

Algorithmic Trading and Market Fairness: Assessing Whether Indian Securities Regulation Can Protect Retail Investors in Machine-Speed Markets

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Abstract

Algorithmic trading and the use of artificial intelligence (AI) and machine learning (ML) have reconstituted securities markets from human-paced environments into machine-speed systems in which orders are generated and executed in microseconds; in India, algorithmic orders now account for a majority of turnover in several market segments. This article asks whether Indian securities regulation, and the Securities and Exchange Board of India (SEBI) in particular, is equipped not only to preserve market integrity and systemic stability but also to protect retail investors from the structural disadvantage that machine-speed markets produce. Drawing on a comparative survey of algorithmic-trading regulation in the United States, the European Union, the United Kingdom and Singapore, and on the literature concerning app-based trading platforms and AI in corporate accountability, it argues that efficiency alone is an inadequate measure of a fair market. While automation can narrow spreads, deepen liquidity and sharpen price discovery, it also amplifies volatility, enables manipulation through spoofing and layering, and entrenches infrastructural inequality between institutional and retail participants — a concern made concrete by SEBI's own finding that the great majority of individual derivatives traders lose money. The article contends that SEBI's framework, including its June 2025 AI/ML consultation and its February 2025 retail-algorithm circular, remains oriented towards integrity and systemic risk rather than retail fairness. After weighing the principal objections, it identifies doctrinal and policy gaps and proposes a retail-fairness framework of risk-based registration, model governance, human oversight, gamification limits, liability rules and a structured compensation mechanism.

Keywords: Algorithmic trading · High-frequency trading · SEBI · Retail investor protection · Market fairness · AI/ML governance

1. Introduction

Within little more than a decade, participation in Indian securities markets has been transformed twice over: first by the democratisation of access through mobile trading applications, and second by the migration of execution itself from human decision-making to automated systems operating at machine speed. The National Stock Exchange recorded over ninety million active client accounts by 2024, roughly a threefold increase since 2019, the overwhelming majority onboarded through platforms such as Zerodha, Groww, Upstox and Angel One (NSE 2024; Tejaswini 2025). At the same time, algorithmic and high-frequency trading — computer systems that generate and execute orders in microseconds — have come to account for a majority of order flow in several Indian market segments, with algorithmic orders

representing around 57 per cent of NSE cash-segment turnover and approaching 70 per cent in equity derivatives (Business World 2026; Yadav and Saganali 2025).

These developments are frequently defended in the language of efficiency. Automation narrows bid–ask spreads, deepens liquidity, reduces human error and sharpens price discovery (Yadav and Saganali 2025; Brogaard 2010; Hasbrouck and Saar 2013). Yet efficiency is not the same as fairness, and a market may be highly efficient in the aggregate while remaining structurally unequal for the individual retail investor who trades against it. The stakes are not abstract: SEBI’s own research records that the overwhelming majority of individual traders in the equity derivatives segment lose money, with aggregate net losses exceeding ₹1.8 lakh crore over the three years to FY2024 (SEBI 2024a). That datum makes the inquiry concrete. The central question of this article is whether Indian securities regulation, and SEBI in particular, is equipped not only to maintain market integrity and systemic stability — objectives it pursues with increasing sophistication — but also to protect retail investors from the structural disadvantage that machine-speed markets create.

The argument proceeds in eight further sections. Section 2 characterises the shift to machine-speed markets and the limits of Indian anti-manipulation doctrine. Section 3 isolates the retail fairness problem and anchors it in the empirical record. Section 4 examines India’s current regulatory position, including the SEBI Act mandate, the algorithmic-trading controls (with the February 2025 retail-algo circular) and the June 2025 AI/ML consultation. Section 5 draws comparative lessons from the United States, the European Union, the United Kingdom and Singapore. Section 6 identifies the doctrinal and policy gaps. Section 7 confronts the principal objections to the thesis. Section 8 proposes a reform framework. Section 9 concludes. The article does not contend that algorithmic trading should be curtailed; its benefits are real and well documented. It argues, rather, that efficiency alone cannot be the measure of a fair securities market, and that India’s framework must be supplemented by a dedicated retail-fairness dimension that it presently lacks.

