

The New Realities of Market Structures and Liquidity: Where Have We Been? Where Are We Going?

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**“Getting a Grip on Liquidity:
Markets, Institutions, and Central Banks”**

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Motivation

- Market structure is heavily regulated (inherent) due to liquidity externality
- Tremendous role for coordination among platforms—Currently about 60 platforms trade U.S. equities
- Agency relationship in brokerage is central
 - Delegated decision-making
- Much change in last decade; more likely

Overview

- Where have we been?
 - Regulation NMS; nature of competition
 - Statistical evidence and past trading changes
 - Maker--taker pricing
- Where are we going?
 - Challenges of “maker-taker,” “taker-maker”
 - Enhanced importance of “Best Execution”
 - Speed and fast trading
 - Increased role of regulatory “pilot studies”
 - Fixed-income moving past post-trade opacity

Nature of Competition

- Competition for individual orders (better pricing for customers) vs. competition among platforms (innovation)
- Central limit order book (“CLOB”) vs. fragmentation
- What kind of competition did regulators encourage in equity?

Regulation NMS

- Order protection (“trade-through”) rule is fundamental to it
- Protects top price on each platform when those executions would result in improvement, but not deeper in order book
- Order protection--very controversial adoption (2005/2007)

Consequences of Reg NMS

- Reduction in NYSE market share from 80% to 20% (fragmentation vs. centralization)
- Trading costs down substantially (Angel, Harris and Spatt (2011, 2015))
- Trading became highly electronic
 - In order to benefit from NMS a platform needed to be a “fast” market
 - Specialists could not be compliant

