Investments

Module 3, 2017-18

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Course information

Course Website: my.nes.ru

Instructor's Office Hours: by previous appointment

Class Time: Wednesday, Jan 10, and then always on **Mondays** (Jan 15 to Feb 19) from 7 to 10pm

Room Number: [TBA]

TAs: [Names and contact information]

Course description

This course presents the basics of portfolio theory, the mean-variance optimization. We start from asset owners and their preferences and develop the efficient frontier of investment portfolios. A case study of the Norwegian Pension Fund discusses issues of ethical investment and the cost of exclusion of certain assets from the investment universe. We then present the two major equilibrium models for capital markets – the capital asset pricing model (CAPM) and arbitrage pricing theory (APT). In these models, risk is linked to factors such as the market factor, macro factors or so-called "style" factors such as size, value or momentum. A second case study shows how successful investment strategies have been built on academic research on the size and value factor. Next, we turn to bonds, review their pricing, bond portfolio management and risk factors affecting bond returns. Finally, we discuss delegated portfolio management, performance measurement and theories of active portfolio management.
Throughout the course, we will work with spreadsheet examples so that you can acquire the concepts by playing with the data. This will include three homework assignments. As a result, you will be able to solve complex problems of managing an investment portfolio and train your economic intuition. Estimation issues will be discussed in the course Empirical Finance.

Course requirements, grading, and attendance policies

Requirements: Financial Markets and Instruments.

The course grade is composed of grades for

- three home assignments (20%),
- two case presentations and write-ups, as well as their discussion in class (30%), and
- a final exam (50%).

Course contents

Week	Topic	Chapters
1	Asset owners and their preferences. Historical data on risk and return. Introduction to portfolio theory, the two-asset case	BKM 5-6, A 1-2
2	The core of modern portfolio management: Mean-variance portfolio optimization. Its dismal performance in pure form. Robust versions and related investment strategies.	BKM 7, A 3
3	The capital asset pricing model (CAPM), factor models, arbitrage pricing theory (APT), "style" and macro factors.	BKM 8-10, A 6-7, 14
4	Case 1 (Norwegian Pension Fund) due. Efficient markets and behavioral finance; Empirical evidence on the CAPM and APT	BKM 11-13
5	Case 2 (Dimensional Fund Advisors, 2002) due. Review of bond prices and yields; The yield curve; Management of bond portfolios (duration, convexity, immunization); Risk factors affecting bond returns.	BKM 14-16, A 9
6	Delegated investing: Mutual funds, pension funds, hedge funds and private equity. Performance evaluation. The theory of active portfolio management: Treynor-Black and Black-Litterman models	BKM 24, 26-27, A 15-18
7	Review and any unfinished business; Guest lecture.	

(BKM = Bodie, Kane and Markus, A = Ang, see Course material below)

Description of course methodology

The course will be taught by a combination of lectures, case discussions, spreadsheet examples presented in class and practical problems to be solved as homework.

Sample tasks for course evaluation

1. You consider investing in two stocks: Coca Cola and Reebok. Coca Cola has an expected return of 10% and a standard deviation of 31.5%; Reebok has an expected return of 20% and a standard deviation of 58.5%. The correlation of their returns is 0.2.
a) Set up a spreadsheet and calculate the expected return and standard deviation of 101 portfolios where the weight of Coca Cola ranges from 0% to 100% in steps of 1%. (Accordingly, the weight of Reebok goes from 100% to 0.)
b) Draw a graph of all these portfolios where you plot the standard deviation on the horizontal axis and the expected return on the vertical axis.
c) Repeat the exercise for the same numbers, except that the correlation now equals -0.8.

2. Consider a zero-coupon bond with nominal $100 and annual yield of 5%, with one year to maturity. You believe that after one week the yield will change from 5% to 5.5%. Find the expected change in the bond price in three ways:
a) Exactly, computing the new price
b) approximately, using the initial duration
c) approximately, using the initial duration and convexity.

Course material

Required textbooks and material

Bodie, Zvi, Alex Kane, and Alan J. Markus, Investments. Mcgraw-Hill, 10th Global edition.

Additional material

Ang, Andrew, Asset Management: A Systematic Approach to Factor Investing, Oxford University Press, 2014.
Elton, Edwin J., Martin J. Gruber, Stephen J. Brown, and William N. Goetzmann, Modern Portfolio Theory and Investment Analysis. Wiley, 9th edition (paperback) 2017.
Holden, Craig, Excel Modeling in Investment, Pearson, 5th Edition, 2014.

Cases

- The Norwegian Government Pension Fund: The Divestiture of Wal-Mart Stores Inc. (on portfolio theory and ethical investing). Columbia Case Works, Author: Andrew Ang.
- Dimensional Fund Advisors, 2002 (on size and value factors). Harvard Business School cases, Author: Randolph B. Cohen.

Academic integrity policy

Cheating, plagiarism, and any other violations of academic ethics at NES are not tolerated.