

REIMAGINING POSSESSION UNDER SEBI (PROHIBITION OF INSIDER TRADING) REGULATIONS, 2015: THE CHALLENGE OF SYNTHETIC UPSI AND ALGORITHMIC INFERENCE

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ABSTRACT

The insider trading laws in India were formulated in an era where information flowed interpersonally through one another, but this is no longer the case. Algorithms forecast and even discover sensitive trends in financial markets before a human being could think of. These systems are able to transform scraps of general information into valuable insights that act like insider information, despite there being no regulation violated. As the computational sophistication has increased, there has been a conceptual mismatch between the law and technology in the architecture of the SEBI (Prohibition of Insider Trading) Regulations, 2015, especially the way that Regulation 3(1) continues to be premised on a source-based view of “possession”. This paper explains that this model does not recognise any inferential possession as a functional equivalent of access on an insider level under the aegis of synthetic UPSI. The given definition presupposes that sensitive information should be presented by an acquainted individual, but when knowledge is being built, rather than described, the definition would not be able to reflect the fact of algorithmic inference. It poses a question on whether the concept of constructive possession is capable of filling that gap or not, and based on that, it posits the so-called Epistemic Responsibility Standard. It argues against the regulatory inertia of algorithmic inference and points out the asymmetries of enforcement. It seeks to present interpretive and supervisory modifications to bring Regulation 3(1) into concurrence with the modern realities of information so that fairness in the securities market can be maintained in the age of information advantage being built by code just as much as it was previously by communication.

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INTRODUCTION

*“Public trust is essential to the fair and efficient operation of our market”*⁸⁷

In a world where insider trading can no longer be conducted just by talking but by computing, the design of insider trading regulation is being put to the test by events that it itself could not predict. At the centre of these is the development of what can be called Synthetic Unpublished Price Sensitive Information (“**USPI**”) that can be characterised as a family of data outputs which mimics informational advantage and market responsiveness of UPSI, but is produced by algorithmically inferring data that is acquired legally and is non-sensitive. Unlike classical UPSI, which is the product of human communication and organisational access, the synthetic counterpart is the informational shadow cast by lawful but structurally asymmetric inputs processed through high-complexity computational modelling.⁸⁸

Regulation 3(1)⁸⁹ of the SEBI (Prohibition of Insider Trading) Regulations, 2015 (“**Regulations**”), codifies a source-dependent approach to possession. The Regulations prohibit any person from trading while in possession of UPSI. The statute presupposes a relational transfer of knowledge wherein something is transferred and not constructed. The jurisprudence underlying this model is ontologically rooted in possession-through-communication, with liability contingent on the receipt of inside information, not its independent derivation.⁹⁰ Santosh Shukla in his order for the matter of Adani Green Energy, rightly sets the premise as “the true character of the SEBI Act lies not in its sombre title but in its design and purpose and specific provisions describing the role and functions of Securities and Exchange Board of India (“**SEBI**”) and prohibiting certain acts and conduct. It privileges investor protection over insiders’

⁸⁷ Gurbir S. Grewal, *Statement on Insider Trading Enforcement Actions*, U.S. Sec. & Exch. Comm’n (June 29, 2023), <https://www.sec.gov/newsroom/speeches-statements/20230629>.

⁸⁸ Andrew W. Lo, *ADAPTIVE MARKETS: FINANCIAL EVOLUTION AT THE SPEED OF THOUGHT* (Princeton Univ. Press 2017).

⁸⁹ Securities and Exchange Board of India (Prohibition of Insider Trading) Regulations 2015, Regulation 3(1) (India).

⁹⁰ Rajat Sethi, Misha Chadna and Aditi Agarwal, *Insider Trading: Circumstantial Evidence is Evidence Enough?* 32 NAT’L L. SCH. INDIA REV. 9 (2020).

unjust enrichment, market development over undesirable transactions that affect the integrity and endanger the level playing field and seeks to provide ample opportunities for the creation of businesses, smooth means of capital raising and breathing life into companies where growth is possible under a regulated environment.”⁹¹ However, as capital markets become increasingly shaped by black-box systems and inferential analytics, this communicative presumption faces a profound theoretical and enforcement crisis.⁹²

The challenges of assigning liability when algorithmic inferences replicate UPSI without any breach of source-based rules is what leads to the *black box dilemma*. These days, Algorithms do not merely digest information; they synthesise, cross-pollinate public records, alternative data streams, metadata exhausts, and behavioural patterns to simulate corporate events with near-insider precision.⁹³ Industrial shipping data derived from satellite feeds, supplier revenue disclosures, and public earnings guidance, when processed through high-complexity models, can approximate undisclosed quarterly financials of a listed entity. While none of these data points is UPSI in isolation, their computationally modelled union is materially indistinguishable from it in effect.⁹⁴ It leads us to question when inferential knowledge constitutes constructive possession under a statute premised on source-based liability?

The concept of constructive possession, well-established in narcotics and criminal law, has yet to be judicially applied to insider trading in India. Its functional logic, however, maps compellingly onto modern financial epistemology as it is sufficient, under such a framework, that a person has knowingly and purposefully acquired dominion over material knowledge even if that knowledge emerged from inference rather than

⁹¹ *Order in the Matter of Adani Green Energy Ltd.*, Order No. QJA/SS/IVD-2/ID11/31834/2025-26, Securities and Exchange Board of India (Dec. 2025) (India).

⁹² Rishi K. Narang, *INSIDE THE BLACK BOX: A SIMPLE GUIDE TO QUANTITATIVE AND HIGH-FREQUENCY TRADING* (Wiley Finance 2013).

⁹³ Michael Kearns & Aaron Roth, *THE ETHICAL ALGORITHM: THE SCIENCE OF SOCIALLY AWARE ALGORITHM DESIGN* (OUP 2020).

⁹⁴ Ashishchandra Rao & Ria Rastogi, *Algorithmic Trading: Expanding Access to Retail Investors and Regulatory Supervision*, *ECONOMIC LAWS PRACTICE* (Feb. 24, 2025), <https://elplaw.in/leadership/algorithmic-trading-expanding-access-to-retail-investors-and-regulatory-supervision/>.

communication.⁹⁵ This reconceptualisation is critical in an era where the informational asymmetry sought to be penalised by insider trading law is no longer transmitted but simulated. Regulation 2(1)(n)⁹⁶ of the Regulations defines UPSI, which includes any information that is not generally available and is likely to *materially* affect the price of securities. When Synthetic UPSI is inferred from exclusive access to advanced analytics, the spirit of the regulation is arguably breached even if its letter is not.⁹⁷ In economic consequence, such trades have market-moving value akin to traditional insider trades, raising concerns about regulatory arbitrage.⁹⁸ Unlike human insiders, machine-generated insights do not leave a communicative trail, making enforcement contingent on deconstructing the inferential architecture.⁹⁹

THE DOCTRINAL STASIS OF REGULATION 3(1)

Regulation 3(1) is built on an old but clear idea that price-sensitive information is dangerous when shared without a good reason. The rule states that insiders may not *communicate, give, or provide access* to information which is not required to be communicated, given or provided by the insider unless there are legal or justifiable reasons to do so. The law doesn't prohibit having UPSI in the abstract.¹⁰⁰ It prohibits dealing in securities when that possession is tied to some communicable breach. This means that possession under the regulation is relational and empirical.¹⁰¹ On one hand, this makes a lot of sense but the supposition that exists within this framework is that UPSI is always pre-existing, a secret of some inner circle, and inherited. The modern

⁹⁵ Mihailis Diamantis, *Functional Corporate Knowledge*, 61 WM. & MARY L. REV. 319 (2019). (It is to throw light on the foundational principle that dominion over material knowledge may be attributed through conduct and organisational design and construct liability be it in corporate criminal matters or securities law.)

