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THE COMPARISON OF GOOGLE BARD AND CHATGPT USE IN FINANCIAL MARKETS

FİNANSAL PİYASALARDA GOOGLE BARD VE CHATGPT KULLANIMININ KARŞILAŞTIRILMASI

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Öz

Bu çalışmanın temel amacı finansal piyasalarda ChatGPT ve Google Bard kullanılmasının üstünlüklerinin ve yetersizliklerinin neler olduğunu karşılaştırmalı olarak araştırmaktır. Yöntem olarak bugüne kadar yapılan akademik çalışmalar ve araştırmalar incelenmiştir. Bu doğrultuda her iki yöntemin üstünlükleri ve yetersizlikleri tablolar halinde sunulmaya çalışılmıştır. Çalışmanın sonucunda iki yapay zekâ sistemine de özel yetenekler atfedilebileceği gözlemlenmiş ve karşılaştırıldığında ise net üstünlüğün zamanla daha iyi anlaşılacağı yönünde bulgulara erişilmiştir. Çünkü yapay zeka sistemleri kullanıcıların geri dönüşlerinden beslenmektedir. Bununla birlikte ChatGPT, veri analizi ve hızlı karar alma konusunda etkili bir şekilde çalışırken, duygu ve önyargılardan arınma konusunda sınırlamalara sahip olabileceği vurgulanmıştır. Google Bard ise gelişmiş tahmin ve analiz yetenekleri ile risk yönetimi ve portföy optimizasyonunda etkili olabileceği belirtilmiştir. Ancak, her iki sistemde de güncel ve doğru veri kullanımı önemli olduğu ve faktörlerin yöntemlerin performansı etki olacağı ortak görüşü hakimdir.

Anahtar Kelime: ChatGPT, Google Bard, Finansal Piyasalar.

Jel Kodları: G10, G20, G22

Abstract

The main purpose of this study is to comparatively investigate the advantages and disadvantages of using ChatGPT and Google Bard in financial markets. As a method, academic studies and researches done so far were examined. In this direction, the advantages and disadvantages of both methods were tried to be presented in tables. As a result of the study, it was observed that special abilities can be attributed to both artificial intelligence systems, and when

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compared, it was found that the net advantage would be better understood over time. Because artificial intelligence systems are fed by the feedback of users. However, it has been observed that while ChatGPT works effectively in data analysis and rapid decision making, it may have limitations when it comes to freedom from emotion and bias. Google Bard, on the other hand, has been stated to be effective in risk management and portfolio optimization with its advanced forecasting and analysis capabilities. However, it is common opinion that the use of up-to-date and accurate data is important in both systems and that the factors will affect the performance of the methods.

Key Words: ChatGPT, Google Bard, Financial Markets

Jel Codes: G10, G20, G22

INTRODUCTION

One of the innovations brought by Industry 4.0 is the technology of artificial intelligence. Just as many sectors have benefited from it, the finance sector will also take its share from these advancements. In today's world, artificial intelligence systems, increasingly crucial, not only impact people's daily activities and job roles but also influence perspectives on events, entertainment preferences, and lifestyles. Social media platforms like Facebook, Twitter, and Netflix, which constitute some of today's largest companies, have based their strategies on artificial intelligence. Since the early 21st century, artificial intelligence systems have become an integral part of daily life for people from all walks of society, transferring the structure and way of life of the modern world into virtual environments. From computer-based systems used in workplaces to robotic vacuum cleaners used for household cleaning, from vehicle navigation systems determining routes to bank accounts organizing investment transactions, from online shopping platforms for placing orders to phones used for searching, artificial intelligence systems are utilized in a multitude of applications that shape everyday life.

Alan Turing is considered the father of artificial intelligence. On the other hand, the term "artificial intelligence" was first used in 1956 in a workshop on artificial intelligence organized by John McCarthy at Dartmouth College. In addition to John McCarthy, important names in the field such as Marvin L. Minsky (Massachusetts Institute of Technology-MIT), Nathaniel Rochester (International Business Machines-IBM) and Claude Shannon (Bell Laboratories) took part in this event (Dick, 2019). Although McCarthy and his friends are considered to be the pioneers of artificial intelligence, they have largely shaped the basis of artificial intelligence by establishing three research centers. In addition, although there is no agreed definition, it is generally accepted that it is a science based on computers and mathematics, although different definitions are made in different disciplines (Wang, 2019). Artificial intelligence generally refers to the artificial production of the human mind that can learn, plan, perceive or process natural language. . It is the theory and development of computer systems capable of performing activities that generally require human intelligence, such as visual perception, speech recognition, decision making, and language translation. Artificial intelligence is an IT industry that mostly works with machines that are built to work like humans. John McCarthy (father of AI) defined

AI as “the scientific and technical knowledge of developing particularly intelligent computer programs”. Pallathadka, et al. (2023) According to McCarthy, who is considered one of the pioneers of artificial intelligence studies, if human intelligence and learning phenomena are understood and defined down to the last detail, machines will have the ability and intelligence to learn by imitating this situation. (McCarthy, 2007).

