BROWN UNIVERSITY

Econ 1710 Investments I Syllabus (wii be revised) Fall 2010

> "The function and operation of asset markets; the determinants of the prices of stocks, bonds, options, and futures; the relations between risk, return, and investment management; the capital asset pricing model, normative portfolio management, and market efficiency. Prerequisite: ECON 1110 or 1130; and ECON 1620 or 1630 or APMA 1650."

Lecture Class Meetings:
Tuesdays and Thursdays, 9:00 am – 10:20 am in Watson (CIT) Center 165

TA Conference Meetings:
C01 – Wednesday, 12:00 pm - 12:50 pm in Smith-Buonanno Hall 101
C02 – Wednesday, 7:00 pm - 7:50 pm in Salomon Center 202

Instructor: Professor Akio Yasuhara
Office: 70 Waterman St., Rm. 309.
E-mail: Akio_Yasuhara@brown.edu
Office hours: Tuesdays and Thursdays from 11:00 am to 12:00 am, or by appointment.

Teaching Assistant: to be announced

Textbook and Reading Materials:
Boddie, Kane and Marcus, *Investments.*(latest edition)
The Wall Street Journal – The articles list is posted on the course web page,
Lecture notes and homework sets on our Course Web Page at: http://mycourses.brown.edu
"Guest" access will be open for the first two weeks.

Grading Rule

The course grade will be decided based upon the student's performance on one midterm examination, the final examination and homework problems. The homework sets count for 30 percent of the course grade, the midterm exam counts for 30 percent of the grade, and the final exam counts for the remaining 40 percent of the grade. To assure an "A"(or "B") for the course, show a 90(80, respectively)-percent-or-above performance. The weighted-average score below 65% will receive a "NC."

Auditing students must complete all homework assignments and show the minimum 65 percent grade on homework.

Homework sets are on our course web-page for download. They are in the 'pdf' format. Print them out to write your answers on them. Homework is essential for (1) confirming your understanding of the course materials, (2) testing your ability to apply analytical skills to cases different from lectures. and (3) the preparation for the exams.

Homework problems must be <u>solved by yourself without any help from anyone else</u>. The due date for each homework will be announced in class. The due date shall be strictly enforced. Do not ask your friend to hand in your homework. If you will be absent from the class meeting due to unavoidable reasons, hand in homework by e-mail attachment. Your TA will discuss homework answers in the TA sections.

Exams – The dates of the exams:
Midterm exam (in class) .... to be announced
Final exam .... Thursday, Dec. 16, from 2:00 pm to 4:10 pm.

COURSE OUTLINE

Part 1 – Preparation in Mathematics and Statistics

Mathematical tools (lecture note)

1. Rules of differentiation and partial differentiation
2. Taylor expansion and approximation

3. Un-constrained optimization methods
4. Constrained optimization methods.

Statistics (Appendix B in chapter 7)

1. Uncertainty tree
2. Random variables and the probability distribution
3. Statistical concepts and measures:
   the expected value, variance and standard deviation,
   covariance, correlation coefficient, etc.
4. Some theorems.
5. The Normal distribution, and the Log-Normal distribution.

Accounting

1. income statement
2. balance sheet

Part 2 – The Overall View of the U.S. Financial Markets

I. Introduction (chapters 1 through 4)
   1. Overview of the U.S. financial markets
      participants – deficit units, surplus units, brokers, dealers, investment bankers, etc
      market institutions – exchanges, the OTC market, ECNs, financial intermediaries, etc
   2. Financial instruments
      Treasury securities, corporate bonds and stocks, mortgage contracts, derivatives, etc
   3. Market data
      flow of funds data and balance of payments data
   4. Market indexes
   5. Regulations – the 1933 Securities Act, the 1934 Securities Exchange Act, and others
   6. Rules on the individual investment account with a broker
      margin purchase
      short sale
      the danger of "financial leverage"
   7. The roles played by the Securities and Exchange Commission and the Federal Reserve System
   8. Economic Functions of financial markets
      inter-temporal resource allocation
      risk sharing
   9. Global markets
   10. New developments

