Technology, Competition, Market Structure, and Regulation

Terry Hendershott

Haas School of Business

University of California, Berkeley

AMF

May 27, 2010

Recent developments (Stoll in 2007)

- Rise of electronic trading
- Demutualization and going public of exchanges
- Consolidation
  - NYSE/Arca/Euronext, Nasdaq/Instinet
  - CME/CBOT or ICE/CBOT
- Fragmentation – new markets
  - ISE, Liquidnet, BATS, ICE
- Globalization
- Decline in spreads, commissions
- Consolidation of dealer firms

- Question: Will consolidation reduce competition & raise prices?

Developments in the last 3 years

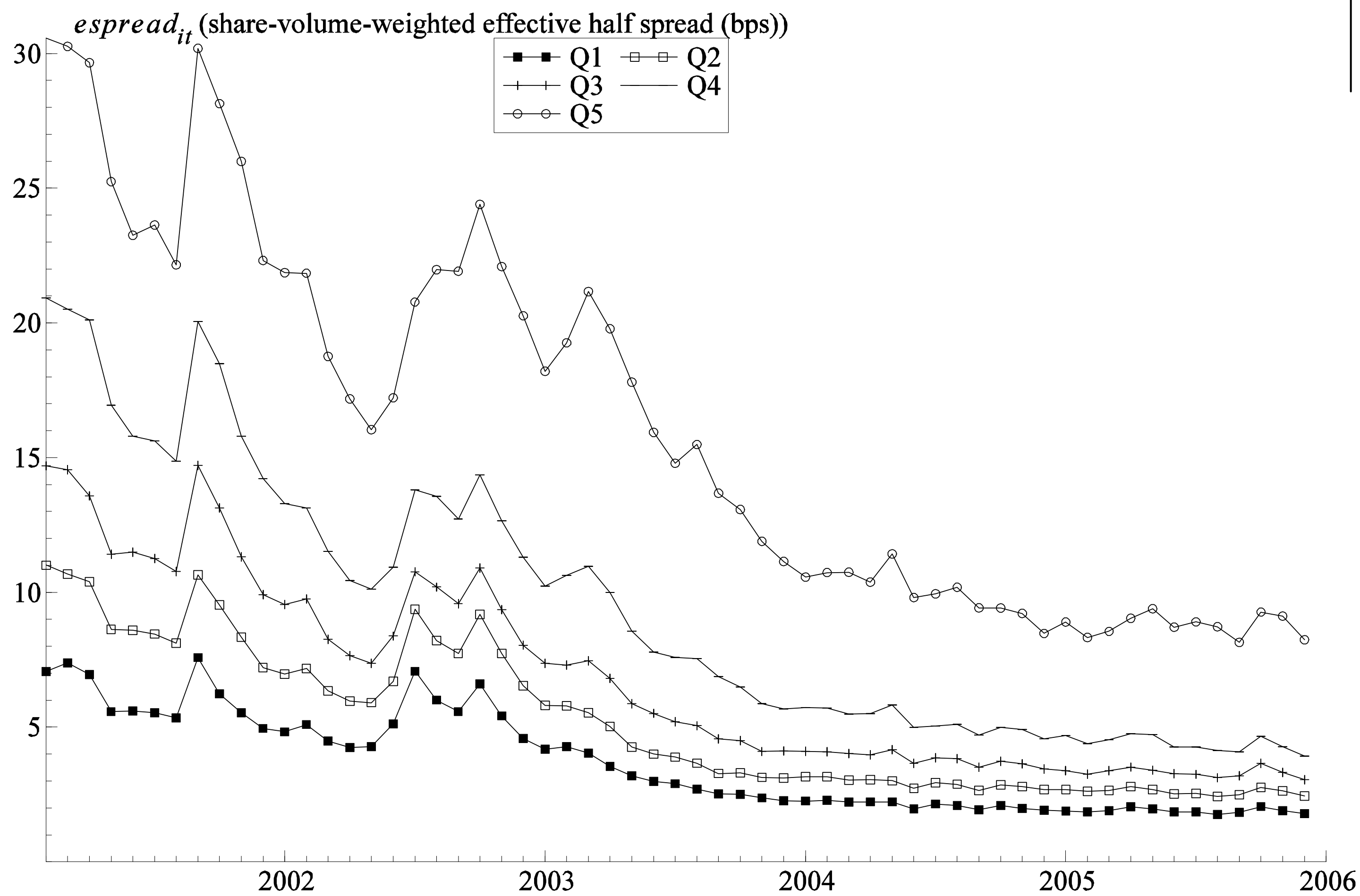
- Continued competition/fragmentation
  - Cost of entry is trivial
    - Are exchanges relevant? do we miss them? remutualizing?
  - Technology to monitor and trade in many markets
    - Markets linked through traders' technology
      - Do we need trade through regulations?
    - New types of markets, especially dark pools

