Impact of AI on Equity Markets

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INTRODUCTION

"AI has the power to revolutionize financial services and change how clients get services." - Analytics India Magazine. One of the key factors which has impacted the equity markets is AI helps with prediction and thus a lot of decision making gets easier as well as the risk associated is not entirely based on human judgement but also backed by statistics.
This paper analyses the impact of Artificial Intelligence (AI) on equity markets. This research consists of secondary data.
In our secondary research we also found out the term "artificial intelligence" (AI) has become a promising technology for the equity market in recent years. The potential of AI to process large quantities of data to find patterns has resulted in its use in decision-making and trading in equity markets. However, there are also worries about how AI will affect equity market stability and fairness. This study seeks to examine the effects of AI on equity markets and identify its potential benefits and risks.

LITERATURE REVIEW

Longbing Cao (2020), stated in the research paper entitled as "Artificial intelligence (AI) in Finance: A Review" the current boom in Intelligence in the financial industry is proof of the significant developments and opportunities that AI offers for a more intelligent society, economy, and financial system. In Artificial intelligence (AI), data science, economics, finance, and other important research areas and industrial domains, smart Finance powered by AI has emerged as a hot and crucial subject. Modern and alternative economic-financial mechanisms, goods, models, services, systems, and applications are becoming more customised, sophisticated, better, safer, and more recent because of Artificial intelligence (AI). (Cao, 2020)

Carlo Milana and Arvind Ashta "Artificial intelligence techniques in finance and financial markets: A survey of the literature" With the increasing growth of artificial intelligence (AI) and computer their influence over banks and other financial entities, especially academic and non-academic research is changing. The recent disease spikes, followed by the financial crisis restrictions on economic growth, have added new difficulties for technology connected to AI. The publications under consideration have raised hopes for improved output, new information, advisory and management services, risk mitigation, and certain unsolved challenges pertaining to negative consequences on long-term sustainability and increased economic welfare. (Carlo Milana, 2021)

Dr. Neha Jain, Dr. Swarup Kumar Panda, Dr. Uma Durgude and Ramya K R (2023) “Role of Artificial Intelligence in effective operations of Financial Technology: An Empirical Study” Artificial intelligence's capabilities are revolutionizing the company's operations by giving them access to more efficient risk and fraud management procedures for improved product offers. Through this lens, we'll also discuss how they're being utilised more frequently and how that's altering clients' experiences. The findings of this study will undoubtedly help everyone gain access to more information so they can better address their customers' and consumers' requirements in this global financial system. This technology, which incorporates a few different technologies, is taken into consideration while identifying market improvements and keeping an eye on crucial issues. Applications of artificial intelligence are developing every day to ensure that those with low incomes, those from disadvantaged backgrounds, women, and young people may participate in the mainstream financial system. (Dr. Neha Jain, 2023)

Sudhir Allam, (2016) "The impact of Artificial Intelligence on Innovation - An Exploratory Analysis” Artificial intelligence (AI) guides creative activities while transforming businesses. AI may drive firms to fundamentally rethink their innovation processes due to the quick development of technology and the reallocation of human resources. The general population believes that artificial intelligence (AI) has endless potential. New, more effective business models as well as effective public sector and service delivery will be supported by AI. The goal of this study was to investigate how AI is affecting innovation and what that means for the US economy. According to global research of 203 managers, organisations in the health and life sciences, industrial, retailing, and finance sectors are engaged in testing water, notably in the United States. (Allam, 2021)

Ashutosh Kolte, Jewel Kumar Roy, László Vasa stated in the research paper entitled as “The impact of unpredictable resource prices and equity volatility in advanced and emerging economies: An econometric and machine learning approach” This study investigates the links between market volatility in industrialised and emerging nations between the years 2000 and 2020. Only the European Union, the Pacific, South America, Latin America, East Asia, West Asia, and South Asia are included in this analysis. This study demonstrates a gap in equity return uncertainty for capital markets. The findings of this study have significant implications for investors wanting to diversify their portfolios. (Ashutosh Kolte, 2022)

