

Faculty Liberal Arts and Professional Studies Department of Economics

Course: AP/ECON 4140, Section M, 3.0 – Financial Econometrics Course Webpage: <u>https://eclass.yorku.ca</u> Term: Summer 2023, S2 (Course start and end date: July 4 – August 15) Prerequisite / Co-requisite: AP/ECON 3210 3.00 or AP/ECON 3500 3.00, or equivalent.

Course Instructor: Pujee Tuvaandorj Email: <u>tpujee@yorku.ca</u> Time: Monday and Wednesday 4:00 PM–7:00 PM Location: Monday VH 3006; Wednesday CLH 110 Office Hours: Tuesday 5:00 PM-6:00 PM. The Zoom link will also be posted on eClass. Teaching Assistant: TBA

Course Description

This course will cover the fundamentals of financial econometrics. The objective of the course is to introduce students to the basic characteristics of financial data and provide an account of the statistical models that aim to capture these empirical regularities. Estimation and evaluation of financial econometric models, and prediction of financial time series will be covered.

The course materials including announcements, lecture slides, notes, and problems will be posted on https://eclass.yorku.ca

Learning goals: At the end of this course, students will be able to

- 1. understand the properties of financial data,
- 2. understand the essential concepts in financial econometrics,
- 3. analyze financial data using econometric models,
- 4. estimate basic cross-sectional and time series models for finance,
- 5. interpret a computer output of model estimation and testing,
- 6. develop basic programming skills.

Required Textbook

• D. Ruppert and D. S. Matheson (2015), *Statistics and Data Analysis for Financial Engineering: with R examples,* Springer

The copies of the textbook will be available in the campus bookstore. The following list of books may be useful as references for further study.

Supplementary Text (optional)

- Ruppert, David (2006), *Statistics and Finance*, 2nd Printing, Springer.
- R. S. Tsay (2013), An Introduction to Analysis of Financial Data with R, Wiley, NJ.
- J. Fan and Q. Yao (2017), The Elements of Financial Econometrics, Cambridge University Press.
- C. Gourieroux and J. Jasiak (2014), Financial Econometrics: Problems, Models, and Methods, Princeton University

Outline

- Probability and Statistics (Definitions, Theory, R example) Ruppert-Matheson, Appendix A and Chapters 5, 7 Ruppert, Chapter 2
- Time Series Models (ARIMA model, Box-Jenkins methodology, R example) Ruppert-Matheson, Chapter 12 Ruppert, Chapter 4
- Returns (Definitions, Stylized facts, R example) Ruppert-Matheson, Chapter 2 Ruppert, Chapter 3
- Portfolio Theory (Theory, Empirical example, R illustration) Ruppert-Matheson, Chapter 16 Ruppert, Chapter 5
- Regression (Theory, Empirical example, R illustration) Ruppert-Matheson, Chapter 9 Ruppert, Chapter 6
- The Capital Asset Pricing Model (Theory, Empirical example, R illustration) Ruppert-Matheson, Chapter 17 Ruppert, Chapter 7
- GARCH Models (Theory, Empirical example, R illustration) Ruppert-Matheson, Chapter 14 Ruppert, Chapter 12
- Value-at-Risk (Theory, Empirical example, R illustration) Ruppert-Matheson, Chapter 19 Ruppert, Chapter 11
- 9. Option Pricing (Theory, Empirical example, R illustration) if time allows Ruppert, Chapter 8

Note: The lecture outline is tentative and will be updated as the course progresses.

Evaluation

The overall grade for the course will be based on the maximum of

- a) Final exam;
- b) 0.65*Final exam+0.35*Midterm exam;
- c) 0.5* Final exam+0.35*Midterm exam+0.15*Assignment;
- d) 0.85*Final exam+0.15*Assignment;

where the highest possible marks for each (Final, Midterm, Assignments) is 100.

Press.

