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Present situation of alternative markets and their control in the U.S.

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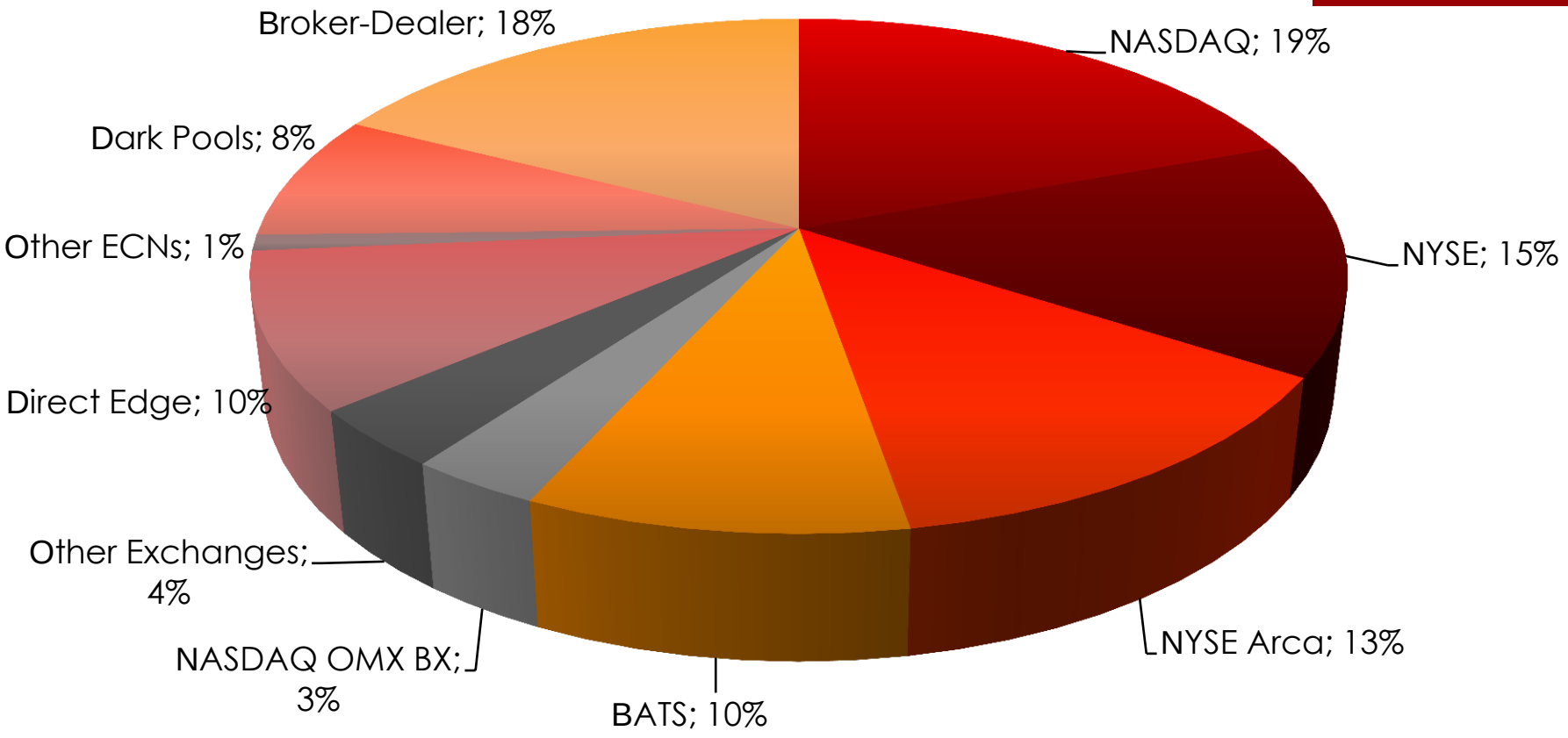
I. Market dispersion/fragmentation in the U.S.