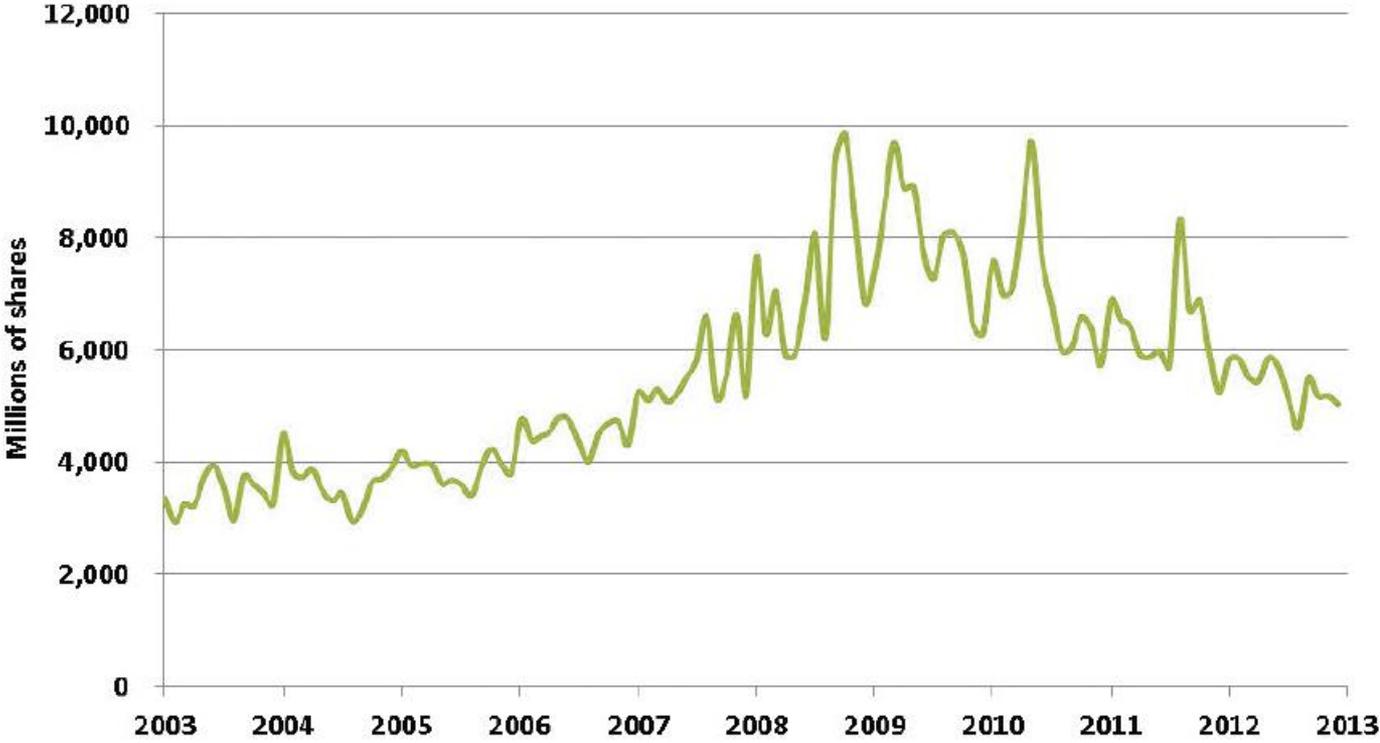
How the Markets Changed

- Spreads (and trading costs)
- More platforms (electronic trading)
- Demise of the specialist (NYSE market share)
- Rise of dark pools
- Shares per trade
- Execution speeds
- Quoting/Cancellations

“Equity Trading in the 21st
Century:
An Update” (some trends)

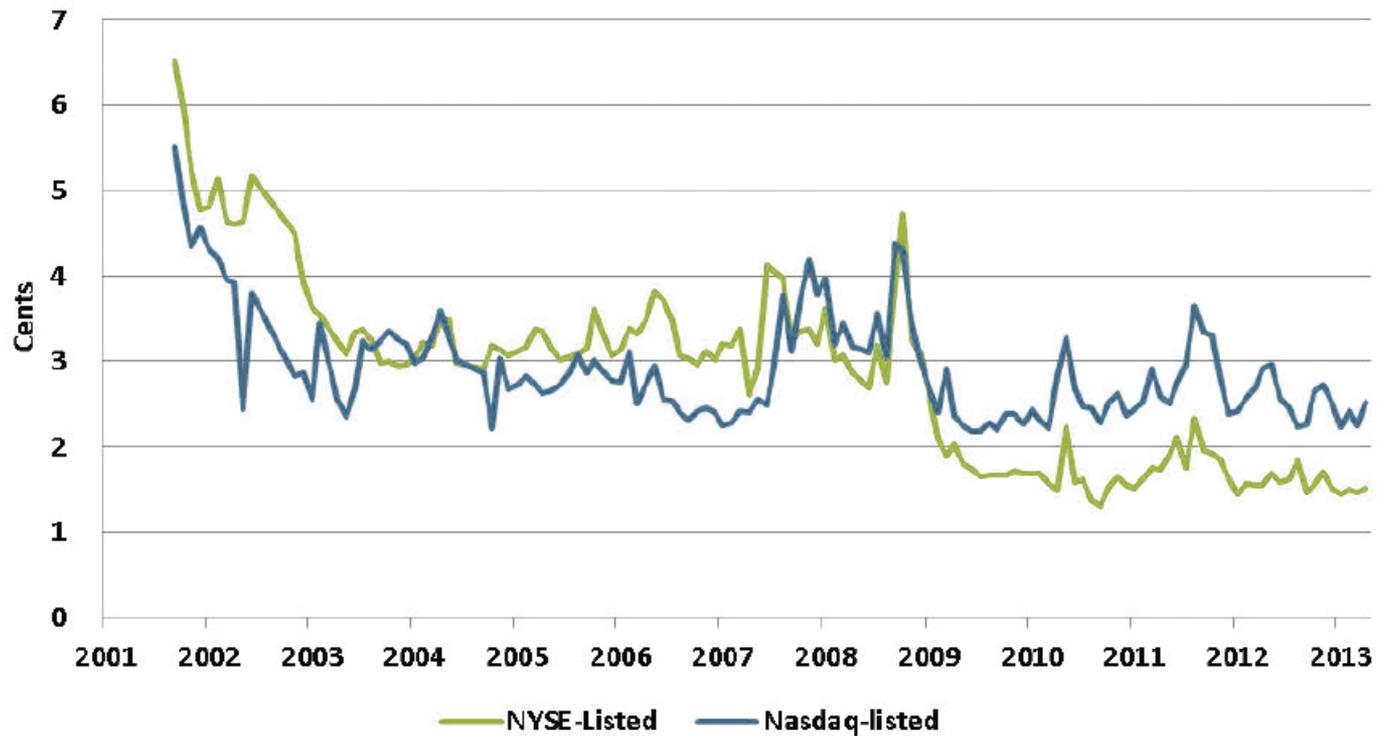
Jim Angel, Larry Harris and Chester
Spatt