⁹⁶ Securities and Exchange Board of India (Prohibition of Insider Trading) Regulations 2015, Regulation 2(1)(n) (India).

⁹⁷ Vijaya Sampath, *Letter and Spirit of the Law*, LAKSHMIKUMARAN & SRIDHARAN ATTORNEYS (Aug. 13, 2015), <https://www.lakshmisri.com/insights/articles/letter-and-spirit-of-the-law/>.

⁹⁸ SOLON BAROCAS, MORITZ HARDT AND ARVIND NARAYANAN, *FAIRNESS AND MACHINE LEARNING: LIMITATIONS AND OPPORTUNITIES* (MIT Press 2023).

⁹⁹ Jenna Burrell, *How the Machine "Thinks": Understanding Opacity in Machine Learning Algorithms*, 3 BIG DATA & SOC'Y 1 (2016).

¹⁰⁰ Armaan Patkar, *Technology Innovations in Securities Trading: Can SEBI's Bicycle Catch the High-Frequency Trading Ferrari?*, 12 INDIAN J.L. & TECH. 3 (2016).

¹⁰¹ V. Swati, *A Critical Evaluation of India's Regulatory Framework and Its Initiatives to Combat Insider Trading*, 7 INT'L J.L. MGMT. & HUMAN. 1083 (2024).

market reality has a completely different appearance. Inference, nowadays, may be more important than access as algorithmic systems construct patterns¹⁰² and produce outputs with a predictive accuracy that makes the difference between authoritarian analysis and information appropriation less distinct. This is *not regarded as possession* in Regulation 3(1) since no communication of information was made. The regulation considers possession as a factual chain in the sense that one had UPSI and conveyed it to the other, instead of a functional state of informational advantage.¹⁰³ This is the stasis of the doctrine which the law must meet.

The 2025 amendment to Regulation 2(1)(n) makes this limitation acutely visible. SEBI expanded the scope of UPSI to include rating changes, control-shifting agreements, auditor resignations, insolvency proceedings, and forensic audits.¹⁰⁴ These additions were calibrated to align with the kinds of disclosures already flagged under Regulation 30 of the SEBI (Listing Obligations and Disclosure Requirement) Regulations, 2015 (“**LODR**”).¹⁰⁵ The amendment represents a material step in recognising that price-sensitive events are not confined to earnings announcements or merger activity but extend to regulatory, reputational, and compliance-related developments.¹⁰⁶ Critically, however, SEBI expanded the content of UPSI without reconsidering the architecture of how UPSI arises. The regulation still presupposes that information must be accessed or communicated through a traceable person. As market practice increasingly demonstrates, the source of an informational advantage is not always a person, it is often a system, a dataset, or a computationally constructed signal. What is missing in

¹⁰² Alessio Azzutti, Wolf-Georg Ringe and H. Siegfried Stiehl, *Machine Learning, Market Manipulation, and Collusion on Capital Markets: Why the “Black Box” Matters*, 43 U. PA. J. INT’L L. 79 (2021); See Gina-Gail S. Fletcher, *Detering Algorithmic Manipulation*, 74 VAND. L. REV. 259 (2021).

¹⁰³ Sunandan Wadadekar & Mridul Anand, *Preponderance of Probability and Presumptions of Guilt: Contextualising SEBI’s Move towards More Permissive Evidentiary Standards in Securities Regulation*, 17 NUJS L. REV. 93 (2024).

¹⁰⁴ Meher Mehta, Ayushi Singh and Maiden Shukla, *Amendments to the SEBI (Prohibition of Insider Trading) Regulations, 2015: Widening the Scope of Unpublished Price Sensitive Information*, SNR ASSOCIATES & ADVOCATES (July 14, 2025), <https://www.snrlaw.in/amendments-to-the-sebi-prohibition-of-insider-trading-regulations-2015-widening-the-scope-of-unpublished-price-sensitive-information/>.

¹⁰⁵ Securities and Exchange Board of India (Listing Obligations and Disclosure Requirements) Regulations 2015, reg 30 (India).

¹⁰⁶ CS (Dr) Pallavi Baghel, *From Routine to Restricted: Expanding Scope of UPSI Under SEBI 2025 Amendment* (2025) ICSI Chartered Sec 144.

the regulation is a theory of constructive possession, a way to say that someone can be in possession of something if they've reconstructed it to a materially equivalent degree, even if they didn't access it in the conventional sense.¹⁰⁷ This is not a radical idea, as other areas of law already use constructive concepts to bridge doctrinal gaps. In criminal law, constructive possession is the power and willingness of an individual to have control of a given object even though it is not necessarily in their possession at the moment. Functional equivalence has also a long history in securities law, such as considering derivative contracts as a proxy to equity interest.¹⁰⁸

It is well established that insider trading in India constitutes not only a civil infraction but also a criminal offence under Section 15G of the SEBI Act.¹⁰⁹ The evidentiary threshold reflects this gravity as the charge of insider trading is one of the most serious infractions in connection with the securities market, and the preponderance of likelihood required to establish it must be correspondingly substantial,¹¹⁰ but it is still in a debated pool.¹¹¹ This severity compounds the doctrinal problem. The higher the evidentiary standard, the less tractable inferential possession becomes under a source-based framework. The 2024 SEBI Consultation Paper preceding the definitional amendment specifically acknowledged problems of information asymmetry and inconsistent treatment of material events,¹¹² but even in recognising those asymmetries, SEBI declined to revisit the theory of possession, leaving the law's conceptual foundation intact while the market mechanics it governs evolve well beyond it. Traders who construct Synthetic UPSI can trade with confidence, knowing there is no

¹⁰⁷ Louis Kaplow, *A Model of the Optimal Complexity of Legal Rules*, 11 J.L. ECON. & ORG. 151 (1995).

¹⁰⁸ FRANK H. EASTERBROOK & DANIEL R. FISCHEL, *THE ECONOMIC STRUCTURE OF CORPORATE LAW* (HARVARD UNIVERSITY PRESS 1996).

¹⁰⁹ Securities and Exchange Board of India Act, 1992, § 15G (India).

¹¹⁰ Sundeep Khanna, *The Tragedy of Dilip Pendse's Malfeasance*, MINT, July 7, 2017.

