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Dynamic Changes in US Financial Market under Fed's Rate Hike: Past, Present and Prospect

Jiarui Chen[1,a,*]

[1]Anhui University, Economics School of Anhui University, Hefei, 230601, China
a.i02114343@stu.ahu.edu.cn
**corresponding author*

Abstract: In March 2022, the Federal Reserve began a new round of interest rate hike. Until February 2023, Jerome Hayden Powell, the incumbent chairman of Fed, still indicated that the continuation of the interest rate hike policy is still appropriate. Many significant changes have occurred in the financial markets over the past year, however, limited information is currently available to analyze the impact of the new round of Fed rate hike policy. This paper analyzes data of the U.S. dollar index, the Nasdaq 100 index and multiple secondary sources, applies economic principles such as the J-curve effect, cites examples from Japan, Sri Lanka and China, and finds that the U.S. financial market is in an overall sustained tightening state under the interest rate hike policy, and the international financial market will have to cope with more debt and trade challenges. This paper's analysis is of great reference value to the investment decisions of the government, banks, enterprises and individuals.

Keywords: fed rate hike, financial market, stronger dollar, the J-curve effect, investment decisions

1. Introduction

Since the outbreak of the New Crown epidemic in early 2020, the U.S. economy has inevitably been hit by this global public health crisis. In response to the impact of the New Crown pneumonia epidemic, the U.S. implemented aggressive monetary and fiscal policies, and aggressive U.S. macro policies became an important driver of this round of inflation. The Fed's massive liquidity injection has led to a flood of liquidity in the market. From April 2020 to February 2022, the federal funds rate averaged 0.08% per month, and the Fed implemented a zero-interest rate policy for about two years until the first 25 basis point rate increase was announced in March 2022. The Fed's total assets expanded rapidly from approximately \$4.2 trillion at the end of February 2020 to nearly \$9 trillion at the end of March 2022, an expansion of approximately 110 percent. "The Coronavirus Assistance, Relief, and Economic Security Act, enacted in March 2020, and the American Relief Program, introduced in March 2021, provide economic impact payments to eligible individuals and families. The U.S. used its fiscal deficit to issue three massive rounds of epidemic relief for residents, which substantially raised the income of U.S. residents, and each massive round of fiscal disbursements quickly pushed up the savings rate of U.S. residents and provided an income base to stimulate consumption [1]. In response to continued domestic inflation in the U.S., the Fed began a new round of interest rate hikes in March 2022 and as of early February 2023, the Fed has indicated that continued rate hikes are appropriate.

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How broad is the ripple effect of the Fed's rate hike policy? What is the extent of the impact on the banking sector, foreign exchange markets and financial market's sub-markets? How will market participants and countries respond to the possible challenges? The solution to the above questions must be analyzed based on the tightening of the Fed's monetary policy.

The rest of the paper is organized in this order: Section 2 explores the impact of the Fed's rate hike on the banking sector from two perspectives: changes in bank financing costs and changes in corporate financing costs; Section 3 explores the impact of the Fed's rate hike on the foreign exchange market from two perspectives: the strengthening of the U.S. dollar and changes in the international trade pattern; Section 4 explores the impact of the Fed's rate hike on the financial market sub-markets from two perspectives: the U.S. bond market and the U.S. stock market, and explores the impact of the Fed's rate hike on the international financial market.

2. Banking Sector

The direct purpose of the Fed's interest rate hike is to raise the borrowing cost of commercial banks from the central bank and to suppress malicious speculation by raising the bank offered rate, thus raising the cost of short-term financing in the financial market. This impact can be analyzed in two ways depending on the subject as follows: bank financing costs and corporate financing costs.

2.1. Changes in Bank Financing Costs

Since June 2022, bank financing has become increasingly difficult as the Fed raises rates and shrinks its balance sheet (QT). Since the Fed's balance sheet reduction six months ago, the Fed's balance sheet has shrunk by about $330 billion to about $8.58 trillion at the end of November; banks' reserve balances have shrunk by $305 billion to about $3.05 trillion, twice as much as before the outbreak [2]. Short-term funding rates have risen as banks return to the market for cash, while balances in the Fed's reverse repurchase facility have begun to dwindle, signs of funding stress. Banks are now turning to other sources of funding as the Fed's shrinking balance sheets and rate hikes have caused savers to move cash out of banks and into other higher-yielding options. For the assessment of bank financing pressure, the tool of "discount window" can be used, which is generally the last channel of funds for banks. Banks borrow funds from the central bank with short-term treasury bills, government bonds and commercial loans as collateral. The balance of the discount window has increased from almost zero at the beginning of 2022 to the current US$5.9 billion, and at one point rose to US$10.1 billion at the end of November (the highest level since June 2020) [3].

