HFT and Algo Regulatory Framework

Regulation of High Frequency Trading ("HFT"), algorithmic strategies ("algo") and co-location facilities ("colo") continues to be a topic of discussion for many regulators, exchanges and trade bodies. Papers discussing these topics have been released in countries such as China, India and Japan. A wide variety of rules, regulations & market structure changes are being considered, with aims ranging from ensuring fairness across market participants, to decreasing volatility, market interruptions and potential manipulations. This paper discusses some of the proposals put forward recently, considers the potential for market impact and the lessons that can be learnt from markets which have already implemented HFT & Algo restrictions.

Undesirable behaviour can manifest through either electronic algorithms or through manual order placement and it is important to understand which behaviours are specific to technology, and which are independent of delivery method. In view of the issues that have arisen in global markets where there is high usage of algos, global regulators have been giving thought to the differences within HFT strategies. Please find below an extract from a report published by the U.S. Securities and Exchange Commission, titled “Equity Market Structure Literature Review Part II: High Frequency Trading” following the flash crash of 6th May 2010, published in 2014.

<table>
<thead>
<tr>
<th>HFT Strategy</th>
<th>Description</th>
<th>Effect on Market Quality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Order Anticipatory</td>
<td>Seek to ascertain the existence of a large order to trade ahead of and capture a price movement</td>
<td>May create artificial price distortions leading to market impact</td>
</tr>
<tr>
<td>Momentum Ignition</td>
<td>Initiate a series of orders and trades in an attempt to ignite a rapid price movement either up or down</td>
<td>May create artificial price distortions leading to market impact</td>
</tr>
<tr>
<td>Latency Arbitrage</td>
<td>Capitalize on market data latency differences in an attempt to profit from quote transitions</td>
<td>Removes liquidity at more attractive prices</td>
</tr>
<tr>
<td>Rebase Arbitrage</td>
<td>Capitalize on rebate arb situations by capturing high rebates in one venue and simultaneously unwinding at another venue at a lower fee</td>
<td>Competes with passive orders, but does help reduce spreads</td>
</tr>
<tr>
<td>Statistical Arbitrage</td>
<td>Capture pricing inefficiencies between related products or markets. E.g., Trading ETF and underlyng basket of stocks</td>
<td>Adds liquidity across a number of products. Ex) Trading ETF vs. underlying basket</td>
</tr>
<tr>
<td>Passive Market Making</td>
<td>Submit passive resting orders that provide liquidity at specified prices, typically at the NBBO</td>
<td>Adds liquidity and keeps spreads competitive</td>
</tr>
</tbody>
</table>


From this, it can be seen that some strategies such as passive market-making, perform a legitimate and valuable service to the broader market by providing liquidity, which in turn helps reduce volatility and decreases implicit costs through efficient price formation. Equally, other strategies such as momentum ignition should be viewed as abusive given they may look to manipulate market prices.

The need for fair dissemination of market data has also come to the fore in the HFT discussion. It is important to be clear on the differences between latency in order submission versus latency in post-trade information published to the market (referred to as “the tape”) which was originally designed for everyone to see at the same time. The tape should provide the whole market with the pricing information upon which
market participants base their order submission decisions. If a limited universe or sub-set of market participants are able to access the tape before others and then utilise that information to trade ahead of others, (described above as “order anticipatory”) it could be said that this is a form of inside information – i.e. information that should be public is being provided to a subset of the market on a preferential basis. All market participants should be able to access the tape equally and fairly on a reasonable commercial basis.

Below we highlight our thoughts on the range of proposals set out by regulators recently.

**Minimum Resting Time for Orders**

Introduction of a ‘Minimum Order Resting Time’ would dis-incentivise participation in the price discovery process and provision of liquidity to the market, by exposing the orders in the resting period to HFT strategies and thereby potentially increasing the risk of market abuse.

It would also reduce the ability of market participants to efficiently route orders between regional exchanges, increasing the likelihood of poor execution as the actual execution price may differ from the published price at the time of the routing decision, due to the minimum resting time.

**Frequent Batch Auctions**

The Taiwan securities market operates this way with stock trading every 5 seconds. Using such a model in other markets may bring some liquidity benefits, dependent on specific market factors such as trade size. Trade size across Asia varies and we note that India currently has one of the lowest trade size in the region at 145 shares - even compared with markets that have similar or higher levels of retail participation such as China A shares (85% retail and 5,061 shares average trade size1), Australia (35% retail and 700 shares average trade size) or Hong Kong (20% retail and 5,703 shares average trade size).

