USC Marshall School of Business FBE

FBE 443 INTRODUCTION TO FORECASTING AND RISK ANALYSIS

Selo İmrohoroğlu
http://www-rcf.usc.edu/~simrohor/main.html

COURSE SYLLABUS

Spring 2008, HOH 301, MW 2:00 – 3:50 pm

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OFFICE HOURS

Office hours are 11:00-12:00 am on Monday and Wednesday, or by appointment. I am around most of the time but I strongly advise that you get in touch with me ahead of time if you want to talk to me outside of class and outside of my office hours. Just let me know when you want to talk to me so we can set up an appointment.

COURSE PREREQUISITES

I will assume that the student is familiar with basic statistics (BUAD 310) and finance (BUAD 306) concepts. In addition, we will go much deeper into some of the quantitative tools of mathematics and statistics as they are applied in portfolio management and economic consulting, and therefore we will cover some advanced reading material. This effort will require at least high school level algebra and statistics. We will spend some time reviewing these tools.

COURSE OBJECTIVES

FBE 443 is an upper level Finance elective course that aims to **develop the econometric tools used in many practical problems of modern economics and finance**. The course will combine economics, finance and statistics to put together a working toolset for estimating and forecasting objects such as sales, housing starts, demand for a product, business cycles, equity returns, and return covariances and variances. Practitioners in the financial sector can use the quantitative tools developed in this course to estimate various asset pricing models and obtain estimates of asset return correlations and volatility. This "covariance matrix" is a necessary input for many critical decisions in capital structure, optimal asset allocation, risk management of portfolios and derivatives pricing. Economic consultants can use the techniques covered in this course to make statements about sales and demand for various products and services. The course will combine theory and computer applications, with a bias toward the latter, and develop **applied tools** that are currently in use **in the investment banking, management, and business and economic consulting areas**.

REQUIRED COURSE MATERIAL

Required Textbook: Chris Brooks (2002), *Introductory Econometrics for Finance*, (1st edition) Cambridge University Press.

I will also cover parts of Bob Litterman (2003), *Modern Investment Management: An Equilibrium Approach*, John Wiley and Sons, Inc.

Required Articles:

1. John Cochrane (1999), "New Facts in Finance", Federal Reserve Bank of Chicago, *Economic Perspectives*, Third Quarter 1999.
2. George Constantinides (2002), "Rational Asset Prices", *Journal of Finance*, Vol. LVII, No. 4 (August), pp. 1567-1591.
3. Burton Malkiel (2003), "The Efficient Market Hypothesis and Its Critics", *Journal of Economic Perspectives*, Vol. 17, No. 1 (Winter), pp. 59-82.

I will likely add some more articles to this list later on. You will be responsible for all articles, even those that are not discussed in detail in class. There may be direct questions from these articles in exams and quizzes.
In addition, I highly recommend that you read regularly sources of economic and business news. Probably the best source of weekly news is The Economist http://www.economist.com. It is a British publication with extensive U.S. and world coverage, and it has a substantial student discount. The Wall Street Journal is of course a prime source of information: http://www/wsj.com. The New York Times has broad coverage and good analysis; http://www.nytimes.com/. Its online subscription is free. The Economist and the WSJ have substantial student discounts available at https://www.economist.com/academic and http://online.wsj.com/registration/student.

Required Software: Eviews Version 5.1, Quantitative Micro Software;
http://www.eviews.com
Eviews is on the image of all Marshall School PCs. If you want to purchase your own full copy, it is about $87, and the required form to get this price is posted in the Public Folders section of Outlook. You will need to fill the form and fax it to Eviews.

STATEMENT ON TECHNOLOGY USE
Please note that communication devices such as cell phones, Blackberries, etc. capable of sending and or receiving electronic communication and all entertainment devices such as iPods or other MP3 players are to be turned off and kept off throughout the class session. Receiving or sending communication or entertainment during class disrupts the learning environment and is rude to those around you. Laptops can be used only with the express permission of the professor. When you are permitted to use your laptop for note-taking

purposes, Internet connections are prohibited unless otherwise stated by the professor. There will be no use of laptops during examinations.

