RESEARCH PAPER

Regulating retail algorithmic trading in India: Is SEBI's 2025 framework protection or regulatory gatekeeping?

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ABSTRACT

Rapidly growing involvement of retail participants in algorithmic trading reflects an important transformation of the structure of securities markets in India that brings with it difficult dilemmas regarding issues of accessibility, control, and regulatory motivation. The regulatory framework for 2025 presented by the Securities and Exchange Board of India appears to be an outcome of an important confrontation between two opposing forces. On one hand, the necessity to protect the interests of novices from harm caused by fast technological markets, and on the other, the necessity to ensure accessible innovation-oriented markets. Through the integration of the mechanisms for compliance, approval and execution within broker-controlled infrastructures, the framework changes the locus of control from individual traders and independent software developers to controlled third parties. Although such an approach can be seen as precautionary in nature, there is the possibility that the conditions set out under this scheme may have turned engagement into a conditional one instead of being an unconditional right. This paper argues that despite its formal legitimacy due to the reasons stated above, the setup results in the exclusion of people and practices due to structural reasons. The article puts the regulatory approach adopted by SEBI into perspective by looking at the issues surrounding proportionality, technological regulation, and financial inclusion. It is claimed that through the excessive regulations in novel technological areas, we may end up stifling innovation instead of regulating it.

Keywords: Retail algorithmic trading, SEBI 2025 framework, Investor protection, Regulatory Gatekeeping, Broker APIs, Market access and innovation.

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INTRODUCTION

The financial markets of India are experiencing a dramatic change due to fast advancements in technology and digitalization. Automated trading used to be solely practiced by large institutional firms with advanced systems. But, with time, this process is gradually spreading into the realm of retail traders. The development of APIs offered by brokers, trading platforms of third parties, as well as various trading automation tools, makes it easier for traders to use automated trading strategies either developed by someone else or personally by the trader. As a result, the historic divide between the institutional and retail players is gradually losing its clarity, posing some serious issues regarding access, control, and risk within contemporary securities markets. There are definite advantages and risks associated with the development of algorithmic trading within the retail environment. First, it provides the opportunity for greater market engagement on the one side, thus supporting a notion of financial democratization that gives retail traders access to complicated trading techniques. Second, however, it involves significant risks since algorithmic trading is quite complicated and demands considerable skills to be developed properly.

Coding mistakes, lack of back-testing, or sudden market fluctuations can cause fast and significant losses that occur too quickly to be stopped by humans. It is important to note that such problems are not isolated incidents but have broader implications, as they can destabilize the market as well.

With regard to the above, a regulatory regime was put forth by the Securities and Exchange Board of India in the year 2025 for managing retail algorithmic trading.7 The new regulatory regime is quite different from the previous regulatory system that had no formalities. The major components of the regulatory regime include limiting broker APIs, registering algorithms with the

stock exchanges, tagging algorithms for traceability and imposing increased responsibilities on intermediaries. Although these regulatory measures were designed to be precautionary measures

for protecting investors and ensuring the integrity of markets, they do change the structure of market access by giving more control to brokers.

It is the two-sidedness of the regulation that lays down the basis for the present research.9 Even though, on one hand, the goal of the regulation is to provide investor protection, on the other, it makes people wonder about the creation of a broker-dominated system that will make it more difficult for individual investors and small developers to enter the market. Although this duality of the situation can be observed in many countries across the globe, it takes up special importance in a country like India, where the market participation of retail investors is growing rapidly.

Regulation of algorithmic trading in the retail space is a policy dilemma that goes beyond the simple need for regulating the phenomenon. Although there is no doubt about the need for regulation in order to manage the risks involved in algorithmic trading, it is equally important how this regulation is structured and implemented. The 2025 framework proposed by SEBI attempts to resolve some of these issues but at the same time it involves a change in the structure of the markets themselves.

The main issue that will be addressed in this paper is whether the structure serves mainly as a safeguarding system or if it acts as a gatekeeping structure within the regulations. The difference between the two is quite significant because regulatory practices that are too stringent can hinder the purpose of democratizing financial markets. Through requiring more API calls to be brokered, requiring registration for algorithmic processes, and demanding adherence to compliance practices that could consume considerable resources, this structure might end up limiting the participation of independent traders and algorithm developers in the market.

Equally, however, it would be a mistake to describe the framework as purely restrictive without considering the very real dangers that the measures are meant to address. The lack of sufficient controls in a highly volatile technology space could lead to severe consequences for small investors

while also threatening the integrity of the markets themselves. It is here that the question becomes one of striking the right balance when considering whether SEBI's regulatory strategy achieves this objective.

For the purpose of a comprehensive analysis of the problems mentioned above, this study adopts a series of related research questions that pertain to both the protective and restrictive features of the regulatory regime. First, the main research question refers to the efficiency of SEBI's 2025 framework to promote greater investor protection in the domain of retail algorithmic trading. Specifically, it deals with the ability of the proposed regulations to alleviate potential risks without causing an undue burden on market participants. Second, one may identify an aspect related to the structural impact of the framework, specifically on the role of brokers and exchanges. This aspect implies an examination of whether the regulation leads to a system where algorithmic trading depends on intermediary organizations.

