Financial Markets Microstructure

Lecture 1

Introduction and institutions
Chapters 0 and 1 of FPR

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Københavns Universitet
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This slide deck:

Contact Information

Lecturer: Egor Starkov

- Contact: absalon or email (egor.starkov@econ.ku.dk)
- Office hours: by appointment (or after lectures)

Schedule

2 hours of lectures once or twice a week

- Wednesdays 13.00-15.00 (weeks 6-13,15-20);
- Fridays 10.00-12.00 (weeks 6,8,10,12,16,18,20).
- Physical classes, no streams/recordings

Resources

- Get the book by Foucault, Pagano, and Röell.
  - We'll be using it a lot (incl. exercises).
  - Will switch to research articles towards the end of the course.
- Everything else (lectures, problem sets for exercise classes, etc.) is on Absalon – check regularly.
- I will upload the slides before the lectures for you to print out.
  - Those may contain omissions!
- 2020 lectures are on youtube.
- Study groups may be helpful. Email me before 17:00 Thu, Feb 09 if you are looking for a group.

Problem sets and Exam

- **readings and exercises** after lectures (esp. in earlier part of the course)
  - voluntary; will go through some in class
  - readings not always immediately related to theory, but always related to the course
- 2 problem sets (larger, cumulative, more open-ended?)
  - Voluntary too. Take them as an opportunity to check your progress
- **final exam**: 12-hr take-home exam.

This slide deck:

Why do we need markets?

1. **What** is a market?

2. **Why** do we need markets?
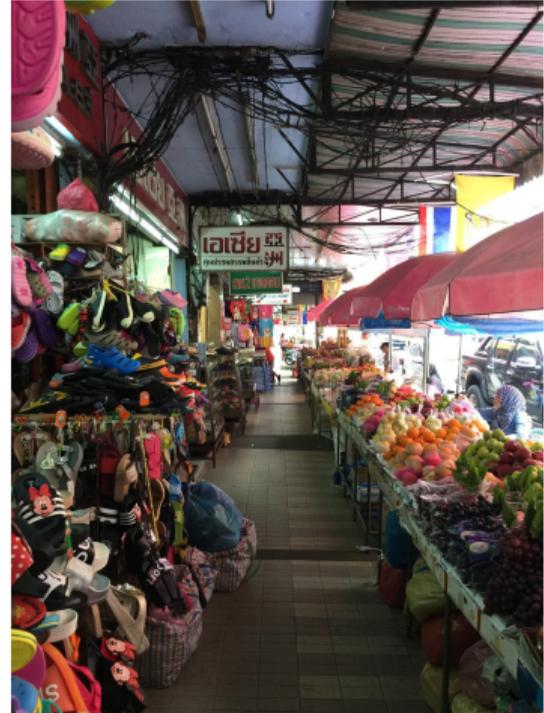
Why do we need markets?

1 **What** is a market?
  ■ Institution for property rights exchange
2 **Why** do we need markets?
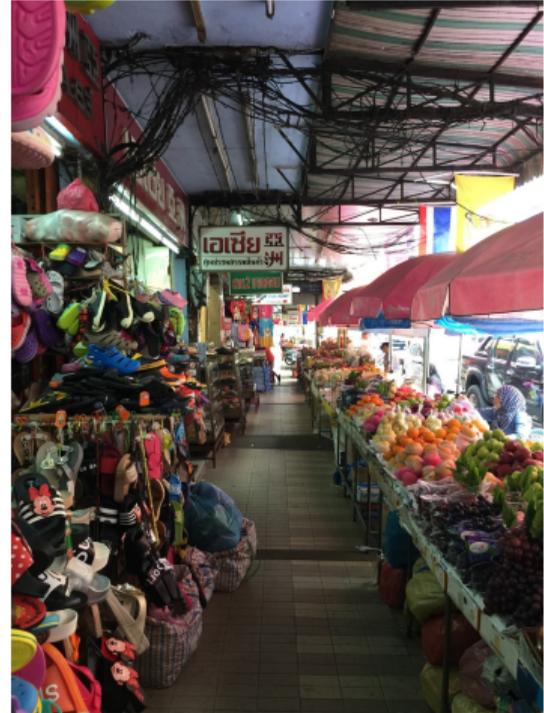
Why do we need markets?

