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

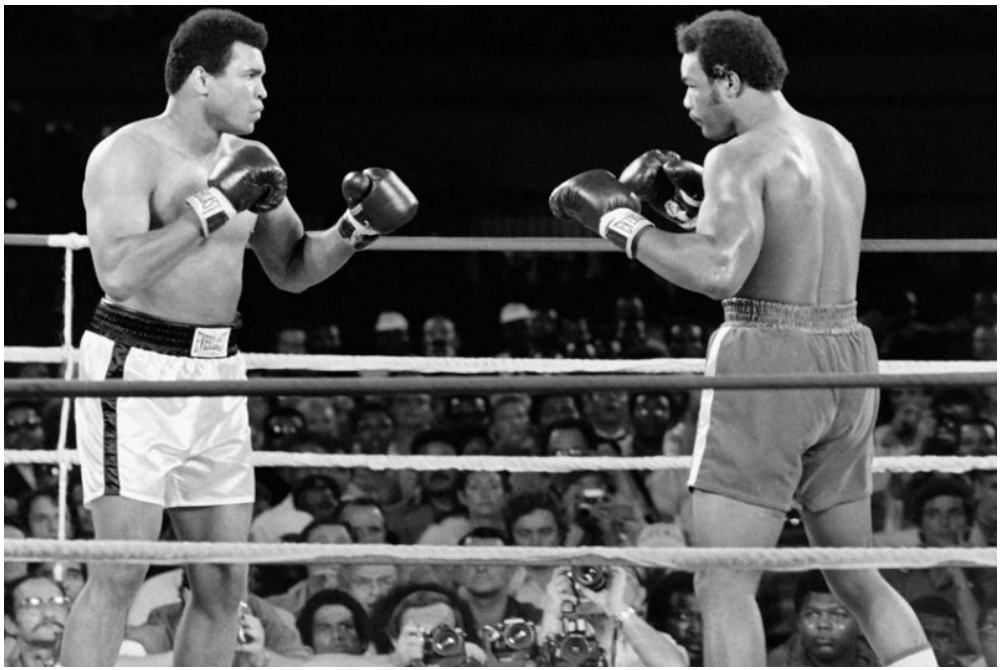
- The impacts of *pure* exchange tick size competition
- The immediate responses of HFT liquidity suppliers

In the left corner....

