INVESTMENTS ANALYSIS & PORTFOLIO MANAGEMENT– FALL 2007

FIN-672 Investments Analysis & Portfolio Man't (3 credits) Professor Michel A. Robe
Office: Myers (Kogod) T-44 e-mail: mrobe@american.edu
Class: Th. 8-10.40 PM (*Ward 5*) Office Hours: M 1.30-3; Th. 5-8; Fr. 9-10.30 & appointments
Web page: http://www.american.edu/academic.depts/ksb/finance_realestate/mrobe/672index.htm Phone: (202) 885-1880

Prerequisites

This course's quantitative demands on students are somewhat steeper than for a core MBA finance course. The formal prerequisite is to have obtained a grade of C or better in *Financial Management* (FIN-614). Knowledge of statistics and spreadsheets shall prove most helpful.

Course Objectives

This course acquaints MBA students with the theoretical and more practical aspects of investment analysis, for security selection and portfolio management purposes. The goal is to expose students to material that any participant in the investments industry – from private investor to pension fund consultant to portfolio manager – will find useful. The course includes a deeper coverage of some tools that are familiar from the first finance course (*Financial Management*) and, mostly, other tools not seen previously in the curriculum. Logically, the study of investment pricing techniques and of the institutional background in which investment professionals operate should precede the study of how these professionals do or ought to behave. The course, which consists of six main parts, is organized accordingly.

After an introduction and a brief review of general finance concepts, **Part I** of the course presents the institutional environment in which portfolio managers operate. We discuss participants; instruments and their markets; and the way that securities are traded.

Parts II and III analyze the two categories of financial instruments that nowadays account for most trading activity: fixed income assets and interest-rate derivatives securities.

Part II deals with securities that provide fixed periodic income, such as municipal and other local government bonds, US Treasury Bills, Notes and Bonds, and mortgage-backed securities. The material includes the computation of bond yields, and the measurement of the term structure of interest rates.

Following the mid-term exam on Thursday, October 18, **Part III** discusses portfolio-management techniques that are specific to fixed-income securities. Topics include overviews of interest-rate risk measurement (including duration and convexity) and management, and credit risk (including credit spreads and credit crunches). *Time permitting*, yield-curve and spread-convergence trading techniques and bond-portfolio hedging shall be discussed. Credit derivatives and hedging techniques shall be introduced.

Part IV then presents the key elements of fundamental analysis for equities. The main items discussed in this part of the course are the elements of a "top-down" analysis of a firm's prospects, from macroeconomic and industry analysis to company-specific items. Practitioners rely on three main methods to value individual equities: ratio analysis, discount models and "comparables." We shall revisit dividend discount models, and cover in detail price/earnings ratio analysis.

Parts V and VI deal with portfolio management. **Part V** is short. It starts with the basic elements of modern portfolio theory: return (both nominal and real), risk, and the trade-off that risk-averse investors must make between the two. It then covers portfolio mechanics. **Part VI** tackles "top-down" portfolio management as well as the major pricing models for financial assets. Among those, we first study the CAPM ("capital asset pricing model"), building on and significantly extending the notions learned in previous finance courses. We then explain how to use the CAPM in practice, i.e., how to implement index

pricing models and (*time permitting*) multi-factor models and hedge fund strategies. Performance measurement concludes the course.

Course Materials

Required: *Investments, 7th Edition*, by Zvi Bodie, Alex Kane & Alan Marcus. Irwin, 2007 (BKM7).

Recommended supplementary texts:

Modern Investment Theory - Fifth Edition, by Robert Haugen. Prentice Hall, 2001. (H)

A Random Walk Down Wall Street – Seventh Edition, Burton Malkiel, Norton, 2000.

