

SIMON FRASER UNIVERSITY
Department of Economics

Econ 815 – FINANCIAL ECONOMICS I
Syllabus – Fall 2015

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COURSE OBJECTIVES AND PREREQUISITES

This course is the first of a two course sequence in financial economics. In previous years it was staffed by the business faculty. Although for historical reasons it is called Portfolio Theory, starting this year its coverage will be broader, and accordingly, it will eventually be renamed Financial Economics I. The goal is to survey a variety of topics in asset pricing theory. The follow-up course by Bertille Antoine (Econ 818), will then focus on empirical issues. Financial economics provides a great example of the interaction between theory and empirical evidence. The goal of this two-course sequence is to illustrate this.

We are going to discuss 9 key ideas in asset pricing theory; roughly one per week. Students will be asked to read the following 9 papers: (1) Arrow's (1964) model of dynamic spanning, (2) Sharpe's (1964) CAPM model, (3) Merton's (1971) dynamic partial equilibrium model of optimal consumption/portfolio decisions, (4) Black & Scholes' (1973) option pricing model, (5) Lucas's (1978) general equilibrium consumption-based CAPM model, (6) Harrison & Kreps' (1978) model of speculative trading with heterogeneous beliefs, (7) Harrison & Kreps' (1979) theory of risk-neutral pricing and equivalent martingale measures, (8) Grossman & Stiglitz' (1980) informational efficiency impossibility theorem, and (9) Tirole's (1982) No Trade theorem. Although these papers may appear to be a bit 'dated', they continue to exert a profound influence on modern financial theory and practice. If time permits, we will discuss some of these recent extensions.

Much of modern financial theory uses the tools of continuous-time stochastic processes and continuous-time dynamic optimization. The first couple weeks of the course will provide a 'crash course' tutorial on these methods.

COURSE EVALUATION

	<u>Weight in Grade</u>
Problem Sets	– 20%
Midterm exam (Tuesday, October 20)	– 40%
Final exam (To Be Decided)	– 40%

COURSE MATERIALS

There is no required textbook for this course. Papers and notes will be posted on the website as we go along. For those seeking a good textbook treatment of modern asset pricing, I recommend John Cochrane's (2005) book, *Asset Pricing*, which is available at the bookstore and on reserve at the library.

COURSE OUTLINE AND READINGS

I. MATHEMATICAL BACKGROUND

- Sept. 15 – **Introduction and Overview**
Cochrane text, Preface
- Sept. 17 – **Stochastic Processes**
Dixit & Pindyck, Chpt. 3 (pgs. 59-71)
Key Terms & Concepts: *Sample Paths, Stationarity, Martingales, Binomial Tree, Filtration, Weak Convergence, Mean-Squared Convergence, Ito Integral, Wiener Process, Brownian Motion, Diffusion Process*
- Sept. 22 – **Stochastic Calculus**
Dixit & Pindyck, Chpt. 3 (pgs. 79-81)
Cochrane (2013), “Continuous Time Summary/Review” (webpage)
Key Terms & Concepts: *Ito’s Lemma, Stochastic Differential Equations, generator, Feynman-Kac Formula*
- Sept. 24 – **Dynamic Programming**
Dixit & Pindyck, Chpt. 4 (pgs. 93-107)
Key Terms & Concepts: *Value Function, Hamilton-Jacobi-Bellman (HJB) Equation*

