

Securities Markets: Trading Mechanisms, Liquidity, and Pricing

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Overview

This course explains how financial securities are traded in real markets, and how the process of trading affects price formation and market quality. In many finance courses, the mechanism of determining a security price is a black box, with no connection to the market in which the security is traded. By contrast, this course focuses on the actual market trading mechanism, as well as on the various market participants, and how these factors affect prices and liquidity. In particular, we discuss in detail: (1) price formation when the market is designed as a limit order market, dealer market, dark pool, call auction, etc.; (2) the definition of liquidity in connection with trading costs, market impact, resilience, and market stability; (3) how liquidity is affected by various market participants in the trading industry: the "buy-side" (investors, asset managers, arbitrageurs), and the "sell-side" (brokers, dealers, exchanges); (4) the role of market design and trading rules in maximizing liquidity; and (5) how trading frictions generate deviations of asset prices from their correct value.

Learning outcomes

When you complete this course, you should be able to **understand**:

- Market efficiency and arbitrage. Are markets efficient, or are they dominated by irrational investors? Are prices predictable? How does price discovery work in the real world?
- Market design. How do today's complex securities markets operate? What is the difference between electronic limit order markets, dark pools, over-the-counter markets, call auctions, etc.?
- Market liquidity. What does it mean that a market is liquid? How do we measure liquidity? How is liquidity related to trading costs?
- Asset allocation in illiquid markets. How do we account for illiquidity and transaction costs in managing a portfolio?
- High Frequency Trading (HFT). What are the strategies of High Frequency Traders? How do they affect market quality? What is the connection with the Flash Crash of May 6, 2010?

Key topics

Part 1: Market efficiency and arbitrage

The role of information in market efficiency

Anomalies and behavioral finance

Arbitrage: exploiting market inefficiencies; arbitrage costs and risks

Part 2: Trading Industry and Trading Mechanisms

Trading and price discovery

Trading industry: key players

Trading mechanisms: limit order markets, OTC markets, dark pools

Part 3: Illiquidity and Asset Management

Liquidity: definition and connection with trading costs

Asset management in illiquid markets

Implementation Shortfall, Efficient Trading Frontier

Course materials

Recommended Textbook

One book that covers part of the material studied in class is

Harris, L. (2003), *Trading and Exchanges*, Oxford University Press.

The book is available at the HEC library. It is not required for the course, but it is highly recommended if you want to understand the course topics in more depth. In particular, the textbook is a good purchase for those who plan to work in the trading industry: brokers, portfolio managers, traders, quants, etc.

Articles, Assignments, and Other Course Materials

Course materials can be downloaded from the course web page, which will be announced by e-mail before the first week of classes. In lectures, I will follow my lecture notes, which I will make available before each class.

Teaching methods

We combine lectures, classroom discussions, readings, and cases, to strengthen your understanding of basic topics, and to sharpen your analytic and problem solving skills. The course presents a thorough conceptual framework for understanding securities markets, yet at the same time offers much practical knowledge. The course is therefore challenging, and requires a significant amount of work outside of class in order to get most out of it.

Grading

The final grade is based on 3 assignments and a final exam. The corresponding weightings in the final grade are:

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|-------------------------|-----|
| Assignments (Team) | 30% |
| Final Exam (Individual) | 70% |

The assignments should be typed or written legibly, and submitted in hard copy at the beginning of class on the scheduled date. The assignments may be discussed only with the members of your group. Only one solution per group should be handed in. No late submissions will be accepted.

The exam is closed-book and closed-notes, with a calculator allowed but no other electronic device (e.g., calculator software on a smart phone is not permitted).

Exam Re-grading Policy: You may request a re-grade on the exam. Each re-grade request must be accompanied by a concise written explanation of the request (e-mail is acceptable). The request should be submitted to me within one week after exams are distributed. The whole exam will be re-graded, so your score can either increase or decrease as a result.

Class participation is very important. Many of you have useful experience that can undoubtedly benefit our class discussions. Do not hesitate to share your experience with the rest of the class!

Ioanid Rosu

Ioanid Rosu has joined HEC Paris as Associate Professor in 2010. A graduate of University of Bucharest, he earned two PhDs from MIT, one in mathematics in 1999 and one in financial economics in 2004. Between 2004 and 2010 he was Assistant Professor of Finance at the University of Chicago, Booth School of Business, where he taught the introductory finance course in the MBA and Executive MBA programs. His research focuses on the liquidity of financial markets and its effect on asset prices and investor decisions. He is also interested in mergers and acquisitions, option pricing, and high frequency trading.

Schedule Fall 2014

| <u>Class</u> | <u>Topic</u> | <u>Assignments</u> |
|---------------------|---|---|
| Topic 1: Nov 10 | 1. Introduction; Market Efficiency - Random Walks and Predictability, Event Studies | |
| Topic 2: Nov 13 | 2. Market Inefficiency and Behavioral Finance - Anomalies, Arbitrage, Short Selling | |
| Topic 3: Nov 17 | 3. Trading and Price Discovery - Asymmetric Information | |
| Topic 4: Nov 19 | 4. Investing and Trading - The Trading Industry, Recent Trends | Assignment #1 Due (beginning of class) |
| Topic 5a: Nov 25 | 5a. Market Design - Trading Mechanisms, Limit Order Markets | |
| Topic 5b: Nov 28 | 5b. Market Design - Call Auctions, Dark Pools | |
| Topic 5c: Dec 02 | 5c. Market Design - Floor Markets, Dealer Markets, Hybrid Markets | |
| Topic 6: Dec 04 | 6. Trading Costs and Market Illiquidity - Measures of Market Liquidity, Illiquidity Premium | Assignment #2 Due (beginning of class) |
| Topic 7a: Dec 08 | 7a. Asset Management in Illiquid Markets - Asset Allocation in Practice; Implementation Shortfall | |
| Topic 7b: Dec 09 | 7b. Asset Management in Illiquid Markets - Order Execution Strategies, Efficient Trading Frontier | |
| Topic 8: Dec 16 | 8. New Trends in Investing and Trading - Money Management and Skill, Liquidity Provision | |
| Topic 9: Dec 18 | 9. High Frequency Trading - Strategies, Effects on Market Quality, Flash Crash of May 6, 2010 | Assignment #3 Due (beginning of class) |

❖ **Final Exam: Wed Jan 7, 2015, 2-4pm**