¹¹¹ Shruti Rajan, Anubhav Ghosh and Anurag Gupta, *Prosecution for Securities Law Violations and SEBI's Powers*, BAR & BENCH (Feb. 17, 2023), <https://www.barandbench.com/columns/prosecution-for-securities-law-violations-sebi-powers>.

¹¹² SEBI, Proposed Review of the Definition of Unpublished Price Sensitive Information (UPSI) under SEBI (Prohibition of Insider Trading) Regulations, 2015 to Bring Regulatory Clarity, Certainty and Uniformity of Compliance in the Ecosystem, (Consultation Paper, Nov. 9, 2024), <https://www.sebi.gov.in/reports-and-statistics/reports/nov-2024/consultation-paper-on-proposed-review-of-the-definition-of-unpublished-price-sensitive-information-under-sebi-prohibition-of-insider-trading-regulations-2015-to-bring-regulatory-clarity-certainty-88313.html>.

communicative chain to trace. In the meantime, retail investors are left to respond to the revelation that the institutional players have already sensitized and factored. The stasis in Regulation 3(1) is not, however, a mere drafting matter since it represents an archaic theory of information that is based on transmission but not on construction, and until SEBI is able to revise the doctrine of possession to refer to functional or constructive knowledge, the law will be ineffective in preventing leaks but blind to simulation.

ALGORITHMIC INFERENCE AND DOCTRINAL RESPONSE

Since the definitional contours of Synthetic UPSI have been set and the structural distance between Regulation 3(1) source-based model created, the question arises as to how the current jurisprudence deals with and is baffled by the problem of inferential possession. This is where it becomes difficult because now one does not require the key to crack the answer to the problem, the formula can be inverted and still score higher. That is where predictive analytics and the securities law intersect.¹¹³ The systematic models of hedge funds and proprietary trading desks today are fed an ecosystem of signals.¹¹⁴ It includes satellite images showing storage tank shadows at ports, natural language processing of public earnings calls, social media sentiment, machine-readable ESG disclosures, and real-time shipping telemetry.¹¹⁵ Taken individually, none of these data points would qualify as UPSI under Regulation 2(1)(n) definitions but fed into the right model, they begin to approximate what used to be obtainable only through boardroom leaks.

In *Manoj Gaur v. SEBI*,¹¹⁶ the Securities Appellate Tribunal (“SAT”) held that liability under Regulation 3(1) arises only when a person trades while in possession of UPSI

¹¹³ G. Sabarinathan, *SEBI's Regulation of the Indian Securities Market: A Critical Review of the Major Developments*, 35 VIKALPA 23 (2010).

¹¹⁴ Gayatri Puthran, *Litigating Insider Trading: Decoding Evidences in Cases under SEBI (Prohibition of Insider Trading) Regulations, 2015*, 14 NUJS L. REV. 3 (2021).

¹¹⁵ Alan Baiju, *Regulation of Insider Trading in India: Assessing the Obstacles and Possible Solutions*, 2 INDIAN J. INTEGRATED RSCH. L. 1 (2022).

¹¹⁶ *Manoj Gaur v. Securities and Exchange Board of India*, Appeal No. 64 of 2012 (Securities Appellate Tribunal Oct. 3, 2012).

traceable to a company-connected source. The SAT insisted that trading timing alone does not prove motive or transmission. Insider trading is not presumed but must be established through positive evidence. The argument is reasonable when used in the case of classical communicative leaks, but it falls short when used in terms of algorithmic inference. A model that repeatedly issues earnings announcements at small quantitative levels, or foreshadows important managerial actions in the case of regulatory filings, leaves no trace of communication but creates market-moving informational benefits¹¹⁷ which are economically identical to the mischief with which Regulation 3(1) is intended to guard.¹¹⁸

The SAT in ***Chandrakala v. SEBI***¹¹⁹ (“**Chandrakala**”) took a stricter approach, insisting that it is important to demonstrate that one had conscious access to UPSI. Such a construction, though filterable against opportunistic enforcement, makes it hard to prosecute instances of informational advantage being referred. The tribunal decided that the mere fact that one is close to an information source or that one is likely to access the information is not enough to assume possession, but that one needs concrete evidence. The same ruling, however, also took that in case the surrounding circumstances are so strong that to indicate that the information was known, circumstantial inference is also a valid tool of evidence. This condition has doctrinal importance in the sense that it creates a tight yet analytically critical opening to a constructively epistemic liability on the condition that the conditions of model design are so strong as to justify an inference of possession.

Additionally, the ruling of the SAT in ***Rakesh Agrawal v. SEBI***¹²⁰ provided a defence based on *bona fide intent* and lack of personal gain through exploitation of UPSI, and

¹¹⁷ Securities and Exchange Board of India, Report of the High-Level Committee to Review the SEBI (Prohibition of Insider Trading) Regulations, 1992 (Chair N. K. Sodhi, Dec. 1, 2013) 18.

¹¹⁸ Vedansh Saklani & Lakshmi Priya Vinjamuri, An Analysis of Insider Trading Regulations: A Comparative Study of India, USA & U.K., 7 INT’L J.L. MGMT. & HUMAN. 979 (2024).

¹¹⁹ Chandrakala v. Adjudicating Officer, Securities and Exchange Board of India, Appeal No. 209 of 2011 (Securities Appellate Tribunal Jan. 31, 2012).

¹²⁰ Rakesh Agrawal v. Securities and Exchange Board of India, Appeal No. 33 of 2001 (Securities Appellate Tribunal Nov. 3, 2003).

focused on contextual interpretation of the text of the regulation, rather than strict adherence to the text. Although the case did not concern algorithmic inference, the reasoning of the tribunal is educative as it showed that it was ready to go beyond the literal interpretation of Regulation 3(1) where the equities of a case required it. That flexibility can be extended to consider whether the deliberate synthetic construction of insider-quality data crosses a normative threshold even if it falls outside the current definitional perimeter of UPSI.¹²¹ Critics would argue that such expansion would chill innovation and conflate legitimate research with insider conduct. After all, predictive analytics is a pillar of modern capital markets. It must be considered that if a machine consistently beats consensus earnings expectations through data that no one else understands, is the market really informed or is it just the illusion of fairness.

The critical gap left when taken together, is that none of these decisions addresses the question of whether the deliberate construction of a predictive signal using structurally exclusive datasets to simulate the outcome of insider access can constitute possession under Regulation 3(1)? This challenge is alluded to by SEBI in its 2021 Consultation Paper on algorithmic trading¹²², which admitted that the distinction between a legitimate advantage and unfair informational edge has become blurred because of the emergence of artificial intelligence and high-frequency trading systems. However, SEBI stopped short of reclassifying outputs derived from legal data sources as UPSI or proposing any doctrinal reform of the possession framework which is precisely the frontier to address.

