



Artificial Intelligence: Challenges for Stock Market Trading

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Introduction:

Artificial intelligence is newly added bread for wisdom and karma among Generation Z. In current scenario, it is very difficult to find the area of knowledge where AI is not reached. With enormous deposition of data and information regarding karma of large no of entities, Artificial intelligence provides outstanding wisdom even if without emotion IQ. Story is not end with the giving Knowledge and information. It is giving the prediction power and direction to act with in the black box. Is it mean that all wisdom has been accumulated at computer machine without emotional space? And what about Karma? In philosophy 'Wisdom is the ability to use knowledge and experience with ethical understanding to make judgement'. Karma plays a role to take action under control of the wisdom. "AI is the first technology in history that can make decisions and generate new ideas. if many AI systems interact without sufficient oversight, markets may become harder for humans to understand or control." (Yuval Noah Harari).

Artificial intelligence has entered in financial market with loud noise and euphoria. As Far as financial market concern wisdom is ability to take conscious decision to invest in market or something more than this. Karma is to act in financial market in the role of market participants according financial wisdom. This approach

decides the direction of the investment in financial market. AI has become the transformative technology in finance (Milana and Ashta). prior to machine intelligence; investment sentiment can be decided as per the mindset bias of the large investment groups. In latter stage machine intelligence is pushing the sentiment away from financial market. 'Sudden liquidity withdrawal as one of the major risks associated with AI-driven algorithmic trading' (IMF 2024). 'Maintaining financial stability is an important pillar of AI safety, as any disruption or instability in the financial system can have far-reaching consequences, affecting individuals, businesses and entire nations' (Report on AI in finance. BIS 2024).

This paper is exploring the world of artificial intelligence in perspective of Stock market investment and respective decisions. More specifically, this study has emphasis the wisdom of AI for taking investment decision. Whether it gives conscious judgement or mare hallucination? Here is an attempt to put critical thinking on the AI technology in financial market. This study not ignoring the positive economies or resilience created by AI in the financial market. this paper is a mare attempt to through critical approach on ability of artificial intelligence in order to take concise and ethical judgement with respect to investment in financial market.

Literature Review:

Artificial intelligence might be new for world but concept of Artificial intelligence come on table in mid of twentieth century. Many research tried to predict the future of AI driven world but since last decade practical use of AI in stock market or another sector is giving more clearer picture for stakeholders about AI. Patel, J., Shah, S., Thakkar, P., & Kotecha, K. (2015). Suggested hybrid method for understand the nonlinear nature of the stock market price movements. By using machine learning technique, they accepted two stage fusion approach to proposed alternative to traditional method of price forecast. Gu, S., Kelly, B., & Xiu, D. (2020), have work on various Models in AI; neural network and tree-based models are more powerful than the tradition econometrics approach on understanding the non-linear nature of the stock market. Study Suggested that machine learning substantially enhance asset prices and return prediction. It concluded that, machine learning is a complement to traditional financial theories, not replacement. Fischer, T., & Krauss, C. (2018) examined the Long-Short term memory networks for predicting financial market movements in US stock market. It enhances LSTM can capture complex temporal dependency in financial market.

Above researches has supported best use of AI model in financial market, but also highlighted that these models are not the replace of trading financial theories. Cao, L. (2023) warned that generative AI can give misinformation or AI hallucinations. That may lead to poor investment decision. Kirilenko, A., et al. (2017) AI powered stock trading models with generative AI model reacts simultaneously to bad news with short period of time. This impulsive action by the market participants AI models may increase the volatility in market. here probability of flash crash cannot be denied.

This paper is small attempt to highlight the challenges for using Artificial inelegance in stock market. Generative AI gives prediction power to machine by learning from the past experience of the model feeders or trainers. Action with the beat cerates impulse, lead to big movement in short time spam and volatility in market increase. Volatile market generates the negative return for investor and deteriorates value for the financial assets. Long term impact of the of volatility on financial market may be devastating.

Financial market is vulnerable to the technological shifts. It has since in 1987 as computerised trading had started in stock market. Big bubble has been created in market and ended with big crash. Some sort of impacts also seen in beginning of the 1990's as internet started to enter in the financial market. again in 2000 Dot com bubble and its fear keeps financial market under pressure. After the subprime crise the financial market has ride on the economic cycle but New born baby, Artificial intelligence started acquiring its significant position in market. High expectation from AI is leads biased and poor decision making by investor. Investors are looking at the single side of the coin. Currently Financial market is ride on herd behaviour of investor. They are impressed with the predicative approach of artificial inelegance enhance their return on the assets. But other site of the coin is being brush aside.

