

11/18/2014

Professor: Tavy Ronen  
Doctoral Seminar in Microstructure and Credit Markets  
26:390:685:01  
Wednesdays, 1:00-3:50  
Room 202, 1WP  
Fall 2014

## ***Course Objectives:***

Market microstructure is the study of how markets operate and how transaction dynamics can affect security price formation and behavior. The impact of microstructure on all areas of finance has been increasingly apparent. Empirical microstructure has opened the door for improved transaction cost measurement, volatility dynamics and even asymmetric information measures, among other. Thus, this field is an important building block towards understanding today's financial markets. The course focuses on empirical methods and models, with special attention to high frequency data analysis. Microstructure has grown to be a large field. In part this course can be seen as a survey of the main schools of thought in the subfield, with a more in depth focus on certain subfields. Credit Market research has become increasingly important in the past few years, and therefore will figure dominantly in this class.

This is a doctoral level elective seminar course and the prerequisites are Survey of Financial Theory I, matrix algebra, calculus, basic probability and econometrics (doctoral level).

This class has two main goals. The first is for the student to attain knowledge and understanding of the subject matter. The second is to gain an appreciation for the academic field you are planning to enter and covers basic presentation and writing skills in the field. These skills can be crucial in today's academic job market. Students will be expected to present, write reports, and act as referees to eachothers' work at all time. The class will act as practice for presentations, discussions, etc. The grade will depend on all of these factors as well as the mastery of the academic material.

## ***Required Materials:***

- All Blackboard postings.
- All assigned articles.
- Please obtain the phone number of another student in the class today (mandatory). You must have a 'backup buddy', or partner in the class. This partner is your liaison to the class. I need a written list of liaison partners.

## ***Useful Background References:***

### ***Texts:***

- Empirical Market Microstructure: The Institutions, Economics and Econometrics of Securities Trading, Joel Hasbrouck, Oxford University Press, 2006
- Trading and Exchanges, Larry Harris, Oxford University Press
- SAS Manual. You will be expected to know how to read and program in SAS. This will prove helpful throughout your career.

[More general Finance:](#)

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These are only suggested reference as background if you encounter something you feel shaky on. By no means do I suggest you go out and buy all of these now! This list is simply here to make life a bit easier for you.

Campbell, Lo and MacKinley, 1997, *The Econometrics of Financial Markets*, Princeton University Press.

Copeland, Thomas E. and J. Weston, 1992, *Financial Theory and Corporate Policy*, 3<sup>rd</sup> Edition, Addison-Wesley Publishing Company.

Huang, Chi-fu and Robert Litzenberger, 1988, *Foundations of Financial Economics*, Prentice Hall ISBN 0-13-500653-8

Ingersoll, Jonathan, 1987, *Theory of Financial Decision Making*, Rowman and Littlefield.

[Excellent website for doctoral students:](#)

<http://www-2.iies.su.se/~masa/tips4economists.html>

I looked for something that can help guide you in writing the mock referee report and found this excellent site with many helpful links.

**Microstructure:**

The theory and practice of microstructure also relies on institutional structure. While I might provide some coverage, since the institutions change so fast that (a) trading practices are not well-documented, and (b) knowledge of institutional detail has a rapid decay rate, I will expect you to keep up on this end yourselves as much as possible. The web is an excellent source, as well as some texts that are not necessarily up to date, but are a good start:

O'Hara, Maureen, 1995, *Market Microstructure Theory* (Blackwell Publishers, Cambridge, MA) –doctoral level, but really theory oriented, not our main focus.

[Trading and Exchanges](#), Harris, Lawrence E., 2003, Oxford university Press, New York.

[Equity Markets in Action, The Fundamentals of Liquidity, Market Structure & Trading](#), Schwartz and Francioni, Wiley, 2004, ISBN: 0-471-46922-X

**Resources:**

The Wharton Research Data Services (WRDS) is your source for the TAQ trade and quote data for US equities, for TRACE bond data, and most other databases you will access. Make sure you are familiar with it.

The web site for Joel Hasbrouck's book ([Empirical Market Microstructure](#)) has links to SAS programs and data (which illustrate some of the techniques in the book). Also, you will find Joel's Mathematica programs used to develop many of the results in the book. (Mathematica is a symbolic math manipulation program).

For the sections of the course that cover Joel Hasbrouck's book, we will be following his class notes and lectures, which are in the public domain and are designed to facilitate the reading of the book. They are also much more updated than the textbook in terms of more recent events and changes in the trading world.

