Algorithmic Trading

Mridul Upadhyay, Rahul Gahlot and Pretti Sharma

Department of Information Technology, JECRC, Jaipur

ABSTRACT

Research, no doubt, plays an important role in formulating any policy. Algorithmic Trading and, in particular, High Frequency Trading and Colocation, are some of the most controversial issues affecting how global security transactions are conducted. Rapid execution, accuracy, reduced costs, and avoidance of human emotions are some of the reasons for the increase. At the same time, the development of these technologies raises many regulatory challenges, especially with regard to market exploitation and ensuring market equity and integrity. And since these high-frequency sales are in the low-income category in India, research is in the survival category. This paper provides the first direct evidence of the impact of AT and HFT on the Indian Stock market. There is no strong evidence that AT is damaging the markets. Problems such as market fraud have been around for a long time.

Technology has changed the way financial markets operate and the way financial assets are marketed. Two important parallel technological changes are investors using computers to make their trading processes and markets redesigned so almost all markets now have electronic ordering books on Twitter, Facebook and other social networking sites.

In this paper, we have discussed the methods used to perform large quantities of trading analysis and our ability to obtain data technically. Algorithmic techniques pose a major challenge to algorithms and terrifying systems for data integration and predictability, analysis, versatility, complexity, and great size. Potential developments include new algorithms, methods, systems and applications in algorithmic trading that derive useful and hidden information from trading effectively.

I. INTRODUCTION

Algorithmic trading is a system of trading which facilitates transaction decision making in the financial markets using any simple or complex logics, based on user certain inputs. Guidelines of the Securities Exchange Board of India (SEBI) define algorithmic trading, popularly called ‘algo trading’ in trading parlance, as any order that is generated using automated execution logic in which the computer executes the pre-programmed trading instructions, accounting for a variety of variables such as timing, price and volume. It offers the benefits of speedier and more efficient order execution when compared to human traders executing orders, also mitigating execution cost as well as the scope for any manual errors and emotional trading decisions.

Algorithmic trading, or computer directed trading, cuts down transaction costs, and allows investment managers to take control of their own trading processes. The main objective of algo trading is not necessarily to maximize profits but rather to control execution costs and market risk.
Algorithms have become such a common feature in the trading landscape that it is unthinkable for a broker not to offer them because that is what clients demand. These mathematical models analyse every quote and trade in the stock market, identify liquidity opportunities, and turn the information into intelligent trading decisions.

Execution of trades on stock exchanges based on pre-defined criteria and without any human intervention using computer programs and software is called algorithmic trading or algo trading. While being a subset of algorithmic trading, high-frequency trading involves buying and selling thousands of shares in fractions of seconds. Algorithmic trading, or computer-directed trading, cuts down transaction costs, and allows investment managers to take control of their own trading processes. The main objective of algo trading is not necessarily to maximize profits but rather to control execution costs and market risk.

II. PROBLEMS ADDRESSED

1. High Frequency Trading

It is believed that the high number of trades typically entered by HFT traders results in greater liquidity in the markets. HFT firms contribute to over 50% of the equity turnover by volume in some major markets, and play a critical role in providing order flow, increasing the liquidity level. Traditional liquidity providers such as market makers now earn rebate fees by leveraging HFT strategies to make up for the loss of income caused by smaller spreads.

2. Collecting meaningful and real-time information

A lot of the literature uses data from U.S. markets, which have highly fragmented liquidity. If AT adoption was taking place in different ways in different places, it becomes difficult to pin-point the starting point to measure the impact on the overall market.

3. Endogeneity and threats to validity

Since HFT involves rapid intraday trading with positions generally held only for minutes—or even just seconds—it can give rise to price fluctuations and short term volatility. Given that HFT volumes are normally a relatively high percentage of overall trading, the price fluctuations caused by this strategy can lead to overall volatility in the market. of making trades that has been questioned by many analysts.

