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| **Title** | **Portfolio Theory and Management** |
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| **Lecturer** | **Daniel Broby** | Tutor | Daniel Broby |
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|  | Code | AG924 | Semester | 2 | Weeks | 1 – 5 | Credits | 10 |  |
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|  | **Assessment** |  | Examination | 70% |  | Coursework | 30% Group |  | Test |  |  |
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|  | Finance | Option |  | Int. Banking & Fin. | Option |  | Investment & Fin. | Compulsory |  | Int. Accounting & Fin. | Option |  |
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## CLASS AIMS

The aim of this class is to examine the Markowitz(1952) approach to optimal portfolio selection. The class explores issues relating to optimal portfolio choice and issues in passive and active fund management through the lens of the nature of variance, covariance, risk and return The class introduces practical applications and an extension of basic theory.

## LEARNING OUTCOMES

The class provides opportunities for students to develop and demonstrate knowledge, understanding and skills in the following areas:

**i) Knowledge Based Outcomes:**

On completion of the class students should be able to:

* discuss the approach of building optimal portfolios using the Markowitz model;
* explain the estimation risk problem in sample mean-variance portfolios;
* critically evaluate the alternative approaches to solve the estimation risk problems in mean-variance analysis;
* discuss whether optimal mean-variance strategies can outperform naïve diversification strategies;
* use Excel to solve small-scale mean-variance problems;
* describe how portfolios are constructed to address client investment objectives and constraints;
* describe strategic and tactical asset allocation;
* compare the passive and active investment management;
* explain factors necessary for successful active management;
* describe how active managers attempt to identify and capture market inefficiencies;
* understand ethical considerations in investment; and
* awareness of regulatory, industry and CFA Institute policies and procedures as relates to portfolio management.

**ii) Skills Outcomes:**

 On completion of this class students should be able to demonstrate that they can:

* use time series data to construct a correlation matrix an efficient frontier;
* understand the practical applications of Modern Portfolio Theory;
* read, reference understand academic research papers relating to portfolio construction;
* use computational skills in undertaking empirical research through the use of Excel in the areas covered by the class that are also applicable to other areas of finance;
* use analytical skills in interpreting empirical findings and recognising some of the limitations faced by empirical researchers; and
* Learn the basics behind and make use of Bloomberg for construction of portfolios.

**TEACHING AND LEARNING**

The teaching and learning strategy adopted in this class to meet the learning outcomes will use a variety of approaches. Students will learn through directed reading, independent reading, formal class contact time in lectures and workshops, undertaking empirical research on own/groups, independent evaluation of research findings, and the use of electronic resources. The formal class contact time will be used to introduce the topics of mean-variance analysis, asset pricing, and fund performance. We will also consider how to use Excel to solve mean-variance problems.

**ASSESSMENT**

An assignment will account for 30 per cent and the final examination for 70 percent of the assessment. The assignment will be a group based empirical research project that will involve the creation of efficient frontiers from a data set using either Excel or Matlab. The final examination will take place in the April/May diet of examinations and last two hours. Any reassessment will be via a re-sit exam of the same format as the main exam.

**READING**

Bodie, Z., Kane, A., and Marcus, A.J., Investments, 10th Global Edition (2014), Part II, Portfolio Theory and Practice p117- 256, Part VII Applied Portfolio Management pages 835 – pages 977.

Elton, E.J., Gruber, M.J., Brown, S.J. and Goetzmann, W.N., Modern portfolio theory and investment, (9th Edition) John Wiley&Sons. Inc., New York, Chapter 4: The Characteristics of the Opportunity Set Under Risk, Chapter 5: Delineating Efficient Portfolios Chapter 6: Techniques for Calculating the Efficient Frontier, Chapter 7: The Correlation Structure of Security Returns: The Single-Index Model, Chapter 8: The Correlation Structure of Security Returns: Multi-Index Models and Grouping Techniques, Chapter 9: Simple Techniques for Determining the Efficient Frontier, Chapter 10: Estimating Expected Returns, Chapter 11: How to Select Among the Portfolios in the Opportunity Set, Chapter 12: International Diversification, Chapter 25: Mutual Funds, Chapter 26: Evaluation of Portfolio Performance, Chapter 27: Evaluation of Security Analysis, Chapter 28: Portfolio Management Revisited

Most textbooks on portfolio management and investment cover the same subject area so there is a wide choice of reading and different ways of addressing the same approach available.

Benninga, S. and Czaczkes, B., 2000. Financial Modelling. MIT press. (pages 195-272, Portfolio Models, Calculating Variance and Covariance Matrix and Efficient Portfolios).

Cochrane, J.H., 2009. Asset Pricing:(Revised Edition). Princeton university press.

Markowitz, H., 1952. Portfolio selection. The journal of finance, 7(1), pp.77-91.

Solnik, B.H., 1995. Why not diversify internationally rather than domestically? Financial Analysts Journal, 51(1), pp.89-94.

Sharpe, W.F., 1994. The sharpe ratio. The Journal of Portfolio Management, 21(1), pp.49-58.

Tu, J. and G. Zhou, 2011, Markowitz meets Talmud: A combination of sophisticated and naïve diversification strategies, *Journal of Financial Economics*, 99, 204-215.

DeMiguel, V., Garlappi, L. and R. Uppal, 2009, Optimal versus naïve diversification: How inefficient is the 1/N strategy?, *Review of Financial Studies*, 22, 1915-1953.

DeMiguel, V.,Martin-Utrera, A and F.J. Nogales, 2013, Size Matters: Optimal Calibration of Shrinkage Estimators for Portfolio Selection, *Journal of Banking and Finance*, 37, 3018-3034.

## LECTURE PROGRAMME

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| **Session** | **Lecture Title/Subject/Content** |
| **1** | A review of portfolio analysis and capital market theory.  How the valuation of companies and measurement of risk, the risk return trade off and the implications of capital asset pricing impact the management of investment portfolios. Introduction to portfolio management, the investment industry and its participants. |
| **2** | The relation between portfolio risk and stocks’ return variance and covariance. Mean Variance optimisation, efficient frontier and diversification. How borrowing and/or lending at RF allows maximisation of the Sharpe ratio. How the CML provides a mean-variance model of portfolio choice. How the risk tolerance of investors influences the proportion of wealth invested on risk-free and risky assets. Constraints and how they impact the outcome. |
| **3** | Worked examples, International diversification, criticisms of mean-variance analysis, solving sample mean-variance portfolios, and the estimation risk problem.  |
| **4** | Factor models, linear factor models, and imposing portfolio constraints, solutions to the estimation risk problem – shrinkage approaches |
| **5** | Funds and Performance, persistence of fund performance, benchmarks and indexes. Black Litterman mean-variance analysis and conditioning information, can optimal mean-variance strategies outperform the 1/N strategy. |