F773
Empirical Methods in Finance
Winter 2020 Course Outline

Finance and Business Economics
DeGroote School of Business
McMaster University

COURSE OBJECTIVE

The course covers estimation methods for time-series and cross-sectional models used in empirical finance. The intention is to expose students to econometric techniques and methods involving estimation, inference and forecasting used in empirical finance.

INSTRUCTOR AND CONTACT INFORMATION

Dr. Ron Balvers
Title: Professor
Email: balvers@mcmaster.ca
Office: DSB A105
Office Hours: Mon 11am-1pm, Thu 2pm-4pm, or by appointment

Tel: (905) 525-9140 x23969

Class Time: Thursday 10:00 am – 1:00 pm, DSB/421

COURSE DESCRIPTION

The course material involves testing and estimating asset pricing models using linear regression, maximum likelihood, and generalized method of moments methods, as well as focusing on topics of predictability of returns, state space models, and simultaneous equations models. All topics will include computer-based applications primarily using Matlab.

AUDIENCE AND PREREQUISITES

This course is intended mainly for second-year finance Ph.D. students. However, doctoral students and advanced master's students from other areas are also welcome to take the course. The course assumes background knowledge in advanced econometrics as well as finance theory (at least at the

master's level). It also requires a mathematical background that includes upper-level undergraduate calculus, matrix algebra and statistics.

LEARNING OUTCOMES

At the end of the course, students are expected to: (1) have an in-depth understanding of modern econometric methods used in empirical finance; (2) have the skills and understanding to apply and adapt econometric methods to conduct independent research in empirical finance.

REQUIRED COURSE MATERIALS AND READINGS

Class Notes. Chapter 4.

William H. Greene, Econometric Analysis, 7th edition, Pearson: New York, NY, 2012

Chang-Jin Kim and Charles R. Nelson, *State-Space Models with Regime Switching*, MIT Press, 1999.

James H. Hamilton, *Time Series Analysis*, Princeton University Press, 1994.

John H. Cochrane. *Asset Pricing*, Princeton, NJ: Princeton University Press, first edition, 2001 or updated edition, 2004.

Campbell, John Y., Andrew W. Lo, and A. Craig MacKinlay. *The Econometrics of Financial Markets*, Princeton, NJ: Princeton University Press, 1997.

EVALUATION

Learning in this course results primarily from in-class discussion and out-of-class analysis and study. Your learning will be tested by means of two exams, a term paper, and homework assignments. The assignments involve use of Matlab and apply econometric techniques with actual data.

Your final grade will be calculated as follows: A midterm and a final exam, each counting for 30% of the grade; a term paper counting for 30% of the grade; and four to seven homework assignments, together counting for 10% of the grade.

There will be a straight grading scale based on the percentage earned (with the aforementioned weights) of the maximum score: A+ ↔ 90% - 100%; A ↔ 85% - 89%; A- ↔ 80% - 84%; B+ ↔ 75% - 79%; B ↔ 70% - 74%; B- ↔ 60% - 69%; F ↔ below 60%. Attendance is expected but will not be factored into the grades. Make-ups or a grade of Incomplete will not be given unless a satisfactory excuse is provided.

THE TERM PAPER

Students are required to turn in one term paper of around fifteen typed, double-spaced pages. In the paper you may present and process an original idea. Alternatively, you may try to reproduce the empirical results of a previously published paper in the area of financial econometrics and empirical finance; this is a minimum requirement: a good term paper might also try ways to improve on the existing work by extending the sample period, including different variables, using different econometric methods, or, generally, checking the robustness of the results.

The time table for the paper is as follows. First, on *Thursday January 23* you must get approval from me for the paper you choose to reproduce and you must explain to me how you will get the relevant data. Second, on *Thursday March 12* you are required to submit and discuss in class your initial regression results (or theoretical results as the case may be). Third, the complete paper is due in our class of *Thursday April 2*. Note that submission of your paper to me later than April 2 will result in a grade of 0 on the paper, unless a university-approved excuse can be provided for the delay. It is therefore very important that you start work on your paper early and that you have your data in hand well before the midterm.

