

High-Frequency Trading around Large Institutional Orders

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Main Idea and Findings

There are many theories about HFTs (suppliers of liquidity, fee collectors, legalized front-runners, etc). The paper studies trading behavior of HFTs around large institutional orders.

The hypothesis tested here is that HFTs trade against order flow first and with it later. On average, the implementation shortfall is 7.4 bps or \$2,860 per bet:

- 7.4 – 2.9 bps if against-wind HFTs;
- 7.4 + 4.7 bps if with-wind HFTs.

Comment #1: Data

- NASDAQ-OMX, Swedish stocks (LOB, 65% of volume);
- Time period from Jan 2011-Mar 2013;
- Mandatory HFT reporting;
- 5,910 large meta-orders of 4 large institutions;
- Each meta-order has 135 child orders, 4% ADV, \$2M, 4 hours.

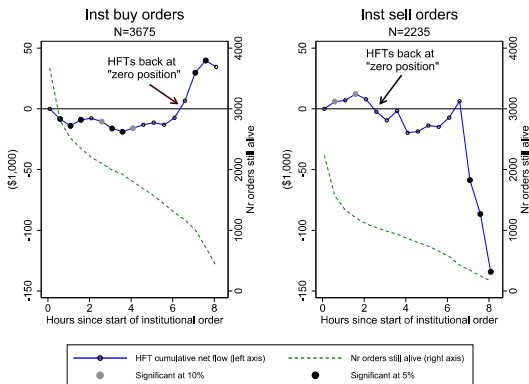
No need in HFT identification. Typical institutional trades. Power of tests? (shortfall 7.4 bps with $SE = 1$ bps ($= 50/\sqrt{5910}$)).

Comment #1: cont'd

Since the datasets are non-standard, add more detailed description and more information on data sample:

- Add more descriptive stat for the sample (volume, vola, avg prices, spread, tick size etc) to compare with other markets;
- What is behavior of traders during normal times; also, add more info on strategies, e.g. std of intraday inventories, half-lives, cross-correlations.

Comment #2: HFTs' Inventories



“The results are inconsistent with front-running in the sense of HFTs who detect a large long-lasting order right from the start trade along with it”. “HFTs not only unwind their positions when they detect a long-lasting order, but trade along with it”.

Comment #2 -cont'd

- This is not "apple-to-apple comparison," e.g. add results on how HFT trade during 8-hour orders.
- What are "zero-level" inventories? Patterns before time 0? Different interpretations? If HFTs start with positive positions for buys or negative positions for sells, then front-running?
- How do results depend on proxies for HFT's existing inventories? Check whether HFTs' "switching points" correspond to times when HFTs' inventories hit their typical boundaries. (Caution: trades in other markets)
- In placebo tests, contemporaneous volume and returns are affected by order itself. Match on pre-event characteristics, otherwise results are difficult to interpret.
- HFTs inventories \$20K (volume \$20M per day), while large orders are \$2M. Similar to 75K vs 2K contracts during flash crash in SP&500 E-mini. Who provides the rest of liquidity?

Comment #3: Implementation Shortfall

“HFTs against-wind flow lowers trading costs whereas HFT with-wind flow increases it”:

$$IS = -2.9 \cdot \frac{Q_{HFT}}{Q_{LI}} \cdot I_{against} + 4.6 \cdot \frac{Q_{HFT}}{Q_{LI}} \cdot I_{with} + 6.4 \cdot \frac{Q_{LI}}{V}.$$

This is a somewhat obvious result, since conditioning on the sign and size of *contemporaneous* HFTs' trades.

But it is also difficult to interpret, because shortfall (without opportunity costs! endogeneity issue) is regressed on scaled Q_{HFT}/Q_{LI} and Q_{LI}/V .

Cross-sectional patterns in costs may interact with cross-sectional patterns in Q_{HFT}/Q_{LI} and Q_{LI}/V .

Comment #3 - cont'd

- Robustness checks to other specifications of cost model, e.g., non-linear price impact, fixed costs;
- “Spreading the order over a longer horizon reduces execution costs”. Most likely true, but endogeneity? Expensive orders executed faster or cancelled?
- Instruments like spare HFTs' capacity interacted with Q_{LI}/V ?
- Issue with clustering by day-stock.

Conclusions

HFTs may be too small and don't affect costs much. The patterns of their trading may relate to characteristics of large orders (size and speed) and market conditions, so difficult to get clean results.

Despite many difficulties, studying how the market accommodates large orders is an important research agenda.

It is good that the focus is slowly shifting to studying large traders LFTs, who probably play much more important role in financial markets than HFTs.