

# DEBATE: The True Impact of HIGH-FREQUENCY TRADING

## HIGH-FREQUENCY TRADING CREATES MARKET UPSET

By Robert Young

High-frequency trading (HFT) has inhabited the market for more than a decade, but only during the last couple of years has it become a subject of intense scrutiny, both in Canada and around the globe. Today, HFT—which allows traders to use advanced algorithms and systems to make trades in milliseconds and profit on millions of transactions—is part of the common parlance on Bay and Wall streets.

Different types of HFT strategies exist. Not all of these strategies are bad for the market, but some take advantage of information leakage (the ability to access trading information before others), providing a good return for a few technologically advanced investors at the expense of the millions of people who invest their savings with professional money managers.

HFT emerged in the public realm quite abruptly with the May 2010 Flash

Crash, when the U.S. Dow Jones Industrial Average briefly lost almost 1,000 points before rebounding almost 600 points in a very short period of time. It got even more attention when financial author and commentator Michael Lewis asserted in his recent book, *Flash Boys*, that the “market was rigged” by high-frequency traders.

The emergence of HFT ultimately changed market dynamics. Previously, the market was mostly made up of retail investors (individuals who buy and sell shares on their own behalf) and institutional investors (large asset managers investing in large size on behalf of pensioners). Both groups typically trade shares based on the fundamental principle of buying or selling according to their view of the underlying value or promise of a company.

However, with the rise of HFT, a larger number of arbitrageurs—traders looking to exploit market inefficiencies—are now added into the mix. In general, these types of traders diverge from retail and institutional investors because they buy and sell shares in a way that is completely

disconnected from a company’s underlying value and fundamentals.

When describing HFT specifically, Mary Schapiro, former chair of the U.S. Securities and Exchange Commission (SEC), described the practice as having “very little to do with whether you think IBM’s got a great business plan and solid earnings growth in its future and a lot more to do with what’s the minuscule aberrational price move that you can take advantage of.”

One of the most common examples is momentum-type arbitrage trading strategies, in which traders look for signals from large institutional orders in

## HIGH-FREQUENCY TRADING IMPROVES MARKETS

By Douglas Cumming

High-frequency trading (HFT) provides four main benefits to markets. It improves the efficiency of the market by providing liquidity and lowering trading costs. It improves price discovery (the process of finding where prices equate demand and supply). It reduces systematic risk in markets and reduces the likelihood of flash crashes. And it reduces market manipulation, thereby improving market integrity. These benefits are based on empirical studies involving massive data sets carried out by academics without any preconceived bias or stake in their outcomes.

All available data indicate market efficiency, in terms of trading costs (such as bid-ask spreads), has gone down with the presence of HFT, while trading volume has gone up. The effect has been large. For instance, a 2011 study by T. Hendershott, C. Jones and A. Menkveld shows a narrowing of bid-ask spreads by roughly 50%.

This means it’s cheaper for all traders, whether human or machine, to trade on

exchanges with high-frequency traders. Empirical evidence has also shown HFT reduces market fragmentation and enhances price discovery. For example, a 2010 study by J. Brogaard shows HFT quotes add substantially to price discovery and contribute more to price discovery than non-HFT quotes. A further study by Brogaard, Hendershott and R. Riordan in 2013 finds high-frequency traders trade in the direction of permanent price changes and against transitory price changes; incorporate public information more quickly; and incorporate limit order imbalances in trades. These effects are beneficial to both institutional and retail traders, reducing trading costs, reducing temporary price pressure and limiting intraday volatility.

Consistent with evidence of improved market efficiency, evidence shows high-frequency traders reduce systematic risk in markets. For example, a number of studies show high-frequency traders reduce the likelihood of flash crashes and do not increase or contribute to them. In a 2013 study, J. MacIntosh explains this was even the case with the May 2010 Flash Crash, for example, which is often misattributed to high-frequency traders. Further, S. Groth’s 2011 study finds high-frequency traders do not withdraw from markets during periods of high volatility, and this finding is consistent with studies from Brogaard (2010) and Brogaard et al. (2013). Also, A. Golub et al. in 2012 show 68% of mini flash crashes were caused by intermarket sweep orders—not high-frequency traders.

Market quality, in terms of the absence of manipulation, has gone up with the presence of HFT. For example, a recent study by M. Aitken et al. in 2013 shows end-of-day prices were substantially less distorted in stock markets around the world after HFT entered those exchanges.