As in other courses, I need your cooperation to ensure orderly conduct of the lectures.

- Please arrive on time. If you are going to be late on a particular day, for a valid reason, please let me know in advance.
- If you have to leave early on a particular day, for a valid reason, please let me know in advance; also, try to find a seat near an aisle to minimize disruption to others. You may not come and go as you please.
- For the exams, please arrive on time and take your seat promptly. You may start only when I announce the start of the exam and you must stop and hand-in your exams when the exam ends.
- Private discussions, including scribbling notes, among students are disruptive to others. If you have a question or something to contribute to the class discussion please share it with all of us.

EVALUATION OF STUDENTS' WORK

Requirement	Grade Value
5 Individual Homework Assignments	40%
Exam	40%
Group Project	20%

The final course grade is based on a "curve". I adhere to the Marshall School guidelines which suggest an average grade of 3.3 out of 4.0 for upper level undergraduate elective courses. I will occasionally post the full distribution of all your grades, so that you can tell where you stand in the class.

The Federal government and the University regulations prevent me from posting your grades due to privacy concerns. I will post the grades on Blackboard, http://blackboard.usc.edu

HOMEWORK ASSIGNMENTS

There will be five individual homework assignments with due dates given in the schedule below. Each homework assignment involves the use of Eviews and/or Excel on economic and financial data and is worth 8% of the course grade. 40% of the course grade is determined by these computer assignments/applications. Each student will be given an individual data set consisting of monthly observations on two risky asset (or portfolio) returns. In addition, students will receive a common data set consisting of monthly observations on the 10-year Treasury bond yield, the 1-month Treasury bill yield, NASDAQ and Dow Jones Industrial indices, and quarterly real GDP. The computer assignments will involve the use of the common as well as the individual data sets. More

detailed information, the data sets to be used, and further guidelines are posted on the course web site
If an assignment is late for any reason, then for every 24-hour period that an assignment is late I will deduct 20% from the maximum allowable points before grading. I accept assignments submitted over the internet, provided that they are well-formatted (not too long) Word of PDF documents. I do not accept Excel spreadsheets, unless I specifically ask for them.

EXAM
The exam will be a 100-minute comprehensive, all-inclusive, closed-book, closed-notes exam, with a combination of short answer and problem/essay questions. You may use a calculator, but sharing one is not permitted. Also, devices capable of wireless transmission are not allowed. If you miss the exam due to a medical emergency that can be documented and verified, then a make-up exam will be given. Otherwise, a grade of zero will be given for the missed exam.
Some practice questions including those at the end of Brooks' chapters and suggested answers will be posted at the course web site.

Any violation of the code of academic honesty will be treated severely.

GROUP PROJECTS
I will randomly assign students to portfolio management groups. Each group will have about 4 students. These groups will form and manage portfolios of stocks and bonds that I will assign. They will use a quantitative approach. In particular, they will implement the Goldman Sachs Quantitative Group's technique of estimating expected returns and the covariance matrix.

Each team project will be about 12-15 pages long and will be presented in class. 10% of the Group Project grades will be assigned by the students themselves after all the in-class presentations and discussions are made. The remaining 10% will be assigned by me and it will be based on the revised project document due on Monday May 12 by 2 PM. Please send it to me by this deadline as an attachment to an e-mail. For each 24-hour period that this project is late, I will deduct 20% from the eventual grade for the project.

Educational Objectives:

1) To form a portfolio of risky assets using a quantitative method.
2) To analyze the relevant financial environment, macroeconomic conditions, and make changes to the estimated expected returns and the covariance matrix if necessary.
3) To apply concepts and tools from this course to an actual portfolio formation task.

Deliverables:

1. A single-sheet of executive summary of your group project due in class 2:00 PM on April 28. This will help us to follow your presentations.