Category	Weight	Date	Due
Assignments	15%		
Midterm Exam	35%		
Final Exam	50%		

There will be 1 assignment that include both problem solving and computer tasks. For the computer exercises, I recommend R or RStudio which can be downloaded free of charge from R-Project website: <u>http://www.r-project.org</u> <u>https://rstudio.com/</u>

Assignments received later than the due date will not be accepted. The final exam will be comprehensive.

Grading System: The grading scheme for the course conforms to the 9-point grading system used in undergraduate programs at York (e.g., A + = 9, A = 8, B + = 7, C + = 5). Assignments and exams will bear either a letter grade designation or a corresponding number grade (e.g. A + = 90 to 100, A = 80 to 90, B + = 75 to 79, etc.) For a full description of York grading system see: <u>https://calendars.students.yorku.ca/2020-2021/grading-scheme-and-feedback</u>

Organization of the course

The course materials will be posted on the course's eClass website. The slides for the covered topics will be posted before each class. More details and explanations on the lecture topics will be provided during the meeting.

A part of the class time will be devoted to computer illustrations of the theoretical concepts, Q&A related to the presentation, and interactive activities.

Weekly office hours will be held via Zoom through which students will interact with the course director/TA, as well as with one another. The Zoom link will be posted on the course's eClass website.

Please note the following:

- Zoom is hosted on servers in the U.S. This includes recordings done through Zoom.
- If you have privacy concerns about your data, provide only your first name or a nickname when you join a session.
- The system is configured in a way that all participants are automatically notified when a session is being recorded. In other words, a session cannot be recorded without you knowing about it.

To attend virtual office hours and participate in our virtual classroom, it is required that you have a computer with webcam and microphone or a smart device with these features.

Here are some useful links for student computing information, resources and help:

<u>Student Guide to eClass/Moodle</u> <u>Zoom@YorkU Best Practices</u> <u>Zoom@YorkU User Reference Guide</u> <u>Computing for Students Website</u> <u>Student Guide to eLearning at York University</u>

Assignment Submission, Lateness Penalties and Missed Tests

Assignment Submission: Proper academic performance depends on students doing their work, not only well, but on time. Accordingly, assignments for this course must be received on the due date specified for the assignments.

Lateness Penalty: Assignments received later than the due date will not be accepted and will be given a grade

zero. Exceptions to the lateness penalty for valid reasons such as illness, compassionate grounds, etc., may be entertained by the Course Instructor but will require supporting documentation (e.g., a doctor's letter). If a student misses the assignments, and have a documented excuse, the final exam will carry the extra weight.

Missed Exams: If a student misses the midterm, and have a documented excuse, the final exam will also carry the extra weight. There will be no make-ups for the midterm exam. A deferral for the final exam will be granted only for with a documented reason, such as illness, compassionate grounds, etc., which is confirmed by supporting documentation (e.g., doctor's letter). These students must fill out the Deferred Standing Agreement form and submit it along with all original supporting documentation to the Department of Economics within ten business days of the original exam date. See <u>https://econ.laps.yorku.ca/students/academic-policies-procedure/deferred-standing/</u> for details.

Return to Campus

WITH THE SEPT. 7 RETURN TO CAMPUS FOR IN-PERSON CLASSES JUST AROUND THE CORNER, IT'S IMPORTANT FOR THE UNIVERSITY COMMUNITY TO KNOW WHAT TO EXPECT AND HOW WE CAN ALL STAY AS SAFE AS POSSIBLE.

IN ALIGNMENT WITH PUBLIC HEALTH REQUIREMENTS, YORK HAS TRANSITIONED TO A COMMUNITY OF CARE APPROACH TO HEALTH AND SAFETY.

While IT IS NO LONGER MANDATORY TO WEAR MASKS, THE UNIVERSITY STRONGLY ENCOURAGES THE USE OF MASKS, ESPECIALLY IN INDOOR SETTINGS. WHILE THE REQUIREMENT TO BE VACCINATED IS ALSO PAUSED, YORK STRONGLY RECOMMENDS THAT EVERYONE RECEIVES A COMPLETE VACCINE SERIES, INCLUDING BOOSTERS WHEN ELIGIBLE. MASKING AND VACCINATION REMAIN THE TWO MOST EFFECTIVE WAYS FOR EVERYONE TO PROTECT THEIR HEALTH.