Thirdly, the inquiry is made about the proper balance between innovation and regulation in order to determine whether this framework helps or restricts the innovation of new methods of trading. Lastly, it is evaluated whether the framework is in line with the proportionality requirement of being appropriate, necessary, and not excessive in order to fulfill its objectives. Thus, these are the criteria on the basis of which SEBI intervention can be analysed from the legal and policy perspectives.

The main purpose of this research is to conduct an analytical study of the SEBI regulatory policy for retail algorithmic trading in 2025 with a specific emphasis on its impact on investors and market accessibility. It is necessary to go beyond the description of the regulatory policy and look at its structure, logic, and consequences. One of the goals is to examine whether the measures implemented by SEBI can mitigate the risks related to retail algorithmic trading, such as market manipulation and financial stability problems. Simultaneously, it is required to find out if there are any restrictions that might prevent independent traders and small developers from participating in the process. One of the other objectives that should be pursued here is that of evaluating the changing role of brokers in relation to the current regulatory framework, especially since these players now have a bigger duty to oversee algorithmic trading. It is also important to understand the overall effects of the regulatory environment on the innovation of fintech solutions.

At the end of the day, what the paper hopes to find out is whether the strategy that SEBI adopted was a balanced one or whether it was simply an indication of an attempt by the organization to exercise more control over the situation at hand.

The scope of this paper will be limited to an analysis of the relevant legal and regulatory regime applicable to retail algorithmic trading in India, with particular

emphasis being laid on the steps taken by SEBI in 2025 in this regard. For this purpose, the methodology adopted in this paper will mainly be doctrinal and will be based on secondary sources comprising mainly of regulatory documents published by SEBI. While early attempts at regulation of the issue have been mentioned for purposes of providing background information, their discussion will be limited to that effect. Technical aspects of algorithmic trading such as programming techniques or software design will not fall within the ambit of this research. Empirical studies based on market data or trading results also do not fall within the scope of this paper.

It should also be emphasized that the 2025 framework is quite new, and the consequences of its implementation are yet to become known. Consequently, the results of the research conducted within the present paper are based on the framework's content rather than its impact. Regardless of these shortcomings, the current paper makes an attempt to conduct an adequate evaluation of the regulation in question.

Evolution of Algorithmic Trading and regulatory concerns

2.1 What is Algorithmic Trading?

Algorithmic trading is the term used to describe the trading of securities using computers according to pre-set rules. The rules could be simple such as when and where to buy or sell, or could involve more complicated mathematics. However, the essential element of algorithmic trading is the

automation process.15 This means that once the rules have been programmed into the computer, the order will be automatically placed without needing any manual intervention whatsoever.

Originally, the concept of algorithmic trading involved only institutional traders like hedge funds, prop trading firms and large financial corporations. Such players had the necessary technological means, financial power, and competence to develop efficient trading systems. Often, institutional algorithms were built with high-frequency trading methods, advanced statistical calculations and direct market access, ensuring a high degree of effectiveness.19 Retail algorithmic trading, on the other hand, is a fairly new phenomenon in the sphere. This method involves traders making use of simpler algorithms that are developed in simplified systems. Retail algorithms are usually less sophisticated and designed with the help of ready-made templates or software. Retail traders do not usually know how to write code by themselves; thus, they make use of systems providing dragand-drop capabilities. Still, the basic idea behind them stays unchanged. Trades are executed according to specific predefined conditions.

The differences between the institutional and retail approaches to algorithmic trading extend beyond the technological and include fundamental structural considerations. The institutional traders enjoy a tightly controlled environment with direct access to exchanges and sophisticated risk management tools. On the contrary, retail traders enter the market via brokers that act as

15 Albert J. Menkveld, "High Frequency Trading and the New Market Makers," 16 Journal of Financial Markets 712 (2013).

intermediaries between them and the exchange. These divergent access levels become important once the issue of regulation comes into play.

2.2 Growth of Retail Algorithmic Trading in India

The development of retail algorithmic trading in India may be seen as a manifestation of a more general phenomenon where the participation of retail investors in financial markets has been growing steadily over the years. Over the last ten years, the participation of retail investors in financial markets has steadily increased due to several factors, including digitization, reduced transaction costs, and increased financial literacy.

One of the critical factors responsible for this increase is the presence of APIs offered by the brokers themselves. The use of such APIs allows traders to interface their trading algorithms directly with the broker's trading platform, thus allowing automatic trade execution through the use of such algorithms. Through the provision of market data and order entry mechanisms, APIs have greatly lowered the technical hurdle required for access. Instead of building complex technological solutions from scratch, the trader can simply utilize the APIs provided by the broker. Apart from the APIs offered by brokers, other platforms have made great contributions towards lowering the barrier of entry for algo-trading. The availability of such diverse choices has made algorithmic trading easier for more people. One such phenomenon that has come into existence is that of the strategy marketplace. In the strategy marketplace, people can develop and sell algorithms/strategies for retail traders to use in their personal accounts. This has resulted in a completely new paradigm in which there is an interaction between the developer of the strategy and the trader using it through a common platform.

On the whole, the rise of retail algorithmic trading in India seems to indicate a trend towards increased

adoption of technology in financial transactions. But it is clear that much of the

development of retail algorithmic trading has been in the context of a broker-centric trading system where access is determined through brokers and their systems.