1. **What** is a market?
   - Institution for property rights exchange

2. **Why** do we need markets?
   - Want property rights to be allocated efficiently in the society
   - In plain words: want to transfer stuff from those own but do not value it much to those who value it a lot, in exchange for other stuff.
   - Smooth functioning of markets is essential for this
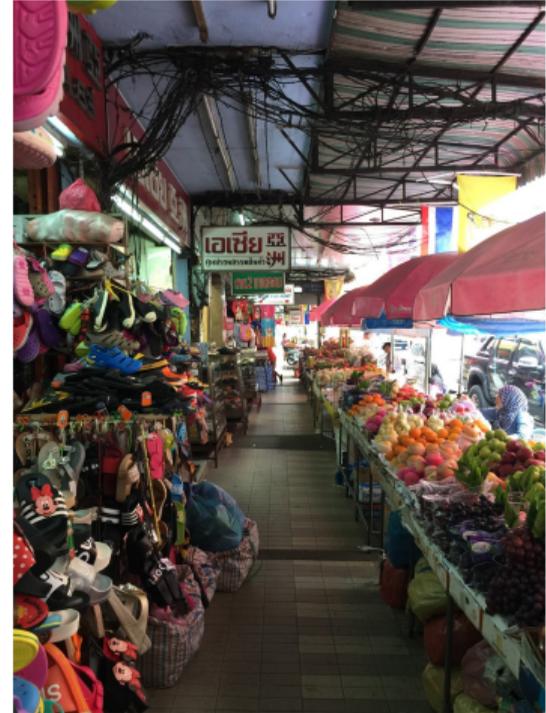
Why do we need Financial Markets?

- **Financial markets**: markets for financial assets
- **Financial assets**: move wealth across time and contingencies:
    - Financial assets provide 'contingent cash flows'
    - Stocks, bonds, derivatives...

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- **Financial assets**: move wealth across time and contingencies:
  - Financial assets provide 'contingent cash flows'
  - Stocks, bonds, derivatives…
- **Purposes** of financial markets:
  - Forum for trade in the stock (consolidation);
  - Each trader can compare their private valuation against the current price, which conveys some historical info (transparency);
  - Guarantee of getting what is paid for (security)
- **Specifics** of financial markets:
  - Feature to a lot of asymmetric information
  - Because of this, usually organized in a specific way and heavily regulated.

This slide deck:

Types of Financial Markets

- **Primary markets**: "Allocate savings to investment"
  - Issues of new assets (typically by investment bank)
- **Secondary markets**: "Reallocate investments across savers"
  - Trade the existing assets on exchange

Types of Financial Markets

- **Primary markets**: "Allocate savings to investment"
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    - Trade the existing assets on exchange
- This course: focus on secondary markets, such as
    - Stock and bond markets
    - Derivative markets
    - Currency (FX) markets
    - Most insights will apply to commodity markets that deal in futures (oil/gas, metals, food...)
   - (Corporate finance looks at primary markets)

Market Setups

Markets can be set up in different ways

1. Decentralized "markets"

2. Dealer markets

3. Order-driven markets

   - Continuous

    - Call

4. Hybrid (dealer+order) markets

Direct trading

- Buyers and sellers could interact directly.
- A useful benchmark, but not a very interesting case.
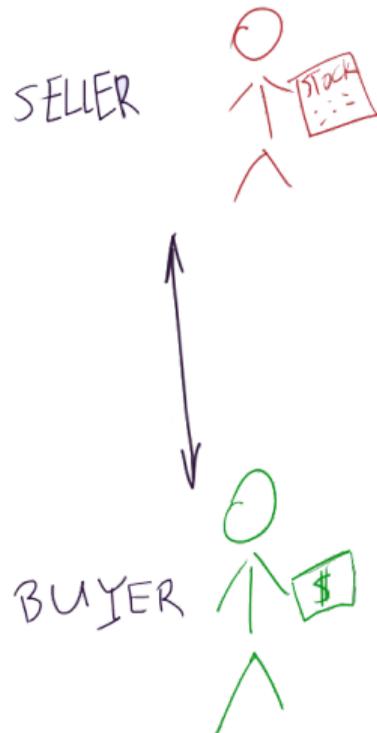
Dealer Markets

