

The Impact of Federal Reserve Interest Rate Adjustments on Investments in Emerging Technology Industries

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Abstract. This paper explores in depth the multi-dimensional impact of the Federal Reserve's interest rate adjustment policy on investment in emerging technology industries. Through detailed theoretical analysis and rich data support, the paper elaborates on how the Fed's interest rate cuts effectively reduce the financing costs of the emerging technology industry, thereby promoting the acceleration of capital inflows into the field. Interest rate cuts not only directly reduce the borrowing burden of enterprises, but also significantly improve the overall liquidity of the market, enhance investors' confidence and risk appetite, which has played a positive role in promoting the improvement of market valuation and the optimization of capital flows. At the same time, this paper also carefully analyzes the long-term impact and potential risks that the interest rate reduction policy may bring, such as the excessive speculation in the market and the unreasonable allocation of resources. Ultimately, this paper aims to provide policymakers and investors with a comprehensive and in-depth view to better understand the far-reaching impact of the Federal Reserve's interest rate policy on investments in the emerging technology sector, so that they can make more informed and forward-looking decisions.

Keywords: Federal reserve; interest rate policy; emerging technology; financing costs; investor decision-making.

1. Introduction

The Federal Reserve (the United States Federal Reserve System), as one of the most influential central banks in the world, plays a core role in the formulation and implementation of monetary policy, financial market regulation, and international financial cooperation. In the complex and ever-changing global economic environment, each monetary policy adjustment by the Federal Reserve not only affects the domestic U.S. economy but also has far-reaching effects on global capital flows, investment trends, and the development of various industries. Since March 2020, the Federal Reserve has implemented a series of monetary tightening policies to address the dual pressures of slowing global economic growth and inflation. However, facing the continuously evolving global economic environment, in September 2024, the Federal Reserve decided to cut interest rates by 50 basis points. This measure aims to create favorable conditions for economic recovery by reducing corporate financing costs, enhancing market liquidity, and promoting investment and consumption.

With the deepening of global economic integration, technological innovation has become a key factor driving economic growth and enhancing industrial competitiveness. Emerging technology industries, as a concentrated manifestation of technological innovation, are becoming increasingly significant in the modern economy. However, the high-risk and high-investment nature of this industry makes it highly dependent on capital. Therefore, the potential impact of the Federal Reserve's interest rate cuts on investments in emerging technology industries has received much attention. Interest rate cuts not only reduce borrowing costs, stimulate investment, and attract more venture capital to emerging markets but also provide a more relaxed financing environment for the development of emerging technology industries.

Previous studies have shown that interest rate cuts often promote investment, drive economic growth, and attract foreign capital to markets with high growth potential by reducing financing costs.

Scholars such as Zheng Liying and Yi Xianrong have argued that the Federal Reserve's monetary policy adjustments can reshape global asset prices, influence global capital flow directions, and alter the financial market landscape, thereby significantly impacting the future global economy. Emerging technology industries, as pioneers of economic transformation and industrial upgrading, have become increasingly important in capital markets in recent years [1]. Li Xiaohua and Zhang Zuoxiang pointed out that the United States has continuously promoted the development of emerging technology industries through policy adjustments, especially in fields such as artificial intelligence and high technology, which support technological innovation and free market competition [2].

However, despite the abundance of literature on the overall economic effects of the Federal Reserve's monetary policy, there is still a lack of specific research on the impact of interest rate cuts on investments in emerging technology industries. Most previous analyses have focused on macroeconomic perspectives, lacking specialized studies on emerging industries, especially technology-driven ones. Addressing this gap, this paper will explore the direct and indirect impacts of the Federal Reserve's interest rate cut policy on investments in emerging technology industries through detailed theoretical analysis and data research. This paper not only aims to reveal the intrinsic link between monetary policy and the development of emerging industries but also hopes to provide investors with more accurate market expectations and decision-making grounds, offering theoretical support and policy recommendations for the healthy development of emerging technology industries and the sustained prosperity of the global economy.

2. Fundamentals and Mechanism of Federal Reserve Interest Rate Adjustments

2.1. The Federal Reserve's Monetary Policy Tools and Interest Rate Adjustment Methods

As the central bank of the United States, the Federal Reserve has a range of monetary policy tools to influence economic activity and achieve its policy objectives. These tools mainly include the following three aspects:

First, setting the target range for the federal funds rate. The federal funds rate is the interest rate for overnight loans in the U.S. interbank market. The Federal Reserve sets this target range by analyzing current data and predicting future economic conditions, serving as forward guidance. Raising or lowering interest rates effectively means increasing or decreasing the federal funds rate. By setting the target range for the federal funds rate, the central bank can, on the one hand, allow the public to promptly understand the content of its monetary policy, thereby shortening the response time lag; on the other hand, it can effectively guide public expectations, reduce the social cost of policy implementation, and enhance the effectiveness of the policy.

