THE GROWING ROLE OF AI IN TRADING AND STOCK MARKET DEMOCRATIZATION

Abstract

AI-based capital market solutions are transforming the industry. The increasing adoption of AI in global capital markets offers several data-driven opportunities for trading firms, enabling them to improve market forecasts, predictions, and pricing at a rapid pace. Innovations with AI can drive higher volumes, alter the market structure and dynamics, and introduce new risks. A balanced and flexible approach, combining human oversight with stronger regulations to protect stakeholders while enabling AI-driven innovations, will foster growth in the financial sector.

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The constant change and churn in global capital markets and stock trading demands real-time monitoring and highly responsive systems. Financial institutions (FIs) are harnessing Artificial intelligence (AI) and generative AI (Gen AI) across the breadth and depth of services to boost liquidity, improve risk management, and efficiency. While quantitative trading strategies have been in play for a long time, they use pre-defined statistical and mathematical models, rules and algorithms, rely on structured data, and have limited adaptability. Traders need to optimise these models to improve performance. AI-driven trading systems use deep learning, neural networks and reinforcement learning to analyse both structured and unstructured repositories. They can recognise patterns and detect complex non-linear relationships, and continuously learn and improve based on market conditions.

AI adoption in trading has increased over the past few years. This is evident from the upsurge in patent filing in algorithmic and high frequency trading. AI is increasingly a large component of algorithmic and high frequency trading patents — from 19% in 2017 to over 50% in 2020 and beyond. AI-based trading systems, capable of processing vast amounts of data and adapting dynamically, are set to revolutionise the stock market.


AI is powering capital markets

The use of AI-based applications is not new to the financial world. AI technology has been adopted by financial institutions as it evolved— with applications incorporating leading-edge technologies such as deep learning (DL), machine language (ML), natural language processing (NLP), data mining, statistical models and large language models (LLM) to generate accurate results. Predictive analytics leverage ML, data mining, deep learning and statistical models to forecast market volatility and stock price movements. NLP-based applications can garner intelligent information from unstructured data such as news articles and online forums to understand market sentiment. ML and DL algorithms are used for complex and sophisticated financial analysis to identify patterns and trends, and improve accuracy of predictions. LLM-based applications can quickly analyse complex documents and news articles, speeding up initial market reactions, and influencing pricing.

AI-driven trading programs bring in automation and data-driven decision making, eliminating human bias. With AI, stock market traders see a huge boost to efficiency, and now have the opportunity to analyse vast amounts of data across multiple sources, which was otherwise not possible. These systems can work globally 24x7, allowing traders to derive maximum benefit. AI-based risk management in capital markets warns against sudden market movements, and can guard against volatility.

The influence of AI on global capital markets
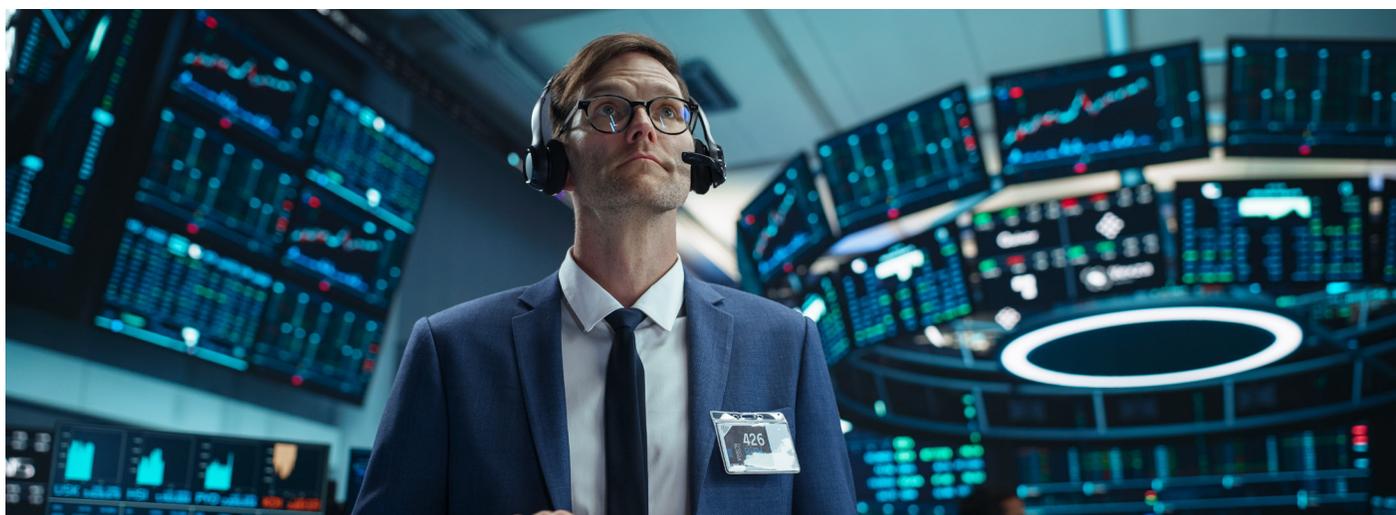
AI in finance was estimated at USD 38.36 billion in 2024. It is expected to have an exponential growth to USD 190.33 billion by 2030, at a compound annual growth rate (CAGR) of 30.6% between 2024 and 2030. According to surveys conducted by the International Monetary Fund (IMF), more than 50% of investment bankers indicate readiness for the use of Gen AI

