Analysis of the Investment Value of Technology Companies

Peiyang Gan

School of Finance, Shanghai University of Finance and Economy, Shanghai, China

2021121586@stu.sufe.edu.cn

Abstract. Since 2022, the US technology industry has been in crisis of recession. Under the influence of the sluggish macroeconomic environment and the Federal Reserve's interest rate hike policy, the exchange rate of the US dollar continues to rise. This has had a huge impact on the US real industry, as companies have to reduce staff . In addition, the application of artificial intelligence has driven a reshuffle in the US technology industry. Amid this situation, the stock prices of U.S. technology companies have been volatile. This study aims to build a feasible investment value analysis model for investors by combining the trend analysis of macroeconomic environment and industry environment with the analysis of public financial data, taking three technology enterprises as examples. Through the research, it can be seen that analyzing the financial data and open market information of enterprises can effectively quantify the short-term performance and investment value of enterprises, and the long-term value of enterprises can be obtained by combining macro analysis and valuation model. The research method in this paper can effectively help investors to conduct valuation analysis when the stock price of enterprises fluctuates, which can be improved in the future by combining statistical data.

Keywords: Financial report, macroeconomic environment, Profitability.

1. Introduction

As the birthplace of many top technology enterprises in the world, the technology industry in the United States is not only an important part of its national economy, but also a representative of the top level of science and technology in the world. However, since 2020, the economy of the United States has gradually shown a trend of decline, and the inflation problem in the United States has become more and more serious. The Federal Reserve's intervention through interest rate hike policy has made the exchange rate of the US dollar continue to strengthen, which has a certain impact on the import and export of real goods of the United States. Under the action of monetary policy and other macro-control, the US economy has a trend of recession. As an important part of the US economy, the technology industry has also fallen into the crisis of recession in recent years. After the end of 2020, major technology enterprises have had a wave of layoffs. The application of AI has become a new trend in the technology industry, which has also promoted the reshuffle of the technology industry pattern. Stock prices of a number of tech companies have swung wildly in recent years, making it difficult for investors to analyze their value.

This study aims to improve the traditional investment valuation model by analyzing the macro environment, business performance and development prospects of enterprises. The study takes Nvidia, Intel and Zoom as examples to conduct in-depth research on the investment value of technology enterprises. Find the best tech companies to invest in among examples, both in the short term and over the long term through comparative analysis of the public market information and financial data of enterprises.

The remaining part of this paper is arranged as follows: the second section is literature review; the third section is fundamental analysis, including macroeconomic environment analysis and industry environment analysis; the fourth section is enterprise performance analysis; and the fifth section is comparative analysis.

2. Literature review

In 2024, affected by the macroeconomic situation, the development of US technology industry is unpredictable, and a large number of technology enterprises set off a wave of layoffs. Under the combined action of factors such as the declining macroeconomic situation and bottlenecks in technology growth, the US technology industry is in the crisis of recession [1-3]. Further analysis of the layoffs wave in the industry shows that the layoffs wave in the US technology industry is not only a structural adjustment to the blind enrollment expansion during the coronavirus epidemic period, but also a method to control costs in the case of economic downturn and reduced operating profits of enterprises. The wave of layoffs in the technology industry has both affected the talent landscape of the U.S. tech industry, hampering its growth, and brought about the impact of artificial intelligence replacing labor [4-5]. Artificial intelligence is the most important scientific and technological achievement in the American technology industry since the 21st century. Its emergence has brought changes to the American technology industry. On the one hand, artificial intelligence is one of the main driving forces for the development of American technology enterprises today; on the other hand, the neglect of leading enterprises to develop AI may cause a reshuffle of the industry. The situation of technology industry in the United States has a complex mix of growth and decline [6-7].