Xiaomin Mou, (2019) “Artificial Intelligence: Investment Trends and Selected Industry Uses” both developed and developing nations are developing more business uses for AI, which is accelerating the rush to finance, develop, and acquire AI technology and start-ups. AI may accelerate economic growth in both developed and emerging economies. Power transmission in the energy sector can be improved using AI. It could enhance classroom conditions, learning results, and student readiness for the move from school to the workplace. AI in manufacturing might improve predictive maintenance and help develop more useful, high-quality, and reasonably priced goods. Those without access to credit or financial services can benefit from AI. AI can drastically impact logistics and other industries outside of automation and road safety. (Mou, 2019)

SotirisP. Chatzis, Vassilis Siakoulis, Anastasios Petropoulos, Evangelos Stavroulaki, Nikos Vlachogiannakis stated in the research paper entitled as “Forecasting stock market crisis events using deep and statistical machine learning techniques.” this study examines the process of stock market transmission. from the bond and currency market. The developed approach combines a variety of machine learning algorithms with daily stock, bond, and currency data from 39 countries, spanning a wide spectrum of economies. In particular, the paper uses advantages of several methods, such as Classification Trees, SVMs, Random Forests, neural networks, deep neural networks, and extreme gradient boosting. Returns and volatility, the two main linkages via which financial contagion might begin, are covered by the independent variables that make up the data. This paper uses a variety of machine learning methods to choose the most pertinent variables from a wide pool of suggested variables. Lastly, to correct the unbalanced character of the available fitting dataset, the

authors used bootstrap sampling. This paper's experimental findings offer compelling proof that stock market crises frequently display endurance. This study provides strong evidence for the interconnectedness and cross-contagion effects between the stock, bond, and currency markets. The research concluded by showing how the application of Deep Neural Networks significantly increases classification accuracy and offers a trustworthy way for creating a global systemic early warning tool that is more effective and risk-sensitive than those that are presently in place. These instruments might be used by central banks to make early changes to their monetary policy in order to ensure financial stability. (SotirisP. Chatzis, 2018)

Coralie Jaunin and Philippe van der Beck,(2021) "The Equity Market Implications of the Retail Investment Boom" Using a structural model, we compute institutional and retail demand curves and derive conclusions about how market clearing might affect aggregate price. Since institutional demand is inelastic, stock prices may be greatly impacted by Robinhood traders. Robinhood traders in the second quarter of 2020 oversee 10% of the cross-sectional volatility in stock performance while having a meagre 0.2% market share. Also, the total market value of the equities in the quintile with the smallest size would have been25% less without the spike in retail trading activity. (Beck, 2021)

Indranil Ghosh, Manas K. Sanyal stated in the research paper entitled as "Introspecting predictability of market fear in Indian context during COVID-19 pandemic: An integrated approach of applied predictive modelling and explainable AI" this study talks about Frequent lockdowns, curfews, emergencies, and other mayhem have fuelled the high degree of erratic movement in the equities markets and led to bewildered investor behaviour. Therefore, determining market fear predictability at such a crucial time is of the biggest practical relevance. Market apprehension may be measured using past and implied volatility in the equity market. This study accounts for implied and historical volatility for the present COVID-19 period using the 20-day rolling standard deviation of NIFTY returns and the India VIX, respectively. Significant features have been chosen using the supervised Boruta feature selection process. The level of predictability of the assets is then carefully evaluated using state-of-the-art machine learning and deep learning algorithms like Gradient Boosting (GB), Extra Tree Regression (ERT), Deep Neural Network (DNN), and Long Short-Term Memory Network (LSTM), which are all based on the processed feature set. Numerous numerical and statistical tests have been run on the integrated prediction frameworks to derive findings. Frameworks for Explainable AI are also used to investigate the nature and effect of various factors. The results do indicate that, despite having highly volatile characteristics, it is possible to predict historical volatility and India VIX with accuracy. using the suggested designs and provide useful, practical information. (Indranil Ghosh, 2021)