There are several possible reasons for the increasing use of the discount window by banks. First, interest rates remain high, and financing pressure on small banks has increased. To improve liquidity, some smaller banks may find that discount window rates are less costly than other funding instruments, making the discount window more likely to be their first choice.

In addition, in order to deal with liquidity risks, major banks have increased their precautionary preparations. Due to the sharp increase in interest rates by the Federal Reserve, the large losses in bank securities investment portfolios have not only brought about the problem of asset decline, but also caused potential liquidity problems. As the Fed shrinks its balance sheet, liquidity in the financial system is drying up, deposits are dwindling (currently mainly in large banks), funding pressures are rising, and borrowing costs are rising.

2.2. Changes in Corporate Financing Costs

Against the backdrop of the Fed's interest rate hike, as bank loans are an important financing channel for enterprises, the interest rates on loans from banks to enterprises will increase accordingly,

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resulting in higher financing costs and narrower profit margins for enterprises. In this situation, the methods and strategies for enterprises to cope with the challenge are worth analyzing.

A monthly survey of business owners by the National Federation of Independent Business (NFIB) found that the percentage of business owners who see financing as their biggest business problem has surpassed the highest level since the Federal Reserve's last rate hike in December 2018. Sixty-two percent of business owners said they are now "not interested" in applying for a loan [4]. As companies generally have a negative attitude toward increased interest rates on bank loans, they can try to diversify their funding sources by broadening their access to financing. First, listed companies can consider issuing additional shares to expand their financing. Because equity financing does not require interest repayment, enterprises are less burdened and possess lower financing risks. At the same time, the stock market itself provides more opportunities for enterprises to adjust their own asset structure, which is conducive to enhancing the integration ability of enterprises and adjusting their governance structure. Second, companies can consider bond financing. Compared with the above-mentioned equity financing, the interest payable on bonds is paid before tax and the burden on the company is lower compared to equity financing. In addition, creditors usually do not have the right to participate in corporate decision-making, and business owner can better control the company compared to equity financing. The interest enjoyed by creditors is generally fixed, so companies have the opportunity to use financial leverage and enjoy a net increase in profits if the company's revenue increase is greater than the interest payable on the bonds. Plus, companies can opt for financial leasing. In many cases, due to the credit problems of small and medium-sized enterprises to obtain bank loans, will also face, such as the current loan interest rate increases, the choice of financial leasing can obtain the benefits of the project’s own output. At the same time, compared with bank loans, the lessee company is able to adjust the repayment period at any time according to its own actual business situation, and adopt the method of deferred payment, etc. The burden of repayment at maturity is light, and after the lease expires, the lessee company can also purchase the rental equipment it has used and make the equipment its own asset.

3. The Foreign Exchange Market

The Fed's interest rate hike will not only have a direct impact on banks, but will also have a direct impact on the exchange rate of the U.S. dollar, contributing to the appreciation of the dollar and the depreciation of other countries' currencies, causing an outflow of funds from other countries into the United States. In addition, the Fed's interest rate hike will also affect depositors' willingness to deposit, prompting them to increase their bank deposits, resulting in less income for consumption, indirectly reducing foreign exports to the U.S. and creating a shock to international trade. Therefore, the impact of a stronger U.S. dollar and the changes in the international trade pattern deserve analysis.

3.1. Stronger US Dollar

Since the Federal Reserve began raising interest rates in March 2022, the U.S. dollar has shown an increasing trend of strength (please see Figure 1, solid line is USD index and dotted line is linear estimation). There are two elements that tend to drive the strength of the dollar, namely the Fed's monetary policy and the state of the U.S. economy on investor expectations. If the Fed keeps raising interest rates and keeps the dollar at a high level, the return on investment in the U.S. for companies and individuals from other countries will increase accordingly, resulting in a continued influx of capital from other countries into the U.S. For the U.S., a strong dollar means cheaper domestic imports and better ability to deal with inflation.