3. Basic fact analysis

3.1. Analysis of macroeconomy

In terms of GDP, according to the "Advance Estimate" released by the US Bureau of Economic Analysis on July 25, the US gross domestic product (GDP) increased at an annual rate of 2.8% in the second quarter of 2024, up from 1.4% in the first quarter of 2024. The increase in GDP in the second quarter mainly reflected increases in consumer spending, private inventory investment, and nonresidential fixed investment, with imports also rising. The data suggest that, despite some turbulence, the U.S. economy is resilient and no recession is imminent.

On the inflation front, data from the National Bureau of Economic Research (NBER) showed that the situation of inflation in the US was improved in June 2024. The CPI index increased 2.98% on year (seasonally adjusted). Median inflation expectations for one year and five years ahead both fell 0.2% in June to 3.0% and 2.8%, respectively. According to the Federal Reserve Bank of New York's latest Survey of Consumer Expectations (SCE), that number is still well above the 2.2% rate seen before February 2020 [8].

On the unemployment rate, the Bureau of Labor Statistics released a report showing that nonfarm payrolls increased by 114,000 in July, well below the previous 179,000; The unemployment rate came in at 4.3% in July, up 0.2% month-over-month and the highest reading since October 2021 [9]. The excessively high unemployment rate brought panic to the market. On August 2, 2024, the three major indexes of the US stock market (S&P 500 index, Nasdaq index and Dow Jones Industrial Index) all fell by more than 1%, while the exchange rate of the US dollar and the US dollar index fell as well.

In terms of monetary policy, on July 27, 2024, the Federal Reserve announced the eleventh Fed rate hike, and the target range of the federal funds rate rose to 5.25%-5.50%. After 2020, the Federal Reserve aims to control the rising inflation rate through a series of Fed rate hikes. A Fed rate hike is an increase in the federal funds rate, which raises borrowing costs for businesses and has the effect of discouraging the expansion of consumption [10]. The main purpose of this operation is to prevent the economy from overheating and cool down the economy, thus reducing the high inflation rate. In the short term, the Fed rate hike policy is unfavorable to the operation of enterprises. First of all, the increase in borrowing cost means that the operating cost of enterprises increases, which affects the profitability of enterprises, reduces the investment confidence of investors, and is not conducive to the operation of enterprises. Secondly, the interest rate hike will increase the bond yield and attract other funds to flow into the money and bond market, which will inhibit investors' investment in the stock market to a certain extent and is not conducive to enterprises' investment absorption. Finally,

the interest rate hike will lead to the appreciation of the US dollar against other currencies, expand the price advantage of US imported products in the domestic market, and is not conducive to the export of products. Therefore, for US manufacturing enterprises, the interest rate hike will have a certain impact on their profitability.

3.2. Analysis of industry

Since the 21st century, the technology industry in the United States has been booming. Companies such as Meta, Google and Apple have attracted huge investment in the global capital market, and the industry has expanded rapidly. However, since 2022, the US technology industry has seen a recession trend, and major technology enterprises have carried out large-scale layoffs, which has had a great impact on the development of the industry. This phenomenon is the result of a combination of factors.

3.2.1 Structural adjustment after COVID-19 pandemic

After the outbreak of COVID-19 in 2019, the development of real industries such as retail industry and FMCG industry stagnated due to the impact of the epidemic, while technology enterprises such as Internet enterprises received little impact. A large number of employees and investment entered the technology industry, and the technology industry expanded rapidly. Amazon, Meta, Twitter, Alphabet and Microsoft increased their number of employees by 99%, 60%, 53%, 50% and 47% respectively from 2019 to 2021. After the end of the epidemic, when the global economy shows a downward trend in 2022, technology companies need to revise their recruitment strategies to restore their operating costs to a reasonable range. The simplest way is to lay off employees. On the one hand, layoffs can reduce the company's expenses, and on the other hand, layoffs can make the company's financial statements more excellent. Thus, attracting more investors. Since 2022, the above technology companies have started layoffs, accounting for 8%, 25%, 58%, 7.7% and 5.5% of the company's employees, respectively.

