

Securities Markets: Market Structure, Pricing, and Liquidity

Professor: Ioanid Rosu
rosu@hec.fr
Bldg. W2, Rm. 27
Ext. 7159

Assistant: Véronique Salat
rimbault@hec.fr
Bldg. W2, Rm. 21
Ext. 9605

Overview

This course explains how prices of financial securities are set in real markets, and how the structure of the market affects (i) price formation (market efficiency), (ii) cost of capital (expected return), (iii) ease of trading (market liquidity), and (iv) investment policy (asset allocation). 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 structure (the identity of the market participants, as well as the market trading mechanism), and how it affects prices, liquidity and asset allocation. As a result, this course also speaks to financial crises, and in particular explains why markets can suddenly become more inefficient, liquidity can dry up, and investors withdraw from the market. In this course, we discuss in detail (1) how trading frictions generate deviations of asset prices from their correct value, and how these inefficiencies are exploited (arbitrage); (2) price formation when markets are designed as limit order markets, dealer markets, dark pools, call auctions, etc.; (3) how liquidity is defined in connection with trading costs and funding constraints, and how market design maximizes liquidity; (4) 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); and (5) how liquidity affects the decisions of the various types of traders and investors, as well as their performance.

Learning outcomes

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

- *Market efficiency and arbitrage.* Are markets efficient or are they irrational? Can arbitrageurs exploit market inefficiencies or do they face limits to arbitrage? Is the cost of capital affected by pricing anomalies or by risk factors? How does price discovery work?
- *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?
- *Liquidity.* What does it mean that a market is liquid? How is liquidity related to trading costs? What is the difference between market liquidity and funding liquidity?
- *Asset allocation in illiquid markets.* How do we account for illiquidity and transaction costs in managing a portfolio? How does illiquidity affect performance, and the cost of capital?
- *High Frequency Trading (HFT).* What are the strategies of High Frequency Traders? How do they affect liquidity? 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 risk factors; 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

Market structure (participants, information, design); High Frequency Trading

Course materials

Textbooks

There are two textbooks that cover the material studied in class:

- Pedersen, Lasse (2015), *Efficiently Inefficient*, Princeton University Press.
- Harris, Lawrence (2003), *Trading and Exchanges*, Oxford University Press.

The book by Pedersen covers mostly topics related to market efficiency, liquidity, and asset management, while the book by Harris covers mostly topics related to the trading industry and market design. Both these course are useful, especially if you want to understand the course topics in more depth.

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 method

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:

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 2015

<u>Class</u>	<u>Topic</u>	<u>Assignments</u>
Topic 1: Nov 13, 19, 20	1. Introduction; Risk and Return; CAPM vs. APT	
Topic 2: Nov 26, 27	2. Market Efficiency - Random Walks and Predictability, Event Studies	Assignment #1 Due (beginning of class)
Topic 3: Dec 3,4	3. Market Inefficiency and Behavioral Finance - Anomalies, Risk Factors, Arbitrage, Short Selling	
Topic 4: Dec 10	4. Trading and Price Discovery - Asymmetric Information; Trading Industry	
Topic 5: Dec 11	5. Market Design - Trading Mechanisms: Limit Order Markets, Call Auctions, Dark Pools, Floor Markets, etc.	Assignment #2 Due (beginning of class)
Topic 6: Dec 17	6. Trading, Liquidity and Asset Management - Measures of Market Liquidity and Funding Liquidity, the Illiquidity Premium; Asset Allocation in Practice	
Topic 7: Dec 18	7. Market Structure (Participants, Information, Design) - New Trends; High Frequency Trading; Flash Crash of May 6, 2010	Assignment #3 Due (beginning of class)

❖ **Final Exam: Thursday, 7 January 2016, 10:00-12:00**