One benefit of slowing down the market from continuous trading could be an increase in liquidity available at a given point in time which in turn could reduce price impact. Where there is greater liquidity there is more efficient price formation meaning all market participants suffer less price impact (often referred to as “slippage”).

As an example, we have looked at market volumes of Nifty50 index constituents during 5th to 11th August 2016 trading. The cumulative volume in number of shares that trades currently in 5 seconds, 1 second and 500 milliseconds buckets can be seen in the below table.

<table>
<thead>
<tr>
<th>Average Volume</th>
<th>% of Day's volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>5s</td>
<td>204,271</td>
</tr>
<tr>
<td>1s</td>
<td>40,869</td>
</tr>
<tr>
<td>500ms</td>
<td>20,451</td>
</tr>
</tbody>
</table>

Source: Thomson Reuters, Deutsche Bank Analytics

Operation of batch auctions in this market at a frequency of 20-30ms may not increase available liquidity to all market participants, but in fact mean that liquidity available may be lower than 0.002% of full day’s volume.

Where auctions are being considered we suggest that attention need be given to the auction time frame, given longer auctions may be more effective in aggregating liquidity. Market structure statistics for APAC markets can be seen below.

APAC market microstructure summary

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>CHINA</td>
<td>60.26%</td>
<td>160%</td>
<td>100%</td>
<td>-</td>
<td>-2%</td>
<td>-9%</td>
<td>10</td>
<td>5,031</td>
<td>18%</td>
<td>86,370</td>
<td>19,193</td>
</tr>
<tr>
<td>JAPAN</td>
<td>18.69%</td>
<td>201%</td>
<td>94%</td>
<td>19.8</td>
<td>4%</td>
<td>17%</td>
<td>28</td>
<td>1,249</td>
<td>23%</td>
<td>23,569</td>
<td>18,011</td>
</tr>
<tr>
<td>AUSTRALIA</td>
<td>5.36%</td>
<td>67%</td>
<td>63%</td>
<td>0%</td>
<td>1%</td>
<td>12</td>
<td>706</td>
<td>13%</td>
<td>7,665</td>
<td>5,367</td>
<td>30</td>
</tr>
<tr>
<td>SOUTH KOREA</td>
<td>5.90%</td>
<td>103%</td>
<td>190%</td>
<td>21.3</td>
<td>4%</td>
<td>7%</td>
<td>4%</td>
<td>20</td>
<td>96%</td>
<td>7,406</td>
<td>14,402</td>
</tr>
<tr>
<td>HONG KONG</td>
<td>4.12%</td>
<td>25%</td>
<td>97%</td>
<td>16.4</td>
<td>1%</td>
<td>2%</td>
<td>12</td>
<td>5,703</td>
<td>17%</td>
<td>5,412</td>
<td>14,194</td>
</tr>
<tr>
<td>INDIA</td>
<td>2.25%</td>
<td>44%</td>
<td>190%</td>
<td>16.8</td>
<td>6%</td>
<td>3%</td>
<td>6</td>
<td>146</td>
<td>14%</td>
<td>2,959</td>
<td>2,712</td>
</tr>
<tr>
<td>TAIWAN</td>
<td>2.97%</td>
<td>52%</td>
<td>180%</td>
<td>16.3</td>
<td>4%</td>
<td>7%</td>
<td>4%</td>
<td>44</td>
<td>3,939</td>
<td>2,575</td>
<td>8,319</td>
</tr>
<tr>
<td>THAILAND</td>
<td>0.90%</td>
<td>49%</td>
<td>190%</td>
<td>3%</td>
<td>15%</td>
<td>43</td>
<td>10,107</td>
<td>15%</td>
<td>1,296</td>
<td>2,543</td>
<td>0</td>
</tr>
<tr>
<td>SINGAPORE</td>
<td>0.52%</td>
<td>25%</td>
<td>100%</td>
<td>19.4</td>
<td>0%</td>
<td>2%</td>
<td>18</td>
<td>1,993</td>
<td>14%</td>
<td>620</td>
<td>690</td>
</tr>
<tr>
<td>MALAYSIA</td>
<td>0.33%</td>
<td>24%</td>
<td>100%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>18</td>
<td>2,651</td>
<td>9%</td>
<td>369</td>
<td>220</td>
</tr>
<tr>
<td>INDONESIA</td>
<td>0.33%</td>
<td>30%</td>
<td>100%</td>
<td>4%</td>
<td>10%</td>
<td>20</td>
<td>10,250</td>
<td>13%</td>
<td>455</td>
<td>13</td>
<td>0</td>
</tr>
<tr>
<td>PHILIPPINES</td>
<td>0.11%</td>
<td>13%</td>
<td>100%</td>
<td>-</td>
<td>11%</td>
<td>14%</td>
<td>15</td>
<td>5,117</td>
<td>16%</td>
<td>163</td>
<td>1</td>
</tr>
</tbody>
</table>