2. From Human-Speed Markets to Machine-Speed Markets

2.1 Algorithmic and high-frequency trading defined

Algorithmic trading is the use of computer algorithms to generate and execute trading decisions automatically, according to pre-defined parameters and without continuous human intervention (Yadav and Saganali 2025, pp 351–352). High-frequency trading (HFT) is a subset characterised by ultra-low latency, rapid order submission and cancellation, and extremely short holding periods. The competitive logic of HFT is temporal: an order that reaches the matching engine microseconds before another captures the available price. This has produced an infrastructure arms race — co-location of servers within exchange data centres, proprietary low-latency data feeds, and latency-arbitrage strategies that exploit minute timing differences between trading venues. In India, these advantages are concretely available: the exchanges offer co-location and direct market access, and algorithmic orders now constitute a majority of turnover in several segments (Business World 2026; Yadav and Saganali 2025).

2.2 Benefits and systemic risks

The benefits are well established in the empirical literature. Studies of market microstructure suggest that automation can narrow spreads, enhance liquidity and improve price efficiency under normal conditions (Brogaard 2010; Hasbrouck and Saar 2013). But the same speed and interconnection introduce new categories of risk. Automated systems can generate cascading feedback loops during periods of stress, amplifying rather than dampening volatility. The 2010 ‘Flash Crash’ in the United States demonstrated

how interacting algorithms could trigger extreme short-term dislocation, and the 2012 Knight Capital episode showed how inadequately tested code could generate catastrophic losses within minutes (Kirilenko et al. 2017; Yadav and Saganali 2025).

2.3 Spoofing, layering and the limits of Indian anti-manipulation doctrine

Manipulative strategies have also become more technologically sophisticated. Spoofing — entering orders without intention to execute, so as to create a false impression of demand — and the related practice of layering exploit the very speed and opacity that define modern markets. In India, such conduct is addressed, if imperfectly, through the SEBI (Prohibition of Fraudulent and Unfair Trade Practices Relating to Securities Market) Regulations 2003: regulation 4(2)(a) prohibits ‘creating a false or misleading appearance of trading’, and SEBI has proceeded against spoofing under that and related provisions (SEBI 2003).¹ Yet spoofing is not expressly defined in Indian securities law, and enforcement proceeds through civil penalties under the general anti-fraud framework rather than under a purpose-built prohibition of the kind available in the United States.

Crucially, these dynamics generate informational inequality. The participant who can observe order flow first, co-locate closest to the matching engine and deploy adaptive models trained on richer data enjoys a structural advantage unavailable to the ordinary investor. As trading migrates from a human pace to a machine pace, the gap between those who possess this infrastructure and those who do not widens. The transformation is therefore not merely technical; it reallocates advantage within the market, and it is this reallocation that gives rise to the fairness question at the heart of this article.

3. The Retail-Investor Fairness Problem

3.1 Structural asymmetry

The fairness problem created by machine-speed markets cannot be reduced to a question of aggregate market efficiency. Even if automation improves overall liquidity and price discovery, it simultaneously entrenches a structural asymmetry between institutional actors and retail investors. Institutions command superior infrastructure — co-location, low-latency connectivity — faster execution, proprietary data and sophisticated algorithmic tools; the retail investor typically possesses none of these. The retail participant who places a market order through a mobile application is, in effect, transacting in an environment whose pricing has already been shaped by actors operating orders of magnitude faster.