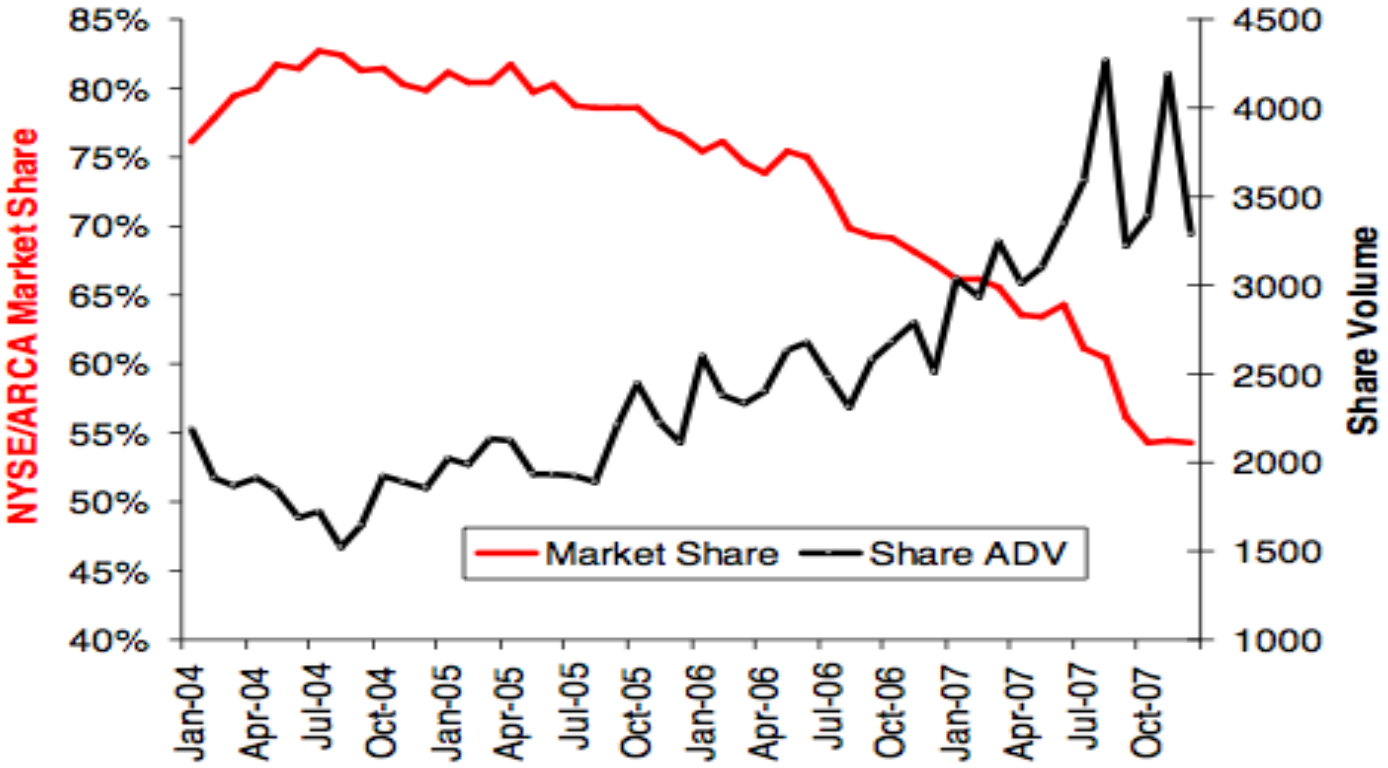
Trading volume shares of NMS securities



Excerpt from SEC, “Concept Release on Equity Market Structure”, Jan 2010

Lower liquidity in major markets (1) NYSE share volume in NYSE-listed securities

NYSE Share Volume in NYSE-Listed Securities
54.33% Market Share in December 07 (approx half from ARCA)

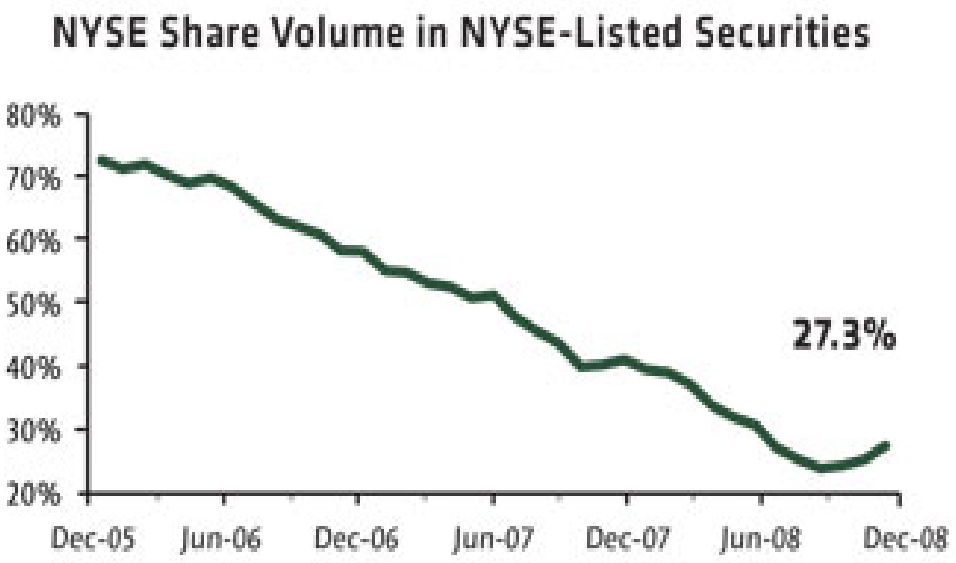


Stavros Siokos(2008) “A General Overview of the Financial Markets”

Lower liquidity in major markets (2-1) NYSE share volume in NYSE-listed securities (excluding ARCA)

Liquidity Leaving the Floor

NYSE traded only 27.3% matched market share of NYSE-listed securities in December 2008. Where are those shares being traded if not on NYSE? The answer is obvious. With faster trading and growing liquidity, it's no wonder that NASDAQ continues to be the market of choice for trading NYSE-listed securities.



(Excluding ARCA, matched share only) NASDAQ data

Lower liquidity in major markets (2-2) NYSE share volume in NYSE-listed securities (excluding ARCA)

Liquidity Leaving the Floor

NYSE declined to 24.1% matched market share of NYSE-listed securities in May 2009. Where are those shares being traded if not on NYSE? The answer is obvious. With faster trading and growing liquidity, it's no wonder that NASDAQ continues to be the market of choice for trading NYSE-listed securities.

(Excluding ARCA, matched share only) NASDAQ data

Lower liquidity in major markets (3)

- There is no market to trade a majority of its own market listed securities.

  The state that SEC intended with Regulation NMS.

  Sirri(2008) SEC Staff Speech at SIFMA DP Conference

- There are no exchanges whose own NMS securities share volume exceeds 19%.
- Dark Pools trading NMS securities
  10 systems (2002) to 29 systems (2009)
- However, Dark Pools account for 7.2% of all NMS securities trading in total
  (the largest being 1.3% for one market)

  SEC "Regulation of Non-Public Trading Interest: Proposed Release", FR, Nov 23, 2009

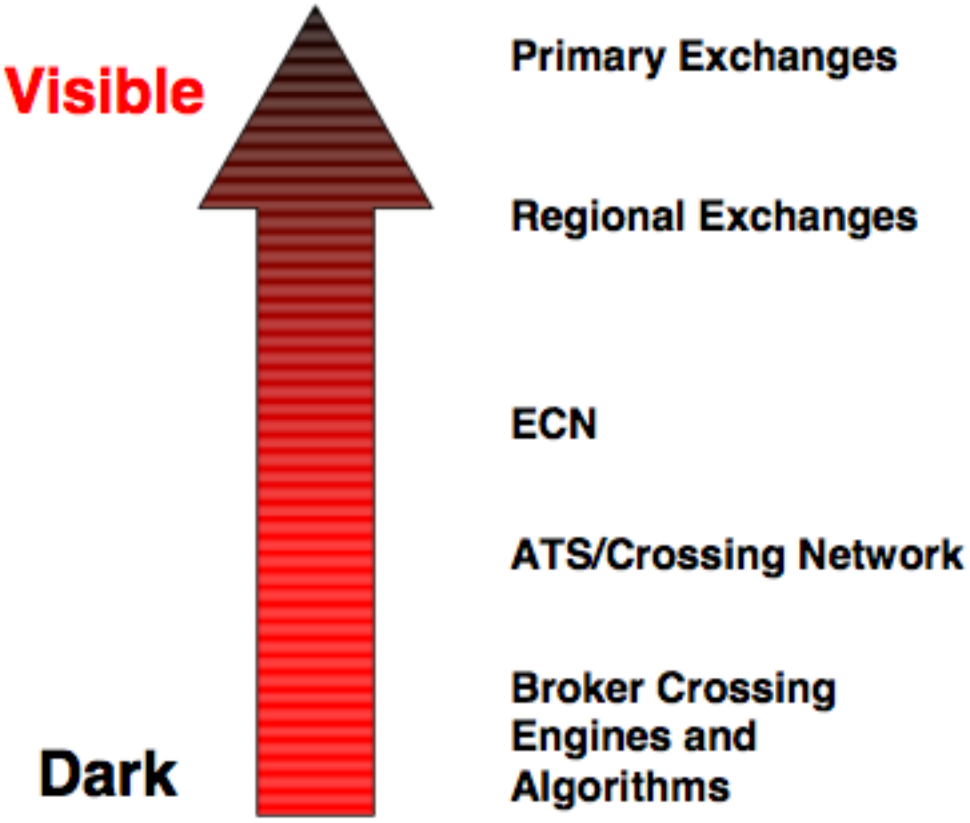
  * Dark Pools have since expanded to 11 – 13%, according to a private estimation.

