



# Centralized and decentralized financial trading systems: Historical perspectives

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# Financial Trading Systems

- Financial trading systems play central role in market economies.
- Exchanges are not casinos.
- Trading platforms help to facilitate capital formation, share risks, and aggregate information. Markets have to be fair, orderly, and efficient.

# Organization of trading

- Organized exchanges – centralized structure.  
Examples: the NYSE, the CME (the Merc), the MOEX.
- Dealers market – decentralized structure.  
Examples: NASDAQ, the Euronext, fixed income, FX.

# Organized exchange - the NYSE



# Buttonwood agreement, 1792

”We the Subscribers, Brokers for the Purchase and Sale of Public Stock, do hereby solemnly promise and pledge ourselves to each other, that we will not buy or sell from this day for any person whatsoever, any kind of Public Stock, at a less rate than one quarter per cent Commission on the Specie value and that we will give a preference to each other in our Negotiations.

In Testimony whereof we have set our hands this 17<sup>th</sup> day of May at New York. 1792.”

What was the economics behind this agreement?

# Organized exchange as private club

- Brokers explicitly agreed to restrict competition and charge their customers a minimum fixed commission of 25 bps.
- It was essentially creation of a cartel in securities trading, which has survived for two hundred years.
- Similar story about the first exchanges in Bruges, Amsterdam, and London.

How to maintain cartel in securities trading?



# How can we maintain cartel?

- Restrict entry to trading floor to the limited number of members.
- Insure that its members comply with agreement and nobody is cheating.

Cartel agreement naturally led to the concept of organized exchange as a closed trading floor with a restrictive list of members.

What are the possible ways to cheat on cartel?

# Possible ways to cheat on cartel?

- Price competition under fixed commissions:
  - e.g., a broker thinks that price is \$40.50
  - a client buys at \$40.50 with commission of \$0.05 or
  - a client buys at \$40.30 with commission of \$0.25
- Non-price competition under fixed commissions (soft dollars).
- Error accounts (fake out trades).

# Clearing and Settlement

- After trading trades have to be cleared at a clearing house.
- Clearing is often centralized.
- A clearing corporation is an organization associated with an exchange to handle the confirmation, settlement and delivery of transactions.

# Organized exchange: Summary

By 1970s, the trading in securities markets was shaped by the logic of cartel.

Organized exchange was like a private club with valuable membership and limited access to the trading floor.

Fixed commissions led to a lot of non-price competition (soft dollars) or price-type competition (fake “out trades”), lots of policing and inefficiency.

In 1970s and 1980s, fixed commissions were ruled illegal under the anti-trust laws.

# State Organized Exchanges in Russia

- Exchanges organized under patronage of the state.



“Санкт-Петербургская Биржа”

