

Analysis of the behavior of High Frequency Traders on Euronext Paris

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Opposite perspectives on High-frequency trading :

- **The good perspective** : high-frequency trading increases liquidity in the markets and allows for lower market volatility.
- **The bad perspective** : high-frequency trading is harmful for liquidity : when speed differentials between traders exist, adverse selection may increase and liquidity may become more expensive.



- Many other questions still surround the high-frequency trading activity.

⇒ **Analyze recent data in order to provide an objective answer.**

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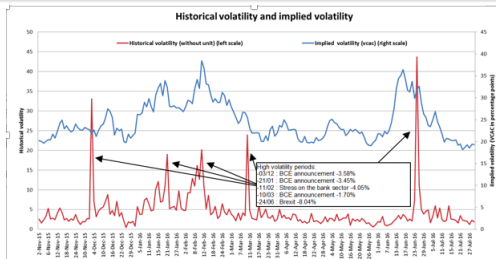
Introduction (1) : overall view of the analysis period

Data Description :

- CAC 40 values (on Euronext) from November 2015 to July 2016.
- Actors classified as HFTs = Supplemental Liquidity Provider (SLP) members + HFTs identified by the AMF classification.

Volatility measures :

- The implied volatility (VCAC) .
- The historical volatility .



The Plan

- Analysis over a 9 month period
 - Liquidity provision : market depth and spread
 - Day to day trend
 - Intraday trend
 - Trading activity : turnover and aggressive/passive behaviour
 - Day to day trend
 - Intraday trend
 - Focus on high volatility days
 - 24th of June 2016 : Brexit announcement
- This descriptive approach provides a comparison between the HFTs behaviour and that of a 'traditional' market maker.
- Note : this is a descriptive analysis reflecting the current situation in the French market alone.

The macroeconomic announcements and events hours :

- 09 :00 : French market opening, after the fixing..
- 11 :30 : European figures.
- 11 :45-12 :00 : CAC 40 Futures and Eurostoxx 50 prices Fixing , on the 3rd Friday of each month (expiration).
- 13 :00 : Consumer confidence figures (Germany) and monetary policy decisions (UK).
- 13 :45 : ECB announcements.
- 14 :30 : ECB press conference and U.S. figures.
- 15 :30 : American market opening.
- 16 :00 : U.S. figures.
- 17 :30 : Last continuous trading exchanges before the closing fixing.

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Liquidity provision

Liquidity indicators

- Market depth : the average cumulative amount of the first 3 best bid / ask limits.
- Spread : the bid ask spread.

What could be expected from MMs?

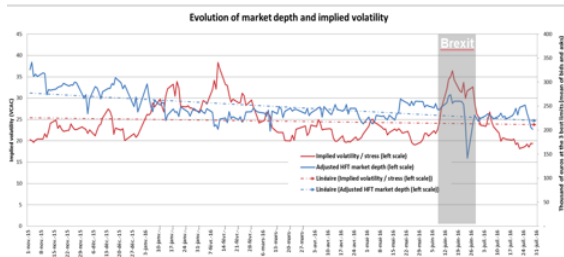
Since most HFTs are/or claim to play the role of market makers, we would expect :

- A high presence of HFTs in the LOB.
- A high influence on the bid ask spread.
- HFTs could avoid these high volatility periods, or in opposite, they could remain present in the LOB since some of them receive rebates (SLP member).

Liquidity provision : day to day evolution (1)

Evolution of market depth compared to volatility :

- Market depth and implied volatility follow an opposite trend during the period.



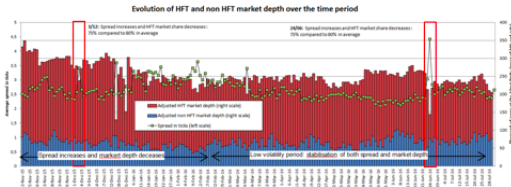
Liquidity provision : Day to day evolution (2)

Evolution of market depth :

- Over time, liquidity provided by HFTs seems to be proportional to overall market depth : 80% of the overall liquidity.

HFTs have a strong impact on the spread :

- HFTs participate in reducing the spread : they are at the best bid or best offer price 91 % of the time over the trading day.



Presence in the LOB	Market Share	Amount
At the best limit	70,8%	40 826 €
At the best 2 limits	77,3%	122 084 €
At the best 3 limits	79,3%	224 774 €

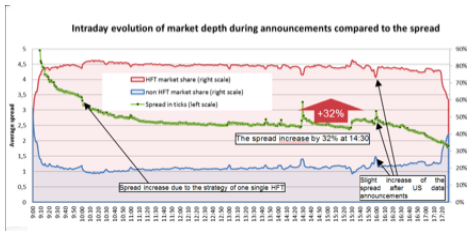
Liquidity provision : Intraday evolution

Intraday behavior of HFTs is very different from the one of non HFTs :

- Non HFTs behavior is relatively constant over time.
- HFTs strongly reduce their liquidity provision before announcements and events.

HFTs activity strongly influence the spread :

- Before announcements HFTs strongly reduce their liquidity provision. It leads to a larger spread.



Our findings :

- HFTs are highly present in the LOB : almost 80%.
- HFTs highly influence spreads.
- Attempts of imposing mandatory presence for HFTs during announcements have been fruitless : MifiD 2 provides broad scope for LOB absences.

Indicators :

- The turnover : HFTs market share.
- The aggressiveness : the aggressive/passive ratio .

What could be expected from MMs?