2.3 Risks associated with Retail Algorithmic Trading

With the rise in the practice of algorithmic trading in the retail segment, various risks have emerged. The first of those relates to market manipulation through the design of algorithms. These can be used to execute and subsequently cancel trades within seconds to create an illusion or false signal in the market regarding price changes. Although there are regulations around this issue, its difficulty lies in the rising numbers of retail users.

One of the other major risks is that of systemic instability, which arises when there are very swift and drastic changes within the market itself. The nature of algorithmic trading is fast-paced, with various algorithms reacting to the same signals in the market in different ways, thus causing prices to shift very quickly.34 This phenomenon has been described by many as a "flash crash." Although quite uncommon, they could prove to be extremely damaging.35 The problem of mis-selling trading strategies is also becoming an increasingly important issue for the retail industry. The marketplace of strategies is usually filled with pre-made strategies that claim to generate a high rate of return but have no real data to support the claims. It is possible that retail traders might buy and implement such strategies without comprehending the assumptions involved.

Further, information asymmetry adds another layer of difficulty in terms of risks. Individual investors generally do not have equal access to information as institutional investors. The retail investor may not even be aware of how the algorithm works or how changes in the market environment could impact its operation.

The combined effect of all these risks show the necessity for a regulatory structure that caters to issues of market integrity and investor protection. The problem is how to design this regulatory structure without overly limiting access.

2.4 Pre-2025 regulatory position of SEBI

Prior to the establishment of the framework for 2025, the regulation of algorithmic trading in India was mainly influenced by a number of circulars that were published by the Securities and Exchange Board of India, targeting institutions and stockbrokers. The first regulatory move may be attributed to the Circular issued by SEBI on March 30, 2012, titled "Broad Guidelines on Algorithmic Trading". These guidelines marked the official recognition of algorithmic trading in India's securities markets, setting out minimum standards for systems approval, risk management and auditing. According to the circular, stock exchanges are expected to provide that brokers using algorithms secure prior approval, conduct pre-trade risk assessment, and maintain audit logs.

Subsequent regulatory developments further strengthened this framework. SEBI's circular dated May 21, 2013 on "Risk Controls for Algorithmic Trading" introduced additional safeguards such as price bands, quantity limits and order-to-trade ratio monitoring, particularly aimed at controlling the risks associated with high-frequency trading. These measures were supplemented by guidelines on co-location and proximity hosting, which sought to ensure fair access to trading infrastructure while regulating latency advantages enjoyed by certain market participants. These regulations were put in place to provide equal access to trading facilities among other market players while at the same time controlling any latency advantage possessed by some of the players.

But these tools failed to account for the rise of retail algorithmic trading. With the growing number of APIs and external websites available, individual traders could now use algorithmic trading without taking into consideration the previous framework. According to SEBI's regulations at that time, the use of algorithmic trading was expected to be mainly carried out by brokers or their

institutional clients. Thus, the use of algorithmic trading by retail traders using loosely regulated APIs was beyond what was initially anticipated.

The issue has become more prominent after SEBI released its Consultation Paper titled "Algorithmic Trading by Retail Investors" in December 2021, where the increase in the usage of APIs by retail investors and the lack of regulations around this practice have been recognized. The Consultation Paper also mentioned that there was an issue with the use of algorithms without any regulation, the opacity of the performance of the strategies used, and the misutilization of automation. In addition, the lack of uniform rules for the usage of APIs made each broker create its own policy.

However, in reality, the pre-2025 environment transformed into a broker-led framework. The broker became the main authority in the context of regulating algorithmic access through API permissions and setting up the criteria for accessing them. Even though certain

brokers placed limitations on API usage such as API approvals and usage limits, these criteria were neither standardized nor regulated by SEBI.

Moreover, the previous regulatory regime did not sufficiently cover matters of accountability in respect of algorithmic trading among retail traders. Matters pertaining to liability in case of any defects in the strategy employed, operational mistakes, or even disruption in the markets were left unanswered. Moreover, there was no provision of any process for validating the strategies adopted or assessing risk factors and investor suitability. This lack of an organized regulation for retail algorithmic trading resulted in a disjointed regulatory framework. Institutional algorithmic trading was regulated under a well-thought-out system of rules, while retail algorithmic trading had to contend with an unclear regulatory framework that was dependent on the policies of the brokers. The increasing adoption of algorithmic trading by retail clients made it necessary to have a regulation in place.

2.5 Need for regulatory intervention

This new framework can be said to be the response by the Indian Securities and Exchange Board to the problems that have been highlighted in the discussion. The rapid rise in the number of players in this sector and the risks involved made it imperative to intervene and regulate. For the Indian regulator, protecting the investors was the key motive behind regulation.

In terms of policy considerations, the rationale for regulation stems from the potential damage that can arise due to inadequate or insufficient regulation of algorithms. The retail investors will not have the necessary know-how and means to mitigate any risks related to automated trading. They could end up losing a lot of money if they did not have the proper protection. Simultaneously, the lack of regulation of algorithmic behavior will pose threats to the operations of the markets. For example, there could be cases of extreme volatility and manipulation. The emergence of another reason for regulating algorithms is the shift in market dynamics. With the reduction in entry barriers due to technological advancements, there would be an increase in market players. That is why, there comes the need for an organized framework. But at the same time, regulation comes with its own disadvantages. Although regulation can contribute towards making the situation safer, it does carry with it some associated cost and limitations that can deter people from participating. The key issue for regulators lies in ensuring that regulations are proportional to the risks involved.