3.2 The aggregate evidence: SEBI’s F&O loss study

The consequences are visible in the aggregate data. SEBI’s own repeated studies of the equity derivatives segment have found that the great majority of individual traders lose money — 89 per cent in FY2022, rising to 93 per cent across FY2022–FY2024 — with aggregate net losses exceeding ₹1.8 lakh crore over three years, and the most active loss-makers (the top 3.5 per cent) losing on average around ₹28 lakh each (SEBI 2023, 2024a). The data do not, by themselves, demonstrate that machine-speed markets cause retail losses; many factors contribute. But they make it implausible to maintain that microstructural efficiency is delivering for the retail investor, and they undermine any complacent reliance on aggregate market quality as the measure of fairness.

This exposes the limits of ‘formal equality of access’. Indian markets are, in a formal sense, open: any investor may open an account and trade the same instruments on the same venues. But formal equality of

¹The SEBI order against Nimi Enterprises is one illustration: spoofing in India is presently pursued under the general anti-fraud provisions of the PFUTP Regulations rather than under a purpose-built prohibition, and the available remedy is civil rather than criminal — a position commentators have criticised as inadequate for machine-speed manipulation.

access is not equality of trading capacity. Where the actual capacity to compete depends on infrastructure and information that are, by their nature, available only to a small set of well-resourced participants, the promise of an open market becomes substantially hollow for the retail investor. Fairness, properly understood, concerns not merely the right to enter the market but the conditions under which one competes within it — a distinction that efficiency-centred regulation tends to obscure.

3.3 Platform-level risks and the advisory–execution boundary

The fairness problem is compounded at the platform level. App-based intermediaries exercise what may be described as a soft regulatory power over investor behaviour — channelling, encouraging and occasionally distorting decision-making through interface design, push notifications, curated stock lists and one-tap execution — without bearing the corresponding obligations of brokers or investment advisers (Tejaswini 2025). Gamification techniques such as streak notifications, leaderboards and celebratory animations encourage frequent and speculative trading; SEBI's own data record a marked increase in intraday and derivatives participation by retail investors after 2020, coinciding with the rise of these platforms (SEBI 2024b; Tejaswini 2025). Many newly onboarded investors are financially inexperienced, and for them the platform itself functions as the primary financial information environment. Algorithmic recommendation features — curated thematic collections, 'market buzz' notifications and nudge systems — operationally resemble investment advice, yet the platforms surfacing them are registered as brokers operating under a suitability-light regime rather than as advisers bound by fiduciary duties (SEBI 2013; Tejaswini 2025). The behavioural influence is real; the accountability is not.

The consequences become acute during failure. Platform outages have repeatedly left retail investors unable to log in or to exit positions during volatile hours, in some cases with substantial uncompensated losses, and with no regulatory mechanism for real-time outage reporting or remedy (Tejaswini 2025). The retail fairness problem therefore operates on three levels at once: infrastructural disadvantage in execution, informational and behavioural exploitation through platform design, and the absence of effective remedy when systems fail. A regulatory framework that addresses only the first, or that treats the second and third as incidental, leaves the retail investor structurally exposed.

4. Indian Regulatory Framework

4.1 SEBI's statutory mandate

SEBI's authority and purpose are defined by the Securities and Exchange Board of India Act 1992, whose preamble and section 11(1) charge it with protecting the interests of investors and regulating and developing the securities market (Securities and Exchange Board of India Act 1992, ss 11, 11B). The fairness of the retail investor's position is therefore not external to SEBI's mandate but central to it; the question is whether the operational architecture SEBI has built around algorithmic trading discharges that statutory purpose for retail investors in machine-speed markets.

4.2 Algorithmic-trading controls and the February 2025 retail-algo circular

That mandate has been operationalised, in the algorithmic-trading context, through a series of regulatory phases. An initial period of permissive facilitation treated online platforms as technologically enhanced brokers within the existing registration framework. From 2012, SEBI introduced technology-specific measures, beginning with its Broad Guidelines on Algorithmic Trading, which established the architecture that still governs the field: exchange-level approval of algorithms before deployment, order-to-message and throttling controls, mandatory risk-management checks, audit trails and exchange surveillance (SEBI 2012). More recently, SEBI has moved from consultation to binding rule on the retail-algo question. Its

