

16F026

3 ECTS

Market Liquidity and High-Frequency Trading

Professor: Roberto Pascual

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Introduction

This course provides both theoretical and (primarily) empirical background on Market Microstructure, an area of Financial Economics that studies the organization and regulation of markets and its impact on market quality. The course will cover two central topics: liquidity of security markets and price discovery at high frequencies.

Some of the questions we will address in the course are: What is liquidity? Why do traders, regulators, and market authorities care about liquidity? How can we measure liquidity? Why liquidity matters in asset pricing and corporate finance? Who provides liquidity? What is the limit order book? What are the risks and costs liquidity providers run? How can they manage those risks? Is the liquidity of different stocks connected somehow? Why do prices change at high frequencies (i.e., at the intraday level)? What are trading frictions (TFs)? Why do TFs matter in price discovery? What do TFs have to do with liquidity? Can we gauge how important TFs are? Does trading activity contribute to price discovery? Does the presence of informed traders in the market impair liquidity? Can we measure the likelihood of trading with informed traders? What is algorithmic trading? What is a high frequency trader (HFT)? What do HFTs do? What is the impact of HFTs on liquidity, price efficiency, and volatility? What about systematic or operational risk? What about other traders' welfare?

Objectives

- Understand the foundations of market microstructure research
- Understand why liquidity matters
- Understand how securities markets work and how are they organized
- Learn how various market imperfections affect price formation, liquidity, and the speed of price discovery
- Understand the interplay between order flow and price discovery
- Learn how to use empirical methodologies to evaluate liquidity and model price discovery at high frequencies
- Understand why HFTs have changed the way markets work

Required Background Knowledge

The target audience for this course is economics and finance graduate students. The course is mostly self-contained, but it presumes some exposure to undergraduate finance, economics, statistics, and econometrics. The grade will be based on weekly empirical exercises with real data and a final exam.

Learning Outcomes

The students will learn how to manage high frequency data and how to use very well-known empirical methods to analyze that data.

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Methodology

The course will combine basic conceptual background, seminar theoretical models, overview of academic empirical studies, and empirical methods. The students will learn the issues involved in the course by working with real high-frequency data.

Evaluation

Weekly exercises by groups of three people at most will represent 40% of the grade. A closed book final exam will represent the other 60% of the grade. All students must obtain at least 4 points out of 10 in the final exam for the exercises to be taken into account in the final grade.

Course contents

- Part I: Liquidity and market structure
- Part II: Measuring liquidity
- Part III: Why liquidity matters
- Part IV: Order flow, liquidity, and price discovery
- Part V: Empirical methods
- Part VI: High frequency markets

Detailed description:

Session	Day	Time	Title, contents, material
1	Th.	17h	Liquidity, liquidity providers, types of orders, limit order book
2	Fr.	11h	Monitoring orders, transparency, dark pools
3	Th.	17h	Measures of implicit trading costs and depth
4	Fr.	11h	The illiquidity premium and the liquidity risk
5	Th.	17h	Informed traders and the adverse selection costs paradigm
6	Fr.	11h	Risk-averse dealers and inventory holding costs paradigm
7	Th.	17h	Price impact methods and reduced-form methods
8	Fr.	11h	The PIN approach
9	Th.	17h	AT, HFT, latency, colocation, importance of HFTs, HFT strategies
10	Fr.	11h	The impact of HFT

Bibliography

- Aldridge, I. (2013). High Frequency Trading. Wiley.
- Foucault, T., M. Pagano, and A. Roëll (2013). Market Liquidity: Theory, Evidence and Policy. Oxford University Press (Basic).
- Harris L. (2003). Trading and Exchanges. Oxford University Press.
- Hasbrouck, J. (2007). Empirical Market Microstructure: The Institutions, Economics, and Econometrics of Securities Trading. Oxford University Press. (Basic)

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O'Hara, M. (1995). Market Microstructure Theory. Blackwell Publishers Inc.

Professor Biography

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EDUCATION

Bachelor in Business Administration

Universidad Jaume I, Castellón

Ph.D. in Economics

Universidad Carlos III de Madrid

Title: "Market Microstructure, Adverse Selection Costs, and Liquidity" (Chairman: Álvaro Escribano and Mikel Tapia)

AREAS OF INTEREST

Market microstructure

Financial Econometrics

Experimental Finance

Corporate Governance

RECENT SELECTED PUBLICATIONS IN ENGLISH

Chakrabarty, B., R. Pascual, and A. Shkilko, 2015. "Evaluating trade classification algorithms: bulk volume classification versus the tick rule and the Lee-Ready algorithm". *Journal of Financial Markets* 25, 52-79.

Abad, D., and R. Pascual, 2015, "The friction-free weighted price contribution". *International Review of Economics and Finance*, 37, 226-239.

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- Pascual, R., and B. Pascual-Fuster, 2014, "The relative contribution of ask and bid quotes to price discovery". *Journal of Financial Markets* 20, 129-150.
- Medina, V., A. Pardo and R. Pascual, 2014, "The timeline of trading frictions in the European CO2 market". *Energy Economics* 42, 378-394.
- Pardo, A., and R. Pascual, 2012, "On the hidden side of liquidity", *European Journal of Finance* 18, 10, 949-967.
- Abad, D., and R. Pascual, 2010, "Switching to a temporary call auction in times of high uncertainty", *Journal of Financial Research* 33, 1, 45-75.
- Pascual, R. and D. Veredas, 2010, "Does the Open Limit Order Book Matter in Explaining Informational Volatility?" *Journal of Financial Econometrics* 8, 57-87.
- Pascual, R. and D. Veredas, 2009, "What pieces of limit order book information matter in explaining the behavior of aggressive and patient traders?" *Quantitative Finance* 9, 527-545.
- Pascual, R., Pascual-Fuster, and B., F. Climent, 2006, "Cross-listing, Price Discovery, and the Informativeness of the Trading Process" *Journal of Financial Markets* 9, 144-161.
- Pascual, R., Escribano, A. and M. Tapia, 2004, "Adverse selection costs, trading activity and price discovery in the NYSE: An empirical analysis" *Journal of Banking and Finance* 28, 107-128.