chi-x

Bats

Turquoise



LSE

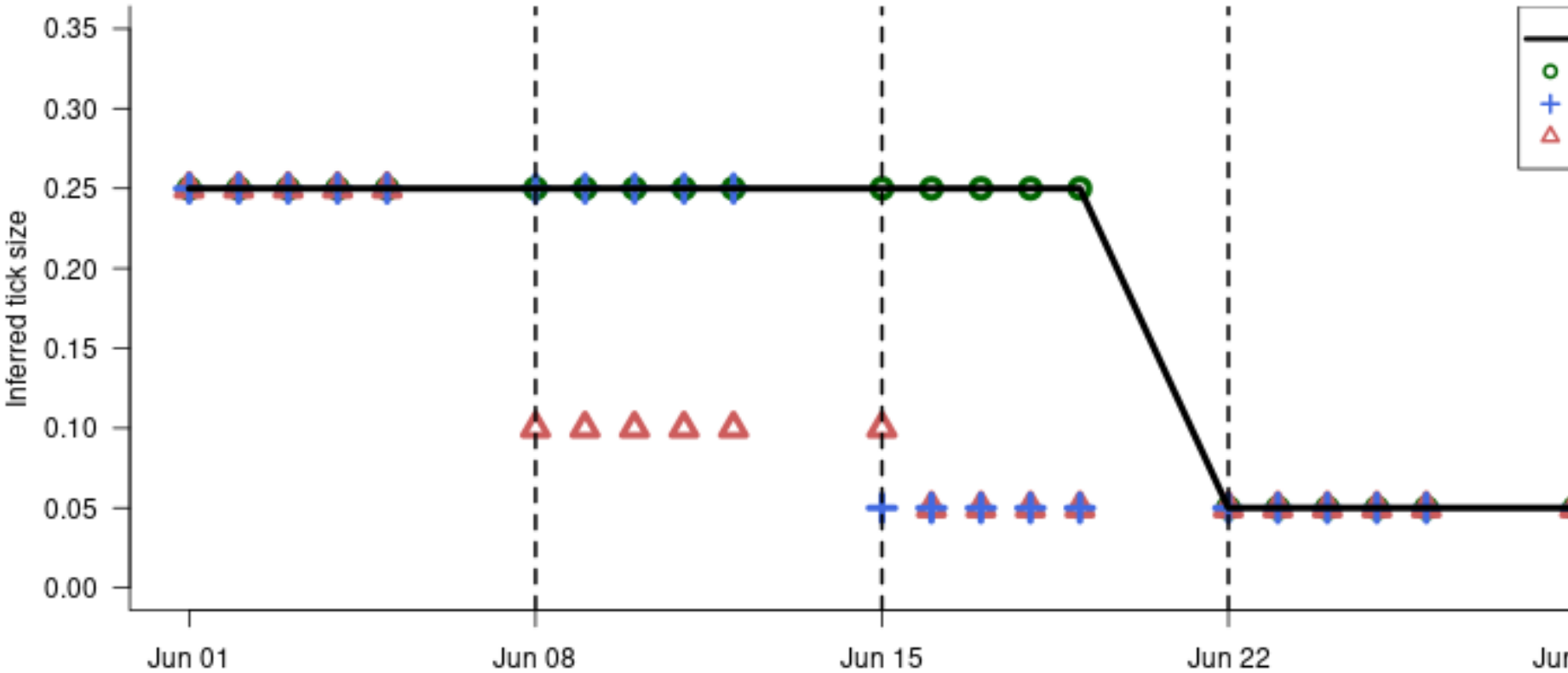
NASDAQ OMX

OSLO BØRS

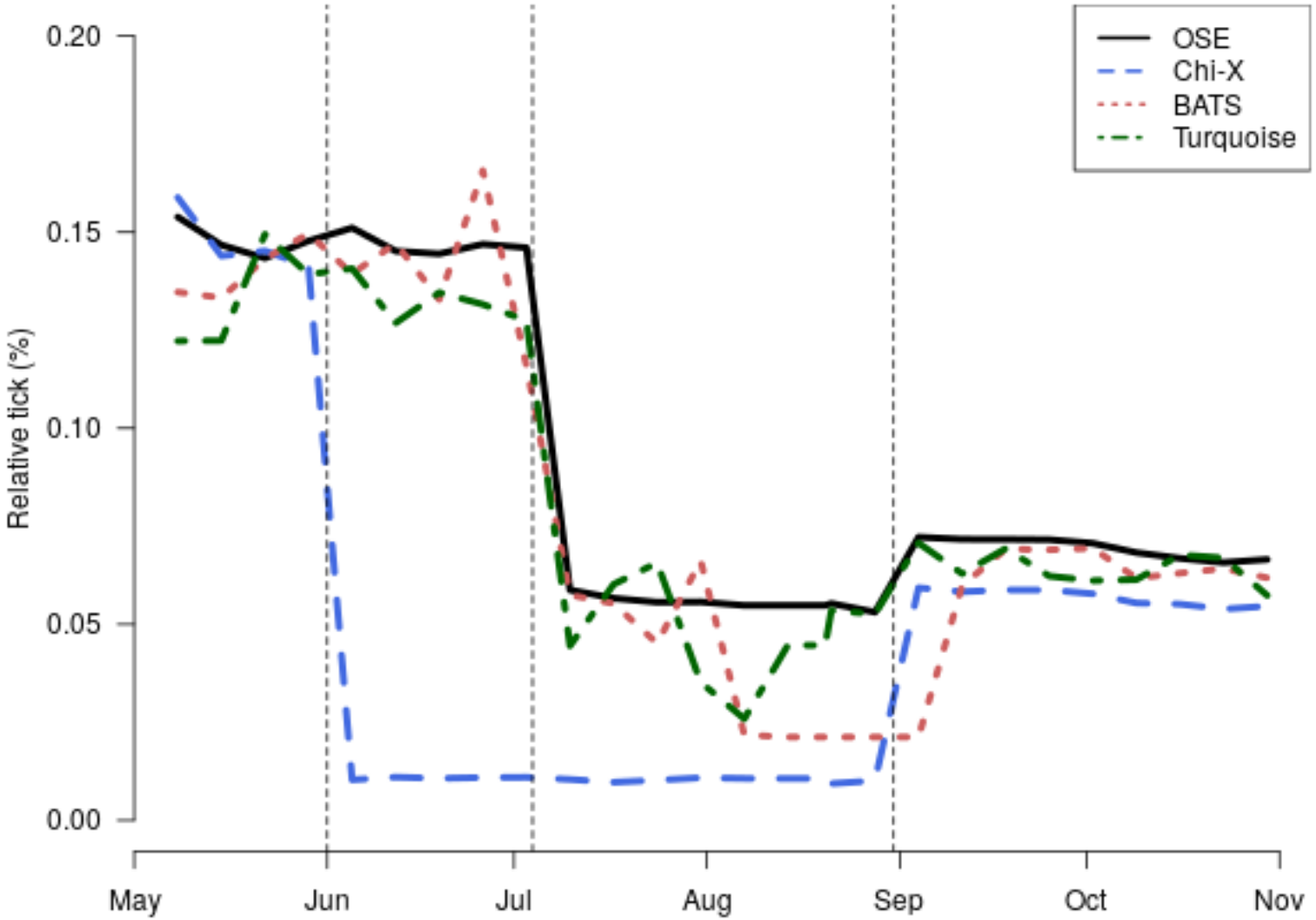
Events of War

- 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.

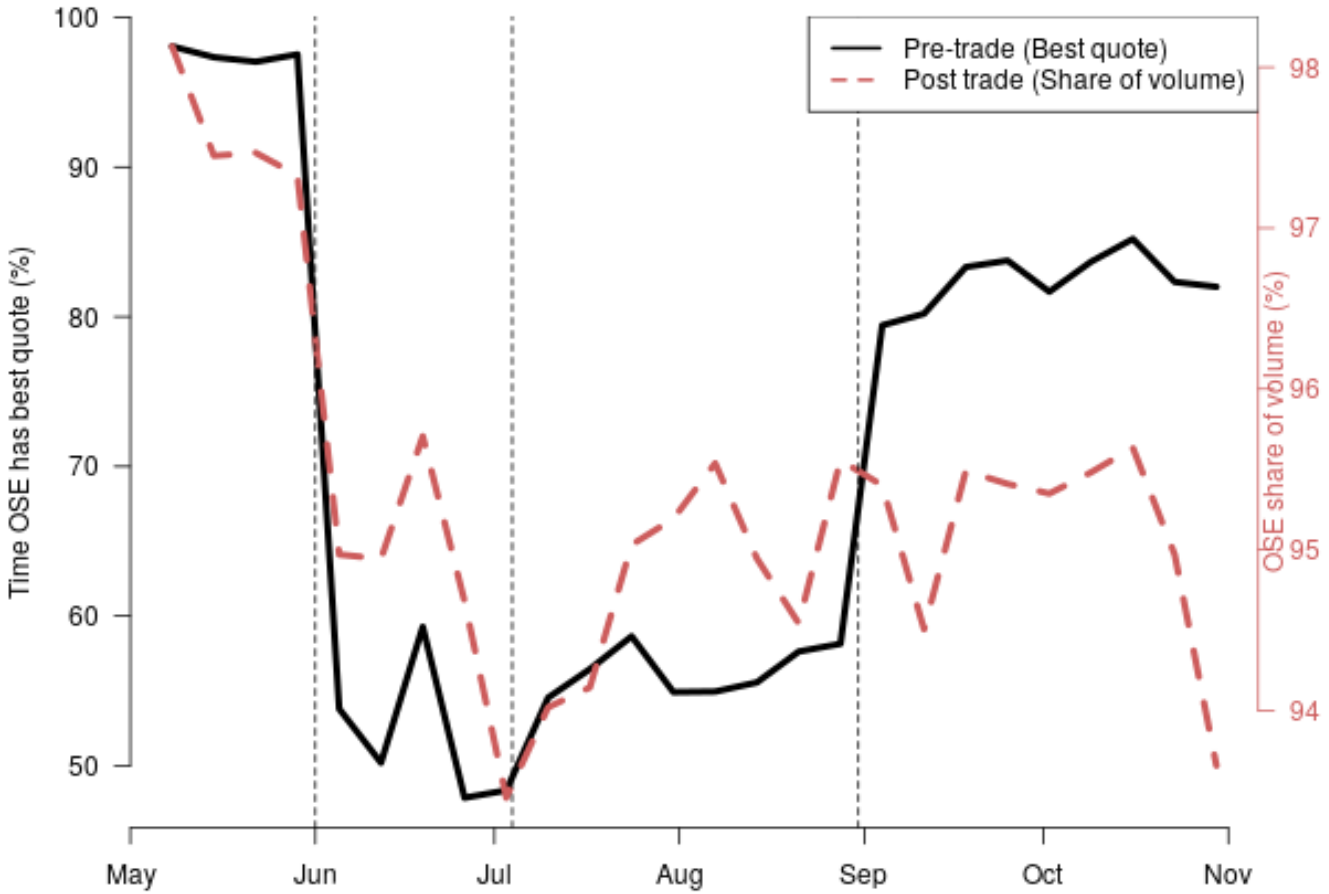
BP at LSE: Tick size evolution



Market aggregate: Relative Tick (Oslo)



