

Darren Toulson, head of research, LiquidMetrix explains to Best Execution how to dissect an order to see what is really going on.



Do HFTs really ‘Game’ buy-side orders?

In recent years, a significant proportion of liquidity provision and trading on lit markets, usually estimated to be around 40% of matched volumes in Europe, is conducted by ‘HFT’ firms.

A common buy-side complaint is that the trading styles and strategies of HFT firms exacerbate the market impact of ‘real’ orders being sent to the market, making it difficult for them to access lit liquidity without being ‘gamed’ by faster HFT participants. This fear has led to an ‘arms race’ with increasingly elaborate algorithms, faster connections and faster machines being used to slice orders and hide intent when accessing lit markets.

To what extent are these fears justified?

Example: SOR order

We’ll look in detail at the lit market reaction to a

specific buy-side order. The example chosen here is typical of the behaviour seen when analysing thousands of similar orders.

The order in question is a ‘SOR slice’ executed in a Swedish stock by a London-based algorithm. The order’s target volume is too large to execute with a single aggressive order at EBBO on one venue and so was split into chunks and sent aggressively, and simultaneously, to 3 London-based MTFs (CHIX, BATE, TRQX) and the primary Swedish market.

The entire algorithm executed over a period of 58ms and resulted in over 70 individual fills at different price levels on different execution venues.

So what happened?

The diagram opposite shows all on-book offer liquidity (this was a buy order) available on CHIX/TRQX/BATS/BURG/XSTO at the first millisecond of

the SOR order. Each rectangle represents a piece of resting liquidity on a lit venue. The background colour depicts the venue.

The volume text colour shows what happened to the available liquidity over the next 58ms as the SOR slice executed:

- Black: the SOR algorithm successfully 'hit' the liquidity; for instance, the SOR algorithm successfully hit all of the London MTF liquidity at 174.1.
- Orange: the liquidity was pulled (cancelled) before the aggressive orders sent by the SOR slice reached the venue. So, at the first price level of 174.1, 7 out of 11 of the resting orders on Stockholm were cancelled just before the SOR orders could execute.
- Red: another market participant sent an aggressive order that executed ahead of the SOR slice. In other words, it was 'stolen' by a faster participant.

What's striking about this picture is the amount of red / orange activity. There is nothing special about the timing of this order; market activity on this stock in the seconds preceding the order was negligible.

So to tell the story of what happened with this SOR slice:

- The first orders sent by the SOR to London MTFs successfully hit their targets.
- HFT liquidity providers, reacting to these trades, immediately cancelled most of the orders resting on XSTO. This implies that the HFTs were able to react to the executions on London and send messages to cancel orders in XSTO faster than time taken for the SOR orders to reach Stockholm.
- Other HFT market participants (not necessarily the same firms) aggressively traded 'in front' of the SOR slice.
- A similar story unfolds as the SOR order executes further down the book.

The analysis

What does this example tell us? Firstly, it illustrates the degree to which liquidity and trading really do react at millisecond timescales. Buyside orders

KEY - Status

Cancelled

Stolen

Missed

Our hits

KEY - Trading venues

= BURG

= XSTO

= BATE

= CHIX

= TRQX

= XHFT

		180	979	500	400
		300	600	600	1,374
		833	604	400	159
		500	1,000	2,865	400
		731	200	300	500
		590	609	99	500
		914	400	2,180	62
		600	200	400	597
		750	200	700	691
		387	126	198	500
		400	398	200	300
174.2	24,264	600	491	500	1,036
		500	250	500	1,000
		1,000	726	300	600
		600	500	71	500
		400	300	600	400
		234	207	500	600
		180	605	1,099	714
		790	600	300	500
		597	750	600	390
		200	700	300	81
		653	600	200	300
		400	390	600	
174.1	16,984	600	411	600	500
		600	500	500	1,046
		1,000	250	1,000	500
		300	763	570	500
		600	400	300	246
		497	750	700	600
		400	551	200	600
		400	250	250	600

Diagram: Orderbook across all venues showing orders available at the beginning of the SOR trade

attempting to access such liquidity must be precise in their timing and sequencing otherwise they may be 'gamed'.

However, it also demonstrates that much of the resting liquidity on lit venues is currently being provided by HFT players. The improvements in average spreads and liquidity seen when MTFs appeared in Europe may well be in part due to such HFT liquidity providers feeling able to offer tight prices as long as they can "dodge the falling knife" when they see large incoming buyside orders.

Finally, what of current proposals for minimum 500ms resting times? This rule would primarily target the 'orange' HFT liquidity providers, i.e. those trying to avoid adverse selection but who do add liquidity. It would do nothing to prevent, and in fact would encourage, aggressive (red) HFT activity using lower latency to trade ahead of slower participants.

Perhaps not the regulators' intended target? ■