THEORETICAL INFRASTRUCTURE OF CONSTRUCTIVE POSSESSION

The concept of constructive possession is not new to the law.¹²³ Its foundational logic lies in the law's capacity to impute responsibility to a person who did not directly hold

¹²¹ AKSHAT MALL, *Insider Trading in India: A Study of the Emerging Issues of Insider Trading with Reference to Securities Laws* (2023) (LL.M. Dissertation, Hidayatullah National Law University).

¹²² SEBI, Consultation Paper on Algorithmic Trading by Retail Investors (Consultation Paper, Dec. 9, 2021), https://www.sebi.gov.in/reports-and-statistics/reports/dec-2021/consultation-paper-on-algorithmic-trading-by-retail-investors_54515.html

¹²³ *Kendall v. Kendall*, 426 Mass. 318 (1997).

or receive a thing, but who, by virtue of their actions or omissions, should be regarded as having dominion over it.¹²⁴ To apply this doctrine to Regulation 3(1), it is necessary to build an epistemic framework in which informational asymmetry arises not from leaks or direct access, but from algorithmically inferred signals that replicate, with material accuracy, what would otherwise qualify as UPSI. Constructive possession of Synthetic UPSI is not a legal stretch but a principled response to a technical evolution in market conduct. Under Indian property jurisprudence, a buyer who fails to make inquiries where circumstances suggest the presence of prior rights may be deemed to have constructive notice of those rights, which is codified under section 3 of the Transfer of Property Act, 1882.¹²⁵ The concept operates on the logic that legal ignorance should not be shielded where reasonable diligence could have uncovered the truth.¹²⁶ It finds a mirror in the algorithmic trader who, through complex but *lawful* data mining, uncovers a signal that reflects internal developments within a company.

Another educational similarity is the doctrine of constructive trust. Fiduciaries have been subject to scrutiny even in the absence of an expressed fiduciary relationship by the courts, and especially when a party finds themselves in possession of property or information in such a way that imposes moral restraint.¹²⁷ The Indian courts have used this doctrine in cases of unjust enrichment and misuse of confidential information. In *Sriyaneesh Knitters*,¹²⁸ Justice Kirpal highlighted the importance of the substance, and not the form, and fiduciary obligations could be created through conduct and not through the contractual terms. This elastic interpretive prism provides a convincing rationale behind the idea that a market participant who intentionally develops models that are aimed at obtaining price-sensitive information out of structurally asymmetric

¹²⁴ Meghana Killampalli & Soumya Tiwari, *Presumed Culprits or Protected Traders? Decoding SEBI's 2023 Draft Regulations on Unexplained Suspicious Trading Activities: A Dive into Efficacy and Challenges*, 18 NUALS L. J. 71 (2024).

¹²⁵ Transfer of Property Act, 1882, §3 (India).

¹²⁶ MALLIKA TALAY, V.P. SARATHI'S LAW OF TRANSFER OF PROPERTY (EBC 2024).

¹²⁷ GRAHAM VIRGO, THE PRINCIPLES OF EQUITY AND TRUSTS (Oxford University Press 2020).

¹²⁸ Board of Trustees of the Port of Bombay v. Sriyaneesh Knitters, Civil Appeal No. 6185 and 6186–89 of 1983 (Supreme Court of India July 30, 1999).

available data that may be publicly published should be subject to a fair amount of regulatory liability, regardless of the existence of a formal fiduciary relationship.

The transplantation of constructive possession must be calibrated against the architecture of Regulation 3(1). SEBI and the SAT have consistently held that possession, not communication, is the operative trigger for liability.¹²⁹ Chandrakala held that concrete proof of possession is required and accepted that circumstantial inference is valid where the surrounding circumstances are sufficiently compelling. This creates the doctrinal opening for what this paper terms the Epistemic Responsibility Standard (“**ERS**”). The Standard operates as a two-pronged inquiry. First, did the actor know, or ought they reasonably to have known, that the system they deployed was functionally synthesising UPSI? Second, was the inference the product of deliberate design or of negligent oversight in flagging materiality thresholds? A market participant who deploys machine models to analyse public data will, in many cases, operate within the legitimate bounds of analytical research. However, when such a model consistently begins to predict material, non-public corporate events before their announcement, these inferences cross from analytical sophistication into functional appropriation. An objection often raised is that inference from public data, however asymmetrically available, should not be penalised, as it encourages research and price discovery.¹³⁰ This is valid, but the law already draws lines when lawful data is used in a manner that reconstructs protected zones, considering how copyright law treats reverse engineering¹³¹ of protected expressions.¹³² As it is described within the context of Regulation 3(1) enforcement, a regulation that prohibits certain types of information dissemination by it, it can be argued that when this form of synthetic inference creates a gap between *insider* and *outsider* quantitative analysts, and as a result of that gap, it disrupts the fundamental principle of fairness.

¹²⁹ Securities and Exchange Board of India v. Kanaiyalal Baldevbhai Patel, Civil Appeal No. 2595 of 2013 (Supreme Court of India Sept. 20, 2017).

¹³⁰ V. K. Kaul v. Adjudicating Officer, Securities and Exchange Board of India, Appeal No. 55 of 2012 (Securities Appellate Tribunal Oct. 8, 2012).

¹³¹ Lotus Development Corp. v. Borland International Inc., 49 F.3d 807 (1st Cir. 1995).

¹³² Pamela Samuelson, Reverse Engineering Under Siege, 14 BERKELEY TECH. L.J. 445 (1999).

A parallel can be drawn from the decision rendered by the US Supreme Court in *Dirks v. Securities and Exchange Commission*¹³³. In this case, the court decided that at the time when an insider discloses the material non-public information, the outsider is bound not to trade on the information, the outsider was aware that such disclosure was in breach of the fiduciary duties of the insider. Since the algorithms systems in question can create probabilistic inferences that approximate *insider-quality* outputs in the absence of an actual violation by the insider, such as when a trader is able to use an algorithm to obtain a statistical understanding of how similar or different he/she is to an insider at the time of executing a trade, the inference builder may, under the ERS, be deemed to have *constructive knowledge of the functional equivalent* of what the builder created.¹³⁴ Therefore, traders cannot avoid the reach of Regulation 3(1) by simply programming the intent of the trader into a machine and then, therefore, arguing that they do not have the requisite intent to violate Regulation 3(1). The ultimate question as to whether a trader should have possession of information will be determined by whether or not an algorithm has been constructed to replicate the unique investigatory insight at the time the trader executes a trade.¹³⁵

COMPARATIVE ANALYSIS: UNITED STATES, EUROPEAN UNION AND UNITED KINGDOM

One of the most revealing features of India's insider trading regime is not what it contains, but what it omits. In the above-stated jurisdictions, the law has begun to reckon with a world where information is not always received but reconstructed, and each of them offers doctrinal tools from which India can draw measured and principled reform.

¹³³ *Dirks v. Securities and Exchange Commission*, 463 U.S. 646 (1983).

¹³⁴ Donald C. Langevoort, *Insider Trading and the Fiduciary Principle: A Post-Chiarella Restatement*, 70 CAL. L. REV. 1 (1982).