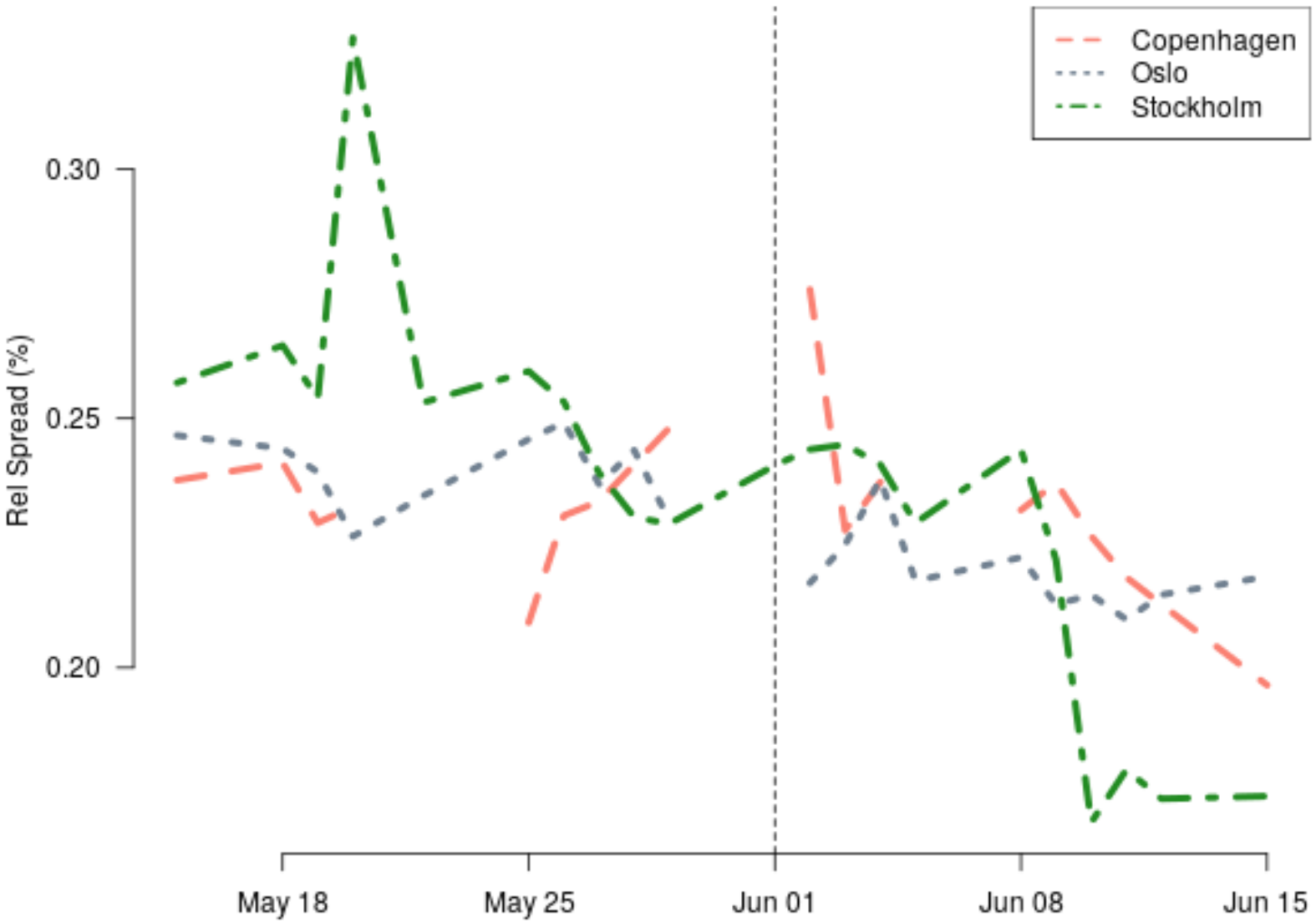
Market Share Consequences



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.

