High frequency trading: To let be or to not let be

Some market participants and academics have already concluded that HFT is disruptive and needs to be contained

High frequency trading (HFT) has always been a matter of intense debate. The decibel levels have become much higher in the past few months, thanks to Michael Lewis's recent book, Flash Boys : A Wall Street Revolt.

Berkshire Hathaway Inc.'s Charlie Munger told CNBC in early May "(HFT) is the functional equivalent of letting rats in a granary. No, I don't like it." In the same interview, Microsoft Corp.'s Bill Gates, also a Berkshire Hathaway board member, said that it doesn't seem like HFT firms add much value "because when you really need the liquidity, it's not guaranteed to be there." Gates added, wisely, "I'm not an expert on it…"

Of course, in some other circles, there has been a far more informed debate. Craig Pirrong, a professor of finance and energy markets director at the Bauer College of Business, University of Houston, wrote in his blog in early April, "The debate (over the book) is generating more informed commentary than the book itself."

A few days after Pirrong's post, Nobel laureate Joseph Stiglitz jumped in. Presenting a paper at the Federal Reserve Bank of Atlanta's 2014 Financial Markets Conference, he said, "We have identified a number of potentially significant adverse effects of too active markets… Much of the argumentation of those who advocate unfettered markets relies on focusing on intermediate variables (volume of trade) or concepts alleged (improvements in price discovery), the effects of which on welfare are typically not established. We have suggested, by contrast, that in the relevant sense, (unfettered) markets may be neither more informative nor more liquid. … Less active markets can not only be safer markets, they can better serve the societal functions that they are intended to serve."

One of Stiglitz's main quibbles is that the so-called improved price discovery that comes because of more active markets does not lead to better resource allocations. "Those making real decisions, e.g. about how much to invest in a steel mill, are clearly unlikely to be affected by variations in prices within a nanosecond. In that sense, they are fundamentally irrelevant for real resource allocations."

This criticism isn't new. In early 2012, Securities and Exchange Board of India (Sebi) chairman U.K. Sinha had asked what social purpose was being served by reducing trading time to a few microseconds. According to Asia Risk magazine, Sinha had said at the time that Sebi may consider speed limits on HFT, although the regulator decided against it later. Interestingly, some academics and some market infrastructure providers now believe that the solution to contain the risks of HFT has to do with containing the

speed with which they access the markets. It's still early to say if these new exchange models will be successful, but more on this later.

'Stealing information rents?'

Stiglitz says in the paper that high frequency traders have an informational advantage because they observe not only prices but also order flow. By doing this, they eat into the profits of those who have "spent resources to obtain information about the real economy. (Thus, HFT) can be thought of as stealing the information rents that otherwise would have gone to those who had invested in information… (And) if the returns to investing in information are reduced, the market will become less informative."

Pirrong, who publishes a blog called Streetwise Professor, agrees that HFT affects the incentives to collect information. But he also argues in his response, "(Stiglitz) implicitly assumes that the information produced by non-HFT traders is, in fact, fundamental information that would improve decisions. But many of the informed traders who HFT firms sniff out are producing information that does not improve any economic decision on any margin. Getting better information about an impending earnings report can be very profitable, but revelation of this information doesn't improve decision making." (In the real sense, one might add.)

An obvious example is the trading behaviour of hedge fund Galleon Group, whose founder has been indicted for insider trading. If anything, HFT firms would have done the marketplace a service by neutralizing the informational advantage of such firms. Some other so-called informed traders, such as index funds and exchange-traded funds, bring nothing to the table either, when it comes to improving decision making on resource allocation.

Pirrong argues that it should be recognized that some so-called informed trading is rent seeking and socially wasteful, and can hence be charged of having the same impact on the markets as what Stiglitz accuses HFT firms of. "Stealing of information rents by HFT," he says, "can be a feature (of the marketplace), rather than a bug… Once one recognizes that much informed trading is a form of rent seeking—the point that Hirshleifer made over 40 years ago—most of Stiglitz's objections to HFT dissolve… It is impossible to sustain the critiques of HFT, because even if there are rent seeking aspects to HFT, it also can reduce other forms of rent seeking."

But isn't all this too theoretical? (Pirrong, in fact, says in an earlier blog post that the moralistic argument that HFT affects returns of informed traders, is theology, not economics/finance.)

Pros and cons

What does economic literature say about the benefits/ill-effects of HFT? Much of the early literature on the subject, at least the papers with the most citations, said that algorithmic trading (AT) and HFT (a sub-set of AT) improved market quality.

Terrence Hendershott, Charles Jones and Albert Menkveld said in a paper published in the Journal of Finance that AT improves liquidity and enhances the informativeness of quotes. Joel Hasbrouck and Gideon Saar, in a paper published by the Journal of Financial Markets, wrote that low-latency activity (read HFT) improves traditional market quality measures such as spreads, depth and volatility and that they need not work to the detriment of long-term investors.

Jonathan Brogaard, then at the Kellogg School of Management, Northwestern University, wrote that HFT firms add substantially to the price discovery process and may in fact reduce volatility.

Alain Chaboud et al studied the impact of AT in the foreign exchange market and concluded that it contributes to a more efficient price discovery process, has a small, but positive impact on market liquidity and that there was no evidence that AT causes excess volatility.

After the flash crash in mid-2010, Andrei Kirilenko, Mehrdad Samadi, Albert S. Kyle and Tugkan Tuzun, all of whom were associated with the Commodity Futures Trading Commission (CFTC), studied the role HFT played in the crash. The paper is better known for the conclusion that HFT did not trigger the flash crash, and is often quoted by HFT enthusiasts. But it didn't eulogize HFT either—they said HFT's contribution to higher trading volumes may be mistaken for liquidity by fundamental traders; they may compete for liquidity and amplify price volatility. They concluded, "We believe that technological innovation is critical for market development. However, as markets change, appropriate safeguards must be implemented to keep pace with trading practices enabled by advances in technology."

