Advanced Portfolio Theory

Course Outline
Academic Semester: 2025/26

1. General

School	**School of Finance and Statistics**		
Academic Unit	**Department of Banking and Financial Management**		
Level of Studies	**Undergraduate**		
Course Code	**ΧΡΠΘΧ01**		
Semester	**6th or 8th**		
Course Title	**Advanced Portfolio Theory**		
Idependent Teaching Activities		Weekly Teaching Hours	Credits
	Lectures	**4**	**7,5**
Course Type	**Special background**		
Prerequite Courses			
Language of Instruction and Examinations	**Greek**		
Is the course offered to Erasmus Students?			
Url (Eclass)	**https://eclass.unipi.gr/modules/auth/courses.php?fc=64**		

2. Learning Outcomes

Learning Outcomes

After completing the course, students will be able to:

- Calculate and understand the basic parameters that characterize a portfolio consisting of many different assets, namely its expected return and its risk.
  - (This section requires basic mathematical tools from statistics and linear algebra, such as calculating the mean, variance, covariance, correlation coefficient, etc.)
- Understand the benefits of portfolio diversification, which we study in detail and examine the ways in which we can achieve it.
- Find among the "good" solutions, the optimal solution for an investor that will maximize his expected return per unit of risk.
- The above will help achieve the ultimate goal of the course, which is to find the "optimal" (or "optimal") portfolio.
- To evaluate the performance of a portfolio using basic evaluation measures such as the Jensen, Treynor, Sharpe measures, as well as measures such as the CAPM, which take into account the so-called "market portfolio" and excess return.
- Taking into account the subjective criteria of an investor (for example, how much he aversive he is to risk) but also his basic characteristics (such as, for example, what his initial wealth is), they will find the optimal portfolio that maximizes the utility function of the investor's wealth.
- This part of the material, which is also the last, differs from the rest both in terms of the concepts that will be used and in terms of the methodology that will be followed in order to reach our goal, which is the optimal portfolio, which results from solving a problem of maximizing the utility function that characterizes each investor, which is in turn a function of his wealth. Also, in this specific part, students will gain knowledge

about the completeness or incompleteness of the market, which plays a decisive role in the problem of maximizing the utility function.

General Competences

3. Syllabus

1. Expected Return and Risk of a Portfolio with N Assets, Minimum Variance Portfolios
2. Risk Diversification, Efficient Frontier
3. Models (Univariate Model or One-Index Model, Capital Market Line Equation, CAPM)
4. Portfolio Performance Evaluation Measures
5. Maximization of Utility Functions, Market Completeness (Incompleteness)

4. Teaching and Learning Methods - Evaluation

Delivery	**Face-to-face**	
Use of Information and Communications Technology	• **Slides for each lecture, which will be available in the e-class.** • **(In addition to the slide material containing the theory of the course, separate sets of slides with exercises that we will solve in class will be uploaded.)**	
Teaching Methods	**Activity**	**Semester Workload**
	Lectures	52
	Independent Study	135,5
	Course Total	**187,5**
Student Performance Evaluation	• Optional participation in mid-term exam that will include approximately half of the material and takes place halfway through the semester. Only in the case that the progress grade is >5 will it be counted in the final grade and in fact 20% of the progress grade will be added to the final exam grade. • In the final exam, the topics contain development questions (criteria, where calculations are required) as well as exercises similar to those that will have been solved in class.	

5. Attached Bibliography

Suggested Bibliography

No specific textbook is required. All necessary reading material will be provided on the slides.

Related Academic Journals