The required text is available at the bookstore. The fourth (BKM4), fifth (BKM5) and sixth (BKM6) editions of BKM are acceptable substitutes to the seventh edition. One should note, however, that some of the material covered in class (particularly on more advanced bond portfolio management tools) is not included in BKM4 or BKM 5. The previous edition of Haugen (H4) will also be on the 2-hour reserve at the library; while not up-to-date for institutional developments, it provides an excellent treatment of portfolio issues for mathematically-inclined students. Additional materials will be handed out in class.

In addition to the textbooks and transparencies, I have prepared a "readings packet" (RP) containing copies of published articles. The latter are drawn primarily from print-only practitioner-oriented journals such as the *Journal of Portfolio Management* and the *Financial Analysts Journal.* The packet does not constitute exam material. Rather, it is intended to round out interested students' awareness of important issues faced by practitioners. The packet may be obtained from the 2-hour reserve at the library. More recent articles are available from my online library, accessible through the course's website.

Investments is an especially dynamic area, and students are urged to follow current developments in the press. This includes reading the following papers: The Wall Street Journal (www.wsj.com, pay site), The Economist (weekly, www.economist.com, mostly pay site) or The Financial Times (www.ft.com, free registration). Barron's, Euromoney and Value Line's Investment Surveys are some of the other good sources of investment news. Other newspapers may also be useful for the purpose of the class, but often lack significant amounts of relevant information.

Transparencies

The lectures shall be based partly on PowerPoint transparencies. Except for the first lecture, I shall make these transparencies available on the Web as the class progresses. Transparencies for every lecture can be downloaded *COB* the Friday before (i.e., Fridays at 5 PM). You will probably want to print a paper copy of the relevant transparencies before each class to help in note taking. The web address from which to download the slides shall be confirmed on the first day of classes. All course announcements shall be made online – it is your responsibility to check the course's website regularly.

Grading

The weights for the final grade are as follows:

mid-term & final exams:	65% = Max [30%MT+35%F or 35%MT+30%F]
group assignments (numerical problems):	30% (15% each)
class participation:	5%

There will be one mid-term exam (10-18) and one final exam (12-13). Both the mid-term and the final exam shall be closed book. Each student, however, may bring in a calculator and one 8.5"x11" cheat sheet. For the midterm, one side of a sheet may be filled with anything the student wishes, but must be handwritten by him/her (no photocopying). For the final, both sides may be thus filled.

In addition, since we wish to emphasize practical skills, students shall complete two sets of numerical problems that use actual asset returns. To reflect how most companies conduct business, students shall form groups to handle this assignment. Groups shall comprise three or four students -- no fewer, no more. Groups shall e-mail their composition to me by September 30 at the latest. Once groups have been formed, their composition is not allowed to change. I reserve the right to handle any and all group-related problems.

It is very hard to do Assignment #1, and it is almost impossible to do Assignment #2, without prior familiarity with Excel (or some other spreadsheet program). In order to ensure that everyone in the class has the incentive to requisite proficiency, student are advised to check out a financial statistics practice set that shall be posted online before the second class. Files and instructions for the project will be downloadable by the Friday following the first class meeting.

General suggestions for preparing the assignment are included with the latter. Each group is to return an e-mail with its written answers and the supporting Excel spreadsheets by:

Assignment #1 (group):	by Thursday, November 3 at 3PM;
Assignment #2 (group):	by Thursday, December 13 at 3PM (= day of the final).

Assignments and projects that are late will not be graded.

In order to approximate business practice, where an individual's performance evaluation reflects not only the opinion of supervisors but also that of peers, group members shall evaluate one another. Each group member's grade will thus reflect overall group performance and other members' opinions. Evaluation sheets are provided at the end of this handout.

To help students prepare for the assignment and the exams, six practice sets with solutions shall be handed out. Four of those sets include practice questions, and two are practice exams (one mid-term and one final). None of the six sets will be graded, but students are strongly encouraged to try hard to solve them and to use office hours to discuss any problems they may have doing so. One of the best self-tests for a student of his or her command of the material before a case or the exam is whether he or she can handle the questions of the relevant practice sets. The questions on the exams will cover the reading material, and will be very similar to those in the six practice sets.