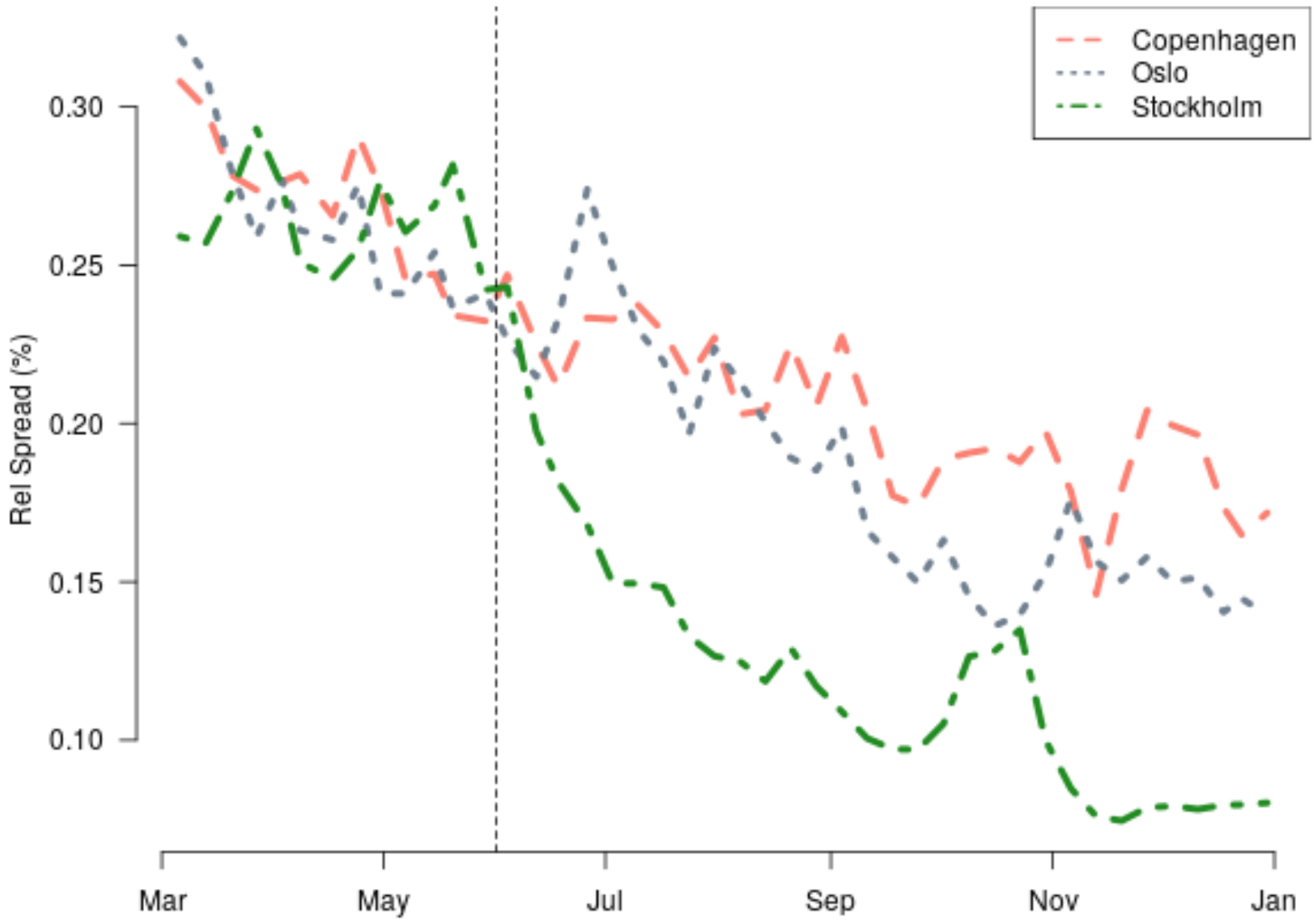
Spread (NBBO) around first move



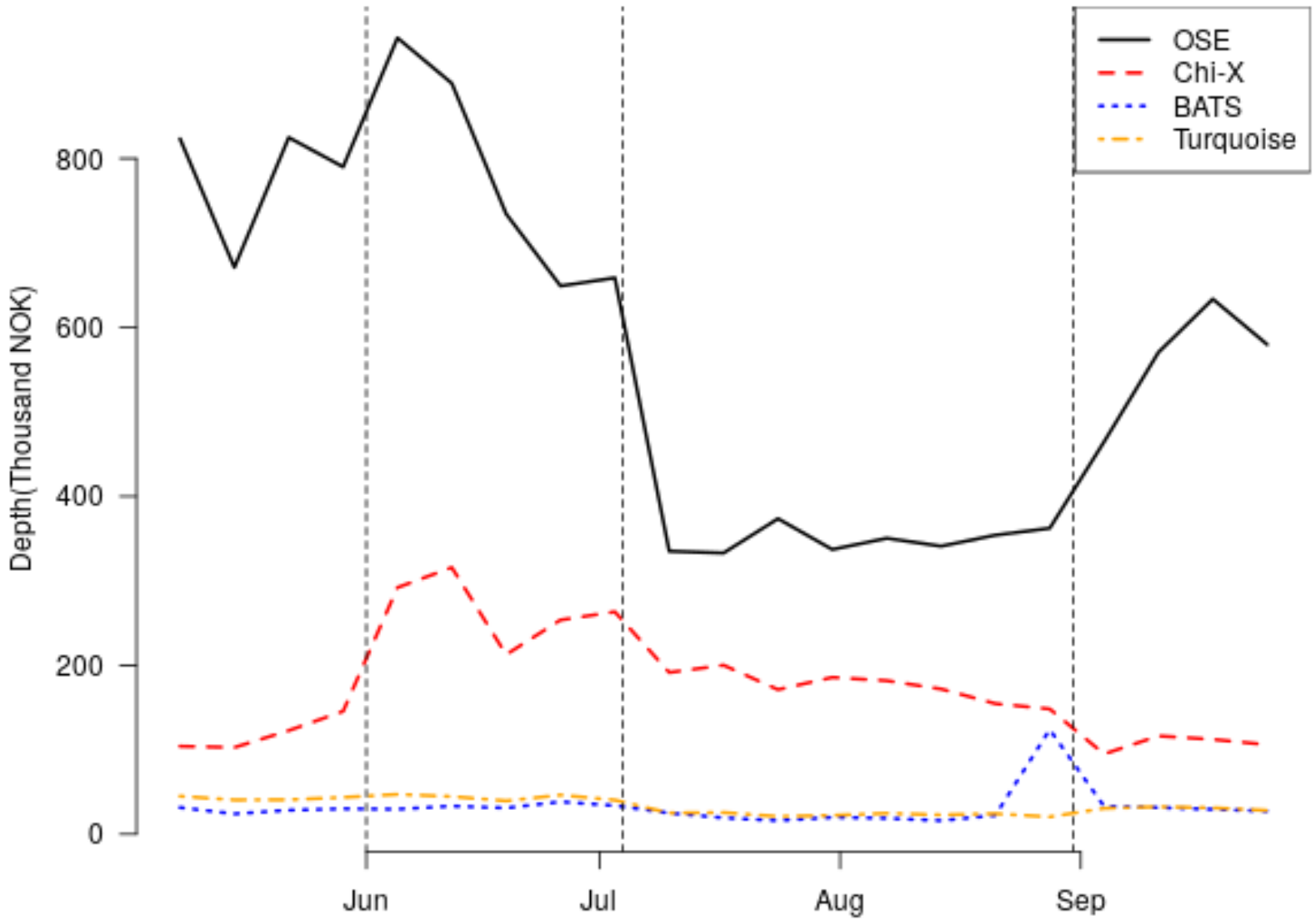
Total effects – pre-war to post-harmonization

- Spreads (transaction costs) fall in both away and home markets
- Depth falls
- Volume
  - decreases in home markets.
  - increases in away markets.