circular of 4 February 2025 on the safer participation of retail investors in algorithmic trading requires that algorithmic orders routed through broker application programming interfaces (APIs) be tagged with unique ‘algo IDs’; treats orders whose per-second frequency exceeds a specified threshold as algorithmic; and permits only exchange-empanelled providers offering exchange-approved strategies to serve the retail segment, with implementation phased into 2026 (SEBI 2025c, as extended by SEBI 2025b). That circular sits alongside SEBI’s parallel consultation on the gamification of securities markets (SEBI 2024b). The Indian model is, in consequence, best characterised as centralised and preventive: rather than relying primarily on after-the-fact enforcement, SEBI requires algorithms to be approved at the exchange level before they operate, imposes order throttling and position limits, and mandates detailed audit trails and surveillance systems (Yadav and Saganali 2025, pp 354–355).

4.3 The June 2025 AI/ML consultation

SEBI’s most significant recent step on the AI front is its June 2025 consultation paper on Guidelines for Responsible Usage of AI/ML in Indian Securities Markets (SEBI 2025a). Building on the NITI Aayog Principles for Responsible AI and the IOSCO guidance on AI and ML in markets, the paper articulates five core principles: model governance; investor protection through disclosure; a testing framework; fairness and bias; and data privacy and cyber security (SEBI 2025a; NITI Aayog 2021; IOSCO 2021). The model-governance principle requires market participants to maintain skilled internal teams, documentation, model versioning, auditability and explainability, risk controls during market stress, exception handling and fallback plans, designated senior-management accountability, oversight of third-party vendors (with the participant remaining responsible for outsourced AI services), independent auditing with findings communicated to SEBI, and full-verbosity logging permitting chronological reconstruction of events. The testing framework requires segregated pre-deployment testing, shadow testing against live traffic, retention of input and output data for at least five years, and continuous monitoring because model behaviour may drift over time. The investor-protection principle requires disclosure of AI/ML use that directly affects clients — expressly including the selection of trading algorithms and HFT — in comprehensible language. The paper also proposes a tiered, ‘regulatory-lite’ approach for internal, non-client-facing uses, and an annexure mapping risks such as market manipulation, concentration, herding, lack of explainability and runaway model behaviour to controls including circuit breakers, kill switches and human-in-the-loop mechanisms.

Two observations follow. First, the framework is genuinely sophisticated in its treatment of model risk, governance and systemic stability. Second, and notwithstanding the investor-protection principle, its centre of gravity remains market integrity and the prudential soundness of regulated entities rather than the substantive fairness of the retail investor’s position. Disclosure obligations, however well drafted, place the burden of comprehension on investors who are frequently inexperienced, and they do not address the infrastructural asymmetry or the behavioural design of the platforms through which most retail investors trade. The February 2025 retail-algo circular brings binding controls closer to the retail edge, but its primary register is operational containment rather than substantive fairness. Taken in the round, SEBI regulates how institutions deploy AI and how algorithms are deployed to retail; it does not yet establish retail fairness as an independent regulatory objective.

5. Comparative Regulatory Approaches

5.1 United States

The United States operates a fragmented, enforcement-driven model. Oversight is divided between the

Securities and Exchange Commission and the Commodity Futures Trading Commission, with system-integrity and risk-control obligations imposed through Regulation SCI and the Market Access Rule (Rule 15c3-5 under the Securities Exchange Act 1934), and deterrence pursued through vigorous anti-manipulation enforcement, including against spoofing (Yadav and Saganali 2025; SEC 2014). The post-2021 episode involving app-based retail trading prompted an SEC staff report identifying gamification, digital engagement practices and payment for order flow as concerns, but the response was largely diagnostic and disclosure-oriented rather than the imposition of binding design rules (SEC 2021). The lesson is cautionary: disclosure-centric approaches did not prevent the disruptions they were meant to address.

