
REGULATING ALGORITHMIC AND HIGH-FREQUENCY TRADES: CAN SEBI'S REGULATIONS DIFFERENTIATE GREEN FROM GREY IN THE INDIAN MARKET SCENARIO?

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ABSTRACT

The Union Budget this year, included a rise in the tax rate on futures and options, iterating the relevance of algorithmic high-frequency trades which are characteristically, driven by the speed and swing of catalytic methods, showing its ever-growing impact in this segment and markets in toto. Tech-savvy traders and investors make money based on the volume and speed of their trades via sophisticated algorithms and computer infrastructure based on the volume and speed of their trades rather than by employing traditional trading techniques. It is latency-sensitive, i.e., executed with a minimal time gap, marked by a rise in daily portfolio turnover and an increase in the ratio between orders and trades. Since several extremely complex algorithms and short-term investment horizons lead to many trading strategies and practices, there is no single definition of HFT. Corporate bigwigs have performed high-frequency trading to top the charts of cut-throat competition levels, which has resulted either in a sudden surge or a nosedive in stock prices. This has most of the time imperilled the position of modest investors, due to its “uncertain” aftermath. Regulating this trading practice thereby becomes imperative and regulators around the world have been working in this direction for years. The securities watchdog, SEBI, has also demonstrated awareness of the risks associated with HFT in India by proactively implementing measures to regulate it. However, the process of developing a robust framework has become a race on an icy track, that requires finding the ideal ratio to foster innovation and maintain market integrity. The paper explains the impact of the HFTs in India and abroad, regulatory aspects, techniques to counter increasing HFTs and the ensuing challenge of drawing a line between such trades executed with and without bonafide objects, when they are driven by Artificial Intelligence (AI), in this era of digital supremacy.

Keywords: High-frequency trades, SEBI, market integrity, digital supremacy

1. Introduction to high-frequency trading

The goal of technological advancement is to lessen human inefficiency and improve human well-being. This function increases market efficiency and gets around human limitations in the stock markets.¹ Before the advent of trading software and the widespread use of computers, the Bombay Stock Exchange located in Mumbai (India), witnessed up to 6,000 brokers and jobbers purchasing and selling stocks in its kidney-shaped ring on behalf of their clients². This continued until the late 90s and 00s. However, in the US, the computer-based HFT system developed in 1983 with the introduction of a purely electronic form of trading³. Soon, thousands of orders flooded the markets and automated programs issued and cancelled tiny orders routed to high-frequency traders within milliseconds known as flash orders.⁴

HFT made up less than 10% of equity orders in the early 2000s. The NYSE reports that between 2005 and 2009, trading volume increased by roughly 164% as a result of a rise in high-frequency trading.⁵ HFT represents nearly 40% of consolidated volume in Europe and roughly 70% of consolidated volume in the United States⁶.

In India, the National Stock Exchange (NSE), the first national market infrastructure institution (MII) founded in 1992, implemented electronic screen-based trading in 1994 and online trading in 2000⁷. The SEBI allowed the provisioning of Direct Market Access (DMA) in 2008 to all the traders trading on the NSE, the first step toward algorithmic trading in India. This attracted many high-net-worth investors to invest in the Indian markets, which was a melting pot, be it Indian investors, FIIs, foreign banks, financial institutions, etc to execute HFTs. Gradually

¹ Armaan Patkar, *Technology Innovations in Securities Trading: Can SEBI's Bicycle Catch the High-Frequency Trading Ferrari*, the Indian Journal of Law and Technology, National Law school repository (2016) <https://repository.nls.ac.in/cgi/viewcontent.cgi?article=1006&context=ijlt>. (Last visited 04 Aug 2024)

² Jagannath Dubhashi, *BSE: A place where just asserting the lift of a finger says it all*, INDIA TODAY. (Jul 31, 1985) <https://www.indiatoday.in/magazine/cover-story/story/19850731-bse-a-place-where-just-asserting-the-lift-of-a-finger-says-it-all-770248-2013-12-27>

³ Irene Aldridge, *High-frequency trading: A practical guide to algorithmic strategies and trading systems*, 2nd Ed, WILEY (April, 2013) <https://www.wiley.com/en-us/HighFrequency+Trading%3A+A+Practical+to+Algorithmic+Strategies+and+Trading+Systems%2C+2nd+Edition-p-9781118343500>. (Last visited 04 Aug 2024)

⁴ Charles Duhigg, *Stock traders find speed pays, in milliseconds*, THE NEW YORK TIMES (23 Jul 2009) <https://www.nytimes.com/2009/07/24/business/24trading.html>

⁵ *Id.*

⁶ Frank Zhang & Stuart Powell, *The Impact of High-Frequency Trading on Markets*, CFA INSTITUTE. <https://www.cfainstitute.org/-/media/documents/article/cfa-magazine/2011/cfm-v22-n2-3.pdf>.

⁷ Anirudh Banerjee, *Evolution of high-frequency trading in India and the impact of regulations on HFT activity*, LINKEDIN (Sept 13 2022). <https://www.linkedin.com/pulse/evolution-high-frequency-trading-india-impact-regulations-hft->

many profit-hungry investors used this opportunity and as a result in 2011, the total HFT which accounted for less than 1% of overall trading volume, grew to 6.3% in 2015 and 14.8% in 2019⁸.