- A dealer quotes a bid and an ask price (valid up to certain number of shares)
- Bid-ask spread:
  - Narrow to fend off competitors
  - Wide to generate trading profits
- Dealer exchanges: Nasdaq
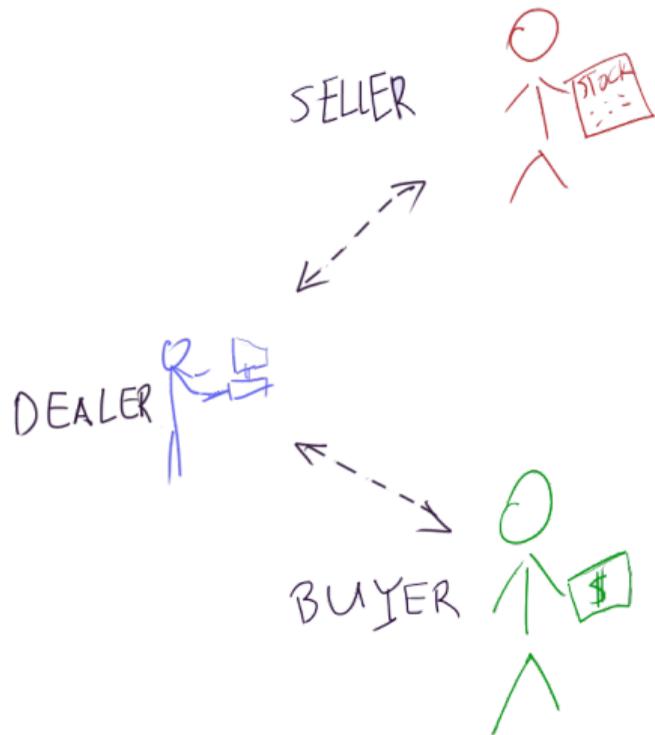
Order-driven markets

- Timing
  1. Orders are submitted
  2. Trades are arranged
- The markets can vary in different ways
  - Frequency of trading: how often?
  - Order precedence: price/time/public
  - Pricing rule: uniform/discriminatory price, determined from orders/taken from other exchange
  - Opening/closing: are there any special trading rules?
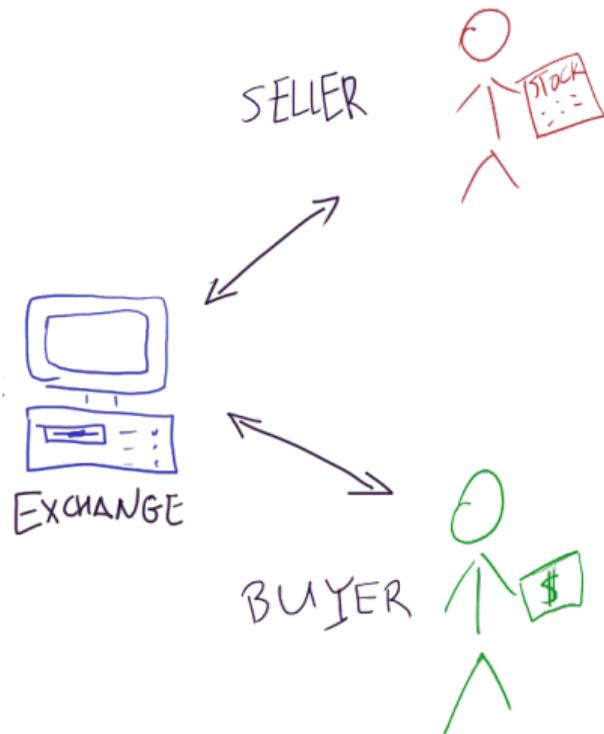
Order types

- There's a tremendous amount of different order types. We focus on two main ones:
- **Market order** specifies quantity: "buy 500 shares at best available price".
- **Limit order** specifies a quantity and a price: "will buy 500 shares at below price 40"
    - Limit orders sit in the Limit Order Book until they can be executed
- Trades occur either through
    1. a limit order 'match' (somebody posts a bid price above the lowest ask price), or
    2. through market orders against the LOB

Order-driven markets: Continuous auctions

- LOs together compose a Limit Order Book.
  - Any given LO can be **marketable** or not.
  - A marketable LO is expected to execute immediately given other orders in the LOB.
- Traders can choose orders best for them:
  - Patient traders are more passive: use limit orders (fill LOB)
  - Impatient traders are more aggressive: use market orders (deplete LOB)
- Discriminatory price: depends on how your order is matched
- Continuous LOB exchanges: NYSE (both electronic and 'outcry'), LSE, BATS, Euronext

Order-driven markets: Call (batch) auctions

- Orders are collected (in a 'batch') and cleared at a certain frequency
- The price is chosen so as to maximize the number of executed orders
- Uniform price: all orders in a batch trades at same price
- In theory, very good efficiency properties: all profitable trades are carried out
- But... slower than the continuous market
- Call auction exchanges: most of the major exchanges (e.g. Nasdaq, LSE, Euronext) operate call auctions together with other trading methods. Danish electricity markets work via call auctions afaik.

