SLOAN SCHOOL OF MANAGEMENT MASSACHUSETTS INSTITUTE OF TECHNOLOGY

Andrew W. Lo and Kathryn M. Kaminski E62–618 and E62-659

Summer 2010 8-5727

15.414 Financial Management

This course provides a rigorous introduction to the fundamentals of modern financial analysis and applications to business challenges in capital budgeting, project evaluation, corporate investment and financing decisions, and basic security analysis and investment management. The five major sections of the course are: (A) an introduction to the financial system, the six unifying principles of modern finance, and fundamental present-value relations; (B) valuation models for both stocks and bonds and capital budgeting; (C) methods for incorporating uncertainty into valuation models, including portfolio theory, mean-variance optimization, and the Capital Asset Pricing Model; (D) valuation of derivative securities; and (E) applications to corporate financial decisions, including capital budgeting, project financing, and corporate risk management.

Course Materials

- R. Brealey, S. Myers, and F. Allen, *Principles of Corporate Finance*, 10th edition, Irwin/McGraw Hill.
 - Brealey, Myers, and Allen is the world's most popular finance text. It provides a thorough introduction to financial theory and practice.
- Class Notes
 - Class notes will be available on STELLAR (only Lecture 1 notes will be distributed in class). They contain material not found in Brealey, Myers, and Allen, and provide alternate perspectives on the major themes of the course.
- Reading Packet
 - The reading packet, available from Copy Tech, contains cases and a few additional readings.

Course Requirements and Grading

Grades will be determined by class participation (15%) and your performance on the assignments (45%) and final exam (40%).

As noted in the course outline, there will be written assignments consisting of four problem sets and one case. You should work together on the assignments in your study groups.

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Recitations

Recitations provide the opportunity to review class materials and present additional applications and problems. Helen Yang (<u>heleny@mit.edu</u>), a MIT Sloan Fellow Flex second-year student, and Amy Zhou (<u>amyzhou@mit.edu</u>), a fourth-year Ph.D. student, will hold recitations as indicated in the course outline. Helen and Amy will also be available outside of class for additional help. Students seeking intensive one-on-one help should talk with Professors Kaminski, Lo, or Marsha Warren about additional resources that are available.

Administrative Assistant

Jayna Cummings, E62–621A, (617) 258–5727, jcummin@mit.edu.

Additional Readings (not required)

- Z. Bodie, A. Kane, and A. Marcus, Investments, 8th edition, Irwin/McGraw Hill, 2008.
 - BKM focuses exclusively on capital markets. They provide a more rigorous and thorough analysis of investments than Brealey, Myers, and Allen.
- P. Bernstein, Capital Ideas, Free Press, 1993.
 - Bernstein is one of the most well-respected and influential practitioners in the financial industry, and the founding editor of the *Journal of Portfolio Management*. This is a lively and beautifully written account of the most important ideas in academic finance, many of which were developed at MIT in the 1960's and 1970's.
- J. Hull, Introduction to Futures and Options Markets, 3rd edition, Prentice Hall, 1998.
 - Hull provides a straightforward introduction to options, futures, and swaps (collectively called financial derivatives). The book discusses the valuation of these securities, the mechanics of trading, and the use of financial derivatives in managing risk.

Course Schedule

This is an approximate schedule for the course; some material may take longer or shorter to cover than the time allotted.