Worldwide, not many industry leaders spoke or entered into any discourse with analysts except Manoj Narang, a New York-based Indian investor who was quite outspoken in this regard. He founded *Trade Worx*, a firm that became active in high-speed trading in late 2008⁹. In one of his interviews, he claimed that using technology to increase scale and efficiency in investment management is what quantitative and algorithmic trading are all about¹⁰. Being among the select few advocates of HFT and a critic of its capacity to manipulate markets, Narang has garnered both acclaim and derision in equal measure.

This way, the concept of HFT spread far and wide, encapsulating the world of stocks and securities. The proof as to how consequential are its effects shall be posited in the further contents of this paper.

2. Relevant cases in India and the US

A. Cases in the US:

Being a hotbed of high-frequency trading, several cases have unfolded in the US, some related to the crimes committed upon its execution. Renowned economist and Nobel Prize laureate-Mike Spencer once stated that high-frequency trading should be banned.¹¹ However, American investors continued to execute trades with higher and higher speed with low regard for the ethics of trade and business. They understood that speed is very vital to any HFT strategy.¹² HF Traders, equipped with cutting-edge technology¹³ looked to transmit an order from their servers to the

⁸ *Id.*

⁹ Herbert Lash, *Exclusive: Trade Worx founder Narang leaves his high-frequency firm*, REUTERS. (Jan 13, 2015) <https://www.reuters.com/article/idUSKBN0KM1Z7/>

¹⁰ “*High-frequency trading: An interview with the Contrarian Quant, Manoj Narang*”, CMC. (Oct 30, 2019) <https://www.cmcmarkets.com/en-gb/opto/high-frequency-trading-an-interview-with-the-contrarian-quant-manoj-narang>

¹¹ Matthew Philips, (2011) “*Should High-Frequency Trading Be Banned? One Nobel Winner Thinks So*”, FREAKONOMICS, (Mar 28, 2011) <https://freakonomics.com/2011/03/should-high-frequency-trading-be-banned-one-nobel-winner-thinks-so/>.

¹² Orlando Cosme Jr, *Regulating high-frequency trading: The case for individual ...* 109 *J. Crim. L. & Criminology* 365 (2019), <https://scholarlycommons.law.northwestern.edu/cgi/viewcontent.cgi?article=7648&context=jclc>.

¹³ Divya Pillai, (2024) *High-frequency trading (HFT) landscape in India*, MEDIUM (Jan 28, 2024). <https://medium.com/@divyaapillai/high-frequency-trading-hft-landscape-in-india-770a682dee33>.

market servers at lightning speeds that match buy as well as sell orders. A while back, each millisecond of reduced latency was worth over USD 100 million¹⁴. High-frequency traders had an advantage over regular investors due to the advanced technology of algorithmic programming and the co-location facility, which discouraged people with limited resources from investing in the markets.¹⁵

Such practices led to serious repercussions, witnessed in the last decade when the Dow Jones average (DJIA) declined 9 per cent in not even 5 minutes, and then quickly rebounded on May 6th, 2010.¹⁶ Over 300 points were lost for the day, 600 in 5min., and almost 1,000 in total, but most of the 600-point drop was recovered in 20min¹⁷. A turbulent event called the “Flash Crash”¹⁸. It was claimed that a prominent trader (Waddell & Reed Financial Inc.) sold a sum of 75,000 S&P contracts (amounting to billion \$4.1)¹⁹, at a very high frequency.

Fining Octeg LLC, a division of HFT company Getco LLC, is one of the other cases. Octeg neglected to exercise appropriate control over its stock trading operations.²⁰ Latour Trading LLC, an HFT company, paid a \$16 million fine to the SEC in September 2014 for purchasing and selling stocks without sufficient cash on hand by utilizing incorrect calculations.²¹

The SEC and CFTC²² have made a concentrated effort to use certain enforcement actions to place HFTs under more scrutiny. To monitor their trades, the SEC has recommended that some HFT broker-dealers registered with the FINRA. The CFTC has cracked down on spoofing,

¹⁴ Ciamac Moallemi & Mehmet Saglam, *The cost of latency in high-frequency trading*, SSRN. (Mar 17 2010) https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1571935

¹⁵ Frank Zhang & Stuart Powell, *The Impact of High-Frequency Trading on Markets*, CFA INSTITUTE (Mar-Apr 2011). <https://www.cfainstitute.org/-/media/documents/article/cfa-magazine/2011/cfm-v22-n2-3.pdf>.

¹⁶ *Findings regarding the market events of May 6, 2010 (2010), US Securities and Exchange Commission*. <https://www.sec.gov/files/marketevents-report.pdf>.

¹⁷ Tom Lauricella, et al (2010) *How a trading algorithm went awry* - THE WALL STREET JOURNAL. (Oct 2 2010) <https://www.wsj.com/articles/SB10001424052748704029304575526390131916792>.

¹⁸ *Understanding the flash crash of 2010: Causes, impacts, and lessons learned*, MEDIUM. (Feb 21, 2024) <https://medium.com/@strike.marketingteam/understanding-the-flash-crash-of-2010-causes-impacts-and-lessons-learned-2fcc0f158c79>.