Second, open market operations. The Federal Reserve buys and sells U.S. Treasury securities in the open market to control the money supply, thereby affecting the federal funds rate and economic activity. For example, purchasing bonds increases the money supply, while selling bonds reduces it. Open market operations affect interest rate levels, which in turn impact investment, consumption, and overall demand, thus influencing the economy. When the Federal Reserve buys bonds, it increases the reserves in the banking system, which lowers interest rates and stimulates economic growth; conversely, selling bonds reduces reserves in the banking system, raising interest rates and curbing economic overheating [3]. Xue Tingyu et al. argue that open market operations, as one of the three major monetary policy tools of central banks, involve buying and selling government bonds in the financial market to control the money supply and interest rates. This is a commonly used tool by central banks in most developed and market-based economies [4]. Depending on the economic situation, if the central bank needs to tighten credit, it will choose to sell securities to withdraw part of the base currency, thereby reducing the amount of available funds for financial institutions. Conversely, when the central bank needs to relax credit, it will buy securities, expand the supply of base currency, and directly increase the funds available to financial institutions.

Third, forward guidance. The Federal Reserve influences market expectations by communicating its future policy direction, which helps stabilize market sentiment and guide economic activity. When the economy is running smoothly, countries can use traditional monetary policies to achieve economic control objectives; however, during economic downturns, with interest rates continuing to fall and approaching the zero lower bound, traditional monetary policies may fail to achieve desired effects. Therefore, central banks around the world issue forward guidance (including macroeconomic forecasts or information on future interest rate paths) to guide public and market expectations regarding the future stance or changes in monetary policy [5].

2.2. The Impact of Federal Reserve Interest Rate Adjustments on the Economic Environment

The Federal Reserve's interest rate adjustment policy has complex impacts on the economic environment, involving multiple aspects with both positive and negative effects. Jiang Shiyin et al. argue that when the Federal Reserve announces an interest rate hike, it not only affects the domestic U.S. economy but also impacts open economies, including China. After the Federal Reserve hikes interest rates, the risk of a "hard landing" in the U.S. increases, and there is depreciation pressure on the Chinese yuan, which brings numerous negative impacts on the Chinese economy. The Federal Reserve's adjustments to monetary policy have consistently impacted China's emerging markets, but the shock to the yuan's exchange rate remains within controllable limits [6].

Xu Can, based on the theory of interest rate parity, pointed out that, on the one hand, Federal Reserve rate hikes (exiting QE, etc.) lead to a narrowing of the interest rate differential between China and the U.S., causing international capital to flow back to the U.S., which is unfavorable for domestic investment in China [7]. On the other hand, rate hikes lead to the appreciation of the U.S. dollar and the depreciation of the yuan in the exchange rate market, which is conducive to improving China's export trade. Ultimately, the negative impact of Federal Reserve rate hikes (tightening monetary policy) on China's economic output is not significant. Wang Ke used the Mundell-Fleming-Dornbusch model and its extension for the context of two major countries to analyze the possible spillover effects of Federal Reserve rate hikes on China's output. He proposed that the spillover effects of the Federal Reserve's tightening monetary policy would be transmitted to China's output through interest rates, exchange rates, trade, and signaling channels. He concluded that, during two rate-hike cycles, the spillover effects of Federal Reserve rate hikes on China's output were consistently positive, with the impact gradually weakening over time [8].

3. Investment Characteristics and Current Situation of Emerging Technology Industries

The investment characteristics of emerging technology industries are mainly reflected in the following aspects: high capital demand, high risk, and significant policy sensitivity. First, high capital demand is one of the core characteristics of emerging technology industries. Due to the high cost of research and development and the long-term return cycle, capital support is crucial for their development. For example, companies in the clean energy and artificial intelligence sectors require long-term investments to achieve technological breakthroughs, which makes their reliance on funding significantly higher than traditional industries [9]. Second, the high risk of emerging technology industries is reflected in market uncertainty and the uncertainty of technology development, leading traditional financial institutions like banks to be cautious in supporting these enterprises. Instead, most capital comes from venture capital and private equity investments [10]. Therefore, the activity of the capital market is highly correlated with the investment scale in these industries.