Toan Luu Duc Huynh, Erik Hille, Muhammad Ali Nasir stated in the research paper entitled as "Diversification in the age of the 4th industrial revolution: "The role of artificial intelligence, green bonds and cryptocurrencies" analysed the volatility connectedness and first, according to our study, portfolios composed of these assets exhibit substantial tail dependency, which raises the possibility of sizable joint losses during economic turbulence. Second, even while volatility transmission is smaller over time, it is greater in the near term, indicating that short-term shocks could make an asset more volatile. The volatility of the past has an influence on Bitcoin, as it does with green bonds and NASDAQ AI, and both Bitcoin and gold are crucial assets for hedging. Due to its low show transmission to the NASDAQ AL of just roughly 1.41%, gold may act as a safe haven during economic downturns. Last but not least, the portfolio has an inherent risk that all financial assets may need to be sold off due to their extraordinary importance. The generic equality indexes and the NASDAQ AI are poor hedging mechanisms for one and another. (Gonçalves, 2022)

Imlak Shaikh (2020) stated in the research paper entitled as Impact of COVID-19 pandemic disease outbreak on the global equity markets" according to behavioural finance research, "investor mood" influences investment decisions, which can subsequently affect how much certain asset classes are priced. This study examines the 12 major equity markets' returns and volatility behaviour in light of the COVID-19 pandemic illness outbreak. Empirical studies show that the number of new fatalities and incidents related to COVID-19

that are published every day has upset investor sentiment globally and resulted in the market having an unheard-of negative return. The heightened probability of emergent pandemic crises, which has been more prominent during the first quarter of 2020, is taken into account when measuring market connectivity and volatility spillover. Moreover, the volatility index has reached its highest level since the global financial crisis. (Shaikh, 2021)

Jean-Jacques Ohana, Steve Ohana, Eric Benhamou, David Saltiel, Beatrice Guez stated in the research paper entitled as "Explainable Al Models of Stock Crashes: A Machine- Learning Explanation of the Covid March 2020 Equity Meltdown" Using a collection of 150 technical, fundamental, and macroeconomic factors, we investigate the gradient boosting decision tree (GBDT) approach to predict significant decreases in the S&P 500 price. On the pricing of S&P 500 futures, we discover that GBDT outperforms conventional machine learning (ML) techniques. We demonstrate that maintaining fewer, well-chosen features is beneficial for all machine learning strategies. Shapley values from game theory have lately been used in machine learning. The fundamental elements that predict stock market crises are clearly identified, and each date's potential for a crisis is explained locally using a consistent features attribution. We analyse the March 2020 financial crisis in-depth using this methodology. The model correctly predicted this event outside of the sample. This analysis demonstrates how the technology sector was able to foresee the opposite of what really transpired both before and after the accident. (Jean-Jacques Ohana, 2022)

Chih-Chiang Wu, Wei-Peng Chen (2022) stated in the research paper entitled as “What’s an AI name worth? The impact of AI ETFs on their underlying stocks” This study separates U.S. AI ETFs into those with AI names and those without AI names to examine the anomalous returns of component shares on the inception dates of ETFs. The results demonstrate that ETF names can also result in name premiums for constituent businesses, as component stocks of AI ETFs with AI names exhibited cumulative abnormal returns (CARs) that were around 0.4% higher than those of AI ETFs without AI names over the event period. By suggesting that name premiums on underlying assets are also produced through derivative names. (Chih-Chiang Wu, 2022)