Class participation is important and will be explicitly rewarded (5% of the total grade). Effectively, the class participation grade may change a grade near a cutoff. Understandably, job search or other obligations may occasionally conflict with class. It is each student's responsibility to let me know ahead of time, and to find out from his/her classmates what has been missed during the absence.

Honor Code

By registering for the class, students promise to abide by the University Honor Code. In particular, (i) because I have taught courses similar to *Investments* at Miami, McGill and Kogod, solutions and solution keys to some of the group assignment questions may exist. **Any** use of, or reference to, existing solutions (whether written by me or by former students) is prohibited. (ii) Students shall not copy one another's solution for the financial statistics project due by the beginning of the second class meeting. (iii) Students within a group shall be judged, partly, by how well they work together. Members of any given group, however, shall **not** collaborate with any other group or person. (iii) Both the mid-term and the final exams shall be closed book, subject to the caveat in the previous section. Naturally, students are not allowed to collaborate with any other person during the exams.

Failure to respect these requirements shall be considered a severe violation of the University Honor Code and dealt with accordingly.

Course Outline

Below is a detailed list of topics that will be covered in class together with suggested readings. Only readings in Bodie/Kane/Marcus –fourth (BKM4), fifth (BKM5) *or* sixth (BKM6) edition -- are mandatory. Additional readings, including those in the "readings packet" (RP) and the "online library packet" (LP), are recommended but will not constitute exam materials.

Students are strongly encouraged to learn/review the material in the BKM Quantitative Review (BKM7 pp. 128-44 & 249-56; BKM6 pp. 1007-41; BKM5 pp. 940-975 & 171-177; BKM4 pp 892-927 & 166-173) prior to the first lecture. That material will not be covered in class.

Part I: Introduction - The Investment Environment (August 30, September 6 & 13)

Financial assets – what & why? (BKM7 pp. 1-7; BKM6 pp. 4-8; BKM5 pp. 2-7; BKM4 pp. 2-6)

Financial market participants (BKM7 pp. 12-9; BKM6 pp. 11-19; BKM 5 pp. 7-16; BKM4 pp. 6-15 & 21-4)

Financial instruments (BKM7 pp. 25-51; BKM6 pp. 31-60; BKM5 pp. 27-59; BKM4 pp. 29-62)

Elements of Market Microstructure (BKM7 pp. 15-9, 57-87 & 95-117)
(BKM6 pp. 20-25, 65-101 & 107-30)
(BKM5 pp. 16-22, 64-97 & 103-27)
(BKM4 pp. 15-21, 67-95 & 101-23)

Suggested Supplementary Reading:

Students should visit the NYSE (http://www.nyse.com) & NASDAQ (http://www.nasdaq.com) sites

Students interested in foreign exchanges may read the Toronto Stock Exchange Profile (LP)

Part II: Fixed Income Securities (September 20 & 27, October 4 & 11)

Real *vs*. nominal returns & risk (BKM7 pp 123-7, 131-3, 144-6 & 150-1; BKM6 pp. 138-42 & 150-1; BKM5 pp.132-137 & 143-4; BKM4, pp.127-40)

Bond types: Terminology and concepts (BKM 7 pp. 457-64, 477 & 479-86; BKM6 pp. 448-55; BKM5 pp. 415-22 & 434-42; BKM4 pp. 400-14)

Bond prices and yields (BKM7 pp. 464-79; BKM6 pp. 455-70; BKM5 pp. 422-34 & 441-2; BKM4 pp. 414-26)

Term structure of interest rates (BKM7 pp. 495-514; BKM6 pp. 487-510; BKM5 pp. 452-73; BKM4 pp. 435-54)

Suggested Supplementary Reading:

Siegel and Montgomery: *Stocks, Bonds, and Bills after Taxes and Inflation* (RP)