**Class Organization/Weekly Assignments:**

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This is a seminar course. Each week we will cover several papers within one subtopic.

There will be one midterm exam. One of your presentations will be submitted as a full-fledged paper at the end of term, and will be empirical, using at least one of TRACE or TAQ data, on the intradaily level. You will have assignments weekly.

### **Grades:**

Class Participation/Preparation/Synopses/Written weekly work: 35 percent

Presentation/Discussion/Oral Skills: 25 percent

Midterm: 20 percent

Project: 20 percent

The exam and presentation dates will be announced soon. These dates cannot be changed. Once announced, firm. Please make arrangements to adhere to them.

### **Office hours:**

Mondays, 11:00-11:30 am; My office is 1128. Tel: 1-973-353-5272. I don't really get my messages so it is better to email me, leave me your phone numbers, and I will call you back.

### **E--mail policy: (tronen@andromeda.rutgers.edu)**

You may prefer to ask me questions by e--mail. Your message **MUST** include a subject and your name, clearly identifying yourself as my student. Please make sure your Email queries are self contained, and can be answered in a reasonably short way.

*Tentative Schedule: subject to change!*

Dates: September 3

**Meeting 1**

**Topic 1: Introduction to course: Course objectives, requirements, general overview, What is Microstructure?**

**Dates: September 10**

**Meeting 2**

**Topic: Introduction to Microstructure**

*Before arriving:*

Survey/Institutional Articles/Data

1. Madhavan (2000), Market Microstructure: A survey, Journal of Financial Markets 3, 205-258
2. Biais, Glosten and Spatt (2002), The Microstructure of Stock Markets, Universite de Toulouse.
3. Comerton-Forde and Rydge (2004), A Review of Stock Market Microstructure (Securities Industry Research Centre of Asia-Pacific, Sydney).

**Basic Models:**

4. Roll, Richard, 1984: A simple implicit measure of the effective bid ask spread in an efficient market, Journal of Finance 39, 1127-1139.\*

Assignment: Prepare a 10 minute presentation on 'What is Microstructure'. Your assignment is to teach **MBA** students the day 1 outline on what this field is. My expectation is that you will have started with this but downloaded all cited articles that are mentioned here that **YOU** think are important, and that you have done a supplementary literature search on refereed articles. Do not search for similar courses and simply rewrite.

You will be tested on your presentation skill, the content, how effective you are at teaching, timing yourself, how you answer questions, etc.

Lectures will be on architecture of markets.

**Dates: September 17**

**Meeting 3**

**Topic: Introduction to Microstructure Sequential Trade models of Asymmetric Information, and Continuous Auction Models (Strategic Trade)**

1. Glosten, Lawrence R. and Paul R. Milgrom, 1985, Bid, ask, and transaction prices in a specialist market with heterogeneously informed traders. Journal of Financial Economics 14, 71-100;\*
2. Kyle, Albert S., 1985, Continuous auctions and insider trading. Econometrica 53, 1315-1336;\*
3. Anat R. Admati and Paul Pfleiderer, 1988, A Theory of Intraday Patterns: Volume and Price Variability, The Review of Financial Studies, Vol. 1, No. pp. 3-40 \*

More seminal articles:

4. Glosten, Lawrence R., 1989, Insider trading, liquidity, and the role of the monopolist specialist. *Journal of Business* 62, 211-35;

5. Foster, D., and S. Viswanathan, 1990, A Theory of the Intraday Variations in Volume, variance, and Trading Costs in Securities Markets, *Review of Financial Studies* 3, 593-624.

Assignment: This week, each of you will be preparing a 10 minute presentation on one of these articles, which I will assign to you one week in advance. Your assignment is to teach your fellow **doctoral student classmates** the paper (not me). My expectation is that you will have started with this but downloaded all cited articles that are mentioned here that YOU think are important, and that you have done a supplementary literature search on refereed articles. Do not search for similar courses and simply rewrite.

You will be tested on your presentation skill, the content, how effective you are at explaining difficult concepts, interest level, timing yourself, how you answer questions, etc.

Lectures will be on architecture of markets.

