



The Impact Of Algorithmic Trading In Investor Trading Decisions

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ABSTRACT

Artificial intelligence has taken over humankind's manual activities, which are subtly zestful and evolving every single minute. Algorithms, which are smarter and faster than humans, drove human market makers out of business. This study aims at analyzing how algorithmic trading system outperforms humans in terms of speed and accuracy and how it affects the human intervention altogether by taking the impulse out of trading. Algorithmic trading (algo trading), is a concept that defines trading carried out using algorithms which is the new reality and increasingly prevalent in the current financial market. "A pot of milk is ruined by a drop of blood". It is one thing for a trader to lose money due to defective connection but the consequences of a single broken algorithm can be disastrous. This paper also probes into the psychological factors affecting trading strategies and trader's remorse.

Keywords: Algorithms, trading, financial market, manual.

INTRODUCTION

Securities trading has changed dramatically over the last few decades, as more and more phases of the trading process have been automated through the use of computerized technologies. Two key interrelated technological advancements are investors employing computers to automate their trading strategy and the markets rearranging themselves so that all markets are now electronically limited order books. Algorithmic trading, (use of computer algorithms) in securities trading, has become a major element in today's financial markets. The plain-sailing way of accessing the markets with such speed and quality encourages the use of algorithmic trading, which is defined as the use of computer algorithms to make trading choices, place orders and handle those orders after they have been submitted. Over 80% of all trades in the financial markets are currently controlled by algorithmic trading systems. Behavioral biases

and emotions that characterize human traders are not present in such trade activities. Buy side (conventional asset managers and hedge funds) and sell side (banks, brokers, and broker-dealers) organizations have discovered their business has shifted to an information system-driven region where trading is done with minimal human participation.

The looming of algorithmic trading has rewritten the regulations of manual trading. The way algo trading has impact on investors making decision is that it creates a lot of advantages in favor of them. Despite the fact that these computerized systems are fast at completing trades and allowing you to manage many accounts at once, it is still arduous to beat a human professional trader. Since February 2009, foreign institutional investors have been able to use the DMA facility through nominated managers. Algorithmic Trade now accounts for a large portion of trading in India. High-frequency trading technology, which allows an organization to make tens of thousands of trades per second, is often used by algorithmic traders. Order implementation, arbitrage, and fad trading tactics are all examples of situations where algorithmic trading can be used. Before every human trader, algorithms can spot any profit opportunities that arises in the market in the given time.

Over the projection period of 2022-2027, the algorithmic trading is speculated to grow at a CAGR of 10.5%. Algorithms are nothing more than human inventions. It can function on any scenario that a human mind may conjure up. Market behaviors, including volatilities and unpredictable situations, is taken into account when developing algo strategies. In this paper, we explore how much algo trading has benefitted the Indian stock market over the years and how it has a huge impact on decision making behaviors of investors by taking over manual trading. Algorithmic trading has not only modified the traditional relationship between investors and their market-access intermediaries, but also the trader's emphasis, much like the development of the telephone in 1876 changed the way people communicated.

REVIEW OF LITERATURE

In this literature review, we will cover an overview of some of the studies on the significance of algorithmic trading in stock market, techniques and the volatility of the models and research progress of the trading. The researchers foresee that the associated and interpreted literature review will assist other researchers for their closure on unidentified areas of the topic.

1. According to **Gowtham Ramkumar (2018)**, The importance of stock markets has been felt by global economies at various times, ranging from the stock market disaster of 1929 in the United States to the Scam of Harshad Mehta in Indian stock market history. To get the most out of the markets, large scale institutional investors use a variety of trading tactics. It is clearly stated by the researcher that algo trading has become the most preferred technique of the investors.

2. **Boehmer, Fong, and Wu (2015)** found that the intensity of algorithmic trading increases short-term volatility (estimated by standardized intraday price ranges) in 42 equities 11 markets around the world. The authors also point out that the rise in volatility cannot be accredited to faster price discovery or algorithmic traders' proclivity for entering risky markets.

3. According to **Dr. Sachin Napate, Mukul Thakur (2020)**, Algorithmic trading is a combination of fundamental statistical methodologies and computer technologies. Such a trading program is not possible and cannot be carried out without any core statistical methodologies or information technology. In this study, they interpreted at two different ways for dealing with time series data. These recommended tactics could be applied to a variety of price time models or enhanced by the addition of leverage. Overall, this research explains the utility of relatively basic tactics for profit generation and examines relevant details for the investors.

4. **Amit Mittal (2014)**, scoped that in order for algorithmic trading to be regulated in the rates and Currency markets, a new regulatory framework is being developed. Early trading algorithms were quickly accelerated in the making of an advanced high frequency trading, where retail investors benefited from liquidity but with the existence of unbalanced dispersion of the market.