Session	Instructor	Date – A	Date – B	Торіс	Assignment Due
1	AL	Jul	14	Introduction	
2	AL	Jul 14		Present Value Relations 1	
3	AL	Jul 15		Present Value Relations 2	
4	AL	Jul	15	Fixed Income Securities 1	
5	KK	Jul 19	Jul 19	Fixed Income Securities 2	
6	KK	Jul 20	Jul 20	Equity Securities	Problem Set 1
7	KK	Jul 21	Jul 21	Capital Budgeting	
8	AL, KK	Jul	22	Trading Lab Session	
9	KK	Jul 26	Jul 26	Case Discussion	Acid Rain Case
10	AL	Jul 27	Jul 27	Introduction to Risk and Return	
11	AL	Jul 29	Jul 29	Portfolio Theory 1	
12	AL	Jul 30	Jul 30	Portfolio Theory 2	
13	AL	Aug 2	Aug 2	The CAPM 1	
14	AL	Aug 3	Aug 3	The CAPM 2	Problem Set 2
15	AL	Aug 4	Aug 4	Practical Considerations	
16	AL	Au	g 5	Market Efficiency	
17	KK	Aug 6	Aug 6	Futures and Forward Contracts 1	
18	KK	Aug 9	Aug 9	Futures and Forward Contracts 2	
19	KK	Aug 10	Aug 10	Options	
20	KK	Aug 11	Aug 11	Corporate Financing 1	Problem Set 3
21	KK	Aug 16	Aug 16	Corporate Financing 2	
22	KK	Aug 17	Aug 17	Corporate Financing 3	
23	KK	Aug 23	Aug 23	Corporate Risk Management	Problem Set 4
24	KK	Aug 24	Aug 24	Course Review	Bring Your Questions

Lectures

Session	Date	Торіс
1	Jul 16	Discounting and Present Value Relations
2	Jul 23	Fixed Income and Equity Securities
3	Aug 2	Risk, Return, and Portfolio Theory
4	Aug 6	The CAPM
5	Aug 17	Options and Futures
6	Aug 24	Corporate Financing
7	Aug 25	Course Review

Recitations

Course Outline

Chapters listed below refer to the course textbook, Brealey, Myers, and Allen (BMA); articles referenced using the authors' last names are provided in the Readings Packet.

PART A. INTRODUCTION

Session 1 Introduction to Finance and Course Overview

- Financial decisions of households and corporations
- Objectives of corporate financial managers.
- Approaches to valuing financial and real assets
- The role of financial markets
- Unifying principles of finance

Read Kahneman and Tversky (1982), Maloney and Mulherin (2003)

Session 2 **Present Value Relations 1**

- Net Present Value (NPV)
- Opportunity cost of capital
- Discount rates and the time value of money

PART B. VALUATION

Session 3 **Present Value Relations 2**

- Mechanics of NPV calculations
- Compound interest
- Annuity and perpetuity formulas
- Real vs. nominal cash flows

Session 4 Fixed Income Securities 1

- Fixed-income markets
- Term structure of interest rates
- Market conventions, properties of bond prices

Session 5 Fixed Income Securities 2

- Measuring and hedging interest rate risk
- Inflation risk, credit risk
- The Financial Crisis of 2007–2008

Chapter 2

Chapter 1

Chapters 3, 23.1-23.2, 24

Session 6	Equity Securities	Chapter 4
	 Discounted Cash Flow (DCF) model 	
	 EPS, P/E, discount rates Assignment Due: Problem Set 1 	
Session 7	Capital Budgeting	Chapter 5-6
	Capital budgeting criteriaNPV rule, cash flow calculations, discount rates	
	Read Graham and Harvey (2001)	
Session 8	Trading Lab Session (Please note the location on calendar)	
	Read CRL Handout	
Session 9	Case Discussion	
	Assignment Due: Acid Rain Case	
PART C.	RISK AND RETURN	
Session 10	Introduction to Risk and Return	Chapter 7.1 – 7.2
	 Historical asset returns 	
	 The time value of money 	
Session 11	Portfolio Theory 1	Chapter 7.2 - 7.4
	 Measures of risk 	
	 Risk and investment horizon 	
Session 12	Portfolio Theory 2	
	 Diversification, systematic and idiosyncratic risk 	
	Portfolio optimizationEfficient risk/return trade-offs	
Session 13	The Capital Asset Pricing Model (CAPM) 1	Chapter 8.1 – 8.2
	 The CAPM and linear risk/return trade-offs 	
	Read Jagannathan and McGrattan (1995)	