Lit and dark venues of NMS securities

(i) Lit venue	Total 74.6%	(ii) Dark venue	Total 25.4%
Registered exchanges	Total 63.8%	**Dark pools**	
NASDAQ	19.4%	About 32 markets	7.9%
NYSE	14.7%		
NYSE Arca	13.2%	Broker-dealer internalization	
BATS	9.5%	Over 200 brokers & dealers	17.5%
NASDAQ OMX BX	3.3%		
Others	3.7%		
ECNs	Total 10.8%		
Direct Edge (registered exchange)	9.8%		
Others	1.0%		

Excerpt from SEC, “Concept Release on Equity Market Structure”, Jan 2010

Market dispersion/ fragmentation in the U.S.



Stavros Siokos(2008) “A General Overview of the Financial Markets”, Citi Group

Assessment of market dispersion fragmentation (1)

Positive

- There is no concern in the market decentralization itself.
- Forwarding of CQS (quote) and CTS (trading information), between the markets = ”National Market System”
- Exchanges and ATS with a large trading volume have disclosure obligations to CQS and CTS and are Lit venues.
- An ATS with a small trading volume is a Dark venue without a disclosure obligation. However, the proposed SEC rule is to limit Dark ATSs to fairly small ones.

Assessment of market dispersion/fragmentation (2)
Negative

- Concerns over the market structure after flash and crash, May 2010
- Arbitrage trading over the borders of markets and financial products under the high-speed trading environment -> Rapid spread of price fluctuations to introduce an overshoot
- Whether to be able to sufficiently monitor market behaviors striding over markets and products (proposal for control such as information gathering on major traders).
- To what extent the unification of rules is implemented among markets (order cancellation, circuit breaker, commission system, etc.)

cf. Relationship with business models of the market.

II. History of market dispersion/ fragmentation

U.S. market dispersion/fragmentation (1)

1st period: The end of the 1960s to the 1970s (rise of institutional investors)

Expansion of large transactions -> Fixed commission at Exchanges vs Discounted commission outside Exchanges

The outflow of institutional investor trading to the “third market” and the “fourth market”

=> Deregulation of commission leads trading back to Exchange

U.S. market dispersion/fragmentation (2)

- 2nd period: The 1990s (electronic trading thanks to the development of information and communication technology)

  Electronic trading outside the Exchange called Proprietary Trading System (PTS, called ATS later)

  Faster, less-costly trading

  Spread-rigging allegations of NASDAQ MM

  -> Dealer market with a large spread -> Auction market=PTS

  (Outflow from NYSE was insignificant)

  Order Handling Rules (1997)

  Trading system outside Exchange meeting certain conditions = ECN

  Requirement of quotation disclosure and public access (enhanced transparency)

U.S. market dispersion/fragmentation (3-1)

- 3rd period: Comprehensive control over the registered exchange and trading system outside exchange

PTS = Practically the same market function as exchange

Equal competitive condition -> Promotes innovation of the total securities market

Regulation ATS Adopted in December 1998

Those with a market function are defined as an Alternative Trading System (ATS)

Incorporated into NMS

ATSs choose (i) Registration with exchange (SRO) or

(ii) Registration as brokers/dealers & Comply with Reg ATS

The larger ATSs → the stricter obligations.

Existing exchange can also become ATS.

U.S. market dispersion/fragmentation (3-2)

- Inter-market competition Success of Instinet Incorporated (INET), Archipelago, etc.

  Multifaceted competition = Price, trading cost, execution speed, market impact

- Selection of small systems -> Consolidation into two big camps

  Archipelago -> The Pacific Exchange, RediBook, GlobeNet

  Instinet (INET) -> Leading Island, small-scale Strike+Brut

- Consolidation of ATS and existing exchanges NYSE-> Archipelago, NASDAQ-> INET

High technical capabilities of new entrants, preparedness for Regulation NMS

Convergence of market fragmentation?

U.S. market dispersion/fragmentation (4)

- Regulation NMS Adopted in May 2005, introduction in stages by 2007

  Mixture and competition among existing exchanges and ATSs -> Level playing field, prevention of adverse effects caused by market fragmentation

  (Functions as a unified market as a whole even when fragmented)

- (i) Order protection rule (ban on trade through, but with exception), (ii) Fair market access rule (the upper limit set for commissions upon access to the tone of the other markets, guarantee of fair access), (iii) Minimum quotation rule (limits bidding by quoting slightly higher than other markets in increments of less than one cent), (iv) Rules for distributing market data income (trading volume and number of transactions + contribution to indication)

- Computerized market, good indication even for small scale -> Advantageous in competition

- Decline in relative status of NYSE Order protection rule (ban on trade-through)

  with exception : OK to ignore good quotations from a “slow” market

- Automatization of NYSE, relative advantage of “fast market (even being small)”

III. Recent changes on the market

Changes on the market side

- Faster and more sophisticated and diversified trading system
- Growth of trading systems (ATS/MTF/PTS) other than exchange
- More diversified market business model, maker-taker commission
- Regulation NMS (adopted in 2005, full operation in 2007)
- Development of internalization system at brokerage firms (for quasi market?)
- Broad “trading venue” has been decentralized/divided into 40 or more
- Emergence of Dark Pools

- Promotion of competition, Innovation + Necessary prevention against adverse effect of fragmentation

