

# INVESTMENTS AND PORTFOLIO MANAGEMENT



LISBON  
SCHOOL OF  
ECONOMICS &  
MANAGEMENT  
UNIVERSIDADE DE LISBOA

MASTER IN FINANCE

2018 – 2019

CFA Program  
Partner of



CFA Institute

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## SYLLABUS

### PART I – FINANCIAL MARKET STRUCTURE AND INSTRUMENTS

1. Market Organization and Structure
  - 1.1. Functions of the financial system
  - 1.2. Market Classification
  - 1.3. Financial Instruments
  - 1.4. Trading in financial markets
  - 1.5. Security Market Indices
  
2. Pooled Investments
  - 2.1. Investment Funds
  - 2.2. The process of portfolio management

### PART II – THEORY OF PORTFOLIO MANAGEMENT

1. Portfolio Concepts
  - 1.1. Definitions of risk and return
  - 1.2. Emergence of portfolio theory
2. Mean – Variance Theory (MVT)
  - 2.1. Assumptions of MVT
  - 2.2. Combination of two assets
  - 2.3. Including the risk-free asset
  - 2.4. Three or more assets
  - 2.5. Allowing for short selling
  - 2.6. Investment Opportunity sets
  - 2.7. Minimum variance portfolios

- 2.8. Efficient Frontiers and Tangent Portfolios
- 2.9. Safety Criteria in MVT
- 2.10. Internationally diversified portfolios
  
- 3. Return Generating Models
  - 3.1. Estimating MVT inputs
  - 3.2. Constant correlation model (CCM)
  - 3.3. Single Index Model (SIM)
    - 3.3.1. Underlying ideas
    - 3.3.2. Model assumptions
    - 3.3.3. Characteristics of SIM
    - 3.3.4. A measure of non-diversifiable risk
    - 3.3.5. Using SIM: parameter estimation
  - 3.4. Multi-factor Models (MFM)
    - 3.4.1. Properties of MFM
    - 3.4.2. Factor model equivalence
    - 3.4.3. Using MFM
    - 3.4.4. Fama-French factor model
    - 3.4.5. Carhart factor model
  - 3.5. Estimation risk versus model risk

## PART III – SELECTING OF OPTIMAL PORTFOLIOS

- 1. Investors
  - 1.1. Individual investors: pooled investments vs wealth management
  - 1.2. Wealth management principles
  - 1.3. Institutional Investors
  - 1.4. Investor classification and risk-return investment profiling
  - 1.5. Reasons for Investment Policy Statements (IPS)
  
- 2. Expected Utility Theory (EUT)
  - 2.1. Recap from utility theory under certainty
  - 2.2. Issues of utility theory under uncertainty
  - 2.3. Principle of expected utility
  - 2.4. Risk Tolerance functions
  - 2.5. Optimal Portfolios
  - 2.6. Basics on prospect theory
  
- 3. Alternatives to Utility
  - 3.1. Maximizing long-term growth
  - 3.2. Stochastic Dominance
  - 3.3. Revisiting Safety Criteria from the investor's perspective

## PART IV – MODELS OF EQUILIBRUM IN CAPITAL MARKETS

1. The Capital Asset Pricing Model (CAPM)
  - 1.1. Assumptions of standard CAPM
  - 1.2. The standard CAPM
    - 1.2.1. The market portfolio
    - 1.2.2. The capital market line (CML)
    - 1.2.3. The securities market line (SML)
  - 1.3. Limitations of CAPM
  - 1.4. Non-standards forms of CAPM
  - 1.5. Empirically testing CAPM
2. The Arbitrage Pricing Theory (APT)
  - 2.1. Assumptions of APT
  - 2.2. Estimating and testing APT
  - 2.3. APT versus CAPM
3. Market Efficiency
  - 3.1. Forms of efficiency
  - 3.2. Testing market's efficiency
  - 3.3. Weak versus strong arbitrage
4. Behavioral Finance
  - 4.1. Anomalies in financial markets
  - 4.2. Behavioral issues and APT

