Opportunities and Problems Presented by ChatGPT to the Financial Industry

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Abstract. ChatGPT marks the beginning of a new AI revolution, it has aroused strong concern from all walks of life. The generative AI represented by ChatGPT will have a huge impact on the financial industry. This paper reviews the basic development and functional application of ChatGPT. On this basis, this paper discusses the opportunities and challenges presented by ChatGPT to the financial industry. Moreover, the main problems still existing in applications and the matching solutions are pointed out as well. The literature shows that ChatGPT has potential to help financial organizations improve risk control ability, market insight and market competitiveness, thanks to its powerful natural language processing, data collation and data analysis capabilities. But ChatGPT also brings various issues, such as data privacy and securities issue, accuracy and timeliness issue, legal risks, and ethical issue at the same time. ChatGPT is a "double-edged sword", it should be used appropriately to achieve "finance for people".

Keywords: ChatGPT; artificial intelligence; financial industry; risk regulation.

1. Introduction

ChatGPT is an AI-powered chatbot developed by OpenAI. The development of ChatGPT was highly motivated by the need for AI language models that were both complex and versatile.

There are three significant turning points in its growth. First, ChatGPT uses Transformer architecture. This enables the creation of efficient and extensible language models [1]. Second, the development of the GPT series, shows the potential of AI language models in a variety of applications, including text generation, translation and data analysis. Third, ChatGPT is released on the basis of previous generations of GPT products. The improvements have been made in understanding, accuracy, and versatility below at the same time [2].

ChatGPT has greater computational performance and a large number of training parameters, with training based on reinforcement learning from human input and a significant amount of manually labeled data. ChatGPT can handle complicated activities such as article writing, text summarizing, language translation, computer code development and other advanced tasks.

In June 2018, OpenAI released GPT-1. The number of model parameters reached 117 million, and the amount of pre-training data was about 5GB. Since then, the number of parameters in each generation of GPT model has increased explosively [3].

For detail, the related data was shown in Table 1.

Table 1. Comparison between the number of GPT model parameters and the amount of pre-training

GPT model	Release time	Parameter quantity	Amount of pre-training data
GPT-1	June.2018	117million	About 5GB
GPT-2	February.2019	1.5billion	40GB
GPT-3	May.2020	175billion	45TB
ChatGPT	November.2022	One hundred billion level	One hundred TB level

Data source: Zeng Xiong. Discussion on the application of ChatGPT in financial industry [J] Age of financial technology, 2023, 31(05): 19-22.

ChatGPT is a new AIGC technology achievement that accelerates the transition from sensing and comprehending the world to generating and creating it. China's financial industry has entered a period of rapid development, and ChatGPT will greatly contribute to the maturity of China's financial market.

In the next twenty years, China's financial industry will reach heights it has never reached before. The following discussion will focus on China's finance industry.

2. Applications in the Financial Field

The financial industry is very different from the natural industry, the financial industry interacts with economic agents. When there is an economic crisis, the market is full of uncertainty. Economic subjects have their own psychological expectations on the trend of the market, which will affect various existing economic activities, and thus affect the entire financial industry. This article will focus on the financial sector, specifically five typical industries and markets that are most affected by ChatGPT.

2.1. Banking Industry

Banks need to promote related products to customers, and customers also need to understand and choose the products provided by banks. But in this process, there is a problem of information asymmetry. ChatGPT can solve this problem perfectly. Combined with the banking industry, ChatGPT will effectively improve its risk management level, intelligent customer service level and business handling efficiency [4]. In addition, the application of ChatGPT helps to promote the development of personalized services. ChatGPT can not only perform big data analysis, operations management, and financial service marketing, but it can also automatically identify and sort out customer information [5]. For instance, historical transaction records, income status, and so on, in order to provide personalized service solutions to each customer [5].

2.2. Insurance Industry

Claims settlement is one of the most important aspects of the insurance industry, and ChatGPT can provide insurance organizations with more accurate data analysis services. Combined with insurance industry, ChatGPT can effectively improve the risk assessment ability, improve the efficiency of insurance recommendation, and shorten the claim settlement time [4]. Specifically, ChatGPT can identify input wants and problem, then give relatively matching claim settlement methods immediately so as to better meet customer expectations [6].