Policy sensitivity is another important characteristic of emerging technology industries. Government policy support, such as tax incentives, research and development subsidies, and favorable financing environments, often directly determines the development speed and scale of these industries [11]. For instance, the Federal Reserve's interest rate cuts serve as an example of how an accommodating monetary policy can lower financing costs, which not only improves the ability of

companies to acquire capital but also stimulates investor interest in high-risk, high-return industries [12]. Especially during the 2024 rate-cutting cycle, the massive influx of venture capital and cross-border capital further drove the growth of emerging technology industries, creating significant investment opportunities in the fields of artificial intelligence and clean energy.

In terms of the current situation, the global investment scale of emerging technology industries has continued to grow. For example, in 2023, the total investment in artificial intelligence and blockchain technology reached 1.5 trillion USD and 800 billion EUR in the United States and the European Union, respectively, with year-on-year growth rates of 15% and 10% [13]. Meanwhile, emerging markets in the Asia-Pacific region have also attracted a large amount of international capital, especially China, India, and Vietnam, which have achieved rapid development in related technological fields through policy support and capital introduction. In the field of artificial intelligence, China accounts for nearly 30% of global investment, indicating its rapid rise in the emerging technology sector.

In summary, as an important growth driver of the global economy, emerging technology industries have a high reliance on the capital environment and policy support due to their high capital demand, high risk, and policy sensitivity. As global capital markets increasingly focus on technological innovation, the investment potential of emerging technology industries is expected to expand further in the future. However, the high risk and uncertainty of long-term returns also require higher levels of expertise from investors. Balancing risk and return will be a major challenge for investors in emerging technology industries.

4. The Impact of Federal Reserve Interest Rate Adjustments on Investments in Emerging Technology Industries

4.1. Financing Costs and Investment Opportunities

The Federal Reserve's interest rate adjustment policies directly affect market interest rates, which in turn influence the financing costs for emerging technology industries. When the Federal Reserve raises interest rates, borrowing costs increase, which may reduce investment opportunities in emerging technology industries, as higher-cost capital can hinder business expansion and innovation activities. Conversely, when interest rates are lowered, financing costs decrease, making it more likely for companies to invest, thereby promoting technological innovation and industrial growth.

4.1.1 The impact on financing costs

Federal Reserve interest rate adjustments directly affect the financing costs of emerging technology industries. During an interest rate hike cycle, rising interest rates lead to higher borrowing costs for companies, increasing the difficulty of financing. For emerging technology companies that rely heavily on funding for research and market expansion, a high-interest-rate environment undoubtedly increases their financial pressure. For example, during the Federal Reserve's rate hike, some start-up companies may face survival difficulties due to challenges in obtaining low-cost funding, and venture capital also decreases accordingly, reducing the number of unicorn companies and IPO activities [14].

However, during a rate cut cycle, the situation is quite the opposite. Lowering interest rates means reduced borrowing costs and increased availability of capital, allowing emerging technology companies to obtain cheaper financing. This not only helps ease their financial pressure but also promotes more active investment and financing activities. For areas like innovative pharmaceuticals, which require high investment, carry high risk, and offer high returns, interest rate cuts will reduce financing difficulties and promote their research and market expansion [15].

4.1.2 Mechanism of promotion

Lowering interest rates not only reduces financing costs but also indirectly promotes the development of emerging technology industries by boosting market confidence and economic vitality.

During a rate cut cycle, the macroeconomic environment improves both domestically and internationally, investment conditions improve, and market confidence strengthens. This helps increase investors' optimism about emerging technology industries, thereby increasing investment. Additionally, interest rate cuts enhance capital market liquidity, making it easier for investors to allocate funds to emerging technology industries. In a market environment with ample liquidity, emerging technology companies are more likely to receive funding support, accelerating their technological innovation and market expansion.

4.2. Investor Sentiment and Risk Appetite

Federal Reserve interest rate adjustments have a significant impact on investor sentiment and risk appetite. During an interest rate hike cycle, rising interest rates and increased financial market volatility often make investors more cautious and pessimistic. They tend to allocate funds to low-risk, low-return traditional industries and reduce investment in emerging technology industries. Such changes in sentiment may lead to lower valuations and fewer investment opportunities in emerging technology industries. However, during a rate cut cycle, investor sentiment is usually more optimistic and proactive. Investors are more willing to take on risks in pursuit of high returns. Lower interest rates reduce borrowing costs and increase market liquidity, making it easier for investors to allocate funds to emerging technology industries. Additionally, interest rate cuts may trigger "momentum-chasing" behavior among investors, further boosting valuations and increasing investment opportunities in emerging technology industries [16].

