Impact of AI on Equity Markets

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INTRODUCTION

"AI has the potential to super-charge financial services and transforms the way services are delivered to customers."- 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 Artificial intelligence (AI) has emerged as a promising technology for the equity market in recent years. The ability of AI to process large amounts of data and identify patterns has led to its use in decision-making and trading in equity markets. However, there are also concerns about the impact of AI on equity market stability and fairness. This research paper aims to explore the impact 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 power in their application to banking and financial institutions, especially academic and non-academic research is changing. The recent disease spikes, followed by the financial crisis restrictions on economic growth, have added new challenges for AI-related technologies. The publications under consideration have raised hopes for better productivity, fresh data, information, advisory and management services, risk reduction, and certain unresolved issues relating to detrimental effects on long-term sustainability and rising economic wellbeing. (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 the needs of their clients and consumers 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. Because to the rapid growth of technology and the reallocation of human resources, AI may force businesses to completely rethink their innovation processes. The public views artificial intelligence (AI) as having limitless potential. AI will support new, more efficient business models as well as efficient, public sector and services. 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 research explores the interaction between industrialized and developing economies' market volatility relationships between 2000 and 2020. This analysis is restricted exclusively to the European Union, the Pacific, South America, Latin America, East Asia, West Asia, and South Asia. This paper shows for capital markets, there is a gap in equity return uncertainty. This papers results have major effects on investors looking to diversify their portfolios. (Ashutosh Kolte, 2022)

Xiaomin Mou, (2019) "Artificial Intelligence: Investment Trends and Selected Industry Uses" the number of commercial applications for AI is growing in both established and emerging countries, 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 improve learning environments, learning outcomes, and better prepare students for the transition from school to the job. 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 paper investigates stock market transmission mechanism from the bond and currency market. The created method integrates various machine learning algorithms with daily stock, bond, and currency data from 39 nations, covering a wide range of economies. In particular, the paper uses advantages of several methods, such as Classification Trees, Support Vector Machines, Random Forests, Neural Networks, Extreme Gradient Boosting, and Deep Neural Networks. The two primary linkage channels through which financial contagion can start—returns and volatility—are covered by the independent variables that are part of 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. The interdependence and cross-contagion effects between the stock, bond, and currency markets are also well supported by this research. The paper concluded by demonstrating that the usage of Deep Neural Networks considerably improves classification accuracy and provides a reliable method for developing a worldwide systemic early warning tool that is more effective and risk-sensitive than the ones that are already in place. To maintain financial stability, central banks may utilise these tools to early modify their monetary policy. (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. So, it is of utmost practical importance to gauge market fear predictability at such a pivotal moment. Equity market implied and historical volatility can be used to quantify market apprehension. The 20-day rolling standard deviation of NIFTY returns and the India VIX are the two variables that this study uses to account for implied and historical volatility throughout the current COVID-19 period, respectively. Significant features have been chosen using the supervised Boruta feature selection process. Then, on the basis of the processed feature set, cutting-edge machine learning and deep learning algorithms such as Gradient Boosting (GB), Extra Tree Regression (ERT), Deep Neural Network (DNN), and Long Short-Term Memory Network (LSTM) are used to meticulously assess the degree of predictability of the assets. To draw conclusions, a variety of numerical and statistical tests have been performed on the integrated prediction frameworks. Also used to analyse the nature and influence of various aspects are Explainable AI frameworks. The results do indicate that, despite having highly volatile characteristics, both India VIX and historic volatility can be accurately forecasted 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 this analysis implied that first, portfolios made up of these assets show heavy-tail dependence, which suggests that there is a strong likelihood of large joint losses during economic volatility. Second, while volatility transmission reduces with time, it is larger in the short term, suggesting that short-term shocks may increase the volatility of the assets. Finally, Bitcoin and gold are essential assets for hedging, while the volatility of the past has an impact on Bitcoin as well, a trait it also has in common with green bonds and NASDAQ AI. Gold may serve as a haven during economic downturns because its show transmission to the NASDAQ Al is only about 1.41%. Lastly, the portfolio has an intrinsic self-transmitting risk that the necessitate mission of all financial assets is extremely large. 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