However, the development process has accelerated with great advances in computer science and discoveries in the field of machine learning. Since the 1950s, scientists have started basic studies with the aim of imitating human-like thought processes through computers. In the early periods, specialized artificial intelligence systems were created in limited areas, but in the following years, the development of technologies such as artificial neural networks with the use of deep learning and big data shaped the contemporary form of artificial intelligence (Russell and Norvig, 2021). On the other hand, as in many areas, the effect of artificial intelligence in financial markets is also of great importance. While financial markets are defined by huge data flows and their complex structures, artificial intelligence plays an important role in analyzing this abundance of data and gaining insights. AI can be used in a range of financial tasks such as identifying trends, managing risk, optimizing portfolios and making forecasts by rapidly analyzing data in financial markets. In particular, financial institutions can use AI-based systems to better serve investors and customers and make better investment decisions (Narang, 2019). In addition, artificial intelligence can automate trading operations in financial markets and quickly adapt to market conditions. Algorithmic trading has the potential to generate better returns by taking advantage of the ability of AI-based systems to detect small differences in financial asset prices and trade quickly. However, the rapid response of such systems and large volumes of trading can increase market volatility and lead to undesirable consequences (Hasanhodzic, 2022). In fact, the impact of artificial intelligence in financial markets is seen as an important development area. AI-based systems can improve financial institutions' decision-making and customer service, while algorithmic trading offers investors the potential for better returns. However, it is important to further research and develop regulatory frameworks on the effects of these technologies on the stability of financial markets (Gomber, et.al., 2019)

The software that emerged as the products of this development creates an agenda in line with its working principles and capabilities and is the subject of various researches. As one of these software; ChatGPT is a chatbot designed to produce texts that are indistinguishable from human-created content. What gives it its name is that it was created with a language model that includes the advanced final version (3.5th generation) of the Generative Pretrained Transformer (GPT) language model. GPT-3.5 is a third-generation language model that uses deep learning to generate human-like text. In other words; It is a computational system designed to generate sequences of words, codes or other data starting from a source input (Floridi & Chiriatti, 2020: 684).

The development of ChatGPT was driven by a continuous and intensive R&D process conducted by OpenAI. First introduced in 2018 under the name GPT (Generative Pre-trained Transformer), the language model was later renamed ChatGPT, making it usable for interactive and text-based tasks. ChatGPT has gained the potential to provide users with convenient and interactive solutions by being pre-trained on large datasets and then customizable with fine-tuning (Radford, et. al., 2019)

In the financial markets, ChatGPT is expected to have a significant impact. This language model can be of great help to investors and financial professionals when used in financial data analysis and forecasting. Used in text-based financial analysis and understanding market sentiment, ChatGPT can provide insight into critical topics such as identifying market trends, risk management, and portfolio optimization. In addition, it can have the ability to react quickly to instant developments and make informed investment decisions by analyzing data sources such as financial news, reports and social media content (Zhao, et.al., 2021)

However, in addition to these developments, it is thought that ChatGPT will bring some difficulties and risks in financial markets. The data sensitivity and model fallibility issues of AI-based systems should be addressed as important considerations for reliability and accuracy in financial markets. In addition, the complexity of the internal workings of language models such as ChatGPT may pose problems with the intelligibility and interpretability of the decisions made. Therefore, financial experts and researchers should do more work and develop regulatory frameworks on how to use language models in financial markets and manage potential risks (D'Cruz, et. al., 2022)

Ultimately, ChatGPT's impact on financial markets is significant, and AI-based language models can dramatically transform financial analysis and forecasting processes. However, for the effective use of this technology, it is important to understand and manage the potential risks and challenges. The success of AI-based applications in financial markets will be possible with careful planning, strong regulatory frameworks and cooperation (Gomber, et. al., 2019)