5.2 European Union

The European Union adopts the most prescriptive, ex-ante model. Under MiFID II (article 17) and its associated regulatory technical standards (notably RTS 6), HFT firms require authorisation, algorithms must be tested and stress-tested before deployment, and firms must maintain kill switches, order-to-trade ratio limits and algorithm flagging (Directive 2014/65/EU; Commission Delegated Regulation (EU) 2017/589). This financial-market regime is increasingly complemented by horizontal AI governance under the EU Artificial Intelligence Act, which classifies certain systems as high-risk — triggering transparency, explainability and human-oversight obligations — and which distinguishes the responsibilities of ‘providers’ from those of ‘deployers’ (Regulation (EU) 2024/1689; Prakash and Banerjee 2025). The EU also addresses platform design directly: ESMA has warned against gamification techniques and required that firms allow users to exit a transaction process at any point (ESMA 2022).

5.3 United Kingdom

The United Kingdom, having retained a MiFID II-derived framework supervised by the Financial Conduct Authority, occupies a moderately prescriptive middle position, combining ex-ante controls with a market-abuse regime (Yadav and Saganali 2025).

5.4 Singapore

Singapore, under the Monetary Authority of Singapore, exemplifies a principles-based approach centred on technology risk management, operational resilience and supervisory oversight, with risk-based rather than instrument-specific licensing (MAS 2021).

5.5 Lessons for India

For India, no single model is wholly transferable, but each contributes something. The US experience counsels against over-reliance on disclosure; the EU demonstrates that platform design itself can be regulated rather than merely disclosed, and that financial regulation can be layered with horizontal AI governance; Singapore shows the value of principles-based resilience standards calibrated to supervisory capacity. India’s existing centralised, preventive architecture is in fact well suited to absorb the EU’s design-regulation insight while retaining its own exchange-level approval mechanism. The most useful direction for India is therefore a layered model: preserve the preventive exchange-level controls it already operates, add EU-style design and explainability obligations for retail-facing systems, and adopt principles-based resilience and human-oversight requirements in the manner of Singapore — without importing the US’s reliance on ex-post enforcement as the primary instrument.

6. Gaps in Indian Law and Regulation

Against this comparative backdrop, several doctrinal and policy gaps become apparent. First, and most fundamentally, Indian regulation lacks a dedicated fairness framework for retail investors in machine-

speed markets: SEBI's controls are designed around operational integrity, systemic risk and the conduct of regulated entities, and the structural disadvantage of the retail investor is not treated as an independent regulatory object.

Second, transparency around algorithmic strategies and AI-driven recommendations is limited; investors generally cannot know how the instruments surfaced to them are selected, or how the algorithms they trade against behave. Third, liability attribution is difficult where AI/ML systems cause harm. The literature on AI in corporate accountability observes that existing frameworks struggle to assign responsibility when autonomous or semi-autonomous systems produce erroneous outputs, and that the opacity of 'black box' models makes it hard for boards and regulators alike to justify or interrogate decisions (Prakash and Banerjee 2025). SEBI's consultation rightly anticipates that participants 'might attempt to avoid liability ... by attributing [outcomes] to the AI systems', but the doctrinal tools for resisting that move remain underdeveloped (SEBI 2025a, Annexure B).

Fourth, explainability obligations are nascent: the consultation paper requires explainability and auditability, but as guidance rather than enforceable rule, and without specifying the standard of explanation owed to a retail investor. Fifth, retail-facing disclosures are weak; disclosure of model 'features, purpose, risks, limitations and accuracy' assumes a level of financial literacy that much of the new investor cohort lacks. Sixth, accountability for third-party vendors and trading-technology providers is incompletely addressed: the consultation deems vendor-provided services to be the participant's responsibility, which is sound, but the broader ecosystem of technology providers and the risk of concentration among a few dominant vendors require dedicated oversight.