In this situation, the 2025 Framework is an effort to counter new threats while ensuring market integrity. Whether it is successful in this undertaking is subject to scrutiny.

3. SEBI's 2025 framework: Legal and structural analysis

The regulatory gaps identified in the previous regime, especially as far as retail involvement in algorithmic trading is concerned, led to a well-thought-out and systematic response by the Securities and Exchange Board of India. These developments resulted in a policy framework for regulating retail algorithmic trading that came into being by means of its circular issued in February 2025 titled "Safer Participation of Retail Investors in Algorithmic Trading." Based on the regulatory gaps identified in the previous regime, the Securities and Exchange Board of India

developed a systematic framework for regulating retail algorithmic trading with its circular titled "Safer Participation of Retail Investors in Algorithmic Trading" issued on February 2025. The framework is based on the conceptual framework outlined in SEBI's Consultation Paper on "Algorithmic Trading by Retail Investors".

The 2025 framework is indicative of a move from a principle-based to a rules-compliant system. The framework is based on the principles of protection of the investor, traceability of the activities conducted through the algorithm, and institutional accountability. Unlike other systems where individuals such as retail traders are regulated by SEBI, this one is focused on the intermediary approach whereby brokers and stock exchanges are expected to keep tabs on the activities conducted in the algorithmic market. In a manner similar to the general securities market regulation, SEBI expects intermediaries to enforce compliance within their institutions. The most notable aspect of this framework is the inclusion of the regulation of retail algorithmic trading activities. By doing so, the outline recognizes retail algorithmic trading activities as part of the surveillance and regulation system under the purview of SEBI. Also, the framework provides for the implementation of controls such as access to the API, registration of the algorithmic activities, and tagging of these activities.

The philosophy behind the regulation in the 2025 Framework is decidedly that of an intermediary and control-based approach and not that of a user-based approach. SEBI does not license the enduser directly but integrates its regulation into the organizational structure of brokers and stock exchanges. This shows that SEBI follows the same philosophy for regulating retail

investors as it does for, say, margin trading and derivatives trading.

The regulatory structure is organized around three basic tenets, namely:

(i) controlled entry,

(ii) tracking of all algorithmic orders, and (iii) accountability to the regulated firms.

In contrast to prior circulars, which have been concerned with high-frequency trading by institutions, the proposed framework of 2025 acknowledges retail algorithmic trading as a separate

regulatory domain and attempts to incorporate it into a compliance boundary. Such an objective can be fulfilled through standardization of APIs, mandatory algo registration, unique tag numbers, and increased auditing. The framework should also be considered in light of the relevant regulations such as SEBI (Stock Brokers) Regulations 1992, SEBI (Intermediaries) Regulations 2008, and stock exchange regulations such as those by National Stock Exchange of India and BSE Limited. This set of regulations will act as the legislative framework through which the 2025 framework will operate in respect to retail algorithmic trading.

3.1 Broker API regulation

Another important feature of the 2025 framework concerns the regulation of APIs provided by brokers, which form the core medium through which algorithmic trading can be executed. APIs provide a facility where an automated connection is established between the algorithm of the trader and the trading platform of the broker, thus enabling orders to be placed and executed within seconds. Until 2025, the rules governing API use varied among brokers, reflecting a lack of standardization in the market. In the new framework, the regulation of API use is made uniform through a set of regulatory measures that govern API provision. According to the framework, brokers will have to create a formal system of vetting API applicants. This process will involve carrying out due diligence on the user, examining the type of algorithmic trading strategy used and confirming whether the trading activity meets risk management thresholds.

A central pillar of the 2025 Framework is the standardisation and regulation of broker APIs, which function as the primary access point for retail algorithmic trading. Prior to this intervention, API access was governed by disparate broker-level policies, resulting in inconsistent eligibility criteria, risk controls, and monitoring mechanisms. The framework addresses this fragmentation by introducing a uniform regulatory layer over API issuance and usage. Under the 2025 Framework, brokers are required to provide APIs only through a controlled and "white-listed" access system. Retail clients seeking API access must undergo a formal approval process, which includes clientlevel due diligence, assessment of trading intent, and verification of compliance readiness. This reflects an extension of the "know your client" and risk profiling obligations already embedded in the SEBI (Stock Brokers) Regulations, 1992.

Additionally, the model requires that APIs should not allow unrestricted automated trading. Rather, they should be restricted to only authorized and registered algorithms, thus ending the prior system where APIs were used without restrictions to automate. Also, brokers need to put in place realtime surveillance systems to detect any API-generated trades.

The first consideration from the perspective of regulatory compliance is that brokers will have to ensure that their APIs are designed in such a way that the algorithms used are subject to pre-trade risk tests, which include price band checks, limit on quantity, and even control on the rate of order generation, which were all introduced in SEBI's algorithmic trading circular of 2012 and 2013. The result is that APIs become a regulated gateway, access to which depends on meeting specific criteria.

