

Mitigants to the Possible Risks and Costs Arising with Computer-Based Trading

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Our project commissioned impact assessment on the policy options

Circuit breakers, Harmonised circuit breakers

Tick sizes

Minimum obligations for market makers

Minimum resting times

Order to Execution limits

Algorithmic regulation

Central Limit Order Book (CLOB) vs. Exchange order books

Market abuse surveillance

Maker-taker fees

Continuous market vs. randomised call auctions

Internalisation

Order preference and Priority rules

Circuit Breakers

- They constrain extreme price moves and allow markets to recompile
- Magnet/Gravity effect argument, could make things worse in normal times. Lights going off effect during flash crash.
- But what is the empirical evidence regarding their effect on market quality? Many authors find negative effects of CBs on market quality (magnet effect), others find little effect, positive effects are rare. But:
 - Many papers on small markets that are out of date
 - Many papers are concerned with a plain vanilla type of trading halt rather than the modern type employed eg by LSE, or multi-market stops which are too rare to evaluate
 - Difficult to obtain the required counterfactual so many results are statistically suspect. Not much limit order book and spillover analysis.

- New types of circuit breakers triggered by ex ante rather than ex post trading may be particularly effective in dealing with periodic illiquidity and technical errors.
- Reverts to Auction mode which allows price formation to continue so mitigates effects of trading suspension
- LSEG submission: On an average day there are 30-40 trading suspensions, whereas in the first two weeks of August 2011, this shot up to about 170 suspensions per day due to increased volatility. Despite the high number of suspensions, large volume and wide market swings, trading was generally “orderly” in their view. We are working on an empirical paper using LSE data on all transactions during July and August 2011.

- In conclusion, there is general industry (see OW survey) support for these, particularly for those designed to limit periodic illiquidity induced by temporary imbalances in limit order books. They are especially relevant to markets operating at high speed.
- Different markets may find different circuit breaker policies optimal, but in times of overall market stress there is a need for coordination of circuit breakers cross markets, and this could be a mandate for regulatory involvement.
- However, further investigation is needed to establish how coordination could best be achieved in the prevailing market structure

Tick Size

- The level of tick size for any given stock reflects a trade-off between liquidity provision and transaction costs, extreme messaging volume versus travelx gauging
- Historical trend has been towards smaller tick sizes. In US from 1/8 to 1/16 to 1/100 from end of 1990s until 2001. In UK, they have reduced similarly but by exchange choice rather than legislative mandate.
- Optimal tick size is not zero. Are there arguments to increase tick sizes in some cases to improve stability and stop undercutting? Are there arguments to decrease tick sizes to reduce transaction costs and dark trading? Are there arguments to harmonize tick sizes across venues?

- In US, tick sizes for a very large set of stocks is 1 cent whereas in UK they vary across stocks by price level and capitalization (in various bands)
- Race to the bottom in Europe (competitive reductions in tick sizes). In US trading off lit venues can take place subpenny.
- Some empirical work evaluating effects of different tick size regimes. FESE/Bats pilot study. AMF work. Citigroup reverse split study. Needs more.
- Affects retail and institutional investors differently.

- The current approach of allowing each European trading venue to choose its own minimum tick size has merits, but this can result in a race to the bottom between venues.
- A uniform policy applied across all European trading venues is unlikely to be optimal, but a coherent overall minimum tick size policy applying to subsets of trading venues may be desirable.
- This coordinated policy could be industry-based, such as the one agreed to recently by the Federation of European Securities Exchanges (FESE) members.

Market Making Obligations

- The current system of exchanges individually determining how to structure market maker obligations and pay for them seems to be working well for most markets.
- Extending those obligations more broadly across markets and to the market making function more generally is problematic due to its likely impact on liquidity provision.
- The complications arise from the nature of high frequency market making across markets, which differs from traditional market making within markets. Requirements to post two-sided quotes may restrict, rather than improve, liquidity provision.

Minimum Resting Times

- Markets now feature a large number of fleeting orders that are cancelled very soon after submission. This increases the costs of monitoring the market for all participants, and reduces the predictability of a trades execution quality.
- Fleeting behaviour in part legitimate (fragmented markets, derivatives and baskets, pinging hidden orders on exchanges), in part possibly abusive (spoofing, layering, quote stuffing etc.) which can undermine market quality or, at the least, create a bad public perception.
- Mifid II proposes uniform 500 milli-seconds. But could depends on security and/or general market conditions, difft for buy and sell etc. In limit even for market orders in sense of one batch auction per second, say, see EIA2: Farmer and Skouras.

