Tick Size Wars. Competitive Tick Size Regimes and Trader Behavior

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Tick Size Wars: Explicit price grid competition

• Global regulators enforce harmonized tick size schedules
• Leads to “implicit” tick size competition
  • Dark pools (almost continuous tick size in the US, midpoint Europe)
  • Inverted / Asymmetric (maker/taker) fee structures
• Each regulatory intervention seeking to eliminate implicit competition met by ever more imaginative structures.

This study

• The impacts of pure exchange tick size competition
• The immediate responses of HFT liquidity suppliers
The Tick Size Wars of ’09

In the left corner....

chi-x
Bats
Turquoise
LSE
NASDAQ OMX
OSLO BØRS
• 2007: MiFID

• 2008: Chi-X, BATS, Turquoise starts trading limited range UK, Scandinavian stocks.

• June 2009: Chi-X, BATS, Turquoise reduces tick sizes selected LSE, Scandinavian stocks.

• Later that month: LSE reacts, all exchanges trade London shares on new lower tick.

• Early July: OSE reacts, competitive lowering of tick sizes, but still higher than competitors.

• Fall: Pan-European agreement on common tick sizes across all exchanges.
Market Share Consequences

Time OSE has best quote (%) vs. OSE share of volume (%)

- Pre-trade (Best quote)
- Post trade (Share of volume)

May | Jun | Jul | Aug | Sep | Oct | Nov
---|---|---|---|---|---|---

- Pre-trade: Decrease from May to Jun, then increase from Jul to Nov.
- Post trade: Decrease from May to Jun, then increase from Jul to Nov.

98 | 97 | 96 | 95 | 94
Effect on market quality of first lowering of tick sizes

- Spreads (transaction costs) fall in both away and home markets
- Depth is unchanged
- Volume increases in both home and away markets.
Spread (NBBO) around first move
Total effects – pre-war to post-harmonization

- Spreads (transaction costs) fall in both away and home markets
- Depth falls
- Volume
  - decreases in home markets.
  - increases in away markets.
Spread (NBBO) throughout the war
Competition from small-tick markets

Large Tick Exchange

Best bid ➔ |                 | ← Best ask

Small Tick Exchange

Possible price improvements
Quoting strategies in small-tick markets

Possibilities

- Undercutting of prices at the large-tick exchange?
- Price competition at the small-tick exchange?

Large Tick Exchange

Best bid → | | | | | | | ← Best ask

Best bid

Small Tick Exchange

New equilibrium?
Chi-X improvement on OSE price

Fraction of day Chi-X improves on OSE price
What are traders using small-tick market for?

- Price
  - Best bid
    - Improve more than one tick
    - Improve just one tick
    - Same as main (or worse)
Placing of Chi-X quotes relative to main market

When tick sizes are the same:

![NHY 29 May 2009 Chart](image-url)
Placing of Chi-X quotes relative to main market

When Chi-X tick sizes are smaller:
How often does Chi-X improve by more than one tick?
HFT traders at the small-tick markets

- Use the small-tick markets to undercut main market by minimal ticks.
- Do *not* use to the small-tick market to move prices towards a less constrained equilibrium.
Minimal effect on NBBO
'09 Tick Size War: Exchanges’ competitive lowering tick size

- Entrant exchanges undercut to gain market share.
- Immediate loss of market for old exchanges:
  - 100% → 50% time at best quote
  - 98% → 92% trading volume
- Market quality effects: pre-war → post-war (post-harmonization)
  - Spreads (transaction costs) fall in both away and home markets
  - Depth falls
  - Volume
    - decreases in home markets.
    - increases in away markets.
- Quoting behavior: Traders use small-tick market to undercut main market by one tick, not for price competition on the small-tick market.
• Explicit tick size competition leads to undercutting behavior.
• HFT market makers undercut by only one new tick – No new “equilibrium” spread.
• Regulation required to avoid explicit tick size competition
• With regulation requiring harmonized ticks, implicit competition emerges
  • Midpoint Dark Trading (Europe)
  • Fractional Dark Trading (US)
  • Large in Scale Blocks
  • Inverted Fee Venues
• Narrower unconstrained tick sizes may eliminate this competitive conduct.