

The Ethics of High Frequency Trading

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Abstract: High frequency trading (HFT) is currently under a cloud of controversy about its negative impact on financial markets. Questions arise over the fairness of the activity. Does HFT put longer-term investors at a disadvantage? This paper describes the most common HFT strategies and analyzes the ethics of HFT from a duty based and utilitarian standpoint, concluding that the ethics must be assessed according to each strategy.

High Frequency Trading (HFT) complicates the work of regulators. The agencies are not always armed with the best tools to identify and demonstrate price manipulation or market abuse. HFT enables the placement of millions of orders on securities like stocks, derivatives and currencies in just a few microseconds. Is HFT an ethical market activity? The question is important, because HFT now accounts for 70 percent of transactions in U.S. markets and 40 percent in European markets.² In HFT, a large number of orders are quickly placed, which can sometimes give a misleading picture of the order book and allow for manipulation. Fraud is difficult to detect, and the person behind it even more so.

What is HFT?

HFT is “the use of sophisticated technological tools and computer algorithms to trade securities on a rapid basis.”³ HFT is characterized by algorithms running a large number of orders on computers without human interference. Many of these orders are almost immediately canceled (60 percent in

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² Source: http://en.wikipedia.org/wiki/High-frequency_trading

³ Source: http://en.wikipedia.org/wiki/High-frequency_trading

the next second and ultimately between 95 and 99 percent). In other words, HFT uses proprietary trading strategies carried out by computers. Unlike regular investing, an investment position in HFT may be held for only seconds or fractions of a second with the computer trading in and out of positions thousands or tens of thousands of times a day.⁴ The goal is to achieve a profit between a buyer and a seller, as at the end of the day the net position is zero or insignificant. Most of the time securities are held for very short time intervals – seven seconds on average. This leads to very low margins on each trade, requiring very high speeds of execution. Therefore, HFT traders install their computers as closely as possible to the mainframes of the platform market to reduce latency, all the while working for their own accounts (proprietary trading) instead of clients and focusing on highly liquid securities.

High-frequency trading has taken place at least since 1999, after the U.S. Securities and Exchange Commission (SEC) authorized electronic exchanges in 1998. At the turn of the 21st century, HFT trades had an execution time of several seconds. By 2010 the time had decreased to milliseconds and even microseconds.⁵ The largest high-frequency trading firms in the U.S. are Getco LLC, Knight Capital Group, Jump Trading, and Citadel LLC. At the end of a day for the HFT, there is no open position in the market. Firms engaged in HFT rely heavily on the processing speed of their trades and on their access to financial markets.

Market Making

Many high-frequency traders provide liquidity and price discovery to the markets through market making. A market maker is a broker-dealer firm that accepts the risk of holding a certain number of shares of a particular security in order to facilitate trading in that security. Each market maker competes for customer order flow by displaying buy-and-sell quotations for a guaranteed number of shares. Once an order is received, market makers immediately sell from their own inventory or seek an offsetting order. This process takes place in mere seconds.⁶ Without market makers, markets do not function as well (fewer transactions, more volatile prices) because there is no guarantee that at any moment, buyers and sellers will be perfectly balanced and spontaneous. Others are making the market without having the status and constraints. Profit derives from the difference between the price at purchase and the price at sale or discounts obtained by marketplaces willing to encourage market makers rather

⁴ Source: <http://www.youtube.com/watch?v=FGHbddeUBuQ> “What is High-frequency trading” Video

⁵ Source:
<http://www.bankofengland.co.uk/publications/Documents/speeches/2010/speech445.pdf>

⁶ Source: <http://www.investopedia.com/terms/m/marketmaker.asp#axzz2DBI9KLC3>

than their competitors in order to provide liquidity to attract investors. It is estimated 50 percent of HFT results from market making activities that are contractual or free.

Another way high-frequency traders provide liquidity and price discovery to the markets is through arbitrage trading – which is the simultaneous purchase and sale of an asset in order to profit from a difference in the price. Arbitrage profits arise from exploiting price differences of identical or similar financial instruments on different markets or in different forms. Arbitrage exists as a result of market inefficiencies; it provides a mechanism to ensure prices do not deviate substantially from fair value for long periods of time⁷. High-frequency traders also use liquidity to manage risk or lock in profits.⁸ They compete with other high-frequency traders on the basis of speed, for very small, consistent profits.⁹ HFTs do not generally compete with long-term investors (who typically look for opportunities over a period of weeks, months, or years). As a result, high-frequency trading has a potential Sharpe ratio (measure of reward per unit of risk) thousands of times higher than the traditional buy-and-hold strategies.¹⁰ Aiming to capture just a fraction of a penny per share or currency unit on every trade, high-frequency traders move in and out of such short-term positions several times each day. Fractions of a penny accumulate fast to produce significantly positive results at the end of every day.¹¹ High-frequency trading firms do not employ significant leverage, do not accumulate positions, and typically liquidate their entire portfolios on a daily basis.¹²