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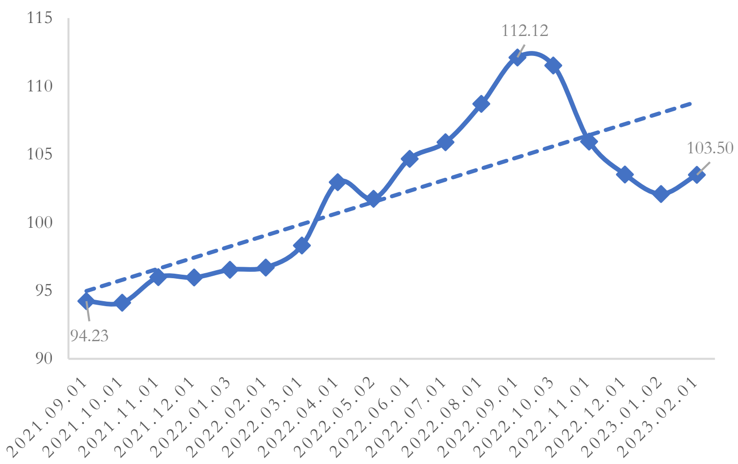

Figure 1: USD index (with trendline).
Data source: Investing [5]
Photo credit: Original

For the rest of the world, it is suffering from the impact of the strong dollar. In Japan, for instance, Japan has not abandoned its "zero interest rate" policy so far, and the sharp fall in the yen's exchange rate has led to a steep rise in production costs for Japanese firms, and a severe devaluation is also damaging the interests of Japanese firms. The Central Bank of Japan announced after its monetary policy meeting on December 20, 2022, that it would partially adjust its current ultra-loose monetary policy by extending long-term interest rate fluctuations from plus or minus 0.25% to plus or minus 0.5% [6].Always take the "zero interest rate" policy of Japan under the impact of yen "diving" and the the rising dollar, also need to adjust the yield curve control plan to relax the YCC monetary policy, see the impact of the continued strength of the dollar is strong.

3.2. Changes in the International Trade Pattern

The Fed's interest rate hike is the main driver of the stronger U.S. dollar, and changes in bilateral exchange rates between each country's currency and the U.S. dollar can have a direct impact on international trade, such as import and export trade. From the perspective of trading countries other than those with the U.S. dollar as legal tender, currency depreciation leads to an increase in the import cost of raw materials and intermediate products for products manufactured in that country, while if the relative price of domestic exports in the U.S. due to currency depreciation decreases, and when the relatively low price advantage brought about by exchange rate fluctuations can offset the increase in product production costs, it is beneficial for trading countries to increase exports in the U.S. Hence, the domestic consumption of the product will be somewhat suppressed due to the price increase, while the export of the product is likely to benefit. In terms of imports, a decline in the exchange rate of the importing country's currency will cause it to depreciate, and the translation of the foreign currency price of imported goods into the importing country's currency will cause the price of goods expressed in the importing country's currency to rise, reducing domestic consumption demand in the importing country and thus leading to a reduction in imports.

In the analysis of trade, it is necessary to consider the J-curve effect, also known as the "time lag effect", which means that a currency devaluation does not immediately lead to an improvement in the country's trade balance, but rather increases imports and decreases exports for a certain period of time before an increase in trade revenue occurs. One is the price effect, and the other is the quantity effect. The price effect means that the local currency price of the imported product will increase due to the

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depreciation of the local currency while the quantity of the imported product remains unchanged, leading to a deterioration of the trade balance. The quantity effect means that as a result of currency devaluation a country's exports are relatively less expensive while its imports are more costly, resulting in an increase in exports and a decrease in imports. If the quantity effects of exports and imports exceed the price effects, currency depreciation increases net exports, which will contribute to the trade balance. Under the above premise, the quantity effect has different effects in the short and long run because consumers and producers need a certain period of time to react to exchange rate changes. In the short run, the quantity effect is weak and hardly exceeds the price effect, so the currency depreciation leads to a deterioration of the country's trade balance; in the long run, the quantity effect is so significant that it can offset the price effect and improve the trade balance for the country. In the face of the J-curve effect, a country's expectation of increased trade revenue from currency depreciation should be cautious. In the context of the Fed's interest rate hike, a larger and longer lasting change in the exchange rate leads to a durable change in a country's trade type, and even if the Fed's interest rate hike policy ceases to be implemented and the exchange rate returns to its original relative level, the country's trade type will not automatically switch to its original form.

4. Other Sub-markets of Financial Market and International Financial Market

Under the Federal Reserve’s policy of raising interest rates and shrinking its balance sheet, the money supply in the market decreases, which in turn has a significant impact on the financial markets. The analysis of this issue can be specified according to three classifications: the U.S. bond market, the U.S. stock market and the international financial market.