Brick: *A Primer on Mortgage-Backed Securities* (LP)

Mid-term exam (Thursday, October 18, 2007)

Part III: Elements of Fixed-income Portfolio Management (October 11 & 25, November 1)

III. A. Interest rate risk measurement and management:

Duration & convexity and their limitations – plain vanilla bonds (BKM 7 pp. 524-37; BKM6 pp. 519-36)

Duration & convexity for convertibles & mortgage-backed bonds (BKM 7 pp. 537-42; BKM6 pp. 519-36)

Passive bond portf. man't & immunization (BKM7 pp. 542-52; BKM6 pp. 536-47; BKM5 pp. 498-508; BKM4 pp. 468-82)

Active bond portf. man't & immunization (*as time allows*; BKM7 pp. 552-5; BKM6 pp. 547-50)

III.B. Credit risk measurement and management:

Traditional analysis (BKM7, pp. 479-86; BKM6 pp. 471-9)

Suggested Supplementary Reading:

Michel Crouhy & Dan Galai, *Risk Management*, McGraw Hill (2000; *Principles,* 2005)

Chapter 7: Credit Rating Systems

Chapter 8: The migration approach to measuring credit risk

Chapter 9: KMV and the contingent-claim approach to measuring credit risk

Part IV: Fundamental Equity Analysis (November 8 & 15)

"Top-Down" Security Analysis:

Macroeconomic Analysis (BKM7, pp. 570-82; BKM6 pp. 571-85; BKM5 pp. 532-45; BKM4 pp. 503-15)

Industry Analysis (BKM7, pp. 582-94; BKM6 pp. 581-8 & 590-1; BKM5 pp. 545-54; BKM4 pp. 515-23)

Firm-level Analysis (BKM 7, pp. 603-7; BKM6 pp. 588-90 & 591-5; BKM5 pp. 531-32 & 564-5; BKM4 pp. 531-3)

Firm-level Analysis

Dividend Discount Models (BKM7 pp. 607-21; BKM6 pp. 608-22; BKM5 pp.565-76 & 585-8; BKM4 pp.533-44) *and* Free cash-flows (BKM7 pp. 630-4; BKM6 pp. 634-6)

Comparables & P/E-Ratio Analysis (BKM7 pp. 621-30 & 634-6; BKM6 pp. 606-8 & 622-33; BKM5 pp. 576-85; BKM4 pp. 544-50 & 557-8)

Financial Statements Analysis (*as time allows*, BKM7 pp. 649-77; BKM6 pp. 655-83)

Part V: Portfolio Management (November 15 & 29)

V.A: Risk, Return and Portfolio Mechanics

Risk, return and Value at Risk or VAR (BKM7 pp. 131-59, 206-7, & 229-34)
(BKM6 pp. 137-50, 151-4, 166-7, 173-9, 184-90, 224-34 & 269-72)
(BKM5 pp. 136-43, 154-62, 162-7, 208-9 & 249-56)
(BKM4 pp. 132-8, 149-51, 156-61, 201-3 and 240-7)

Risk-aversion (BKM7 pp. 165-74; BKM6 pp. 165-73 & 191-5;
BKM5 pp. 155-62 & 178-82; BKM4 pp. 154-5 & 173-6)

Suggested Supplementary Reading:

Levy and Spector: *Cross-Asset versus Time Diversification* (LP)
Green and Hollifield: *When Will Mean-Variance Efficient Portfolios Be Well-Diversified*? (LP)

V.B: Fundamentals of Asset Allocation

Optimal asset selection:

2 assets: risky & riskless (BKM7 pp.177-89) or both risky (pp. 208-16)
risky & riskless (BKM6 pp.198-215) or both risky (pp. 225-34)
risky & riskless (BKM5 pp.186-96) or both risky (pp. 209-17)
risky & riskless (BKM4 pp.182-93) or both risky (pp.203-11)