¹³⁵ Muhammad Kamran & Sahil Kanuga, *Supreme Court: Insider Trading Cannot Be Sustained on Circumstantial Evidence*, NISHITH DESAI ASSOCIATES (July 7, 2022), <https://nishithdesai.com/hotline.aspx/disclaimer.aspx/supreme-court-insider-trading-cannot-be-sustained-on-circumstantial-evidence-6173>.

United States of America

The U.S. reform agenda started earnestly with the Rule 10b5-1, which was subsequently amended in December 2022. It initially aimed to allow insiders to trade under pre-established plans without liability accrual.¹³⁶ The amendments also added a good-faith aspect, which runs through the life of a trading plan, not just at the onset of the plan. More importantly, the Securities and Exchange Commission (“SEC”) was not only worried about the abuse of confidential information, but also about traders who based their strategies on other and inferential data to effectively mimic the appearance of insider knowledge without actual insider trading.¹³⁷ Mosaic data was explicitly identified by the SEC as a possible source of unfair informational advantage, and it was not only legal inputs used in specific manners that could replicate the effect of having non-public information, which might be subject to investigation.¹³⁸ In the case of *Salman v. United States*¹³⁹ (“Salman”), the court unanimously ruled through the ruling of Justice Alito that insider trading liability is applicable even in cases where the tipper is not given a tangible monetary gain as long as the disclosure is made to a relative or close associate. This expansion of the benefit-and-breach logic is analytically significant in the context of Synthetic UPSI, as the benefit lies not in the monetary output but in the informational edge. Cases such as *United States v. O'Hagan*¹⁴⁰ and *SEC v. Panuwat*¹⁴¹ laid down the *misappropriation theory*, which enabled the courts to punish trades on the basis of confidential information acquired through false representation,

¹³⁶ Rule 10b5-1 and Insider Trading, Securities Act Release No. 33-11138; 34-96458 (Dec. 14, 2022).

¹³⁷ Gary Gensler, *Testimony Before the United States Senate Committee on Banking, Housing, and Urban Affairs*, SECURITIES AND EXCHANGE COMMISSION (Sept. 12, 2023), <https://www.sec.gov/newsroom/speeches-statements/gensler-senate-testimony-091223>.

¹³⁸ Allan Horwich, *The Mosaic Theory of Materiality – Does the Illusion Have a Future?*, NORTHWESTERN LAW & ECON. RESEARCH PAPER NO. 14-05 (2015).

¹³⁹ *Salman v. United States*, 580 U.S. 39 (2016).

¹⁴⁰ *United States v. O'Hagan*, 521 U.S. 642 (1997).

¹⁴¹ J. W. Verret & Greg Lawrence, *Introduction to SEC v. Panuwat: Understanding “Shadow” Insider Trading*, HARVARD LAW SCHOOL FORUM ON CORPORATE GOVERNANCE (Apr. 29, 2024), <https://corpgov.law.harvard.edu/2024/04/29/introduction-to-sec-v-panuwat-understanding-shadow-insider-trading/>.

regardless of whether the tipper was an employee of the company. India does not have to mimic this standard, but it must not overlook the conceptual bridge that it suggests.

European Union

The European framework under Market Abuse Regulation (“**MAR**”) also recognises functional asymmetry as a core concern, and it is this dimension that India ought most carefully to study. Article 7(1)(a)¹⁴² of MAR defines inside information not just in terms of content, but in relation to its market impact and materiality. Under MAR, an actor who possesses information, however derived, that a reasonable investor would regard as material and non-public may attract liability regardless of whether that information was received from a connected person, making it different from the posture of Regulation 3(1). The European Securities and Markets Authority (“**ESMA**”) has taken formal steps to acknowledge that *data fusion*, which is the combination of multiple individually non-material or publicly available data sources, can generate informational asymmetry that is economically equivalent to insider possession.¹⁴³ If SEBI were to adopt an effects-based definitional clause within or ancillary to Regulation 3(1), modelled on Article 7(1)(a) of MAR, it would shift the liability inquiry from the origin of information to its market consequence, enabling it to capture Synthetic UPSI without requiring doctrinal violence to the existing regulatory text. Equally important is ESMA's emerging guidance on the explainability of algorithmic systems in market contexts. The European Commission’s White Paper on Artificial Intelligence reinforces the principle - *accountability must attach to the outputs of AI systems in proportion to the risk those outputs generate*.¹⁴⁴ When applied to insider trading, this means that a trading entity whose model consistently generates predictions equivalent in market effect to UPSI cannot escape scrutiny by invoking the complexity of the process. The MAR-inferred effects-based

¹⁴² Regulation (EU) No. 596/2014 of the European Parliament and of the Council of Apr. 16, 2014, on Market Abuse, 2014 O.J. (L 173) 1, art. 7(1)(a).

¹⁴³ European Securities and Markets Authority [ESMA], Discussion Paper on the Integrated Collection of Funds' Data, ESMA12-2121844265-4904 (June 23, 2025).

¹⁴⁴ European Commission White Paper on Artificial Intelligence – A European Approach, COM (2020) 65 final (Feb. 19, 2020).

logic and the AI guidance of ESMA are the most significant external templates for reform available to SEBI.

United Kingdom

The UK market abuse regime, under which the UK Financial Conduct Authority (“FCA”) functions, is the UK Market Abuse Regulation, as retained and amended post-Brexit. The FCA has recognised that although some of the alternative data strategies might fall within the formal confines of the current law, their net aggregate impact might violate the fairness doctrine that forms the basis of the market abuse regime, especially where such strategies bring about systematic informational benefits unavailable to more normal market participants.¹⁴⁵ The fairness doctrine of the FCA is a substantive principle of market integrity as opposed to a more formal source-tracing exercise and allows regulators to investigate not just whether the information was acquired improperly, but also whether its use causes market distortions that are not in line with the equitable functioning of the market.¹⁴⁶

Contrasting that with India, we see that no such regulatory debate has formally begun. Even after SEBI mentioned concerns around AI-based information advantage, it did not propose doctrinal reform. It does not contain any interpretive direction, no circular and no enforcement measure of information created by synthesis or inference. Even as market mechanisms are far beyond the source structure, Indian jurisprudence is still bound to the source structure. This silence is not innocent because the world regulatory environment is changing towards an *effects-based* theory of insider liability, where it is not the manner in which the information is obtained but rather how it acts in the market.¹⁴⁷ This overlap of the U.S. functional equivalence doctrine with the effects-based

¹⁴⁵ Latham & Watkins LLP, *Regulator Raises Concerns Over Alternative Data*, JD SUPRA (30 January, 2020) <https://www.jdsupra.com/legalnews/regulator-raises-concerns-over-85876/>.

¹⁴⁶ Mark Steward, *Market Integrity and Strategic Approach*, FINANCIAL CONDUCT AUTHORITY (7 February, 2020) <https://www.fca.org.uk/news/speeches/market-integrity-and-strategic-approach> (This speech is by Mark Steward, Executive Director of Enforcement and Market Oversight at the FCA, delivered at the 19th Annual Institute on Securities Regulation in Europe event in London.).

