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**ARTIFICIAL INTELLIGENCE AND MARKET REGULATION: SEBI'S  
FRAMEWORK FOR AI/ML GOVERNANCE IN INDIAN SECURITIES  
MARKETS**

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**INTRODUCTION:**

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Artificial Intelligence (“AI”) and Machine Learning (“ML”) have emerged as transformative technologies that have reshaped global securities markets. Integration of AI/ML tremendously improves efficiency and accuracy and attracts investors, while it also presents newer regulatory and ethical challenges. Recognizing both the potential and perils of AI, regulators worldwide, including IOSCO, ESMA, SEC, and SEBI, are formulating frameworks to ensure responsible innovation without stifling technological advancement. The paper discusses the evolving regulatory landscape governing the use of AI/ML in the securities sector, focusing on consultation guidelines introduced by the Securities and Exchange Board of India (“SEBI”). It discusses in-depth these guidelines in comparison to the established frameworks of the United States and the European Union. The paper evaluates the extent of convergence in regulatory philosophy, identifies gaps in compliance, and gives recommendations to bring alignment in India's approach for governance of AI with global best practices.

**PART 1: ROLE OF AI/ML IN THE SECURITIES MARKET**

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The financial market is never behind in decoding how to make more money. It has always explored ways to expand its horizon beyond its existing capabilities. Therefore, keeping up

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with this attitude and technological pace, the market has adopted the use of AI and ML. Market participants, including investors, intermediaries, and regulatory bodies, utilise the AI/ML model to enhance their market performance by increasing efficiency and returns to investors. The integration of AI in financial markets has been ongoing since the 1980s, when APEXS, Inc. developed PlanPower, an AI-based financial technology designed to generate financial plans for individuals earning more than \$75,000 annually.<sup>2</sup>

Let's examine, with a focus on capital markets, how AI leverages a vast amount of data to identify patterns and generate informed investment responses. The domain of AI is pervasive; within this domain, there is a subfield called 'machine learning'. ML can be described as developing a series of actions to solve a problem, called algorithms, that automatically optimise through experience with minimal or no human intervention. These techniques can identify patterns in vast amounts of data from more diverse and innovative sources.<sup>3</sup> The diversification and rapid growth of AI make it challenging to categorise its types; therefore, AI is often used as a collective term for all AI technologies.

In the capital market, the incorporation of AI has improved efficiency, accuracy, and risk management.<sup>4</sup> The most promising uses of AI are in investment management and customer service. Businesses use AI models to create investment portfolios, provide financial advice, and give clients trading recommendations and real-time insights.<sup>5</sup> This results in improved client satisfaction and retention, providing a competitive edge to firms that adopt this technology.<sup>6</sup> However, just having the knowledge or experimenting with AI is not sufficient; understanding how the AI technology works and what are the risks involved are equally important.

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<sup>2</sup>Joanna England, *FinTech: AI and the Future of Financial Services*, FinTech Magazine (Oct. 30, 2025), <https://fintechmagazine.com/financial-services-finserv/fintech-ai-and-future-financial-services>.

<sup>3</sup>Financial Stability Board (FSB), *Artificial Intelligence and Machine Learning in Financial Services* (Nov. 1, 2017), <https://www.fsb.org/uploads/P011117.pdf>.

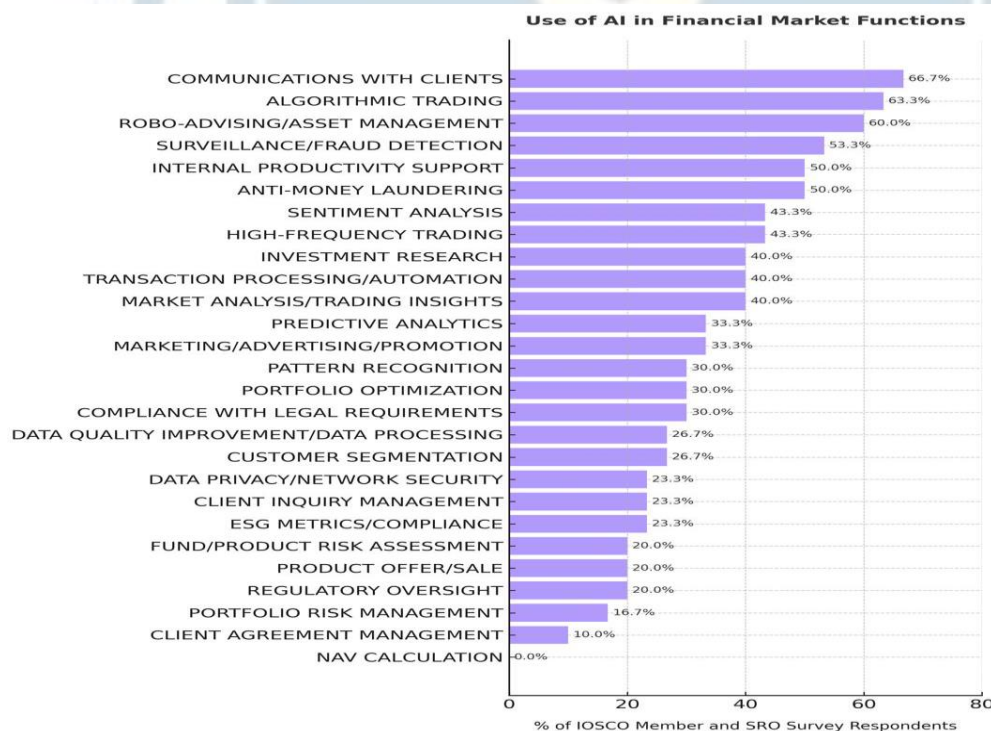
<sup>4</sup>Sunil Kumar Das, Shaista Anwar, Urvee Tulsyan, Yash Gupta, Rahul Vudatta & Syed Hassan Imam Gardezi, *The Role of AI in Financial Markets: Impacts on Trading, Portfolio Management and Price Prediction*, Journal of Electrical Systems (2024), <https://www.jespublication.com>

<sup>5</sup>Quantum Computing for Market Volatility Prediction, In the Valley Blog, <https://inthevalley.blog/ai-generated-articles/industry-insights/fintech/quantum-computing-for-market-volatility-prediction/>.

<sup>6</sup>World Economic Forum, *Industries in the Intelligent Age: White Paper Series* (2025), [https://reports.weforum.org/docs/WEF\\_Artificial\\_Intelligence\\_in\\_Financial\\_Services\\_2025.pdf](https://reports.weforum.org/docs/WEF_Artificial_Intelligence_in_Financial_Services_2025.pdf).