2. A 10-20 minute oral presentation to be delivered during classes on April 28 and April 30, with a class discussion to follow. I will adjust the time allocations depending on class size.
3. An electronic copy of your revised report to be e-mailed to me at selo@marshall.usc.edu by 2 PM on Monday, May 12.

Format of Group Project Report and Presentation

The format of the group project report and presentation should be 1) a one-page executive summary (double-sided is OK), 2) up to 15 pages of text (single-spaced, using a normal sized font) discussing the portfolio issue, 3) detailed supporting exhibits, and 4) a list of your sources of information. The entire document should not exceed 20 pages.

GRADE APPEAL

If you are not satisfied with your homework or exam grade for objective reasons, you may appeal to me in writing, within one week after the homework or exam is handed out. Be clear and specific about the answers that you feel needs to be re-graded and about your reasons for requesting re-grading. As a result of re-grading your score may increase or decrease.

RETURN OF PAPERS AND EXAM

Graded paperwork that is unclaimed by a student will be discarded after 4 weeks. Students who miss class sessions when paperwork is returned are responsible for arranging for an appointment to retrieve the material. Disputes over graded material should be brought to the professor's attention as soon as possible.

MAKE UP EXAMS

Current department policy to which I adhere is the following:

> No make-up midterm or final exams will be allowed. If for any reason a student must miss an exam, he/she will be given a '0' for that exam. If there are extenuating circumstances that prevent the student from taking an exam, he/she must discuss the reason with the instructor before the time of the exam. Current department policy is that a student will not be given a make-up exam unless he/she obtains a written permission from the instructor in advance. In addition, a student must be able to document the extenuating circumstance.

BLACKBOARD CONNECTION

All course material will be on the course web site on Blackboard. Your grades will also be posted on Blackboard. In addition Blackboard is my principal means of communication with you outside class. Therefore, it is important that,

1. you can get on Blackboard,
2. you automatically have your e-mail messages forwarded to your favorite e-mail account so that you can receive them promptly,
3. your e-mail account is functioning.

GETTING HELP
If you have questions about any aspect of the course, you can always ask me. If it is a quick question, you can catch me before or after the class, or during the break in between. If you want more time or privacy, you can come to my office hour. If you cannot make my office hour, you can contact me for an appointment.

The best way to reach me is by e-mail. I check it all the time. The worst way is to call me as I do not check my phone messages nearly as often as I check my e-mail.

STATEMENT ON ACADEMIC INTEGRITY
USC seeks to maintain an optimal learning environment. General principles of academic honesty include the concept of respect for the intellectual property of others, the expectation that individual work will be submitted unless otherwise allowed by an instructor, and the obligations both to protect one's own academic work from misuse by others as well as to avoid using another's work as one's own. All students are expected to understand and abide by these principles. *Scampus,* the Student Guidebook, contains the Student Conduct Code in Section 11.00, while the recommended sanctions are located in Appendix A. http://www.usc.edu/dept/publications/SCAMPUS/gov/
Students will be referred to the Office of Student Judicial Affairs and Community Standards for further review, should there be any suspicion of academic dishonesty. The Review process can be found at: http://www.usc.edu/student-affairs/SJACS/

STATEMENT FOR STUDENTS WITH DISABILITIES
Any student requesting academic accommodations based on a disability is required to register with Disability Services and Programs (DSP) each semester. A letter of verification for approved accommodations can be obtained from DSP. Please be sure the letter is delivered to me (or to TA) as early in the semester as possible. DSP is located in STU 301 and is open 8:30 a.m. – 5:00 p.m., Monday through Friday. The phone number for DSP is (213) 740-0776.