4.1. Changes in the U.S. Bond Market

The U.S. bond market could be said to have gone through almost a full year of difficult turmoil in 2022.In 2022, seven interest rate hikes by the Federal Reserve, raising rates from around 0% to 4.25% to 4.50%, combined with unfavorable factors such as high inflation and slowing economic growth, depressed bond prices, which move inversely to yields, causing the Bloomberg U.S. Aggregate Bond Index to fall 15%, the worst performance since the creation of this index in 1976 [7].Against the backdrop of the Fed’s interest rate hike, bond yields increase and investors tend to sell bonds due to the lower coupon rates of the issued bonds, resulting in lower bond prices and higher bond yields. The rise in bond yields will bring about an increase in the risk of national debt service and a decline in national credit, and investors will tend to give up their bond holdings and sell them instead to buy stocks, futures and other investment products.

The continued high level of inflation is an important reason for the changes in bond markets in developed countries such as the United States. In the case of Treasury bonds, for example, the nominal yield is only equal to the real yield when the issue price of the bond and the face value of the bond remain constant. One way to price Treasury yields is by adjusting inflation compensation on top of the real rate to get the nominal rate, and high inflation in the U.S. in 2022 has been the trigger for the rise in U.S. Treasury rates. On February 10, 2022, the Bureau of Labor Statistics released data showing that the U.S. CPI rose 7.5% year-over-year in January, accelerating again to the highest level since March 1982, above expectations of 7.3% and also above the previous value of 7.0%. This is the ninth consecutive month that the figure has been at or above 5%, and the CPI increased unexpectedly by 0.6% in January from a year earlier, compared with an expected 0.4% increase and a previous 0.5% increase [8]. When the Fed implements a policy of interest rate increases with the possibility of upward inflation, nominal interest rates in the economy must adjust accordingly to coincide with the fact that real interest rates in the economy are roughly unchanged.

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4.2. Changes in the U.S. Stock Market

The Fed's interest rate hike on the one hand represents an increase in deposit rates, on the basis of which investors are more willing to save money in banks. On the other hand, the interest rate hike policy will make loan interest rates rise, even for the banking sector, the increase in loan interest rates gives banks the opportunity to earn more profits, but the interest rate hike may inhibit the scale of credit, leading to a decline in banks' business volume, in addition to the shrinkage of funds in the market and the fall in asset prices, which will also be negative for bank stocks. The effect of the interest rate hike policy on the stock market is that companies have difficulty financing after the loan interest rates are raised, resulting in lower cash flow and less money being put into the stock market. It is effective to follow the Nasdaq 100 index to analyze the U.S. stock market.

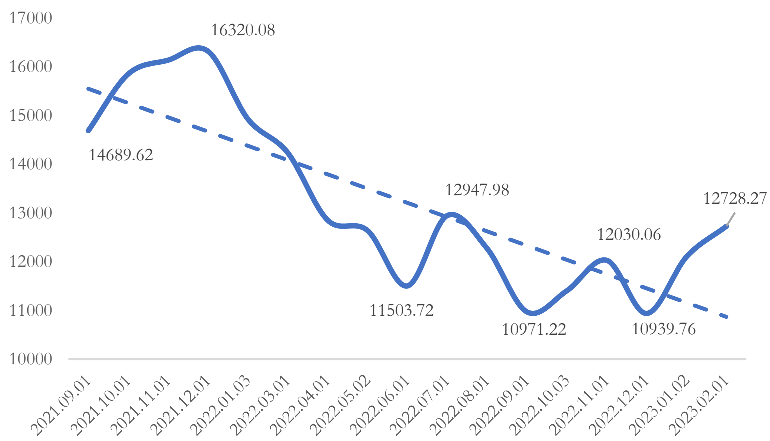

Figure 2: Nasdaq 100 index (with trendline).
Data source: Investing [9]
Photo credit: Original

Before the Fed rate hike in March 2022, to after the rate hike until February 2023, the Nasdaq 100 showed a downward trend in volatility (please see Figure 2, dotted line is linear estimation), implying that its constituents as a whole were in a downward trend at this time, indicating that there were more sell orders in the U.S. equity market and that capital outflows outweighed capital inflows, causing the index to fall. Goldman Sachs said in its latest report that the past month's rally in U.S. stocks may have been the best of the year, and it will be difficult to see such a rally again this year. The bank's chief U.S. equity strategist David Kostin said investors are betting that the U.S. economy will achieve a soft landing, growth is expected to be above-trend level, and the above scenario has been factored into prices. In addition to these reasons, Goldman Sachs believes that weak corporate earnings will also constrain the performance of U.S. stocks, and even if the U.S. economy avoids recession, corporate earnings are unlikely to grow significantly in 2023 [10].

4.3. Changes in International Financial Markets

Against the background of the Fed's continued interest rate hikes, international financial markets have been shaken, mainly in the following three aspects.

