Interactions among High-Frequency Traders

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Objective

- Analyse trading activity and **cross sectional interaction** of individual **HFT firms**,
  - correlation among strategies
  - related price impact

- Investigate whether correlation of strategies lead to:
  - improvement of price efficiency and liquidity
  - price pressure in turbulent periods.

Data and Methodology

- Data:
    - trades from ZEN database, with timestamp at second level and **submitter identity**;
    - quotes from Bloomberg for the **20 largest stocks of FTSE 100** (LSE) from September to December 2012

- Methodology:
    - **high-frequency Vector Autoregression (VAR)** and a set of **Granger Causality tests** on pooled data to address correlation and possible causation between HFTs and IBs strategies.

Main Findings

- HFT:
    - Positive temporal order flow dependence among HFTs, but negative among IBs
    - Strategies are correlated across stocks, in terms of order flow and volume.
    - permanent price impact
- IB:
    - Negative temporal order flow dependence
    - price reversal effect

Comments

Correlation between strategies has been already highlighted by Chabout et al.(2014) for the forex market.

- What is the additional contribution of the paper on that?
- Why the behaviour of HFT should be different for the stock market?

Comments

Commonality in the behaviour of HFT could give rise to price pressure, due to:

- Commonality in the algorithms HFT are using
- Uniformly more efficient in processing information

Disentangle among the two hypothesis by looking to HFT profits given the nice dataset you have (with submitter identity)

Comments

Daily data analysis contradict the high frequency results:

Table 3 coefficients of relative capital allocation (RCA) and aggressive ratio are negative:

$\Rightarrow$ **HFT put less capital** and are **less aggressive** when other HFTs are heavily trading on that stock.

$\Rightarrow$ How could be that if their trades are correlated?

Comments on HF analysis

- **Order flow**: the variable is defined as the "*difference between aggressive buy-volume and aggressive sell-volume*" but it is not very clear how this variable behaves through time, through stocks, and if it is different between the two categories (HFTs and IBs).
  => More info should be provided

- IBs are **both brokers and Market Makers**.
- HFTs and a part of IBs could present a similar behaviour as Market Makers or liquidity providers
  => a deeper analysis of this aspect could be particularly useful

Comments

- For example:
  - Interaction between HFTs and IBs: **how often they trades between each others**

- What is the distribution and the average size of a single trade for HFTs and IBs? Usually HFTs trade very **small quantities** and this lower volume might be reflected in the order flow variable.

Price Impact of HFTs (i)

An OLS regression shows that the price impact is permanent for HFT

This result could be due to:

- Strong **autocorrelation** of the return for this frequency. The lag dependent variable has not been included in the OLS

- High lead-lag correlation between order flows and stock returns

Price Impact of HFTs (ii)

The OLS regression may face endogeneity issues like:
- is the stock return pattern that drives HFT behaviour, or
- HFT moves the price?

Electronic trading makes stock markets more efficient by enabling them to react more quickly to new information

What is the role of news here? And the impact of changing volatility?

Conclusion

Very interesting paper!

Enjoy reading it!

Thank you