¹⁹ George Bowley, *Lone \$4.1 Billion Sale Led to 'Flash Crash' in May* (Oct. 1, 2010) <https://www.nytimes.com/2010/10/02/business/02flash.html>

²⁰ Nina Mehta, *Getco fined \$450,000 for failing to supervise equity trading*, BLOOMBERG (Mar 23 “2012). <https://www.bloomberg.com/news/articles/2012-03-22/getco-fined-450-000-for-failing-to-supervise-equity-trading-1>

²¹ Scott Patterson, *High-frequency trading firm Latour to pay \$16 million SEC penalty* - THE WALL STREET JOURNAL (Sept. 17, 2014) <https://www.wsj.com/articles/high-frequency-trading-firm-latour-agrees-to-pay-16-million-penalty-sec-says-1410964917>

²² The Commodity Futures Trading Commission (CFTC) is an independent agency of the US government created in 1974 that regulates the U.S. derivatives markets, which includes futures, swaps, and certain kinds of options.

utilizing the anti-spoofing authority²³ granted by the *Dodd-Frank Act*²⁴ while taking enforcement actions involving algorithmic trading. The Regulation Automated Trading (Reg AT) rule, which was proposed by the CFTC in November 2015, mandates that proprietary traders who are given "direct electronic access" to perform complex trading procedures on regulated exchanges, register for this purpose.²⁵

The first criminal conviction was upheld by the U.S. Court of Appeals in 2017.²⁶ of an HF trader for spoofing, demonstrating the significance of a company's criminal responsibility for engaging in illicit HFT²⁷.

B. Cases in India:

In India, the case that made a dent in the reputation of the regulators was unveiled by a whistleblower's letter to the SEBI sent in January 2015, detailing how certain institutions registered for HFT and algorithmic trading were allowed to profit illegally by the NSE's insiders²⁸. A stock market investor on the NSE between 2010 and 2015 allegedly received a (slightly) lower price upon sale and paid a (slightly) higher price upon purchase²⁹. This way, the infamous NSE co-location fiasco came to light, featuring Ravi Narain (MD & CEO of NSE until March 2013), and Chitra Ramkrishna, (Deputy CEO during that period)³⁰ at its helm, finger-pointing the very institution tasked with the protection of the integrity of the stock markets. Stockbrokers and data vendors can install their trading systems close to stock exchange premises and connect to their trading platform by using the co-location facility that is available to them. The co-location space's rack space is adaptable enough to accommodate the requirements of any

²³ Miller, R.M. and Shorter, G. *High-frequency trading: Overview of recent developments*, Congressional Research Service. (4 Apr 2016) <https://sgp.fas.org/crs/misc/R44443.pdf>.

²⁴ See Dodd-Frank Wall Street Reform and Consumer Protection Act (P. L. 111-203) <https://www.congress.gov/111/plaws/publ203/PLAW-111publ203.pdf>. (21 Jul, 2010)

²⁵ Press release, CFTC Unanimously Approves Proposed Rule on Automated Trading (Press Release (7283-15)) (Nov 24, 2015) <https://www.cftc.gov/PressRoom/PressReleases/7283-15>

²⁶ *United States v. Coscia*, 866 F.3d 782, 785 (7th Cir. 2017).

²⁷ Orlando Cosme Jr. *Regulating high-frequency trading: The case for individual ...* 109 J. Crim. L. & Criminology 365 (1019) (368) <https://scholarlycommons.law.northwestern.edu/cgi/viewcontent.cgi?article=7648&context=jclc>

²⁸ Sucheta Dalal, *High-frequency trading needs a detailed probe*, MONEYLIFE. (08 July 2015) <https://www.moneylife.in/article/highfrequency-trading-needs-a-detailed-probe/42620.html>.

²⁹ Santhosh Nair, *Explained: The NSE co-location scam, how Ravi Narain and Chitra Ramkrishna are involved*, FIRST POST. (20 Feb 2022) <https://www.firstpost.com/business/explained-what-is-the-nse-co-location-scam-how-ravi-narain-and-chitra-ramkrishna-are-involved-in-it-10391841.html>.

³⁰ *Id*

stock brokers who want to use it³¹. The facility was lawful in and of itself, but there were claims that NSE employees gave certain traders special access to using it without providing any explanation and that these vital records were then purportedly disclosed to a small number of offshore traders. In January 2010, the NSE launched its tick-by-tick (TBT) high-frequency and co-location service, refusing to grant access to certain brokers³². A packet of information, such as a buy/sell order, for an order cancellation or modification, is represented by each tick³³. It had neither requested nor disclosed permissions from SEBI³⁴ to start the service, meaning that the legality of these trades could be questioned. The players who had access to the facility reportedly earned a daily total of between Rs 50 and Rs 100 crore³⁵. Allegations were made that the SEBI failed to act promptly and handled the matter lightly, treating the NSE as though it had made a simple mistake³⁶.

The NSE was finally ordered by SEBI to make a payment of ₹6.25 billion, with a 12% interest rate, per se more than ₹10 billion in April 2019. Due to the NSE's granting of preferential access, the order barred the NSE from market fundraising for six months. In 2021, SEBI also fined NSE Rs. 1 crore and the then-CEOs of NSE Rs. 25 lakhs apiece. SEBI highlighted the exchange's failure to ensure a level playing field³⁷ against its guidelines of fairness and equity³⁸.

³¹ SEBI Circular dated May 13, 2015, bearing Ref. No. CIR/MRD/DP/07/2015 _Colocation proximity hosting facility offered by the stock exchanges, https://www.sebi.gov.in/sebi_data/attachdocs/1431512252858.pdf.