Where markets are fully transparent and all orders are displayed, market participants who are looking to acquire a stake equal to a large proportion of the daily, or even multiple days, volume can only send a small portion of the full quantity to the market, otherwise they risk having significant market impact due to the thin order book. Introducing auctions at reasonable time intervals could increase trade size and so encourage participants to show more liquidity than they are currently, albeit at lower levels than markets where there are alternate liquidity mechanisms for wholesale investors. We would recommend further study to consider the balance between aggregation of liquidity and a high enough frequency of order submission points to allow for full order quantity to execute.

Experience from the New York Stock Exchange and the London Stock Exchange suggests where there is a level of market fragmentation (i.e. more than one venue where a stock can be traded), and there continues to be a choice between continuous trading and auctions, volumes will tend to stay in the continuous market. Applying the same mechanism equally becomes important if a change in behaviours is desired. Synchronising the auctions can also prove difficult – an academic study published by Eric Budish of Notre Dame, titled “Frequent Batch Auctions as a Market Design Response” suggests randomisation of the auction start and end times (say in a 25 microsecond period) can protect the auction price from gaming but he also concludes market fragmentation remains a hurdle.

We also note that if introduction of auctions is only implemented for the securities and not for the derivatives market, it could also increase arbitrage opportunities in the market as information gained from the displayed auction in the securities market is used to position in derivatives.

We also note that introduction of auctions would require significant changes to broking infrastructure and algorithms and so have a high implementation cost. While international brokers can leverage their resources to replicate work done in other markets, domestic retail brokers may not have the same resources or experience and therefore such a change would require a longer time to implement to allow full readiness.

Random Speed Bumps of delays in order processing / matching; and Randomisation of orders received during a period (say 1-2 seconds)

These mechanisms would impact natural price formation and so dis-incentivise market participants from showing liquidity. Delaying the order execution by the introduction of a speed bump would not dis-incentivise HFT activities but only delay their execution by the specific time period and so just push the issue back by the length of the bump time, whatever the delay.
Introduction of random speed bumps may impact the ability of institutions to use Smart Order Routers ("SOR") that allow routing of institutional orders between regional exchanges to access liquidity at different venues and help provide best execution. Inability to efficiently route orders to the multiple venues will have an impact on overall liquidity of the market.

A venue in Canada (Alpha) introduced randomised speed bumps and many brokers complained that it made simultaneous routing (where a broker equalises the time orders take to reach multiple venues by applying their own speed bump dependent on the physical location of servers) impossible.

**Maximum Order Message-to-Trade requirement**
Setting a cap on orders could dis-incentivise market participants who trade passively and provide liquidity to the market rather than just taking liquidity. As an example, in the case of a stock that's price is going up, a passive liquidity provider will post on the near side of the spread and cancel and re-post on the near touch if the stock price moves up. This leads to high cancellation rates in the event of high volatility. Restricting such market participants by a maximum order to trade ratio could in turn intensify market volatility by reducing liquidity, as market participants have less options to post at the desired price points.

**Order-to-Trade messaging fees**
There are a number of countries that have used pricing as a way to discourage high levels of message traffic. In India, fees associated with excessive order placement have existed since May 2013, and further, the recent introduction of a fair usage levy for multi-leg orders implemented by NSE on futures and options could be a good option to dis-incentivise participants that have high messaging and low execution rates. Hong Kong has some of the lowest levels of HFT in the securities markets due to the stamp tax and post trading exchange level clearing costs. European countries such as Italy and France use Financial Transaction Taxes.