3.2.2 Government policy’s influence

Under the influence of a series of Fed rate hike policies by the Federal Reserve, the exchange rate of US dollar continues to increase. However, the policy fails to control inflation effectively. The risk of economic recession in the US is still severe, resulting in relatively weak long-term demand for products of US technology enterprises. In the case of the continuous appreciation of the US dollar exchange rate, hardware manufacturers such as Intel are faced with the disadvantage of export price competition and the price competition of import enterprises. Under the influence of this adverse market environment, the performance of such enterprises has received a direct impact. The market environment also indirectly affects the growth potential and expectation of technology enterprises. In addition, the Fed rate hike policy of the Federal Reserve has increased the financing cost of enterprises. Small and medium-sized enterprises are facing financing difficulties, while the investment and efficiency of large enterprises are affected by high borrowing costs and fall short of expectations.

3.2.3 The trend of artificial intelligence

Artificial intelligence has gradually become one of the main directions of scientific and technological development in recent years, and it has played an important role in political decision-making, scientific research, social governance and environmental protection. Today, artificial intelligence has entered finance, law, agricultural production, light and heavy industry, transportation, smart medical care and other fields. It plays a very key role in these areas. The United States also attaches great importance to AI development. In October 2016, the Obama administration issued "Preparing for the Future of Artificial Intelligence", requiring the federal government to give priority support to AI research in some fields, and the plan will be updated twice in 2019 and 2023. The US Congress has regulated the development of AI industry through legislation, such as the 2019 John S. McCain National Defense Authorization Act, which was signed into effect in 2018, guiding the Department of Defense to carry out various AI-related activities and proposing the definition of AI.

American technology companies have responded to the plan, so the current trend in the technology industry is to develop AI and related industrial chains.

The development of AI has promoted the "reshuffle" of large and small enterprises in the US technology industry. Nvidia, Meta and other Internet enterprises focus on the field of artificial intelligence, which has led to the rise of their stock prices, while the corresponding traditional technology enterprises such as Apple and Tesla have further shrunk in the case of further decline in domestic demand and international market competitiveness. Share prices have fallen to varying degrees.

4. Analysis of enterprises

4.1. Nvidia

Nvidia is an American fabless semiconductor company that designs and sells graphics processing units (GpUs), application programming interfaces (apis), and system-on-chip units (SoCs) for data science and high-performance computing markets. Nvidia is also a major provider of artificial intelligence (AI) hardware and software. On June 18, 2024, Nvidia replaced Microsoft as the world's most valuable company and the most valuable company in the technology industry, with a current market cap of around $2.6trillion.

Unless otherwise stated, the following data are as of the close of trading on August 14, 2024.

Table 1 Statistic Data of Nvidia

Risk Factor		Profitability	
Market cap	$3.016T	ATO	0.92
Beta	1.68	PM(ttm)	53.40%
Debt Ratio	16.82%	ROA(ttm)	49.10%
Current ratio(mrq)	3.53	ROE(ttm)	115.66%

As shown in Table 1, in terms of the company's risk coefficient, the data of Yahoo finance show that Nvidia's beta is 1.68, debt ratio is 16.82%, and current ratio is 3.53, which shows that Nvidia's market risk is high. This indicates that the volatility of its stock returns is large, and it may also bear losses greater than the average market expectation when it may obtain gains beyond the market. The debt ratio is within a reasonable range, indicating that Nvidia's financial leverage is relatively reasonable and the risk is small, while the current ratio is large, indicating that the liquidity risk of the enterprise is small.

In terms of the company's profitability, according to the data of yahoo finance, Nvidia's Total asset turnover is as high as 0.92, which can be seen that the company's capital turnover is high, which indicates the high capital utilization efficiency of the enterprise. The Profit Margin is about 53.40%, reflecting the high profit margin of the enterprise, indicating that the enterprise has good operating capacity, and the ROA (ttm) and ROE (ttm) are 49.10% and 115.66% respectively.

