Research on Gold Price Changes and Factors Under the Background of Fed Interest Rate Hike

Yijie Xu*

School of statistics and Mathematics, Zhongnan University of Economics and Law, Wuhan, China

*Corresponding author: ddale60975@student.napavalley.edu

Abstract. With the change of international form, the gold market is changing rapidly. In 2021, the U.S. stagflation was serious, so in 2022, the Federal Reserve adopted a series of interest rate hikes, coupled with the impact of the conflict between Russia and Ukraine. As a safe haven product, the price of gold fluctuated greatly in the short term. As an important commodity, gold is crucial to judge its price change trend. This paper mainly analyzes the U.S. monetary policy from 2022 to 2023. By studying the reasons and background of the promulgation of monetary policy, it judges the causes of the Federal Reserve's interest rate increase, and judges the background of joint inflation and regional conflict according to the international form in 2022. Combined with the change trend of gold price, it makes a joint analysis, and gets the impact trend of the Federal Reserve's interest rate increase on gold price from 2022 to 2023. Finally, it comes to the conclusion that the increase of interest rate will lead to the decline of gold price. In the early stage of interest rate increase and a large number of interest rate increases, the gold price is more affected by the increase of interest rate, so it is suitable to short gold at this time, while in the late stage of interest rate increase and the slowdown of interest rate increase policy, the gold price is more affected by other factors, so it is suitable to long gold at this time.

Keywords: Federal Reserve; Interest rates; Gold price; Monetary policy; Investment plan.

1. Introduction

1.1. Background

Gold is an important asset in the financial market. Before the collapse of the Bretton Woods system, the US dollar is linked to gold and the gold worked as currency. After the collapse of the Bretton Woods system, although the US dollar was separated from gold, gold remained an important part in financial market as a product. Many countries store up gold as an important international reserve, so nowadays gold still plays a partial role as currency. Meanwhile, as an investment commodity, gold holds a position comparable to crude oil in the financial market, affecting the financial market. Since 2017, under the influence of trade friction between China and US, the COVID-19 epidemic, the international economic downturn and other events, the price of gold has fluctuated significantly. Finding out the factors that affect the price of gold and judging the trend of gold price are issues that investors cannot ignore.

1.2. Related research

Wu used the vector error correction model to analyzed the influencing factors of gold prices in 2023. The author found that there were three main influencing factors: the Supply and demand relationship, the impact of financial markets, the occurrence of unpredictable events. And the effect of trade friction between China and US had the greatest impact when the tax hike policy has just been implemented, after which the impact decreased [1]. Zhang analyzed the the supply and demand situation of the global gold market to judged the the value of gold as asset allocation in 2022. The author found that the market scale of gold ETF will continued to rise and the central bank's demand for gold increased, so the potential for gold to rise in the future is large, making it suitable for asset allocation [2]. Zhu used the CFETS Index to analyzed the relationship between the exchange rate of RMB, the US dollar Index and the gold price in 2022. The author found that the US dollar index showed a weak positive correlation with the RMB exchange rate, while the gold price showed a weak negative correlation with the RMB exchange rate and there was a certain lag in changes [3]. Zhang analyzed the impact of the COVID-19 on gold prices from 2019 to 2022 in 2022. The author found that the COVID-19 in 2019 and 2020 made the gold price rise significantly, while since 2021, the gold price has reduced which due to three main reasons: the increase of vaccination rate, the global economic recovery and the continued transmission of tightening expectations by the Federal Reserve [4]. Zong analyzed the gold market and found the reason why the price of gold increased in 2020. At the beginning of 2020, US stock market circuit breaker, intensified market panic, and increased demand for gold as a safe haven product. In the second half of 2020, due to a rebound in interest rates and a reduction in the impact of the COVID-19, coupled with a decrease in demand for gold by the central bank and consumers in 2020, the price of gold began to gradually decline after August 2020 [5]. Zhen focused on the analysis of the impact of uncertain factors, namely the uncertainty of economic policies and the impact of investor sentiment. The author found that the short-term fluctuations in gold prices were influenced by expectations and economic policies, and the longer the time, the smaller the impact. But in situations of extreme policy uncertainty, the sentiment of investors had a significant impact on long-term fluctuations in gold prices [6].