Seventh, platform design, gamification and behavioural nudging fall largely outside the existing broker-centric framework, which was built for transactional intermediation rather than pre-transactional influence. Eighth, audit, testing and stress-testing requirements, though articulated in the consultation, are not yet binding across retail-facing products. Ninth, and acutely, there is no adequate compensation or remedy mechanism for retail investors harmed by platform outages, algorithmic errors or manipulative trading environments — the recurring outages on major platforms have left affected investors without recourse (Tejaswini 2025).

A doctrinal point reinforces these gaps: India's principal anti-manipulation instrument, the PFUTP Regulations 2003, does not expressly define spoofing or layering and is enforced only through civil penalties (SEBI 2003). Conduct that is paradigmatic of machine-speed manipulation must therefore be addressed by analogy to a general anti-fraud rule rather than under a purpose-built prohibition — a doctrinal lacuna with practical consequences for retail investors who bear the costs of such conduct.

7. Objections and Responses

A thesis that calls for additional regulation must confront the strongest cases against it. Four objections deserve particular attention.

The efficiency objection. On one view, the retail investor is a net beneficiary of machine-speed trading: automation narrows spreads and deepens liquidity, so the ordinary investor transacts at better prices than in a slower, thinner market, and the latency advantages enjoyed by the fastest participants are competed away over time (Brogaard 2010; Hasbrouck and Saar 2013; Yadav and Saganali 2025). The point has empirical support and should not be dismissed. But it answers a different question from the one posed here. That the market is more efficient in aggregate does not establish that its gains are fairly distributed, and SEBI's own finding that the overwhelming majority of individual derivatives traders lose money is

difficult to reconcile with the claim that microstructural efficiency reliably translates into retail welfare (SEBI 2024a). Efficiency and fairness are related but distinct; the former cannot simply be assumed to deliver the latter.

The cost-of-regulation objection. A familiar charge is that preventive controls of the kind proposed below raise compliance costs, deter entry and slow innovation — an objection already levelled at India’s exchange-level algorithm-approval regime, which is said to constrain innovation at the margin (Yadav and Saganali 2025). This is a real trade-off, and it is why the framework proposed in Section 8 is risk-based and incremental rather than uniform: the heaviest obligations attach only to the highest-risk, most retail-facing systems, and most measures harden commitments SEBI has already made. The objection counsels calibration, not inaction.

The formal-equality objection. A more liberal objection holds that the law’s task is to secure equal access and adequate disclosure, leaving outcomes to individual choice; paternalistic design rules, on this view, are both unnecessary and intrusive. Yet the comparative record suggests that formal access and disclosure are insufficient where the trading environment is itself engineered to shape behaviour: the mandatory disclosures surrounding app-based trading in the United States did not prevent the disruptions of early 2021 (SEC 2021; Tejaswini 2025). Where capacity to compete is structurally unequal and platform design operates below the level of conscious choice, formal equality is not a complete answer.

The regulatory-arbitrage objection. Finally, it may be argued that unilateral Indian rules will simply push activity offshore or advantage foreign venues, given the cross-border mobility of trading infrastructure (Yadav and Saganali 2025). The risk is genuine but limited in the retail context: the measures proposed are directed primarily at retail-facing intermediation within India, which is far less mobile than institutional HFT, and SEBI’s centralised architecture is comparatively well placed to enforce them. None of these objections is without force, but none defeats the case for treating retail fairness as a distinct regulatory object; together they shape the design of the framework rather than dispense with it.

8. Towards a Retail-Fairness Framework for Algorithmic Trading in India

The gaps and objections together point towards a concrete reform agenda. Each recommendation below is derived rather than asserted: it is justified by reference to three things — the specific gap it is designed to close (Section 6), the principles or evidence supplied by the materials (chiefly SEBI’s own AI/ML, gamification and retail-algo work, the documented record of platform failures, and the comparative literature), and the comparative model best suited to the Indian context (Section 5). The proposals are deliberately incremental, in that most harden or recalibrate commitments SEBI has already articulated, and they are intended to layer a retail-fairness dimension onto the framework SEBI already operates rather than to displace it.

