Investments & Portfolio Management

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Office hours: by appointment

Course Description

Investments & Portfolio Management addresses the main challenge faced by the financial manager or the investor: the identification and valuation of productive assets or investments and the subsequent allocation of capital/resources to those investment choices that will ultimately form an investment portfolio.

We will use concepts of asset pricing under certainty and uncertainty, and will apply them to the investment decisions of the investor. We will study how different valuation methods may lead to different investment styles and some emphasis will be placed on the analysis of the cash flows generated by the assets, the cost of capital, and interest rate curves. The process of identifying the assets that will be brought to our portfolio is supported by two main methodologies: asset pricing/valuation techniques and factor models. The latter should help us capture trends in the markets that we might want to have exposure to. From there we intend to move on to more complex settings in order to consider various scenarios from different possible outcomes from our assets. In this context more advanced techniques will be introduced to deal with asset allocation and portfolio management.

Finally, a highly relevant aspect of the course is related to the monitoring and understanding of market moves. A good amount of time will go into the discussion of market news and identification of trends, and such analysis will be integrated with the previous elements.

Objectives

The objective of the course is to introduce the student to the analysis of investment decisions that considers the functioning of financial markets and the implementation of those investment ideas, as well as the building and management of a portfolio of those securities. In particular, by the end of the course the students should be able to:

- Understand the main pricing elements across asset classes,
- Analyse the impact of news and policies on financial markets and asset prices,
- Understand the determinants of risk premia and returns as part of the overall market dynamics,
- familiarise themselves with the various options in financial markets that allow to implement specific exposures in order to build a portfolio of securities that responds to different investor profiles and objectives.
Methodology

Every week you will have an additional session (for a total of five) with the TA, where you will solve practice questions. These should help you review the main topics and keep up with the theory classes.

There will be 10 3-hour sessions and 5 practice sessions. Additionally, the module requires the preparation of lectures/presentations and problem sets through personal study.

Lectures will develop the concepts and methodologies that constitute the main components of the course outline. These classes are based on lecture notes and published/working papers although some textbooks may play a supporting role during the first stages.

Practice sessions will include the discussion of problem sets and real investment cases. We recommend that you work in groups with a size of 5-6 people. Only one solution per group is to be submitted and all group members will receive the same grade. Solutions must be handed-in before the TA sessions. Both the real investment case and the most relevant exercises in problem sets will be presented and discussed by the students.

Evaluation criteria

In order to pass the course, you should get at least 50 points out of 100, according to the following distribution:

- Final exam: 40 points (however passing this exam is also a requirement)
- Investment Project/Portfolio Game: 30 points.
- Problem Sets: 30 points.

Students are required to attend 80% of classes. Failing to do so without justified reason will imply a Zero grade in the participation/attendance evaluation item and may lead to suspension from the program.

As with all courses taught at the UPF BSM, students who fail the course during regular evaluation will be allowed ONE re-take of the examination/evaluation. Students that pass any Retake exam should get a 5 by default as a final grade for the course. If the course is again failed after the retake, students will have to register again for the course the following year.

In case of a justified no-show to an exam, the student must inform the corresponding faculty member and the director(s) of the program so that they study the possibility of rescheduling the exam (one possibility being during the “Retake” period). In the meantime, the student will get an “incomplete”, which will be replaced by the actual grade after the final exam is taken. The “incomplete” will not be reflected on the student’s Academic Transcript.

Plagiarism is to use another’s work and to present it as one’s own without acknowledging the sources in the correct way. All essays, reports or projects handed in by a student must be original work completed by the student. By enrolling at any UPF BSM Master of Science and signing the “Honor Code”, students acknowledge that they understand the schools’ policy on plagiarism and certify that all course assignments will be their own work, except where indicated by correct referencing. Failing to do so may result in automatic expulsion from the program.”
Calendar and Contents (tentative)

1. Asset Pricing:
   a. Time Value of Money
   b. Interest Rates, Risk Premia, Criteria for Investment Decisions
   c. Cash Flow discounting and Financial Planning
   d. Valuation of Bonds
      i. Zero-coupon and coupon bonds
      ii. Term structure of bond yields
      iii. Sovereign vs. Swap vs. Corporate (IG vs. HY) curves
      iv. Modelling and forecasting yield curves
   e. Valuation of Stocks
      i. Dividend growth models
      ii. Free Cash Flow models
      iii. Firm valuation based on financial ratios
      iv. Cross-section of stock returns
         1. Segmentation by sector, geography, style...

