UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Financial Markets Analytics

2122-1-F9101Q053

Learning objectives

The objective of the course 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.

In this perspective, some of the classes will be of an applicative/informatics nature, based on the use of the R software.

Contents

The course focuses on two macro areas of topics. A first part focused on more advanced portfolio theory models, i.e. Strategic/Tactical Asset Allocation models. The focus in this first part will be more on the empirical applications of the models and the more technical data issues involved in the development of the models. In the second part the course focuses on Equity Portfolio Management issues, introducing Economic, Fundamental and Screening factor models, clarifying the relationship with the market efficiency hypothesis and the relevance of data and its quality for building investment strategies.

Detailed program

Topic	References/Readings
Strategic Asset Allocation	
The framework for Asset Management, Strategic Asset Allocation	QEPM and Slides (Markowitz, CAPM, APT
Improving Strategic Asset Allocation (1)	Scherer (2002)
Introduction to Quantitative Equity Portfolio Management	QEPM Slides
Improving SAA (R application), Resampling	
Quantitative Equity Portfolio Management	
Introduction to Quantitative Equity Portfolio Management (QEPM)	QEPM Slides
Fundamental Models	QEPM Slides
Economic Models	QEPM / Miller (2005b) Liodakis (2005)
Screening and fundamental models	Slides
Economic Models Estimation	Slides
Stock Screening Models	QEPM / Harvey at al. (1999) Miller (2005a
One-off topics in Portfolio Management	
Dynamic portfolio strategies (focus on CPPI)	Pain and Rand (2008)
Constant proportion portfolio insurance (CPPI) with R	
Arbitrage based strategies (Pairs Trading)	

Pairs Trading with R	Coding
Momentum investing, Cross sectional vs Time series	
Momentum investing with R	Coding

Prerequisites

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

Students are also expected to know the basic concepts of statistics and in particular those related to multiple linear regression models. Basic concepts of matrix algebra will also be given for granted.

Teaching methods

The course 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.

Assessment methods

The learning will be tested through:

1. A computer- based exam of 10 close-ended questions in 15 minutes, followed by a short oral exam.

2. An oral presentation of the voluntary Assignment, proposed during the course, in groups of 2-3 students, with critical discussion of the results (1-5 points).

The final result will be the sum of the two parts.

This method of assessing learning is motivated by the objective of putting the students in the operational conditions typical of work activity and to bring out in particular their soft skills (organisational, communicative, creative...).

Textbooks and Reading Materials

The course content is based in part on the book:

- 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 ch.1 to 7.

The textbook covers approximately 30% of the topics covered in the course. The remaining topics will be based on sets of slides used throughout the course and made available to students, and articles from the following journals:

Harvey C., D. Achour, G. Hopkins and C. Lang, 1999, Stock Selection in Mexico, Emerging Markets Quarterly 3, Fall, pp. 38-75.

Miller, K., 2005a, S&P 500 Industry Group Rotation Model, Citigroup Smith Barney Quantitative Research.

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

Scherer, B., 2002, Portfolio Resampling: Review and Critique, Financial Analysts Journal, 58(6), pp. 98-109.

Pain, D. and J. Rand, 2008, Recent Developments in Portfolio Insurance, Bank of England Quarterly Bulletin.

Semester

Second semester

Teaching language

Italian