1. **Mandatory algorithm registration and risk-based classification.** SEBI should require every algorithm deployed in Indian markets to be registered and classified by risk — separating, for instance, low-risk execution algorithms from adaptive AI/ML models and retail-facing recommendation systems — with obligations scaled to the assigned tier. This is not invented from nothing: it builds on India’s existing exchange-level algorithm approval — extended in 2025 by the requirement that broker-API orders carry unique algo IDs and that only exchange-approved strategies reach retail — and adopts the tiered, regulatory-lite-to-full logic SEBI itself proposes in the 2025 AI/ML consultation, reinforced by the EU AI Act’s risk-based categorisation of AI systems (SEBI 2025a, para 6; SEBI

2025c; Regulation (EU) 2024/1689). Its purpose is to give the regulator a fairness-calibrated object, so that the systems most capable of disadvantaging retail investors attract the most scrutiny.

2. **Enhanced exchange-level testing and periodic re-validation.** The existing pre-deployment approval should be strengthened by mandatory segregated and shadow testing, stress testing against extreme scenarios, and periodic re-validation. This draws directly on the testing framework in SEBI's consultation — which already prescribes segregated and shadow testing and continuous monitoring because model behaviour drifts after deployment — and on the comparative record: the EU mandates pre-deployment and stress testing, and the 2012 Knight Capital collapse illustrates the cost of deploying inadequately tested code (SEBI 2025a, § 5.3; Yadav and Saganali 2025).
3. **AI/ML model governance obligations.** The model-governance elements in SEBI's consultation — documentation, model versioning, designated senior-management accountability, independent audit and full-verbosity logging — should be converted from guidance into binding obligations for retail-facing systems. These requirements already represent SEBI's considered position and echo IOSCO's measures on senior-management oversight and on the skills needed to challenge algorithms; the gap lies not in their substance but in their non-binding status (SEBI 2025a, § 5.1; IOSCO 2021, Measures 1 and 3).
4. **Explainability and auditability requirements.** SEBI should specify an enforceable standard of explainability calibrated to the audience, including a retail-facing standard requiring that recommendations and automated decisions be explicable in comprehensible terms. This rests on three planks: SEBI's own explainability and explainable-AI controls, the corporate-accountability literature's account of how 'black box' opacity defeats both board and regulatory scrutiny, and the comparative recommendation that authorities require explainability audits (SEBI 2025a, § 5.1 and Annexure B; Prakash and Banerjee 2025; Yadav and Saganali 2025).
5. **Mandatory human oversight for high-risk models.** High-risk and adaptive systems should require human-in-the-loop or human-around-the-loop mechanisms and clear human accountability for AI-driven decisions. This is taken directly from SEBI's own Annexure B controls for model failure and lack of accountability, and is mirrored in the EU AI Act's human-oversight obligation for high-risk systems; it ensures that an identifiable human remains answerable (SEBI 2025a, Annexure B; Regulation (EU) 2024/1689).
6. **Retail-investor risk disclosures for algorithmic products.** Disclosures should be standardised, written in plain language and tested for comprehension, rather than left to each participant's discretion. SEBI's consultation already requires comprehensible disclosure of AI/ML use; the reform's added rigour reflects the cautionary comparative lesson that disclosure alone is insufficient — the mandatory disclosures surrounding app-based trading in the United States did not prevent the disruptions of early 2021 (SEBI 2025a, § 5.2; SEC 2021; Tejaswini 2025).
7. **Restrictions on gamification and manipulative app design.** SEBI should move beyond disclosure to substantive design standards — prohibiting confetti-style celebratory animations, streaks and leaderboards for risky products, and guaranteeing the right to exit a transaction flow at any point. This is modelled on ESMA's concrete recommendations and reinforced by SEBI's own gamification consultation; the underlying reasoning is that platform design must be regulated, not merely disclosed, because design operates at the pre-transactional stage that broker conduct rules do not reach (ESMA 2022; SEBI 2024b; Tejaswini 2025).

