INTRODUCTION TO FINANCIAL ECONOMICS

15.416J (Spring 1997) - Jiang Wang

Course Description: This course provides an introduction to the theory of financial economics. It is intended for doctoral students at the Sloan School of Management and the Economics Department. This course covers the following topics:

- Choice under uncertainty
- Contingent claim valuation
- Mean variance analysis and the Capital Asset Pricing Model
- The Arbitrage Pricing Theory
- Dynamic asset valuation
- Financial markets with imperfections
- Financial innovations
- An introduction to continuous-time finance

Readings: The readings of this course are mostly drawn from the following two text books and a reading packet:

- *Foundations for Financial Economics* by Chi-fu Huang and Robert Litzenberger, Prentice Hall (1988)
- *Theory of Financial Decision Making* by Jonathan Ingersoll, Rowman and Littlefield (1987)

The reading packet is available from the Graphics Arts (located in the basement of E52).

Grade: The grade of the course will be based on the midterm exam (35%), final exam (50%) and homework and class participation (15%). Assigned homework should be handed in at the beginning of class on the listed due date and no late homework will be accepted.

Other Information:

Lectures: MW 14:30-16:00, E51-151

Office Hours: Th 4-5:30, E52-435

Phone: 253-2632

TA: Arvind Krishnamurthy, E52-458 (253-3919) (email: akrish@mit.edu)

Secretary: Madeleine Um, E52-460 (253-9747)

COURSE OUTLINE

1 Choice Under Uncertainty

- Expected utility: A review
- Risk aversion
- Stochastic dominance
- Portfolio separation theorems

READING:

- Huang and Litzenberger, Chapter 1, 2
- Ingersoll, Chapter 5, 6
- Cass and Stiglitz (1970), "The Structure of Investor Preferences and Asset Returns, and Separability in Portfolio Allocation," *Journal of Economic Theory* 2, 122-160.
- Pratt (1964), "Risk Aversion in the Small and the Large," *Econometrica* 32, 122-136.
- Rothschild and Stiglitz (1970), "Increasing Risk I: Definition," *Journal of Economic Theory* 2, 225-243.
- Rothschild and Stiglitz (1971), "Increasing Risk II: Economic Consequences," *Journal of Economic Theory* 3, 66-84.

2 Discrete Time Asset Valuation: Two-Period

- Arrow-Debreu economy and state-contingent claims
- Arbitrage
- Risk sharing and aggregation
- Options: An example of arbitrage pricing
- Modigliani-Miller Theorems

READING:

- Huang and Litzenberger, Chapter 5, 6
- Arrow (1964), "The Role of Securities in the Optimal Allocation of Risk-Bearing," *Review of Economic Studies* 31, 91-96.
- Hirshleifer (1970), *Investment, Interest and Capital*, Prentice-Hall.
- Rubinstein (1974), "An Aggregation Theorem for Securities Markets," *Journal of Financial Economics* 1, 225-244.

3 Mean-Variance Analysis and the CAPM

- Mean-variance analysis
- The Capital Asset Pricing Model

READING:

- Huang and Litzenberger, Chapter 3, 4
- Ingersoll, Chapter 4

4 Arbitrage Pricing Theory

- Linear factor models
- Asymptotic arbitrage

READING:

- Huang and Litzenberger, Chapter 4
- Ingersoll, Chapter 7
- Connor (1984), "A Unified Beta Pricing Theory," *Journal of Economic Theory* 34, 13-31.
- Huberman (1983), "A Simple Approach to Arbitrage Pricing Theory," *Journal of Economic Theory* 28, 1183-1191.
- Ross (1976), "Arbitrage Theory of Capital Asset Pricing," *Journal of Economic Theory* 13, 341-360.

5 Discrete Time Asset Valuation: Multi-Period

- Dynamic Portfolio Choice
- Equilibrium Pricing
- Valuation by Arbitrage

READING:

- Huang and Litzenberger, Chapter 8
- Ingersoll, Chapter 10, 11
- Cox, Ross and Rubinstein (1979), "Option Pricing: A Simplified Approach," *Journal of Financial Economics* 7, 229-263.
- Cox, Ingersoll and Ross (1981), "The Relation between Forward Prices and Futures Prices," *Journal of Financial Economics* 9, 321-346.
- Dothan (1990), *Prices in Financial Markets*, Oxford University Press.
- Duffie (1992), *Dynamic Asset Pricing Theory*, Princeton University Press.