In conclusion, Nvidia's risk coefficient is moderate, profitability is good, the enterprise's market performance is good in the short term.

4.2. Intel（INTC）

Intel Corporation is an American multinational corporation and technology company that designs, manufactures, and sells computer components and related products for commercial and consumer markets. It is considered one of the world's largest semiconductor chip makers by revenue. Intel supplies microprocessors to most computer system manufacturers and is one of the developers of the x86 family of instruction sets used in most personal computers (PCS). It also produces chipsets, network interface controllers, flash memory, graphics processing units (GPUs), field programmable gate arrays (FPGAs), and other devices related to communication and computing. The market value of the company is about $142.26billion, which is one of the leading enterprises in the industry.

Unless otherwise stated, the following data are as of the close of trading on August 14, 2024.

Table 2 statistic data of Intel

Risk Factor		Profitability	
Market cap	$140.26B	ATO	0.09
Beta	1.05	PM(ttm)	1.77%
Debt Ratio	25.72%	ROA(ttm)	0.16%
Current ratio(mrq)	1.57	ROE(ttm)	0.78%

As shown in Table 2, in terms of the company's risk coefficient, Nasdaq data show that INTEL's beta is 1.05, which shows that Intel's stock volatility is small, close to the market average, indicating that its stock price is expected to fluctuate less, and its return is relatively close to the market average. The debt ratio is 25.72%, and the current ratio is 1.57. The debt ratio is within a reasonable range, indicating that Intel's total debt control is reasonable, and there will be no debt repayment risk caused by capital chain or cash flow rupture in the short term. The current ratio is greater than 1, indicating that the short-term assets of the enterprise are greater than the total short-term liabilities, and the liquidity risk in the short term is small.

In terms of the company's profitability, according to the data of Nasdaq, Intel's Total asset turnover is only 0.03, which shows that the company's capital turnover is low, which indicates the low capital utilization efficiency of the company. The Profit Margin is about 1.77%, which reflects the low profit margin of the enterprise. The main reason is that Intel's total assets are relatively large, but its operating profit is relatively low. Therefore, Intel fails to make good use of its assets and cash flow for enterprise operation. ROA (ttm) and ROE (ttm) are 0.16% and 0.78% respectively, which shows that the operating and sales profit of the enterprise is low, which indicates that the profitability of the enterprise is poor, and the investment return is lower than the market expectation.

To sum up, Intel's risk coefficient is moderate and its profitability is poor. Intel's financial report for the second quarter of 2024 shows that the company's gross margin is 35.4%, down 5.6% from the previous quarter, lower than the market forecast value. On the one hand, due to the cyclical fluctuations of the semiconductor industry, Intel has increased investment in research and development for the sustainable development of the enterprise. Thus, affecting the company's profit margin; On the other hand, Intel's business and profit margins have been hit by the increase in AI PC products, the transition of wafer factories and other non-core business expenses. Therefore, the author believes that Intel's current stock price is in the range of volatility, the short-term market performance of the enterprise is not ideal.

4.3. Zoom Video Communication（ZM）

Zoom is a technology company incorporated in Delaware on April 21, 2011 and headquartered in SAN Jose, California. Its main business is cloud computing-based remote conferencing software services and provides computer software and mobile applications for video calling, instant messaging and business telephone systems.

Unless otherwise stated, the following data are as of the close of trading on August 14, 2024.

Table 3 statistic data of Zoom

Risk Factor		Profitability	
Market cap	$18.38B	ATO	0.26
Beta	-0.06	PM(ttm)	18.37%
Debt Ratio	0.73%	ROA(ttm)	4.77%
Current ratio(mrq)	4.46	ROE(ttm)	11.31%

As shown in Table 3, in terms of the company's risk coefficient, the data of Yahoo finance show that the beta of Zoom is -0.06, indicating that the volatility direction of Zoom's expected return rate is opposite to that of the market, and investing in Zoom's stock can hedge the risk of market volatility.