AI is also expected to impact the market structure and dynamics. Non banking financial institutions (NBFIs) are already prevalent, and hold more than 50% of financial assets globally. Unlike traditional banks which come with legacy applications and infrastructure, NBFIs are agile, less bound by regulations, and can easily adopt AI. These factors could accelerate the shift toward nonbanks, proprietary trading firms, and hedge funds, making financial markets

for financial systems. Innovations in AI are likely to have far-reaching implications for global capital markets.

AI-driven trading applications have the ability to process large volumes of new information at a rapid pace. Frequent and large portfolio adjustments can lead to higher trading volumes. AI-driven exchange-traded funds (ETFs) have as

more challenging to monitor and less transparent.

Algorithmic trading has already transformed financial markets, and also powered NBFIs. Sophisticated AI algorithms, and the ability to analyse large volumes of data in shorter spans of time will enable automated trading decisions. Algorithmic trading has a largely positive influence on market stability. Gen AI has the potential to broaden access to algorithmic trading, making it more

much as 11.6 times higher turnover as compared to other active ETFs. A typical actively managed equity ETF adjusts its portfolio less than once a year, whereas AI-driven ETFs do so approximately once a month. While market liquidity would increase if this is on the rise, the higher volume can also lead to increased market instability.

inclusive and extending its reach across a wider range of assets, geographic regions, and global markets. This may have an impact on market volatility in the short-term. However, AI-driven algorithmic trading strategies can be programmed to "switch off" during periods of high volatility. AI can also improve market access, boost liquidity, and increase efficiency in market segments, including emerging markets.

Adopting AI: risks and mitigation strategies

The widespread adoption of AI can contribute to several risk factors. AI enhances the interconnectedness of capital markets, which can contribute to the spread of stress and financial spillovers. As markets adopt AI, it can also lead to potential herding and market concentration, especially if trading and investment strategies were to be trained

on similar data sets from the same vendors. The limited number of AI models and data providers could potentially result in vendor concentration, and possible major disruptions in case of any systemic outages. Deepfakes and misinformation can easily manipulate markets. Fast-paced decision making can cause flash crashes, and market volatility that can

lower liquidity. As with all other industries, cybersecurity is a major concern. Cyber attacks on financial firms and market utilities, data manipulation, and theft can lead to large-scale outages. Model hallucinations can lead to lowering of trust.

However, the opportunities provided by AI and Gen AI technologies are set to transform global capital markets. Consumers and businesses would look towards regulatory authorities to establish guidelines for model management, stress testing, cybersecurity, and transparency. Industry-specific regulations that extend to NBFIs would help establish market stability. Specific guidelines are required for consumer applications, which will require a balance between AI usage and consumer protection. At the same time, regulations and guidelines need to be flexible enough, given that the usage of AI is continuously evolving in the financial sector.

The progressive adoption of AI in capital markets will require international standard setting bodies, governments and institutions to extend technology-related regulations to cover AI systems. Even though AI systems can be autonomous, given the critical nature of the financial sector, a human-in-the-loop needs to be an essential component of any AI solution. Cyber resilience, risk mapping, and strengthening of measures to address market volatility will allow for safe AI adoption. New volatility mechanisms may be required to address flash crashes. Authorities and governments need to

partner with industry to ensure that nonbank financial intermediaries are bound by regulations, requiring them to identify themselves and specify AI-related information. Given the far reaching impact of AI in the financial sector, a balanced and flexible approach is required, so that the sector can reap the benefits, while mitigating risks.

Ensuring human oversight, reinforcing regulations and guidelines, and closely monitoring AI adoption will support a secure transformation of capital markets.

How can Infosys BPM help?

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