In Australia, the Treasury sets out guidance for the recovery of costs from the market based on a “user pays” basis. When competition was implemented and the alternate venue Chi-X launched, a fee was put on each order message (including order entry, cancellation and trade messages) which had the effect of reducing the number of unexecuted orders as it made such strategies uneconomic. As per the Australian Securities and Investment Commission’s ("ASIC") model, the cost of surveillance is distributed amongst market participants in proportion to the number of messages each sends to the market during each quarter. This fee is recovered by the exchanges and forwarded to ASIC to be utilised for further enhancement of surveillance infrastructure.

The Australian model was based on the positive experience of Canada when such a model was introduced by the regulator IIROC in 2010. A “Message Processing Fee” is levied on each marketplace and the broker pays their regulatory fees based on the number of messages that are received from the market place or sent by the broker. The interesting thing about the Canadian model is that the charge is calculated at end of month and distributed based on message market share so you can’t predict the fees. For example, if IIROC fees are $12 billion annually, $1 billion would be distributed at the end of the month based on how many messages each trading venue and broker processed or submitted as a percentage of the total market messages. If only 1 message was submitted by 1 broker, that broker would pay the full $1 billion that month. As it isn’t predictive, strategies that look to avoid a specific cap, or distribute messages across multiple market member IDs, do not help avoid the charge.

The effectiveness of pricing out strategies rather than specifying levels of order to execution ratios deserves strong consideration. Such deterrents would not require system-build, meaning time to market can be immediate with low or negligible additional cost to those that have low levels of order submission.

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2 [https://www.nseindia.com/content/circulars/FAOP32600.pdf](https://www.nseindia.com/content/circulars/FAOP32600.pdf)
Separate queues for colo orders and non-colo orders (2 queues)
This may encourage the relocation of exchange members’ servers to immediately outside the co-lo facility or area of proximity, in order to gain the proximity advantage without being identified as co-lo. These participants would continue to have latency advantage over investors that have their servers at further distance locations or different cities, so if the objective is to equalising access for all participants, the goal will not be achieved. For example, if average round trip time (i.e. the sending of the order and receiving the exchange acknowledgement back) for co-located market orders is as low as 0.2-0.35 milliseconds and non co-located orders can take up to 1 millisecond, independent of splitting the order queues, orders sent from the co-location centre will still continue to execute ahead of non co-located orders.

The time to get an order to market has always been a race - but that race should happen on a level playing field to give all competitors a fair environment. Or in other words, market competition should allow those that invest in the technology to send in orders faster but the tape should be equally available to all.

The cost for the exchanges and all market participants in implementing separated queues would likely be significant, and depending on the specifics of implementation may either have very little positive impact to the market and in fact have the unintended consequence of reducing market volumes and liquidity.

Review of Tick-by-Tick data feed
Equal access to tick by tick data creates a level playing field for all market participants, if the data is distributed real-time and at low cost. Delaying this information may lead to co-located participants increasing their activity and increasing the benefits to those using low latency strategies versus those watching the tape to pick an entry point. Additionally, if dissemination of market data is slowed, the opportunity for market abuse could increase as if there is a time interval delay to the market data, it would give unfair advantage to market participants who are trading within the delay period as they get fill messages back showing the last traded price. So rather than level the playing field it would actually give HFT an even greater advantage and may gain even more market share.

Minimum execution quantity (“MEQ”)
Making a MEQ order type available to market participants can allow investors to set a floor for the trade size that can be executed versus a single counterparty. This is an effective way of prevent HFT strategies ‘fishing’ for large orders by trading in small size, potentially at an uneconomic price, purely to seek out the quantity behind. Using this order type can be voluntary so market participants can time the roll out as they choose on the exchange technology supports it.

Queue priority for orders that choose to apply a minimum resting time
There is some consideration in the US of giving priority to orders that are willing to rest for a minimum time. NASDAQ has proposed an Extended Life Order and the Toronto Stock Exchange is currently supporting a Long Life Order. IEX will also likely propose some sort of variation on queue prioritisation as well. Rather than just move the whole queue back 500 ms, it may prove more effective to think about how to give longer-term liquidity priority within the queue.

Aggregating orders in direct data feeds at each price level
IEX is going to do this on their direct data feeds at all price levels (they now only provide top of book data, but will begin to provide depth of book data as well soon). Therefore HFTs won’t be able to see their queue priority. They will simply know that they are 100 shares of the 5000 displayed at top of book, with no view into where within that queue they rest. This should help with some of the HFT strategies that race for queue priority. They will still look to be first, but you won’t see the cancellation of the order flow that is lower in the queue, because the market maker won’t have visibility into their queue position. Reducing

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Cancellation ratios would take some of the pressure off the load in the systems and so improve the stability of the platform.