¹⁴⁷ EMILIOS AVGOULEAS, *THE MECHANICS AND REGULATION OF MARKET ABUSE* (Oxford University Press, 2005).

definition of MAR, with the fairness-doctrine logic of the FCA, is a compelling international consensus that Indian securities regulation can take inspiration from.

THE SYNTHETIC UPSI LIABILITY TEST

In order to fall under the confines of Regulation 3(1), the Indian securities law needs to acknowledge a premise underpinning it that inference can be as powerful as access, and the liability threshold should be a mirror image of that functional equivalence. The law has always created boundaries between the in and the out, and traditionally, the border was patrolled by origin and access. This necessitates acknowledgement that in a market that is increasingly being influenced by inference as opposed to leaks, the liability framework will have to change so as to seal the gap.¹⁴⁸ The test proposed is based on three fundamental prongs, i.e., (i) inference equivalence, (ii) data asymmetry, and (iii) intentional construction or foreseeability. Together, they operationalise the idea that knowledge may be possessed not only through communication but through inference that is materially indistinguishable from what insider access would have yielded.

Inference Equivalence

The first prong asks whether the model's output resembles, in substance and timing, information that would ordinarily qualify as UPSI. This is not a test of ordinary financial modelling or thematic forecasting; it concerns models that forecast earnings outcomes within narrow quantitative margins before announcement, anticipate key managerial changes within short windows, or predict material corporate events before their regulatory disclosure. If the predicted event had triggered disclosure obligations under the LODR Regulations or the PIT Regulations, its synthetic duplication should attract the same regulatory attention.¹⁴⁹

¹⁴⁸ Kevin R. Douglas, *Missing the Role of Property in the Regulation of Insider Trading*, 69 CATH. U. L. REV. 209 (2020). See Richard A. Booth, *The Missing Link Between Insider Trading and Securities Fraud*, REGULATION, Winter 2007–2008, at 42.

¹⁴⁹ Securities And Exchange Board of India, Review of Disclosure Requirements for Material Events or Information under SEBI (Listing Obligations and Disclosure Requirements) Regulations, 2015 (Consultation Paper, Nov. 12, 2022), <https://www.sebi.gov.in/reports-and-statistics/reports/nov-2022/review-of-disclosure-requirements-for->

The legal system already accepts that circumstantial inferences can substitute for direct evidence, as the Chandrakala demonstrates. The same evidential test should apply to a synthetic signal that encapsulates the functional form of UPSI.¹⁵⁰ The Salman doctrine also affirms that material benefit is not a prerequisite to prove breach, as well as the fact that the output was a working alternative to what would otherwise constitute illegal transmission.

Data Asymmetry

The second prong looks at the model itself, architecture, and poses the question: Was the inference made using data or a tool not reasonably available to the rest of the market? This aspect is structural-access because it does not predict what the output predicts, but the informational and computational infrastructure which generated it. A customer of a natural language processing tool that is in a position of having exclusive proprietary information and is licensed to use said information has a structurally distinct status compared to a participant of a market who is using publicly available sources of information, even though both can technically be within the confines of the law. It's like having a secret vantage point while everyone else is watching from afar.¹⁵¹ By analogy, inference built on structurally exclusive datasets available only to institutions with specific contractual arrangements, specialised technical capabilities, or privileged data access implicates the *parity principle* that is foundational to the insider trading regime. If an actor occupies a position of special data access and trades with advantageous timing, a legal presumption of constructive possession is not unreasonable.¹⁵² The asymmetry at issue is infrastructural. An inference becomes problematic not only when it is accurate but when it is built on a foundation of exclusive privilege.¹⁵³

[material-events-or-information-under-sebi-listing-obligations-and-disclosure-requirements-regulations-2015_64962.html](https://sebi.gov.in/sebiweb/other/otherpages/sectors/othersectors/2015/64962.html).

¹⁵⁰ Andrew Verstein, *Insider Trading in Commodities Markets*, 102 VA. L. REV. 447 (2016).

¹⁵¹ Elyas Elyasiani & Iqbal Mansur, *Hedge Fund Return, Volatility Asymmetry, and Systemic Effects: A Higher-Moment Factor-EGARCH Model*, 28 J. FIN. STAB. 49 (2017).

¹⁵² Trei O'Brien, *Should a Possession or Use Standard Be Employed to Prove Insider Trading?*, 36 SAN DIEGO L. REV. 213 (1999).

¹⁵³ Michael A. Perino, *The Lost History of Insider Trading*, 2019 U. ILL. L. REV. 951 (2019).

Reimagining Possession under SEBI (Prohibition of Insider Trading) Regulations, 2015: The Challenge of Synthetic UPSI and Algorithmic Inference

Intentional Construction on Foreseeability

The third prong addresses culpability. Was the synthetic output the result of deliberate construction, or was it a foreseeable consequence of a system designed, trained, and deployed by the trader with awareness of its predictive capabilities? This is where constructive possession becomes most operationally relevant, as actual knowledge is not required if the system's outputs are functionally identical to insider-quality information and those outputs are deliberately engineered or foreseeably produced by the actor's design choices. SEBI's adjudication in the matter of *Vishvapradhan Commercial Pvt. Ltd.*¹⁵⁴ supports this reasoning that culpability was found not merely in direct knowledge, but in the deliberate structuring of transactions designed to avoid compliance while treating the intent of Regulation 4. Section 115 of the Bharatiya Sakshya Adhiniyam, 2023¹⁵⁵ allows the courts to make the assumption of intent when conduct is repeatedly followed, and the outcome is a prohibited one. The opaque nature of their models cannot serve as a defence to trading entities when they are trained to replicate the predictive benefit that insider access would otherwise help them to have. The implementation of a system that is designed to generate outputs that are functionally identical to UPSI is, according to this analysis, the very conduct that is the target of the constructive possession inquiry.

CHALLENGES TO THE PROPOSED LIABILITY TEST

There are substantial objections to the three-pronged liability test suggested above. Intellectual honesty requires that they are not recognised and put aside, but that they be approached on a one-on-one basis.

The Chilling Effect on Mosaic Research

Most commonly raised is the argument that limiting liability to inferred informational benefit will deter lawful mosaic research, upon which price discovery and analytical

¹⁵⁴ Order against *Vishvapradhan Commercial Pvt. Ltd. in the Matter of NDTV*, SAT Appeal No. 293/2018 & Misc. App. No. 235/2018, WTM/GM/EFD/31/2018-19 (June 26, 2018).

