UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Portfolio Theory

2425-1-F1601M051-F1601M055M

Learning area

Learning objectives

The students will learn the portfolio optimization models proposed in the literature together with the necessary mathematical instruments. Particular attention will focus on the practical implementation of the proposed theoretical models.

Contents

Mathematical tools. Portfolio optimization models.

Detailed program

Mathematical instruments: functions of several variables, matrix algebra, quadratic forms, sign of a quadratic form, eigenvalues and eigenvectors, diagonalization.
Mean-variance model (Markowitz model): assumptions, theoretical derivation in the case of n risky assets and in the case of n risky assets and one riskless asset, efficient frontier, two funds separation theorem.
Limits of Markowitz model.
Alternative asset allocation models: risk parity, maximum diversified portfolio, introduction in the mean-variance model of higher order moments (skewness and kurtosis).

Prerequisites

Foundations of differential calculus and of matrix algebra

Teaching methods

Theoretical lectures. Lectures with empirical content in which the proposed theoretical models will be applied in practice on real financial data with MatLab.

Assessment methods

The examination is written with exercises and theoretical questions (open questions and exercises). The oral exam (on the topics presented during the lectures and the applications with MatLab) is mandatory.

Textbooks and Reading Materials

Lectures notes. Further referring texts will be suggested during the lessons.

Sustainable Development Goals

QUALITY EDUCATION