## PART V – EVALUATING THE INVESTMENT PROCESS

1. Portfolio Performance Evaluation
  - 1.1. Issues of performance evaluation
  - 1.2. Evaluating performance using CAPM
  - 1.3. Other measures of performance
  - 1.4. Problems with performance evaluation
2. Issues in Portfolio Management
  - 2.1. Portfolio management revisited
  - 2.2. Styles of portfolio management: Active vs. Passive Management
  - 2.3. Contemporary issues of Portfolio Management

# BIBLIOGRAPHY

## Mandatory

### Textbooks

Joshi, M. S., and J. M. Paterson (2013). *Introduction to mathematical portfolio theory*. Cambridge University Press.

Maginn, J. L., Tuttle, D. L., McLeavey, D. W., & Pinto, J. E. (Eds.). (2007). *Managing investment portfolios: a dynamic process*, 3rd edition, John Wiley & Sons.

### Additional mandatory readings

Carhart, M. M. (1997), On persistence in mutual fund performance. *The Journal of finance*, 52(1), 57-82.

Fama, E. F., and K. R. French (1996), Multifactor explanations of asset pricing anomalies. *The journal of finance*, 51(1), 55-84.

Kahneman, D., & Tversky, A. (1979). Prospect theory: An analysis of decision under risk. *Econometrica*, 47(2), 263-291.

Levy, H. (1992), Stochastic dominance and expected utility: survey and analysis. *Management science*, 38(4), 555-593.

Linciano, N., and P. Soccorso, P. (2012). Assessing investors' risk tolerance through a questionnaire, available at SSRN.

Markowitz, H. (1952), Portfolio selection, *The Journal of Finance*, 7(1), 77-91.

Roll, R. (1977). A critique of the asset pricing theory's tests Part I: On past and potential testability of the theory. *Journal of financial economics*, 4(2), 129-176.

Roll, R., & Ross, S. A. (1980). An empirical investigation of the arbitrage pricing theory. *The Journal of Finance*, 35(5), 1073-1103.

Rubinstein, M. (2002), Markowitz's "Portfolio Selection": A Fifty-Year Retrospective, *The Journal of Finance*, 57(3), 1041-1045.

## Related ISEG – Master Final Works (MFW)

Arriaga Cunha, A. (2012), Cumulative Prospect Theory: A Parametric Analysis of the Functional Forms and Applications, ISEG MFW in Finance.

Cardoso, J. (2015), Robust Mean-Variance. ISEG MFW in Finance.

Frade, A. (2017), Model risk in MVT return generating models. ISEG MFWs in Finance.

Silva, R. (2012), Risk profiling and the DOSPERT scale: an approach using Prospect Theory, ISEG MFW in Finance.

Rocha, E. (2016), Security selection in post-modern portfolio theory: an application to the European stock market, ISEG MFW in Finance.

## Optional (recommended) readings

### Textbooks

Elton E.J., M. J. Gruber, S. J. Brown and W. N. Goetzmann (2014), Modern Portfolio Theory and Investment Analysis, 9th Edition, Wiley.

### CFA Readings

#### Level I

1. Reading # 40 – Portfolio management: an overview
2. Reading # 41 – Risk management: an introduction
3. Reading # 42 – Portfolio risk and return: part I
4. Reading # 43 – Portfolio risk and return: part II
5. Reading # 44 – Basics of portfolio planning and construction
6. Reading # 45 – Market Organization and Structure
7. Reading # 46 – Security Market Indices
8. Reading # 47 – Market Efficiency
9. Reading # 48 – Overview of equity securities
10. Reading # 51 – Fixed income securities: defining elements
11. Reading # 57 – Derivative markets and instruments
12. Reading # 60 – Introduction to alternative investments