Sarah Röhm, Markus Bick, Martin Boeckle stated in the research paper entitled as “The Impact of Artificial Intelligence on the Investment Decision Process in Venture Capital Firms” The cognitive biases and heuristics of investors have an impact on investments in a hypercompetitive market when capital surplus is pushing deal sizes, startup prices, and deal activity. In regard to the VC investment funnel, this exploratory research examines the problems, opportunities, techniques, and likely future of AI adoption. Data from 17 expert interviews with early-stage VC investors and academia researchers were used in a qualitative analysis.The findings demonstrate that despite implementing data-driven decision support, many firms do not yet employ AI due to a lack of staff, time, and financial resources. Today's VC firms use AI mostly to diversify their portfolios and raise the effectiveness of their sourcing and screening processes. The interviews also show that, regardless of business size or resource available, VC use of AI will rise considerably over the following few years. New third-party software providers with reasonably priced AI technologies developed specifically to improve the VC investment decision-making process will be the driving force in this scenario. (Sarah Röhm, 2022)

Indranil Ghosh, Esteban Alfaro-Cortés, Matías Gámez, Noelia García-Rubio stated in the research paper entitled as "Role of proliferation COVID-19 media chatter in predicting Indian stock market: Integrated framework of nonlinear feature transformation and advanced AI" The novel Coronavirus has been the subject of several news stories and reports in the international media as a result of the COVID-19 pandemic epidemic. Investors connected to financial markets are worried due to the ferocity of news coverage of various pandemic features and the sentiment around them. In this study, frameworks based on predictive modelling and AI have been presented to evaluate the propagation of COVID-19 news to Indian stock markets. Using a variety of systematic media chatter indices related to the COVID-19 pandemic as well as a variety of traditional technical indicators and macroeconomic variables, two hybrid predictive frameworks called UMAP-LSTM and ISOMAP-GBR have been developed to accurately forecast the daily stock prices of 10 Indian companies from various industry verticals. The precise forecasting exercise's findings demonstrate how important it is to monitor major international and Indian media topics. Additional model interpretation using Explainable AI (XAI) methodologies demonstrates that bearish market regimes are brought on by a lot of media hype, coverage, bogus news, etc. (Indranil Ghosh, 2023)

RESEARCH METHODOLOGY

This research is primarily based on secondary data. It contains references from research papers and reviews from both google scholar and SCOPUS. This paper mainly focuses on benefits of Artificial Intelligence (AI) on equity markets and how it has led to increase investments in the equity markets. A methodology is a plan that a researcher creates to ensure that their research study produces reliable and valid results that align with their objectives. The sort of data that will be gathered, where it will come from, and how it will be gathered and examined are all included in this plan's specifics.

OBJECTIVE OF STUDY

The goal of this study is to examine the numerous effects of AI adoption in financial markets, examining its potential to alter market behaviours, improve investment strategies, enhance decision-making processes, and impact market participants, including investors, traders, and regulatory authorities.

PLAN OF STUDY

Datasets related to AI applications in equity markets, such as news sentiment data, social media sentiment data, and AI-driven investment strategies.

RESEARCH FINDINGS

Equity markets have recently been significantly impacted by artificial intelligence (AI). Here are a few ways artificial intelligence has affected equities markets:

1. AI has made it possible for traders to analyse massive volumes of data in real-time, allowing them to create more complex trading strategies. By using machine learning techniques, traders may identify patterns and trends that would be difficult or impossible to identify manually. As a result, trading efficiency has increased, risks have decreased, and earnings have climbed.
2. Enhancing Decision-Making: AI has had a substantial impact on equities market decision-making. Machine learning algorithms can analyse data and help traders and investors decide what to invest in based on the most current and pertinent information available. Decision-making has become more informed as a result, and portfolio management has improved.
3. Improved Market Forecasting: By assessing enormous amounts of data from several sources, including news stories, social media, and financial reports, AI systems may accurately forecast market moves. Investors now find it simpler to recognise prospective possibilities and risks and change their investments accordingly.
4. Greater Market Efficiency: Thanks to AI, information can now be accessed and analysed by investors more rapidly and precisely than ever. As a result, market inefficiencies have decreased, and securities have been priced more effectively. Trading algorithms that are powered by AI can spot market mispricing's and execute transactions automatically to profit from them.