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World Economic Forum (“**WEF**”) and International Organisation of Securities Commissions (“**IOSCO**”), in their reports, provide a sound evidential basis for assessing where AI is most active and where regulatory priorities should be concentrated.<sup>7</sup> According to the reports, AI is significantly utilised in both front-office and back-office functions. IOSCO's review documents that AI applications are particularly prevalent in client communications, algorithmic trading, robo-advising/asset management, as well as surveillance/fraud detection, with significant adoption also reported for predictive analytics, transaction automation, and internal productivity support.<sup>3</sup> This distribution reflects a pragmatic prioritisation by firms of tools that either (a) scale client engagement and advisory services at low marginal cost, or (b) enhance trading performance and monitoring capabilities.

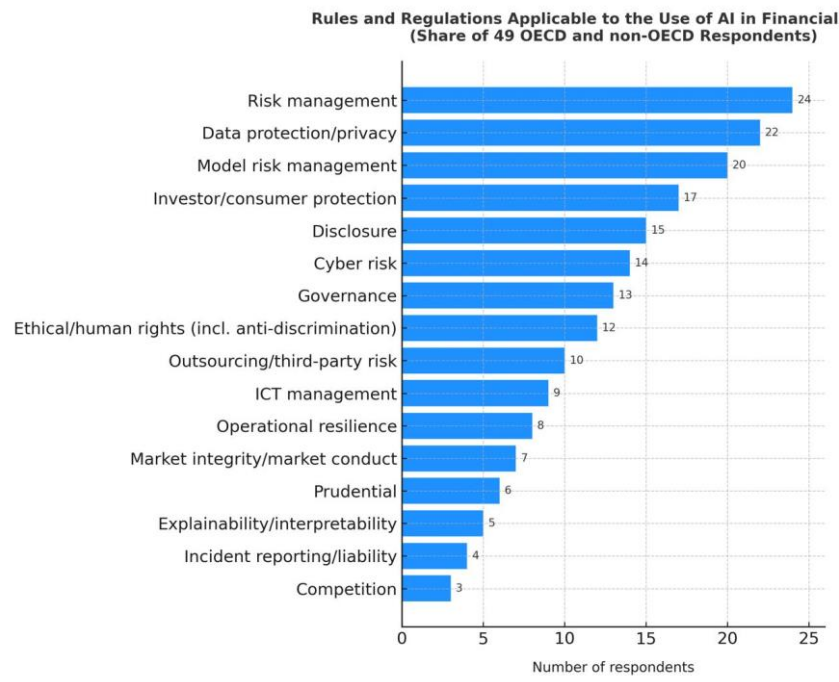


<sup>7</sup>International Organization of Securities Commissions (IOSCO), Artificial Intelligence in Capital Markets: Use Cases, Risks and Challenges (Consultation Report, 2025).

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These implementations have significant effects on market dynamics, algorithmic advice and tailored communications change the way investment information is being created and accessed, while automated trading strategies can frequently impact liquidity and price formation.



The OECD results highlight a concentrated supervisory focus on the safety and soundness, as well as consumer protection, dimensions of AI, while giving nascent attention to accountability and market structure effects.<sup>8</sup>

Firms are deploying AI in functions with immediate market impact, yet regulatory authorities' attention remains centred mainly on model validation, data governance and conventional risk controls. This mismatch creates potential blind spots—particularly with respect to algorithmic explainability, incident reporting for model failures, and market-structure effects

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<sup>8</sup>Organisation for Economic Co-operation and Development (OECD), *Regulatory Approaches to Artificial Intelligence in Finance* (Stocktake of 49 Jurisdictions, 2024).

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arising from model homogeneity and data concentration. If left unaddressed, these blind spots may give rise to harm that is not readily captured by traditional supervisory modalities.<sup>9</sup>

However, the AI is a poisoned chalice; the more it appears desirable, the more it is prone to risks. Reportedly, Cybersecurity, privacy concerns, market manipulation, money laundering, and consumer and investor risks are among the key risks in the financial sector.<sup>10</sup> These risks are on the horizon, which could soon brew into a storm. Therefore, financial supervisors are constantly conducting surveys, publishing reports, and attempting to govern the AI and market to promote innovation and productivity while also preventing misuse.

## PART 2: GLOBAL PERSPECTIVE

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Governments, banks, and financial regulators worldwide are taking measures to study, understand, and regulate the entire economic market. These authorities are reviewing the existing legal framework to incorporate AI-based systems used by market players. The advancement of AI and its technologies has led to an increase in the deployment of data-driven models. Furthermore, to drive innovation, improve financial inclusion, and enhance consumer control over their finances, AI has taken on another form: Open Banking and its extension, Open Finance. The regulatory body, therefore, finds a growing urge to make rules and regulations for the market.

The UK's Financial Conduct Authority ("FCA") has conducted AI live testing for firms to overcome the "proof of concept paralysis" and help them deal with AI in real market conditions.<sup>11</sup> Through this testing, firms receive structured regulatory engagement, safety monitoring, and feedback mechanisms, helping them adopt AI responsibly and with accountability. Furthermore, the FCA is publishing high-level observations from a multi-firm review of algorithmic trading controls to highlight governance and testing weaknesses under

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<sup>9</sup>Financial Stability Board (FSB), *The Financial Stability Implications of Artificial Intelligence* (Report, 2024).

<sup>10</sup>Organisation for Economic Co-operation and Development (OECD), *Regulatory Approaches to Artificial Intelligence in Finance* (2024), [https://www.oecd.org/content/dam/oecd/en/publications/reports/2024/09/regulatory-approaches-to-artificial-intelligence-in-finance\\_43d082c3/f1498c02-en.pdf](https://www.oecd.org/content/dam/oecd/en/publications/reports/2024/09/regulatory-approaches-to-artificial-intelligence-in-finance_43d082c3/f1498c02-en.pdf).

<sup>11</sup>Financial Conduct Authority (FCA), *FS25/5: AI Live Testing — Feedback Statement* (Feedback Statement, Sept. 9, 2025), <https://www.fca.org.uk/publications/feedback-statements/fs25-5-ai-live-testing?>

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MiFID RTS 6.<sup>12</sup> Additionally, the FCA is providing guidelines for synthetic data governance to enable safe model training and innovation without compromising privacy, and is collaborating internationally on explainable AI tools for supervisors through the BIS Project Noor.<sup>13</sup>

The European Commission, in line with the AI Act, has developed the General-Purpose AI Code of Practice, covering chapters on Transparency, Copyright, and Safety and Security. To gather the information required by the AI Act, the Code offers a user-friendly Model Documentation Form.<sup>14</sup> Additionally, in July 2025, HM Treasury's Digitalisation Taskforce advised adopting a common data standard (ISO 20022) to modernise UK financial markets and enhance efficiency, interoperability, and competitiveness across the securities chain.<sup>15</sup>