II. ASSET PRICING THEORY

- Sept. 29 – **Financial Markets and Arrow-Debreu General Equilibrium**
Arrow (1964), “The Role of Securities in the Optimal Allocation of Risk-Bearing”
Athreya (2013, pgs. 208-13), “Time, Uncertainty, and the ADM Model”
Key Terms & Concepts: *Complete Markets, Contingent Claims, Arrow Securities*
- Oct. 1 – **Dynamic Spanning**
Radner (1972), “Existence of Equilibrium of Plans, Prices, and Price Expectations”
Athreya (2013, pgs. 214-21), “The Radner Version of the ADM Economy”
Key Terms & Concepts: *Radner Equilibrium*
- Oct. 6 – **Portfolio Theory**
Campbell (2003), “Lecture Notes” (pgs. 1-11)
Campbell (2000), “Diversification: A Bigger Free Lunch”
Key Terms & Concepts: *Diversification, Mean-Variance Efficiency, Systematic Risk*
- Oct. 8 – **The CAPM**
Sharpe (1964), “Capital Asset Prices: A Theory of Mkt. Equil. under Conditions of Risk”
Luenberger (1998), “The Capital Asset Pricing Model”
Campbell (2003), “Lecture Notes” (pgs. 12-22)
Cochrane (1999), “Portfolio Advice for a Multifactor World”
Key Terms & Concepts: *The Market Portfolio, Beta, Sharpe Ratio, Capital Market Line*

- Oct. 13 – **Dynamic Consumption/Portfolio Rules**
Merton (1971), “Optimum Consumption and Portfolio Rules in a Continuous-Time Model”
Key Terms & Concepts: *HARA Utility*
- Oct. 15 – **Applications and Extensions of the Merton Model**
Class Notes
Key Terms & Concepts: *Hedging, Learning*
- Oct. 20 – **Midterm Exam**
- Oct. 22 – **Derivative Securities**
Cochrane text, Chpt. 17 (pgs. 313-320)
- Oct. 27 – **The Black-Scholes Formula**
Black & Scholes (1973), “The Pricing of Options and Corporate Liabilities”
Black (1989), “How We Came Up with the Option Formula”
Key Terms & Concepts: *Replicating Portfolio, Delta Hedging, No Arbitrage Pricing, Heat Equation, PDEs*
- Oct. 29 – **The Consumption-Based CAPM Model**
Lucas (1978), “Asset Prices in an Exchange Economy”
Cochrane text, Chpt. 1 (pgs. 3-7, 25-30)
Key Terms & Concepts: *Euler Equation, Stochastic Discount Factor*
- Nov. 3 – **Applications and Extensions of the Lucas Model**
Class Notes
Key Terms & Concepts: *The Equity Premium Puzzle, Hansen-Jagannathan Bounds*
- Nov. 5 – **Heterogeneous Beliefs**
Harrison & Kreps (1978), “Speculative Investor Behavior..with Heterogeneous Expectations”
Key Terms & Concepts: *Priors, Subjective Beliefs, Merging, Agreeing to Disagree, Resale Option*
- Nov. 10 – **Applications of Heterogeneous Beliefs**
Scheinkman & Xiong (2003), “Overconfidence and Speculative Bubbles”
Kasa, Walker & Whiteman (2014), “Heterogeneous Beliefs & Tests of Present Value Models”
- Nov. 12 – **Equivalent Martingale Measures and Risk-Neutral Pricing**
Nov. 17 – Harrison & Kreps (1979), “Martingales and Arbitrage in Multiperiod Securities Markets”
Cochrane text, Chpt. 4 (pgs. 61-75)
Chpts. 14 & 15 from Neftci’s (1996) book, *Mathematics of Financial Derivatives*
Key Terms & Concepts: *Self-Financing Portfolio, No Arbitrage, Absolute Continuity, Radon-Nikodym Derivative, Girsanov Theorem, Martingale Representation Theorem, Martingale Method*
- Nov. 19 – **Information and the Grossman-Stiglitz Paradox**
Nov. 24 – Grossman & Stiglitz (1980), “On the Impossibility of Informationally Efficient Markets”
- Nov. 26 – **Speculation, Common Knowledge, and No-Trade Theorems**
Dec. 1 – Tirole (1982), “On the Possibility of Speculation under Rational Expectations”
Key Terms & Concepts: *Common Priors, Aumann’s Theorem, Liquidity Traders*