

The Role of Artificial Intelligence in Shaping the Future of Exchanges & Clearing Houses: Opportunities, Challenges, and Regulatory Principles

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Summary

As the global industry association for exchanges and clearing houses (CCPs), we represent the providers of over 250 of market infrastructure that see more than \$124tr in trading pass through them annually (at end-2023). Our members' extensive experience with technology makes them well-placed to offer views on the development of Artificial Intelligence (AI). While the technological innovations and the associated concerns about managing generative AI are significant, it is important to remember that, as trusted third parties providing secure and regulated platforms for trading securities, our members are already carefully scrutinising tools and establishing controls to govern AI use.

In this paper we set out the industry's views on AI. Namely:

- AI has been around for a long time, but recent advances have opened new opportunities in individual productivity, operational efficiency and new product development.
- AI use cases amongst our members are numerous and varied, among these AI can help exchanges and CCPs to:
 - detect fraud,
 - undertake market surveillance,
 - facilitate trade execution,
 - manage risk,
 - optimise settlement,
 - provide customer support,
 - and enhance compliance.
- The industry is cognizant of the importance of managing specific risks attached to AI. Existing risk management techniques are being applied, where applicable, to AI and our members welcome the development of new techniques.
- Third party vendors will enable the development of AI in financial markets. The software and hardware tools used to train and serve AI models are diverse; however, there is potential for a smaller number of vendors emerging as leaders in the provision of cloud services, large language models and open-source projects.
- Our members favour principle and risk-based approaches to regulation, where requirements are proportional to the level of risk associated with AI applications. At this point, we see no need to change regulation of exchanges and CCPs in response to the growth in AI.
- Ultimately, government policy should encourage modernisation by promoting the use of cutting-edge technologies like AI, cloud computing, and machine learning in capital markets. This enhances market dynamics and provides better services to consumers.

AI is rapidly transforming industries worldwide, and the financial sector is no exception. AI has been around for a long time but the evolution of AI from basic automation to more advanced machine learning models and generative AI has opened new avenues for enhancing operational efficiency, improving market surveillance, and managing risk.

We are committed to shaping an AI regulatory framework that fosters innovation while safeguarding market integrity and investor protection. While AI offers numerous benefits, it also presents new risks. A principles-based, risk-sensitive regulatory approach that encourages innovation without stifling progress should be the goal of all regulators and governments.

1. The Value of AI for Exchanges and CCPs

A. Market Efficiency and Productivity Gains

AI brings valuable contributions in various ways. First, it can identify intricate patterns within data that humans might overlook, aiding in accurately identifying and mimicking behaviours more accurately. Second, AI's ability to handle repetitive tasks can outpace human capabilities, boosting overall efficiency. Furthermore, AI systems ensure consistent task performance without succumbing to fatigue or distractions ensuring reliable results over time. Additionally, AI's ability to manage large datasets without demanding excessive human capital highlights its scalability and resourcefulness, further enriching its value.

Our members generally see AI use cases in three broad categories:

1. Individual productivity – tools designed to improve the output of individual employees. Examples could include using generative AI to help develop code, virtual assistants to help staff or automated data entry.
2. Operational efficiency – tools designed to improve the efficiency of the overall operation of exchanges and CCPs. Examples include predictive tools to identify hardware that requires maintenance, automation of repetitive processes or fraud detection and prevention.
3. New product developments – these would be products and services that an exchange or CCP could offer to market participants or the broader market. Examples could include market data offerings and regulatory compliance solutions.

B. Use Cases of AI in Exchanges and CCPs

AI offers significant potential for enhancing various functions of exchanges. One of the most promising applications is to significantly streamline the **process of listing for issuers**. AI can automate and simplify the preparation of listing documentation by ensuring compliance with complex regulatory requirements for issuers. AI tools could also assist issuers in accurately pricing their initial offerings, identifying market demand, and optimising timing for their listings. Reducing administrative burdens and helping timings to market can encourage new listings.

A further area of interest lies in **advanced risk management**. CCPs could leverage AI-powered predictive models to assess and manage risk in real-time, a capability that would transform the way data is analysed and acted upon. These models could potentially process vast amounts of data from various sources to detect early warning signs of market instability, helping to prevent disruptions and react to volatility.

Market surveillance is another area where AI can significantly improve operations. By continuously monitoring trading activity, AI systems can theoretically detect irregular patterns, flagging potential market manipulation or suspicious behaviours that might otherwise go unnoticed. This continuous oversight could enhance compliance with regulatory standards and contribute to maintaining market integrity. Although many of these AI surveillance tools are still being refined, their future application could significantly bolster exchanges' ability to detect fraudulent activities such as insider trading.

AI's application in **fraud detection and financial crime prevention** also holds substantial promise. Exchanges and clearinghouses are exploring using AI to strengthen anti-money laundering (AML) efforts and meet know-your-customer (KYC) protocols. With AI, exchanges could move to real-time fraud detection, reducing financial crime and improving compliance.

Finally, AI could be used to optimise **trade execution and settlement** processes. AI-driven algorithms have the potential to analyse market conditions and execute trades faster and more efficiently than traditional methods. This could improve liquidity, reduce latency, and lead to more efficient markets.