Since most HFTs are/or claim to play the role of market makers, we would expect :

- A market share less than 50%.
- An aggressive/passive ratio less than 50% .

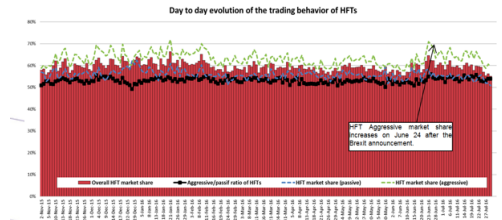
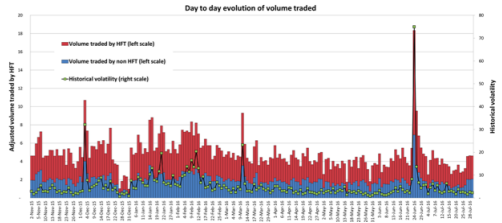
Trading activity : day to day evolution

Evolution of turnover :

- HFTs activity in terms of turnover is relatively constant over time, it represents 60% of overall trading activity.

Evolution of aggressiveness :

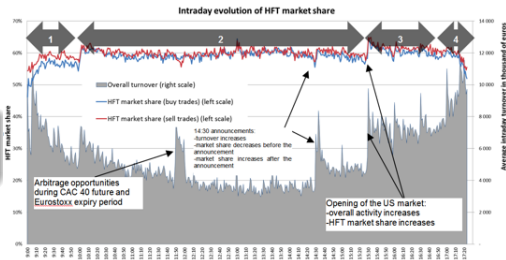
- Aggressiveness is relatively constant over time : aggressive/passive ratio stands at 53%.



Trading activity : intraday evolution

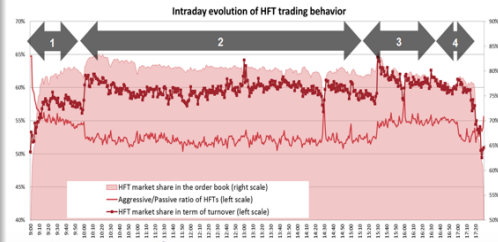
Evolution of turnover :

- Turnover : the 'U shape'.



Evolution of HFTs trading activity :

- Aggressiveness increases around announcements : less passive trades due to less market depth before announcements, and more aggressive trades due to high volatility after announcements.



Our findings

- HFTs market share stands at 60%.
- HFTs are more liquidity consumers than providers; this is accentuated after the U.S. financial markets opening (the aggressive/passive ratio increases from 52% to 55%), and during announcements and events (the aggressive/passive ratio can reach 60%).

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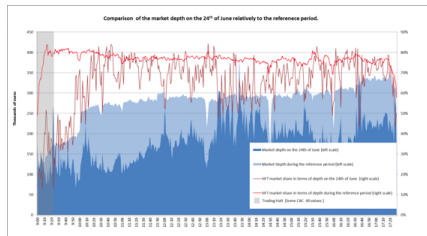
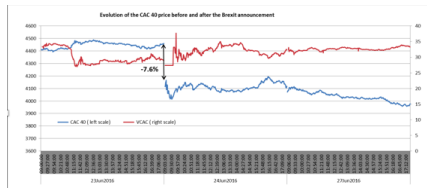
June 24th : Brexit announcement (1)

Context :

- Contrary to predictions, Britain decided to leave the EU.
- Decision took place before the market opening .
- The CAC 40 index opened down 7.6% and some CAC 40 stocks were suspended (trading halt) till 9 :20.
- Reference period : from June 7th till June 23rd .

Impact :

- Market depth shrank : at the beginning of the day, it was 45% lower than for the reference period, and 33% lower for the rest of the trading day.



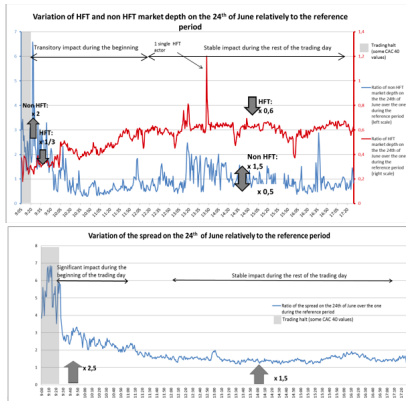
June 24th : Brexit announcement (2)

Impact on market depth :

- Non-HFTs supported liquidity by entering very large orders in LOB.
- HFTs reduced liquidity provision by almost 40% over the day.

Impact on spreads :

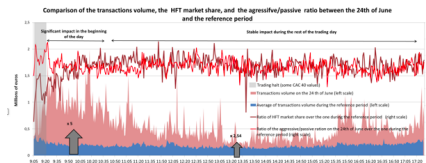
- Spreads increased.



June 24th : Brexit announcement (3)

Impact on trading activity :

- Transaction volume increased.
- HFT market share shrank by 20% for the reference period at the beginning of the day, and 8% higher for the rest of the day.



	Beginning of the day compared to the reference period	The rest of the trading day compared to the reference period
Overall market depth	45% less	33% less
HFT liquidity provision	x 0,33	x 0,6
Non HFT liquidity provision	x 2	x 0,5/ x 1,5 (x1 in average)
Spread	x 2,5	x 1,5
Transaction volume	x 5	x 2,5
HFTs Market share in volume	20% less	8% more
Aggressive/passive ratio of HFTs	30% more	5,7% more

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Conclusion

- The presence of HFTs in the market couldn't be judged by "good or bad" : it's a double edged sword.