2. Risk and Return
   a. Capital Markets and the Pricing of Risk
   b. Common and uncommon measures of risk and return
   c. Main asset classes and return dynamics
   d. Estimating expected returns:
      i. the CAPM model
   e. Market Efficiency and limitations to the CAPM model
   f. Main asset classes and return dynamics

3. Portfolio Optimization (mean-variance framework)
   a. Risk-return and correlation dynamics: theory of Optimal Portfolio Choice
   b. Portfolios on the Efficient Frontier
      i. Markowitz, Minimum Variance
         1. Constraints
         2. Leverage
   c. Beyond the Efficient Frontier (alternative construction methods)
      i. Return Estimation and Robust allocation methods
         1. The Black-Litterman model
      ii. Outside the mean-variance framework
         1. Pseudo-variance, Sortino ratio...

4. Multi-Factor Models
   a. Arbitrage Pricing Theory (APT)
   b. Factor Models
   c. Market Factors:
      i. Market Indexes, Value, Size, Momentum, Quality, Low Volatility...
      ii. Exposure to market factors:
         1. ETFs, Funds, ...
      iii. Passive vs. Active Management: Alternative Investments, Private Equity, ...

5. Advance Portfolio Optimization
   a. Risk Parity
   b. Explicit vs. Implicit factor models:
i. Principal Component Analysis and Principal Portfolios

c. Probabilistic Scenario Optimization:
   i. Investor's Profiles and the asset universe
   ii. Scenario simulations
   iii. Value at Risk, Expected Shortfall
   iv. Achieving the investment target: a probabilistic approach

6. Machine Learning in Finance
   a. Macro trend identification and translation to factor exposure
   b. Investment strategies (algorithmic trading)

WEEK 1 (sept 29)
  o Introduction and basic notions
  o General concepts in financial markets
  o Interest rate and cash flow discounting

Slides: 2016_1, 2016_2 1/2
Problem set 0: Tue oct 3 (no submission)

WEEK 2 (oct 6)
  o Interest rate and cash flow discounting
  o Interest rates and determinants of risk
  o Bond pricing and yield curves

Slides: 2016_2 2/2, 2016_3, 2016_4 1/2

WEEK 3 (oct 13)
  o Bond pricing and yield curves
  o Stata Model of interest rate curves
  o Valuation of Stocks

Slides: 2016_4 2/2, 2016_5 3/4
Problem set 1: Due tue oct 17

WEEK 4 (oct 20)
  o Valuation of Stocks
  o Returns, Risk, CAPM

Slides: 2016_5 4/4, 2016_6 3/4

WEEK 5 (oct 27)
  o Returns, Risk, CAPM
  o Optimal Portfolio Allocation

Slides: 2016_6 4/2, 2016_7
Problem set 2: Due tue oct 31

WEEK 6 (nov 3)
  o Asset Allocation Methods
    • Tangent portfolio (Markowitz)
    • (Global) Minimum Variance
    • Black-Litterman
  o Factor Models and Arbitrage Pricing Theory (APT)

Slides: Lecture notes

WEEK 7 (nov 10)
  o Factor Models and Arbitrage Pricing Theory (APT)
  o Market Factors (Value, Size, Momentum, Low Vol., Growth...)
  o Factor model of European Banking Sector Returns
  o Factor Investing

Slides: Lecture notes
Problem set 3: Due tue nov 14

WEEK 8 (nov 17)
  o Factor Investing
  o Asset Allocation/Portfolio Strategies
    • Equal Weight
    • Risk Parity
    • Principal Portfolios (PCA)