Session 14	The Capital Asset Pricing Model (CAPM) 2	Chapter 8.3
	 Applications of the CAPM 	
	Assignment Due: Problem Set 2	
Session 15	Practical Implications	Chapter 8.4
	Extensions of the CAPMEmpirical evidenceEstimating alpha, beta, and the cost of capital	
Session 16	Market Efficiency	Chapter 13
	 Origins of the Efficient Markets Hypothesis Implications and empirical tests of the EMH Behavioral finance and neuroeconomics The Adaptive Markets Hypothesis 	
	Read Lo (2005, 2007)	

PART D. DERIVATIVES

Session 17	Forwards and Futures Contracts 1	Chapter 26.4	
	Definitions of forward and futuresArbitrage pricing relations		
Session 18	Forwards and Futures Contracts 2		
	 Using forwards and futures to hedge 		
Session 19	Options	Chapter 20–21	
	 Basic properties of options 		
	 Valuation of options 		

Binomial and Black-Scholes option pricing models

PART E. CORPORATE FINANCE

Session 20	Corporate Financing 1	Chapter 9
	 Risk and the cost of capital 	
	Assignment Due: Problem Set 3	
Session 21	Corporate Financing 2	Chapter 14-15, 17
	Raising capitalSource of fundsLeverage, risk, and the M&M Theorems	
	Read Kim and Ritter (1999) and Smith (1986)	
Session 22	Corporate Financing 3	Chapter 18-19
	Optimal capital structureCorporate taxes, after-tax WACCFinancial distress.	
	Read Myers (1984)	
Session 23	Corporate Risk Management	
	 The 3 P's of Total Risk Management Risk management and the M&M theorems 	

Risk management and the M&M theorems
Risk management and corporate governance

Read Lo (1999)

Assignment Due: Problem Set 4

Session 24 Course Review

Review course notes and bring your questions to class

Readings Packet

Cases

1. 'Acid Rain: The Southern Company (A).' HBS case 9–792–060.

Articles

- 1. Graham, J. and C. Harvey, 2001, "The Theory and Practice of Corporate Finance: Evidence from the Field", *Journal of Financial Economics* 60, 187–243.
- 2. Jagannathan, R. and E. McGrattan, 1995, "The CAPM Debate", *Federal Reserve Bank of Minneapolis Quarterly Review* 19, 2–17.
- 3. Kahneman, D. and A. Tversky, 1982, "The Psychology of Preferences", *Scientific American* 246, 160–173.
- 4. Kim, M. and J. Ritter, 1999, "Valuing IPOs", Journal of Financial Economics 53, 409-437.
- 5. Lo, A., 1999, "The Three P's of Total Risk Management", *Financial Analysts Journal* 55, 13–26.
- 6. Lo, A., 2005, "Reconciling Efficient Markets with Behavioral Finance: The Adaptive Markets Hypothesis", *Journal of Investment Consulting* 7, 21–44.
- 7. Lo, A., 2007, "Efficient Markets Hypothesis", to appear in *The New Palgrave: A Dictionary* of *Economics*, 2nd Edition. New York: Palgrave Macmillan.
- 8. Lo, A., 2009, "The Feasibility of Systemic Risk Management", Written Testimony Prepared for the U.S. House of Representatives Financial Services Committee.
- 9. Lo, A. and M. Mueller, 2010, "Warning: Physics Envy May Be Hazardous to Your Wealth!", *Journal of Investment Management* 8, 13-63.
- Maloney, M. and H. Mulherin, 2003, "The Complexity of Price Discovery in an Efficient Market: The Stock Market Reaction to the Challenger Crash", *Journal of Corporate Finance* 9, 453–479.
- 11. Myers, S., 1984, "Finance Theory and Finance Practice", *Interfaces* 14, 126–137. Reprinted in *Midland Corporate Finance Journal* 5 (Spring 1987).
- 12. Smith, C., 1986, "Raising Capital: Theory and Evidence", Midland Corporate Finance Journal 4, 6–22.
- 13. Zweig, J., 2009, "Does Stock-Market Data Really Go Back 200 Years?", *Wall Street Journal* (Eastern Edition) July 11, B1.

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