¹⁵⁵ Bharatiya Sakshya Adhiniyam, 2023, § 115 (India).

competition in securities markets is based. The mosaic theory, which consists of combining non-material information separately to create a material investment thesis,¹⁵⁶ is a popular type of market research in the United States, and the SEC has largely accepted it so long as no single part of the mosaic is material, non-public information. Whenever a model makes accurate forecasts of corporate events, the risk is that Synthetic UPSI liability is confused with advanced research and insider behaviour, which locks out just the analytical hard work which creates an efficient market. The challenge is thus to make a principled distinction between creative analytics that enhance price discovery and considered constructions,¹⁵⁷ otherwise it will be caught up in the *origin test*. The cumulative structure of the test deals with this objection. The first prong not only involves accuracy but also involves a *certain* form of accuracy that involves the systemic prediction of events that would result in the existence of mandatory disclosure obligations. Thematic analysis, general forecasting, or very accurate macroeconomic modelling does not meet this requirement. The second prong also narrows down the test to structural inaccessibility, rather than analytical sophistication. A maker of information accessible to any industrious investigator will not be liable on this framework, on which only an agent whose infrastructure puts them in informational structural non-replicability. These two prongs acting in concert shield legitimate use of mosaic research and focus on the targeted conduct.

The Evidentiary Difficulty to Establish Inference Equivalence

A second objection goes to evidentiary tractability. Synthetic UPSI does not leave a chain of custody, no communicative trail, no inside man to subpoena and leave something that one may term as a *forensic void*. The regulator has to prove possession without a leak, based on circumstantial output and analysis of statistical patterns. This

¹⁵⁶ Aaron S. Davidowitz, *Abandoning the "Mosaic Theory": Why the "Mosaic Theory" of Securities Analysis Constitutes Illegal Insider Trading and What to Do About It*, 46 WASH. U. J.L. & POL'Y 281 (2015).

¹⁵⁷ Securities and Exchange Board of India, Guidelines for Responsible Usage of AI/ML in Indian Securities Markets, (Consultation Paper, June 20, 2025), https://www.sebi.gov.in/reports-and-statistics/reports/jun-2025/consultation-paper-on-guidelines-for-responsible-usage-of-ai-ml-in-indian-securities-markets_94687.html.

is not insurmountable, but it demands institutional capacity and evidentiary frameworks that SEBI has not yet developed at scale. The ERS addresses this in part by shifting the evidential burden. Once SEBI establishes a *prima facie* case that a model's outputs are functionally equivalent to material UPSI, and that the trader acted on those outputs with advantageous timing, the burden should shift to the respondent to demonstrate that the model was designed for legitimate analytical purposes and that no structural data asymmetry was involved.

The Definitional Circularity of Data Asymmetry

The third objection is doctrinal, as if data asymmetry is defined by reference to information which is not reasonably available to the rest of the market, the inquiry becomes self-referential, sophisticated institutional actors have always accessed superior data sources.¹⁵⁸ At what quantitative or qualitative threshold does superior data access become structurally exclusive in the legally relevant sense? The response lies in calibrating the threshold by reference to practical replicability. Data that is technically public but practically inaccessible due to prohibitive cost, specialised arrangements with data vendors, or proprietary infrastructure, making it structurally asymmetric in a legally meaningful sense.¹⁵⁹ The operative question is not whether a competitor could in theory access the same data, but whether the class of market participants who could realistically do so is so narrow as to create a two-tier informational market. This is consistent with MAR's effects-based approach, under which the concern is the market distortion produced by informational asymmetry, not the formal classification of the data itself. Defining the threshold by reference to market replicability gives the test objective content and avoids circularity by anchoring it in observable market structure.

¹⁵⁸ Kevin S. Haeberle, *Information Asymmetry and Protection of Ordinary Investors*, 53 UC DAVIS L REV 145-195 (2019).

¹⁵⁹ Angelina Fisher and Thomas Streinz, *Confronting Data Inequality*, 60 COLUM. J. TRANSNAT'L L. 830-956 (2022).

THE WAY FORWARD

No regulatory regime is old-fashioned unless it knows how to adjust to the market it is overseeing. All the accuracy of Regulation 3(1) remains in a framework that is developed with a market premised on face-to-face communication and traceable disclosures. It is not a question of legislative intervention but a question of doctrinal adjustment, i.e., the incorporation of inference-driven conduct into the preexisting legal framework without compromising the regulatory certainty or excessively enforcing it. The reform plan is presented in this section at three levels that are complementary to each other, i.e. *interpretive, administrative and supervisory*.

An Explanatory Clause to Regulation 3(1)

The least time-consuming, most jurisprudentially conservative one is the addition of an Explanation to Regulation 3(1) to explain that possession comprises *inferred, derived, or functionally equivalent* information where specific access asymmetry and price-sensitivity criteria are met. This is because models constructed on legal data can, and do, produce outputs that are functionally the same as what previously was the preserve of insiders.¹⁶⁰ By keeping the law based on the manner of accessing the information as the sole determinant of liability, the law runs the risk of providing traders with a blueprint to avoid Regulation 3(1), as they can substitute leaks with logic. The description would be doctrinally similar to the current treatment of constructive knowledge and circumstantial possession by the Indian courts in similar regulatory situations. In *Hindustan Steel Ltd. v. State of Orissa*¹⁶¹, Justice Shah ruled that liability under a regulatory framework did not necessarily have to be based on the intention to commit, but a behaviour that was below what was expected as the standard of diligence in a regulated area. The SAT in the case of *DSQ Holdings Ltd. v. SEBI*¹⁶² based on the

¹⁶⁰ Yash Sharan & S. K. Subhiksha, *Blink and You'll Miss It: The Fast Lane of High-Frequency Trading and Legal Bumps in India*, 7 J. ON GOVERNANCE 94 (2025).

¹⁶¹ *Hindustan Steel Ltd. v. State of Orissa*, Civil Appeal Nos. 883–892 of 1966 (Supreme Court of India Aug. 4, 1969).

¹⁶² *DSQ Holdings v. Securities and Exchange Board of India*, Appeal No. 345/2004 (Securities Appellate Tribunal Dec. 8, 2005).

rationale in *SEC v. David E. Lipson*¹⁶³, admitted that behaviour applied in context can imply that there is possession, even in the absence of evidence of communication. The three-pronged test ought to be adopted as the operative standard in the said Explanation - possession is constructively proved to exist when (i) the output of a computational system has the functional equivalent of UPSI when compared to its market impact and the events it predicts; (ii) the system was designed or implemented with the knowledge of deliberate construction or the generation of outputs of the type of UPSI; and (iii) the design or This is structured in such way that it does not intrude into the valid analysis research.

A Guidance Circular for Institutional Actors

Inference-based trading is institutionalised mostly with the advancement of Portfolio Management Services and Alternative Investment Funds, which have grown tremendously since 2015 and regularly use machine learning, natural language processing, and high-resolution data aggregation to gain tradeable information.¹⁶⁴ A targeted guidance circular addressed to this segment would serve two functions: (i) it would place institutional actors on notice that SEBI considers inference-generated informational asymmetry within the scope of its regulatory concern, and (ii) it would specify the compliance expectations of entities whose models generate UPSI-equivalent outputs. The circular should mandate model audit disclosures for systems that consistently predict material events, require mandatory risk attribution assessments that identify the structural data inputs underpinning high-conviction predictive signals, and establish ethical firewalls between data science functions and execution desks within regulated entities. These obligations are analogous to the latency transparency requirements SEBI has imposed in execution environments.¹⁶⁵ Just as SEBI now seeks

¹⁶³ *SEC v. David E. Lipson*, 278 F.3d 656 (7th Cir. 2002).