The debt ratio is 0.73%, indicating that the debt ratio of the enterprise is low and the leverage risk is small; The current ratio is 4.46, indicating strong asset liquidity.

In terms of the company's profitability, according to the data of yahoo finance, Zoom's Total asset turnover is 0.26, showing that the company's capital turnover is moderate, which indicates that the company has a good capital utilization efficiency. The Profit Margin is about 18.37%, indicating that the enterprise has relatively good profitability, and the ROA (ttm) and ROE (ttm) are 4.77% and 11.31% respectively.

To sum up, Zoom has a relatively low risk coefficient and good profitability.

5. Comparison

By comparing the financial data and public market information of the three enterprises, we can get the data as shown in the figure below. According to the data of Yahoo Finance, part of the market information of the three technology enterprises at the close of trading on August 14, 2024 is shown in Table 4.

Table 4 Comparison of Market Ratio

Firm	NVIDIA	INTEL	ZOOM
Market Ratio			
P/E(ttm)	72.11	33.97	21.93
P/B(ttm)	61.36	1.32	2.21
Dividend Yield	0.04%	1.58%	N/A
PEG(5year)	1.39	0.59	4.71

According to the data in Table 4, the P/E ratio of the three enterprises is 72.11, 33.97 and 21.93 respectively; Price-to-book ratios were 61.36, 1.32 and 2.21, respectively. Nvidia has the highest price-to-book ratio and price-to-book ratio, but the three enterprises have relatively high price-to-book ratio and price-to-book ratio, so this type of stock does not fit the investment strategy of value investor. Nvidia's PEG ratio(5year) is 1.39, Intel's PEG ratio(5year) is 0.59, compared with Zoom's 4.71. The low PEG ratio indicates that Nvidia and Intel have high expected future earnings growth rate, and the current stock price may be undervalued. This figure indicates that there may be room for the stock to rise in the short term, which is in line with the investment strategy of PEG investors. However, it can be seen from the financial data in the following chart that when Intel has the highest debt ratio, its ROA and ROE are the lowest among the three enterprises. In terms of the company's financial data and public market information, Nvidia is undoubtedly the most suitable investment target in short-term investment, because it has a low PEG ratio, and the financial information shows that the company's profitability is strong while the liquidity risk and debt repayment risk are low. The analysis shows that the recent business development is relatively excellent (Figure 1).