5. **Chaboud et al. (2014)**, identified that the triangular arbitrage models are regulated with algorithmic trading to measure the pricing frequency and efficiency and the returns in multiple exchange markets including yen, dollar, euro.

RESEARCH METHODOLOGY

The data (secondary) required for this research has been taken from the survey published in IJRAR, research journal, on October 2018, volume 5, issue 4; ijarar.org. As in the current trend, the reasons for preferring algorithmic trading have shown in the Table.1 in both valid and cumulative percent. Compared to models relying on human intuition or instinct, algo trading offers a more methodical approach towards price movements, trader productivity which is displayed and interpreted in Table.2. We can also identify the challenges or impact in employing complete algorithmic trading in Indian stock market. The data of descriptive statistics on the factors has shown in table 3. The factors have been interpreted using mean and standard deviation as it always been used to measure the volatility of securities. A higher Standard Deviation indicates that the price has significantly varied from the mean, whereas a lower deviation indicates minor change from the mean. The preferential table has been elucidated using the frequency and percentile of indicators to arrive at the valid and cumulative percent.

The new Sebi issue granting access to algorithmic trading has put an end to retail investors manually conducting trading activities. The algo trading has almost took over the usage of manual trading with better processed parameters, higher frequency, good monitoring efficiency and also the execution speed. The

dataset on current comparison of manual and algorithmic trading which is shown Table 4 is taken from Forex survey. The reasons for investors decision to drastically change from employing to manual to algo trading has been clearly justified using comparison table with several factors based on market conditions and trading volumes. The failure of algorithmic trading on adapting new market conditions has shown as the result of withstanding necessity of manual trading for better market making with sensible thoughts to preserve financial markets stability.

RESEARCH FINDINGS

1. It is obvious that investors preferring algorithmic trading in stock market is that it has lower chances for mistakes. As the table shows, 36% of the applicants chose this opinion. As much as manual trading, algorithmic trading operates by filtering relevant and less relevant factors in the stock market. Many factors in stock markets are influenced by sentiments which is basically driving the stock market. Approximately 28% choose algorithmic trading, because it overcomes this barrier by assisting traders when to purchase and sell securities. Choosing the right time and market to trade is another factor that made people to prefer algo trading i.e.by 28%. By employing algorithmic trading, investors can trade in multiple markets at the same time without making any errors. The trick is to connect the primary trading servers from one’s location server perfectly. Calamities can cause problems for investors to remove cash from markets that have been impacted by any disasters. As the table stated, nearly 8% of investors prefer algorithmic trading for its multiple serving reason.

| Particulars | Frequency | Percent | Valid percent | Cumulative percent |
|---|------------------|----------------|----------------------|---------------------------|
| Low chance for mistakes | 18 | 36 | 36 | 36 |
| Filters relevant and irrelevant factors | 14 | 28 | 28 | 64 |
| Right time and right market | 14 | 28 | 28 | 92 |
| Variety of markets offer | 4 | 8 | 8 | 100 |
| TOTAL | 50 | 100 | 50 | |

Table (1) Majors reasons for choosing algo trading in Indian stock market (Source: IJRAR survey)

2. Execution consistency is the main benefit of employing algorithmic trading based on the mean score given in tabulation 2. Whatever may be the situation, orders will be executed as per the specified criteria as per the coding of the investors in a fraction of second. Algo trading has the received the consistency score of 4.66. Other factors like being able to back test, anonymity, commission rates, price movements are represented by the average mean score of 4.62 and 4.64. It will allow the investor to comprehend the market’s current trend. With the mean score given as 4.60, we can say that algorithmic trading has a huge impact over matching investor’s pre-trade estimates, customizing the trading strategy for investors. As we

mentioned before, algo trading offers to eliminate human emotions and increases productivity in trading i.e., received a score of 4.50. This is the reason for institutional investors to prefer algo trading because their investment amounts and sizes are far larger than those of regular traders in the market.

| Descriptive statistics | N | Mean | Standard deviation |
|--------------------------------------|----------|-------------|---------------------------|
| Execution sustainability | 50 | 4.66 | 0.479 |
| Back testing ability | 50 | 4.64 | 0.485 |
| Anonymity | 50 | 4.64 | 0.485 |
| Price advancements | 50 | 4.62 | 0.530 |
| Rates on commission | 50 | 4.62 | 0.530 |
| Pre trade results | 50 | 4.60 | 0.606 |
| Customization | 50 | 4.60 | 0.606 |
| Cancelling human emotions and stress | 50 | 4.44 | 0.837 |
| Trading productivity | 50 | 4.50 | 0.678 |

Table (2) indicating benefits of algo trading in Indian stock market (Source: IJRAR survey, money control)