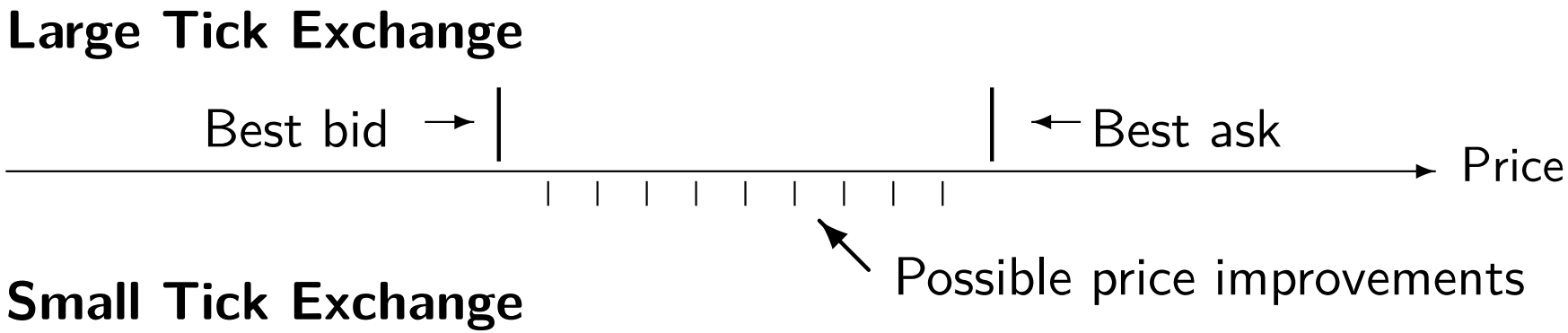
Spread (NBBO) throughout the war



Depth throughout the war (Oslo)