In 2021, IOSCO released its report on AI in Capital Markets, aiming to understand the role of AIML in capital markets, the risks associated with it, and the guidelines for its members regarding the expected standards of conduct for using AI by market participants. IOSCO's 2021 guidance sets six pragmatic measures for intermediaries and asset managers using AI/ML: (1) senior-management accountability and documented governance for the model lifecycle; (2) rigorous pre-deployment testing in segregated environments and continuous monitoring; (3) sufficient in-house skills in development, validation and challenge (including competent compliance and risk functions); (4) robust third-party/vendor governance with clear SLAs and performance metrics; (5) proportionate disclosure to clients and supervisors

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<sup>12</sup> Financial Conduct Authority (FCA), *Multi-Firm Review: Algorithmic Trading Controls — High-Level Observations* (Aug. 21, 2025), <https://www.fca.org.uk/publications/multi-firm-reviews/algorithmic-trading-controls-high-level-observations?>

<sup>13</sup> Bank for International Settlements (BIS) Innovation Hub, *Project Noor: Explaining AI Models for Financial Supervision* (Project Overview, Aug. 18, 2025), [https://www.bis.org/about/bisih/topics/suptech\\_regtech/noor.htm](https://www.bis.org/about/bisih/topics/suptech_regtech/noor.htm).

<sup>14</sup> European Commission, *The General-Purpose AI Code of Practice* (July 10, 2025), <https://www.sidley.com/en/-/media/resource-pages/ai-monitor/guidance/eu-generalpurpose-ai-code-of-practice.pdf>.

<sup>15</sup> HM Treasury, *Digitalisation Taskforce: Final Report* (July 15, 2025), [https://assets.publishing.service.gov.uk/media/688383b1ac2c821a74bbeba2/Digitisation\\_Taskforce\\_Final\\_Report.pdf](https://assets.publishing.service.gov.uk/media/688383b1ac2c821a74bbeba2/Digitisation_Taskforce_Final_Report.pdf).

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about AI use that affects outcomes; and (6) strong data-quality controls to prevent bias and ensure representativeness.<sup>16</sup>

In 2025, IOSCO released another report, based on the findings of its 2021 report. In its 2025 report, IOSCO reviewed its 2021 report to assess how the use case of AI has evolved in financial markets since 2021. The 2025 report also outlines the efforts made by IOSCO members to regulate and enhance the use of AI in financial markets. The report does not provide any recommendations; however, it has analysed the current framework worldwide and explored the potential future applications of AI/ML in the financial market.

In the USA, the Commodity Futures Trading Commission's ("CFTC") Divisions of Clearing and Risk, Data, Market Oversight, and Market Participants issued an advisory related to the use of AI by entities in the USA involved in the Derivatives Market. These advisory serves to remind entities of their obligations under the Commodity Exchange Act and the regulations established by the CFTC as they commence implementing AI.<sup>17</sup>

In 2024, the OECD updated its principles for AI, which serve as the basis for a framework for AI regulation across all OECD nations. The guiding principles are inclusive growth, sustainable development and well-being, human rights and democratic values including fairness and privacy, transparency and explainability, robustness, security and safety, accountability,<sup>18</sup> other recommendations for policy makers to invest in AI research and development, foster an inclusive AI enabling ecosystem, shape an enabling interoperable governance and policy environment for AI, build human capacity and prepare for labour market transition, international co-operation for trustworthy AI.<sup>19</sup>

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<sup>16</sup> International Organization of Securities Commissions (IOSCO), *The Use of Artificial Intelligence and Machine Learning by Market Intermediaries and Asset Managers* (Final Report FR06/2021, Sept. 7, 2021), <https://www.iosco.org/library/pubdocs/pdf/IOSCOPD684.pdf>.

<sup>17</sup> U.S. Commodity Futures Trading Commission (CFTC), *Staff Advisory Related to the Use of Artificial Intelligence by CFTC-Registered Entities and Registrants* (Dec. 5, 2024), <https://www.cftc.gov/PressRoom/PressReleases/9013-24>.

<sup>18</sup> A. Lafram & S. Bahji, *Artificial Intelligence in Morocco: Towards Holistic, Responsible and Ethical National AI Strategy for Moroccan Competitiveness and Strategic Intelligence*, in *Proceedings of the European Conference on Management, Leadership & Governance* 255, 255–263 (2024).

<sup>19</sup> Organisation for Economic Co-operation and Development (OECD), *OECD AI Principles* (2019), <https://oecd.ai/en/ai-principles>.

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The OECD has also published the regulatory approaches to AI in finance. It analyzed the existing regulations across the globe, including the non-OECD members. It acknowledges the efforts made by both members and non-members in identifying the growth and potential risks that come with the use of AI. It further identifies the gaps in these policies and highlights the need to continually review, update, and strengthen them.<sup>20</sup>

### PART 3: ANALYSIS OF THE SEBI GUIDELINES

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On June 20, 2025 SEBI released a consultation paper titled “Guidelines for Responsible Usage of AI/ML in Indian Securities Markets”(“SEBI guidelines”). This draft framework builds on SEBI’s mandate to protect investors and ensure market integrity by addressing the risks posed by AI/ML applications. SEBI’s paper organizes guiding principles into five core dimensions model governance, investor protection/disclosure, testing, fairness and bias, and data privacy/cybersecurity largely mirroring IOSCO’s AI report recommendations. The SEBI guidelines envisage a risk-based, tiered approach.

#### MODEL GOVERNANCE

1. The SEBI guidelines establish a robust governance regime for AI/ML application-based models. It requires market participants to set up skilled internal teams with adequate skills & expertise to monitor the performance, controls, testing & efficacy and security of the algorithms deployed throughout its lifecycle, development and performance.<sup>21</sup>The SEBI guidelines require the appointment of a senior management with adequate experience to oversee AI/ML based model.<sup>22</sup>Market participants must implement risk controls, backup plans and clear governance structures<sup>23</sup> and manage their relation with Third-party service providers.<sup>24</sup>Further, the SEBI guidelines require the market participants to conduct periodic

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<sup>20</sup>*Supra (n 13)*.

<sup>21</sup>SEBI, Consultation Paper on Guidelines for Responsible Usage of AI/ML in Indian Securities Markets guideline 5.1(a), (January 2025), <https://www.sebi.gov.in>.

<sup>22</sup>SEBI, Consultation Paper on Guidelines for Responsible Usage of AI/ML in Indian Securities Markets guideline 5.1(d), (January 2025), <https://www.sebi.gov.in>.

<sup>23</sup>SEBI, Consultation Paper on Guidelines for Responsible Usage of AI/ML in Indian Securities Markets guideline 5.1(b), (January 2025), <https://www.sebi.gov.in>.

<sup>24</sup>SEBI, Consultation Paper on Guidelines for Responsible Usage of AI/ML in Indian Securities Markets guideline 5.1(e), (January 2025), <https://www.sebi.gov.in>.