Exchange versus over-the-counter

Exchange trading

- Organized exchange venues (NYSE, NASDAQ, LSE, ...)
- Generally offer a lot of services
    - Liquidity and stability through *specialists/market makers*
    - Clearing and settlement
    - Transparency

Over-the-counter (OTC) trading

- Off-exchange venues
    - Use quotation systems to match dealers and traders
    - However, no guarantee of liquidity (no specialists)...
    - ...nor transparency: may not publish trade information

Dark liquidity: Liquidity in 'private exchanges' (not public)

Other dimensions

- Many other aspects in which markets can differ:
    - Transparency about current orders
    - Transparency about past trades
    - Fragmentation
    - Listing requirements
    - ...
- Who benefits from markets being organized in a particular way? Who loses?

This slide deck:

Players

- **Traders/investors**: the
  end-"consumers" or suppliers of
  the asset
- **Brokers**: the intermediaries who
  relay investors' orders to the
  market (investment banks)
- **Dealers/market-makers**:
  match orders from different sides
  of the market
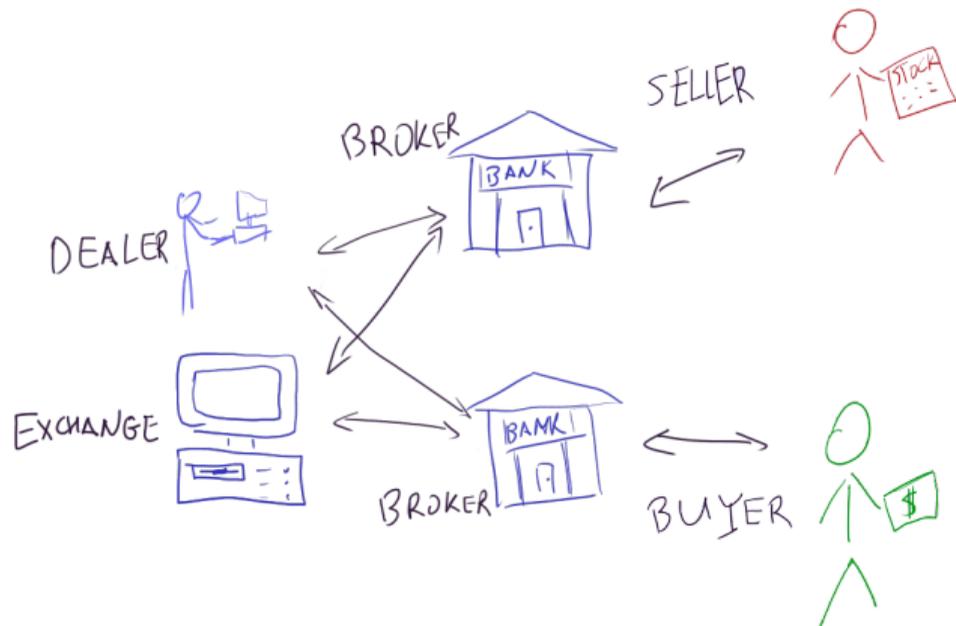
Types of traders

Traders can be classified:

- Retail investors vs institutional investors
  - **Retail:** regular people, individuals with money. <u>Eaton et al. (2020)</u>: retail accounts for about 20% of market activity.
  - **Institutional:** pension funds, mutual funds, hedge funds, private equity funds...
- Informed vs uninformed investors
  - Retail investors and pension funds usually have little "private information".
  - Hedge funds and short-selling funds have good analytics and can react fast.
  - "Private information" $\neq$ "insider information"! Insider trading is banned in most jurisdictions.

This slide deck:

Motivating questions

1 How are market prices created? How are they influenced by traders?

2 How should traders act on their information?

3 Do the market rules matter? And which rules are good for whom?

4 How do we measure if markets are working well?

Course overview

- Institutional details, policy issues, applications (ch.1, 6-10, articles)
- Theories to understand and to analyze policy (ch.3-4, 6-10, articles)
- Some empirical issues (ch.2, 5, articles)

Prerequisites: Finance, micro, games, (math)

Disclaimer: We focus on 'rational' models in this course. Behavioral finance is a complementary and exciting topic.

For next class

1. Match into groups if you want / message me if you are looking for a group or group members.

2. Read the article about GameStop (on Absalon). Think/discuss:
   - What kind of traders are involved on both sides? Based on that fact: why has this story made the news?
   - Would now be a good time to buy GameStop stock? Why/why not?
   - Robinhood (trading app) halted trading in GameStop stocks at some point. Is there a scope for some regulatory intervention to prevent this kind of exclusion of retail traders?

3. Read the Nikola story. Is Hindenburg Research an insider? Is it an informed trader?

4. Do exercises 1-3 after Chapter 1 (pages 44-45) in the textbook