Another artificial intelligence application, Google Bard, is called an artificial intelligence-based language model and translation system. Developed by Google, this technology is an impressive step forward in natural language processing (NLP). Bard is a more advanced AI model that surpasses Google's existing language models and machine translation systems. This innovative technology uses a large language database to better understand texts and provide more accurate translations. Bard is constantly updated and improved with growing datasets. This allows users to access more precise and fluent translations language data was collected and integrated into the model. As the database expanded, the model's language comprehension and translation capabilities increased significantly. In particular, language-based data analysis and learning common phrases improved Bard's translation accuracy and fluency. Subsequently, the model was beta-tested As a result, Google Bard has become an effective

language model and translation system (Johnson, et.al., 2023) Google Bard has made great strides in natural language processing and is likely to be further developed in the future. Bard's language comprehension, translation and written communication capabilities can facilitate better communication and collaboration across different industries and cultures. This technology has great potential to strengthen connections and increase knowledge sharing at the global level. However, issues such as the reliability of language models and data privacy are important considerations that need to be addressed as we move forward. Therefore, it is important for future research to focus on these areas (Bard, 2023).

This study will present a comparative research on the importance of the subject. First of all, after the theoretical and conceptual background is explained in the Introduction section, summaries of similar studies in the academic field will be given in the literature section. Then, under the title of Chapter 3, the advantages and disadvantages of using ChatGPT and Googlae Bard programs on financial markets will be listed comparatively. In the conclusion part, the contribution of this study to the academic literature will be explained and suggestions will be presented to academic studies, investors and policy makers on the subject.

1. LITERATURE

It has been observed that studies on the subject mostly focus on the use of artificial intelligence in areas such as data processing, storage and machine learning. However, there are a very limited number of studies investigating its effects on financial markets. Gürsoy and Doğan (2023) study was seen as close to this study in the literature, and only the effect of Chat GPT on financial markets was examined. In this study, the possible effects of Google bard and Chat GPT usage on the markets were investigated comparatively. Therefore, it is aimed to contribute to the literature by further developing the subject. In this respect, it is hoped that this study will be among the pioneering studies in the academic literature. Summaries of similar studies on the subject are presented below.

Ali and Aysan (2023) explored what ChatGPT offers to the financial sector and how it differs from existing banking and financial instruments. They found that ChatGPT gave valuable clues for their future applications in the financial industry. They found that ChatGPT provides a range of services to financial institutions, including account management, customer service, investment advice, data analysis, and financial and regulatory compliance.

Ante and Demir (2023) analyzed the returns of artificial intelligence-themed crypto assets within the framework of the launch and widespread interest for ChatGPT. They found significant abnormal returns of up to 41% over two weeks for AI tokens after the launch of ChatGPT. They also found that 90% of cryptocurrencies exhibit positive abnormal returns.

Beerbaum (2023) focused on the field of accounting and, taking the example of ChatGPT, what the relevant business rationale was for GAI. With the spread of ChatGPT, it has also brought up a number of ethical issues, especially when it comes to privacy, intellectual property rights, and potential

biases in the content created. One of the biggest concerns has also highlighted the possibility of using generative AI to create deep fake videos or images that could be used for malicious purposes such as political manipulation or spreading misinformation.

Blomkvist, Qiu, and Zhao (2023) examined the impact of the introduction of ChatGPT on stock prices. Following the introduction, firms operating in industries with a greater workforce that replaced artificial intelligence techniques were associated with significantly negative stock returns. They emphasized that the negative share price response was due to increased competition from new technology.

Cao and Zhai (2023) ChatGPT has been used in almost all academic branches. ChatGPT has been found to have a significant impact on academic research in finance and accounting.

Chen, et al. (2023) aimed to leverage the graph inference capabilities of ChatGPT to develop Graph Neural Networks (GNN). Experimental results from predicting stock movements with AI have determined that our model consistently outperforms benchmarks based on state-of-the-art Deep Learning. They emphasized that ChatGPT has promising implications for the financial sector.

Gürsoy and Doğan (2023) investigated the advantages, disadvantages, opportunities and threats of using ChatGPT in financial markets with the SWOT analysis method. At the end of the study, it was found that ChatGPT has potential advantages in financial analysis and decision-making processes. In addition, it was emphasized that ChatGPT offers fast and direct communication, instant data analysis and personalized investment recommendations. As a result, it was emphasized that it can be effective in helping investors follow market movements and create personal investment strategies, and can be used to predict future price movements by analyzing large amounts of data.