Changes on the order side

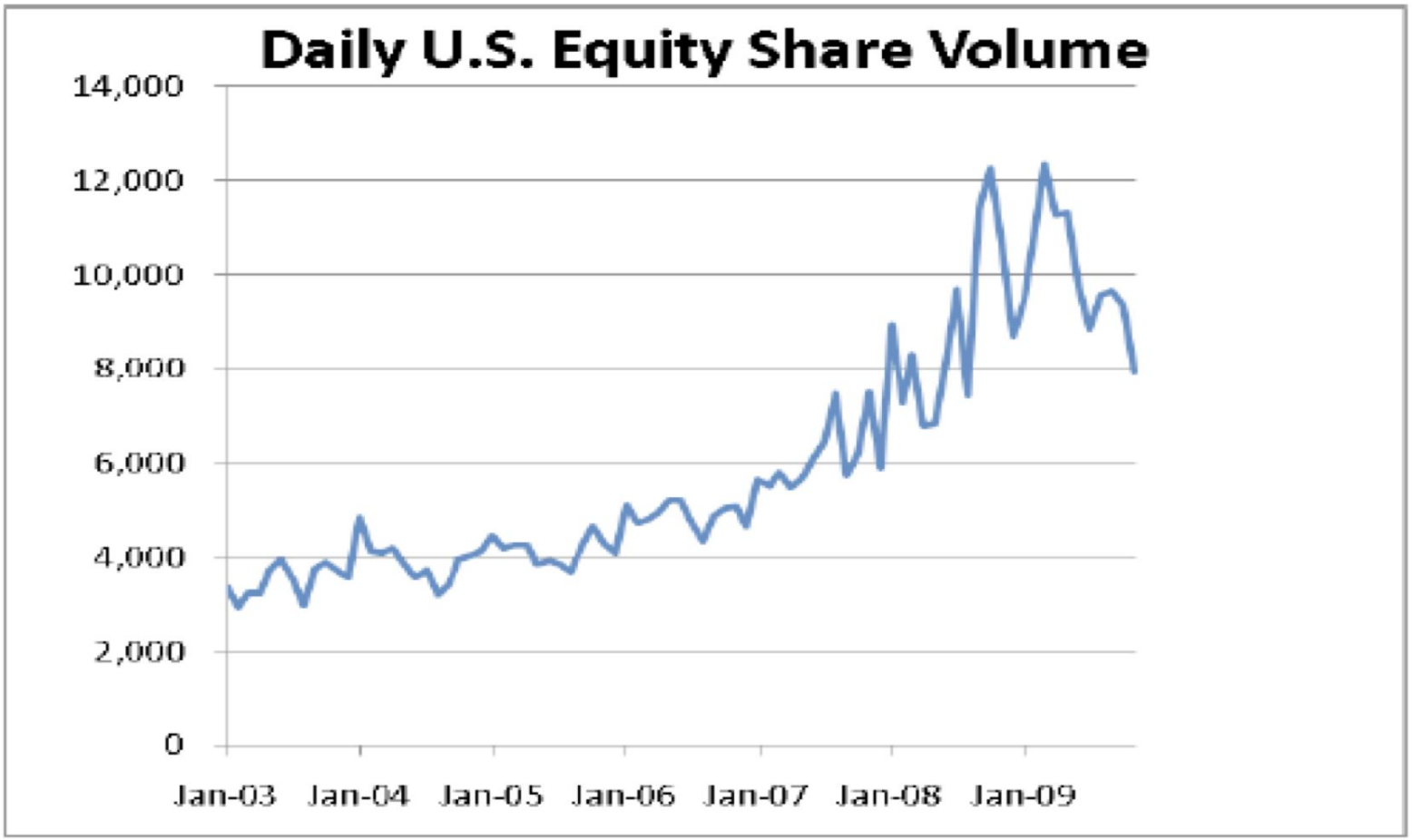
- Expansion of algorithmic trading
- Expansion of high frequency high-speed trading
- Discovery of small price distortion and arbitrage opportunities by the adaption to market fragmentation/decentralization
- Connection with multiple markets by Smart Order Routing

High-speed search for the best price from the order side even under market decentralization