2.3. Securities Industry

Combined with securities industry, ChatGPT can effectively improve its market insight ability, intelligent investment advisory level and transaction efficiency [4]. When ChatGPT is applied to stock market investment and risk management, practitioners and investors both profit. In the stock market, ChatGPT can not only provide investors with various data during the trading period, and it can also analyze the company's financial data and operating data. In this way ChatGPT can help investors find high-quality enterprises, point out potential risks, and improve investors' returns [7]. In the bond market, ChatGPT can be used to analyze the risks of the bond market and provide optimization plans, which can reduce market risks and obtain more stable returns [8].

2.4. Labor Market

Because of the extensive usage of ChatGPT technology, some easy, repetitive, and mechanized financial jobs, such as data analysts, coders, and personal financial advisers, are easily replaced by AI. In addition, financial practitioners must increase their skills in order to better apply ChatGPT to their research works. This will raise the barriers for those involved in the financial sector to entry. Additionally, ChatGPT technology creates new job opportunities. To develop, maintain, and update ChatGPT, professional technicians are needed, which will increase the number of high-skilled workers in the financial sector [5]. Besides, the strong demand for talent will encourage the modernization and transformation of the financial industry [5].

2.5. Internet Finance

The financial sector has gone digital as a result of the growth of Internet financing. To provide clients with services that are more convenient, effective, and safe, information is essential. It also promotes innovation and development in financial markets. Combined with Internet finance, can improve the market competitiveness level and risk control ability of Internet financial platforms and platform innovation ability [4]. Internet finance platforms can employ ChatGPT on historical finance data mining and analysis to give more precise data for the platform analysis and decision support, so as to increase market competitiveness and the ability of high risks control. ChatGPT can analyze and predict users' behavior and market trends, so on to innovate products and adapt to market conditions [5].

Through the above analysis we can find that the data is the bridge between Language Model and Finance. The operation of finance field will create a great amount of data, and data supports the design of various business in this industry.

ChatGPT owns powerful ability to use data that brings the development of the financial industry a huge opportunity. It is worth mentioning that some of the opportunities listed above are not yet complete. It is convinced that, as the model continues to evolve, these features and more new features can be achieved. ChatGPT will bring more opportunities to the financial industry in the future.

3. Problems Caused by ChatGPT

3.1. Data Privacy and Security Issues

The financial sector involves a large amount of sensitive information, such as macroeconomic indicators, market data, corporate financial data, personal transaction data, etc. [5]. Both personal privacy and the stability of the financial markets may be seriously threatened by data leaks. In the bank industry, it may be necessary to process a large amount of personal sensitive information when bank organizations use ChatGPT to analyze customer information. If the related data were collected and used incorrectly, the possibility of potential threats to customer privacy will increase, thereby affecting the bank's reputation and customer satisfaction.

3.2. Accuracy and Timeliness

Real-time market news analysis by ChatGPT has the potential to lead to inaccurate understandings of the news and increase volatility. In addition, ChatGPT-based smart advisors may lead to the amplification of herd effect and increase risk concentration [4]. In the securities industry, ChatGPT can be used to write and generate false news or misinformation. This could not only mislead investors into making bad decisions, but could also cause market prices to fluctuate. Furthermore, because ChatGPT cannot forecast the occurrence of some unexpected occurrences, over-reliance on ChatGPT's automated predictions and proposals will lead to irrational investment behavior, potentially resulting in bigger losses for investors [5].

3.3. Legal Risks

The data sets used in the training of ChatGPT may contain private information or have intellectual property rights, which are at risk of violating copyright, patent rights and data privacy laws and regulations. If they rely on illegal information when making decisions, these financial institutions may also be punished [5].

3.4. Ethical Issue

There is a certain moral hazard with ChatGPT because of its ability to generate Human-like language and writing. This ability may be used by prison for identity forgery, deception and misdirection, phishing attacks, and dissemination of undesirable information [9]. In the insurance industry, due to the "black-box theory" of ChatGPT operation, the solutions provided by ChatGPT

may be affected by factors such as race, gender and place of residence. Therefore, the introduction of ChatGPT may cause prejudice to the insured [10].