3. With the estimated score of 4.60, we can assume that availability of systems and its quality is the key hurdles in employing algorithmic trading. The successful adoption of algorithmic trading requires high quality systems support. The cost of implementing the algo trading technique is also a challenge faced by every investor in the market as it involves complicated mathematical models with significant expenditure. The failure of communication servers and errors in statistical data inputs are the next big hurdles in adopting algo trading. Even a single technical flaw can collapse an entire trading operation which might lead to less return for investors and sometimes on stock market meltdown. It has received the mean score of 4.58 with the challenging models.

| Descriptive statistics | N | Mean | Standard deviation |
|---|----------|-------------|---------------------------|
| Systems support and its quality | 50 | 4.60 | 0.606 |
| Cost of trading | 50 | 4.60 | 0.535 |
| Failure in communication servers/channels | 50 | 4.58 | 0.575 |
| Errors in statistical data inputs | 50 | 4.58 | 0.609 |

Table (3) indicating the challenges of algo trading in Indian stock market (Source: IJRAR, trading strategy guides)

4. When a trader decides to employ algorithmic trading rather than choosing manual trading, he/she needs to consider various aspects like which technique serves better market conditions, has high frequency trading, efficient in monitoring, speed etc., As it stated before, algo trading has a better scope than manual trading in terms of returns and benefits to investors. But there are some disadvantaging factors like inability to adapt to new market conditions. But with adopting algo trading, investors gains trading consistency without any demonstration in human emotions which executing orders. Basically, it is advisable for the

rookie investors to have an experience at both techniques before trading full time. The comparisons between manual and algo trading are displayed in the below table.

| Basis | Manual trading | Algorithmic trading |
|--|-----------------------|----------------------------|
| Vulnerability to human emotions and stress | Yes | No |
| Ability to detect financial market changes | Yes | No |
| Maximum number of trades per minute | 5 | 100,000 |
| High frequency trading | No | Yes |
| Structured monitoring | Low | High |
| Implementing speed | Low | High |
| Adapting to current market trends | Yes | No |

Table (4) displaying the comparisons between manual and algorithmic trading (Source: Money control and corporate finance institute)

CONCLUSION & SUGGESTIONS

From the time of the food gatherers to the present, nomadic species have advanced technology through creativity and foresight. We are improving our skills and attempting to reach the sky in our quest for transhumanism with the help of science and technology. To summarize, algorithmic trading is one of the transpiring trading techniques in the Indian stock market. It shows to be a more effective and successful trading method for investors who deal with huge trade volumes. The primary goal of Algorithmic trading was to communicate more quickly with exchanges in order to acquire a competitive advantage in terms of volume and speed in the trade. Although it makes retail investors to worry about their deprived earnings on a stipulated basis. Meanwhile, SEBI has been monitoring and regulating necessary precautions to eliminate disparities for the benefit of all classes of investors and trading to operate in a concurrent place. Government laws that promote factors including lower transaction costs, rapid, reliable execution of orders are anticipated to drive demand for the algorithmic trading sector.

With this study, we acknowledged the fact that algorithmic trading will have an estimated 95% increase in market share. In today's world, algo trading accounts for around 75%80%, especially in western markets. With the algorithms being very intricate, there is always a big stop button in the hands of humans to prevent the tripping up of the market on the safe side. But with some experience in algorithmic trading, an investor can substitute the manual way of investing. So, we can say the future of trading relies on algorithms and algorithms are the future.

BIBLIOGRAPHY

1. Shah, Kamlesh. 'How Algorithms Are Going to Change the Way You Buy and Sell Stocks'. *The Economic Times*, 22 Aug. 2021. *The Economic Times - The Times of India*, <https://economictimes.indiatimes.com/markets/stocks/news/how-algorithms-are-going-tochange-the-way-you-buy-and-sell-stocks/articleshow/85532682.cms?from=mdr>
2. Benefits of Algorithmic Trading & How Does It Work? | Motilal Oswal. <https://www.motilaloswal.com/blog-details/Algorithmic-trading-and-why-its-worthexploring/1035>. Accessed 17 Apr. 2022.
3. '4 Big Risks of Algorithmic High-Frequency Trading'. Investopedia, <https://www.investopedia.com/articles/markets/012716/four-big-risks-algorithmic-highfrequency-trading.asp>. Accessed 17 Apr. 2022.
4. Gowtham Ramkumar, "A study on the significance of algorithmic trading in Indian stock market. IJRAR 2018 volume 5, issue 4.
5. Sachin Napate and Mukul Thakur, "Algorithmic trading and strategies". Research gate (2020).
6. Gyuzel Zarieva, "Automated trading systems and manual trading in foreign exchange market". University of Nicosia (2015).
7. 'Algorithm Trading Can Help Make Gains in Stock Markets'. Business Today, <https://www.businesstoday.in/magazine/investment/story/algorithm-trading-can-help-makegains-in-stock-markets-24084-2011-05-25>. Accessed 17 Apr. 2022.