Arbitrage among markets and products under the high-speed environment

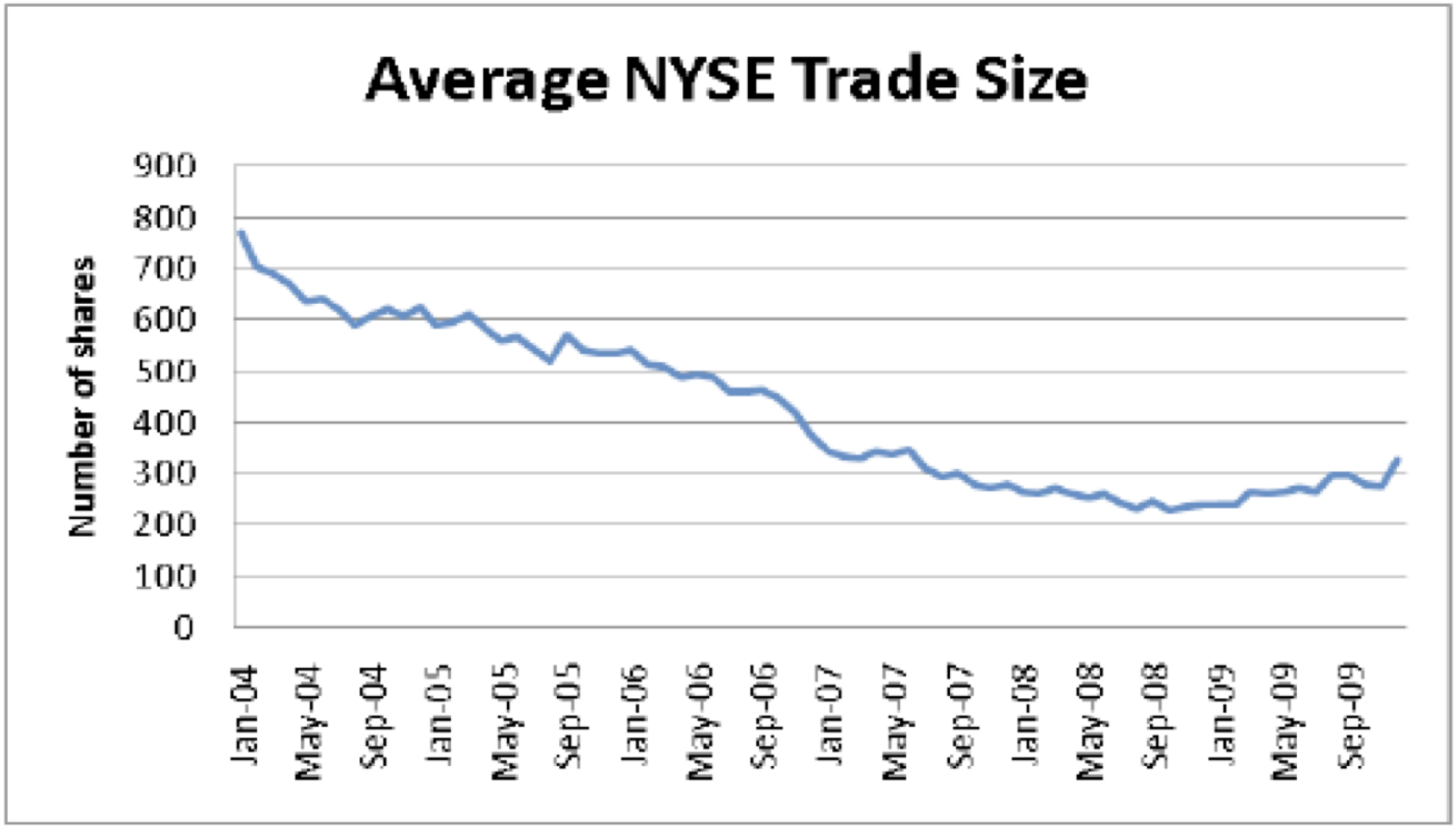
Risk of algorithmic program error

Market changes: Expansion of trading volume

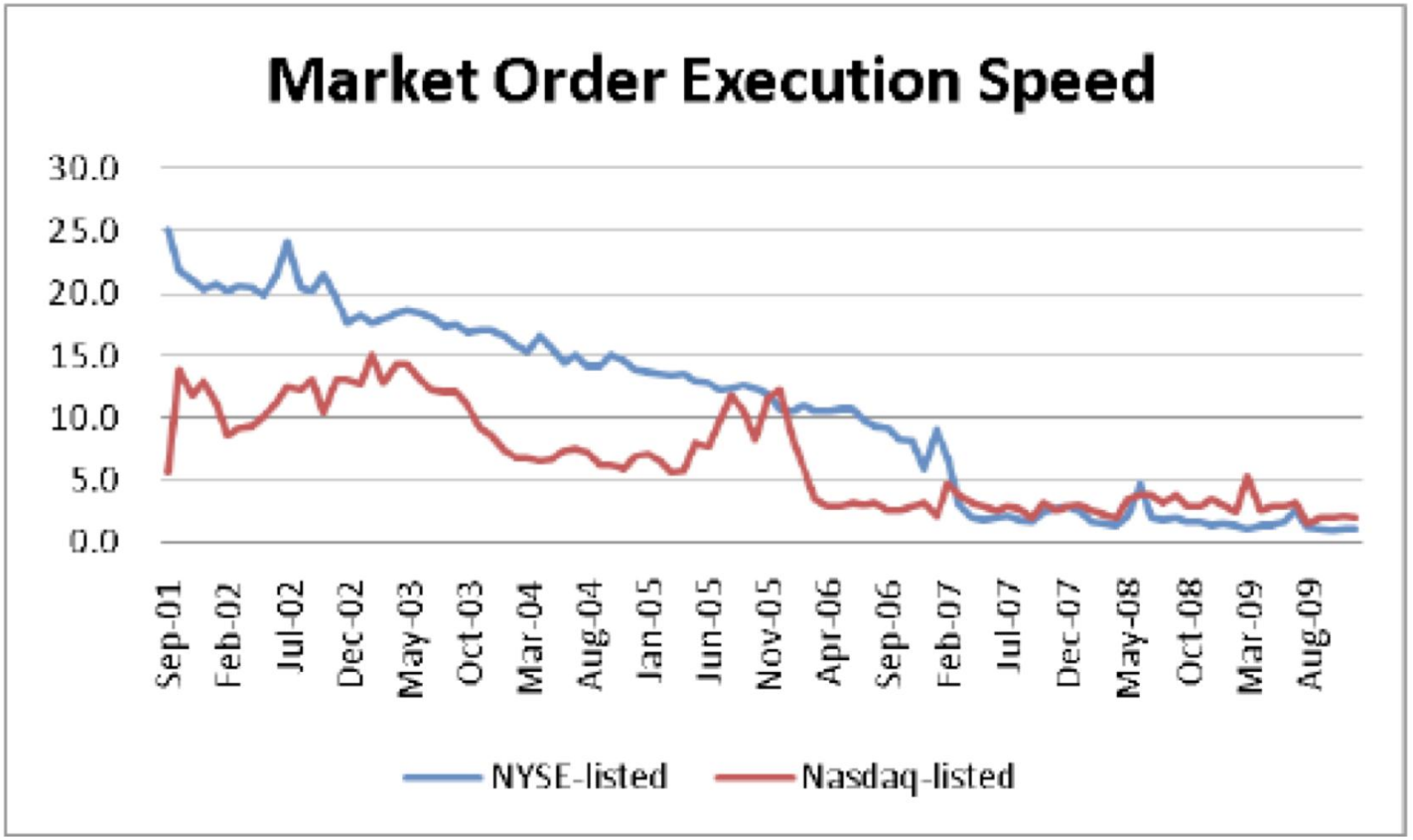


Angel, Harris & Spatt[2010] the same hereinafter

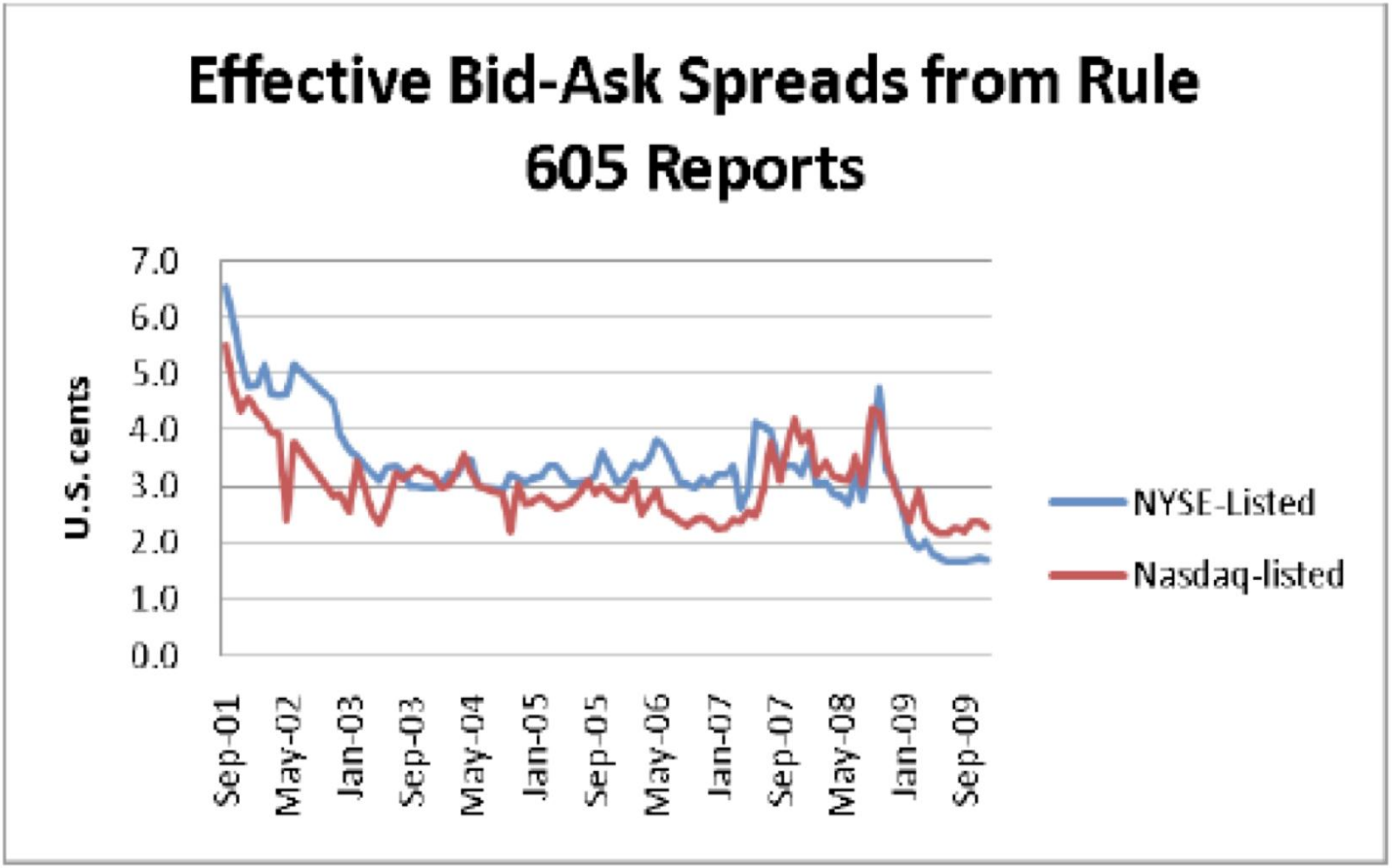
Smaller trade size



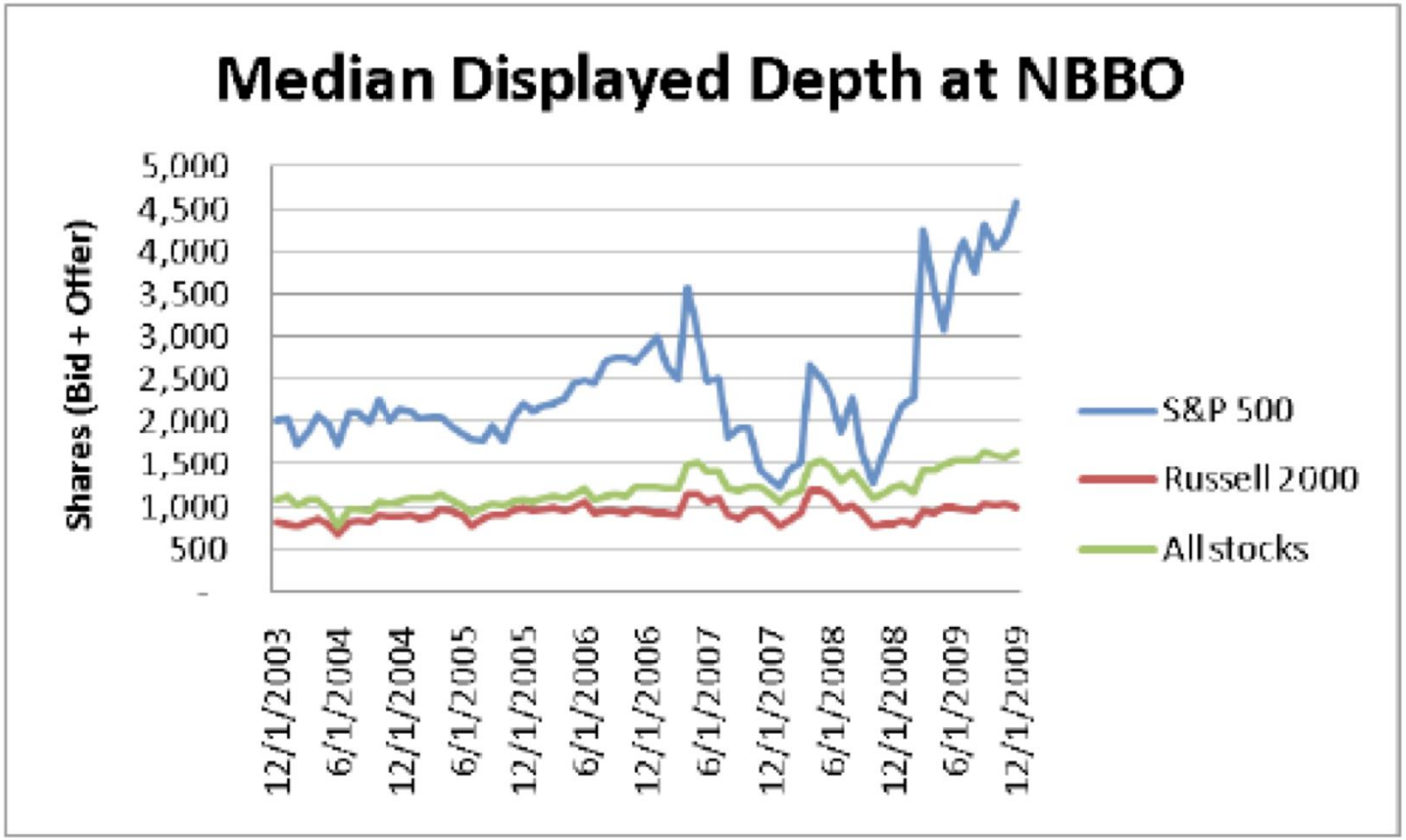
Shorter execution speed of market order



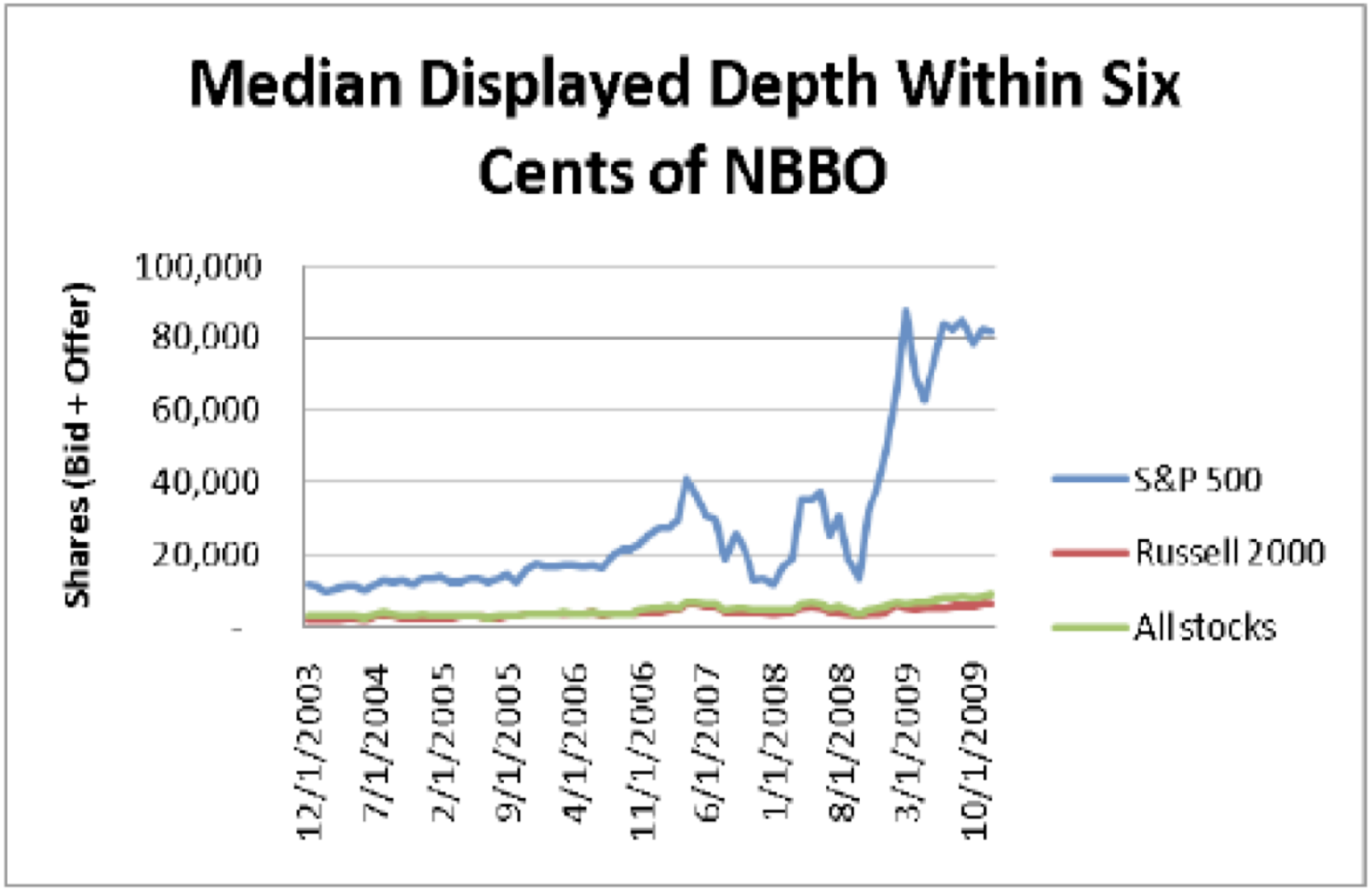
Reduced effective bid-ask spreads



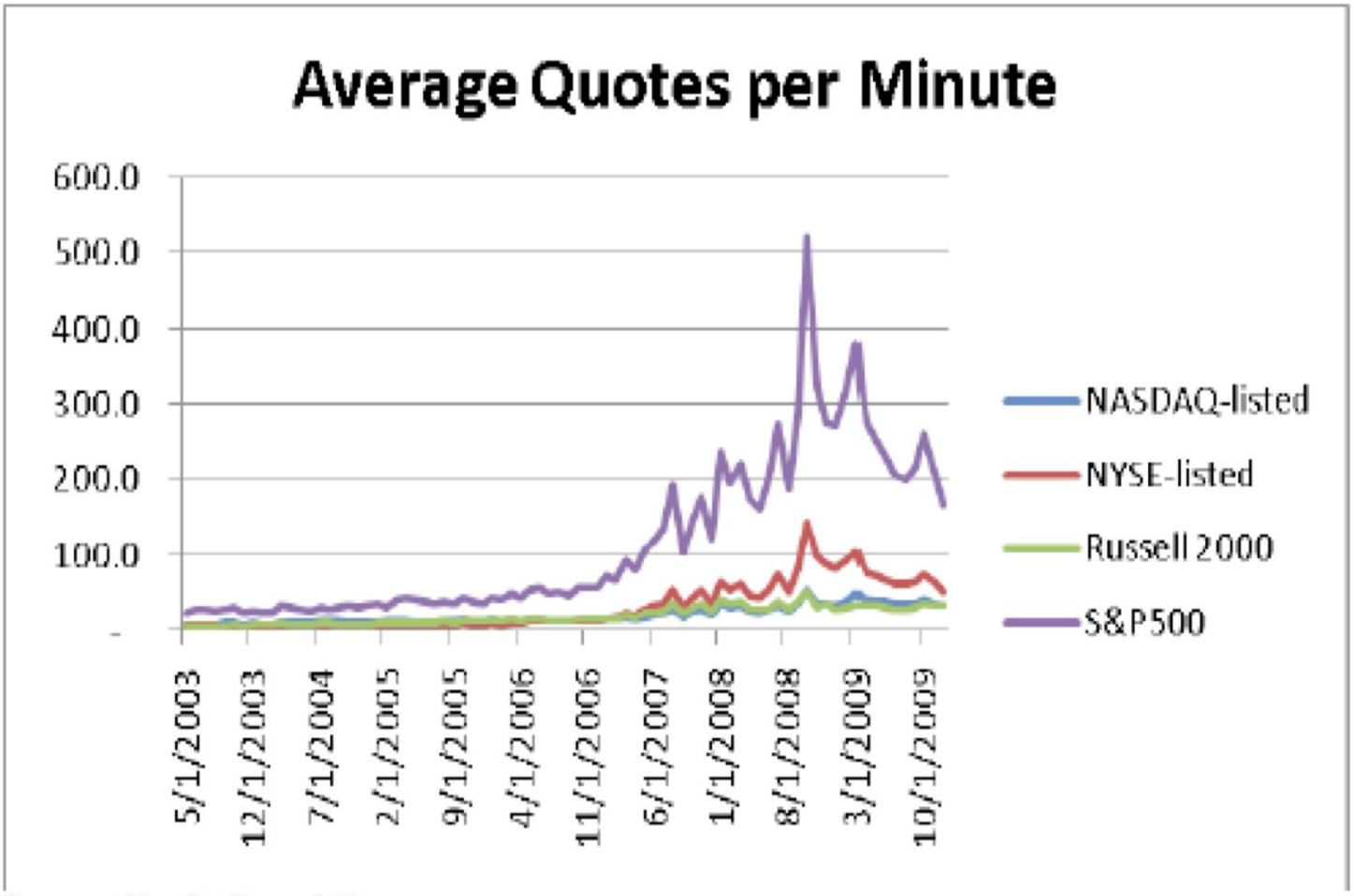
Increased market depth



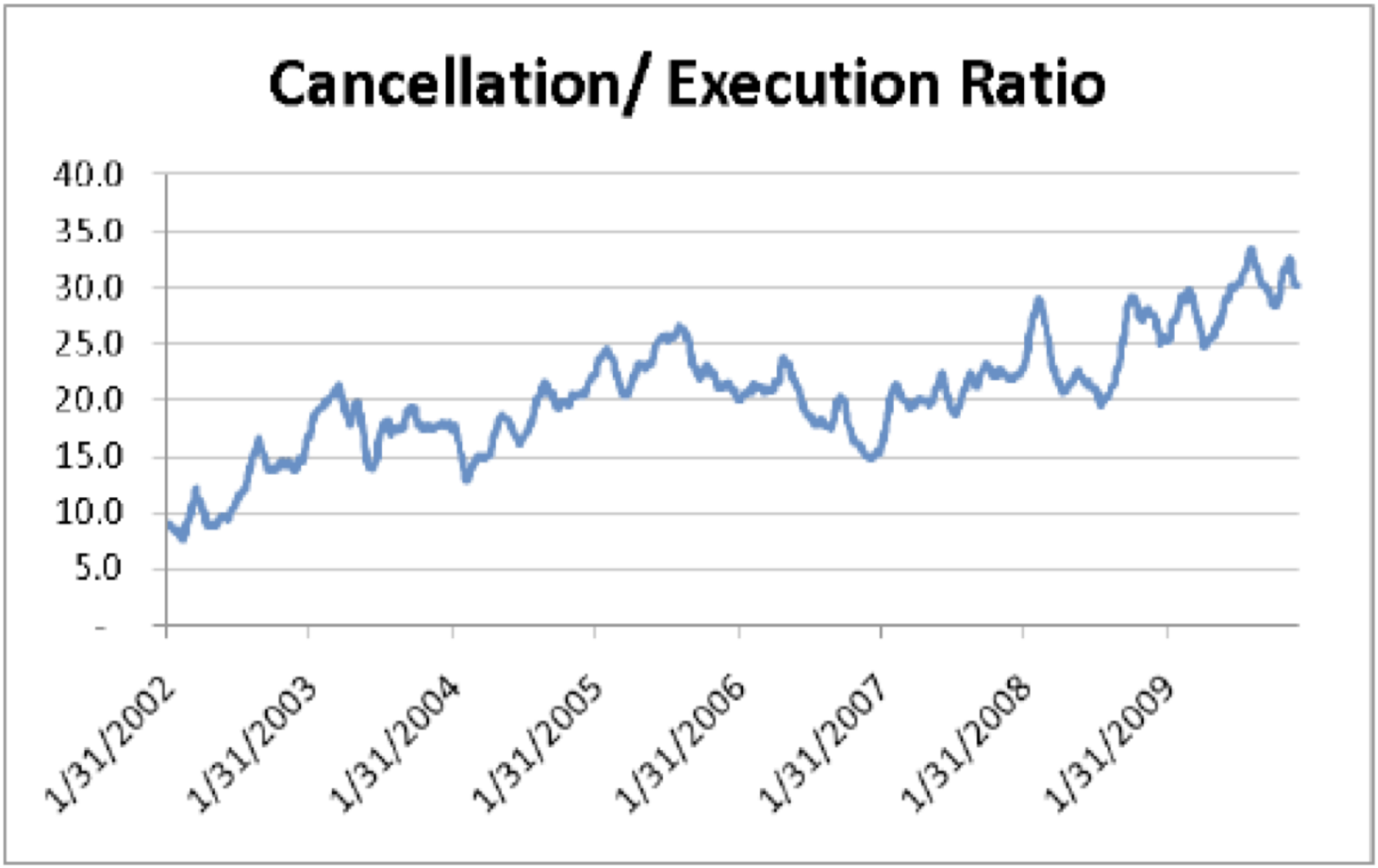
Increased market depth (within 6 cents of NBBO)



Average quotes per minute



Increased cancellation/execution ratio



Changes in securities market (summary)

(I) Increased trading volume

(ii) Smaller trade size per transaction