Registration
Registration of algo strategies is already in place in some markets and has been suggested as a way to improve transparency. The CEO of the OSE in Japan stated in July 2016, that more information is needed about HFT and suggested that registration of HFT firms or the strategies used by these firms, are options which should be considered. Providing the framework around registration is timely and any information obtained as part of the registration process is kept confidential, then registration can represent a relatively unobtrusive monitoring mechanism which has the potential to improve market transparency for regulators.

Conclusion
We believe that improving market equality is a desirable outcome for all. Each of the above options present challenges, some more than others. We encourage rule makers to look carefully at the microstructure of their market before making changes. Much knowledge can be gained from looking at the experiences of other trading venues however this information must be considered in the context of those markets and cannot always be transposed onto another market with the same effect. Lastly it is important to clearly define the end objective driving the need for change and to assess whether the proposed change actually achieves the desired objective without unintended consequences.
Further reading

Japan

In 2014, the Tokyo Stock Exchange (“TSE”) released a paper on HFT which concluded that HFT contributes to liquidity and smoother price formation. The paper noted:

1) That most HFT orders are placed during market hours and provide liquidity:

![Shares of HFT and conventional orders by price (Jan. 2013)](image)

2) That more HFT orders than conventional orders were “make” order type, which provides liquidity:

![Ratio of “make” order value in HFT and conventional trading](image)

In 2015, Japan’s Financial Securities Agency (“FSA”) mentioned HFT in their annual report for the first time.

In 2016, the FSA surveyed brokers, asking what HFT services they provide and released a paper noting that it was considering policies to address:
- Potential for HFT to increase market volatility.
- Potential for inequality between HFT and retail.
- How to ensure stock prices better a firm’s fundamental value.
- Ensuring an appropriate order to trade ratio for HFT.

JPX ‘Analysis of High-Frequency Trading at Tokyo Stock Exchange’

JFSA Paper (Japanese)
[http://www.fsa.go.jp/singi/singi_kinyu/soukai/siryou/20160419/03.pdf](http://www.fsa.go.jp/singi/singi_kinyu/soukai/siryou/20160419/03.pdf)
India

2015 saw three letters from whistle blowers relating to the co-location facility in India:

1) Instances of shorter cables in the co-location centre.
2) Steps to be taken by Securities and Exchange Board of India (“SEBI”) to prove manipulation.

In August 2016, SEBI released a consultation paper on co-location and algorithmic trading “Strengthening of the Regulatory framework for Algorithmic Trading & Co-location”, which looked to address concerns relating to market quality, market integrity and fairness.

Proposals suggested by SEBI within this consultation paper were:
- Minimum order resting time
- Frequent intra-day batch auctions
- Random speed bumps
- Randomisation of orders
- Maximum order-to-trade ratio
- Separation of queues for co-lo and non co-lo orders
- Review of tick-by-tick data feed

In August 2016, the ‘Indira Gandhi Institute of Development Research’ presented a study at a conference in India which analysed the impact of HFT and algo trading on NSE microstructure. Key findings and extracts from the presentation follow.

1) Non algorithmic trading participants have equal share in trades, indicating that algorithmic trading does not crowd our non-algorithmic trading.
2) Cancellation rates have increased significantly from 2009 to 2013. Notably, less than 8% of fast order cancellations occurred at best price, with the majority cancelling away from best price.

Order cancellations on Spot and SSF market in 2013:

<table>
<thead>
<tr>
<th></th>
<th>Spot</th>
<th>Futures</th>
<th>Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>2013</td>
<td>2009</td>
<td>2013</td>
</tr>
<tr>
<td>Algo</td>
<td>12.42</td>
<td>62.19</td>
<td>39.18</td>
</tr>
<tr>
<td>Traded</td>
<td>3.91</td>
<td>12.37</td>
<td>1.59</td>
</tr>
<tr>
<td>Cancelled</td>
<td>8.31</td>
<td>49.73</td>
<td>37.52</td>
</tr>
<tr>
<td>Non Algo</td>
<td>87.58</td>
<td>37.81</td>
<td>60.82</td>
</tr>
<tr>
<td>Traded</td>
<td>56.11</td>
<td>25.69</td>
<td>14.17</td>
</tr>
<tr>
<td>Cancelled</td>
<td>21.75</td>
<td>7.24</td>
<td>44.88</td>
</tr>
</tbody>
</table>

