High-Frequency Trading: The Academic Evidence

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Overview and summary

- Most analyses are based on equity markets.
- Broad characteristics of HFTs
  - Large in size and scope (market coverage)
  - Collocate.
  - A large share of message traffic.
  - Quick reaction to market information.
- Trading styles
  - High rates of order cancellation
  - High turnover
  - Tight position management: net positions are always kept small
  - Often trade passively (like market makers)
    - But often trade actively.

- Market: E-Minis
  - May 6: HFTrs didn’t trigger it, but they contributed to it.
- In normal times, HFTrs
  - Behave like market makers
  - Low inventories, high turnover
  - But trade more actively than “traditional MMs”
Menkveld, Albert J., 2012, *High frequency trading and the new-market makers*

- Market: Chi-X (European equities)
- Dominated by one large HFTr
- Spreads dropped with the entry of the HFTr
- HFTr makes the bulk of its profits on positions held five seconds or less.
- 80% of its trades are passive
500 stocks on Nasdaq’s Inet system.


- Increased HF activity “causes”
  - lower posted and effective spreads
  - Lower short-term volatility
  - Increased depth
The Nasdaq HFT dataset

- Constructed by BATS and Nasdaq, made generally available
- 120 US equities over 2008-2009
- HFTs identified by exchanges as proprietary traders with collocated facilities, high turnover, high rates of cancellations (relative to executions), etc.
- Data record all trades and quotes prevailing at the times of the trades.
Brogaard, Jonathan, 2010, *The activity of high frequency traders*

- HFTrs involved in 68% of dollar volume (sometimes on both sides)
- They’re demanding liquidity in 43% of DV, supplying it in 41%.
- Their strategies are correlated.
- Some evidence that they can predict future order flow.
Brogaard, Jonathan, 2012, *High frequency trading and volatility*

- Increased index volatility $\rightarrow$ increased active HFT
- Increased stock-specific volatility $\rightarrow$ reduced active HFT
- Increased HFT $\rightarrow$ reduced volatility
Hendershott, Terrence J., and Ryan Riordan, 2012, *High frequency trading and price discovery*

- HFTrs active trades anticipate subsequent price movements.
- Their trading enhances price discovery and market efficiency.
  - “Prices reflect information more quickly”
Summary of empirical studies

- HFT seems to be benign/beneficial.
- Limitations
  - With respect to what information does HFT increase efficiency?
  - Studies characterize average markets in typical times.
    - Don’t address stability and abnormal volatility.
A market is more efficient when prices reflect information sooner.

Principle based on fundamental information.
- We require firms to report promptly material developments.

What is the value of efficiency when information is an advance signal of another player’s pending order?
HF behavior: the pathological

- We observe ...
- Volatility in bids and offers
- Sudden extreme surges in message traffic
- ... without apparent fundamental cause
GNTX on June 12, 2008, 12:10pm to 12:20pm