Challenges for Artificial intelligence:

Financial market dealing with high trading volume on single platform. These platforms are computerized and AI driven. Large number of traders and market participants increases their dependence on artificial intelligence due speed and cost-effective characteristics of AI. Over reliance on machine learning model with speed and impulsive trading

ignores the financial basics and financial theories. Continuous oversight for this problem is creating financial bubble in market. Hence this paper discusses some challenges for use Artificial intelligence in financial market trading.

Overfitting Models:

AI works as per training dataset. Historical performance of the market is the training material in machine learning model. Reinforcement learning tries to go to closure of the results. Sometime these result's quality is poor due to overfitting of the models. In case of generative AI models, Continuous reaction on both side keeps actual path away from the result. If More accuracy by self-control could not stopped at smallest infinity side, then simple impulse of wrong decision creates persistency in decision making. One wrong decision may give born to new wrong decisions and problem gets bigger. That what machine has learned from past experience. One can see theses overfitting problem of econometrics. No of events at same time in past or different results on same time on same problem in long term memory of AI may push the model overfit.

Black Box Decision:

Deep learning model are more complex than the linear model. These models have adoptive capacity for nonlinear trend in time series. Deep learning model has more intelligence but within the boundaries of past training dataset. These models research every problem thoroughly and provide deep analysis. It has its own limitation of training data base. Set of decided rules and past experience become black box for these models. Decision with boundaries of the rule cannot capture the sentiment of the market. It may follow herd behaviour and create bubble in financial asset pricing. But concise investment

decision with model needs emotional involvement in it (if possible).

Quality of Data:

Most of the models tend to learn from the past training. Data set used in training is playing significant part in future decision making. Biased training data set only generates biased prediction or results. These results cannot be reliable. To improve the quality of data AI models may adopt the reinforcement learning model, still more positive decision making may brush significant problem aside. Habit of AI to continuous learning from the large long-term memory and store the current result as experience in memory ignores genuine problems of the price valuation in financial market.

AI Hallucinations:

Generative AI may fabricate the output if proper inputs not provided. Insufficient command for generating the result may also give false presentation of data. Reliability of dataset as trainer is a crucial part here. Data hallucination is nothing but inappropriate results. Ambiguous and poorly worded prompt may result in AI hallucinations. Misinterpretation of result may also cause for AI hallucination. Speculative trading in financial market and fabricated news about market impacts the AI result significantly.

Flash Crash:

Artificial intelligence is well trained machine that get activated as and when find the positive returns in the market. whenever market moves in either direction AI model will work efficiently. All AI models may precisely be tested; only at sideways market, where taking decision becomes difficult due to uncertain past results. If any case at indecisive point all automated AI model may stop taking decision and stay unmoved, that dried down the liquidity from

market platform. Story not only ends here; spiral effect of dried down liquidity may nose down the market deeper. other way round as discussed above, if AI model of reinforcement learning giving the response to each result, one speculative move by the market participants and impulsive reaction of the model may create sudden spikes to market. This will trigger all important positions of the traders. Cumulative response from the reinforcement models on the beat may ends with Flash Crash.

Cyber Security Risk:

All AI model vulnerable to the cyber-attacks. These attacks included data manipulation, model manipulation or adverse input etc. Financial market not symmetric as far as adverse news is concern. It reacts more faster to negative news compare to positive data. Cyber-attack like Hacking of trading platform cannot deny as computers started working autonomously. Cyber security risk can compromise trading decision and market integrity. Cyber security is one of the biggest challenges for Artificial intelligence.

Ethics:

Biggest question since staring of the stock trading is whether trading decision of market participants are ethical or not? Regulator of financial market has to face this challenge as when technology shifts. Ability of AI model to filter out the genuine treading orders from overall order book to be tested here. Spoofing, layering, Quote stuffing etc, these are some bugs that can accompany to artificial intelligence. Biggest challenge for AI models is incorporating ethical values in financial market trading. What extend the adoptability of ethics in profit making activity like stock market trading; it is still a question in front of Artificial intelligence models.

Conclusion:

Artificial intelligence is transforming the financial system in new market structure with more involvement of machine of computers. This new market structure cannot replace human emotions with machine intelligence. Rather AI model has long way to enhance its place as entity to think independently. AI technology has many challenges to face off. Some of these has been discussed here. Large unexpected events in the financial market have not experienced by the AI models. Hence AI may reliable up to some extend; but total reliance on technology without human interference devastate market.

Use of AI models in trading increase the systematic risk to the market. correlated responses can amplify the market volatility or stress. This is the risk of financial contagion in crisis situation. Stakeholders of AI has to take into account all the risk associated with use of AI instead of creating mere euphoria. History has experienced; that mare euphoria has skyrocketed the asset prices and created big pricing bubble for time being. Handling this bubble is biggest challenge to regulator, investor or other stakeholders.

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