Ahead, it stipulates that APIs can only be employed for authorised algorithms that have been registered or validated through official means. Additionally, brokers are supposed to keep records of all activity that is related to the use of the APIs, such as order flows and executions. In this way, regulatory control is possible, and it helps to promote transparency. In regulating APIs, brokers are turned into controllers of access. Although APIs still give access to technology, it is no longer unfettered access. It comes under regulatory scrutiny and approval.

3.2 Exchange registration and approval of algorithms

One major advancement that has been included in the 2025 framework is the need for algorithms' registration and approval at the exchange level. The advancement takes from SEBI's previous consideration about system approval but makes a breakthrough by including retail algorithms. According to the scheme, any algorithm meant for use by retail users has to be registered with recognized stock exchanges like the National Stock Exchange of India and BSE Limited.

Algorithm registration entails the filing of data on the logic and risk factors associated with the algorithm, as well as its purpose. Exchanges have the responsibility of verifying this information against the set regulatory requirements, including measures to prevent too many orders, manipulations, and any form of system instability. Once approved, the algorithm can then be used in the trading process. Such a move helps to introduce another stage of regulation before trade is carried out. In other words, traders cannot engage in any strategy involving algorithms that have not been approved by the regulator in advance. As such, this helps minimize cases where traders indulge in non-compliant or harmful behavior. Moreover, it creates a regulatory standard that recognizes exchanges as oversight agencies within the algorithmic trading platform.

3.3 Tagging, audit trails and compliance requirements

The issue of traceability is crucial when it comes to regulating algorithmic trading and the framework for 2025 takes into account this issue by mandating the use of tagging and audit trails. Every algorithm used for trading is assigned a unique identification number that is used for tagging all orders made by that algorithm. Tagging allows regulators and the exchange to trace the source of transactions and analyze behavioral patterns. The practice of tagging is reinforced by the general surveillance framework of SEBI, which utilizes real-time monitoring systems provided by the stock exchange.

Apart from tagging, the framework stipulates that audit trails should be kept. This means that brokers and exchanges need to document algorithmic trades. Such documentation should be done through keeping detailed records on issues like order time stamps, trade execution data, and system logs. The audit trails have to be maintained for specific durations and can be checked by relevant authorities. There is a need to conduct periodic audits and risks assessments too. Brokers must ensure that their systems are able to accommodate algorithmic trading without affecting their stability. Pre-trade risks management, as per previous SEBI circulars, is mandatory.

These measures collectively create a strong compliance architecture for ensuring transparency and accountability in algorithmic trading.

3.4 Classification of algorithmic tools

The 2025 framework incorporates a functional classification of entities that operate in the realm of algorithmic trading in the retail market. Under this classification, there can be three types of actors, namely, algorithm developers, platform providers and end users. Each actor has different requirements as far as regulation is concerned. The algorithm developers, or algo providers, are considered to be individuals or companies that devise trading algorithms. As per their respective functions, these algorithm developers may need to register themselves under SEBI norms if they are providing investment advice or managing portfolios. In such scenarios, the SEBI (Investment Advisers) Regulations, 2013 and SEBI (Portfolio Managers) Regulations, 2020 will be applicable to them.

Platform vendors, on the other hand, provide the technological base upon which the algorithms are used. Third-party platforms that link up to broker APIs can be included here. There are certain responsibilities imposed on the platforms under the framework, especially concerning issues like transparency, disclosure, and adherence to exchange rules. Finally, end-users, otherwise referred to as retail traders, are the actual operators behind the use of algorithmic systems. Even though the framework does not put any regulatory duties on the users themselves, it still regulates their actions via brokerages and exchanges.

This classification helps in allocating responsibilities within the ecosystem. It recognises the diverse roles played by different participants and seeks to regulate them accordingly.

3.5 Role of brokers as gatekeepers

The 2025 framework makes a bigger improvement in the involvement of brokers in algorithmic trading. Brokers are already required under SEBI (Stock Brokers) Regulations, 1992, to undertake certain responsibilities regarding customer due diligence, risk management, and compliance requirements. This framework takes it a step further and ensures that brokers become the primary gatekeepers for algorithms.

Brokers have to confirm the eligibility of the client who wishes to use APIs, approve the algorithm before using it in actual trading and regulate the process of trading. Brokers have to ensure that the rules and regulations of the exchange are followed and that all transactions are recorded in detail. Essentially, brokers not only facilitate trades but also regulate trading behavior. Brokers have a significant responsibility in the process because they have to make substantial investments in technology and establish approval processes. However, at the same time, this responsibility reinforces their status as market players since all access to algorithmic trading has to go through brokers. This is an important aspect of the broker gatekeeper role.

3.6 Liability and accountability structure

Liability in algorithmic trading is complicated and more so when there are several actors involved. The liability issues have been dealt with in the 2025 model through the provision of layers of responsibility, but complete ambiguity has not been avoided.

As per the present law, brokers have the major burden of being responsible for transactions conducted via their systems. This is focused upon by SEBI's previous circulars and the SEBI (Stock Brokers) Regulations, 1992, which place the responsibility for compliance with trading standards and risk management standards upon the brokers. In the proposed 2025 law, brokers would become responsible for automated transactions carried out via API connections of brokers. However, there might still be some liabilities for other players involved in the transaction process. For example, if the developer offers advisory services, he may be held liable under the SEBI (Investment Advisers) Regulations, 2013. These regulations obligate investment advisers to act responsibly, make proper disclosures, and ensure suitability.