4.3. Market Valuation and Capital Flows

The Federal Reserve's interest rate policies also affect market valuation and capital flows. Higher interest rates may lead to lower market valuations because investors require higher returns to compensate for increased borrowing costs. This may suppress capital inflows into emerging technology industries, as investors may seek more stable returns. Conversely, lower interest rates may lead to higher market valuations, attracting more capital to flow into emerging technology industries.

4.3.1 Changes in market valuation

Federal Reserve interest rate adjustments directly impact the market valuation of emerging technology industries. During an interest rate hike cycle, reduced investor risk appetite and increased funding costs tend to suppress the valuation of emerging technology industries, potentially leading to the undervaluation of some high-quality companies and missed investment opportunities.

However, during a rate-cut cycle, the market valuation of emerging technology industries tends to improve. Lowering interest rates reduces capital costs and improves market liquidity, making it easier for investors to allocate funds to these high-growth industries. Additionally, interest rate cuts may trigger a "herd effect" among investors, further driving up valuations in emerging technology industries.

4.3.2 Impact on capital flows

Federal Reserve interest rate adjustments also influence investments in emerging technology industries by affecting capital flows. During an interest rate hike cycle, the appreciation of the U.S. dollar and tighter global liquidity exert pressure on capital outflows from emerging markets. This may lead to a shortage of funds and financing difficulties for emerging technology industries.

However, during a rate cut cycle, the situation is different. Lowering interest rates reduces the attractiveness of U.S. dollar assets, making it easier for global capital to flow into emerging markets. This helps ease funding pressures in emerging technology industries, promoting their rapid growth. Furthermore, interest rate cuts may spark enthusiasm for "cross-border investments," further driving capital inflows into emerging technology industries.

5. Conclusion

This paper examines the impact of Federal Reserve interest rate adjustment policies on emerging technology industries, analyzing their mechanisms and effects from the perspectives of financing costs, investor sentiment, risk appetite, and capital flows. The analysis shows that, as a high-risk, high-investment, and high-return industry, emerging technology industries are particularly sensitive to the capital environment and policies, and Federal Reserve monetary policy adjustments have profound effects on investments in these sectors.

During a rate cut cycle, the Federal Reserve significantly reduces corporate financing costs by lowering the federal funds rate, providing a more accommodating funding environment for emerging technology companies. This reduction in financing costs is especially significant for capital-intensive industries such as artificial intelligence and clean energy, which require long-term and high-cost funding for research and market expansion. The rate-cut policy not only reduces borrowing difficulties for these companies but also stimulates the growth of investment activities by improving the financing environment. Particularly after the Federal Reserve's 50 basis point rate cut in 2024, a large influx of capital entered the emerging technology industries, promoting technological innovation and market expansion in related fields.

In addition to direct financial support, the positive impact of rate cuts on investor sentiment and risk appetite is also an important driver of growth in investments in emerging technology industries. Interest rate cuts, as a signal of an accommodative monetary policy, boost market confidence, significantly increasing investors' interest in high-risk, high-return sectors. This positive sentiment attracts more capital to flow into emerging technology industries and drives up the valuations of related companies. For example, under the rate-cut environment, technology stocks in sectors such as artificial intelligence and biotechnology performed strongly, indicating an optimistic outlook for these high-growth industries.

At the same time, Federal Reserve interest rate adjustment policies also indirectly affect the development of emerging technology industries through international capital flows. During a rate-cut cycle, the decline in yields on U.S. dollar assets makes international capital more inclined to flow into emerging markets and high-growth sectors. This change in capital flows has injected vitality into technological development in emerging economies. For instance, China, Vietnam, and other Asia-Pacific countries have strengthened their global competitiveness in clean energy and artificial intelligence by attracting cross-border capital.

Although rate cuts have significant short-term effects on emerging technology industries, their long-term impact needs to be analyzed in combination with actual policies and market dynamics. On the one hand, the effects of rate cuts take time to transmit to enterprises; on the other hand, prolonged low-interest rates may lead to excessive market speculation or resource misallocation. Therefore, although rate cuts provide opportunities for the development of emerging technology industries, investors must still balance risk and return, avoiding blind optimism or over-reliance on accommodative policies.

In conclusion, the Federal Reserve's interest rate policies provide significant support for the development of emerging technology industries by reducing financing costs, boosting market confidence, and adjusting capital flow directions. As a key driver of global economic growth, the reliance of emerging technology industries on funding and policies places them at a critical position in monetary policy adjustments. In the future, as global demand for technological innovation continues to grow, the investment potential of emerging technology industries will continue to be unleashed. At the same time, this also places higher demands on policymakers and investors—to use effective policies and investment strategies to promote healthy industrial development and achieve long-term economic prosperity.

Authors Contribution

All the authors contributed equally and their names were listed in alphabetical order.

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