**Dates: September 24:**

**Meeting 4**

I will be unable to come to class because of the Jewish Holiday. However, I would like you to meet in the classroom for a minimum of 1.5 hours to learn the data sets together (I prefer 3 hours). You need to figure out how to go onto TAQ, and TRACE. Review each of these data sets and the documentation together carefully. Some of you are familiar with some of these data sets but not others. I expect the more seasoned students to help the others. I expect a report at the end of this session from each person: In-class assignment: Together, each of you will download 5 firms' data for one day, both stock and bond, You will also get all the Bond data. Then, together you will figure out for the stock: how match all the quotes with the transactions for the stock. Make sure you are all good with SAS. Then, in SAS, compute the basic statistics that you think are interesting on these data. I will say no more. Each of you must submit a report on what happened in class, who helped you the most, or who you helped, what you learned, what the issues that had you stuck are, where you think you want to improve in your knowledge of these issues. What the problem areas were, and of course, your results.

**Dates: October 1:**

**Meeting 6**

**Topic: Mechanisms**

Assignment: Prepare a **20** minute **class** on 'How this exchange operates today'. Your assignment is to teach **UNDERGRAD** students the current day market architecture for your assigned market. Submit to me serious list of references you used to put together your lecture. Do not search for similar courses and simply rewrite.

You will be tested on your presentation skill, the content, how effective you are at teaching, timing yourself, how you answer questions, etc. You must assign 'reading' to the students as well as homework. The assigned reading and the biblio materials must be submitted to me at least 24 hours in advance.

**NYSE**

**OTC STOCKS- FINRA**

**THE EVOLUTION OF ECNS TO PRESENT DAY**

**CORPORATE BOND MARKET**

**TREASURY MARKET**

Lectures will be on architecture of markets.

A,B,C,D,E letters will be assigned

## SECTION 2:

### ***Each week (unless otherwise specified):***

For the second portion of the course, we will have a simple rotation: Each week you will be assigned your rotated weekly role (A,B,C,D or E). If you are 'A' one week 'I', you will be 'B' on week 'i+1'. Each student will have the following task, as per their letter role for the week.

#### **BEFORE THE WEEK BEGINS:**

**PERSON A** writes a literature review that they feel is pertinent for the class to be able to understand Article 0. This must be emailed to me by **Friday 9PM** (preceding the Wednesday class). It must also be put on blackboard and all pertinent articles must be downloaded and attached. This literature review 'places' the article.

Students **B** and **C** and **D** must submit 'referee reports' to me by email by **Monday** (preceding the Wednesday lecture)

#### **During the lecture:**

Person **B** **DISCUSSES** the assigned paper during the **Wednesday** lecture as though they are a discussant at a conference. (hand in before class to me).

**PERSON E** presents their research idea based on the paper from the **PRECEDING** week. The written portion must be submitted to me **AND** to person **D** by **Monday** preceding the lecture.

**PERSON C** discusses **E's** research proposal during the lecture as though they are a discussant at a conference. (please hand written discussion in before class to me).

Group discussion and questions on **C's** presentation and topic.

**A, B, D** write comments on the research paper and the presentation to **TR** only. Due **Friday 9PM** after the presentation.

The following week, person **E** (who will by then become 'A') presents their revised work.

Note: it is your responsibility at all times to identify relevant references and scan and upload all relevant papers.

**Dates: October 8:**

**Meeting 7**

**Topic: Empirically Speaking....**

#### **Empirical Evidence on Intraday Patterns:**

**SEE THE DEADLINES THAT COME BEFORE THIS DATE!!!!**

**0. What's Not There: The Odd- Lot Bias in Taq Data, Working paper, O' Hara Yao Ye**

Required reading:

1. Wood, R., McInish T., Ord, K., 1985. An Investigation of Transactions data for NYSE stocks, *Journal of Finance* 40, 723-739
2. Jain, P. and G. Joh, 1988, The Dependence Between Hourly Prices and Trading Volume, *Journal of Financial and Quantitative Analysis* 23, 269-284.
3. McInish, T., and R. Wood, 1992, An Analysis of Intraday Patterns in Bid/Ask Spreads for NYSE Stocks, *Journal of Finance* 47, 753-764.
4. Chan, KC, W. Christie, and P. Schultz, 1995, Market Structure and the Intraday Patterns of Bid-Ask Spreads for Nasdaq Securities, *Journal of Business* 68, 35-60.
5. Lee, C., and M. Ready, 1991, Inferring Trade Direction from Intraday Data, *Journal of Finance*, 46, 733-746.