3 assets classes: stocks, bonds & T-bills (BKM7 pp. 216-22; BKM6 pp.234-40 & 254-8;
BKM5 pp.217-23; BKM4 pp.211-7)

Markowitz Portfolio Selection Model (BKM7 pp. 222-31; BKM6 pp. 240-54;
BKM 5 pp.223-9; BKM4 pp.217-32)

Suggested Supplementary Reading:

Levy and Spector: *Cross-Asset versus Time Diversification* (LP)
Green and Hollifield: *When Will Mean-Variance Efficient Portfolios Be Well-Diversified*? (LP)

Part VI: Pricing & Managing Portfolios of Financial Assets (November 29 & December 6)

VI A. Pricing

CAPM (BKM7 pp. 293-322; BKM6 pp. 281-304; BKM5 pp. 258-85 & 386-9; BKM4 pp. 251-74 & 373-6)

Index & Multi-factor models (*as time allows*; BKM7 pp 422-33; BKM6 pp. 318-34, 344-8, 356-62 & 416-35)

Security returns: the empirical evidence (*as time allows*)

- Index models (BKM7 pp 422-33; BKM6 pp. 416-26)
- Multi-factor models (BKM7 pp 433-5; BKM6 pp. 426-9)
- The Fama-French factors (BKM7 pp 435-40; BKM6 pp. 429-32)

Liquidity and asset prices (*as time allows: BKM7 pp. 440-3*)

Suggested Supplementary Reading:

Korniotis: Income risk, wealth, and the consumption CAPM (LP)

VI B. Management

Mutual Funds & the practice of portfolio management (*as time allows*, BKM6 pp. 108-30 & 401-5)

Passive portfolio management in practice – Index model of security selection
(*as time allows*, BKM7 pp. 258-86; BKM6 pp. 210-4; BKM4 pp. 182-93)

Active portfolio management and evaluation of portfolio managers' performance
(*as time allows*, BKM7 pp. 851-85; BKM6 pp. 988-98 & 861-93; BKM4 pp. 749-76)

Suggested Supplementary Reading:

Grundy and Malkiel: *Reports of Beta's Death Have Been Greatly Exaggerated* (RP)
Fama and French (2 seminal references in LP) and Daniel and Titman (2 references in LP)

VI C. Hedge Funds and Alternative Investment Vehicles

Hedge Fund Strategies (*as time allows*, BKM7 pp. 99-100 & 108-30 & 401-5)

Portfolio management and performance evaluation (*as time allows*, BKM7 pp. 863-8)

Final exam (Thursday, December 13, 2007)

Additional articles will be posted in an online library.

Group Participation Form

Your name:_____

Other group members:

1. _____ 2. _____

3. _____ 4. _____

A. How were duties assigned? Explain briefly.

B. Were duties evenly distributed? Explain briefly.

C. What specific duties did you perform? Explain briefly.

D. Did you participate fully in the case preparation? If not, why not?
Did all members participate fully? If not, who not? Why not?

E. On a scale of 1 to 10, with 10 being the highest and a note of 4 or less denoting a serious problem, how would you rate group members in the following areas:

1. effort expended / time contributed

Yourself _____ 1. _____ 2. _____

3. _____ 4. _____

2. reliability (e.g., completing assigned tasks, showing up for meetings, etc.)

Yourself _____ 1. _____ 2. _____

3. _____ 4. _____

3. quality of written and/or spreadsheet output

Yourself _____ 1. _____ 2. _____

3. _____ 4. _____

4. quality of contribution to group discussions

Yourself _____ 1. _____ 2. _____

3. _____ 4. _____

5. mastery of content (e.g., level of comprehension of assignment questions and materials, etc.)

Yourself _____ 1. _____ 2. _____

3. _____ 4. _____

6. ability to work well in your group

Yourself _____ 1. _____ 2. _____

3. _____ 4. _____