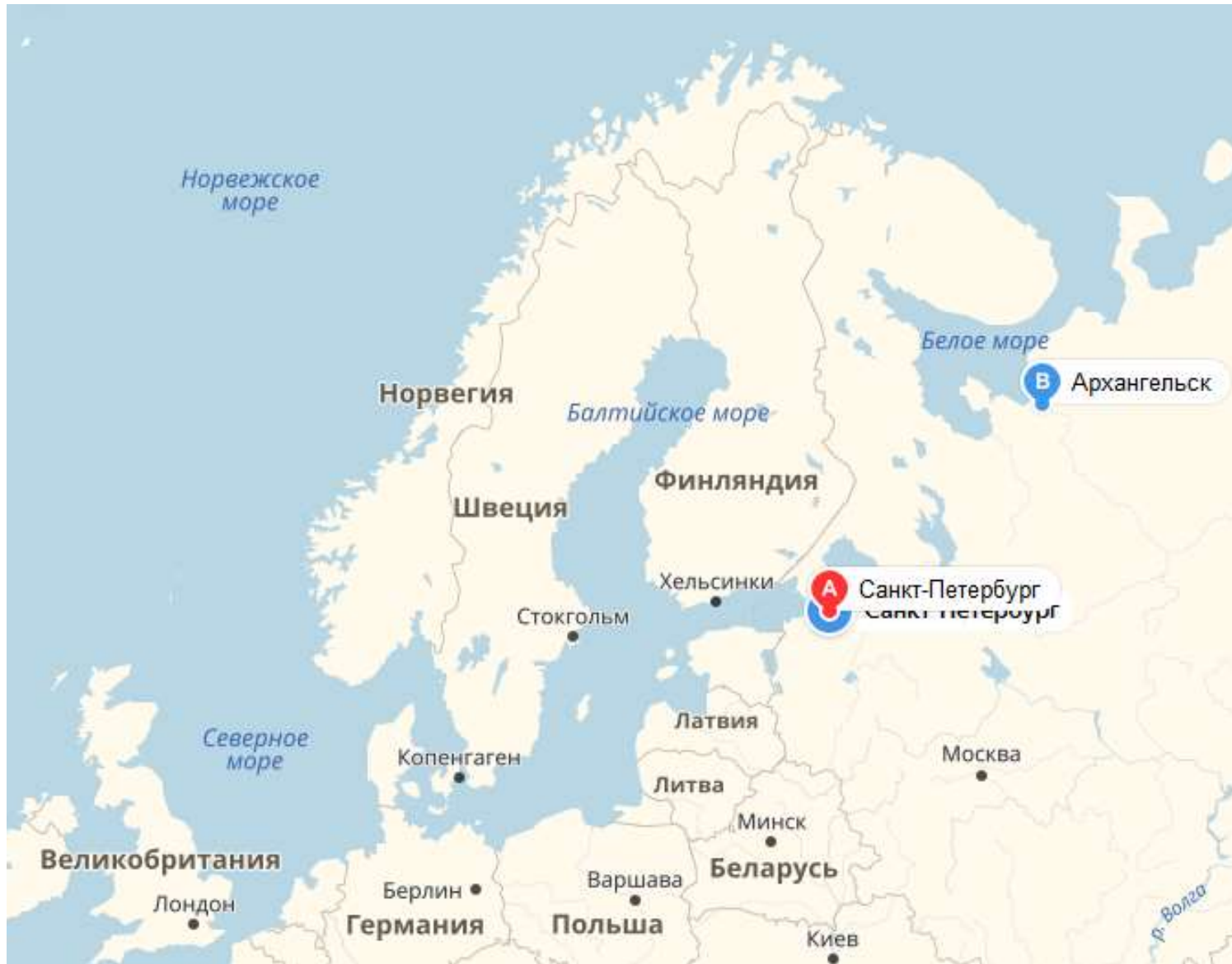
П.В. Лизунов

Exchange in Saint-Petersburg (1703).  
Archangelsk (1789), Odessa (1796),  
Warsaw (1816), Moscow (1837).