Benefits

- More predictable LOB, visible depth more like actual depth, though not much effect away from touch.
- More meaningful quotes, more informational content.
- Reduce some of the excessive level of message traffic.
- Some authors also suggest that minimum resting times may reduce the profitability and incidence of spoofing, quote stuffing and other illicit practices.
- Minimum resting times may also allay concerns that markets are currently 'unfair, not a level playing field (though have never been).

Costs and Risks

- Limit order is an option given for free to market with maturity equal to at least the MRT, since at risk of being adversely selected against by active traders with better or newer info.
- This raises the cost of being a LO supplier. By how much? Based on back-of-the-envelope methodology of (EIA2: Farmer and Skouras), 100s of millions to a few billion euros a year across Europe. Middle of the range number euros 1.33 bn.

- LO providers do not wish to give that away:
 - Raise BAS, lower depth close to touch.
 - They can develop sniping methods to snipe own LO. So *speed* not taken out of equation, speed of market orders picking off stale quotes, perhaps picking off one's own stale quotes: more important to develop speedy LO *and* MO. Only fastest in all domains remain, biggest?
- Most perverse: stale picking off worst when markets are fast, but fast markets are those where liquidity provision is needed most. Plus the disappearance of LO creates more volatility still! No limit order provision around announcements.
- *Empirical Evidence*. Ltd. In June 2009, ICAP introduced a minimum quote lifespan (MQL) on its EBS platform. These quote requirements set a minimum life of 250 milliseconds (ms) for their five 'majors' (generally currency contracts) and 1,500ms in selected precious metals contracts. Taken down since. Istanbul Stock Exchange.

Order to Execution Ratios

- Shadow and/or pecuniary cost to cancelling, so bring private costs towards social costs and reduce cancellations, reduce data storage cost, IT cost.
- Reduces mainly quote cancellations far from touch, in particular order book more predictable away from touch, reduces quote stuffing.
- Eg LSE Millennium system, for example, has message-throttling constraints which limit the total number of messages that can come down a registered users pipes over a 30-second timeframe, plus 500/1 ratios for stocks, ETFs and ETPs.

Costs and Risks

- Many cancellations are legitimate and/or beneficial:
 - Execution algos split large orders into many smaller ones. If strategy reconsidered, lots of cancellations.
 - Arb and Stat Arb exploits relationships across assets and markets, so if one leg does not execute, all others cancelled. If one is a market index, lots of cancellations.
 - Cancellations when pinging for hidden liquidity inside spread (market efficiency).
 - Orders away from touch now costly, so may not get placed, so LOB less deep. Especially in fast markets where more orders maybe cancelled closer to touch and would need to be cancelled more anyway.

Evidence

- No published academic studies.
- Friederich and Payne (EIA18) investigates the effect of the introduction of an OER penalty regime on the Milan Borsa on 2 April 2012. The authors' preliminary findings are that liquidity (spreads and depth) worsened as a result of this policy measure. They also find that the effect is more pronounced in large stocks, although they acknowledge some issues with their methodology.
- Anecdotal evidence suggests that the LSE message policy gave rise to new patterns of trade in low-priced stocks.
- LSE experimented with changes in pricing May 4, 2010, among other measures, the threshold for the high usage surcharge for FTSE 350 securities changed from of 100/1 to a ratio of 500/1. Frequency of LOB updates nearly doubled for a few months as a result before coming down again. No proper scientific investigation of these effects.

Notification of algorithms

“[17.2] An investment firm that engages in algorithmic trading shall at least annually provide to its home Competent Authority a description of the nature of its algorithmic trading strategies, details of the trading parameters or limits to which the system is subject, the key compliance and risk controls that it has in place to ensure the conditions in Paragraph 1 are satisfied and details of the testing of its systems. A competent authority may at any time request further information from an investment firm about its algorithmic trading and the systems used for that trading.”

- For this to be useful, it has to be done properly
- Doing it properly is likely to be extensive, hence expensive
- Other industries (e.g. aero) do it differently

Further Key Mitigants

- Standards e.g. clock-synch for consolidation of audit trails.
- Systemic global coordination of regulatory measures.
- Learn lessons from other safety-critical industries.
- Make surveillance of financial markets easier.
- Develop tools for automated monitoring and forensic analysis.

Many thanks for your attention!