**Dates: October 15:  
Meeting 8**

**Empirical Work on decomposing the spread , on orders and prices**

**0. Price Constraints, Speed Competition, and Liquidity, Yao Ye**

Required reading:

1. Stoll, H., 1989, Inferring the Components of the Bid-Ask Spread: Theory and Empirical Tests, *Journal of Finance* 44, 115-134.
2. Hasbrouck, Joel, 1993, Assessing the quality of a security market: A new approach to transaction-cost measurement. *Review of Financial Studies* 6, 191-212\*
3. Madhavan, A., Richardson, M., and M. Roomans, 1997, Why Do Security Prices Change? A Transaction-Level Analysis of NYSE Stocks, *Review of Financial Studies* 6, 345-374.
4. George T., and Hwang, C., 1995. Transitory Price Changes and Price Limit Rules: Evidence from the Tokyo Stock Exchange. *Journal of Financial and Quantitative Analysis* 30, 313-327.
5. Biais, B, Hillion, P., and C., Spatt, 1995, An Empirical Analysis of the Limit Order Book and the Order Flow in the Paris Bourse, *Journal of Finance* 50, 1655-1689.

**Dates: October 22:  
Meeting 9**

**Topics:** Corporate Bonds, Trace

**THIS WEEK JUST READ THE PAPERS, ALL OF THEM. A**

Assignment: Know this body of literature extremely well. Write a literature review. Submit to me a two page literature review. Pretend it is part of the introduction of a paper you are writing, or part of the 'literature review' of a paper you are writing. You will be graded not only on the content and organization and understanding but on your writing skill. Your literature reviews will be graded comparatively.

1. Kwan, Simon H., 1996, Firm-specific information and the correlation between individual stocks and bonds, *Journal of Financial Economics* 40, 63-80.
2. Hong, Gwangheon., and Arthur D. Warga, 2000, An empirical study of bond market transactions, *Financial Analysts Journal* 56, 32-46.
3. Alexander, Gordon J., Edwards, Amy K., and Michael G. Ferri, 2000, The determinants of trading volume of high-yield corporate bonds, *Journal of Financial Markets* 3, 177-204.
4. Schultz, Paul H., 2001, Corporate bond trading costs and practices: a peek behind the curtain, *Journal of Finance* 56, 677-698.
5. Hotchkiss, Edith S., and Tavy Ronen, 2002, The informational efficiency of the corporate bond market: an intraday analysis, *Review of Financial Studies* 15, 1325-1354.
6. Spatt, Chester S., 2004, Frictions in the bond market, Keynote address at the second MTS conference on financial markets: The organization and performance of fixed-income markets, Vienna, December 16, 2004.
7. Biais, Bruno., and Richard Green, 2007, The microstructure of the bond market in the 20th Century, *IDEI Working Paper*, n. 482.
8. Biais, B. and F. Declerk, 2007, Liquidity, Competition and Price Discovery in the European Corporate Bond Market, working paper, Toulouse School of Economics
9. Goldstein, Michael A., and Edith S. Hotchkiss, 2007, Dealer behavior and the trading of newly issued corporate bonds, Working paper, Boston College.
10. Bao, Jack, Pan, Jun, and Jiang Wang, 2008, Liquidity of corporate bonds, Working Paper, MIT.
11. Saunders, Anthony., Srinivasan, Anand., and Ingo Walter, 2002, Price formation in the OTC corporate bond markets: a field study of the inter-dealer market, *Journal of Economics and Business* 54, 95-113.
12. Downing, Christopher., Underwood, Shane, and Yuhang Xing, 2008. The relative informational efficiency of stocks and bonds: an intraday analysis, *Journal of Financial and Quantitative Analysis*, Forthcoming.
13. Ronen, Tavy and Xing Zhou, 2009, Where Did All the Information Go? Trade in the Corporate Bond Market , Working Paper, Rutgers University.
14. Mahanti, Sriketan, Nashikkar, Amrut, Subrahmanyam, Marti G., Chacko, George, Gaurav Mallik, 2008, Latent liquidity: A new measure of liquidity, with an application to corporate bonds, *Journal of Financial Economics* 88(2), 272-298.
15. Jankowitsch, Rainer, Nashikkar, Amrut, and Marti G. Subrahmanyam, 2008, Price dispersion in OTC markets: A new measure of liquidity, Working Paper, New York University.



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**Dates: October 29 Meeting 10 MIDTERM EXAM**