While these protocols are on pause, the University continues to monitor the impact of COVID-19 and public health guidelines and will reinstate these mandatory protocols if it becomes necessary.

This newly updated website has all the latest information on what you can do and what the University is doing in response to the ongoing pandemic.

- FIND MORE INFORMATION ABOUT <u>MASKS</u> ON THE SITE. N-95 AND SURGICAL MASKS ARE AVAILABLE FOR PURCHASE AT A DISCOUNT ON CAMPUS AT LOCATIONS SUCH AS YORK LANES, THE LIFE SCIENCES BUILDING AND CENTRAL SQUARE.
- ADDITIONAL INFORMATION ON <u>VACCINATIONS</u>, INCLUDING YORK'S MOBILE <u>VACCINATION CLINICS</u> IN PARTNERSHIP WITH GO-VAXX AND TORONTO PUBLIC HEALTH, CAN BE FOUND HERE TOO. WALK IN OR BOOK AN APPOINTMENT THROUGH THE <u>PROVINCIAL BOOKING SITE</u> OR BY CALLING THE PROVINCIAL CONTACT CENTRE AT 1-833-943-3900.
- THE BETTER TOGETHER WEBSITE HAS INFORMATION ON WHERE <u>RAPID TESTS</u> ARE AVAILABLE ON CAMPUSES.
- IF YOU ARE FEELING UNWELL, DON'T COME TO CAMPUS, TEST FOR COVID-19 (IF AVAILABLE) AND UPDATE YOUR STATUS ON <u>YU SCREEN</u> TO RECEIVE GUIDANCE FROM THE UNIVERSITY. WHEN CLASSES START, YOUR INSTRUCTORS WILL DISCUSS THE RESOURCES AVAILABLE TO MITIGATE YOUR TIME AWAY DUE TO ILLNESS.

• REMEMBER, THE FALL IS ALSO FLU SEASON. IT IS STRONGLY RECOMMENDED THAT YOU RECEIVE FLU SHOTS WHEN ELIGIBLE. PLEASE CHECK THE <u>BETTER TOGETHER</u> WEBSITE FOR UPDATES AS WE CONTINUE TO ADAPT TO THE CHANGING ENVIRONMENT.

Other important course information for students

All students are expected to familiarize themselves with the information on Academic Standards, Curriculum & Pedagogy.

Academic honesty and integrity: In this course, we strive to maintain academic integrity to the highest extent possible. Please familiarize yourself with the meaning of academic integrity by completing SPARK's Academic Integrity module at the beginning of the course. Breaches of academic integrity range from cheating to plagiarism (i.e., the improper crediting of another's work, the representation of another's ideas as your own, etc.). All instances of academic dishonesty in this course will be reported to the appropriate university authorities, and can be punishable according to the Senate Policy on Academic Honesty.

Additional important information can be found on the Senate Committee webpage; http://secretariat-

policies.info.yorku.ca/:

- Ethics Review Process for research involving human participants
- Course requirement accommodation for students with disabilities, including physical, medical, systemic, learning and psychiatric disabilities
- Student Conduct Standards
- Religious Observance Accommodation

Course Add/Drop Deadlines

Information on important dates are available at https://registrar.yorku.ca/enrol/dates/2022-2023/summer

	Summer Term 2022-2023 (S2)
Last date to add a course without permission of instructor	July 10
(also see Financial Deadlines)	
Last date to add a course with permission of instructor	July 17
(also see Financial Deadlines)	
Last date to drop a course without receiving a grade	July 24
(also see Financial Deadlines)	
Course Withdrawal Period (withdraw from a course and receive a	July 31– August 15
grade of "W" on transcript)	