Lucas (1978), "Asset Prices in An Exchange Economy," *Econometrica* 46: 1426-1446.

- Radner (1972), "Existence of Equilibrium of Plans, Prices and Price Expectations in A Sequence of Markets," *Econometrica* 40: 289-303.

6 Financial Markets With Imperfections

6.1 Market Incompleteness

- Consumption and Portfolio Choice
- Equilibrium Pricing

READING:

- Duffie (1987), "Stochastic Equilibria with Incomplete Financial Markets," *Journal of Economic Theory* 41, 405-416.

- He and Pearson (1991), "Consumption and Portfolio Policies with Incomplete Markets and Short-Sale Constraints: The Finite-Dimensional Case," *Mathematical Finance* 3, 1-10.

6.2 Heterogeneous Information

- Competitive Rational Expectations Equilibrium
- Non-competitive Rational Expectations Equilibrium

READING:

- Huang and Litzenberger, Chapter 9

- Grossman (1981), "An Introduction to the Theory of Rational Expectations under Asymmetric Information," *Review of Economic Studies* 48, 573-585.

- Grossman and Stiglitz (1980), "On the Impossibility of Informationally Efficient Markets," *American Economic Review* 70, 393-408.

- Kyle (1985), "Continuous Auctions and Insider Trading," *Econometrica* 53, 1315-1335.

6.3 Frictions

- Leverage Constraints
- Trading Costs

READING:

- Constantinides (1986), "Capital Market Equilibrium with Transaction Costs," *Journal of Political Economy* 94, 842-862.

- Davis and Norman (1990), "Portfolio Selection with Transaction Costs," *Mathematics of Operations Research*.

- Grossman and Laroque (1990), "Asset Pricing and Optimal Portfolio Choice in the Presence of Illiquid Durable Consumption Goods," *Econometrica* 58, 25-52.

- Grossman and Vila (1992), "Optimal Investment Strategies with Leverage Constraints," *Journal of Financial and Quantitative Analysis*.

7 Financial Innovations

READING:

- Allen and Gale (1988), "Optimal Security Design," *Review of Financial Studies* 1, 229-264.

- Duffie and Jackson, (1989) "Optimal Innovation of Futures Contracts," *Review of Financial Studies* 2, 275-596.

8 An Introduction to Continuous Time Finance

- Stochastic calculus: A non-technical introduction
- Portfolio/consumption choice
- Intertemporal CAPM
- Intertemporal CCAPM
- Black-Scholes Option Pricing
- Term Structure of Interest Rates

READING:

- Arnold (1974), *Stochastic Differential Equations: Theory and Applications*, John Wiley & Sons, Inc.

- Black and Scholes (1973), "The Pricing of Options and Corporate Liabilities," *Journal of Political Economy* 81, 637-654.

- Breeden (1979), "An Intertemporal Asset Pricing Model with Stochastic Consumption and Investment Opportunities," *Journal of Financial Economics* 7, 265-296.

- Cox, Ingersoll and Ross (1985), "An Intertemporal General Equilibrium Model of Asset Prices," *Econometrica* 53, 363-384.

- Cox, Ingersoll and Ross (1985), "A Theory of the Term Structure of Interest Rates," *Econometrica* 53, 385-408.

- Duffie (1992), *Dynamic Asset Pricing Theory*, Princeton University Press.

- Harrison and Kreps (1979), "Martingales and Arbitrage in Multiperiod Securities Markets," *Journal of Economic Theory* 20: 381-408.

- Merton (1971), "Optimal Consumption and Portfolio Rules in a Continuous Time Model," *Journal of Economic Theory* 3, 373-413.

- Merton (1973), "An Intertemporal Capital Asset Pricing Model," *Econometrica* 41, 867-888.

- Merton (1990), *Continuous Time Finance*, Blackwell.

- Vasicek (1977), "An Equilibrium Characterization of Term Structure," *Journal of Financial Economics* 5, 177-188.