Although retail traders cannot be termed as intermediaries and therefore do not come under regulation, they are not entirely absolved of accountability. They must adhere to the trading guidelines, and violations may result in action being taken against them. In effect, the regime has established a system where all the parties involved have their own areas of accountability regarding the process of algorithmic trading. Still, it is unclear how exactly liability will be assigned in certain cases.

In conclusion, the 2025 model provides an all-encompassing effort to regulate the practice of algorithmic trading by retail investors. Through the inclusion of laws, exchanges, and intermediaries, this model provides a system focused on control, accountability, and traceability. However, whether this model succeeds in accomplishing its objectives without placing unnecessary restrictions remains an open question for debate.

4. Protection vs gatekeeping - A critical evaluation

4.1 Investor protection justifications

The framework for 2025 proposed by the Securities and Exchange Board of India is officially founded on the goal of investor protection, which is acknowledged by Sections 11(1) and 11(2)(b) of the SEBI Act of 1992. When considering the use of algorithmic trading by retail investors, this goal becomes especially significant because of the mismatch between the advanced nature of trading algorithms and the level of understanding possessed by retail traders about how they operate.

One of the main reasons why the framework is justified is because of risk mitigation. The risks posed by algorithmic trading include fast and multiplied risks due to the fact that automated trading platforms can conduct a huge volume of transactions in a matter of milliseconds. Unless appropriate protective measures are put in place, there is a possibility of significant losses occurring from mistakes in programming or in designing an incorrect trading strategy. Pre-trade checks, API constraints, as well as price bands and order limitations, are some of the ways in which such risks have been mitigated in the framework.

The need for stability in the markets represents another rationale for the new rules. Markets, by their very nature, can be volatile in reaction to an increase in trading volumes especially when the same are driven by algorithms reacting to the same signals. Flash crashes in financial markets around the world have proven how the process of algorithmic feedback can result in brief but dramatic interruptions. While such cases are less common in India, the growing role played by algorithms used by individual investors makes it a matter of concern that needs to be addressed systematically.

The third rationale is connected with the problem of misuse prevention. Algorithms used for trading can be utilized for manipulations like spoofing, layering, or the creation of fictitious liquidity. However, it should be taken into account that such methods are illegal under securities legislation and are strictly regulated. In this case, detection of misconduct is made difficult due to the fact that the trade process itself is automated and decentralized. Therefore, with the use of the proposed system, existing prohibitions will become easier to implement.

In aggregate, these rationales provide a cohesive basis for regulation. The regulatory framework targets genuine threats and is generally consistent with the mandate of SEBI. Nonetheless, the credibility of these rationales should also be considered within the context of the impact that the framework may have on access and participation.

4.2 The gatekeeping argument

Although the logic behind investor protection is very strong, there is another issue that emerges in the structure of the 2025 framework. This issue does not stem from the existence of regulation but rather from how regulation is dispersed across the market. Via putting the compliance function of these algorithms inside the hands of brokers and exchanges, the framework makes sure that algorithmic trading access is restricted to certain regulated entities. The regulation of APIs offers an apt example of this dynamic at play. APIs serve as the main

gateway for retail traders accessing the automated trading system. In the proposed model of 2025, API access ceases to be a technical issue but rather becomes a regulated privilege contingent upon broker approval. The brokers will be expected to conduct a client assessment, approve the algorithm, and regulate the use, thus granting considerable discretion on access and conditions.

Algorithm registration is an additional element that adds even more centralization to the process. Although registration is a necessary procedure, at least from a risk management point of view, it presents additional complications that are not always easy for an individual developer to deal with. Cooperation with exchanges and, where relevant, empaneled providers adds another step to the process of approval. This might be no problem for bigger organizations; but, smaller developers might find it hard to meet those requirements.

Another aspect of the gatekeeping issue is compliance costs. This model entails responsibilities regarding system auditing, data retention, and risk management, most of which are paid for by the broker and then charged to the user. Such costs will not be a deterrent to large-volume traders, but for smaller operators, the cost might be quite high. Furthermore, the requirement that all must comply with standardized API and approved algorithms might constrain innovators from trying out alternative approaches.

In other words, these are elements leading to the establishment of a managed ecosystem, in which access is channeled through institutional intermediaries. Even though such management could be beneficial for ensuring security, it still shifts the dynamics by favoring those organizations that fit within the managed ecosystem. In fact, the problem with regulation does not lie in the fact that it is practiced, but in its design.

4.3 Impact on retail traders and small developers

The practical consequences of the framework in 2025 can be most keenly felt through its influence on retail investors and small developers, who represent the essence of the growing algorithmic trading world. The framework has been defended as a tool for promoting safe access to the system, yet its true consequences on access and autonomy warrant further scrutiny.

The system acts as both a source of protection and restriction for the retail traders. From one perspective, the condition that algorithms will only be used after approval ensures traders do not make use of ineffective and possibly fraudulent methods. The intervention of brokers and exchanges in the system is a form of supervision that could prove advantageous for novice traders. From another perspective, the system hinders traders from designing and implementing their own trading systems because they need to obtain approval and are also restricted by API access limitations.