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- reviews and monitoring of AI/ML application performance to ensure its intended performance, such periodic has to share by the market participants with SEBI.<sup>25</sup>
2. Market Participants are required to define data governance norm.<sup>26</sup>The SEBI guidelines also provide for independent auditing of AI/ML based systems to ensure transparency and fairness.<sup>27</sup>
  3. The market participants should retain and secure the logs for AI/ML system to chronologically reconstruct the occurrence of events.<sup>28</sup>The SEBI guidelines further provides that AI/ML should operate in a way that complies with existing regulatory or legal obligations.<sup>29</sup>

### INVESTOR PROTECTION AND DISCLOSURE

The SEBI guidelines focus on safeguarding investors through transparency.<sup>30</sup>The guideline imposes a mandatory disclosure of key information of AI/ML models that materially affects the customers or clients, the SEBI guidelines provide a non-exhaustive list of such disclosures which are required to be made to the investors.<sup>31</sup>Disclosures must be in plain language so investors can make informed decisions.<sup>32</sup>Moreover, an AI-specific grievance redress mechanism aligned with SEBI norms is envisaged.<sup>33</sup>

### TESTING FRAMEWORK

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<sup>25</sup>SEBI, Consultation Paper on Guidelines for Responsible Usage of AI/ML in Indian Securities Markets guideline 5.1(f), (January 2025), <https://www.sebi.gov.in>.

<sup>26</sup>SEBI, Consultation Paper on Guidelines for Responsible Usage of AI/ML in Indian Securities Markets guideline 5.1(g), (January 2025), <https://www.sebi.gov.in>.

<sup>27</sup>SEBI, Consultation Paper on Guidelines for Responsible Usage of AI/ML in Indian Securities Markets guideline 5.1(h), (January 2025), <https://www.sebi.gov.in>.

<sup>28</sup>SEBI, Consultation Paper on Guidelines for Responsible Usage of AI/ML in Indian Securities Markets guideline 5.1(k), (January 2025), <https://www.sebi.gov.in>.

<sup>29</sup>SEBI, Consultation Paper on Guidelines for Responsible Usage of AI/ML in Indian Securities Markets guideline 5.1(m), (January 2025), <https://www.sebi.gov.in>.

<sup>30</sup>SEBI, Consultation Paper on Guidelines for Responsible Usage of AI/ML in Indian Securities Markets guideline 5.2(a), (January 2025), <https://www.sebi.gov.in>.

<sup>31</sup>SEBI, Consultation Paper on Guidelines for Responsible Usage of AI/ML in Indian Securities Markets guideline 5.2(b), (January 2025), <https://www.sebi.gov.in>.

<sup>32</sup>SEBI, Consultation Paper on Guidelines for Responsible Usage of AI/ML in Indian Securities Markets guideline 5.2(c), (January 2025), <https://www.sebi.gov.in>.

<sup>33</sup>SEBI, Consultation Paper on Guidelines for Responsible Usage of AI/ML in Indian Securities Markets guideline 5.2(d), (January 2025), <https://www.sebi.gov.in>.

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The SEBI guidelines supplements governance with rigorous testing and monitoring of AI/ML based model on a continuous basis.<sup>34</sup>It requires pre-deployment testing in a segregated environment and also encourages shadow-testing with live data to ensure the quality and performance.<sup>35</sup> Market participants are required to must document test results, maintain input/output logs for five years, to ensure that its outcomes are explainable, traceable and repeatable.<sup>36</sup>

### **FAIRNESS AND BIAS**

The SEBI guidelines also address the non-discrimination, realising the ethical outcomes that are expected of AI/ML application-based system.<sup>37</sup>It stipulates that AI/ML systems must not discriminate against any client group. Market participants are required to implement an adequate level of data quality to detect and mitigate bias in datasets and algorithms.<sup>38</sup>

### **DATA PRIVACY AND CYBERSECURITY**

The SEBI guidelines recognise that AI/ML depends on the collection and processing of data. It mandates comprehensive internal policies for data privacy, security and cyber-risk management.<sup>39</sup>The collection, usage and processing of investor's personal data must comply with the existing laws, notably the Digital Personal Data Protection Act, 2023.<sup>40</sup>

### **TIERED APPROACH**

The Consultation Paper carefully distinguishes between back-office and customer-facing models, offering a light-touch framework for the latter. While high-impact, client-facing

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<sup>34</sup>SEBI, Consultation Paper on Guidelines for Responsible Usage of AI/ML in Indian Securities Marketsguideline 5.3(a), (January 2025), <https://www.sebi.gov.in>.

<sup>35</sup>SEBI, Consultation Paper on Guidelines for Responsible Usage of AI/ML in Indian Securities Markets guideline 5.3(b), (January 2025),<https://www.sebi.gov.in>.

<sup>36</sup>SEBI, Consultation Paper on Guidelines for Responsible Usage of AI/ML in Indian Securities Markets guideline 5.3(d), (January 2025), <https://www.sebi.gov.in>.

<sup>37</sup>SEBI, Consultation Paper on Guidelines for Responsible Usage of AI/ML in Indian Securities Marketsguideline 5.4(a), (January 2025), <https://www.sebi.gov.in>.

<sup>38</sup>SEBI, Consultation Paper on Guidelines for Responsible Usage of AI/ML in Indian Securities Markets guideline 5.4(b), (January 2025), <https://www.sebi.gov.in>.

<sup>39</sup>SEBI, Consultation Paper on Guidelines for Responsible Usage of AI/ML in Indian Securities Markets guideline 5.5 (a), (January 2025), <https://www.sebi.gov.in>.

<sup>40</sup>SEBI, Consultation Paper on Guidelines for Responsible Usage of AI/ML in Indian Securities Marketsguideline 5.5 (b-c), (January 2025), <https://www.sebi.gov.in>.

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deployments like robo-advice, portfolio rebalancing, or automated order routing are subject to the full range of governance, disclosure, fairness, and testing requirements, internal utilities like cyber security analytics or regulatory reporting may function under a light regime that proportionately seeks to provide for safeguards.<sup>41</sup>



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<sup>41</sup>SEBI, Consultation Paper on Guidelines for Responsible Usage of AI/ML in Indian Securities Markets guideline 6, (January 2025), <https://www.sebi.gov.in>.

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**PART 4: COMPARATIVE ANALYSIS OF THESE GUIDELINES WITH THE GLOBAL PEERS:**

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**LAWS GOVERNING THE USE OF AI/ML IN THE SECURITIES MARKET IN THE USA**

The US approach to AI regulation mainly govern by two strategies (i) establishing guidelines and (ii) establishing standards through federal agencies standards and encouraging self-regulation within the industry.<sup>42</sup> In US the securities industry participants are regulated by federal and state securities agencies and SROs, including Financial Industry Regulatory Authority (FINRA), an independent self-regulatory organization and principal regulator of U.S. broker-dealers, the U.S. Securities and Exchange Commission (“SEC”), which exercises supervisory jurisdiction over broker-dealers. Consequently, the use of AI in the securities industry has attracted significant attention from these regulatory bodies. Since there is no universally adopted definition of AI in the United States, each regulatory authority has developed its own interpretation of AI within its respective rules and regulations.

