Econ 490: Practicum in Financial Economics

UNC at Chapel Hill, Department of Economics

Spring 2017

Instructor

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T 3:30-4:45pm

Class Schedule:

R 3:30-4:45pm Phillips Hall Rm247

Communication:

Assignments, announcements, grades, readings, and other information will be posted on sakai. The sakai site will be the primary method of communication for this course, so please check it frequently.

Prerequisites:

Econ 423 (Financial Economics)

Econ 490 must be taken concurrently with Econ 590

Course Materials:

Recommended Texts: *A Beginners Guide to Matlab for Economics and Econometrics* by Frain (2014)

Recommended Periodicals: Keeping abreast of the financial and macro news is essential for this course. Although not officially required, reading the The Wall Street Journal and/or the Economist is highly recommended.

Code of Conduct: The University Honor Code is in effect. In particular, this implies that all work submitted is your own. Moreover, I expect professional behavior at all times. For example, the non-academic use of personal electronic devices is prohibited.

Software: We will be using Matlab extensively in this course. A prior familiarity with this program is helpful, but not required to succeed in Econ 490/590. There are several excellent primers available: Financial Modeling: Theory, Implementation, and Pratice with Matlab Source by Kienitz and Wetterau (Wiley 2013), Beginners Guide to Matlab for Economics and Econometrics by Frain (2014), as well as several tutorial videos from Matworks (creators of Matlab) https://www.mathworks.com/videos/introduction-to-matlab-81592.html. We will be using version R2016a and higher during the course, but older versions should suffice. In addition to the standard toolboxes, we will be using the DataFeed, DataBase, Econometrics, Financial, and Financial Instruments toolboxes. As a UNC student you can access Matlab via UNC's Virtual Lab: https://virtuallab.unc.edu, or obtain a free copy via UNC's Software Acquisition portal https://sa.unc.edu/shop/home. Note that at the time of writing this document, these two options do not have all of required toolboxes. You can purchase additional toolboxes and/or a base copy of Mathworks by visiting https://www.mathworks.com/store, click "Buy Now" in the Student box, and choose "Matlab Student" along with the aforementioned toolboxes. Note that there are dependencies, which might require the purchase of additional toolboxes for full functionality.

Class Structure: Upon entering the class, each student is assigned an investor identity, consisting of an investable universe (stocks, bonds, etc..), objective function (min. variance, min. tracking error, etc..), and constraints (low transaction costs, high turnover, etc...). Each student's goal is to create and manage, in real-time, the "best" portfolio possible given their "investor identity". This goal is achieved through regular "hands-on" implementations of the various asset pricing and trading strategies developed in Econ 423 and Econ 590.

Grading	% of Course Grade	Date	Details & Policy
Codebook	(60%)	TBD	Students will write, run, and maintain computer code to allocate their funds. That code will be stored in a "code book". Roughly 10 well commented entries are required during the semester, with each entry building upon the previous.
Portfolio Summary	(40%)	Weekly	Each week students must submit a written and visual summary of the performance of their investable universe and suggested optimal portfolio(s). The content of the summary should grow as the students build familiarity with various pricing and allocation techniques.

Letter grades are computed from the total points earned during the semester and assigned based on the scale nearby. There is no maximum number of A's nor B's awarded. However, in previous courses $15\% - 20\%$ of my students have earned in the A range, $30\% - 50\%$ have earned in the B range, and $20\% - 30\%$ have earned in the C range. Although the grade distribution may change this semester, the past scores should give you a sense of my grading standards.

A	$x \geq 95\%$
A-	$90 \leq x < 95$
B+	$85 \leq x < 90$
B	$80 \leq x < 85$
B-	$75 \leq x < 80$
C+	$70 \leq x < 75$
C	$65 \leq x < 70$
C-	$60 \leq x < 65$
D+	$50 \leq x < 60$
D	$40 \leq x < 50$
F	$x < 40$

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The QFE Credential

The goal of the Credential in Quantitative Financial Economics (QFE) is to train students as financial economists, providing all the quantitative tools necessary to bring theory into practice. The Credential is graciously sponsored by, and implemented in conjunction with, the NASDAQ Foundation.

Financial Economics is a subfield of economics wherein money is on both sides of a trade between parties. The trade typically exchanges money now for money at some point in the future, and is subject to uncertainty. There are traditionally two branches of Financial Economics: Asset Pricing (e.g. macro investment analysis) and Corporate Finance (e.g. capital budgeting decisions). The QFE provides the foundation for both branches, but the focus is on the former.