AI use cases in financial markets naturally support key regulatory and governmental priorities, such as enhancing market stability and operational efficiency. Through improved risk management, fraud detection, and market surveillance, AI strengthens exchanges' ability to meet regulatory standards while promoting transparency. At the same time, AI facilitates innovation by helping exchanges introduce new products and optimise processes, aligning with broader goals of fostering a competitive and resilient financial ecosystem.

2. Risks Related to AI

While AI brings numerous benefits to financial services, the exchange and CCP industry is cognizant of the importance of managing potential risks, ensuring that AI applications align with ethical and regulatory standards, and establishing a foundation for the responsible use of AI in the financial sector. Exchanges and CCPs are valued trusted parties operating under stringent regulatory frameworks. The current, principles-based regulatory framework subjects these institutions to extensive oversight, particularly in the areas of risk and resilience management.

A. Bias

AI systems can perpetuate biases present in the data on which they are trained or give erroneous results due to data quality or data context issues. Further, AI systems can present latent risks. Without proper controls, AI systems can amplify, perpetuate, or exacerbate inequitable or undesirable outcomes for individuals or communities. A very specific risk to AI is drift where a model's performance deteriorates over time due to changes in the underlying data or environment it was trained to predict or interpret. With proper controls, AI systems can mitigate and manage inequitable outcomes. This bias when combined with a misunderstanding of the AI system context could lead to unintended biases to the AI system output. Lastly, bias risk may be latent at a given point in time and may increase as the AI system adapts and evolves. These biases could be the result of incomplete training data or significant and unexpected data changes.

B. Explainability and Transparency

When using models, AI or otherwise, financial institutions must be able to provide transparency and explainability for the model outputs. However, for models that are provided by a third party, the

ability to provide the required transparency and explainability could be challenging. Data quality and data context are highly important for the success of any model. The failure of either of these elements may cause the model to behave in an unexpected or unanticipated manner. Context matters. The inability to understand the data context may cause the user to believe that the results of the model can be used in all contexts. Therefore, financial institutions must have the ability to understand how data quality is being maintained and the context for which the AI model can be used. Lastly, the use of a third party for the model and computational power can be further complicated if the third-party claims that the model is proprietary or is the third party's intellectual property. These claims could prevent financial institutions from obtaining the transparency needed to explain the model's results.

However, many traditional AI models are based on a set of predefined rules so they are more transparent and interpretable. These older, more classical machine learning models use decision trees, linear regression and support vector machines that are more interpretable than complex deep learning models.

C. Cybersecurity, Market Manipulation and Fraud

In the cyber-security world, AI will be an asset for both the "good guys" and the "bad guys." The financial services industry has already witnessed how deep fakes can be used to trick unwitting employees to erroneously send payments. In addition, generative AI and Large Language Models (LLMs) allow for better phishing emails to increase the impact and success of these attacks. Meanwhile, phishing attacks continue to be a primary method for threat actors to gain initial access to a financial institution's systems.

To counter malicious actors, AI is currently being used by cyber professionals primarily through their use of cyber vendors. AI/ML is used by advanced intrusion detection systems to not only detect known malicious activity but also to identify variants of this activity and disrupt these attacks. Similarly, AI is used by network monitoring tools to identify changes in network traffic behaviour that may, for example, signal an intrusion looking for new hosts. Given that numerous malware strains attempt to do similar actions to gain access to the underlying operating system and the growing number of clients using advanced intrusion detection systems, the ability of these vendors to provide holistic protection across its customer base is greatly benefited by AI technology and the financial institutions that utilise that technology.

AI is also one of the most effective tools for combating fraud. As previously mentioned, AI excels when analysing large, representative datasets. Utilising AI to detect and prevent fraud is likely the most effective way to counteract malfeasance by bad actors. AI can scrutinise extensive databases of financial transactions to pinpoint unusual and anomalous activities that may suggest fraudulent trading or other nefarious actions.

This helps demonstrate the earlier point on the definition and scope of this exercise. An overly broad definition of AI could hamper exchanges' ability to utilise AI tools to prevent malicious activity if it leads to excessive regulatory burden.

3. Risk Management of AI

Financial institutions are currently effectively using existing risk management frameworks to manage AI risks. In many ways some AI risks are similar to more traditional risk. For example, discrimination

and bias in decision-making by humans are longstanding risks across all business sectors. Nevertheless, due to its capabilities, AI may amplify these risks if the training data is biased, or the opacity of the AI system prevents explainability and accountability.

Furthermore, some of the concerns around explainability are mistaken. Many traditional AI models are based on a set of predefined rules, so they are transparent and interpretable. These older, more classical machine learning models use decision trees, linear regression and support vector machines that are more interpretable than complex deep learning models. Although, it is worth noting the trend towards develop of more complex deep learning models over more traditional models.

Emerging standards, such as NIST's AI Risk Management Framework, have recently been introduced to provide pillars for the comprehensive management of AI risks. As AI continues to develop, existing frameworks, including the NIST AI Risk Management Framework, should be refined and updated, as necessary to capture emerging risk management techniques.