5. Trading Process Automation: Thanks to AI, trades may now be executed by investors without the need for a human trader. Since it enables traders to execute transactions faster and more precisely than ever before, algorithmic trading, which involves the process of making trading decisions using computer algorithms, has grown in popularity.

Interest in using artificial intelligence (AI) in equities markets has risen over the past several years. While some research has suggested that AI can provide a number of benefits to the equity market, such as increased efficiency and improved decision-making, other studies have raised concerns about the potential impact of AI on equity market stability and fairness.

The use of machine learning algorithms to find patterns and trends in market data is one of the primary ways that AI is being used to the stock markets. Due to these algorithms' ability to assess massive volumes of data in real-time, traders are able to make better investing choices. Some studies have suggested that machine learning algorithms can outperform traditional investment strategies in terms of accuracy and efficiency.

The application of AI in equities markets, however, has also raised fears that it would enhance market volatility and instability. For example, some studies have suggested that the use of AI algorithms in high-frequency trading could exacerbate market fluctuations and increase the risk of flash crashes.

The application of AI in equities markets, however, has also raised fears that it would enhance market volatility and instability. For instance, some research has indicated that applying AI algorithms to high-frequency trading may intensify market swings and raise the possibility of flash crashes.

Another worry is that applying AI to equity markets can make already existent market disparities worse. For instance, some research has indicated that AI algorithms may favour particular business models or investment approaches, resulting in unequal access to investment possibilities. Therefore, there are both possible advantages and hazards associated with the impact of AI on equities markets, which is a complicated and diverse topic. To completely comprehend the effects of AI on the stability and fairness of the equities market, more research is required.

AI's Advantages in Stock Markets There could be a number of advantages to using AI in equity markets. One of AI's most significant benefits is its capacity to process massive volumes of data in real-time. Trading experts may improve their investing decisions by identifying patterns and trends in market data using machine learning algorithms. Additionally, these algorithms might help in identifying market dangers and opportunities. Another benefit is the application of AI to increase efficiency in the equity markets. Trading professionals can concentrate on more difficult duties like decision-making by using AI algorithms to automate repetitive chores like data analysis. Decision-making that is quicker and more accurate can be crucial in markets that move quickly.

AI can also be utilised to enhance equity market risk management. Trading professionals can employ machine learning algorithms to analyse market data and spot potential dangers so they can take proactive steps to reduce those risks. This can lessen the chance of losses and boost market performance.

AI Risks in Equities Markets While AI has the potential to enhance equities markets in a number of ways, there are also worries about how it may affect the fairness and stability of the market. The possibility for increasing market volatility is one of the biggest concerns of AI in equities markets. AI algorithms used in high-frequency trading may amplify market turbulence and raise the possibility of flash collapses. Investor losses may result, and the market may become unstable.

Also, there is a chance that the application of AI to equities markets will result in the displacement of human traders. This may result in employment losses in the banking industry and increase already present workplace disparities.

The AIEQ equities exchange-traded fund is one recent illustration of an ETF utilising AI. The company's creator and CEO, Sam Masucci, claims that this actively managed portfolio is a first. Frequently, the S&P 500 performs better than the equity ETF AIEQ.

CONCLUSION

It is a complicated and nuanced problem with both possible advantages and hazards when it comes to how AI may affect equities markets. While there may be a number of advantages to using AI in equities markets, there are also worries about how it may affect fairness and market stability.

Overall, it's critical to evaluate the dangers and possible advantages of AI in equities markets. To guarantee that AI is utilised responsibly and ethically and that its effects on market stability and fairness are closely monitored, regulators and market players should collaborate. By doing this, it could be able to maximise AI's advantages while lowering its dangers.

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