The modern financial economist is deluged with data. Financial market transactions are available across myriad asset classes and recorded at high frequencies. Rigorous quantitative analysis is required to separate the signal from the noise. The QFE will reinforce the statistical and econometric skills of our current undergraduate curriculum, and introduce the students to an array of computational tools.

Econ 423 Financial Economics (3 credits; Fall and Spring)
A central theme underlies the course: How does a risk averse individual allocate their funds? Students begin by defining and measuring risk, making connections to their microeconomics training. They then develop and use asset pricing models to explore the interplay between risk and return. These pricing tools are then applied to several assets, including equities, fixed income, and foreign exchange. Finally, students use these tools to develop a mean-variance optimal portfolio allocation. Along the way, students are introduced to basic quantitative tools, and participate in myriad practical applications.

Econ 490 Practicum in Quantitative Financial Economics (1 credit; Spring)
Working in conjunction with Econ 590, this practicum provides students the opportunity to implement and test the models being developed in Econ 423. Students will work with multiple data sources and programming platforms, and engage in a series of practical experiments using live market information. *Pre-Requisite: Econ 423; Note: Econ 490 must be taken concurrently with Econ 590.*

Econ 590 Advanced Financial Economics (3 credits; Spring)
Building upon the foundation developed in Econ 425, students take part in each of the five steps of the asset allocation process: 1) (Explore) How does the modern financial economist acquire, clean and transform data? 2) (Explain) What drives asset returns? 3) (Predict) Can we forecast returns? 4) (Allocate) How do we form a portfolio in the presence of risk? 5) (Protect) How do we assess and manage risk? *Pre-Requisite: Econ 423*

<h1 align="center">Tentative Course Outline</h1>

Section 1 - Explore

Week 1: [Course Introduction; Acquiring financial data] "Matlab for Economics and Econometrics: A Beginners Guide" by Frain (2014)

Week 2: [Microstructure Data; TAQ; SQL] "Lifecycle of a Security"' by Morris and Goldstein (2010); "Econometrics of Financial Markets" by Campbell, Lo, and MacKinlay (1997), Ch3

Section 2 - Explain

Week 3: [Connecting the Markets and the Macroeconomy] "Macroeconomics" by Mankiw (2010) Ch14; "Bridging the Classroom Gap Between Asset Pricing and Business Cycle Theory" by Aguilar and Soques (2015)

Week 4-5: [Factor Models; Fama-MacBeth] "Economic Forces and the Stock Market" by Chen, Ross, and Roll (1986); "Quantitative Financial Economics" by Cuthbertson (2004) Ch3; "Econometrics of Financial Markets" by Campbell, Lo, and MacKinlay (1997), Ch6; "Common Risk Factors in the Returns of Stocks and Bonds" by Fama and French (1993)

Week 6: [Sequential and Simultaneous Screening Models] "Quantitative Equity Portfolio Management" by Chincarini and Kim (2006) Ch5

Section 3 - Predict

Week 7: [Efficient Market Hypothesis; Event Study; Variance Ratio] "Econometrics of Financial Markets" by Campbell, Lo, and MacKinlay (1997), Ch2&4; "Quantitative Financial Economics" by Cuthbertson (2004) Ch5-8

Week 8: [Time Series Modeling; ARMA; GARCH; Seasonality] "Econometrics of Financial Markets" by Campbell, Lo, and MacKinlay (1997), Ch12

Week 9: [Pairs Trading via Cointegration; Mixed Frequency via MIDAS] "There is a Risk Return Trade-off After All" by Ghysels, Santa-Clara, and Valkanov (2005); "Pairs Trading: Quantitative Methods and Analysis" by Vidyamurthy (2004) Ch5-7

Week 10: Spring Break

Week 11: [Yield Curve Modeling] "Forecasting the Term Structure of Government Bond Yields" by Diebold and Li (2006)

Step 4 - Allocate

Week 12: [Advanced Portfolio Optimization; TCA; Black Litterman] "The Black Litterman Model in Detail" by Walter (2007); "Global Portfolio Optimization" by Black and Litterman (1992)

Step 5 - Protect

Week 13: [Portfolio Risk Attribution; Value at Risk; Factor Exposure Targeting] "An Overview of Value at Risk", by Duffie and Pan (1997); "Quantitative Equity Portfolio Management" by Chincarini and Kim (2006) Ch15.5, Ch9.7, Ch9.8

Week 14: [Credit Risk] "Credit Risk" by Duffie and Singleton (2003) Ch3-4

Term Papers

- Week 15: One-on-One meetings with Professor to refine research ideas

- Week 16: Peer reviews of term papers

- Week 17: Submit term paper