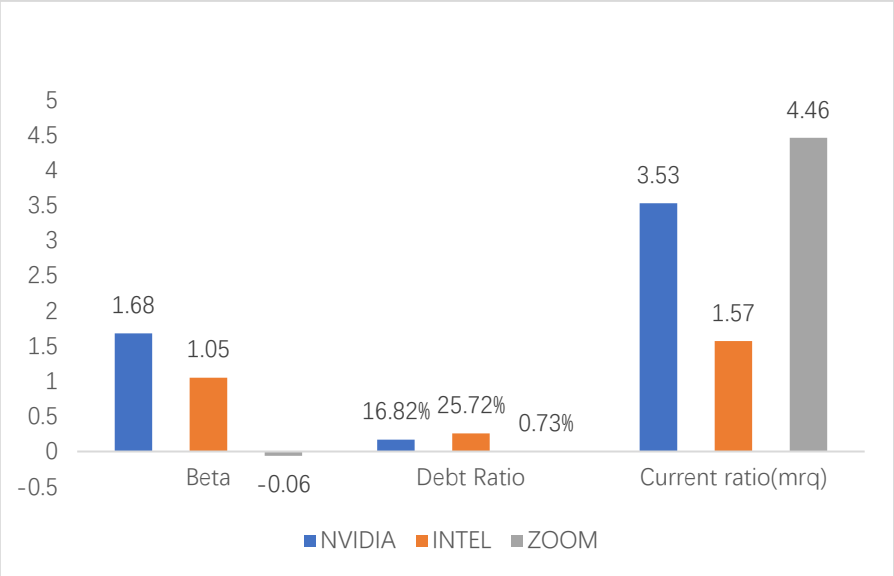


Fig. 1 Comparison of Risk Factor

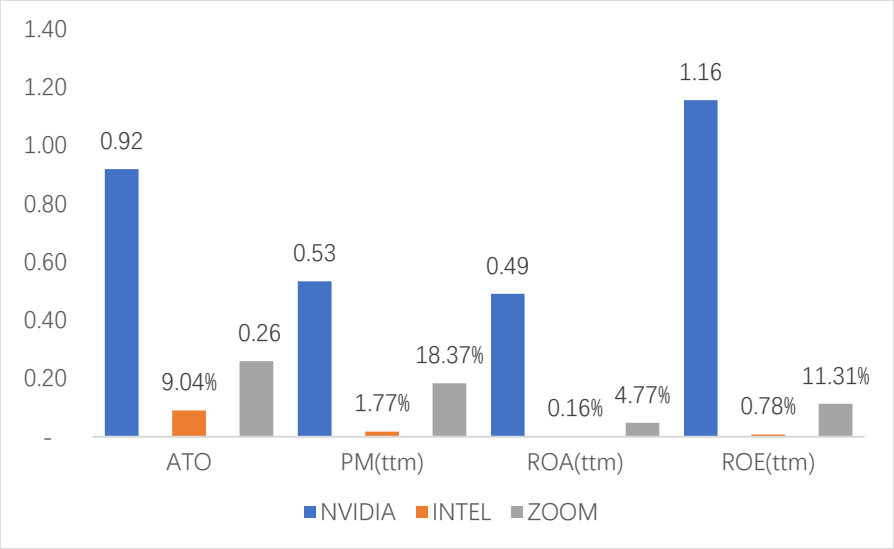


Fig. 2 comparison of profitability

Further analysis of the stocks of the three companies reveals that Intel and Nvidia are one of the constituent stocks of several stock indexes (e. g S&P500), so these two stocks are more favored by index investors (Figure 2). In addition, according to the DCF valuation model, the Nasdaq closing prices of the three stocks on August 13, 2024 local time were $111.64 (NVDA), $20.69 (INTC) and $56.65 (ZM), respectively, while the valuations were $49.58, $26.43 and $84.10, respectively. Only Nvidia's stock is higher than its intrinsic value. In long term, Zoom and Intel stocks are worth investing recently. But according to momentum trading strategy, the 200-day moving average (200d MA) of the three stocks and recent stock price are shown in Table 5.

Table 5 Comparison of Momentum

Firm	NVIDIA	INTEL	ZOOM
200d MA/recent	78.62/111.64	38.8/20.47	64.09/56.65

The information in Table 5 shows that only Nvidia's current stock price is above the 200-day moving average, so for momentum investors, only Nvidia is in line with their strategy. Data from NASDAQ show that with the exception of Intel, the remaining two companies have had insider buying activities in the past six months, making them worthy investments for investors willing to follow insiders.

In conclusion, the author believes that Nvidia is the most suitable company for short-term investment among the three companies. According to the analysis of financial statements, Nvidia's market value and profitability are the highest among the three companies. Its moderate debt ratio and low PEG ratio indicate that various market risks of the enterprise are kept within a reasonable range. According to the analysis of enterprise financial data, it can be seen that there is no obvious risk in the short term. Based on the analysis of public market information, there is momentum in the recent stock price of Nvidia, and there is insider buying behavior in the short term, which is in line with the investment strategies of most investors, including index investors, momentum investors, insider buying investors and so on.