³² Sunitha Natti, *Rs 50,000 or Rs 75,000 crore? NSE co-location scam still a mystery six years on*, THE INDIAN EXPRESS,

(13 Mar 2022) <https://www.newindianexpress.com/business/2022/Mar/13/rs-50000-or-rs-75000-crore-nse-co-location-scam-still-a-mystery-six-years-on-2429389.html>.

³³ Santhosh Nair, *Explainer: All you need to know about the NSE colocation case*, MONEYCONTROL (21 Feb 2022) <https://www.moneycontrol.com/news/business/companies/explainer-nse-colocation-case-what-happened-faq-3985511.html>.

³⁴ The SEBI released the circular on the co-location facility in May 2015. This service was initiated back in 2010 without SEBI's approval.

³⁵ Santhosh Nair., *What is the NSE colocation controversy; Ravi Narain's, Chitra Ramakrishna's role in it*, CNBC TV18, (21 Feb 2022) <https://www.cnbctv18.com/market/explained-what-is-the-nse-colocation-controversy-ravi-narains-chitra-ramakrishnas-role-in-it-12558142.htm>”.

³⁶ *supra* note 32.

³⁷ NSE “*Algo Scam: SEBI Imposes Rs1 Crore Penalty on NSE, Rs25 Lakh Each on Ravi Narain, Chitra Ramakrishna*”, MONEYLIFE, <https://www.moneylife.in/article/nse-algo-scam-sebi-imposes-rs1-crore-penalty-on-nse-rs25-lakh-each-on-ravi-narain-chitra-ramakrishna/62917.html?from=mdr>. (11 Feb 2021)

³⁸ See para 3.1 and 3.2 of SEBI Circular dated May 13, 2015, bearing Ref. No. CIR/MRD/DP/07/2015 _Colocation proximity hosting facility offered by the stock exchanges, https://www.sebi.gov.in/sebi_data/attachdocs/1431512252858.pdf”.

3. SEBI's Role as a Check Post

The unabated HFT and algorithmic trading deem strict regulation necessary, to derail the attempts to misuse this technology. The challenge lies in monitoring the increased use of advanced computer-assisted trading tools, that generate usual market activities, making it difficult to distinguish such activities from HFT. These trading systems use automated features that, while not algorithms or HFTs, allow orders to be placed in the market at a pace that exceeds a human trader.³⁹

The SEBI has to overcome these challenges in the Indian scenario. It has consistently supported the principles of equity, fairness and non-discriminatory access—three essential components of a secure and dynamic capital market⁴⁰. Assessing the impact of HFTs, a circular was passed in 2012⁴¹ that introduced broad guidelines for algorithmic trading after the SEBI permitted stock exchanges to facilitate its trading members with direct market access (DMA)⁴² in April 2008⁴³. Surprisingly, the SEBI was doubtful of its capacity and that of the stock exchanges to handle trades after such access, when the then chairman had remarked that HFTs were “monstrous”⁴⁴ in nature. Nonetheless, with a solemn aim to regulate such trades, it released a few more circulars from 2012-15⁴⁵, and a thorough discussion paper on “*Strengthening of the Regulatory Framework for Algorithmic Trading & Co-location*” in 2016⁴⁶, after dealing with HFT scams for 5 years from 2010-15. The SEBI had, much before the popularity of HFTs in India, passed the (PFUTP) (Securities Market) Regulations in the year 2003⁴⁷ to generally outlaw and control

³⁹ Equity “Market Structure Literature Review (Part II) (2014) US SEC.

https://www.sec.gov/marketstructure/research/hft_lit_review_march_2014.pdf (Last visited 06 Aug 2024)

⁴⁰ SEBI Discussion paper on ‘Strengthening of the Regulatory Framework for Algorithmic Trading & Co-location’ (2016), https://www.sebi.gov.in/sebi_data/attachdocs/1470393485587.pdf.

⁴¹ SEBI Circular No. CIR/MRD/DP/09/2012 dated March 30, 2012, on ‘Broad Guidelines on Algorithmic Trading’ https://www.sebi.gov.in/sebi_data/attachdocs/1369137134098.pdf

⁴² Direct market access (DMA) refers to access to the electronic facilities and order books of financial market exchanges to facilitate daily securities transactions.

Refer to <https://www.investopedia.com/terms/d/directmarketaccess.asp> (visited 02 August 2024)

⁴³ Anuradha uru, & Rasmit Kohli (*Direct market access: New kid on the block*, SSRN. (15 May 2010) https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1608345.

⁴⁴ Mobis Philipose, *SEBI should study the impact of algorithmic trading before taming it*, MINT (12 Mar 2012) <https://www.livemint.com/Opinion/LmtMQAa8sM4pVZ65XJq2ZO/Sebi-should-study-the-impact-of-algorithmic-trading-before-t.html>.

⁴⁵ SEBI circular on measures for strengthening algorithmic trading framework (2018) https://www.sebi.gov.in/sebi_data/meetingfiles/apr-2018/1524113320566_1.pdf. (Last visited 05 Aug 2024)

⁴⁶ SEBI Discussion paper on ‘Strengthening of the Regulatory Framework for Algorithmic Trading & Co-location’ (2016), https://www.sebi.gov.in/sebi_data/attachdocs/1470393485587.pdf. (Last visited 05 Aug 2024)

⁴⁷ SEBI (Prohibition of fraudulent and unfair trade practices relating to securities market) regulations, (2003), https://www.sebi.gov.in/legal/regulations/jul-2003/securities-and-exchange-board-of-india-prohibition-of-fraudulent-and-unfair-trade-practices-relating-to-securities-market-regulations-2003-last-amended-on-october-19-2020-_34633.html. (Last visited 6 Aug 2024)

deceptive and manipulative HFT activities⁴⁸. Some salient provisions that may reasonably apply to an HFT are stated in brief...