While I will be happy to provide you with suggestions on how to proceed on your paper during the semester, the version of the paper you hand in to me on April 2 will be final and your term paper grade will be based on this version. My criteria for judging your paper are the following: (1) accuracy: correctness of your interpretation of the paper to be replicated and thoroughness in conducting the replication (or correct derivation of your results as the case may be); (2) writing: organization and clarity, especially as related to exposition and comparison of your results to the original study (or other work as the case may be); (3) degree of difficulty of the project; (4) originality: the extent to which you contribute or suggest additions to the original study (or other work as the case may be).

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. Students unable to write the mid-term or final exam at the posted exam time, or to complete an assignment or the term paper at the posted time due to the following reasons: religious; work- related (for part-time students only); representing university at an academic or varsity athletic event; conflicts between two overlapping scheduled exams; or other extenuating circumstances, have the option of applying for special arrangements. If an exam or assignment is missed without a valid reason, students will receive a grade of zero (0) for that component.

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 weekly during the term and to note any changes.

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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

COURSE SCHEDULE

WEEK	DATE	ARTICLES
1	Thu. Jan 9	**Estimation and Evaluation of Asset Pricing models using Linear Regression.** Balvers, Chapter 4. Barillas, F. and J. Shanken (2017). Which Alpha? *Review of Financial Studies* 30, 1316-1338.
2	Thu. Jan 16	**Risk-Premium Estimation** (Shanken Correction, EIV Bias) Shanken, J., (1985), Multivariate Tests of the Zero-Beta CAPM, *Journal of Financial Economics* 14, 327-348. Jegadeesh, N., J. Noh, K. Pukthuanthong , R. Roll, and J. Wang (2019). Empirical Tests of Asset Pricing Models with Individual Assets: Resolving the Errors-in-Variables Bias in Risk Premium Estimation. *Journal of Financial Economics* 133, 273–298.
3	Thu. Jan 23	**Risk-Premium Estimation** (Rank Test) Ahn, Seung C. and Horenstein, Alex R. and Wang, Na, Beta Matrix and Common Factors in Stock Returns (January 8, 2017). Journal of Financial and Quantitative Analysis (JFQA), Forthcoming.
4	Thu. Jan 30	**Stock Return Predictability**. Hamilton, Chapter 4. CLM, Chapter 2.
5	Thu. Feb 6	**Stock Return Predictability.** Diebold, F. X. (2015). Comparing Predictive Accuracy, Twenty Years Later: A Personal Perspective on the Use and Abuse of Diebold–Mariano Tests. *Journal of Business and Economic Statistics* 33, 1-9. White, H. (2000). A Reality Check for Data Snooping. Econometrica 68, 1097–1126.
6	Thu. Feb 13	**Maximum Likelihood Estimation**

		Kim and Nelson, Chapter 2. Hamilton , Chapter 5. Greene, Chapter 14.
7	Thu. Feb 27	**Maximum Likelihood Estimation** Cochrane, Chapter 14.
8	Thu. Mar 5	**State Space Models and Kalman Filtering** Kim and Nelson, Chapter 3. Hamilton, Chapter 13.
9	Thu. Mar 12	***Midterm*** 7pm-10pm (C01 in BSB 108, C02 in BSB 120)
10	Thu. Mar 19	**Generalized Method of Moments Estimation** Greene, Chapter 13. Hamilton, Chapter 14.
11	Thu. Mar 26	**Generalized Method of Moments Estimation** Cochrane, Chapters 10, 11, and 13.
12	Thu. Apr 2	**Simultaneous Equation Models** Greene, Chapter 10.
13	Thu. Apr 9	**Simultaneous Equation Models** Hamilton, Chapter 9.

Note: The above schedule is subject to change.