The FINRA AI report has defined AI as “broadly refers to applications of technology to perform tasks that resemble human cognitive function and is generally defined as the capability of a machine to imitate intelligent human behaviour”.<sup>43</sup> The U.S. department of Commerce’s National Institute of Standards and Technology (“NIST”) has adopted the definition of AI from OCED recommendation on AI as “AI system as an engineered or machine-based system that can, for a given set of objective, generate outputs such as prediction, recommendations, or decisions influencing real or virtual environments. It is designed to operate with varying level of autonomy”.<sup>44</sup> FINRA has already published various reports on the use of AI in securities industries similarly, SEC has prescribed proposed rules on Conflicts of Interest Associated with the Use of Predictive Data Analytics by Broker-

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<sup>42</sup>Müge Fazlıoğlu, *Global AI Governance Law and Policy: U.S., International Association of Privacy Professionals* (May 2024), <https://iapp.org/resources/article/global-ai-governance-us/>.

<sup>43</sup> Financial Industry Regulatory Authority, *Report on Artificial Intelligence (AI) in the Securities Industry* (June 2020) <https://www.finra.org/sites/default/files/2020-06/ai-report-061020.pdf>.

<sup>44</sup> U.S. Department of Commerce, National Institute of Standards and Technology, *Artificial Intelligence Risk Management Framework (AI RMF 1.0) (NIST AI 100-1, January 2023)* <https://nvlpubs.nist.gov/nistpubs/ai/NIST.AI.100-1.pdf>.

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Dealers and Investment Advisers (“**Proposed SEC Rules**”),<sup>45</sup> while simultaneously implementing the existing rules and policy frameworks on the misuse of AI. SEC has used the term “covered technology”. The term “covered technology” would be defined broadly to mean an analytical, technological, or computational function, algorithm, model, correlation matrix, or similar method or process that optimizes for, predicts, guides, forecasts, or directs investment-related behaviours or outcomes.<sup>46</sup>

#### **FINRA:**

In 2020 FINRA published a report titled AI in the Securities Industry (the “**FINRA Report**”) that provides a comprehensive guidance for member firms to consider when integrating AI into their existing compliance frameworks. The FINRA in its report on AI in the Securities Industry, has discussed the scope of AI and described it as an umbrella term for a broad spectrum of technologies such as ML, Natural Language Processing, computer vision, Robotics Process Automation.<sup>47</sup> The key highlights of the report are as follows:

1. Member firms using AI should strengthen their model risk management frameworks to address challenges like explainability, data integrity, and privacy. The member firms while updating their model risk management must consider to update model validation process to account for complexities in of an ML model, conduct upfront and ongoing testing, employ current model and new model parallelly and must decommission the current model only after the thorough validation of new models, member firms must maintain the detailed inventory of all the AI models, the members firms must develop model performance benchmark. Firm’s model risk management programs for the use of AI must be in alignment with the supervisory requirements set forth under FINRA Rule 3110.<sup>48</sup>
2. Data is the foundation of all AI applications; AI models largely rely on the data for their analysis and their outcomes; therefore, integrating diverse data sources with improper validation introduces risk, especially when new data falls outside the training set. So,

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<sup>45</sup> Securities and Exchange Commission, Conflicts of Interest Associated with the Use of Predictive Data Analytics by Broker-Dealers and Investment Advisers (Release No 34-97990; IA-6353; File No S7-12-23, 26 July 2023) <https://www.sec.gov/files/rules/proposed/2023/34-97990.pdf>.

<sup>46</sup> Supra (n 48).

<sup>47</sup> Supra (n 48).

<sup>48</sup> Supra (n 48).

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maintaining data validity and consistency is essential to ensure a reliable and unbiased outcome of the AI application. The member firms data governance policies and procedures must align with the FINRA Rule 2010 (Standards of Commercial Honour and Principles of Trade) to observe a high standard of trade.<sup>49</sup>

3. The member firms must ensure the protection of financial and personal customer information. The member firms, while updating their privacy policies, must provide effective provisions for customer consent, data authorisation, user entitlement, access policy and data governance framework. The privacy policy must align with SEC Regulation S-P (Privacy of Consumer Financial Information and Safeguarding Personal Information) and Regulation S-ID (Identity Theft Red Flags), the application of Reg BI and FINRA Rule 2111 (Suitability) to recommendations generated by AI tools to retail investors and retail customers.<sup>50</sup>
4. FINRA requires member firms to create and maintain sound supervisory policies and procedures consistent with its supervisory control rules, such as FINRA Rules 3110 and 3120. These obligations extend to ensuring that adequate systems and processes are in place to oversee and manage the operation and governance of analytical or automated tools used within different areas of a broker-dealer's business.<sup>51</sup>
5. The member firms must take into consideration the cybersecurity risks associated with the information collected by the member firms from new sources.<sup>52</sup>

#### **SEC:**

The proposed SEC rules intends to eliminate, or neutralize the effect of, certain conflicts of interest associated with broker-dealers or investment advisers interactions with investors through these firms, use of technologies that optimize for, predict, guide, forecast, or direct investment-related behaviours or outcomes.<sup>53</sup> The proposed SEC rules addresses the technologies that either intentionally or unintentionally consider firm-favourable outcome that outweigh investor's interest. The proposed SEC rules required the broker-dealers and

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<sup>49</sup> Supra (n 48).

<sup>50</sup> Supra (n 48).

<sup>51</sup> Supra (n 48).

<sup>52</sup> Supra (n 48).

<sup>53</sup> Supra (n 50).