A. No person shall directly or indirectly-

1. Purchase or sell any security listed on an accredited exchange by using or utilizing any manipulative or deceptive device.
2. Use any trick, ruse, or device to commit fraud when handling securities issuance.⁴⁹

B. No person shall indulge in a manipulative, fraudulent, or unfair trade practice in securities markets by

1. Engaging in activities that give the impression of trading in securities markets but are deceptive or false.
2. Using securities as tools to artificially raise, lower, or fluctuate its price to profit unfairly or prevent loss.⁵⁰

The authority has looked into some ways to break the chain of unrestricted HFTs and alleviate concerns about unequal access to the exchanges' trading systems. It proposes mechanisms to deter latency-sensitive strategies like Frequent Batch Auctions, Minimum Resting Time for Orders, Random Speed Bumps, or order matching or processing delays that add a few milliseconds to orders. This delay would affect the flow of HFTs while not deterring non-algo orders for which the delay in milliseconds is insignificant.⁵¹

Any order generated by automated execution logic is deemed to be algorithmic trading, as per SEBI's general guidelines on the subject. This trading system creates trading signals and places orders based on predefined instructions. Algorithmic trading systems monitor prices and place orders when preset criteria are met. As a result, the trader can stop manually placing orders and

⁴⁸ Armann Patkar, (2016) 'Technology Innovations in Securities Trading: Can SEBI's Bicycle Catch the High-Frequency Trading Ferrari,' *Indian Journal of Law and Technology*: Vol. 12: Iss. 1, Article 3." <https://repository.nls.ac.in/cgi/viewcontent.cgi?article=1006&context=ijlt>. (Last visited 07 Aug 2024)

⁴⁹ See regulations 3, SEBI(PFUTP),2003, *supra* note 47

⁵⁰ See regulations 4(1) and (2), SEBI(PFUTP),2003, *supra* note 47

⁵¹ SEBI Discussion paper on 'Strengthening of the Regulatory Framework for Algorithmic Trading & Co-location' (2016), https://www.sebi.gov.in/sebi_data/attachdocs/1470393485587.pdf. (Last visited 07 Aug 2024)

monitoring real-time stock prices⁵². Algorithmic trading has contributed to raising the calibre of the market by facilitating the rapid assimilation of information into market prices, reducing spreads, and increasing liquidity.

The regulatory body has also noted that although investors, particularly individual investors, are using third-party algorithm providers more frequently, these algorithms are being implemented without the necessary clearances from exchanges following regulations. At the moment, exchanges are granting permission for the broker's algo trading, and it has been argued that this transfer of power to the exchanges violates both the letter and the spirit of the law⁵³. Exchanges and brokers are unable to determine whether a specific trade coming from an API link is an algorithmic trade or a non-algorithmic trade when it comes to the algorithms used by retail investors through APIs (Application Programming Interface). The possibility of systematic market manipulation exists with these unregulated algorithms, which may also entice retail investors with the promise of higher returns. They stand to lose a great deal if an algorithmic trading strategy fails, and this can be problematic because there is no established mechanism for handling investor grievances. All systems that grant investors access to execute algo trades ought to incorporate two-factor authentication. As part of the annual system audit report, stock brokers are required to submit a specific report on the algorithm checks and balances they have implemented.⁵⁴ Stock exchanges are required to post information about co-locations on their websites, including requirements for stock brokers and data vendors using the facility, information about costs and fees related to the facility, and quarterly reports on latencies experienced at the exchange. They will put in place appropriate safeguards to prevent unwanted access to their systems, and they will establish policies governing the behaviour and access of stock broker employees in the co-located areas⁵⁵.

⁵² SEBI Consultation Paper on Algorithmic Trading by retail investors (2021) https://www.sebi.gov.in/reports-and-statistics/reports/dec-2021/consultation-paper-on-algorithmic-trading-by-retail-investors_54515.html. (Last visited 07 Aug 2024)

⁵³ S Subramanian, *Investor association moves house panel on algorithm trades*, BUSINESS STANDARD. (Oct 01 2015) http://www.business-standard.com/article/markets/investor-association-moves-house-panel-on-algorithm-trades-115100100703_1.html.

