



UNIVERSITÀ  
DEGLI STUDI DI MILANO-BICOCCA

## SYLLABUS DEL CORSO

### Big Data in Business, Economics and Society

2021-2-F9101Q030-F9101Q030M

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#### Learning objectives

The objective of the laboratory is to deepen and analyze some theoretical and empirical developments in portfolio management, focusing in particular on tactical asset allocation and the main quantitative models of stock selection.

#### Contents

The laboratory concentrates on two macro areas of topics. A first part focused on the most advanced models of portfolio theory, then Strategic/Tactical Asset Allocation models. A second part then concentrating on Equity Portfolio Management issues, analyzing Economic and Fundamental factor models as well as Screening models.

#### Detailed program

**Topic****References/Readings****Strategic Asset Allocation**

The framework for Asset Management, Strategic Asset Allocation

Slides (Markowitz, CAPM, APT)

Improving Strategic Asset Allocation (1)

Scherer (2002)

Improving Strategic Asset Allocation (2)

Slides

Improving SAA (R application), Resampling

**Quantitative Equity Portfolio Management**

Stock Screening Models

QEPM / Harvey et al. (1999) Miller (2005a)

Fundamental Models

QEPM Slides

Economic Models

QEPM / Miller (2005b) Liodakis (2005)

Screening and fundamental models

Slides

Economic Models Estimation

Slides

Arbitrage based strategies ( Pairs Trading)

Pairs Trading with R

Momentum investing (R application)

**Prerequisites**

There are no formal prerequisites for the course, but basic knowledge of financial theory will be useful.

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**Teaching methods**

The laboratory is taught in a traditional way, therefore based on frontal teaching. It provides for the development of applications and models in the computer lab with the help of the R programming language. The development of models, of which some examples are the Black and Littermann model, the efficient frontier resampling, the CPPI etc... is prodromic to the Assignment that is delivered during the course and represents a concrete opportunity for students to exploit and consolidate the knowledge developed during the laboratory.

Assuming the continuation of the Covid-19 emergency period, the lessons will be held in mixed mode: partial attendance and asynchronous/synchronous video-recorded lessons.

**Assessment methods**

The competence level will be assessed by:

1. A closed-ended examination of 10 questions in 15 minutes, conducted on the online examination platform.
2. A final oral presentation of the Assignment, with a critical discussion of the results.

The final grade will be an equal average of the two components.

This assessment method is motivated by the goal to put students into the setting of real business activities and to make their soft skills (e.g. organizational, communicative) and creativity emerge.

In the assumption that the Covid-19 emergency period will continue, the oral examinations will be telematic only. They will be carried out using the WebEx platform and the e-learning page of the teaching will contain a public link to access the exam for possible virtual audience.

## **Textbooks and Reading Materials**

The course material is partly based on the text:

- Ludwig B Chincarini, Daehwan Kim, 2006, Quantitative Equity Portfolio Management, McGraw-Hill Library of Investment and Finance.

The relevant chapters of the text range from chapter 1 to chapter 7.

The manual will cover approximately 30% of the topics discussed during the course. The remaining topics will be supported by sets of slides used during the course and made available to students and articles from the scientific journals listed below:

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Miller, K., 2005b, The Smith Barney U.S. Equity Risk Attribute Model (RAM), Citigroup Smith Barney Quantitative Research.

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## **Semester**

Second semester

## **Teaching language**

Italian

