Tick Size Wars: Competitive Tick Size Regimes and Trader Behavior

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Abstract

We explore the effects of a "tick size war" in which European exchanges directly competed on the minimum pricing increment in the limit order book, the tick size. We find that the exchanges that reduced their tick size immediately captured the market shares of both quoted and executed volume from the exchanges that kept their ticks large. We find that tick size competition improves market quality, reducing trading costs and increasing aggregate depth and volume. These market quality improvements are strongest in stocks where the bid-ask spread was constrained to one tick, where liquidity providers use the finer pricing grid to engage in price competition.

The tick size in equity market design

- *Tick size*: the grid of possible price increments on a stock exchange.
- Choice variable in the design of a limit order market.
- World-wide trend towards smaller tick sizes

Too little liquidity provision?

- Claim: Current tick size too small — deters intermediaries from providing liquidity
- US response: Tick Size Pilot — pilot program experimentally increased tick size – not successful
- EU response: MiFID II – tick size contingent on stock liquidity (in addition to price)

Market Fragmentation

- Tick sizes fix terms of trade in an exchange.
- Competing exchanges "improve" on fixed tick sizes by e.g.
  - midpoint execution
  - fee structure changing implied ticks (maker-taker vs taker-maker).

This paper

Investigate 2009 "tick size war" between

- Established Exchanges: Copenhagen, Oslo, Stockholm
- "New" pan-European exchanges: Chi-X, BATS, Turquoise.

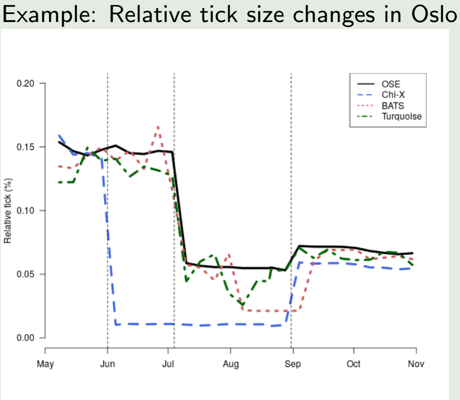
Unique case of using tick size lowering as a competitive move to gain market share. (Most tick size changes are imposed by regulators, and common across exchanges.)

Events of War

- 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.

Resulting tick size changes

Example: Relative tick size changes in Oslo



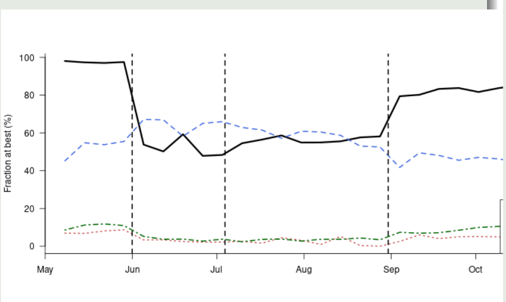
Relative tick size: Tick size/stock price

Effect on Market Shares

Scandinavian exchanges overnight

- lose about 3% of trading volume
- go from quoting the best price all the time to 50% of the time.

Example: Fraction of day each exchange is quoting best price (Oslo):



Effect on Market Quality of June event

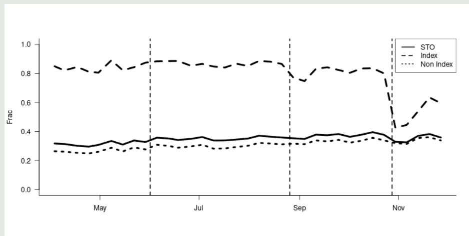
- Spreads (transaction costs) fall in both away and home markets
- Depth is unchanged
- Volume increases in both home and away markets.

Total effects – pre to post harmonization

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

Does tick sizes constrain?

Tick sizes lower bound on bid/ask spread.
If trading at one tick, trading costs can't go lower.
Were these markets constrained?
Illustrate: Stockholm: Fraction of the day index stocks are quoting at one tick.



Show: Effects on market quality concentrated in stocks which are constrained at one tick.

Quoting strategies in small-tick markets

What do traders at the small-tick exchange want to achieve by orders sent there.

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

Estimate: fraction of the trading day the small tick exchange quotes a price that

1. is worse than the main exchange price
2. is the same as the main exchange price
3. improves on the main exchange price by one tick
4. improves on the main exchange by more than one tick.