⁵⁴ SEBI Consultation Paper on Algorithmic Trading by Retail Investors (2021) https://www.sebi.gov.in/reports-and-statistics/reports/dec-2021/consultation-paper-on-algorithmic-trading-by-retail-investors_54515.html. (Last visited 06 Aug 2024)

⁵⁵ SEBI Circular dated May 13, 2015, bearing Ref. No. CIR/MRD/DP/07/2015 _Colocation proximity hosting facility offered by the stock exchanges, https://www.sebi.gov.in/sebi_data/attachdocs/1431512252858.pdf. (Last visited 07 Aug 2024)

4. Recommendations for Better Regulation

The SEBI has tried its level best to regulate HFTs, which necessitates a robust framework to implement them to produce desired effects. Some further steps that may be taken in this direction are listed below-

1. One recommendation would be setting up a separate institution under the aegis of the SEBI or a separate division (set up by the central government) in the NSE. This develops a cohesive and collaborative work structure with the SEBI to enforce these provisions and regulations. The SEBI must also consider comments and suggestions from the public in this regard, which it had not done when it released its papers on the co-location framework⁵⁶

2. It can develop foolproof software that produces “speed bumps” whose importance has been stated in its discussion paper⁵⁷, similar to “circuit breakers” introduced by the SEC after the flash crash. They halted any trade of stocks for 5 minutes when it rose or fell more than 10 per cent⁵⁸. Causing a trading pause similarly can be a successful way of compelling market participants to reset their algorithms, granting time for an orderly market to be re-established⁵⁹. For this, an independent window or an exchange can be set up similar to the derivative market. For instance, the Intercontinental Exchange (IEX) was set up in the US to produce trade delays by reducing speed to reduce HFTs to an extent and also does not allow co-location⁶⁰.

3. The central government may be advised by SEBI to create a tax system akin to the financial transaction tax (FTT), which France implemented in 2012. It consists of sovereign credit default swaps (CDS), high-frequency trading, as well as a tax on the purchase of equity securities⁶¹. Italy too followed in its footsteps and announced the levy of HFT tax subjecting traders to a 0.02

⁵⁶ “*Supra note 53*”

⁵⁷ SEBI Discussion paper on ‘Strengthening of the Regulatory Framework for Algorithmic Trading & Co-location’ (2016), https://www.sebi.gov.in/sebi_data/attachdocs/1470393485587.pdf. (Last visited 06 Aug 2024)

⁵⁸ Wyatt, & George Bowley. *New rules would limit trades in a volatile market*, THE NEW YORK TIMES. (May 18, 2010) <https://nytimes.com/2010/05/19/business/19crash.html?hp>.

⁵⁹ The International Organisation of Securities Commission organisation (IOSCO), *Regulatory Issues Raised by the Impact of Technological Changes on Market Integrity and Efficiency*, (Oct 2011) <https://www.iosco.org/library/pubdocs/pdf/IOSCOPD361.pdf> (Last visited 06 Aug 2024)

⁶⁰ Nicole Bullock, *IEX takes on Wall St Exchanges with a speed bump: A Q&A*, FINANCIAL TIMES. (Aug 18 2016) <https://www.ft.com/content/10e68a4e-64c5-11e6-8310-ecf0bddad227>.

⁶¹ Landwell and associates, *French financial transaction tax on Equity Securities*, PricewaterhouseCoopers. (Aug 14 2012) <https://www.pwc.com/gx/en/financial-services/financial-transaction-taxes-timeline/assets/french-aug1.pdf>.

per cent tax on trades occurring every half a second once above a threshold⁶². The tax will apply regardless of where the transaction is fully executed⁶³. The Indian government in this regard, did hike the tax rate on futures and options⁶⁴ indirectly targeting HFTs as such whiz trades occur the most in this segment⁶⁵, but it is recommended that the SEBI propose a tiered tax structure which is based on the timeframes of a transaction, similar to the one in countries, mentioned above.

4. The SEBI can also legislate a specific regulation in this regard, like other regulations, clearly defining the single act of HFTs and bringing them under its ambit. For example, the German government passed the Securities Trading Act (WpHG) which has been in force since 2002⁶⁶ and last modified in May 2024⁶⁷. Section 3(44) of the definition of HFT states that-

- a. Proximity hosting, co-location, and high-speed direct electronic access reduce network and other latencies; algorithmic order entry facilities
- b. The ability of the system to create, route, initiate, or carry out an order without the need for human intervention,
- c. A high intraday message rate consisting of cancellations, quotes, and orders.⁶⁸

It also passed the “Prevention of Risks and Abuse in HFT” Act established in 2013⁶⁹, containing provisions relating to high-frequency and algorithmic trading.

5. The “Kill switches” facility can help stifle the exercise of those HFTs harmful to prevailing

⁶² Philip Stafford, *Italy introduces tax on high-speed trade and equity derivatives*, FINANCIAL TIMES. (Sept 1 2013) <https://www.ft.com/content/378dcace-117e-11e3-8321-00144feabdc0>”.

⁶³ Clinch, *Italy launches tax on high-frequency trading*, CNBC (Sept 2 2013). <https://www.cnbc.com/id/101002422>.

⁶⁴ Sneha Kulkarni, *Budget 2024: Securities transaction tax (STT) on F&O hiked to 0.02% and 0.1%*, THE ECONOMIC TIMES. (Jul 23, 2024) <https://economictimes.indiatimes.com/wealth/tax/budget-2024-securities-transaction-tax-stt-on-fo-hiked-to-0-02-and-0-1/articleshow/111952257.cms>.

⁶⁵ Santhosh Nair & Kaushal Shroff, *Rise of the machines: HFTs tighten grip, make a killing on the street as F&O volumes explode*”, MONEYCONTROL. (Jan 20 2023) <https://www.moneycontrol.com/news/business/markets/rise-of-the-machines-hfts-tighten-grip-on-market-make-killing-as-fo-volumes-explode-9893991.html>.

⁶⁶ Wertpapierhandelsgesetz (Securities trading act, 1998) BaFin. (May 12 2019) https://www.BaFin.de/SharedDocs/Veroeffentlichungen/EN/Aufsichtsrecht/Gesetz/WpHG_en.html.

