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IS AUSTRALIA *HFT-friendly?*

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Stephen Satchell's paper 'An assessment of the social desirability of high-frequency trading', in this issue of JASSA examines the costs and benefits, and highlights some empirical evidence on the impact of HFT on market quality and welfare. Building on Satchell's paper, this paper provides a perspective on HFT in the Australian market and identifies the factors influencing its attractiveness to HFT players. It also compares the US and Australian markets in terms of these factors to indicate the growth prospects for HFT activity in Australia.

How prevalent is HFT?

HFT has become a dominant form of trading in many equity markets around the world. The US Securities and Exchange Commission described high-frequency trading (HFT) as 'one of the most significant market structure developments in recent years'. Despite its dominance, data restrictions prevent direct measurement of the volume of trading attributable to HFT. However, market estimates suggest that HFT represents a substantial portion of trading. In March 2012, the *Financial Times*¹ reported that HFT accounted for 55 per cent of trading in the United States (US), 38 per cent in Europe, 28 per cent in Japan, 18 per cent in Canada, and 5 per cent in Asia (excluding Japan).

Consistent with other markets, it is not possible to directly identify HFT in the Australian market. There are some firms known globally as HFT players that have recently become ASX and Chi-X participants.² Trades executed by these firms can be easily identified in the trading data. However, there are other HFT firms that are not direct participants of either ASX or Chi-X. These firms trade through other brokers. It is not possible to separate the trades of these firms from other non-HFT clients using publicly available data. Therefore, it is not possible to determine the overall level of HFT activity in Australia with any certainty. However, conversations with brokers in Australia suggest that the current level of HFT in Australia is around 15 to 25 per cent of trading. This is substantially higher than the 3 to 4 per cent estimate reported by the Australian Securities Exchange (ASX) in February 2010.³

Is Australia an attractive market for HFT?

There are several factors that make a market attractive to high-frequency traders. These include: fragmented markets; the use of low-latency trading systems; low explicit trading fees; high liquidity; small tick sizes; and trade-through protection.

These factors help to explain the variation in the level of HFT in different markets and provide some insights into the extent to which HFT might grow in Australia in the future. The US equity market exhibits the highest level of HFT in the world and is considered to be an extremely HFT-friendly market. The US is therefore used as a reference point for examining how Australia measures-up on these factors.

Fragmented markets

When multiple venues trade a single security, liquidity becomes fragmented across these venues. This fragmentation offers high-frequency traders the opportunity to exploit pricing inefficiencies across these venues. HFT acts to reconsolidate liquidity across the different trading venues. Competition between venues also puts downward pressure on exchange trading fees, which is also important for HFT strategies.

The level of fragmentation in the US markets is extreme. There are more than 10 exchanges and over 50 Alternative Trading Systems. This provides a very attractive environment for HFT firms.

In Australia, there are now three exchange venues: ASX TradeMatch, Chi-X (launched October 2011) and ASX PureMatch (launched November 2011). Trading on

Chi-X and PureMatch is limited to the S&P/ASX 200 stocks and some exchange-traded funds (ETFs). Chi-X accounts for approximately 5 per cent of the dollar volume traded in ASX-listed equities while PureMatch has failed to gain traction with participants.⁴ This fragmentation provides trading opportunities for HFT but to a more limited extent than the fragmentation in the US markets.

Low-latency trading systems

HFT strategies depend on being able to trade in and out of positions very quickly and therefore require trading venues offering low-latency trading systems. The large number of orders and trades associated with HFT strategies also requires large capacity systems. Some market participants suggest that if latency is above 10 milliseconds⁵ HFT strategies are more difficult to implement.

All of the major equities markets in the US offer low-latency trading systems. They continually compete with one another to offer faster and better trading technology.

The ASX upgraded its trading technology in November 2010. This technology offers latency down to as little as 300 microseconds and increased the trading capacity to exceed 5 million trades and 500 million order book changes per day. In addition, ASX launched a high-speed distribution network (ASX Net) and enhanced co-location facilities (ASX Liquidity Centre). These changes have made the Australian market more attractive to HFT players.

Like ASX, Chi-X offers a very low-latency platform. The combination of competing exchanges and lower-latency trading systems has made the Australian market a much more attractive venue for HFT.

Low explicit trading fees

Because HFT strategies generate low margins, it is important that low costs are achieved while executing these strategies. In the US markets competition on trading fees has been intense. The growth in HFT has also been aided by maker-taker pricing where differential fees are charged to parties providing and demanding liquidity. Typically, liquidity providers are offered a rebate rather than charged a fee for providing liquidity to the market. In some cases, the situation is reversed and liquidity demanders are offered a rebate. The rebates paid by exchanges are particularly important for electronic market-making strategies as they supplement the spreads earned by the liquidity suppliers. In the US, trading fees and rebates are charged on a cents per shares basis. This means that in low-priced stocks, the rebates offered can be extremely high relative to the tick size and price of the stock. Rebates have fuelled growth in HFT activity in the US.