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SEC-registered investment advisers (“**RIA**”) to eliminate or neutralize the effect of conflict of interest associated with the use of “covered technology” in investor interactions that dominates the firm’s interest over investor’s interest.<sup>54</sup> The member firms would be required to written policies or procedures designed to prevent violation or achieve compliance of broker-dealers and RIAs.<sup>55</sup> The written policies or procedures would have detailed description of the process for evaluating use of a “covered technology” in any investor interaction or a written description of a process of determining how to eliminate or neutralise the effect of any conflict of interest identified under proposed SEC rules.<sup>56</sup> The member firms are also required to maintain records to demonstrate their compliance with the proposed SEC rules.<sup>57</sup>

#### **COMPARISON BETWEEN SEBI GUIDELINES AND USLAWS:**

The United States' regulatory approach towards the use of AI in securities markets is largely decentralized and principle-driven, which contrasts significantly with the structured consultation framework that SEBI has adopted. In the U.S., oversight lies with federal regulators, such as the Securities and Exchange Commission (“**SEC**”), along with the Financial Industry Regulatory Authority (“**FINRA**”).<sup>58</sup> FINRA's AI in the Securities Industry Report 2020 and the 2024 Annual Regulatory Oversight Report stress model risk management, data integrity, privacy, and supervisory control under existing FINRA Rules 3110 and 3120.<sup>59</sup> Firms must maintain inventories of AI models in detail, provide upfront and ongoing validation, perform parallel testing before deployment, and make sure data governance conforms to Rule 2010 on fair trade standards.<sup>60</sup> Similarly, proposed rules by the SEC on “Conflicts of Interest Associated with the Use of Predictive Data Analytics” require broker-dealers and investment advisers to identify and eliminate or neutralize conflicts of interest where AI-driven technologies may favour firm profits over investor interests,

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<sup>54</sup>Supra (n 50).

<sup>55</sup>Supra (n 50).

<sup>56</sup>Supra (n 50).

<sup>57</sup>Supra (n 50).

<sup>58</sup> Financial Industry Regulatory Authority, Report on Artificial Intelligence (AI) in the Securities Industry (June 2020), <https://www.finra.org/sites/default/files/2020-06/ai-report-061020.pdf>.

<sup>59</sup> Ibid.

<sup>60</sup> Ibid.

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accompanied by policies and procedures in writing to supervise the same, together with record-keeping requirements.<sup>61</sup>

SEBI's Guidelines adopt a consultative and non-binding approach to set forth guiding principles on model governance, fairness, investor disclosure, testing, and cybersecurity. Although SEBI's framework echoes FINRA and SEC priorities like testing, accountability, and transparency, it does not have the force of law and legal specificity comparable to U.S. rules.<sup>62</sup>

#### **EU LEGISLATION:**

**European commission:** The European commission has taken an active role in preparing a stage for financial sector for the use of AI/ML. In June, 2024 the Directorate-General for Financial Stability, Financial Services and Capital Markets Union launched a targeted consultation and workshop series to gather industry input on the use of AI in finance.<sup>63</sup> The main aim of this consultation is to provide guidance on the use of AI in financial services. The consultation explicitly seeks stakeholder's views on AI use cases and supports the commission in assessing the market development and risk related to AI and implementation of AI in the financial sector.<sup>64</sup>

**European Securities and Markets Authority ("ESMA"):** ESMA as a regulator of EU's securities market has issued guidelines on the use of AI in investment services. In May, 2024 ESMA published a public statement warning investment firms that any use of AI must comply with the relevant MiFID II requirements and firms must uphold their duty to give supremacy to investor's interests.<sup>65</sup>

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<sup>61</sup> Securities and Exchange Commission, Conflicts of Interest Associated with the Use of Predictive Data Analytics by Broker-Dealers and Investment Advisers (Release No 34-97990; IA-6353; File No S7-12-23, 26 July 2023) <https://www.sec.gov/files/rules/proposed/2023/34-97990.pdf>.

<sup>62</sup>SEBI, Consultation Paper on Guidelines for Responsible Usage of AI/ML in Indian Securities Markets (January 2025) guideline, <https://www.sebi.gov.in>.

<sup>63</sup> European Commission, Targeted Consultation on Artificial Intelligence in the Financial Sector (1 April 2024), [https://finance.ec.europa.eu/document/download/054d25f5-0065-488a-96fb-2bb628c74e6f\\_en?filename=2024-ai-financial-sector-consultation-document\\_en.pdf](https://finance.ec.europa.eu/document/download/054d25f5-0065-488a-96fb-2bb628c74e6f_en?filename=2024-ai-financial-sector-consultation-document_en.pdf).

<sup>64</sup>Ibid.

<sup>65</sup>ESMA, 'ESMA provides guidance to firms using artificial intelligence in investment services' (Press release, 30 May 2024), <https://www.esma.europa.eu/press-news/esma-news/esma-provides-guidance-firms-using-> For general queries or to submit your research for publication, kindly email us at [ijalr.editorial@gmail.com](mailto:ijalr.editorial@gmail.com)

**REGULATORY AUTHORITIES APPROACH****EU AI ACT (“AI ACT”, REGULATION 2024/1689):**

The AI Act is a comprehensive EU regulation for harmonizing AI rules across the EU. The AI Act does specifically mention algorithmic trading; however, it includes the use of AI that affects the consumer. The act adopts a risk-based approach and prohibits the unacceptable risk AI, further, it imposes strict requirements on high-risk AI system.<sup>66</sup> The AI Act has categorised the risk in four categories (i) Unacceptable risk (ii) High risk (iii) Limited risk (iv) Minimal risk.<sup>67</sup> The Act’s Annexure III explicitly states some use case which are designated as ‘high-risk’ such as use of AI for credit worthiness evaluation or credit scoring. Such high-risk AI systems are met with stringent requirements.<sup>68</sup>

Article 10 of the AI Act provides that High-risk AI trained on data must use training, validation, and test datasets that are prepared based on strict quality criteria. Article 10 also provides that such datasets should be relevant, representative, complete and error-free, and have appropriate statistical properties.

Article 14 stipulates reasonable human control over the data generated by an AI model. High-risk AI shall be subject to meaningful human control. Article 14(1) states that systems shall be designed including with appropriate interfaces so they can be effectively overseen by natural persons while operating.

Article 15 provides that High-risk AI must meet high technical standard, article 15 requires appropriate levels of accuracy, robustness and cybersecurity throughout the lifecycle and resilience against faults or adversarial attacks.<sup>69</sup>

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services#:~:text=When%20using%20AI%2C%20ESMA%20expects,best%20interest%20of%20the%20client.

<sup>66</sup> Regulation (EU) 2024/1689 of the European Parliament and of the Council of 13 June 2024 on artificial intelligence (AI Act) art 6.

<sup>67</sup> Byrne Wallace Shields LLP, “AI and MiFID” (Lexology, 8 October 2024), <https://www.lexology.com/library/detail.aspx?g=7a4295af-d3ad-4e54-8bca-e91a7a6ce512>.

<sup>68</sup> Regulation (EU) 2024/1689 of the European Parliament and of the Council of 13 June 2024 laying down harmonised rules on artificial intelligence (AI Act), Annex III (High-risk AI systems referred to in Article 6(2)).

<sup>69</sup> Regulation (EU) 2024/1689 of the European Parliament and of the Council of 13 June 2024 laying down harmonised rules on artificial intelligence (AI Act) art 15.