¹⁶⁴ Abhijit Bhawe, *Beyond the Norms: India's Rising Wealth and the Emergence of PMS and AIF*, THE ECONOMIC TIMES (Feb. 26, 2023), <https://economictimes.indiatimes.com/markets/stocks/news/beyond-the-norms-indias-rising-wealth-and-the-emergence-of-pms-and-aif/articleshow/98248866.cms>.

¹⁶⁵ Securities and Exchange Board of India, Safer Participation of Retail Investors in Algorithmic Trading (Circular No. SEBI/HO/MIRSD/MIRSD-PoD/P/CIR/2025/0000013, Feb. 4, 2025). See Securities and Exchange Board of India, Broad Guidelines on Algorithmic Trading (Circular No. CIR/MRD/DP/09/2012, Mar. 30, 2012).

logic transparency in algorithmic trading system design for market integrity purposes, it must extend that principle to inferential model design where model outputs implicate the informational parity obligations embedded in the PIT Regulations. This approach is consistent with the *substance-over-form doctrine* embraced by both SEBI and Indian courts in market abuse cases, as affirmed in ***Sterlite Industries***.¹⁶⁶ The guidance circular should also clarify unambiguously that the 2025 amendment to the PIT Regulations, which remained silent on AI and inference models, does not constitute regulatory clearance for algorithmic inference strategies. Legislative or regulatory omission is not authorisation, and entities that have treated SEBI's silence on Synthetic UPSI as implicit permission should be disabused of that interpretation.

Innovation Sandbox Explainability Protocol

SEBI has an *Innovation Sandbox* that is now being used as a regulatory pilot area.¹⁶⁷ Instead of targeting advanced predictive models as post hoc enforcement goals, SEBI must position itself as a co-auditor, collaborating with institutional players in this stage to examine models that make predictions of material corporate events prior to their disclosure. This pre-clearance would be used to fulfil the compliance and market efficiency goals. Models whose outputs consistently trigger regulatory flags should be subject to a mandatory *explainability protocol*, under which the designing entity is required to demonstrate the data inputs and inferential architecture underpinning the prediction. This is consistent with the OECD's norms for AI risk mitigation and accountability and with the approach emerging from the European Commission's AI governance framework.¹⁶⁸ Courts adjudicating inference-based violations under Regulation 3(1) may lack the technical competence to evaluate model architecture without expert

¹⁶⁶ *Sterlite Industries (India) Ltd. v. Securities and Exchange Board of India*, Appeal No. 20/2001 (Securities Appellate Tribunal Oct. 22, 2001).

¹⁶⁷ Ramya Chandrashekhar, *Innovation in the Sands of Time: A Critique of SEBI's Framework for Innovation Sandbox*, CYRIL AMARCHAND MANGALDAS (May 29, 2019), <https://corporate.cyrilamarchandblogs.com/2019/05/sebis-framework-innovation-sandbox-fintech/>

¹⁶⁸ Organisation for Economic Co-operation and Development [OECD], *Recommendation of the Council on Artificial Intelligence*, OECD/LEGAL/0449 (May 22, 2019).

assistance. An institutionalised *amicus briefing* protocol under which SEBI may submit technical amicus curiae briefs in cases involving inference-based violations would address this capacity gap. SEBI's job is to keep watch, not bare its teeth at every misstep; when rules are broken, the first response should be to fix the problem, not rush to punish.¹⁶⁹ This methodology can be traced back to the analytical schemes that ESMA implements in the open case of the Wirecard litigation¹⁷⁰, where the technical expertise on regulation was used to guide the judicial decision-making process.

Enforcement under this framework should be calibrated to reflect the novelty and complexity of the conduct. It is a well-established principle that, when regulatory rules are breached, the first response should be remedial rather than immediately penal, with proportionality deciding the severity of the sanction.¹⁷¹ For inference-based violations arising in the early period of doctrinal adaptation, graduated enforcement and trading restrictions may be more appropriate than outright penalty proceedings. This ensures that deterrence is achieved through architectural reform rather than retrospective punishment in cases where the doctrinal basis for liability is still being established. SEBI's ongoing jurisprudence on the responsible usage of AI/ML in Indian Securities Markets provides an emerging framework¹⁷² within which these Sandbox and explainability obligations can be operationalised, and the Synthetic UPSI regime can be anchored in a broader AI governance architecture for the Indian securities market.

CONCLUSION

Insider trading law in India has long drawn its boundaries by tracing how information flows, but that logic belongs to a world where insight was passed hand to hand, not

¹⁶⁹ Piramal Enterprises Ltd. v. Securities and Exchange Board of India, Appeal No. 466 of 2016 (Securities Appellate Tribunal May 15, 2019).

¹⁷⁰ Jan Pieter Krahn, Katja Langenbucher, Christian Leuz and Lorian Pelizzon, *Wirecard Scandal: When All Lines of Defense Against Corporate Fraud Fail*, OXFORD BUSINESS LAW BLOG (Nov. 23, 2020), <https://blogs.law.ox.ac.uk/business-law-blog/blog/2020/11/wirecard-scandal-when-all-lines-defense-against-corporate-fraud-fail>

¹⁷¹ Alice Ristroph, *Proportionality as Principle of Limited Government*, 55 DUKE L.J. 263-331 (2005).

¹⁷² Ashish Rawat & Saksham Shivam, *Algorithmic Insurance and Resource Pooling: The Missing Piece in SEBI's AI/ML Governance Framework*, NLS BUSINESS LAW REVIEW BLOG (30 October, 2025) <https://forum.nls.ac.in/nlsblr-blog-post/algorithmic-insurance-and-resource-pooling-the-missing-piece-in-sebis-ai-ml-governance-framework/>

built from the ground up by machines. Today, inference has grown teeth and models trained on disparate but public data now yield forecasts with uncanny accuracy. It makes a simple case that if a trader builds a system that reliably mirrors undisclosed, price-sensitive events and does so using data or tools most of the market can't touch, then that's not just foresight as constructive possession offers a way to reconcile legal form with technological function. Courts and regulators have long accepted circumstantial reasoning, both in proving mens rea and in imputing knowledge and the time has come to bring that reasoning to bear on inference-based trading systems.¹⁷³ The synthetic UPSI framework proposed here offers a principled test rooted in precedent and responsive to the world we now live in. There is no reason insider trading rules should be any different when the effect of the conduct is the same. This is not about punishing sharp thinking or new tools, but it is about keeping the rules honest. Fairness isn't just about how information is gathered, but it's about how it tilts the playing field. Regulation 3(1) doesn't need rewriting; it needs reinterpretation that meets the moment, and the moment is one where the sharpest trades may come not from whispers but from code.

¹⁷³ Yavar Bathaee, *The Artificial Intelligence Black Box and the Failure of Intent and Causation*, 31 HARV. J.L. & TECH. 890 (2018).