THE COMPARISON CHATGPT ve GOOGLE BARD

Positive Consequences of ChatGPT usage in financial markets and positive and negative Consequences of Google bard usage are presented in the table given below. In addition, the conclusion obtained in Table 1 is presented comparatively within itself. As a method in the study, findings and inferences obtained from academic studies were used as data. In addition, Google news sources in this area were also used.

Table 1. Positive and Negative Consequences for ChatGPT

Classifications	**Positive Consequences**	**Negative Consequences**
Data Analysis and Opportunities	ChatGPT can identify potential opportunities in the markets by quickly analyzing large amounts of financial data.	Due to incorrect data entry or missing data, artificial intelligence can make incorrect analyzes and decisions may be wrong.
Avoiding Emotions and Prejudices	Artificial intelligence can make objective decisions without being affected by human emotions.	ChatGPT may be affected by biases and errors in the data it is trained on, producing inaccurate or biased results.

Classifications	Positive Consequences	Negative Consequences
Automatic Transaction Execution	ChatGPT can execute automated transactions through programmed algorithms, allowing for fast and efficient trading.	Automated trading can increase risks due to sudden market fluctuations and faulty algorithms.
Efficiency and Faster Decisions	Artificial intelligence can analyze data and make decisions much faster than humans.	ChatGPT decisions may be unreliable due to insufficient training or outdated data.

Tablo 2. Positive and Negative Consequences for Google Bard

Classifications	Positive Consequences	Negative Consequences
Advanced Forecasting and Analysis	Google Bard can be effective at predicting trends in markets using deep learning and big data.	Errors in predictions may occur due to updating complex algorithms or incomprehensible results.
Risk Management and Portfolio Optimization	Google Bard can offer investors better risk management and portfolio optimization.	Google Bard models trained with inappropriate parameters and data may not be able to accurately assess risks.
Avoiding Emotions and Prejudices	Google Bard can make decisions independently of human emotions and react quickly to sudden price changes.	Instant changes in markets and sensitivity to news can lead to erroneous trading decisions.
Big Data Processing and Analytics	Google Bard can provide better analytics by processing large amounts of financial data quickly and effectively.	Intensive data processing load can negatively affect system performance and data reliability.

Table 3. Comparison to ChatGPT and Google Bard

Common Comparison Classification	ChatGPT	Google Bard
Data Analysis Capability	High data analysis capability provides the ability to quickly process large amounts of data and identify opportunities.	It can make detailed analyzes with advanced data processing and deep learning methods.
Avoiding Emotions and Prejudices	There may be limitations on feeling and bias clearance and may reflect biases in training data.	Can make objective decisions independently of human emotions and be free from prejudices.
Automation and Speed	It can perform automatic transactions through programmed algorithms.	It can react quickly to the markets with its automatic trading and fast decision making ability.
Risk Management and Forecasting	It can be effective in risk management and portfolio optimization.	With its high forecast accuracy, it can help manage risks and be effective in risk management and portfolio optimization.
Current Data and Performance	Up-to-date data and performance are essential for making the right decisions. But it is necessary to use updated Chat GPT versions.	High performance and data reliability are critical.

CONCLUSION

As a result of the theoretical-based researches, it was concluded that special abilities can be attributed to both artificial intelligence systems in the comparison between ChatGPT and Google Bard.

While ChatGPT works effectively on data analysis and quick decision making, it may have limitations in avoiding emotion and bias. Google Bard, on the other hand, can be effective in risk management and portfolio optimization with its advanced forecasting and analysis capabilities. However, using up-to-date and accurate data on both systems is important and can affect performance. In this case, the following suggestions can be made for future academic studies, investors and policy makers.

For academic studies in this field: Studies should be carried out to increase the performance and reliability of artificial intelligence-based systems in financial markets. Ethical and reliability-oriented research should be conducted to detect and reduce bias in artificial intelligence models. Efforts should be made to increase the accuracy of artificial intelligence models by working on data up-to-date and quality. For Financial Market Investors: Investment strategies should be created by paying attention to the advantages and disadvantages of artificial intelligence-based systems. Up-to-date and accurate data sources should be used to increase the reliability of the systems. Careful parameters should be determined to minimize risks in situations where automatic transactions will be made. For Policy Makers: Research should be supported to understand the impact of artificial intelligence technology on financial markets. Arrangements should be made to prevent biases and errors in artificial intelligence-based systems. Investors should be helped to minimize the risks of automated transactions by developing protective regulations.

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