Basic HFT Strategies

Liquidity Provision

Let's look into the different types and strategies of HFT. The main one has to do with liquidity provision. The two subcategories of liquidity provision are (1) market making, where designated firms (such as Getco) commit to providing two-way bid/offer prices in a range of securities, and (2) rebate trading. Market makers profit both from the spread between their posted bid and offer and from rebates the exchange offers for providing liquidity. To gain the highest rebates, they are generally obliged to provide a two-way price for an agreed minimum size

⁷ Source: <http://www.investopedia.com/terms/a/arbitrage.asp#axzz2DBI9KLC3>

⁸ Source: <http://www.counterpunch.org/2010/04/23/computerized-front-running/>

⁹ Source: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1695041

¹⁰ Source: http://www.huffingtonpost.com/irene-aldrige/how-profitable-are-high-f_b_659466.html

¹¹ Source:

http://www.huffingtonpost.com/irene-aldrige/what-is-high-frequency-tr_b_639203.html

¹² Source: <http://sec.gov/comments/s7-02-10/s70210-129.pdf>

in their chosen securities for an agreed minimum time. Rebate traders are firms that are not designated market makers that can still collect rebates at some exchanges by providing liquidity through posting single-sided bids or offers.¹³

Trading the Tape

The second strategy has to do with trading the tape, which is also split into two techniques. First there is filter trading, in which monitored stocks show significant changes in movement and/or volume. Filter trading involves the constant checking of thousands of stocks for mechanical signs of announcement, rumors, and news items. Stocks are identified that meet a threshold level of variance in the rate of change of price, action, and/or volume and are bought/sold accordingly. For example, a news story could cause a spike in price and a large jump in volume, and the algorithm rapidly buys.

The second type of filter trading is called momentum trading. It involves identifying temporary supply-demand imbalances and trading with short-term momentum as equilibrium is restored. Its characteristics involve the ability to overlap with filter trading and the typically very rapid entry and exit in and out of stocks in an attempt to extract small capital gains. For example, the detection of large buying interest creates imbalances, so shares are purchased and held until the price reaches a level where selling pressure creates equilibrium and price action stalls.¹⁴

Statistical Trading

The third main strategy is called statistical trading, which is again split into two sub-categories: statistical arbitrage and technical trading. Statistical arbitrage exploits short-term price differentials across different but correlated instruments (derivatives and their underlying instruments for example, or correlated pairs of stocks). Technical trading identifies patterns to determine entry and exit points based upon specific rules.¹⁵

¹³ Source:
<http://www.hftreview.com/pg/blog/mike/read/5344/high-frequency-trading-strategies>

¹⁴ Source:
<https://www.fibozachi.com/images/stories/TechniciansCorner/WorldofHFT/t3live%20the%20world%20of%20hft.png>

¹⁵ Source:
<http://www.hftreview.com/pg/blog/mike/read/5344/high-frequency-trading-strategies>

Quote Stuffing

Another strategy is called quote stuffing. This trading technique involves stuffing quotations with completely useless orders to force the competition to analyze thousands of orders and thus slow them down. These orders will be ignored by the system and will not run out because of the best coupled purchases/sales. This can give an advantage the HFT employing the strategy because every millisecond counts.¹⁶

Layering and Spoofing

Another strategy is called layering. Access to the order book and its analysis in a very short time makes this strategy possible. For example, selling a package of action at as high a price as possible requires placing a series of orders on a plateau, thus creating layered orders. Once this level is reached, the strategy calls for massive sales while simultaneously cancelling all remaining purchase orders that have been placed. It is based on the hope of filling the order book for purchase by other players before reversing the trend.¹⁷

Another strategy is called spoofing. This technique closely resembles layering, except there is no execution order. The goal is to load the book and withdraw its orders before execution. The strategy is to attract the market by inflating the volume of the order book without any economic reality behind it.¹⁸