# Great Northern War (1700-1721)

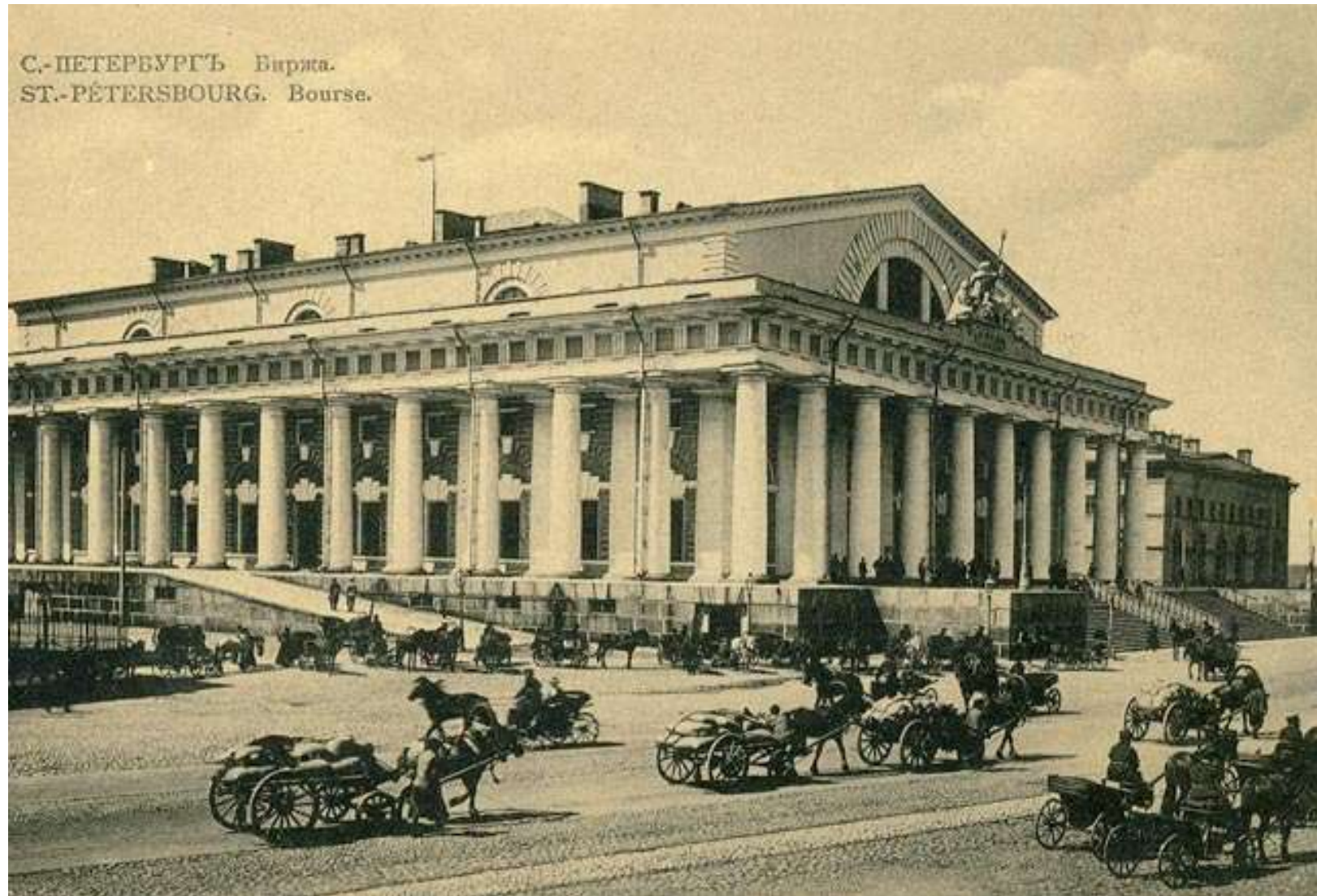


# Map of Russia





# State Organized Exchanges in Russia



# Moscow Exchange

- MOEX – centralized integrated system of trading, clearing, and settlement.

# Decentralized Dealers market-NASDAQ

- Dealers market are trading systems where dealers compete with each other.
- In 1971 NASDAQ was created, employing the telephone technology. Dealers desks look like a big pile of phones.
- In 1980s NASDAQ was transformed into the system with screen quotes.

# Two-Tier Market



# Role of market maker

Market maker transacts with anyone who comes to the market. The role of market maker is to provide liquidity.

Market maker quotes the **bid price** at which he is willing to buy and the **ask price** at which he is willing to sell.

The difference between the bid and the ask prices called **bid-ask spread**. It is an investor's cost of buying or selling security.

# Dealers market vs Organized Exchanges

Centralized and decentralized systems differ in terms of:

- Degree of “customer matching”?
- Transparency? Pre-trade and post-trade transparency. Do dealers like transparency?
- Anonymity?
- What are main concerns of dealers and (large and small) customers in dealer markets?

# Famous Scandals in Securities Trading

Trading involves thinking about how to outsmart others, but some trades are simply fraudulent.

- (1) Collusion of Nasdaq dealers in 1994
- (2) Illegal practices of CME brokers in 2001

# Christie and Schultz (1994)

- Analyze the bid-ask spread for NASDAQ and NYSE traded stocks.
- Use intraday transactions and quotes data revision data from the Institute for the Study of Securities Markets.
- Compare dollar spread for stocks traded on NASDAQ and stocks traded on NYSE stocks.