Average Daily U.S. Equity Trading Volumes



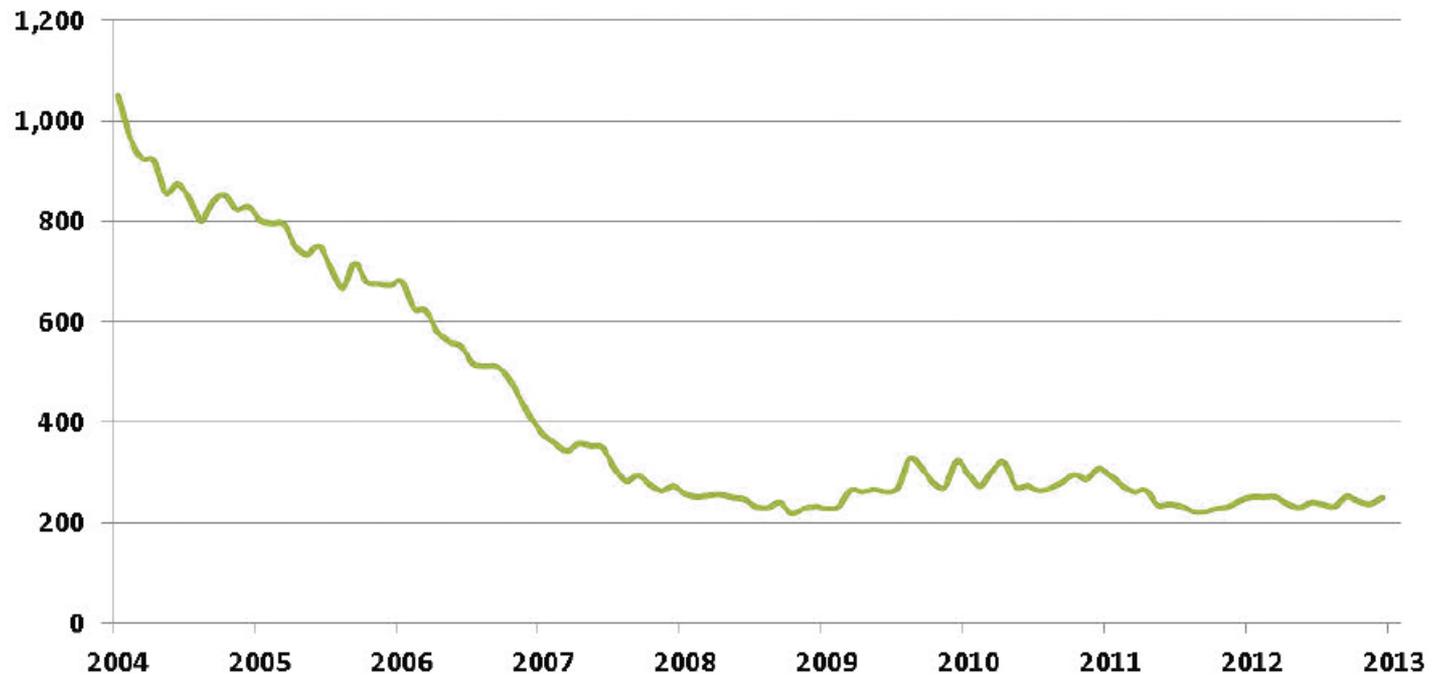
Source: Barclays Capital Equity Research