Among the three companies, the author believes that Zoom is the most suitable company for long-term investment. From the macroeconomic and industry environment analysis, Zoom's main business is to use its own software to provide online meeting and other services for enterprise users and individual users. As a software company without hardware production, in the environment of high US dollar exchange rate and high labor cost in the United States, Zoom's revenue isn't affected by import-export price competition. As a result, it has a relatively stable profit margin over the long term. In terms of the company's development prospects, after the end of the COVID-19 epidemic, businesses such as working from home and cross-border online meetings gradually began to develop. The application of AI also serves as an effective tool for online meeting software. Compared with traditional meetings, tools such as video recording of online meetings and real-time language translation can make working more efficient. Therefore, the author believes that online meeting software will become an indispensable part of the future office. So, the future of the company's industry is relatively clear. According to DCF and fundamental valuation model, Zoom's stock price is $56.55 and its valuation is $100.71, indicating that the stock still has room for appreciation. Therefore, the author believes that Zoom is the most suitable company for long-term investment among the three companies.

6. Conclusion

Through the analysis of the financial information data and open market information of the three technology enterprises, this study obtains the enterprises suitable for long-term investment and short-term investment in the three technology enterprises, and finds a certain analysis method. For short-term investors, the investment value of an enterprise can be obtained by analyzing the company's financial data and open market information. For long-term investors, the macroeconomic environment, industry environment and the development prospect of the company's business in the country where the enterprise is located should be the issues that investors need to study in depth. DCF and fundamental valuation model can also be used to quantitatively estimate the long-term value of the enterprise.

This research method is feasible to some extent, because the financial data and public market information of enterprises are available to ordinary investors. There are quantitative standards for measuring the business performance of an enterprise. However, from the perspective of market volatility, the analysis model is not perfect for the unexpected fluctuations of the market and enterprises. Also, the long-term investment value is difficult to quantify precisely, which can be improved in the future by using statistic models.

References

[1] Sun, C. U.S. high-tech industry undercurrent (in Chinese) [N]. ECONOMIC DAILY, 2023-04-10(004). DOI: 10.28425/n.cnki.njjrb.2023.002419.

[2] Chen, H. Science and Technology Talents of China (in Chinese),2024, (02):57-62.

[3] Feng, Y. & Ren, Z. AI for the United States to "science and technology seven big reshuffles (in Chinese) [N]. Global Times,2024-02-28(011). DOI: 10.28378/n.cnki.nhqsb.2024.001178.

[4] Zhen X. America's economy heading for Recession? Global concerns (in Chinese) [N]. The global times, 2024-08-05(011). DOI: 10.28378/n.cnki.nhqsb.2024.004659.

[5] He L P. The Limited Impact of Federal Reserve interest rate hike on this round of American economy (in Chinese) [J]. International finance,2024, (02): 29-37.DOI: 10.16474/j.cnki.1673-8489.2024.02.002.

[6] Zeng, X. The fed's interest rate movements and the impact on the global financial market (in Chinese) [J]. China Forex,2024, (05): 36-40.DOI: 10.13539/j.cnki.11-5475/f.2024.05.002.

[7] Yang Xi. Investment early, investment small, investment technology banks should pay attention to the three "cooperation" [N]. 21st Century Business Herald,2024-09-03(012).

[8] Xue Jinghua, Xu Huiting. The world's major developed countries to promote industry development countermeasure of artificial intelligence research (in Chinese) [J]. Competitive Intelligence, 2024,20(02): 53-60.DOI: 10.19442/j.cnki.ci.2024.02.008.

[9] Fan, X. Intel starts 15,000 Layoffs Plan as second-quarter loss expands (in Chinese) [N]. China Business News, 2024-08-07(A09).

[10] Wu, B. & Bian, X. Ran. A-share contrarian thinking mining investment opportunity stocks technology giant long-term prospects but period (in Chinese) [N]. 21st Century Business Herald, 2024-08-09(006). DOI: 10.28723/n.cnki.nsjbd.2024.003132.