Approved by Academic Subcommittee of Bachelor's
Programme 'HSE and University of London Double
Degree Programme in Economics'
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Theory of Finance

This elective course consists of two parts.

Part I: Asset Pricing: Empirical Regularities and Important Models, lecturer is Dmitry Makarov.

Part II: Microstructure of Financial Markets, lecturer is Alexei Boulatov.

Abstract

Asset pricing is a branch of Financial Economics devoted to uncovering patterns in asset returns (empirical asset pricing) and explaining these patterns (theoretical asset pricing). In this course, we will focus on theoretical asset pricing models and, in less details, will talk about main patterns in asset returns, those that received most attention in the literature.

Second part of the course is an introduction into some basic concepts and models of the microstructure theory of financial markets. Theoretical Market Microstructure is intended to develop economic models of financial markets within a "microscopic" approach when one explicitly takes into account a particular market design and types of agents involved in a trading process. One application of the Market Microstructure models is analysis of the impact of market organizational structure on various important market characteristics, such as price efficiency, transaction costs, liquidity, etc., and to construct quantitative indicators of market quality. The main part of the class is based on original academic research papers on Market Microstructure theory. The emphasis is on the finance models that are sufficiently simple and analytically tractable. This part of the course may be rather demanding in terms of the analytic skills for some of the students. Although the course materials are self-contained, the students are encouraged to "brush up" their knowledge and skills in mathematical analysis, random processes, and linear algebra.

Prerequisites: Intermediate microeconomics, some calculus and probability theory.

Learning Objectives and Outcomes

There are several important by-products in the process of studying theoretical papers. First, as many explanations of asset pricing puzzles rely on investor irrationality, students will become familiar with examples of behavioral finance research. This is an increasingly promising research area lying at the intersection of psychology and finance.

Second, students will learn (or refresh) some fundamental concepts in financial economics: market efficiency, risk aversion, risk and return, diversification, time discounting and interest rates, cash flows, financial instruments (stocks, bonds, options, etc), utility-based pricing versus pricing by replication, complete and incomplete markets, static versus dynamic models, market efficiency.

Third, students will learn the "language" of financial economics, defined broadly to include not only special terms and notions but also fundamental ideas and analytical frameworks. Without good knowledge of the language, one may find it difficult to understand academic finance papers, and may feel lost at finance research seminars or conference presentations. For 4th year bachelor students, this is especially important given the need to produce a research paper (bachelor thesis) at the end of the

year. Reading many different papers, understanding what the contribution is, learning how these papers are structured – all these ingredients will prove useful when students will be writing their own papers.

Methods of Instruction

The course relies on the following teaching methods:

• Lectures (active participation is encouraged)

• Home assignments

• Self-study: reading additional materials assigned during lectures

• Paper presentations: students are expected to present and discuss in class some required original papers specified by the instructor. Active participation is required.

Grading System and Knowledge Assessment

Overall Grade for the Course: the descriptions of Parts I and II below explain how the grade for each part is determined. The overall grade for the Course is the average of these two grades.

Part I:

 • Home assignments account for 20%

• Midterm exam accounts for 30%

• Final exam accounts for 50%

Part II:

• Class participation including the presentation of papers accounts for 50%.

• The rest of the grade (50%) comes from the final exam.

• The exact material covered in the exam will be announced in class.

Sample materials for knowledge assessment are available in ICEF Information system at https://icef-info.hse.ru.

Required Reading

Part I: Given the above description, it is clear that the main material for the course are research articles. Many of them are fairly recent, and so are not discussed in any textbook. These articles rely to a large extent on what is considered to be standard material in asset pricing. This material is covered in many books, but if I were to recommend some, it would be:

1) Cvitanic J., and F. Zapatero, Introduction to the Economics and Mathematics of Financial Markets, MIT Press 2004.

2) Pennacchi, G., The Theory of Asset Pricing, Pearson Addison Wesley, 2008.

Part II: The lecture notes and required original papers contain all required material. The readings of journal papers will be announced in class. The recommended textbook is:

3) De Jong, F., and B. Rindi, 2010, The Microstructure of Financial Markets, Cambridge Univ. Press, Cambridge.

 Optional Reading:

Lyons, R. 2001, The Microstructure Approach to Exchange Rates, Cambridge, Mass: MIT Press.

Special Equipment and Software Support
Laptop, projector, Internet connection
MS Word, MS Excel

Course Plan

Part I

1) Overview: historical background, key concepts: risk and return, diversification, time discounting and interest rates, cash flows, financial instruments, market efficiency, asset pricing puzzles

2) Empirical regularities: equity premium puzzle, excess volatility, value effect, size effect, momentum, bubbles, comovement, underdiversification.

3) Consumption CAPM: equilibrium stock returns, risk free rate, plausible risk aversion, puzzles

4) Explaining puzzles: habit formation, rare events

5) Behavioral Finance: noise trader risk, arbitrage risk, prospect theory

6) Ambiguity Aversion: multiple priors, portfolio choice, ambiguity premium

Part 2

1. Basic facts and terminology on financial market structure. Auction, dealers' and hybrid markets, order-driven and quote-driven, call and continuous markets. High-frequency (HFT) and algoritmic trading. Liquidity; bid-ask spread and its components; price impact and its components; cost of trading and transaction cost (t-cost). Notion of informational efficiency.

2. General approaches to modelling trading strategies and prices. Price taking and Rational expectations. Information and pricing; Rational Expectations Equilibrium (REE). Models of strategic trading.

3. Dynamic strategies. Dynamic trading strategies, modelling in discrete and continuous time. Liquidity and algorithmic trading. Optimal execution. "Predatory trading" and "front running".

4. Applied topics: Liquidity provision, HFT and algorithmic trading.

a. High-frequency and algorithmic trading and liquidity issues.

b. Quality of markets and informed liquidity provision. Problems of assessing the quality of markets and liquidity provision. Optimization of limited information resources (limited attention).

Sessions 3-4. Price taking, Rational Expectations, and Strategic trading models. Note: Students have to read and be ready to discuss all the papers required for current session. Please pay special attention to the following issues: Compare different trading strategies, pricing rules and types of equilibrium described by all three classes of models.

Sessions 5-6. Dynamic trading strategies. Note: Students have to read and be ready to discuss all the papers required for current session.

Please pay special attention to the following issues: Compare the cases of strategic trading based on single and multiple signals (static and dynamic private information structure), and trading not based on

information (optimal execution). What makes "predatory trading" possible? What are the shortcomings of Brunnermeier and Pedersen (2005) model?

Sessions 7-8. Applied topics. Note: Students have to read and be ready to discuss all the papers required for current session. Please pay special attention to the following issues: What are the different aspects of liquidity discussed in the first two empirical papers? Describe and explain the economic content of the "invariants" considered in the third paper. What do the existing theoretical models say about order cancellation and its impact on the market quality?