For smaller developers, however, these problems are more acute. The process of registration of algorithms, adherence to exchange standards, and interface with broker systems takes effort which may be difficult to obtain. Unlike large organizations, smaller developers do not have the necessary capabilities to go through these steps and may find themselves cut out of the market or having to work through an intermediary. It poses a larger question as well regarding the issue of democratization of financial markets. Though technological innovation has helped to remove barriers to entry, the regulation process may bring back the barrier. The model does not exclude the possibility of retail involvement, but it transforms retail involvement from direct to mediated, based on adherence to institutional procedures. It depends on one's perspective whether the new approach is democracy or not.

4.4 Innovation vs regulation debate

The dynamics between innovation and regulation are inevitably intricate, especially within techdependent industries like algorithmic trading. Innovation can be promoted or restrained by regulation based on how it is established. This dichotomy is clearly manifested through the dilemma between standardisation and flexibility in the 2025 legal outline.

From one perspective, the framework itself can act as an enabler of innovation in that it provides an environment which is stable and predictable. The clear guidelines on how APIs must be used, what kind of algorithms must be registered, and all the necessary compliance measures will allow for greater certainty and more investment in technology. Nevertheless, these very elements which ensure stability could also pose a barrier to innovation. Innovation in automated trading is often characterized by constant trial and error and adjustment according to prevailing market trends. This process of innovation would likely be delayed due to the need for prior regulatory approval and due to the presence of standardized interfaces.

The intermediary's function makes matters even more complex. The broker, who acts as a gatekeeper, will place priority on compliance and minimising risks rather than innovation. This is quite logical from a regulatory standpoint, but this may create a tendency toward conservatism, which stifles innovation. Under such circumstances, innovation can be seen only among bigger players, who have the financial means to handle compliance issues.

In this sense, the model represents a compromise. It strives for creating a secure place where one can experiment, yet employs instruments that may affect the range of experimentation. How justified this compromise is will depend on the value attributed to both security and innovation.

4.5 Comparative perspective

A quick glance at how other countries handle the regulation of algorithmic trading further explains SEBI's position. In the US, the main mode of regulation is through the rules made by the Securities and Exchange Commission combined with regulation by SROs like FINRA. The emphasis here is on risk management, market integrity, and responsibilities of brokers, without having to register every single algorithm. There are provisions for supervision and system integrity, but there is no centralized approval procedure for individual algorithms available to retail customers, as in SEBI's case. Likewise, in the UK, algorithmic trading is regulated by the Financial Conduct Authority using general regulatory regimes like MiFID II, where the focus is on control and risk management. Once more, the focus of the regulation is the organization implementing the algorithms, not the algorithms themselves, allowing greater flexibility in terms of strategy.

These comparison models imply that it might be better to have a more decentralised system wherein the onus lies on the business organisations themselves to adhere to the rules without having any stringent gatekeeper mechanisms of prior approval systems in place. On the other hand, the SEBI model follows a more centralised and preventative strategy.

4.6 Proportionality and regulatory overreach

This criterion of proportionality helps us to assess the 2025 regulations. The first criterion of the proportionality principle is that the measures taken should be appropriate for achieving the desired outcome, which means that they should be relevant to the aim. In addition, these measures should be necessary. They should not be substituted by any other measure with lesser restrictions. Finally, proportionality means that the measures have a proper effect on the rights and interests. When it comes to the appropriateness of the framework, it can be said that the measures proposed fit perfectly well. Algorithms' registration, API control and audit trails relate perfectly to the goals set.

The issue of necessity, on one hand, is more difficult to resolve. Although regulation is obviously needed, it is not necessarily true that all the components of the structure are necessary. For instance, there might be other ways to attain the same ends by means of better disclosure standards or monitoring after the trade transaction than through limiting access.

On the other hand, as far as proportionality in its strictest sense is concerned, there is cause for concern. The burden of compliance and limitations to access faced by retailers and small developers, among others, can prove substantial in comparison to the risks associated with individual traders. When such a burden outweighs the risk associated with the group, there would indeed be cause for concern.

The approach is not automatically considered to be regulatory overreach, but it operates in the realm of stricter regulation. The approach of control and standardisation is a conservative one, and while it may be necessary for a growing economy, it should be exercised judiciously.

4.7 Is SEBI's framework balanced?

The evaluation of SEBI's 2025 framework ultimately turns on the question of balance. On one side, the framework addresses genuine risks associated with retail algorithmic trading and provides a structured mechanism for ensuring investor protection and market integrity. Its emphasis on traceability, accountability, and institutional responsibility represents a significant advancement over the fragmented pre-2025 regime.

On the contrary, the model creates an element of control that changes the dynamics of participation in the market. The model creates a situation where participation in the market becomes controlled because it is based on conditions. This can lead to a lack of autonomy for traders and hinder innovation.

Hence, the model may be described as a combination of the protection and gatekeeping models. The model does not deny access altogether but rather restricts it through certain regulations. Whether such an approach is suitable will depend on the importance of the goals. If protecting investors is the goal, the model makes sense. But if access and innovation are important, then it becomes more restrictive. In its present configuration, the framework favors caution. It is an example of regulatory bias for control over adaptability and for precaution over innovation. Although such an orientation can prove useful in handling immediate threats, its future impact on market growth and inclusiveness is unclear.