⁶⁷ See <https://de.wikipedia.org/wiki/Wertpapierhandelsgesetz> for timelines

⁶⁸ *supra* note 66

⁶⁹ *Algorithmic trading and high-frequency trading* BaFin. (Oct,10 2020) https://www.BaFin.de/EN/Aufsicht/BoersenMaerkte/Handel/Hochfrequenzhandel/high_frequency_trading_node_en.html#:~:text=In%20order%20to%20counter%20the%20risks%20associated%20with,provisions%20relating%20to%20high%20frequency%20and%20algorithmic%20trading.

market conditions. This was adopted in Australia⁷⁰ and it exists in NSE but the control is not automated and is entrusted to an appointed person for its execution when required. It has also not been utilized once to date⁷¹. The SEBI may issue guidelines, specifying the use of such techniques that can pre-empt the possibility of such trades.

6. There is also a need to make provisions for regulating some strategies like ‘market making’, where firms provide continuous buy and sell quotes for various securities. They rapidly update their quotes and positions to achieve the bid-ask spread, the difference between their buy and sell prices⁷². Here, such trades having a semblance of an HFT can mislead the market, resulting in market abuse and manipulation. The aspect of market abuse is to be regulated, to cover all such practices, mainly those which hurt investors, with limited trading acumen. The SEBI may take insights in this regard from the directions issued by the Reserve Bank (RBI) on “market abuse” in 2019⁷³, in which three definitions are worth mentioning-

- a. The term ‘artificial price’ refers to the price of a financial instrument that is purposely manipulated by a market participant to maintain it at a certain level or to cause it to move in a particular direction.
- b. Information misuse, benchmark manipulation, and market manipulation are examples of ‘market abuse.’
- c. ‘Market manipulation’ refers to any transaction that deliberately generates a false or any kind of misleading impression about the demand, price, or supply of the financial instrument. The purpose of such manipulation is to obtain an unfair financial advantage or significant benefit, ultimately leading to an artificial price for the instrument.

7. The SEBI can use requisite law-making tools to develop a dedicated investor grievance redressal committee/board apart from the existing provisions of the general redressal mechanism

⁷⁰ Justin Sadikoen, *High-Frequency Trading and the Global Regulatory Response: A (False) Cause for Alarm in Australia?* (2015) (UNSWLJ Student Series No 15-03), <http://classic.austlii.edu.au/au/journals/UNSWLawJlStuS/2015/3.html> (Last visited 06 Aug 2024)

⁷¹ National Institute of Financial Management (Ministry of Finance), A study of Algorithmic/High-Frequency Trades in the Indian capital markets, <https://www.ajnifm.ac.in/sites/default/files/uploadfiles/Compendium.pdf> (at 61)

⁷² Tanisha Gautam, *Regulating high-frequency trading under Indian Securities Market*, TAXGURU. (Apr 30 2024) <https://taxguru.in/sebi/regulating-high-frequency-trading-indian-securities-market.html>

⁷³ Reserve “Bank of India (Prevention of Market Abuse) Directions, (2019) RBI/2018-19/141 FMRD 11/11.01.012/2018-19 rbi.org.in. <https://www.rbi.org.in/Scripts/NotificationUser.aspx?Id>” =11500. (Last visited 06 Aug 2024)

as specified in its investor charter⁷⁴, to redress problems and misunderstandings in this field, encountered by traders, investors and other bodies alike.

5. Considering other Looming Threats

The SEBI should consider other breeding grounds for algo trading and HFTs. An increasing number of institutions are dabbling in the realm of digital assets as they gain prominence in international finance. High-frequency trading in cryptocurrency involves trading volumes of digital assets in nanoseconds with algorithms, and AI programs for performing time-sensitive trades. In this sense, it is a "hands-off" strategy, since the algorithms used, execute orders according to their programming.⁷⁵ The practice of "scalping a cryptocurrency", is in vogue wherein a digital asset is traded by traders a thousand times in a day, with the help of HFT algorithms. In this regard, many industry experts have called for reforms to create a fairer market microstructure to monitor trade practices in cryptocurrencies⁷⁶. In India, cryptocurrencies have been categorized as virtual digital assets and are subject to taxation at a rate of 30%⁷⁷ still, the use of HF trade strategies makes it important for the SEBI to bring it under its regulatory ambit⁷⁸.

AMC *Quant mutual fund* is one recent example of a case that is being looked into by SEBI for possible front-running. The fund was found with around Rs 9,355 crore cash pile in May 2024. This was around 12.41% of the total AUM (assets under management) and is under investigation. Front-running is a practice where intermediaries exploit their position for profit. They trade stocks minutes before a large institutional investor, like a mutual fund, is expected to enter the market. The trading intermediaries, start accumulating the stock beforehand when they anticipate a mutual fund's buy order. When the order pushes up the stock price, they sell it at a profit⁷⁹. The SEC and FINRA forbid this practice. When HFT firms use algorithmic trading technology to

⁷⁴ SEBI *Investor charter* (2021) <https://investor.sebi.gov.in/Investor-charter.html>. (Last visited 06 Aug 2024)

⁷⁵ *What is high-frequency trading in Crypto?* dYdX. exchange., (Jun 29, 2023) <https://dydx.exchange/crypto-learning/high-frequency-trading>

⁷⁶ Gianluca Lombardi, *High-frequency trading in crypto: Risks and rewards in HFT*, ECOINOMY. (Oct, 17 2023) <https://ecoinomy.eu/trading/cryptocurrency/strategies/high-frequency/>.