Aitken et al. examined closing price manipulation in 22 stock exchanges

Evidence shows high-frequency traders reduce systematic risk in markets

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the market. As a result, when money managers bring orders to buy or sell big blocks of shares to trading venues specializing in the execution of much smaller orders (such as the TSX), they camouflage the orders by dividing them into multiple smaller trades. This often creates an imbalance of supply and demand discernible to high-frequency traders with advanced technology. At times, it results in volatility and market impact costs, which hurt long-term institutional investors and the fund investors they represent.

Proponents argue HFT has provided increased liquidity for markets, which, in turn, has tightened spreads and been a boon for retail investors. However, better liquidity and tightened spreads can be overstated, as many high-frequency traders post and cancel their orders in rapid succession.


Ironclad quantitative studies on the impact of HFT—either wholly negative or positive—have been elusive. But if high-frequency traders are making millions by being the fastest, there is a counterparty on the *other* side of those trades.

In a recent Liquidnet survey of more than 100 traders from around the world, more than half (57%) of respondents said they believe HFT should be a top concern for regulators. And regulatory bodies seem to be listening. For example, the Ontario Securities Commission (OSC) announced earlier this year it may consider measures to regulate HFT as it reviews its market-structure policies, if evidence of predatory activity emerges. The OSC is awaiting the results of a study on the impact of HFT currently being conducted by the Investment Industry Regulatory Organization of Canada. For their part, the SEC and regulatory bodies in the EU have both publicly pledged to take a tougher stance on predatory HFT practices.

A host of global proposals have been put forward to combat HFT. Earlier this year, the TMX Group put forward a proposal featuring “speed bumps” to slow down HFT. But these are just Band-Aid solutions. If the industry is to revitalize and bring integrity back to the markets, institutional and retail investors need a place where they can trade freely while

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being protected from the ever-present risks existing in the current equity market system.

High-frequency traders are not doing anything illegal, but they *are* using technology to give themselves a leg-up on institutional investors and the millions of people they represent. HFT benefits the very few at the expense of the many, which defeats the purpose of why a market exists—and, as a result, has lessened the overall quality of the markets. 

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around the world from January 2003 to June 2011. They found high-frequency traders reduced the frequency and severity of end-of-day dislocation or mispricing. The data indicate the probability of end-of-day dislocation declined by at least 20%, and trading value around dislocation events went down by at least 40%. On days where the end-of-day price distortion was more likely to be attributable to manipulation—for example, on days when options expire, or at the end of quarters and the end of the year—the impact of HFT was even stronger: the probability of end-of-day dislocation went down by at least 70%.

Interestingly, the evidence from Aitken et al. considers many other factors curtailing end-of-day manipulation, such as better trading rules occurring on some of the exchanges in the period considered, as well as surveillance to detect such manipulation. The data indicate HFT was more important than trading rules or surveillance in mitigating end-of-day distortions.

This finding is important, since exchanges and regulators spend significant

resources on rule design and enforcement. Enforcement involves computer algorithms to detect unusual trading patterns, as well as a human element. In Canada, Investment Industry Regulatory Organization of Canada (IIROC) staffers carry out surveillance. Enforcement is a vital aspect of ensuring market quality, but evidence from Aitken et al. shows HFT reduces cases—and, therefore, the need to carry out enforcement—because end-of-day manipulation is less common *with* HFT than *without* it.


Rogue traders or market manipulators can use HFT to engage in forms of manipulation other than end-of-day, such as front-running (trading in advance of a client’s orders). Data from large-scale systematic studies of such manipulation, however, indicate no such evidence of front-running from high-frequency traders.

Michael Lewis’s recent book, *Flash Boys*, discusses some examples of front-running by high-frequency traders, but the evidence is not systematic.

Non-high-frequency traders can engage in front-running just like high-frequency traders can—there is no systematic

pronounced evidence of front-running unique to high-frequency traders.

Overall, there is much evidence showing high-frequency traders provide significant benefits to exchanges and their investors in terms of enhanced market efficiency and integrity. It’s easy to focus on the negative elements of HFT, but it’s important not to forget the advantages new technologies such as HFT can provide. One just needs to be able to curtail the human element of rogue traders programming HFT algorithms in ways to manipulate markets and engage in insider trading.

Regulators must keep pace with new technology and trading patterns in the markets. With the high-quality staff and technology at the Ontario Securities Commission, IIROC and TSX, Canadian markets will continue to lead the world in ensuring an efficient and fair venue for investors. 

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