Effective Bid-Ask Spreads from Rule 605 Reports



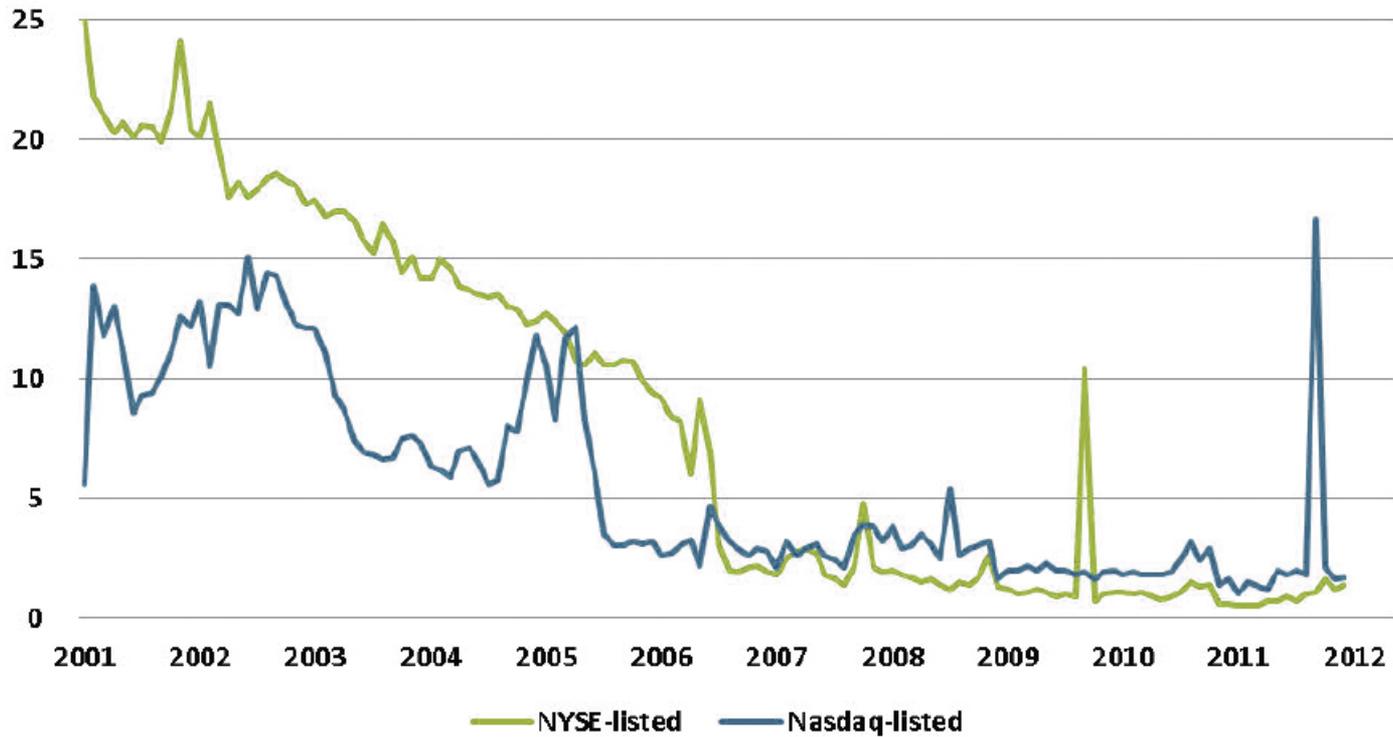
Source: Public Rule 605 Reports from Thomson, Market orders 100-9,999 shares