Lastly, a separate, inexperienced class of high-frequency trading strategies relies exclusively on ultra-low latency direct market access technology. In these strategies, computer scientists rely on speed to gain minuscule advantages in arbitraging price discrepancies in some particular security trading simultaneously on disparate markets.¹⁹

The Ethics of HFT

Is high-frequency trading ethical? Advocates of HFT state that there's no link between HFTs and market abuse. This is the argument made by Sydney-based Capital Markets Cooperative Research Center, after combing through five years of data spanning 2006 to 2011. The research states that despite the widespread global interest in high-frequency and algorithmic trading over the last

¹⁶ Source: <http://www.investopedia.com/terms/q/quote-stuffing.asp#axzz2DBI9KLC3>

¹⁷ Source:
<http://business.financialpost.com/2012/07/18/canadian-regulator-set-to-get-tough-on-high-frequency-trading/>

¹⁸ Source: http://idei.fr/doc/conf/pwri/biais_pwri_0311.pdf

¹⁹ Source: http://en.wikipedia.org/wiki/High-frequency_trading

two years, there's still a lack of empirical research directly examining the impact of these developments on market quality and integrity. The study also finds high-frequency trading is negatively correlated with end-of-day price dislocation, meaning that more high-frequency trading equals less market abuse.²⁰ The proponents of HFT argue HFT strategies contribute to improving market liquidity. Market liquidity gives investors comfort knowing they can sell their investment at any time without complications. In HFT, according to Seven Pillars Institute, "the amount and volume of the trades using this strategy ensure a liquid market. HFT traders act as makeshift market makers who buy and sell when no one will."²¹ Advocates of HFT also state that HFT improves market efficiency. According to the Seven Pillars Institute, "stock prices already have all public and non-public information priced into them. HFT takes advantage of price discrepancies and arbitrages any discrepancies away. Many believe that narrow spreads mean the market is working better. Without the large HFT trades that take advantage of the market's inefficiencies, there would be larger bid/ask spreads. Consequently, investors may be less satisfied with the prices they get in their trades."²² HFT also enables reduced costs for small investors, since an increased liquidity and market efficiency contributes to decreased trading costs. Finally, HFT increases profitability for traders and creates jobs for them.

However in consequentialism, the consequences of one's conduct are the ultimate basis for any judgment about the rightness of that conduct. Thus, from a consequentialist standpoint, a morally right act (or omission) is one that will produce a good outcome or consequence. In act-utilitarianism, what is believed to be right or wrong is based on the effect or consequence. The greatest good depends on whomever or whatever will benefit the most from the act. What are the consequences of practicing high-frequency trading? High-frequency trading may cause new types of serious risks to the financial system. Algorithmic and high-frequency trading were both found to have contributed to volatility in the Flash Crash on May 6, 2010.²³ The Dow Jones Industrial Average plunged to its largest intraday point loss, but not percentage loss, in history, only to recover much of those losses within minutes.²⁴ After almost five months of investigations, the U.S. Securities and Exchange Commission and the Commodity Futures

²⁰ Source:
<http://www.advancedtrading.com/no-link-between-high-frequency-trading-a/240115325>

²¹ Source: <http://sevenpillarsinstitute.org/case-studies/high-frequency-trading>

²² Source: <http://sevenpillarsinstitute.org/case-studies/high-frequency-trading>

²³ Source:
<http://www.bloomberg.com/news/2010-10-01/automatic-trade-of-futures-drove-may-6-stock-crash-report-says.html>

²⁴ Source: Lauricella, Tom, and McKay, Peter A. "Dow Takes a Harrowing 1,010.14-Point Trip," *Online Wall Street Journal*, May 7, 2010

Trading Commission issued a joint report identifying the cause that set off the sequence of events leading to the Flash Crash, concluding that the actions of high-frequency trading firms contributed to volatility during the crash.²⁵

Another recent complaint against HFT is the one that originated from the U.S. grain industry on November 25, 2012. According to grain industry officials and traders, high-speed computerized traders are disrupting their markets, but grain exchanges and regulators have no quick fix for the concerns. The dispute, which pits grain companies at the Chicago Board of Trade against speculators armed with algorithms and superfast data feeds, echoes protests seen in world stock markets in recent years as old-fashioned arm-waving traders have been replaced by electronic matching of bids and offers on screens. Grain hedgers are sounding the same alarms as other traditional buy-and-hold investors who are pitted against the new high-frequency traders. Traditional investors are critical of HFTs, who dart in and out of markets at lightning speed, narrowing bid-ask spreads and providing liquidity but creating dangerous and unnecessary swings in prices.²⁶ If HFT really produces unhealthy price fluctuations, the activity is unethical, for only the traders experience favorable outcomes from financial gains made from the transactions. Other market players do not benefit but instead, suffer from HFT activity.