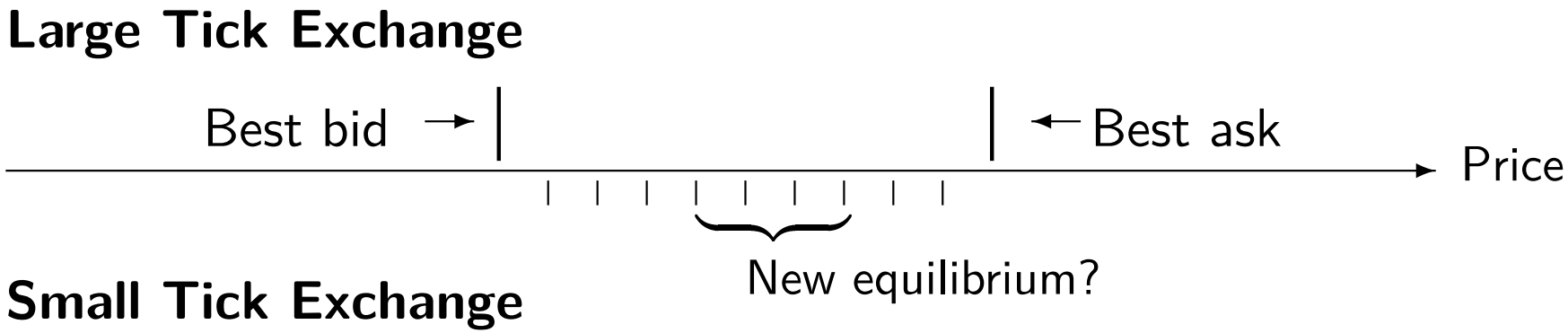


Competition from small-tick markets



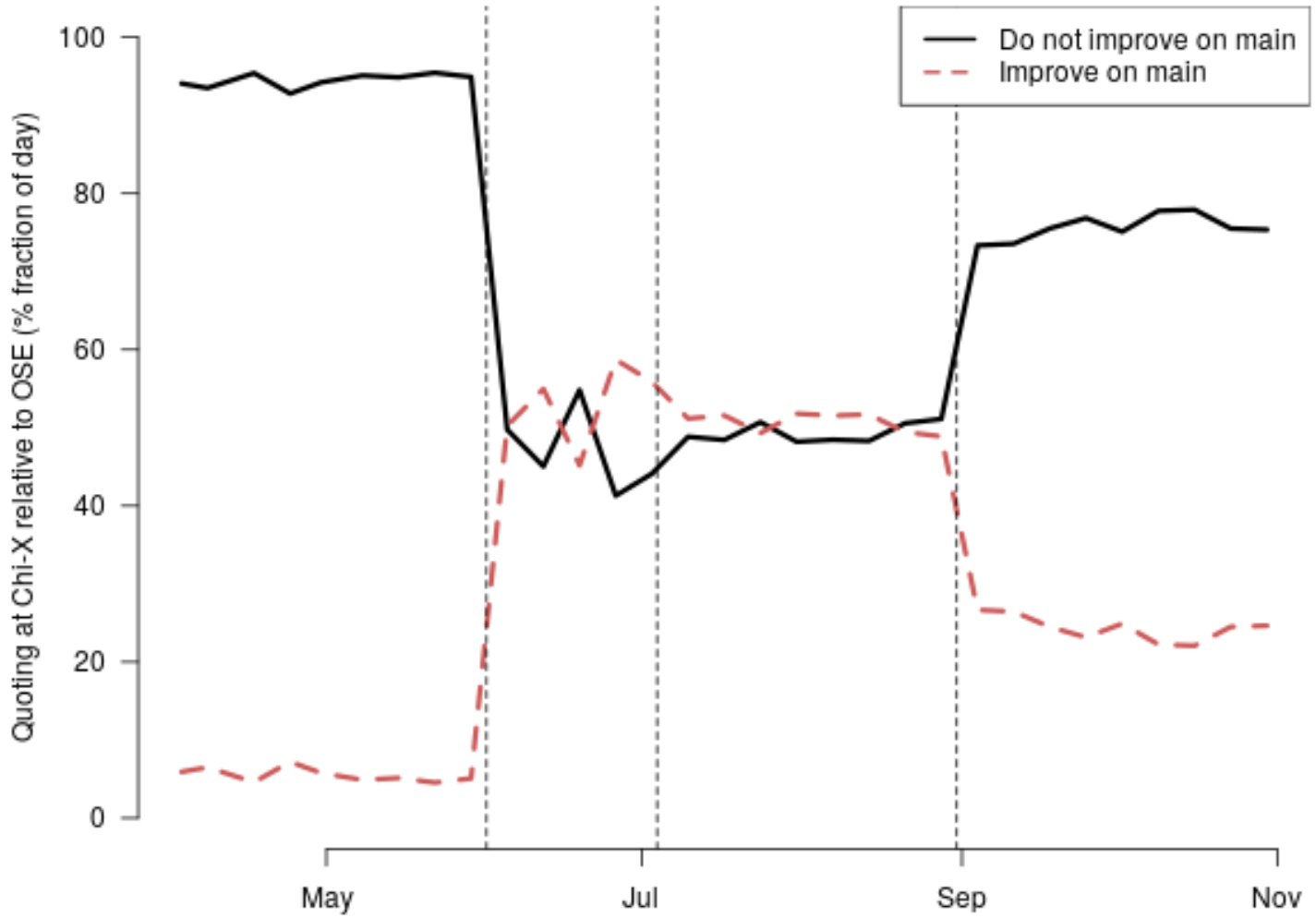
Possibilities

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

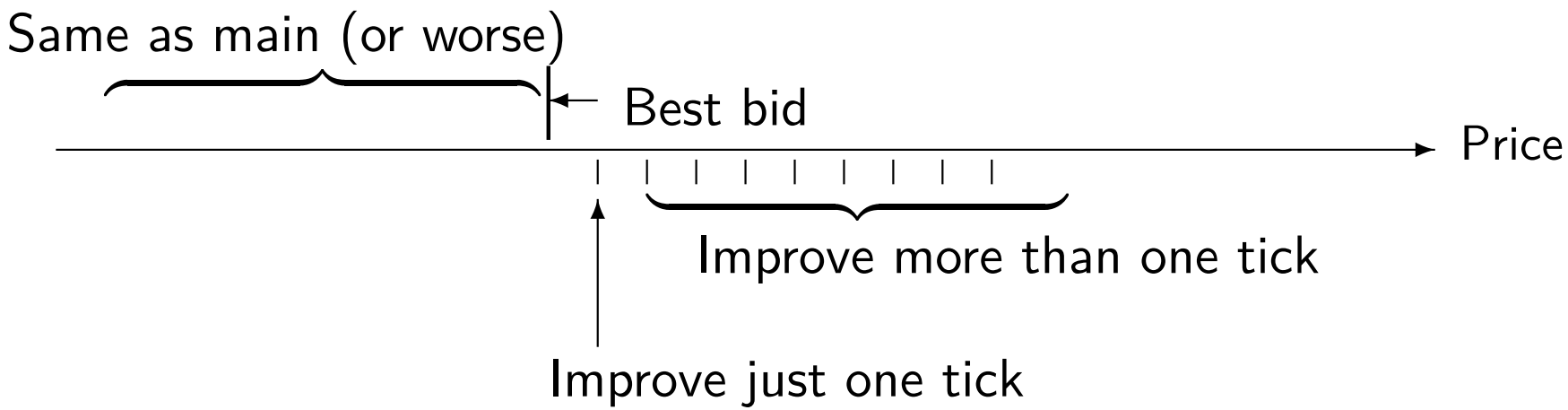


Chi-X improvement on OSE price

Fraction of day Chi-X improves on OSE price

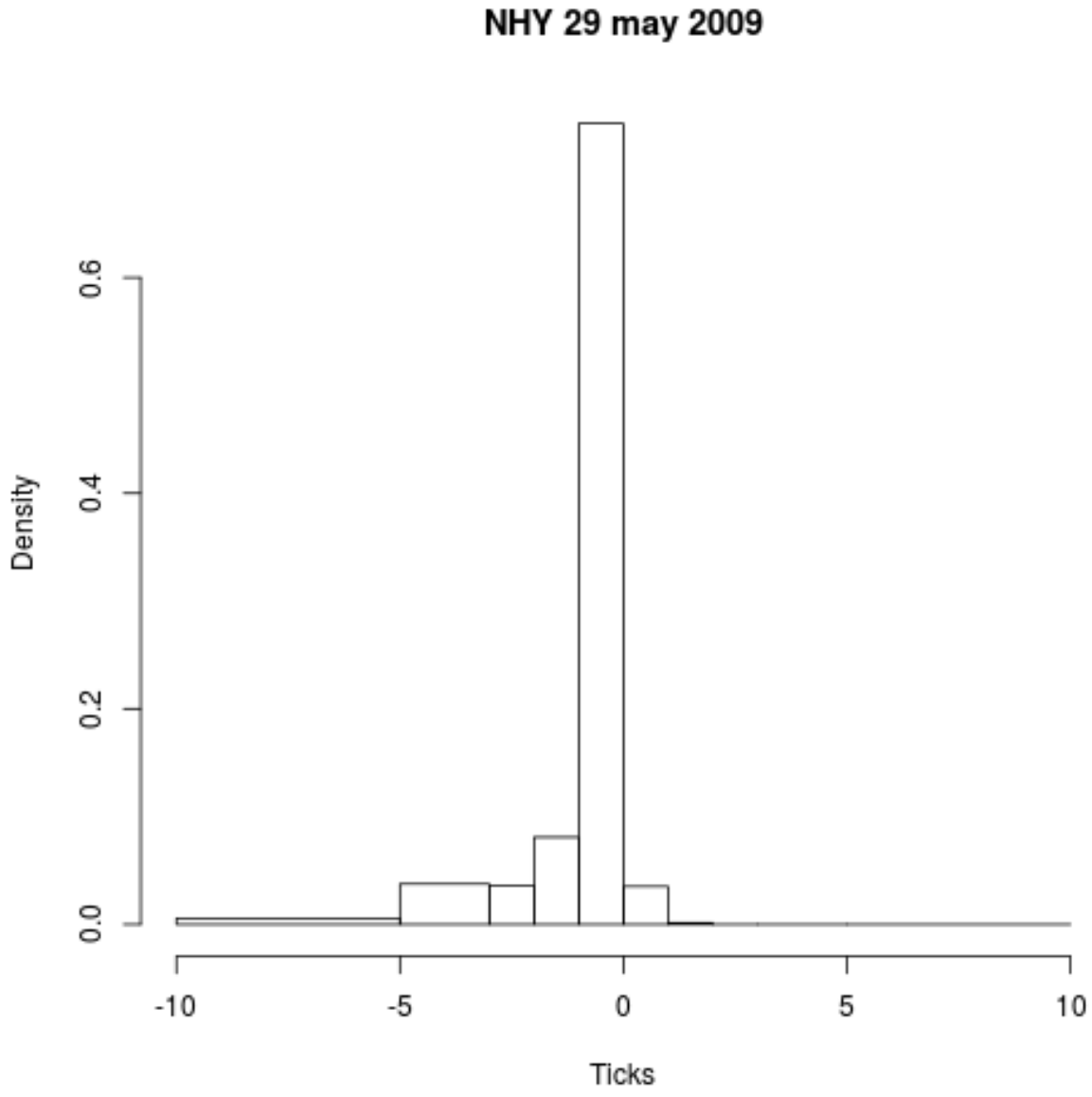


What are traders using small-tick market for?