NYSE-listed Consolidated Average Shares per Trade



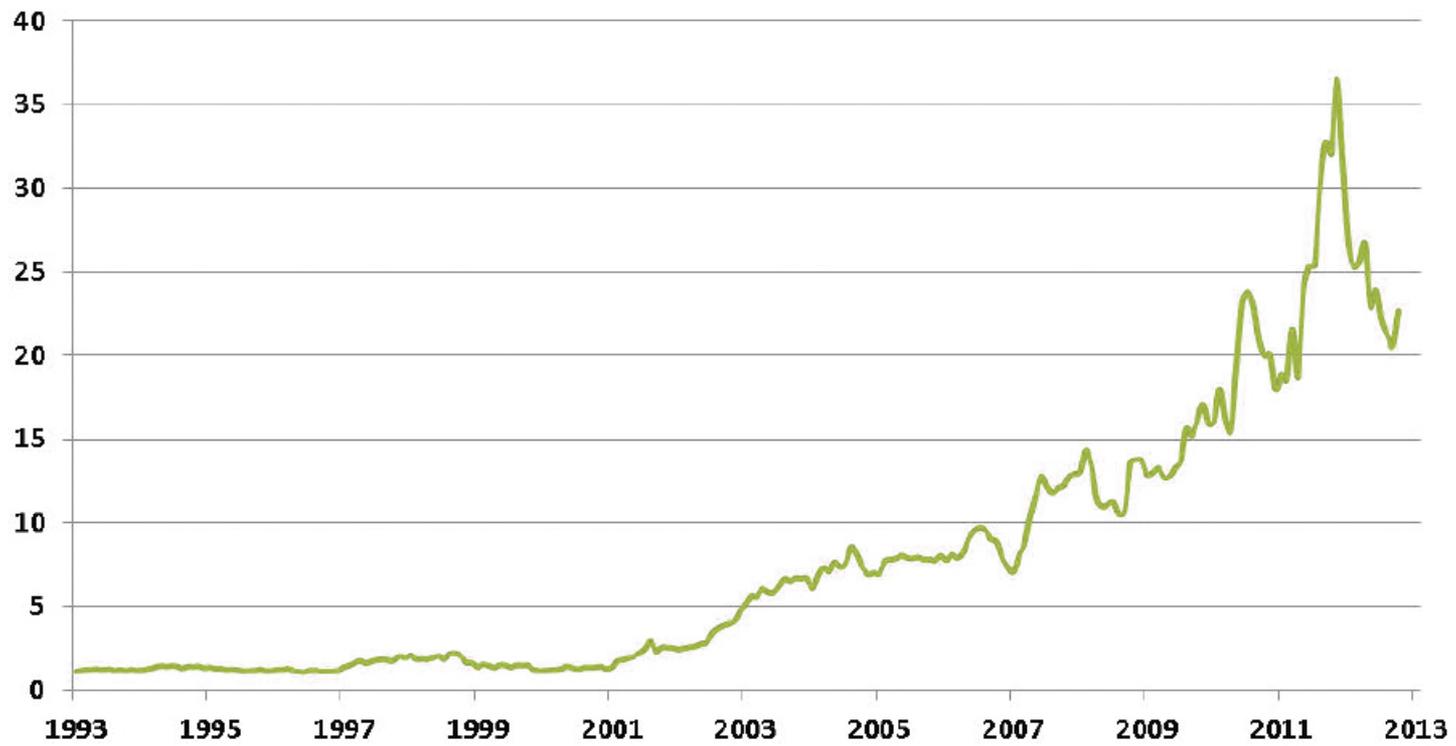
Source: NYSE-Euronext, nyx.com

Market Order Execution Speed in Seconds