In deontological ethics, the morality of an action is judged based on the action's adherence to a rule or rules. It is sometimes described as duty, obligation, or rule-based ethics. There are no rules against high-frequency trading, but deontological principals forbids lying or cheating. According to former Wall Street insider Haim Bodek:

We're cheating. Didn't you know? Everyone knew. HFT trading is predatory, it's disruptive to markets, and it is actually unbeatable without regulatory change. I don't think anybody can compete that's outside of this particular practice, and that's why it's 50 to 70 percent of U.S. market because the diversity of our algorithmic trading tradition have been annihilated by this particular practice.²⁷

For InvestorPlace, high-frequency trading is considered high-tech cheating. They call it skimming by algorithm – and it impairs liquidity and efficiency for real, human investors:

²⁵ Source: <http://www.sec.gov/news/studies/2010/marketevents-report.pdf>

²⁶ Source: <http://www.brecorder.com/agriculture-a-allied/183/1261559/>

²⁷ Source:
http://www.cnbc.com/id/49103708/Ex_Insider_Calls_High_Frequency_Trading_Cheating

It's about time the SEC decided to take on high-frequency trading. There are enough people who already think Wall Street is a rigged game, and HFT tactics are at worst cheating and at best a performance-enhancing drug that hasn't been fully examined by regulators.²⁸

A close analysis of the different techniques used by HFT to turn a profit reveals that most of the techniques, such as the quote stuffing and spoofing methods described earlier, aim at deceiving traders at the other end of the transaction. To deceive people by withholding/falsifying information is to infringe and disrespect the principle that people are rational and make autonomous decisions. These techniques try to sway other traders into making a decision that is detrimental to them. This act constitutes questionable ethics.

As we saw earlier, all HFT traders are working for their own account (proprietary trading) and not for any clients. This implies the motive of HFT is to make profit for yourself – regardless of whether you are producing any value added for others. A virtuous person does not engage in an activity just for the sake of money without giving anything in return to society. A former high-frequency trader states:

I thought I was happy. While the economy was falling apart, I was getting rich and so was everyone around me. Then last spring, the test came back positive -- my wife was pregnant. Suddenly I found myself thinking how I would explain my job to my future daughter. What exactly did I do to make so much money? What exactly was I doing to add value to the world? After two years in high-frequency trading, I could see how little value it actually created. And I saw first-hand it was nowhere near enough to offset the damage it wrought -- where computers create whipsaw volatility and fortunes are made and lost in milliseconds. I knew in my heart that I was nothing more than a leech, regardless of how impressive my trading algorithms were. The brain drain that sucked so many smart and talented people away from noble pursuits and into financial services to earn their fortunes made me question the very foundation of my economic assumptions. I decided to leave the industry and find a new path.²⁹

HFT is accused of a lack of concern for the betterment of society, contributing little of value, and not creating value added.

²⁸ Source: <http://investorplace.com/2012/02/high-frequency-trading-is-high-tech-cheating/>
²⁹ Source: <http://www.marketplace.org/topics/business/commentary/high-frequency-trading-bad-markets-and-soul>

Finally, we may argue high-frequency trading is a form of speculation. None of the religious systems (Christianity, Judaism, Buddhism, Islam) looks well on the practice of speculation/hoarding money in order to make more. Speculation is the act of trading in an asset or conducting a financial transaction that has a significant risk of losing most or all of the initial outlay, in expectation of a substantial gain.³⁰ It is not far away from a sophisticated form of gambling. Many religious traditions take the view that speculation is unethical. If HFT is a form of speculation it too it may be looked upon by some religious traditions as unethical.

Conclusion

HFT's relationship to the market is complex. Each HFT trading strategy needs further detailed and empirical study before any final conclusions are drawn. It is also unfair that HFT has so much room for market misuse and manipulation to favor the traders at the expense of the rest of the players, particularly small investors. Ethical theories demonstrate that some HFT strategies are unethical. The goal is for regulators to closely identify all the specific strategies used in HFT and enforce regulations that is fair not only for HFT traders but also for the majority of market participants, such as small investors, large trading firms, analysts, and brokers.

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³⁰ Source: <http://www.investopedia.com/terms/s/speculation.asp#axzz2DBI9KLC3>