3.5. The Impact on Financial Positions

The wide application of ChatGPT technology makes some simple, repetitive and mechanized financial jobs easy to be replaced by automation. While greatly saving the costs of labors and improving information security, it will have an impact on positions. Blomkvist et al. analyzed the impact of the introduction of ChatGPT on the stock prices of different companies, and found that the stock return rate of companies whose jobs were more easily replaced by AI technology was significantly negative. This result verified the negative impact of ChatGPT on part of the labor market [11].

Above analysis verifies that ChatGPT has a wide range of applications in the financial industry, but before its really implementation, there are still some challenges. ChatGPT still exists data privacy and security issues, accuracy and timeliness issue, legal risks, and ethical issues. ChatGPT should be viewed rationally and correctly, both to see the opportunity brought by ChatGPT and clearly recognize the risks and challenges behind ChatGPT. ChatGPT is a "double-edged sword", it should be used appropriately to achieve "finance for people".

4. Suggestions of the Financial Industry Respond to the ChatGPT Challenge

4.1. Create a Variety of Application Scenarios

With the in-depth development and application of artificial intelligence technology, there will be more and more explosive products like ChatGPT. It is necessary to make full use of ChatGPT to enable financial scenarios. ChatGPT can be fully applied in financial service scenarios such as intelligent customer service, credit scoring, intelligent advisory, automatic marketing, and risk assessment, and fully use the value of data [12].

4.2. Strengthen Financial Supervision

The rapid development of ChatGPT has changed the supervision and operation mode of the financial industry, and brought difficulties to the supervision. For China, whether it is strong supervision or weak supervision should be based on the actual national conditions [13]. The AI regulatory policy suitable for China's social environment, industrial development and scientific and technological innovation should be formulated with an inclusive and prudent attitude [13]. On April 13, 2023, the State Internet Information Office published a draft for public comment, aiming to regulate the application and promote the healthy development of generative artificial intelligence technology. This will be the first regulatory document on generative artificial intelligence technology released in China. It showed that the much-concerned generative artificial intelligence industry has entered a new regulatory era in China.

4.3. Prevent Technical Risks

ChatGPT can produce intelligent answers according to the text input of the users by the training of the given database. While the cost of obtaining information for malicious attackers greatly reduces in this case as well. Besides, ChatGPT can automate code writing. It reduces the technical barrier for attackers to commit network crimes, thus reducing the attack cost of hackers [14]. To prevent these technical risks, the financial industry must develop emergency plans to ensure that the results provided by the model, built on ChatGPT technology are accurate and reliable. As well as to effectively address ChatGPT issues such as false information, data security, intellectual property compliance, and scientific and technological ethics [12].

5. Conclusion

ChatGPT is a new AIGC technology achievement that it is the development direction of a new generation of artificial intelligence in the era of big data and digital economy. Besides, ChatGPT is one of the most important transformation of data elements into productivity. Although the ChatGPT artificial intelligence function is not yet perfect enough and the generated content contains many risks, it is believed that with the advancement of technology and the improvement of relevant laws and regulations, its scientific and continuous development will improve the social labor production efficiency and improve people's quality of life.

ChatGPT may bring opportunities for the financial industry, such as improving the level of risk management in the banking industry, improving the market insight capability of the securities industry, and improving the risk assessment capability of the insurance industry. While ChatGPT is a "double-edged sword", it may create a great amount of problems and challenges at the same time. The rapid development of ChatGPT has changed the supervision and operation mode of the financial industry. ChatGPT may be a potential trouble because of its powerful functions, something necessary is needed to be implemented to control its rapid development. In short, in the face of the new wave of artificial intelligence development, the financial industry should seize the opportunity to meet the new era of artificial intelligence. Therefore, this paper puts forward the following suggestions:

First, the financial industry should seize the opportunity and actively laid out the new generation of large-scale financial language model. The wide application of financial large-scale language model will bring great changes and development to the financial industry, financial organization should fully take its advantages to achieve the goal of "finance for people".

Second, government should strengthen data supervision and financial consumer rights protection. Build a data "firewall" with multiple levels of security to prevent data leakage and abuse. Access to data should be authorized and the system of regular security audits should be established.

Third, government should improve the laws and regulations to ensure violations can be punished and responsibility and implement accountability can be clearly shared.

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