Slides: Lecture notes

WEEK 9 (nov 24)
  o Probabilistic Scenario Optimization
    • Investment Profiles
    • Simulations
    • VaR, Exp. Shortfall...
  o Students project presentations

Slides: Lecture notes
Problem set 4: Due tue nov 28

WEEK 10 (dec 1)
  o Machine Learning in Finance
    • Macro-Business-Cycle Investing
    • Time series models estimation
    • Investment strategies (algorithmic trading)
  o Students project presentations

Slides: Lecture notes
Reading Materials / Bibliography / Resources

The course is mostly self-contained but the following is a non-exhaustive list of relevant references and textbooks:

- Berk and P. DeMarzo; *Corporate Finance*, Pearson (Ch. 1, 2, 3)
- Brealey, R. A., Myers, S. C., and Allen, F.; *Principles of Corporate Finance*, McGraw-Hill (Ch. 1, 2, 3)
- Grinblatt and S. Titman; *Financial Markets and Corporate Strategy*, McGraw-Hill (Ch. 1, 2, 3)
- Cochrane, J.; *Asset Pricing*, Princeton University Press (Ch. 1, 2, 3, 4)
- Fabozzi, Focardi, Rachev, and Arshanapalli; *The Basics of Financial Econometrics*, Wiley
- Ilmanen; *Expected Returns*, Wiley
- Fabozzi and Markowitz; *The Theory and Practice of Investment Management*, Wiley (Ch. 2, 3, 4)
- Ang, A.; *Asset Management: a Systemic Approach to Factor Investing*, Oxford (Ch. 2, 3, 4)
- Meucci, A.; *Risk and Asset Allocation*, Springer Finance (Ch. 3, 4, 5)
- Litterman and the Quantitative Resources Group; *Modern Investment Management: and equilibrium approach*, Wiley Finance (Ch. 3, 4)
- Tutuncu and Cornuejols; *Optimization Methods in Finance*, Cambridge University Press (Ch. 3, 4, 5)
- Grinold and Kahn; *Active Portfolio Management*, McGraw-Hill (Ch. 2, 3, 4, 5)
- Sironi, P.; *Modern Portfolio Management: from Markowitz to Probabilistic Scenario Optimization*, Risk Books (Ch. 3, 4, 5)

You are also encouraged to read the Financial Times or similar papers on a regular basis. During the course, we might be referring to press coverage, and corporate and market news and events, if these are related to, or help to illustrate, topics that we are covering in class. Some entertaining paperbacks for “bedtime reading” include “A Random Walk down Wall Street” (B. Malkiel), "Irrational Exhuberance" (R. Shiller), "Fooled by Randomness" and "The Black Swan" (N. Taleb). Other relevant references will be pointed during the course.

Bio of Professor

Jose Suarez-Lledo is a Manager at the Financial Markets division within the Strategic Planning & Research department at CaixaBank where he is in charge of developing market analysis & forecasting models for financial variables, as well as the analysis reports that the department publishes regularly for clients and investors. Prior to that Jose worked at the Capital Planning & Forecasting department developing models and solutions as part of the methodological framework that allows the bank to generate capital projections.

Before joining CaixaBank Jose was a Director at Moody’s Analytics based in London. As part of the Credit Analytics team he designed macro-econometric models for key economic and financial variables as well as retail and corporate credit models. Dr. Suarez-Lledo’s team provided consulting support to major industry players and implemented stress-testing solutions to quantify portfolio risk under alternative macroeconomic scenarios. Jose is also actively involved in speaking at credit events and economic conferences worldwide and has published his research both in practitioner and academic publications.

Previous to working for Moody’s Analytics, Jose held a research position at the Universidad Autonoma of Barcelona where he focused on illiquid financial markets and the dynamics of asset prices and credit. Jose holds an MSc and a PhD in Economics from the University of Pennsylvania.