8. **Mandatory outage reporting and an investor compensation framework.** SEBI should require real-time reporting of platform outages and establish a structured compensation mechanism for losses caused by outages and demonstrable algorithmic error. This is the most empirically grounded recommendation: the app-platform study documents repeated outages on major platforms — including freezes during market hours and a December 2025 episode generating over a thousand complaints — in which affected investors had no regulatory remedy, and identifies precisely this absence of compensation, real-time reporting and minimum technical standards as the framework’s failing (Tejaswini 2025).
9. **Clear liability rules.** SEBI should articulate allocation-of-liability rules across brokers, platforms, vendors and AI-system deployers, expressly precluding the displacement of responsibility onto the ‘autonomy’ of an AI system; the same statutory pass should give spoofing and layering an express prohibition, removing the doctrinal awkwardness of pursuing machine-speed manipulation under a general anti-fraud rule. The need is established by the corporate-accountability literature, by SEBI’s own consultation (which deems vendor-supplied AI services to remain the participant’s responsibility and warns that participants may attempt to attribute adverse outcomes to the AI itself), and by the doctrinal lacuna in the PFUTP Regulations 2003 (Prakash and Banerjee 2025; SEBI 2025a, § 5.1(e) and Annexure B; SEBI 2003).
10. **Stronger supervision of retail-facing algorithmic products.** Such products should be subject to heightened, dedicated supervision proportionate to their behavioural influence over retail investors. This follows from India’s already-active regulation of retail algorithmic trading — including the February 2025 circular’s empanelment, exchange-approval and algo-ID requirements — and from the app-platform study’s argument for concentration-based oversight thresholds where a small number of platforms intermediate a large share of retail order flow (Yadav and Saganali 2025; Tejaswini 2025; SEBI 2025c).
11. **A dedicated fairness review of market infrastructure.** SEBI should institute a periodic review of co-location, latency advantages and access to market infrastructure, to assess and, where necessary, mitigate the structural advantages they confer on the fastest participants. This is the most original of the proposals, and it is presented as such: it extends the fairness analysis in Section 3 to market microstructure, taking seriously the comparative literature’s identification of co-location and latency as sources of durable structural advantage rather than treating them as neutral features of an efficient market (Yadav and Saganali 2025).

Taken together, these measures would not displace SEBI’s existing emphasis on integrity and stability; they would supplement it with a fairness dimension presently absent. Their common methodological premise is that India need not legislate on a blank slate — most are recalibrations or hardenings of commitments SEBI has already made in its AI/ML consultation, its gamification consultation and its February 2025 retail-algo circular — and they can therefore be implemented incrementally (SEBI 2025a, 2024b, 2025c).

9. Conclusion

Algorithmic and AI-assisted trading have changed the nature of market participation, and in many respects for the better in terms of liquidity, execution and price discovery. But a securities market is not fair merely because it is efficient. The migration to machine speed has reallocated advantage towards those with superior infrastructure, data and tools; the rise of app-based intermediation has added a behavioural

dimension to retail disadvantage that traditional broker regulation was never designed to capture; and SEBI's own data on retail losses in the derivatives segment make the stakes concrete rather than hypothetical. SEBI has built an increasingly capable apparatus for managing operational and systemic risk, and its 2025 AI/ML consultation and February 2025 retail-algo circular are serious and welcome steps. Yet that apparatus remains oriented towards market integrity and the soundness of regulated entities rather than towards the substantive fairness of the retail investor's position. Formal equality of access cannot, by itself, deliver a fair market where actual trading capacity is so unequal. India need not choose between innovation and protection; the comparative experience suggests that a layered framework — preserving its preventive controls, adding design and explainability obligations for retail-facing systems, anchoring liability rules in clearer doctrine and guaranteeing remedy when systems fail — can accommodate both. The task ahead is to make retail fairness an explicit object of securities regulation, recognised by SEBI's own statutory mandate, rather than an incidental by-product of rules written for other ends.

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