

UNIVERSITY OF COLORADO - DEPARTMENT OF ECONOMICS - FALL 2019
ECON 4858 FINANCIAL ECONOMETRICS
PROFESSOR CARLOS BRUNET MARTINS-FILHO

Office. Economics Building 105.

Meetings. Tuesdays and Thursdays 12:30 PM - 1:45 PM at ECON 117.

Office hours. Thursdays 3:00 PM - 4:30 PM or by appointment. For appointment send an email to carlos.martins@colorado.edu.

Prerequisites. Successful completion of ECON 3818 or equivalent is a required prerequisite. Completion of ECON 4818 is desirable, but not necessary.

Objectives. Introduce statistical models, estimation and testing procedures used in analyzing financial data.

Class URL. <http://spot.colorado.edu/~martinsc/Brunet/4858.html>.

Grades. Grades (A-F) will be based on the following:

- There will be five sets of homework questions that will not be graded. However, you must turn in your answers at the specified due date. I will provide answers for these questions. Failing to submit answers for a homework set will result in a 10 percent reduction on **course** grade.
- There will be two midterm examinations. Each accounts for 30 percent of your course grade.
- There will be a final examination. It accounts for 40 percent of your course grade.

Dates for the examinations:

Examination	Date and Time
Midterm 1	October 1
Midterm 2	November 5
Final Examination	December 15, 4:30 PM - 7:00 PM at ECON 117

Homework sets will be available on the class web site with their respective due dates.

Textbook.

1. Ruppert, D., 2004, *Statistics and Finance: An Introduction*. Springer, New York.

Additional.

1. Bernstein, P., 2005, *Capital Ideas: The Improbable Origins of Modern Wall Street*. John Wiley and Sons, New York.

This book gives an informal and historical account of the development of many of the models we treat in class. Great reading for all students in this course.

2. Lai, T. L., and Peng, H., 2008, *Statistical Models and Methods for Financial Markets*. Springer, New York.

3. Ruppert, D., 2011, *Statistics and Data Analysis for Financial Engineering*. Springer, New York.

This book contains much of the material in our textbook. In many instances, however, the treatment is more advanced.

4. Tsay, R. S., 2010, Analysis of Financial Time Series. John Wiley & Sons, Hoboken, New Jersey.

This is an advanced textbook, normally used in graduate courses. Its study is recommended for those that have taken more advanced courses in probability, statistics and econometrics and are looking for a deeper understanding of what we discuss in class.

5. Hanselman, D. and Littlefield, B., 2005, Mastering MATLAB 7. Pearson, Upper Saddle River, New Jersey.

This is one of many step-by-step manuals/guide to MATLAB that are commercially available. It is very easy to read and provides speedy access to the many resources this software offers.

6. Frain, J. C., 2014, MATLAB for Economics and Econometrics: A Beginners Guide. Trinity College Economics Papers - Working Paper 0414.

This is another step-by-step introduction to MATLAB with a focus on the Econometrics Toolbox.

Topics.

Readings are from the textbook and class notes. All topics covered depend on some fundamental statistical concepts and results from Chapter 2 and Econ 3818. As such, throughout the course, we will be repeatedly using the concepts and results from Chapter 2.

1. Returns (Chapter 3)

Gross returns, Net returns and log returns

The random walk model

The efficient market hypothesis

2. Time Series Models (Chapter 4)

Stationarity

Autoregressive AR(p) models and estimation

Moving average models MA(q) and estimation ARMA models

Model selection: Akaike's information criterion (AIC) and Bayesian information criterion (BIC)

3. Regression (Chapter 6)

Least squares estimation

Regression and best linear prediction

Non-normality and data transformations

4. Portfolio Theory (Chapter 5)

Trading off expected return and risk

5. The Capital Asset Pricing Model (Chapter 7)

Capital market line, security market line

Security characteristic line

Using CAPM in portfolio analysis

Factor models

6. GARCH Models (Chapter 12)

Estimation and testing

7. Fixed income securities (Chapter 9)

Zero-coupon bonds, coupon bonds

Yield to maturity

Term structure

Continuous compounding

Continuous forward rates

Sensitivity of price to yield

Important information.

- If you qualify for accommodations because of a disability, please submit a letter from Disability Services in a timely manner (for exam accommodations provide your letter at least one week prior to the exam) so that your needs can be addressed. Disability Services determines accommodations based on documented disabilities. Contact Disability Services at 303-492-8671 or by e-mail dsinfo@colorado.edu. If you have a temporary medical condition or injury, see Temporary Medical Conditions: Injuries, Surgeries, and Illnesses guidelines under Quick Links at Disability Services website and discuss your needs with me.
- Campus policy regarding religious observances requires that faculty make every effort to reasonably and fairly deal with all students who, because of religious obligations, have conflicts with scheduled exams, assignments or required attendance. In this class, if the midterm, final or homework due dates prevent/inhibit you from exercising your rights to religious observance, please inform me by August 29, so that reasonable accommodations can be made. See full details at www.colorado.edu/policies/fac_relig.html.
- Students and faculty each have responsibility for maintaining an appropriate learning environment. Those who fail to adhere to such behavioral standards may be subject to discipline. Professional courtesy and sensitivity are especially important with respect to individuals and topics dealing with differences of race, color, culture, religion, creed, politics, veteran's status, sexual orientation, gender, gender identity and gender expression, age, disability, and nationalities. Class rosters are provided to the instructor with the student's legal name. I will gladly honor your request to address you by an alternate name or gender pronoun. Please advise me of this preference early in the semester so that I may make appropriate changes to my records. See policies at www.colorado.edu/policies/classbehavior.html and at www.colorado.edu/studentaffairs/judicialaffairs/code.html#student_code.
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