4. Third Parties

Third parties and vendors bring great value to financial services and will likely play an important role in the development of AI technologies within financial markets. Through third parties, exchanges and CCPs will gain access to specialised expertise in AI. Vendors can also provide cost efficiencies for exchanges and CCPs by removing the need for in-house development.

AI vendors also allow firms to scale their operations up or down more flexibly. Services can expand or contract, based upon demand, thus alleviating some pressure on major investment in infrastructure. Similarly, AI vendors could help improve the speed to market of new products or services that exchanges or CCPs develop for the betterment of the overall market. Ultimately, AI vendors can allow exchanges and CCPs to focus on their core competencies, while still developing use cases for this emerging technology.

Whilst there are many benefits to using third parties to develop AI tools there are some risks too. But these risks, like data confidentiality, third party reliance, and concentration risk, are not new and exist in many other contexts where exchanges and CCPs rely on third party vendors. Exchanges and CCPs have developed a variety of methods to effectively manage these risks. Regulators, likewise, have existing frameworks to adequately supervise, and where necessary, hold exchanges and CCP accountable for any failures to meet relevant regulatory requirements.

5. AI and Principles-Based Regulation

At this point, we see no need to change regulation of exchanges and CCPs in response to the growth in AI. AI has attracted a lot of attention from governments and regulators who fear that it needs to be more tightly controlled or regulated but AI does not alter the fundamental principles that underpin regulatory frameworks in financial markets. The core objectives of market integrity, investor protection and financial stability remain unchanged, regardless of the technology used. AI-driven systems should be held to the same regulatory standards as existing tools, with a focus on outcomes and accountability rather than the specific technology. This ensures that AI applications enhance efficiency and innovation without compromising the foundational goals of financial regulation, allowing AI to fit seamlessly within the current regulatory landscape

Defining AI will have real implications for its trajectory and utility in financial markets. Therefore, the definition must be intentionally crafted to recognise both current and potential technologies in use. It should be precisely tailored to avoid including more than necessary. An overly broad definition could create unnecessary complexity by imposing extensive compliance obligations.

Principles-based regulation is essential for maintaining flexibility and encouraging innovation. Instead of rigid, prescriptive rules, this approach focuses on achieving desired outcomes, giving organisations the freedom to determine the best methods to meet these standards. Principles enshrined in law and regulatory rules remain valid regardless of the technology used.

Secondly, an **incremental approach** to AI regulation would be desirable. This method allows for gradual adjustments and learning, ensuring that regulations do not hinder technological progress. By evolving alongside AI advancements, the regulatory framework can remain relevant and effective.

Regulators should also apply a **risks-based approach** to regulating AI. This means that requirements should be proportional to the level of risk associated with AI applications. The risk associated with an AI application capable of generative outputs, allowing it significant freedom in decision-making, exceeds that of an AI system constrained to a limited dataset and narrow range of actions. Consequently, these systems should not be seen as identical by regulatory assessments. This approach mirrors that of the National Institute of Standards and Technology (NIST) in crafting its AI Risk Management Framework.

Regulators should also collaborate at an international level. By leveraging existing frameworks and aligning with international standards, regulators can create a cohesive and effective oversight environment. Global standards alignment will facilitate easier compliance for multinational companies and foster international trust and collaboration.

Finally, government policy should encourage modernisation by promoting the use of cutting-edge technologies like AI, cloud computing, and machine learning in capital markets. Additionally, policies should support skills development and professional standards in AI, ensuring that the workforce is prepared to manage and innovate within the evolving technological landscape.

By integrating these principles, the AI regulatory framework can achieve a balance between ensuring robust oversight and fostering innovation. This approach not only protects public interest and safety but also encourages the growth and beneficial application of AI technologies across various industries.

Background

Established in 1961, the WFE is the global industry association for exchanges and clearing houses. Headquartered in London, it represents the providers of over 250 pieces of market infrastructure, including standalone CCPs that are not part of exchange groups. Of our members, 36% are in Asia Pacific, 43% in EMEA and 21% in the Americas. The WFE's 87 member CCPs and clearing services collectively ensure that risk takers post some \$1.3 trillion (equivalent) of resources to back their positions, in the form of initial margin and default fund requirements. The exchanges covered by WFE data are home to over 55,000 listed companies, and the market capitalization of these entities is over \$111tr; around \$124tr in trading annually passes through WFE members (at end-2023).

The WFE is the definitive source for exchange-traded statistics and publishes over 350 market data indicators. Its free statistics database stretches back more than 40 years and provides information and insight into developments on global exchanges. The WFE works with standard-setters, policy makers, regulators and government organisations around the world to support and promote the development of fair, transparent, stable and efficient markets. The WFE shares regulatory authorities' goals of ensuring the safety and soundness of the global financial system.

With extensive experience of developing and enforcing high standards of conduct, the WFE and its members support an orderly, secure, fair and transparent environment for investors; for companies that raise capital; and for all who deal with financial risk. We seek outcomes that maximise the common good, consumer confidence and economic growth. And we engage with policy makers and regulators in an open, collaborative way, reflecting the central, public role that exchanges and CCPs play in a globally integrated financial system.

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