5. Conclusion and recommendations

5.1 Summary of findings

The purpose of this paper was to analyze whether the regulatory regime for algorithmic trading in the retail sector, which came into force in 2025 according to the

Securities and Exchange Board of India, serves as a true investor safeguarding mechanism or a regulatory gatekeeping system. From the analysis carried out in previous chapters, it can be observed that the response is not black and white.

The first question was whether the framework improved investor protections. The results show that it does. The implementation of algorithm registration, control on API access through brokers, risk management measures before trade, and audit trails together take care of all the potential risks that come with retail algorithmic trading. This makes it less probable to make wrong trades. This framework is a success from the perspective of regulation since the pre-2025 framework had weaknesses, which made it difficult for retailers to engage in algorithmic trading.

The second question focused on the extent to which the framework fosters structural dependency on intermediaries. In this case, the findings are equally unequivocal. The framework greatly boosts the importance of intermediaries such as brokers and exchanges, placing them at the center as key players whose mediation is necessary for any activity conducted using the algorithms. The use of APIs, strategy approval and trade monitoring all go through them.

The third issue considered was innovation versus regulation. In this respect, the analysis shows that although the proposed framework offers regulation clarity and predictability, it may create regulatory hurdles for innovation in terms of its process and implementation. The need for obtaining an authorization before deploying the algorithm and utilizing the broker's infrastructure may act as a disincentive to innovate.

Finally, the question of proportionality reveals a mixed outcome. The framework is suitable and rationally connected to its objectives, but certain elements, particularly those relating to access control and compliance burdens, may be more restrictive than necessary. This creates tension between regulatory efficiency and inclusivity.

5.2 Final position

Based on the analysis, it is not accurate to characterise SEBI's 2025 framework as purely protective or purely restrictive. It operates as a hybrid model in which investor protection and regulatory gatekeeping coexist. The framework clearly advances the goal of investor protection. It introduces safeguards that are necessary in a technologically complex and rapidly evolving market environment. It also enhances regulatory oversight and aligns retail algorithmic trading with established principles of risk management and accountability. In this sense, the framework represents a logical and necessary progression in securities regulation. At the same time, the framework reconfigures the structure of market access. With the control embedded in the brokers and exchange houses, a regime that conditions market participation through adherence to the institutionalized process is created. This does not amount to exclusion, but it does limit autonomy. Independent traders and developers are required to operate within a predefined regulatory architecture, which may constrain flexibility and innovation.

This is a rather conservative regulatory structure. There is a preference for safety and control in lieu of openness and innovation. It is quite clear why this was done in view of the potential dangers involved, but this poses some interesting dilemmas when it comes to the future development of markets. There is the danger of stifling any sort of dynamism. Accordingly, the framework should be understood as a protective system with embedded gatekeeping features, rather than as a purely enabling or restrictive regime.

5.3 Policy recommendations

Although the framework for the year 2025 serves as a solid basis for regulating algorithmic trading in retail, there are some adjustments that could be made to ensure that both sides are well-balanced.

(i) Control concentration has emerged as one of the critical issues discussed in this research paper. In order to solve this problem, SEBI can take into account the use of APIs that provide interoperability and reduce dependence on a particular brokerage firm's infrastructure. For example, SEBI can introduce:

a) A standardized API framework among all brokerage firms;

b) Access for regulated third-parties with predefined conditions; and

c) Exchange-level neutral or centralized API gateway system.

This will ensure that the process remains controlled while minimizing discretionary power of brokers. It will also encourage healthy competition in designing trading tools.

(ii) The current regime, which stresses on registration and regulation, could unintentionally discriminate against smaller, independent developers who do not have the institutional capacity to cope with the requirements. In order to encourage innovation and diversity in the space, SEBI could consider taking proactive steps like the introduction of regulatory sandboxing for retail-oriented algorithmic strategies. Sandboxing will enable controlled experimentation without having to fully comply with the regulatory

requirements. Also, the streamlining of the registration process for lower risk algorithms and guidance to differentiate between financial advisory services and technology provision could help.

(iii)The adoption of one standard for compliance may not be ideal in every case of algorithmic trading, since the levels of risks involved vary significantly from one strategy to another. The SEBI may need to adopt a graded regulation system in which the compliance is tailored depending on the levels of risk and other issues such as frequency and volume of trading activities. Less risky and low volume operations may enjoy less stringent regulation measures, whereas complicated operations will require rigorous regulations.

(iv) Although the algorithm registration process at the exchange level ensures greater supervision, it can give rise to delays, thereby making the whole process slow. There is scope for SEBI to improve upon the current process through the introduction of a streamlined process for approval, such as approval for small changes made in the already approved algorithm, along with a clear timeline for decision-making on the part of the exchanges.

(v) Due to the increased use of strategy marketplaces and third-party platforms, there is a need for more transparency regarding how these algorithms are made available to retail investors. There could be standardized disclosure obligations for the algorithm provider such as performance indicators, risk factors, and assumptions. This will ensure that there is no information imbalance, and decisions can be made based on factual information. The platform should ensure that there is clear differentiation between validated and non-validated strategies.

(vi) Regulatory interventions alone are not sufficient to cope with the various threats posed by algorithmic trading. It is equally necessary that awareness among investors about the working of and limitations of algorithms in trading be enhanced. This needs to be done by SEBI along with brokers and stock exchanges in India through well-defined educational programs aimed at understanding risk management and evaluating strategies, among other things.

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