COURSE SCHEDULE AND READING ASSIGNMENTS

Date	Topic	Assignment Due
Week 1:		
1/14	Course Introduction.	Introduction, Math/Stat Review, Ch. 1
1/16	Classical Regression	Chs. 2-3, Eviews Demo
Week 2:		
1/21	Martin Luther King Day, No Class	
1/23	More on Regression, CAPM	Lecture Notes, Chs. 3-4
Week 3:		
1/28	More on Regression	Lecture Notes, Chs. 3-4
1/30 hw1 due	Modeling and Forecasting Trend	Lecture Notes
Week 4:		
2/4	Modeling and Forecasting Seasonality	Ch. 9.1-9.3
2/6	More on Seasonality	
Week 5:		
2/11	Characterizing Cycles	Ch 5, ARMA Notes
2/13 hw2 due	Estimating and Modeling Cycles	Ch 5, ARMA Notes
Week 6:		
2/18	Estimating and Forecasting Cycles	Ch 5, ARMA Notes
2/20	Can we forecast business cycles?	
Week 7:		
2/25	Presidents Day, No Class	
2/27 hw3 due	Monetary Policy and Business Cycles	Lecture Notes
Week 8:		
3/3	Stochastic Volatility	Ch. 8, Eviews on GARCH
3/5	Stochastic Volatility	Ch. 8, Eviews on GARCH
Week 9:		
3/10	Stochastic Volatility	Ch. 8, Eviews on GARCH
3/12 hw4 due	Multivariate GARCH	Ch. 8, Eviews on GARCH

Date	Topic	Assignment Due
Week 10:		
3/24	Factor Based Asset Pricing Models	CAPM Primer
3/26	CAPM and Multifactor Models	Cochrane (1999)
Week 11:		
3/31	Quantitative Portfolio Management	Litterman (2003)
4/2 hw5 due	Black-Litterman Approach	Lecture Notes
Week 12:		
4/7	Portfolio Optimization	Jagannathan
4/9	Standard Asset Pricing Theory	Constantinides (2002), Malkiel (2003)
Week 13:		
4/14	The Efficient Market Hypothesis	
4/16	Mutual Funds and Hedge Funds	
Week 14:		
4/21	Review	
4/23	**Exam**	
Week 15:		
4/28	Group Project Presentations	
4/30	Group Project Presentations	
Revised Group Project		
5/12 M	**Group Project due at 2:00**	

Note: All details in this handout are subject to change with adequate notice. The University's official "Schedule of Classes" supercedes all items such as final exam schedules, etc., which are reproduced here only for your convenience.

Appendix I

PEER EVALUATIONS
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Please allocate 100 points among your team members, including yourself, to reflect each person's relative contribution to your team. Write the name of each member of your team, including yourself, in the spaces below and then assign points to each person. Make sure the points add up to 100. If I do not receive a peer evaluation from you then I will assume that all members contributed equally to the project.

	List Name of Person	**Points**
Yourself	_____	_____
Team Member	_____	_____
Team Member	_____	_____
Team Member	_____	_____
Team Member	_____	_____
Team Member	_____	_____
Total:		100

Explanation

Please explain why you divided up the points the way you did. This explanation is an important component of the peer evaluations, so please take the time to provide a thorough explanation. Peer evaluations that have a good explanation will be taken more seriously than those that do not.

Appendix II
PROJECT EVALUATIONS
FBE 443 Spring 2008

Please allocate 100 points among the projects, including your project, to reflect each project's relative contribution to the learning experience.

Write the name of each project, including your project, in the spaces below and then assign points to each project. Make sure the points add up to 100. If I do not receive a project evaluation from you then I will assume that all projects contributed equally to the learning experience.

	List Name of Project	**Points**
Your Project	_____	_____
Other Project	_____	_____
Other Project	_____	_____
Other Project	_____	_____
Other Project	_____	_____
Other Project	_____	_____
Other Project	_____	_____
Other Project	_____	_____
Other Project	_____	_____
Other Project	_____	_____
Total:		100

Explanation

Please explain why you divided up the points the way you did. This explanation is an important component of the project evaluations, so please take the time to provide a thorough explanation. Project evaluations that have a good explanation will be taken more seriously than those that do not.