First, economies outside the U.S. are caught in an internal and external policy dilemma and may face a deterioration of their economic situation. According to the Mondale-Krugman the impossible triangle theory, that is, independent monetary policy, exchange rate stability, and free movement of capital, each of them has its own attraction and the three goals cannot be achieved simultaneously. As global dollar liquidity decreases, economies run the risk of capital outflows, and in order to reduce capital outflows and local currency depreciation, they are likely to adopt interest rate hiking policies in their own countries at the same time, leading to higher interest rates and higher financing costs for their companies, dampening the economy's newly recovered vitality from the new crown epidemic.

Second, the risk of a debt crisis has emerged as the Fed's interest rate hike has increased the burden on countries holding dollar-denominated debt. Take the example of Sri Lanka's national bankruptcy in July 2022. Sri Lanka's two successive central bankers were convinced that "there is no need to worry about government debt" and advocated increasing the proportion of domestic debt, arguing that the government can safely expand spending and use the fiscal deficit to support employment and public goods.42% increase in Sri Lanka's money supply in less than two years from December 2019 to August 2021, with inflation of 12.1% in 2021, The inflation rate of food items, which are closely related to people's lives, reached a record 22.1%.Foreign exchange reserves plummeted by more than 70% [11].In addition to the high level of debt of the Sri Lankan government, the continuous increase in international food and oil prices overwhelmed the Sri Lankan economy and Sri Lanka eventually went bankrupt. This is a wake-up call for the debt situation of emerging economies, i.e. developing countries with faster growing economies. According to the Institute of International Finance (IIF), debt levels in emerging market economies have risen significantly in recent years. Total outstanding debt has jumped from less than $65 trillion about five years ago to nearly $100 trillion by the end of 2021 [12].2023 is still at the peak of debt service in emerging economies, and short-term debt accounts for a larger share of emerging economy markets may have higher riskiness.

Third, in international trade due to the Fed's continued interest rate hikes in the downward phase, countries will face more trade difficulties. Third, due to the Fed's continued interest rate hikes, international trade is in the downward phase, countries will face more trade difficulties. Take the Chinese economy as an example, since the trade war between China and the United States in 2018, the Chinese economy has started an attempt to build a "new development pattern with a major domestic cycle and a dual domestic and international cycle to promote each other". Simultaneously, China is currently facing shrinking overseas demand, if this situation continues, it will have a direct negative impact on the development of China's manufacturing industry.

5. Conclusion

This paper finds that, first of all, banks' liquidity decreases as a result of the increasing use of the discount window under the Fed's continuous interest rate hikes, and banks face greater funding pressure, while companies' financing costs increase significantly due to higher bank lending rates, which means that those companies face greater operating pressure; secondly, the trend of a stronger U.S. dollar makes it challenging to maintain the exchange rate of national currencies represented by the Japanese yen, and a stronger U.S. dollar also has a profound impact on the development of international trade, bringing about changes in the flow of national products and services and thus promoting the adjustment of international trade patterns; Third, the Federal Reserve in order to cope with inflation and suppress aggregate demand, resulting in the U.S. bond market to maintain high interest rates, while the parallel law of rising bond rates in the United States and Europe will jointly promote the rise in the cost of funds in the international financial field, while the high U.S. domestic interest rates for the U.S. economy brought a greater risk of recession, enhancing the downturn in the U.S. stock market sentiment; in addition, the Fed's interest rate hike has brought negative impact on the economic growth, debt risk and foreign trade status of other countries, which has made the international financial market suffer a big impact.

Therefore, as the international financial markets are suffering from significant volatility against the backdrop of the Fed's interest rate hike, the continued high interest rates and the risk of recession have sounded the alarm for a new international financial crisis, and governments, banks, enterprises and individuals must manage risk well and make investment plans more prudently.

Here are some suggestions. For the government, it should objectively assess the country's economic situation, strengthen the supervision and management of market players, curb malicious speculation and regulate the market order. For banks, they should make a good risk assessment, determine the real situation of investment objects before deciding whether to invest, and follow the principle of diversification to reduce the occurrence of risky situations. For enterprises, they should do a detailed market survey, make a good business plan, and stop making arbitrary decisions. In addition, they should pay attention to the investment portfolio, do a good audit, adjust the budget arrangement according to the actual situation, and improve the financial management method. For individual investors, they should be careful of the false impressions they may face when managing their finances, think more in the opposite direction, and abandon the mentality of fluke, correctly measure investment returns and risks, in addition to choosing a variety of investment tools to achieve diversification of financial tools.

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