III. PROPOSED WORK

The amount of increased liquidity:

It is believed that the high number of trades typically entered by HFT traders results in greater liquidity in the markets. HFT firms contribute to over 50% of the equity turnover by volume in some major markets, and play a critical role in providing order flow, increasing the liquidity level. Traditional liquidity providers such as market makers now earn rebate fees by leveraging HFT strategies to make up for the loss of income caused by smaller spreads. They are data sets whose size is beyond the ability of commonly used software tools and storage systems to capture, store, manage such datasets. Big data analytics is where advanced analytic techniques are applied on large amount of data. The use of algorithms and computers in trading has resulted in the prices of securities being updated more frequently and more accurately. A study from NYSE Euro next shows that quoted spreads from 2007 were lower than those from , a period when HFT was relatively less prevalent.
This indicates that HFT has resulted in traders providing the most competitive bidask prices and in spreads narrowing.

The use of Implementation Shortfall:
The implementation shortfall strategy aims at minimizing the execution cost of an order by trading off the real-time market, thereby saving on the cost of the order and benefiting from the opportunity cost of delayed execution. The strategy will increase the targeted participation rate when the stock price moves favourably and decrease it when the stock price moves adversely. There are various tools such as Quintilian and Trading view that are used in nearly every company to get meaningful insights that help in making better decisions.

Trend Following Strategies:
The most common algorithmic trading strategies follow trends in moving averages, channel breakouts, price level movements and related technical indicators. These are the easiest and simplest strategies to implement through algorithmic trading because these strategies do not involve making any predictions or price forecasts. Trades are initiated based on the occurrence of desirable trends, which are easy and straightforward to implement through algorithms without getting into the complexity of predictive analysis.

The use of computer algorithms in securities trading, or algorithmic trading, has become a central factor in modern financial markets. The desire for cost and time savings within the trading industry spurred buy side as well as sell side institutions to implement algorithmic services along the entire securities trading value chain. This research encompasses this algorithmic evolution, highlighting key cornerstones in its development discussing main trading strategies, and summarizing implications for overall securities markets quality. In addition, it touches on the contribution of algorithmic trading to the recent market turmoil, the U.S. Flash Crash, including the discussions of potential solutions for assuring market reliability and integrity.

Buying a dual listed stock at a lower price in one market and simultaneously selling it at a higher price in another market offers the price differential as risk-free profit or arbitrage. The same operation can be replicated for stocks versus futures instruments, as price differentials do exists from time to time. Implementing an algorithm to identify such price differentials and placing the orders allows profitable opportunities in efficient manner.

IV. CONCLUSION Execution of trades on stock exchanges based on pre-defined criteria and without any human intervention using computer programs and software is called algorithmic trading or algo trading. While being a subset of algorithmic trading, high-frequency trading involves buying and selling thousands of shares in fractions of seconds. HFTs are proprietary trading firms that use high speed systems to monitor market data and submit large numbers of orders to the markets. Limit orders dominated by AT, but have a lower share in total trades. AT supply almost as much liquidity as the demand. AT contribute significantly to order cancellations (55% on spot market & 90.23% on SSF), but have a little share in trades (37% on spot and 8% on SSF). Most of these ‘fast’ cancellations away from the touch. Large percentage of cancellations, is a feature of limit order markets, and can have legitimate reasons. Consequently, data was discussed, as well as its characteristics and importance. Moreover, some of the data analysis tools and methods in particular were examined. Thus, data storage and management, as well as
quantitatively analysis processing were detailed. Validity of the concerns remains questionable. Much of the empirical evidence suggests that AT has indeed improved market quality.

In future, The future prospects of Algorithm Trading are certainly very exciting and Algo Trading is set to grow exponentially between 2018 and 2026. The best part of Algorithmic Trading is that it excludes human emotions and works on conclusive evidence. Hence, it will have an advantage over human trading.

Algorithmic trading is amongst the most talked about technologies in the recent years. It has given trading Firms more power in the rapidly evolving markets by eliminating human errors and changing the way Financial markets are interlinked today. Currently, trading is happening in the span of microseconds and going on to Nanoseconds, with just one millisecond accounting for millions in revenue per year from market trades. Anonymity, Cost, and Speed are few of the many desirable qualities of Algo trading besides ease of use, customization, etc.

V. REFERENCES