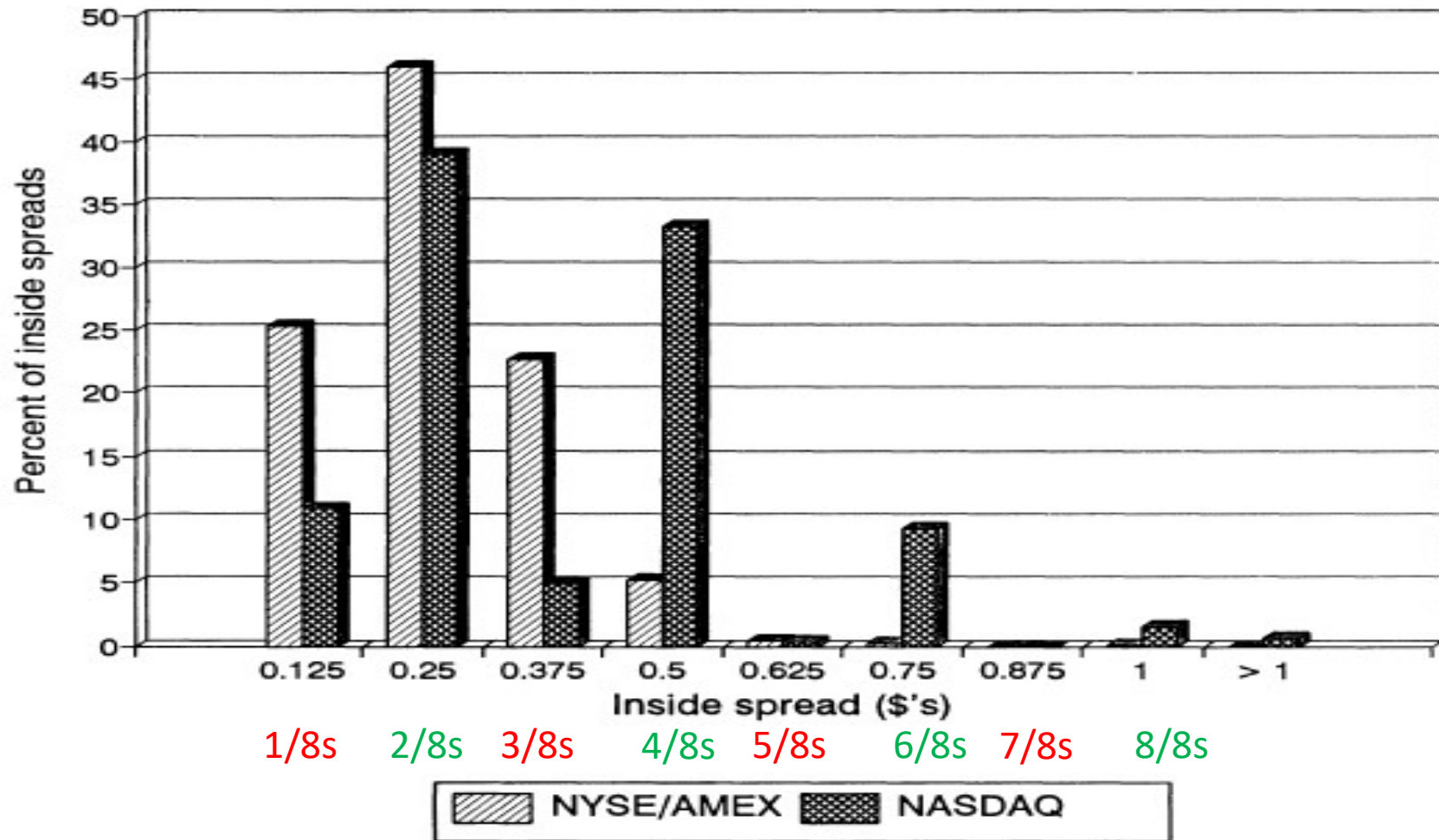


# Types of high frequency data

There are three levels of high frequency data, referring to different aggregation levels of limit orders.

- Level – I data: provides minimal information about the limit order book, it only shows the best bid and ask prices and the total liquidity at that level plus information about trades.
- Level-II data: provides a minimally aggregated limit order book, which assigns the total liquidity at each price level in the market.
- Level-III data: provides information about each individual limit order.
- Audit trail data with account ids is the best.

# Spread distribution: NASDAQ vs NYSE



Source: Christie and Schultz(1994)

# Professors Can Make a Difference!

- Study resulted in a big anti-trust case of the SEC and the Department of Justice in 1994.
- NASDAQ settled the class-action suit and thirty brokerage firms paid \$900 millions.
- Transaction costs on NASDAQ came down.

# Legal Cases against Broker-Dealers

- A big anti-trust case brought by the SEC and the U.S. Department of Justice against Nasdaq dealers.
- A famous case against dealers at the CBOT and CME in 2001.

Which trading system is better:  
Decentralized or Centralized?  
State Organized or Private?

# Decentralized or Centralized Exchanges?

This question is still highly debated, e.g., FX trading on the MOEX versus dealers platforms.

Historical perspective: There has been a lot of research on whether NYSE or Nasdaq provide a better execution.

How would one analyze it empirically?

Conclusion: Transaction costs on the NYSE are lower than those on the NASDAQ.

# Decentralized or Centralized Exchanges?

Competition is good, but still centralized trading platforms have many advantages relative to decentralized systems:

- network externalities
- economy of scale, especially important when resources are limited
- more security and transparency
- easier to monitor and regulate.

MOEX (centralized trading and clearing) is a great comparing to many trading systems in developed countries!

# Decentralized or Centralized Exchanges?

Yet, there are possible issues:

- Lack of competition (monopoly profits)
- Few incentives to innovate
- Concentration of risks



# State Organized or Private Exchanges?

There are successful examples of privately organized exchange and state organized exchanges.

There are issues with decentralized and centralized systems.

Perhaps, new technology could provide a better alternative.