Soohun Kim and Dermot Murphy find that estimates of effective bid-ask spreads can be underestimated owing to the HFT trend of splitting large orders into multiple small orders. Adjusted for this phenomenon, they find that little has changed with respect to liquidity from the late to early sample periods.

Researchers such as Bruno Biais of the Toulouse School of Economics have pointed to so-called dark arts of some HFT firms such as stuffing, smoking and spoofing. Adam D. Clark-Joseph of Harvard University, using confidential trading data in the E-Mini S&P 500 futures market, concluded that HFT firms engage in a form of market manipulation called "exploratory trading". In sum, academics are divided about whether HFT is beneficial to the marketplace or whether they are harmful.

What about market stability?

In January, Sebi hosted leading HFT researchers including Kirilenko and Brogaard. The latter concluded his presentation by saying that equity market quality has improved in the last 20 years and that evidence suggests that technological innovation has partially caused the improvement. But he added these sobering thoughts: "Researchers still have to look at the difficult-to-study questions—a) Is there evidence of increased frequency of crashes?

and b) Is there a trade-off for mean improvements at the expense of increased tail events?"

Anecdotal evidence suggests that the frequency of crashes has increased. After the flash crash, sudden sharp drops in prices, followed by an equally quick recovery in prices are termed mini flash crashes. Eric Scott Hunsader, founder, Nanex LLC, which aggregates data from US exchanges and disseminates it to clients, points to such mini flash crashes and alleged price manipulations by HFT nearly every day. HFT enthusiasts dismiss all of this as a conspiracy theory. But as James Angel, a finance professor at Georgeton University told Bloomberg News last November, "I don't think his analysis is always correct… (But), the reality is, there's still some blemishes around the edges (in our markets) that can and should be addressed. And he draws attention to them."

Slowing down HFT

Some market participants and academics have already concluded that HFT is disruptive and needs to be contained. The hero in Lewis's book, equity trading platform IEX, which is ironically a dark pool—a private exchange, not accessible by the investing public—has introduced a barrier to contain the speed edge of HFT firms. Three trading platforms in the forex space, including ICAP's EBS and Thomson Reuters Matching, are trying different methods to slow down HFT. EBS aggregates orders received in a three millisecond time-frame and then randomizes their place in the queue. In other words, the first order to arrive at the trading platform may not necessarily be the first to get executed, hence minimizing the need for ultra-fast speed. EBS tried the new method with one currency pair last year, before introducing it in its most active contracts this year.

It must be noted, however, that in the forex market, large banks are still highly influential and might well be having a say in the market design adopted by forex trading platforms. The entry of HFT firms in the space has already cut their share of profit; unfettered access to HFT firms will cause profits to fall further.

In the equity markets, HFT is understood to work against the interest of institutional buy-side firms. Retail investors have no reason to complain—on the contrary, they've never had it as good, with bid-ask spreads being narrower than ever and liquidity being more than adequate for small order flows. But the institutional buy side isn't as organized or influential as a group as large banks are in the forex market. Hence, adaptation of a market design that slows down HFT may not happen naturally. Of course, there may be a few exceptions such as IEX, but it remains to be seen whether the venue attracts adequate liquidity, or if market participants prefer the status quo—i.e. unfettered access.

'An arms race'

Eric Budish, Peter Cramton, and John Shim have written in an interesting paper that the current market design with a continuous limit order book is flawed. The market, they say, "does not really work in continuous time, as market correlations completely break down at high-frequency time horizons. This correlation breakdown creates frequent technical

arbitrage opportunities, available to whomever is fastest, which in turn creates an arms race to exploit such opportunities."

The arms race, according to them, "is not only socially wasteful (expenditure), but also results in higher costs by investors via wider spreads and thinner markets." They propose uniform-price sealed-bid double auctions, conducted at frequent but discrete time intervals, e.g., every one second, as an alternate market design.

Cramton said in an email that conducting frequent batch auctions will reduce the incentive to race by several orders of magnitude—by a factor of 1,000 for a trader with a millisecond advantage operating in a market that batches orders every one second. "There will be a shift from a competition for speed to competition on price and on smarts. Traders (will still have an opportunity) to get ahead; (but) by developing smarter algorithms, not faster algorithms, and offering better prices. This improves pricing and overall market quality."

Since the auctions are proposed to be conducted every second, most investors will not miss the benefit of a continuous market. Besides, a sealed-bid auction, which according to the authors will remove the possibility of gaming, will also mean that exchanges will not be disseminating huge data feeds and technology investments can become more rational.

Frequent batch auctions may well be a solution that addresses the current arms race for speed, while at the same time encouraging smart algorithmic trading. And since a majority of market participants aren't interested in price discovery happening at the frenetic pace of microseconds (see this video by Nanex), the slowing down may well be beneficial. Of course, as Pirrong would say, unless there is proof that HFT causes market instability, an assertion that too fast is not good is only a moralistic argument.

On the other hand, as an India-based professor of finance puts it, we won't know how the frequent batch auctions system will work and what externalities it may cause until it's actually tried out. He advocates the Chicago tradition of markets themselves providing solutions to the problems and needs of the marketplace.

All told, the jury is still out. The HFT debate may have become more informed, but work still needs to be done in the area of market stability and how the trade-off on that front weighs against the benefits that proponents say HFT brings. Having said that, considering how heated the debate has become and given the various vested interests, it seems unlikely that even a seminal paper on HFT will cause either side to budge.

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