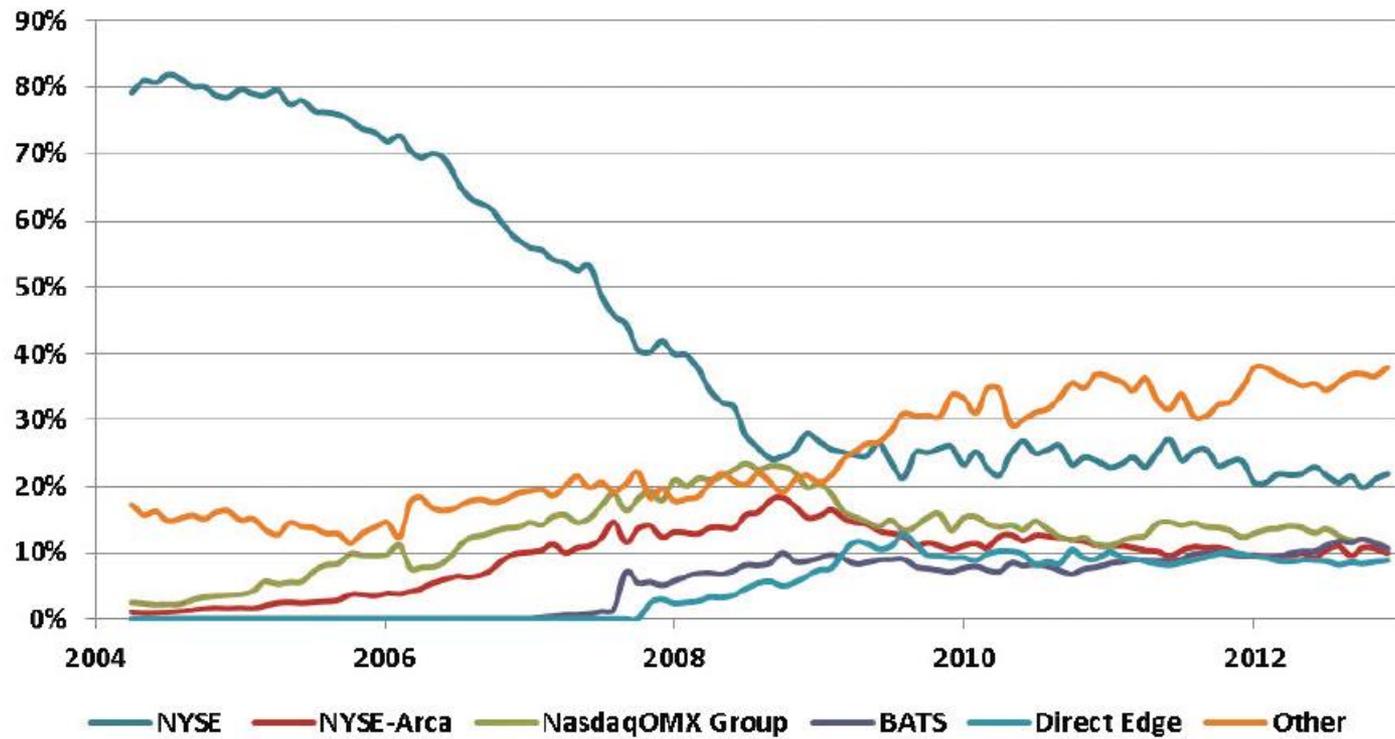
Source: Rule 605 data from Thomson for all eligible market orders (100-9,999 shares)