## Level II

1. Reading # 47 – The portfolio management process
2. Reading # 48 – An introduction to multifactor models
3. Reading # 49 – Measuring and managing market risk
4. Reading # 51 – Analysis of active portfolio management
5. Reading # 52 – Algorithmic trading and high-frequency trading

## Level III

1. Reading # 5 – The behavioral finance perspective
2. Reading # 6 – The behavioral biases of individuals
3. Reading # 7 – Behavioral finance and investment processes
4. Reading # 8 – Managing individual investor portfolios
5. Reading # 13 – Managing institutional investor portfolios
6. Reading # 15 – Capital market expectations
7. Reading # 17 – Asset allocation
8. Reading # 18 – Currency management: an introduction
9. Reading # 19 – Market indices and benchmarks
10. Reading # 29 – Execution of portfolio decisions
11. Reading # 30 – Monitoring and rebalancing
12. Reading # 31 – Evaluating portfolio performance

# ASSESSMENT

Students have the first two weeks in the semester to decide whether or not they wish to enroll in the *continuous evaluation regime*, or if they prefer to be evaluated based upon the *one exam regime*.

Students under the *continuous evaluation regime* are evaluated based upon several individual and group assignment and have access to the usual two exam seasons. In the first exam season the continuous evaluation final grade is the weighted average of all outcomes (including their 1<sup>st</sup> seating exam grade), while in the second exam season the final grade is the grade at the 2<sup>nd</sup> seating exam.

Students under the *one exam regime* are evaluated only based upon their performance at the second seating exam.

All students are encouraged to diversify risk and choose the continuous evaluation regime. Handling all continuous evaluation assignment, students face a variety of different challenges and, thus, learn naturally a large portion of the course material. In addition, real life future tasks related to

investments and portfolio management are likely to be similar to the proposed continuous evaluation challenges. So, while studying this curricular unit students also get some experience.

The one exam regime is only recommended for a very particular group of students, namely those who are taking the course of the second time, who have already participated in the continuous evaluation tasks in a previous year, or working students who feel do not need the market experience. But do not forget ... it is your choice, thus, your risk!

## Continuous evaluation regime

Students who decide to enroll in the continuous evaluation regime, should do so by registering their working group in the AQUILA system before **30th September 2018**.

Each group must have between 3 to 5 students at all times. Groups with less than 5 elements may have to accept other elements during the semester.

The continuous regime is based upon:

- Simulation Game (group) - SG (10%)
- Empirical Assignment (group) - EA (25%)
- CFA-style online Quiz Questions (individual) -QQ (15%)
- First Final Exam (individual) – 1<sup>st</sup> FE (50%\*)

The first season final grade (1<sup>st</sup> Grade) is computed as

$$1^{\text{st}} \text{ Grade} = 0.1 \times \text{SG} + 0.25 \times \text{EA} + 0.15 \times \text{QQ} + 0.5 \times 1^{\text{st}} \text{ FE}$$

\* it is, nonetheless, still required a minimum of 8 points (out of 20) at the final exam.

The second season final grade (2<sup>nd</sup> Grade) is computed:

- If the student had a 1<sup>st</sup> Grade <10, then  
 $2^{\text{nd}} \text{ Grade} = \max (0.1 \times \text{SG} + 0.25 \times \text{EA} + 0.15 \times \text{QQ} + 0.5 \times 2^{\text{nd}} \text{ FE} ; 2^{\text{nd}} \text{ FE})$

- If the student had a 1<sup>st</sup> Grade  $\geq 10$ , then

$$2^{\text{nd}} \text{ Grade} = 2^{\text{nd}} \text{ FE}$$

## One exam regime

All students that do not enroll in the continuous evaluation regime in the AQUILA system before **30th September 2018** are automatically chose the one exam regime.

Students who decide to enroll in the one exam regime can only attend the second seating final exam (2<sup>nd</sup>FE), their final grade will simply be:

$$\text{Grade} = 2^{\text{nd}} \text{ FE} .$$