Part 3 – Preparation for Theories

II. Some key concepts (Chapter 5)
   1. Intended holding period and the holding period return (HPR)
   2. Nominal return and real return
   3. Asset characteristics – return, risk, liquidity, etc
   4. Investment risks – market risk, default risk, inflation risk, currency risk, political risk, etc,
   5. Measuring risk – applications of statistics
   6. Risk aversion

III. Time Value of Money (supplementary lecture note)
   1. Opportunity cost and discounting
   2. Present value and future value
   3. Key formulas
   4. Some applications – life-time financial plan, installment-prepayment loan, etc.

Part 4 – The Mean-Variance Portfolio Selection Theory

V. Portfolio Selection Analysis (chapters 6, 7 and part of 9)

1. The utility function – preference over the probability distribution
    - the mean-variance based model
    - preference over skewness and higher moments
    - more general types of utility functions
2. The case of one risky asset and a risk-free asset.
    - all possible portfolios in the risk-return space
    - short-sale possibility
    - the optimal portfolio
3. The cases of two risky assets with $\rho = +1$
    - the feasible portfolio locus
    - hedging
    - arbitrage
4. The cases of two risky assets with $\rho = -1$
    - the feasible portfolio locus
    - efficient portfolios
    - hedging
    - arbitrage
5. The cases of two risky assets with $\rho = 0$
    - the feasible portfolio locus
    - the merit of diversification
    - the minimum risk portfolio
    - the optimal portfolio
5. The case of three securities with one risk-free
    - the tangency portfolio
    - the optimal portfolio
6. The general case
    - the diversification effect – diversifiable, vs. non-diversifiable risks
    - the "insurance principle", applications to insurance business
    - the optimal portfolio conditions
7. The Capital Asset Pricing Model
    - assumptions
    - the market portfolio
    - the β coefficient

Part 5 – Theories of Various Types of Securities

VI. Valuation of Fixed-Income Securities (chapters 14, 15 and 16)

1. Specifications of bonds
    - the basic agreements
    - provisions and covenants
2. Bond price and the yield-to-maturity (YTM)
    - the YTM calculation
    - the price in relation to the face value
    - default possibility
3. The term structure of interest rates
    - the yield curve and forward rates
    - the expectations theory,and its implications to HPR
    - the liquidity-preference theory, liquidity-premiums, HPR and risk premiums
4. Bond price sensitivity
    - duration and the price volatility
    - convexity
5. Bond portfolio management
    - duration matching – immunization strategy
    - generalized duration math

duration of financial intermediary's equity

VII. Equity Valuation (chapter 18 and chapter 12)

1. Basic characteristics of equity shares
   - ownership with limited liability
   - dividend yield and capital-gain yield
   - the price/earnings (P/E) ratio
   - the present value of growth opportunities (PVGO)
2. Fundamentals approach
   - PV of future dividends
   - the "growth model"and its PVGO and P/E ratio
3. Some facts about stock markets: is market informationally "efficient"?

VIII. Options and futures and other derivatives (chapters 20, 21 and 22)

1. Derivative securities
   - futures and forward contracts
   - call and put options
   - swaps – interest rate swaps and currency swaps
   - credit-market derivatives
2. The maturity-date value
3. Financial engineering
   - futures hedges, protective puts, collar, butterflies, etc
4. Non-arbitrage conditions
   - the spot-futures parity
   - the call-put parity
   - arbitrage strategies
5. Theory of call and put options
   - upper bound and lower bound
   - convexity
   - sensitivity to various factors – maturity, interest rate, volatility, etc.
   - dynamic hedging strategies
6. The black-Scholes option model
   - continuous-time model assumptions
   - how to use it
   - multi-nomial model alternatives?
7. Theory of futures
   - the spot-futures parity with the term structure of interest rates
   - the futures-futures parity
   - the basis risk management