Quote-to-Trade Ratio



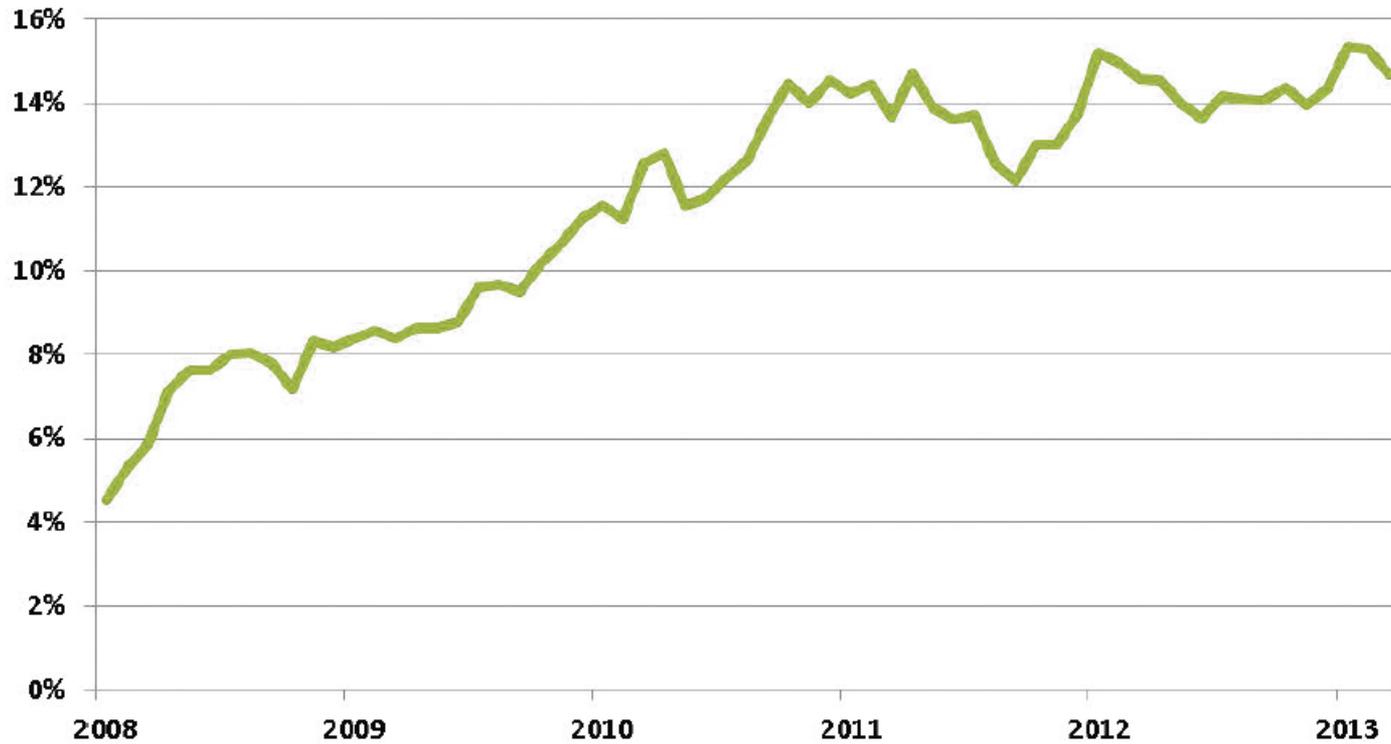
Source: NYSE TAQ Data

NYSE-listed Market Shares



Source: Barclays Capital Equity Research

Dark Pool Market Shares



Source: Rosenblatt Securities

How did NMS lead to fragmentation?

- Fills by components and execution in many pieces—“trade-through” rule
- Reward to tops of book (not full order book) promotes proliferation of platforms
 - Only tops of book protected (incongruity)
- NMS is highly prescriptive—induces fragmentation (not central market), fragility
 - Neither investor nor broker can fully manage overall execution (complaint in M. Lewis book that traders respond to initial fills)

NMS and Best Execution

- “Best Execution” is a responsibility of broker-dealer, not the platforms
 - The platform and broker as substitutes
- NMS order protection rule transfers some mechanics to platforms via NMS linkages
- Best execution is much more germane when there is a serious “routing” decision
- Best execution can be distorted by incentive payments (important issue)

“Maker-taker” vs. “Taker-maker”

- “Maker-taker”
 - Subsidize “maker” (limit order)—rebate
 - Charge fees to “taker” (market order)
 - Encourage liquidity provision
- “Taker-maker”
 - Subsidize “taker” (market order)—rebate
 - Charge fees to “maker” (limit order)
 - Enhance attractiveness for market orders
 - Similarities to “payment for order flow” model

Regulatory Background

- NMS
 - Maker-taker allowed previously
 - Capped fee at \$.003/share
 - Cap was not “indexed”
 - Commissions and spreads much smaller now
 - Trying to get the “best” price on E-Bay, but not considering the shipping fees (“ranking”)
- Agency issue (dealers’ pocket)
- Disclosures weak
- Tick size changed by fees and rebates

Equilibrium

- Monetary transfers between two sides of market can make whether buyers & sellers (or makers & takers) are taxed irrelevant
- Only net trading cost matters w/o frictions
- If no frictions and regulatory impediments, then “Neutrality Theorem”
- However, neutrality can fail for many reasons related to different frictions such as transaction costs, fixed costs, etc.
- Sport Platforms—Does it matter whether buyers, sellers pay the fees? (Translate P)²⁰

NMS and Equilibrium

- Trying to get the “best” price on E-Bay, but not considering the shipping fees (“NMS ranking” on a gross rather than net basis!)
- Not all platforms are the equivalent at the same price
 - Platform is more attractive if you get quicker execution—that’s related to the pricing on the other side
 - Logical problem within NMS
 - Arguably: A serious “Best Execution” concern²¹

