (Tentative)

<table>
<thead>
<tr>
<th>Week (Date)</th>
<th>Topic</th>
<th>Textbook Chapter</th>
<th>Assignment due</th>
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<tbody>
<tr>
<td>1 (Sep 8)</td>
<td>Financial time series and their characteristics</td>
<td>Ch 1</td>
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<tr>
<td>2 (Sep 15)</td>
<td>Linear time series and applications</td>
<td>Ch 2</td>
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<tr>
<td>3 (Sep 22)</td>
<td>Linear time series and applications</td>
<td>Ch 2</td>
<td>PS1 due</td>
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<tr>
<td>4 (Sep 29)</td>
<td>Conditional heteroskedastic models</td>
<td>Ch 3</td>
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<tr>
<td>5 (Oct 6)</td>
<td>Conditional heteroskedastic models</td>
<td>Ch 3</td>
<td>PS2 due</td>
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<td>6 (Oct 13)</td>
<td>In-class exam 1, High frequency data analysis</td>
<td>Ch 5</td>
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<tr>
<td>7 (Oct 20)</td>
<td>Extreme values, quantiles, and value at risk</td>
<td>Ch 7</td>
<td>PS3 due</td>
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<tr>
<td>8 (Nov 3)</td>
<td>Extreme values, quantiles, and value at risk</td>
<td>Ch 7</td>
<td>PS4 due</td>
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<td>9 (Nov 10)</td>
<td>Multivariate time-series analysis</td>
<td>Ch 8</td>
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<td>10 (Nov 17)</td>
<td>Household portfolio choice</td>
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<td>PS5 due</td>
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<td>11 (Nov 24)</td>
<td>In-class exam 2, Final project presentation</td>
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<td>12 (Dec 1)</td>
<td>Final project presentation</td>
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<td>Final paper due by Dec 15</td>
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Problem Sets

There will be five problem sets. The problem sets are due at the beginning of the lectures on the specified dates (see the above Outline).

The grading is based on effort and completeness, not on accuracy of the answers. Each assignment will be graded on a scale of \{0,1,2\}. In answering the questions, students are expected to *show their work*, i.e., write down key logical steps, provide programming codes that are well documented, as well as present final answers in an easy-to-read format. Late submissions will not be accepted. If you fail to submit a problem set and do not provide proper documentation, you will be assigned a mark of zero.

In-class exams

There will be two written in-class exams. Students who can document a compelling reason for missing an exam will be excused and the weight of the exam will be automatically added to the other one.
Final Project
For the final project, each student needs to choose a methodology covered in the course and apply it to a financial time series. In both the presentation and paper, students are expected to explain (i) why studying the chosen time series is important, (ii) why the chosen methodology is appropriate for the time series, (iii) related literature, and (iv) main findings and their implications.

Students need to get a permission on topic and methodology by the end of the Fall break. More details on the formats of the presentation and paper will be announced at the beginning of the semester.

Evaluation
- 5 Problem sets : 30%
- 2 in-class exams : 40%
- Final project presentation : 10%
- Final project paper : 20%

Important Notes

1) Remarking
Any request for the remarking of an exam or problem set must be submitted in writing within two weeks of that exam first being returned to the class. The request should contain a detailed explanation of why you feel you should receive a higher mark. Please note that remarking will apply to the entire assignment/exam, not just the contentious question. As a result, the revised mark maybe higher than, lower than or the same as the original mark. Exams or problem sets completed in pencil or erasable ink will not be regraded.

2) Plagiarism
Please be aware that plagiarism is a serious offence at Carleton and should be recognized and avoided. For further information on how to do so, see Pammett on Plagiarism and Paraphrasing at http://www.carleton.ca/economics/courses/writing-preliminaries.

3) Accommodation Requests
Accommodation Requests: Students with disabilities requiring academic accommodations in this course must contact a coordinator at the Paul Menton Centre (PMC) for Students with Disabilities to complete the necessary Letters of Accommodation. After registering with the PMC, students should make an appointment to meet and discuss their needs with the instructor as early in the term as possible.