- Fairness
  - Transparency/dark liquidity
    - Market integration for liquidity and price discovery
      - Competition for order flow, internalization, & preferencing
  - Latency and market data
  - High-frequency trading

Evolving Market Structure

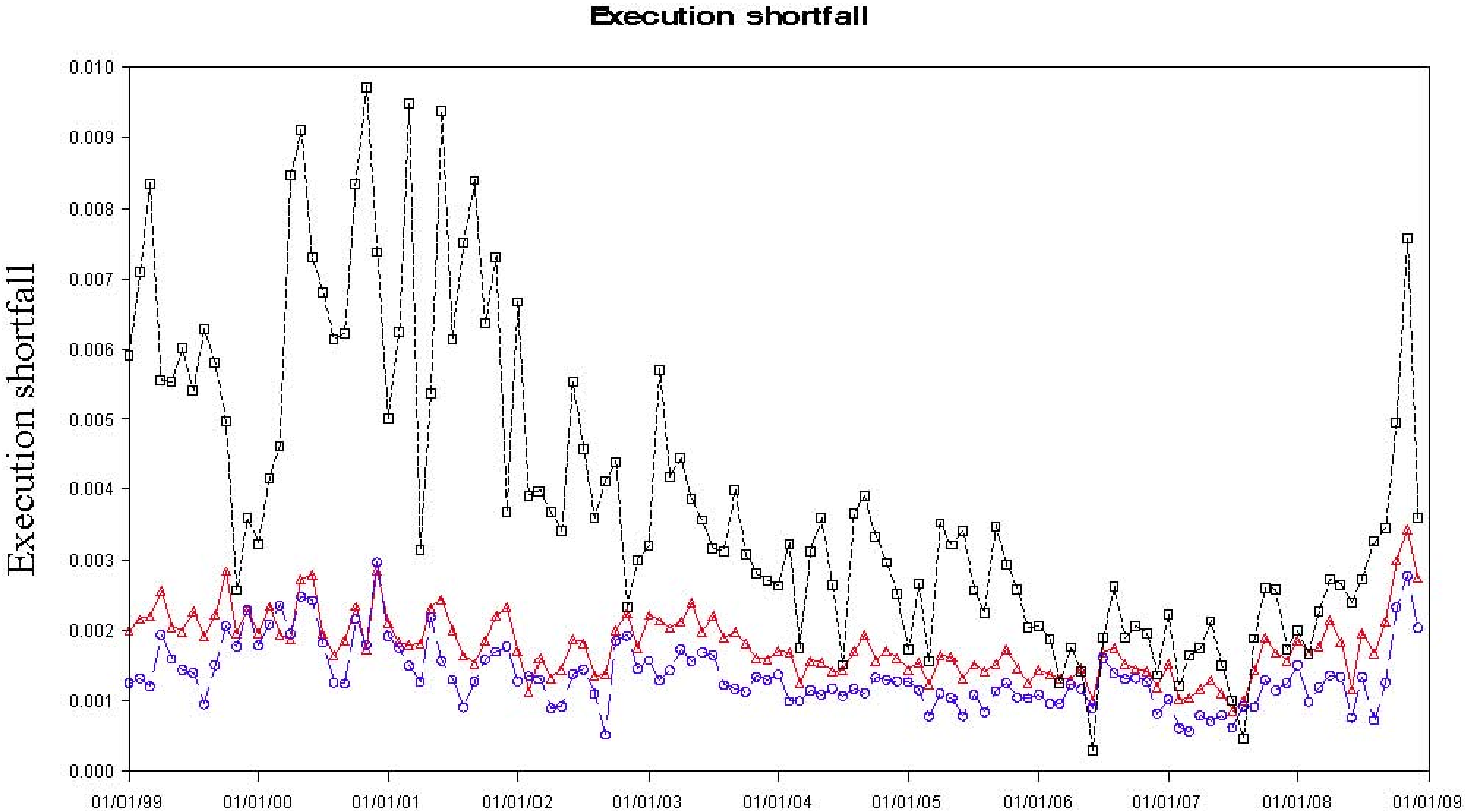
- Do equity market changes require new approaches?
  - My thesis: Technology has made markets better and regulation fostering competition and market integration via technology played an important role; continue approach
  - Open questions:
    - Is there some use of technology now that deviates from past?
      - Was the old regulatory framework faulty? Or incomplete?
    - Is the investment in technology wasteful?
      - More so than in other industries?
  - Technology is transforming trading and investing in ways that reduces many existing players' profits
    - Buggy whip manufacturers thought the car would…

How have markets evolved?