Position of fast cancelled orders in the order book in 2013:

<table>
<thead>
<tr>
<th>Placemnt</th>
<th>Market cap quartiles</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Q1 (Highest)</td>
</tr>
<tr>
<td><strong>Panel A: Spot</strong></td>
<td></td>
</tr>
<tr>
<td>At best price</td>
<td>2.47</td>
</tr>
<tr>
<td>Upto top 2 or 3</td>
<td>5.46</td>
</tr>
<tr>
<td>Upto top 4 or 5</td>
<td>5.59</td>
</tr>
<tr>
<td>Beyond top 5</td>
<td>23.31</td>
</tr>
<tr>
<td>Total</td>
<td>36.83</td>
</tr>
<tr>
<td><strong>Panel B: SSF</strong></td>
<td></td>
</tr>
<tr>
<td>At best price</td>
<td>3.66</td>
</tr>
<tr>
<td>Upto top 2 or 3</td>
<td>8.19</td>
</tr>
<tr>
<td>Upto top 4 or 5</td>
<td>9.83</td>
</tr>
<tr>
<td>Beyond top 5</td>
<td>48.37</td>
</tr>
<tr>
<td>Total</td>
<td>70.05</td>
</tr>
</tbody>
</table>

SEBI ‘Strengthening of the Regulatory framework for Algorithmic Trading & Co-location’

NSE ‘Charges for Multi-Leg Orders’
https://www.nseindia.com/content/circulars/FAOP32600.pdf

Whistleblower letter, Jan 2015

Whistleblower letter, October 2015

SEBI’s conclusions of co-location consultation, May 2015
http://www.cbs.db.com/new/docs/DB_GMS_APAC_Issue37.pdf, Pg 36
Australia

In 2015, the Australian Securities and Investment Commission (“ASIC”) published a review of high-frequency trading and dark liquidity. The review concluded that current levels of HFT and dark liquidity were not adversely affecting Australia’s markets.

Findings from ASIC’s paper note:

1) HFT users make up a small fraction of total market users (less than 0.5%), which is consistent with 2012 findings.

Key statistics on high-frequency trading:

<table>
<thead>
<tr>
<th>Measure</th>
<th>Equities</th>
<th>SPI</th>
<th>Bond futures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trading accounts</td>
<td>&lt;0.5%</td>
<td>2%</td>
<td>4%</td>
</tr>
<tr>
<td>Turnover</td>
<td>27%</td>
<td>21%</td>
<td>14%</td>
</tr>
<tr>
<td>Number of trades</td>
<td>31%</td>
<td>25%</td>
<td>24%</td>
</tr>
<tr>
<td>Number of orders</td>
<td>47%</td>
<td>30%</td>
<td>40%</td>
</tr>
</tbody>
</table>

2) In general, both high-frequency traders and other market users are capable of managing orders over extremely short time intervals.

Average resting time (milliseconds) in market order books:

3) In early-2012, order to trade ratios in the vicinity of 1000:1, were not uncommon. Such high levels are now rarely and, when seen, are indicative of a malfunctioning algorithm rather than a deliberate strategy. In Q1 2015, the average order-to-trade ratio for high-frequency traders was 13:1.19 which suggests a marked reduction in excessive order entry, and is a level which ASIC is comfortable with.
Average order-to-trade ratios for high frequency traders and other market users

ASIC Review of high frequency trading and dark liquidity

Australian Government ‘Cost Recovery Guidelines’

China

In August 2015, the China Securities Regulatory Commission (“CSRC”) proposed draft Program Trading rules for their market (Chinese only). CSRC defined Program Trading with as:
- Entering more than 5x, 5 orders per second a day.
- OR > 2000 orders per day

The draft rules suggested that strategies may need to be registered and algo source code may be requested. A net buy quota could apply to onshore proprietary business and that there would be increased surveillance on frequent order submission or cancellations

Visit CSRC website for full details on the proposed rules -

United States

SEC ‘Equity Market Structure Literature Review - Part II: High Frequency Trading’

The high-frequency trading arms race: Frequent batch auctions as a market design response by Eric Budish, Peter Cramton and John Smith
https://faculty.chicagobooth.edu/eric.budish/research/HFT-FrequentBatchAuctions.pdf

Deutsche Bank

APAC Market Structure Newsletter Issue 42, July 2016
https://autobahn.db.com/microSite/docs/DB_GMS_APACNews_Iss42.pdf
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