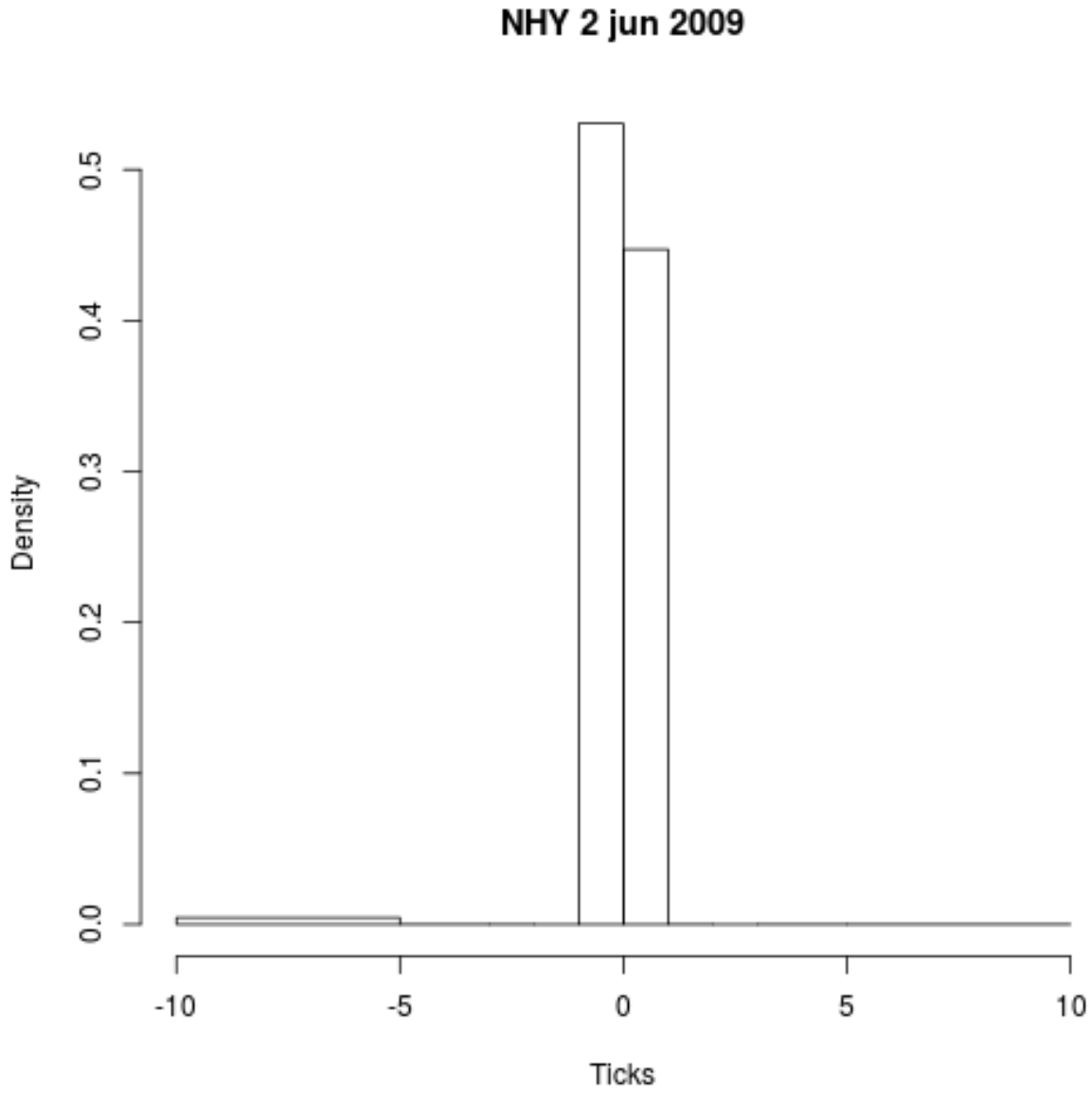
Placing of Chi-X quotes relative to main market

When tick sizes are the same:

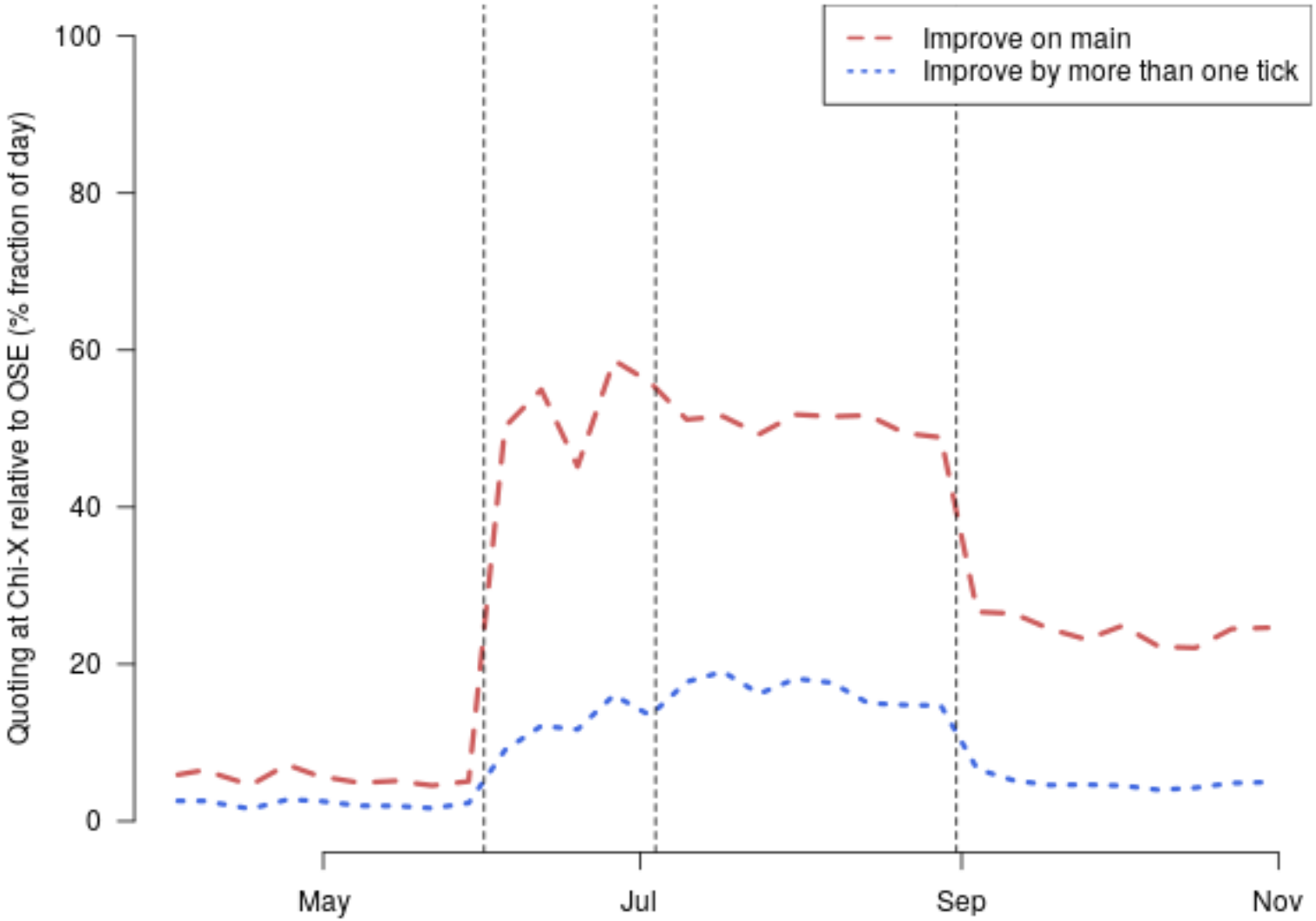


Placing of Chi-X quotes relative to main market

When Chi-X tick sizes are smaller:



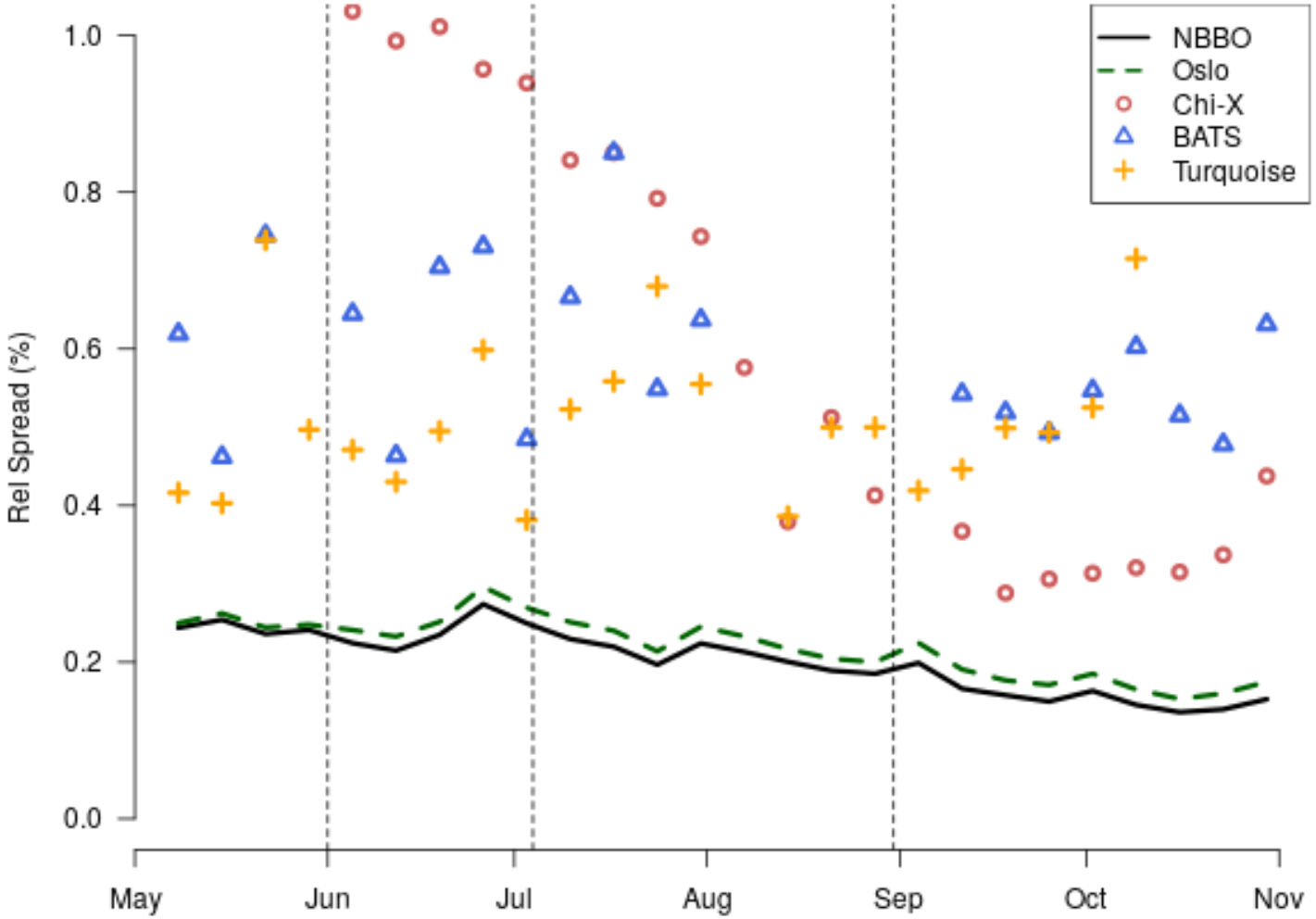
How often does Chi-X improve by more than one tick?



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



Summary

'09 Tick Size War: Exchanges' competitive lowering tick size

- Entrant exchanges undercut to gain market share.
- Immediate loss of market for old exchanges:
  - 100% $\rightarrow$ 50% time at best quote
  - 98% $\rightarrow$ 92% trading volume
- Market quality effects: pre-war $\rightarrow$ 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.

Implications - A Race to the bottom?

- 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.