Agency Problem

- Distortion in the routing decision due to distinct buckets for routing fees & rebates vs. execution—sets up “agency” conflicts
- Evidence in the form of routing to platforms that offer poor/slow execution (both empirically and theoretically)
- Disclosures on routing practices and execution costs would be very useful
 - Inadequate disclosure regime
- Battalio, Corwin and Jennings paper identifies some problematic brokers

Solving the Agency Problem

- Angel, Harris and Spatt (2011, 2015-QJF)
- Ban fees—would change effective tick size
- Direct payment to customer
 - Ban side pocket or kickbacks
- Ranking based upon net rather than gross price (E-Bay, shipping fees)—NMS prescription
- Transparency at trade level (“confirms”)
- Helpful?—Theory v. practice vs. 605/606₂₃

What are the limitations to these solutions?

- Tick size changes due to ban on fees
- Directing payment to customers is complex, especially since exact payments may depend upon monthly activity
- Disclosure
 - At present small investors don't understand the process; would "confirm" disclosure help?
 - Routing and costs disclosures (605/606) complex and a poor fit

Does the Broker Benefit?

- Analogous questions about payment for order flow in the 1990s
- Theoretically (& empirically) distorted routing
 - Still rebates flow through to the customer in practice, even if the routing is distorted
 - Commissions have been surprising low now
 - Nature of competitive equilibrium is consistent with agency problem—even if routing is distorted, the customer derives the benefits!

Equilibrium cum Agency

- Structure robust to whether agency conflict
- Rebates and fees move together across platforms—inherent in competition across platforms and zero profit
- High rebate implies more routing to a platform (maximize rebates or optimize tradeoffs) and slower execution
- Empirical results consistent with this
- Agency conflict due to differences in recipient—investor vs. broker

Policy Questions

- To what extent are current practices consistent with Best Execution standards? (Agency theoretic)
- Should NMS reflect gross or net prices?
- Should we ban rebates/fees?
- Adjust caps downward? Pilot analysis?
- Should we direct fees and rebates to the customer?
- Would “confirm” disclosure or enhanced 605/606 disclosures be helpful?

Speed

- What does an “arms race” tell us?
 - Competition for rents and that there are rents!
 - Investors better served by alternative design, such as ending continuous trading??
 - In other contexts, should we ban advertising??
- Benefits to speed??
 - ***Price discovery enhanced—Info is not exogenous, but arises from trading (French and Roll, *JFE*, 1986)

Is Differential Access New?

- No
 - Co-location (& differential access) is not new
 - New: Use of lasers, drilling thru Allegheny Mts
- “Time and place” advantage at old NYSE
 - Role of NYSE “seats” and nepotism
 - There were big rents from differential access
 - Booths on side of NYSE floor, floor traders
- Time scale is completely different
 - But not crucial that decisions now faster than “human” decision-making
 - Why is it an “arms race” now, but not earlier?²⁹

Have Costs Declined over the Last Decade?

- Technology; trading is faster (neat plots)
 - NMS pushed by only offering order protection to “fast markets”; encouraged HFT investing and eliminated hold-up problems
- Declining bid-ask spreads
 - Angel, Harris and Spatt (2011, 2015)
 - Markets better than ever!
- Declining commissions
- Some claim that the “arms race” is problematic now, but not earlier; I don’t agree

Costs and HFT

- Nature of arbitrage with costs:
 - Recovery of costs is compatible with equilibrium—e.g., not all investors should index or be passive with respect to investing heavily in technology. That would not be consistent with equilibrium and robust price discovery (Grossman and Stiglitz, *AER*, 1980)
 - In equilibrium investors are compensated with higher gross returns for additional costs.
 - Otherwise, no incentive to invest in market enhancements.

Adverse Selection and Trading

- Rationale for rapid cancellation or not leaving orders open on the book
 - Control the situations in which the order fills
 - Can justify surprising large cancellation statics (high quote / trade ratio)
- Executions at fast/nearby platforms are followed by cancellations (“Flash Boys”)
 - Fear that the trader executing would like to trade many more shares and that the initial fill is just the start and so pricing backs off!