Decline is from lower averse selection (less information in trading). For NYSE stocks from Hendershott, Jones, and Menkveld (2010)

More recent and execution shortfall



For NYSE stocks from Anand, Irvine, Puckett, and Venkataraman (2010)
NYSE marketshare in NYSE-listed stocks fell substantially in 2006/2007 and continued

How are the markets functioning?

- Spreads and execution shortfalls fell over time
  - Crisis made it difficult to be sure recently
    - Equity market functioned very well (relative to other markets) during stress; high-frequency traders did not disappear
  - What else should we measure?
    - Transitory volatility? By investor/trade type?
- Transparency/dark liquidity
  - All traders want everyone else to be visible
  - Can it hinder market integration (fragmentation)?
    - New order types (flash orders)
- Fairness
  - High-frequency trading and latency

Dark Pools

What do we know?

- Crossing networks were first
- (Hendershott and Mendelson (Journal of Finance, 2000))
  - "Cream skimming" by sending only imbalances to public markets reduces liquidity and possibly welfare
    - Effect can be large even if dark trading volume is small
    - Although, it may improve price efficiency

- Empirically—Island goes dark
- (Hendershott and Jones (Review of Financial Studies, 2005))
  - In 2002, SEC prohibited "trade throughs" in ETFs
    - ECN Island chooses to not display quotes
  - Price discovery worsens and liquidity declines
  - In 2003, Island redisplays and effects reverse
  - Both transparency and fragmentation appear important

Dark Pools
What to do?

- Well suited for certain types of investors
- Free riding harms existing markets

- Regulate light and dark markets similarly
  - Order exposure cannot/should not be mandated
  - Transparency and fragmentation both important
  - Market designs must not hinder integration by traders
    - Some order types may be problematic
  - Size/volume thresholds for transparency & access
    - Should internalization be viewed any differently?
    - Should we worry about ownership of markets?
  - How should surveillance and regulation be paid for?

Claims about high-frequency traders

- "Rise of the Machines" (The Economist, Aug 1–7, 2009)
  - "Magnifies changes and ultimately makes the system weaker."
  - "It appears exchanges are conspiring with a privileged group of high-frequency traders in a massive fraud."
- "Rise of the (Market) Machines" (Wall Street Journal, Jun-19-09)
  - "...the stock market is more prone than ever to large intraday moves with little or no fundamental catalyst."
  - "locusts … feeding off the equity market."
- "High-Frequency Algorithmic Trading" (New York Times, Aug-5-09)
  - "...use rapid-fire computers to essentially force slower investors to give up profits, then disappear before anyone knows what happened. "
  - "…generated about $21 billion in profits last year."

Securities Market

Traders/Systems

Who was co-located in the old markets?

High-frequency trading-1

- Passive market making
  - Liquidity rebates, the spread, and routing
- Statistical arbitrage
  - Reduces costs & increases price efficiency/discovery
  - Market integration & multi-asset liquidity provision?
- Directional
  - Order anticipation
    - Doesn’t every market maker do this?
  - Momentum ignition
    - How is this profitable? Will markets self-regulate?
- Anything new here?
  - Was the old regulatory approach flawed?