(iii) Higher execution speed

(iv) Reduced bid-ask spreads

(v) Increased market depth

(vi) High-speed quotes

(vii) Increased cancellations

(viii) Polarization by brand characteristics

IV. Regulation of the market

Control by SEC

- Concept Release on Equity Market Structure (Jan 2010)
- Ban on flash orders (Sep 2009)
- Enhanced transparency for Dark Pools (Oct 2009)
- Restriction on direct market access (Jan 2010)
- Information gathering of large volume traders (May 2010)
- Introduction of Consolidated Audit Trail (May 2010)

Measures after flash and crash

- Single stock circuit breaker (approved as a pilot program in June 2010 -> expanded)
- Rules for order cancellation (erroneous trade)(proposed in June 2010, approved in October)
- Ban on Stub Quote (approved in November 2011)

Furthermore …

- Review of cancellation-restraint commission (SEC, CFTC, newspaper release in March 2012)
- Issues such as program errors of algorithms

IOSCO technical paper
Changes of technologies and their control

- High frequency trading: Discovery of price, price fluctuation, liquidity and its quality, fairness (access to market infrastructure, possibility of illegal trading), stability of the market
- Treatment of Dark Pools (while transparency is important, the level of disclosure should be reviewed in consideration also of excessive control over large volume trading)
- Direct Market Access (sufficient due diligence for clients, before-and-after risk management by brokerage firms, information report to the authorities)
- Erroneous orders (formulation of flexible erroneous order policy, understanding of cancellation procedure, protective means by exchange, etc., close attention to the relationship with illegal trade)

Technologies and securities market

- Improved market efficiency through competition between trading systems:

  (Reduced spreads, lower commission, enhanced liquidity)

- Fair conditions for competition between markets?

  Unbundling of “Market Service”: Listing, trading, market data, self-regulation

- Design of trading system: Market design as a business model

  Trading method, commission system, order form, provision of price information, collocation

- Response to technologies: DMA regulations, ban on Stub Quote, stress test of algorithms, reconstitution of trade information

- Prevention of adverse effect of market fragmentation: Regulatory cost, cost for participants observing rules and bearing by investors in the broad sense