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Article 16(f) requires providers to ensure that the high-risk AI system undergoes the relevant conformity assessment procedure as referred to in Article 43 before being placed on the market.<sup>70</sup> Article 43 then outlines the procedures for certain Annex III systems, providers either use internal control (Annex VI) or a notified-body quality-management review (Annex VII).<sup>71</sup>

Article 72 provides that once a high-risk AI system is brought to market, providers must continually monitor it. Article 72(1) requires them to establish and document a post-market surveillance system proportionate to the risks of the system. It must actively and systematically collect, document and analyse relevant data on the performance of the high-risk AI system throughout its lifetime. This is to identify deviations or incidents and ensure continuing compliance with the requirements of the Act.

### **MiFID II AND ESMA GUIDANCE**

This part of the research paper will cover the MiFID II requirements with respect to the application of AI in the investment sector. The requirements are required to be made in four aspects (i) Client best interest and information to clients. (ii) organisational requirements. (iii) Conduct of business requirements. (iv) Record Keeping.<sup>72</sup>

1. **Client best interest and information to clients-** Regardless of the technology used, the deployment of AI in investment services should always be compatible with the general principle of acting in the best interests of clients.<sup>73</sup> According to ESMA, any disclosures

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<sup>70</sup> Regulation (EU) 2024/1689 of the European Parliament and of the Council of 13 June 2024 laying down harmonised rules on artificial intelligence (AI Act) art 16 (f).

<sup>71</sup> Regulation (EU) 2024/1689 of the European Parliament and of the Council of 13 June 2024 laying down harmonised rules on artificial intelligence (AI Act) art 43.

<sup>72</sup>ESMA, Public Statement on AI and investment services (ESMA 35-335435667-5924, 30 May 2024) [https://www.esma.europa.eu/sites/default/files/2024-05/ESMA35-335435667-5924\\_Public\\_Statement\\_on\\_AI\\_and\\_investment\\_services.pdf](https://www.esma.europa.eu/sites/default/files/2024-05/ESMA35-335435667-5924_Public_Statement_on_AI_and_investment_services.pdf).

<sup>73</sup>ESMA, Public Statement on AI and investment services (ESMA 35-335435667-5924, 30 May 2024) guideline 7 [https://www.esma.europa.eu/sites/default/files/2024-05/ESMA35-335435667-5924\\_Public\\_Statement\\_on\\_AI\\_and\\_investment\\_services.pdf](https://www.esma.europa.eu/sites/default/files/2024-05/ESMA35-335435667-5924_Public_Statement_on_AI_and_investment_services.pdf).

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presented to clients concerning the use of AI must be clear, fair, and should not be misleading.<sup>74</sup>

2. **Organisational requirements-** The management body is crucial in guaranteeing adherence to MiFID II organizational requirements when incorporating AI into investment service operations. The leadership of the company must have a solid grasp of how AI technologies are used inside the company and exercise the proper control over their implementation.<sup>75</sup> The member firms are required to make a robust and AI-specific risk management framework.<sup>76</sup> Businesses are expected to put strict governance procedures in place, test models frequently, and keep an eye on AI systems constantly in order to spot and reduce possible risks like algorithmic bias or systemic weaknesses.<sup>77</sup> To facilitate the reduction of algorithmic bias member firms are required to ensure that algorithms are trained and validated on trustworthy datasets, the data supporting these AI systems needs to be precise, thorough, and representative. Businesses must perform thorough due diligence and maintain stringent oversight throughout the data creation, training, testing, validation, and continuous evaluation processes, regardless of whether the data is sourced internally or externally.<sup>78</sup>
3. **Conduct of business requirements-** When AI systems are used to provide investment advice and portfolio management services, strict adherence to MiFID II's conduct of business requirements is crucial.<sup>79</sup> To ensure that AI systems are appropriately developed, put into use, and regularly assessed, businesses must set up robust governance and control systems. This entails matching product distribution to the designated target market and

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<sup>74</sup>ESMA, Public Statement on AI and investment services (ESMA 35-335435667-5924, 30 May 2024) guideline 8 [https://www.esma.europa.eu/sites/default/files/2024-05/ESMA35-335435667-5924\\_Public\\_Statement\\_on\\_AI\\_and\\_investment\\_services.pdf](https://www.esma.europa.eu/sites/default/files/2024-05/ESMA35-335435667-5924_Public_Statement_on_AI_and_investment_services.pdf).

<sup>75</sup>ESMA, Public Statement on AI and investment services (ESMA 35-335435667-5924, 30 May 2024) guideline 10 [https://www.esma.europa.eu/sites/default/files/2024-05/ESMA35-335435667-5924\\_Public\\_Statement\\_on\\_AI\\_and\\_investment\\_services.pdf](https://www.esma.europa.eu/sites/default/files/2024-05/ESMA35-335435667-5924_Public_Statement_on_AI_and_investment_services.pdf).

<sup>76</sup>ESMA, Public Statement on AI and investment services (ESMA 35-335435667-5924, 30 May 2024) guideline 11 [https://www.esma.europa.eu/sites/default/files/2024-05/ESMA35-335435667-5924\\_Public\\_Statement\\_on\\_AI\\_and\\_investment\\_services.pdf](https://www.esma.europa.eu/sites/default/files/2024-05/ESMA35-335435667-5924_Public_Statement_on_AI_and_investment_services.pdf).

<sup>77</sup>ESMA, Public Statement on AI and investment services (ESMA 35-335435667-5924, 30 May 2024) guideline 13 [https://www.esma.europa.eu/sites/default/files/2024-05/ESMA35-335435667-5924\\_Public\\_Statement\\_on\\_AI\\_and\\_investment\\_services.pdf](https://www.esma.europa.eu/sites/default/files/2024-05/ESMA35-335435667-5924_Public_Statement_on_AI_and_investment_services.pdf).

<sup>78</sup>ESMA, Public Statement on AI and investment services (ESMA 35-335435667-5924, 30 May 2024) guideline 12 [https://www.esma.europa.eu/sites/default/files/2024-05/ESMA35-335435667-5924\\_Public\\_Statement\\_on\\_AI\\_and\\_investment\\_services.pdf](https://www.esma.europa.eu/sites/default/files/2024-05/ESMA35-335435667-5924_Public_Statement_on_AI_and_investment_services.pdf).

<sup>79</sup>ESMA, Public Statement on AI and investment services (ESMA 35-335435667-5924, 30 May 2024) guideline 19 [https://www.esma.europa.eu/sites/default/files/2024-05/ESMA35-335435667-5924\\_Public\\_Statement\\_on\\_AI\\_and\\_investment\\_services.pdf](https://www.esma.europa.eu/sites/default/files/2024-05/ESMA35-335435667-5924_Public_Statement_on_AI_and_investment_services.pdf).