⁷⁷ Ektha Surana, (2024) *Taxation on cryptocurrency: Guide to crypto taxes in India 2024*, CLEAR TAX. (Jul 9 2024) <https://cleartax.in/s/cryptocurrency-taxation-guide>.

⁷⁸ Nishchal Shetty, *Why Sebi's regulatory ambit could boost India's crypto industry*, THE ECONOMIC TIMES. (June 1 2024) <https://economictimes.indiatimes.com/markets/cryptocurrency/why-sebis-regulatory-ambit-could-boost-indias-crypto-industry/articleshow/110612441.cms>.

⁷⁹ Abhinav Kaul, *MC explains: Quant MF Under scrutiny: What is front-running and how does it hurt investors?* (June 28 2024) MONEYCONTROL. <https://www.moneycontrol.com/news/business/personal-finance/mc-explains-quant-mf-under-scrutiny-what-is-front-running-and-how-does-it-hurt-investors12754639.html#:~:text=When%20intermediaries%20front-run%20large%20orders%2C%20it%20causes%20the,before%20the%20mutual%20fund%20can%20complete%20its%20purchase.>

identify large incoming orders and purchase those securities before the large orders are fulfilled, the practice is known as "front-running" in the context of HFT. They subsequently make money by charging high prices to the initial investors for the securities.⁸⁰ A study also says that "HFT always front-runs" and that the large traders could be favoured when there is significant noise trading (done without seeking professional advice) and when the signal of HFTs is much weaker to detect⁸¹.

The fundamental aspects of practices such as front-running⁸² may not be governed by individual statutes but are embedded in SEBI's circulars, papers⁸³, and regulations of 2003⁸⁴. These practices may not always be executed with HFT-based strategies, yet the risk of their use persists, as reported in many cases.

6. Concluding Remarks

There are situations when regulatory authorities straddle the fence of giving needed preference to the pros of HFTs on one side and considering the awareness of the impact of its cons on the other. While it is stated that HFTs increase competition and liquidity in the markets⁸⁵, some staunchly believe the contrary⁸⁶. Countries considering the implementation of direct policies like taxes and bans on such activities should think twice before doing so to ensure market efficiency and stability, which is possible by allowing those particular HFTs, executed by retail investors, with no intent of making unfair gains, and filtering out those remaining ones, to be kept under close watch. The required policy-making strategies must hereby be according to the

⁸⁰ *Getting up to speed on high-frequency trading*, FINRA, (2015). <https://www.finra.org/investors/insights/getting-speed-high-frequency-trading>. (Last visited 06 Aug 2024)

⁸¹ Xu & Xue Cheng, *Are front-running HFTs harmful?* SSRN. (Jan 19 2023) https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4329842.

⁸² Such as spoofing and layering. Spoofing involves placing orders in a market that are not intended to execute non-bonafide orders. The purpose is to influence financial market prices. Layering is the process of creating the appearance that multiple traders are interested in buying or selling by using multiple spoofing orders placed as "layers" in the limit order book. See - Do, B.L. and Putniņš, T.J. *Detecting layering and spoofing in markets*, SSRN. (Aug 1 2023) https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4525036.

⁸³ SEBI Discussion paper on 'Strengthening of the Regulatory Framework for Algorithmic Trading & Co-location' (2016), https://www.sebi.gov.in/sebi_data/attachdocs/1470393485587.pdf. (Last visited 06 Aug 2024)

⁸⁴ SEBI ("Prohibition of fraudulent and unfair trade practices relating to securities market") regulations, 2003 <https://www.sebi.gov.in/legal/regulations/jul-2003/securities-and-exchange-board-of-india-prohibition-of-fraudulent-and-unfair-trade-practices-relating-to-securities-market-regulations-2003-last-amended-on-october-19-2020-34633.html>. (Last visited 06 Aug 2024)

⁸⁵ Justin Dulbert, *The impact of high-frequency trading on market liquidity*, MEDIUM. (28 Jun 2024) <https://medium.com/@equityessentials/issue-1-the-impact-of-high-frequency-trading-on-market-liquidity-4513928f5d62>

⁸⁶ "High-frequency trades neither provide liquidity in the futures market nor does it enhance market quality and price discovery" process- See Eun Jung Lee, *High-Frequency Trading in the Korean Index Futures Market*, WILEY, (23. Aug 2013) <http://onlinelibrary.wiley.com/doi/10.1002/fut.21640/full>.

financial and economic conditions of a country and developing them requires extensive research, to be undertaken by all financial institutions including SEBI. Although SEBI understands the effects of high-speed trade in India, there remain many areas mentioned in this paper calling for its specific and timely intervention. Where there is a need to develop a system that can set aside those trades that move with a high frequency that are sometimes detrimental to the stability of a market, there is also a lack of an investor grievance redressal mechanism for addressing concerns related to trading practices, be it HFT or any parallel form of it. SEBI must commit to such areas, as part of its regulatory oversight, by the application of innovative tools and taking swift and stern action to evite financial breakdown. This becomes crucial especially when trades involve the usage of AI, increasing the scope for misuse and evasive acts in the markets.