analyses the returns and volatility behaviour of the 12 main equity markets considering the COVID-19 pandemic disease 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. Market connectedness and volatility spill over consider the increased risk of emergent pandemic crises, which has been more pronounced during the first quarter of 2020. 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" We study a gradient boosting decision tree (GBDT) method to forecast substantial drops in the S&P 500 price using a set of 150 technical, fundamental, and macroeconomic variables. We find that GBDT outperforms other machine learning (ML) methods on the prices of S&P 500 futures. We show that preserving fewer, well selected attributes is advantageous for all machine learning techniques. 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 analyze 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" to compare the abnormal returns of constituent equities on the inception dates of ETFs, this study divides U.S. AI ETFs into those with AI names and those without AI names. The results show that component stocks of AI ETFs with AI names saw cumulative abnormal returns (CARs) that were approximately 0.4% greater than those of AI ETFs without AI names during the event period, demonstrating that ETF names can also result in name premiums for constituent companies. 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" Investments in a hypercompetitive market where capital excess is driving deal sizes, startup prices, and deal activity are affected by the cognitive biases and heuristics of investors. This exploratory study analyses the issues, potential, current approaches, and likely future of AI adoption in relation to the VC investment funnel. A qualitative study was conducted using data from 17 expert interviews with early-stage VC investors and academic researchers. 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 demonstrate that VC adoption of AI will increase significantly over the next few years, irrespective of firm size or resource availability. The driving force in this scenario will be new third-party software companies with affordably priced AI technology created exclusively to enhance the VC investment decision-making process.

 (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 COVID-19 pandemic outbreak has caused the international media to erupt with reports and news about the novel Coronavirus. Investors connected to financial markets are worried due to the ferocity of news coverage of various pandemic features and the sentiment around them. Predictive modelling-based frameworks driven by artificial intelligence (AI) have been proposed in this study to assess the spread of COVID-19 news towards Indian stock markets. UMAP-LSTM and ISOMAP-GBR, two hybrid predictive frameworks, have been built to precisely predict the daily stock prices of 10 Indian companies from various industry verticals using a variety of systematic media chatter indices related to the COVID-19 pandemic as well as a variety of conventional technical indicators and macroeconomic variables. The results of the rigorous forecasting exercise justify the value of keeping an eye on key media stories both globally and in India. Further model interpretation employing Explainable AI (XAI) techniques reveals that bearish market regimes are caused by high levels of general media hype, media coverage, fake 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. This plan includes details on the type of data that will be collected, where it will come from, and how it will be collected and analysed.

OBJECTIVE OF STUDY

This study aims to explore the multifaceted implications 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

Artificial intelligence (AI) has had a significant impact on equity markets in recent years. Here are some ways in which AI has impacted equity 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. Traders can spot patterns and trends that would be challenging or impossible to spot manually by employing machine learning techniques. 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: AI algorithms can effectively predict market movements by analysing vast volumes of data from many sources, such as news articles, social media, and financial reports. 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 use of computer algorithms to make trading choices, has grown in popularity.

Recent years have seen a growing interest in the application of artificial intelligence (AI) to equity markets. 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.

One of the keyways in which AI is being applied to equity markets is through the use of machine learning algorithms to identify patterns and trends in market data. These algorithms can analyze vast amounts of data in real-time, allowing traders to make more informed investment decisions. Some studies have suggested that machine learning algorithms can outperform traditional investment strategies in terms of accuracy and efficiency. However, there are also concerns that the use of AI in equity markets could lead to increased 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. The ability of AI to analyse enormous amounts of data in real-time is one of its most important advantages. Trading professionals can make better investment judgements by using machine learning algorithms to spot patterns and trends in market data. These algorithms can also aid in spotting market risks and opportunities. The use of AI to improve efficiency in the equities markets is another advantage. 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 as a whole.

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.

One recent example of an ETF using AI is the AIEQ equities exchange-traded fund. Sam Masucci, the company's founder and CEO, asserts that this actively managed portfolio is the first of its kind. The equity ETF AIEQ frequently outperforms the S&P 500.

CONCLUSION

The impact of AI on equity markets is a complex and multifaceted issue, with both potential benefits and risks. While the use of AI in equity markets has the potential to provide several benefits, there are also concerns about its impact on market stability and fairness.

Overall, it is important to strike a balance between the potential benefits and risks of AI in equity markets. Regulators and market participants should work together to ensure that AI is used in a responsible and ethical manner, and that its impact on market stability and fairness is carefully monitored. By doing so, it may be possible to harness the benefits of AI while minimizing its risks.

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