In Australia, competition for trading services has also brought with it lower trading fees. ASX reduced its headline trading fee from 0.28 bps to 0.15 bps in June 2010.⁶ Chi-X offers cheaper pricing with differential fees for providing (0.06 bps) and demanding liquidity (0.12 bps).⁷ Neither exchange currently offers rebates. The absence of rebates is likely to ensure that the level of HFT in Australia remains well below the level in the US.

It is also worth noting that the ASIC supervision cost recovery charges may also put some downward pressure on the level of HFT activity in Australia. The cost of supervision is recovered from market operators and participants, with part of these costs being allocated proportionally based on the number of trades and messages generated by them. This therefore provides an economic incentive for participants to reduce the number of messages sent to the market.

High liquidity

Low margins mean that HFT strategies require high levels of turnover in order to be profitable. As a result, these strategies are employed most frequently in liquid markets and in liquid stocks. Trading in less liquid stocks incurs much greater risk as it may be more difficult and costly to manage inventory and adverse selection risk in these stocks. This, combined with the fact that Chi-X currently only trades S&P/ASX 200 stocks and ETFs, means that we would only expect to see substantial HFT activity in these stocks.

Small tick sizes

Tick size is a very important factor for implementing HFT strategies.⁸ Small tick sizes provide high-frequency traders with more price steps at which to place orders and to find arbitrage opportunities. Having small tick sizes also helps to manage risk at tighter pricing increments.

In the US, minimum tick sizes are set at one cent for all stocks. The average stock price in the US is approximately \$30 resulting in a very small average relative tick size of 0.03 per cent. This small increment facilitates HFT.

In Australia, ASIC has mandated a consistent tick size across all exchanges. The tick sizes vary with stock price, with a minimum tick size of one cent for all stocks priced above \$2. The average stock price in Australia is substantially lower than the US at around \$3, which means that the relative tick size for the average stock is approximately 10 times higher than the equivalent statistic for the average US stock. HFT activity is likely to be more prevalent in high-priced stocks than in low-priced stocks in Australia.

Trade-through protection

Trade-through protection means that orders displayed at the best price cannot be traded-through. Market orders must be routed to the market displaying the best price. This rule is helpful for HFT firms using electronic market-making strategies as it ensures that the limit orders they post in displayed markets are protected when they are at the best prices. Regulation NMS in the US markets provides trade-through protection. This rule contributes to the high level of HFT activity in the US.

The Australian market does not offer trade-through protection. The best execution requirements set out in the Market Integrity Rules allow institutional investors to make trading decisions based on factors other than price. This will reduce the level of HFT relative to the US.

Conclusions

The Australian equity market exhibits a number of high-frequency friendly characteristics. The relatively recent upgrade of the ASX trading system and co-location facilities, the launch of Chi-X and reduction in trading fees has attracted and will continue to attract new HFT players and new HFT strategies. However, the lack of rebates and trade-through protection is likely to mean the level of HFT activity in Australia will not grow to the levels that have been observed in the US market.

While it is not possible to identify HFT players in the Australian data, with the market becoming more HFT-friendly, it would be feasible to analyse the changes in the characteristics of trading activity in the Australian market. This type of analysis would assist in obtaining a better understanding of the impact these changes have had on the market and help to inform debate and regulatory policy. This analysis should be the subject of future research. ■

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Notes

1. The *Financial Times* arrived at these estimates based on surveys and estimations from TABB Group, Celnet and Credit Suisse Advanced Execution Services. Details are available at: <http://im.media.ft.com/content/images/354ca2f6-6722-11e1-9d4e-00144feabdc0.img?width=854&height=693&title=&desc=High-frequency trading graphic>
2. For example, Getco and Virtu Financial became ASX participants on 30 May 2011 and 1 August 2011, respectively. Collectively these participants account for less than 1.5 per cent of the value traded on the ASX in the S&P/ASX 200 companies.
3. 'ASX Review of Algorithmic Trading and Market Access Arrangements', February 2010, available at: www.asxgroup.com.au/media/PDFs/20100211_review_algorithmic_trading_and_market_access.pdf
4. See the Fidessa Fragmentation Index at www.fidessa.com for current market share details.
5. A millisecond is equal to one thousandth of a second. A microsecond is one millionth of a second.
6. 'ASX Fees and Activity Rebates — Market Announcement' available at www.asxgroup.com.au/media/PDFs/20100603_asx_fees_and_rebates.pdf
7. 'Chi-X Trading Fees', available at: www.chi-x.com/resources/au/file/Trading%20Fees%20.pdf
8. The minimum tick size is the minimum price variation for a stock. For example, if the minimum tick size is one cent, then orders must be placed at increments of one cent.