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making sure that suggestions and investment choices are in line with the client's financial status, investment objectives, including sustainability preferences, risk tolerance, and general expertise.<sup>80</sup>Regular stress tests are also carried out to evaluate system performance during times of high market volatility.<sup>81</sup>

- 4. Record Keeping-** ESMA expects that investment firms maintain extensive records regarding the utilisation of AI technologies and any complaints received from existing or potential clients, for verification of compliance with MiFID II requirements.<sup>82</sup>The records must accurately document the application of AI in various aspects of delivering an investment service, describing also the decision-making processes, data sources used, algorithms applied, and modifications or updates applied over time.<sup>83</sup>

#### COMPARISON BETWEEN SEBI GUIDELINES AND EU LAWS:

The existing regulatory framework in the European Union concerning AI in securities markets is much more comprehensive, binding, and prescriptive as compared to the consultative approach adopted by SEBI. The EU's AI Act (Regulation 2024/1689) provides a harmonized, risk-based legal regime, classifying AI systems into four categories: unacceptable risk, high risk, limited risk, and minimal risk.<sup>84</sup>High-risk AI systems-used in financial services, among others-are obliged to comply with strict requirements under Articles 10, 14, 15, and 72 on data quality, human oversight, technical robustness, cybersecurity, and continuous post-market monitoring.These provisions are legally binding, with serious penalties for non-compliance. To supplement these, the European Securities and Markets Authority adds sector-specific obligations under MiFID II for management-level

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<sup>80</sup>ESMA, Public Statement on AI and investment services (ESMA 35-335435667-5924, 30 May 2024) guideline 20 [https://www.esma.europa.eu/sites/default/files/2024-05/ESMA35-335435667-5924\\_Public\\_Statement\\_on\\_AI\\_and\\_investment\\_services.pdf](https://www.esma.europa.eu/sites/default/files/2024-05/ESMA35-335435667-5924_Public_Statement_on_AI_and_investment_services.pdf).

<sup>81</sup>ESMA, Public Statement on AI and investment services (ESMA 35-335435667-5924, 30 May 2024) guideline 21 [https://www.esma.europa.eu/sites/default/files/2024-05/ESMA35-335435667-5924\\_Public\\_Statement\\_on\\_AI\\_and\\_investment\\_services.pdf](https://www.esma.europa.eu/sites/default/files/2024-05/ESMA35-335435667-5924_Public_Statement_on_AI_and_investment_services.pdf).

<sup>82</sup>ESMA, Public Statement on AI and investment services (ESMA 35-335435667-5924, 30 May 2024) guideline 23 [https://www.esma.europa.eu/sites/default/files/2024-05/ESMA35-335435667-5924\\_Public\\_Statement\\_on\\_AI\\_and\\_investment\\_services.pdf](https://www.esma.europa.eu/sites/default/files/2024-05/ESMA35-335435667-5924_Public_Statement_on_AI_and_investment_services.pdf).

<sup>83</sup>ESMA, Public Statement on AI and investment services (ESMA 35-335435667-5924, 30 May 2024) guideline 24 [https://www.esma.europa.eu/sites/default/files/2024-05/ESMA35-335435667-5924\\_Public\\_Statement\\_on\\_AI\\_and\\_investment\\_services.pdf](https://www.esma.europa.eu/sites/default/files/2024-05/ESMA35-335435667-5924_Public_Statement_on_AI_and_investment_services.pdf).

<sup>84</sup> Supra (n 74).

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accountability, client best-interest duties, periodic stress testing, disclosure about the use of AI, and more detailed recordkeeping for transparency and investor protection.<sup>85</sup>

In contrast, SEBI's Guidelines are principles-based and non-binding in nature and thus focus on encouraging responsible and ethical AI use rather than imposing any statutory requirements. While SEBI's framework also covers similar pillars-model governance, fairness and bias mitigation, investor disclosure, testing, and data privacy-it lacks quantitative standards of the EU, conformity assessments, and enforcement mechanisms.<sup>86</sup> Further, explicit requirements related to stress testing, adversarial robustness, and clearly defined liability in cases of AI-induced investor harm have not been provided under SEBI's guidelines.

### RECOMMENDATIONS

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The model governance provisions are comprehensive in scope they cover lifecycle oversight, risk management, vendor controls, and audits. However, SEBI has left ambiguous how governance failures are sanctioned. In particular, the SEBI guidelines place compliance responsibility on brokers, funds and exchanges, but do not clarify financial liability or remedies if an AI system causes investor losses. Similarly, while “senior management” is held accountable, the interplay with company law remains unaddressed. SEBI might strengthen 5.1 by requiring an explicit accountability framework for example, mandating algorithmic impact assessments or charters that specify who bears losses if an AI error harms investors.

The disclosure obligations enable investor protection through illumination of the black-box AI decisions; however, their sufficiency depends upon enforcement. The format of disclosures is not specified by the guidelines, or how SEBI will verify them. Past experience has been that such vague disclosure requirements can be met superficially. There is no mention of regulatory review or penalties for misleading AI disclosures. Further, smaller market participants may find compliance burdensome in the absence of guidance.

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<sup>85</sup>Supra (n 82)

<sup>86</sup>SEBI, Consultation Paper on Guidelines for Responsible Usage of AI/ML in Indian Securities Markets(SEBI, 20 June 2025).

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SEBI's testing framework is a strong safeguard against unforeseen failures. Running models in parallel ("shadow mode") and comparing to rule-based baselines is sound. However, the guidelines have not included stress testing; for example, the guidelines do not explicitly require testing AI/ML models under extreme market shocks or simulated data attacks; therefore, stress testing must be included to ensure the reliability of the guidelines.

AI is failing in business; people are adopting it, but they are unsure how exactly to utilise it. Companies need to understand that the genAI is not well-versed in the intricacies of the business and therefore cannot skyrocket the books of account.<sup>87</sup> 95% of businesses fail. Capital markets need to understand this; sector-specific AI is required. Employees tend to favour using generic AI models, such as ChatGPT or Gemini, for their tasks, while avoiding sector-specific or custom AI models, which creates a shadow AI economy.

### CONCLUSION

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AI's integration into the securities market presents both opportunity and obligation. While jurisdictions such as the EU and the US have adopted structured, enforceable, and risk-based regimes, India's SEBI guidelines remain advisory and principle-driven. To ensure investor protection and market integrity, SEBI must transition toward a more robust, enforceable regulatory structure incorporating clear accountability, stress testing, and supervisory oversight. Harmonising India's approach with global standards will not only foster responsible innovation but also enhance investor confidence and international competitiveness. Ultimately, the responsible governance of AI in financial markets requires a balanced framework one that encourages innovation while safeguarding fairness, transparency, and systemic stability.

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<sup>87</sup>PietmanRoos, 'Reject the Doomer/Utopian Drama in AI' (2025) *ICMA Quarterly Report: FinTech and Digitalisation* <https://www.icmagroup.org/media-and-market-data/icma-quarterly-report/> accessed 8 November 2025.

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