High-frequency trading-2

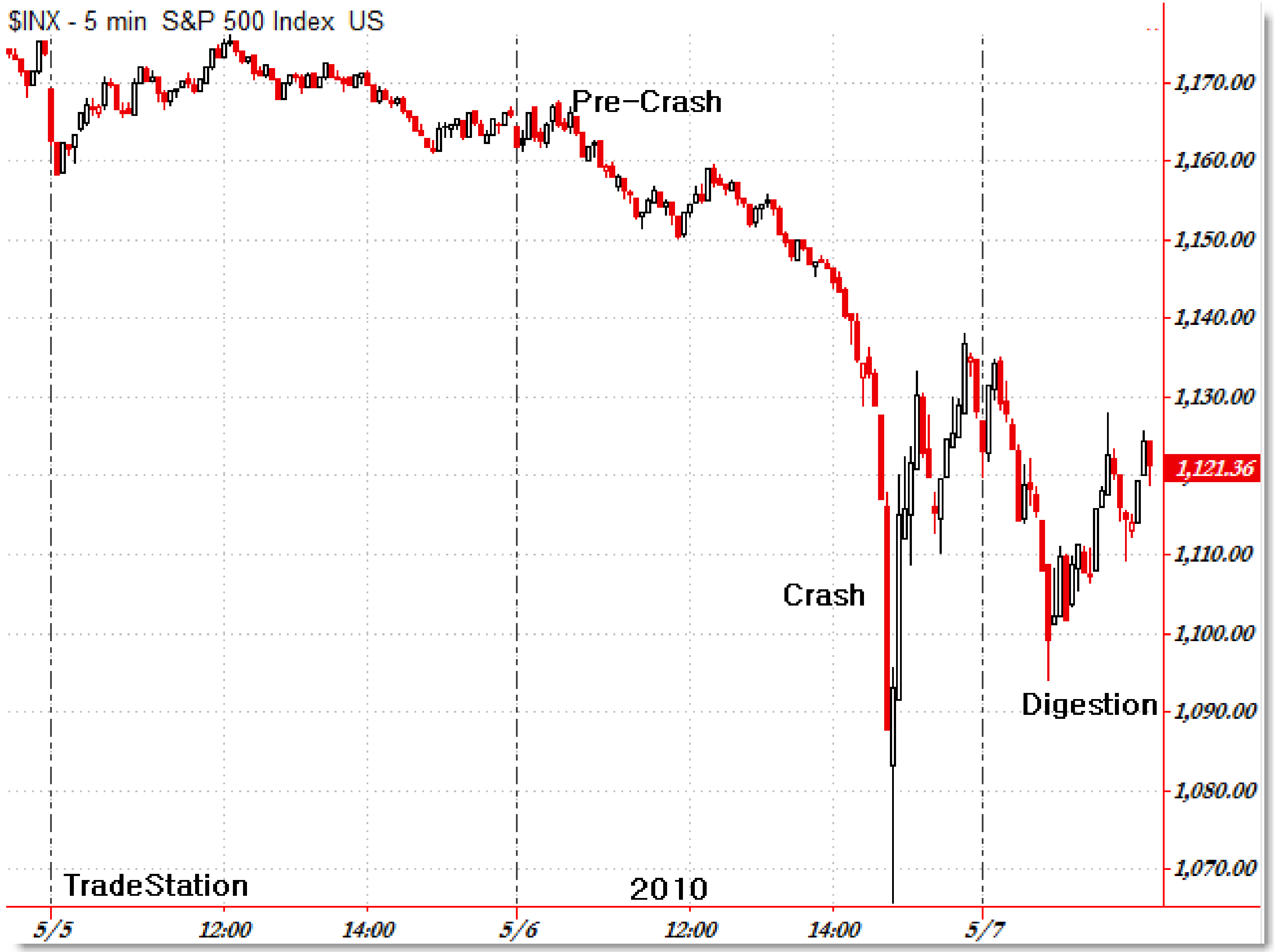
What do we know about algo trading and HFT?

- HFT combines technologies and strategies
  - All HFT is AT, not all AT is HFT
    - Brokers and traders use AT for LFT
- AT improves market quality
  - HJM (2010) – lower spreads, more informative quotes
    - HR (2009) – ATP for DAX
      - AT contribute more to eff. price, consume liquidity when cheap & supply when expensive, no relation to past volatility
  - CHVC (2009) – EBS AT trading
    - Unrelated to volatility, contribute less to eff. price, more corr.
  - JM (2010) – entry of Chi-X and one HFT firm
- Evidence that technology makes markets better
  - No evidence that HFT is bad;

High-frequency trading-3
Fairness

- HFTs have lowest latency and best data
  - Simply follows from their strategies
- Equal access seems reasonable
  - Equality of opportunity or outcomes? Implementation?
  - Will “market” fail to provide speed and data for LFT?
- Should long-term investors be value differently?
  - Social welfare functions can be subjective
    - If HFT is profitable and constrained, LFT will incorporate it
  - Pension funds investing in a hedge fund?
- What are market designs which limit HFT?
  - If HFT is “exploitive” will LFT move to such markets?

What happened (in US) on May 6, 2010?



What happened in October 1987?

Conclusions

- Regulation has been largely pro-competitive
- Technology reduces cost of entry and integrates markets

- Carefully monitor high-frequency trading
  - Speculation helps price efficiency, but has costs
    - If speculation is discouraged, do it uniformly, not just HFT
- Set rules to ensure transparency and limit fragmentation from dark pools
- Study whether or not there is market failure for low-frequency traders and investors