Shang used the VAR model and MS-VAR model and theory in Microeconomics to analyzed the empirical data in 2022. The author found that a tight monetary policy would lead to a decrease in gold prices, an expansionary monetary policy would lead to an increase in gold prices, and the impact of a stable monetary policy was smaller. Meanwhile, different monetary policies had different channels of impact on gold prices [7]. Wang analyzed the price change of gold by through the inherent properties of gold: financial attributes, commodity attributes, and hedging attributes in 2021. And most researchers only focused on financial attributes in the past. The authors found that in these three properties the gold still had the value to be invested [8]. Wang conducts an empirical analysis of non market factors using the GARCH model in 2019. And used the VIX index to reflecting the sentiment of investors. The authors found that the long-term impact of unexpected events on gold prices was gradually weakening, the impact of the events on prices was not immediately to emerged, and the impact varies across different periods [9].

Libo and Yiyi based on the perspective of macroeconomic uncertainty and added the analysis of open interest and trading volumes of gold to judged the value of gold as a safe haven asset in 2015. The authors found that before 2008, there was a positive correlation between holdings and stock uncertainty index before 2008. While after 2008, they presented a negative correlation. And the conclusion was gold can no longer served as an effective hedge asset [10]. Tan used the DCC-MIDAS model to analyze the price of gold in 2022. The author found that for China, spot gold was still the preferred safe haven, but not for the United States. The main reason was that the rise in crude oil prices has led to gold representing more financial rather than monetary attributes, and gold was treated as an investment rather than a currency [11].

1.3. Objective

This paper will study the changes and influencing factors of gold price in the case of US interest rate hike from January 2022 to September 2023. In the second chapter, this paper will give the reasons and specific policies of the Fed's interest rate increase from January 2022 to September 2023, and analyze the corresponding trend of gold prices. In the third chapter, this paper will analyze the influencing factors of gold price, study the changing trend of gold, and give investment suggestions.

2. The changes of gold price

In 2021, due to the impact of the COVID-19, the working hours of the American people have decreased, the unemployment rate in America increase, the real economy has been impacted, the supply chain of goods has been disrupted, and people's income has decreased, leading to a sharp decline in cons`umer demand, in order to revive the domestic economy, the US government has adopted a series of expansionary fiscal and monetary policies to drive economic recovery, for example, the new $190 million rescue plan launched in 2021 and in November 2021, the infrastructure investment and employment bill signed by the government with a spending scale of up to $1.2 trillion at which time the CPI index reached 6.8%. This also foreshadows inflation in 2022.

In February 2022, with the outbreak of the conflict between Russia and Ukraine, the international situation was turbulent, and the price of bulk commodity oil rose all the way. As the blood of industry, the rise of oil price will lead to the overall inflation of the market. Under such circumstances, the U.S. government still maintains an expansionary fiscal policy. In mid-2022, it signed the inflation reduction act with an expenditure scale of $485 billion, and signed a new plan for reducing student loan debt in August 2022. This led to the high inflation rate in the United States in 2022. The CPI index was above 7% in 2022 except December, and reached 9.1% in June 2022, a 41 year high. In order to curb domestic stagflation, the Federal Reserve chose to raise interest rates to recover money from the market to curb inflation.

In March 2022, the Federal Reserve officially announced its first interest rate increase of 25 basis points, followed by a 50 basis point increase in May. In June, July, September and November, the Federal Reserve has increased interest rates by 75 basis points. And ushered in the last interest rate increase of 50 basis points this year in December. The total annual interest rate increase in 2022 has reached 4.25 basis points. Such a strong monetary control policy also effectively curbed inflation, and the CPI index fell to 6.5% in December 2022. So in 2023, as of September, the Federal Reserve has only raised interest rates by 25 basis points three times, respectively in February, March and may. It is still unknown whether to continue to raise interest rates in the future. The interest rate hikes have a significant impact on gold prices. As shown in the following Fig.1.

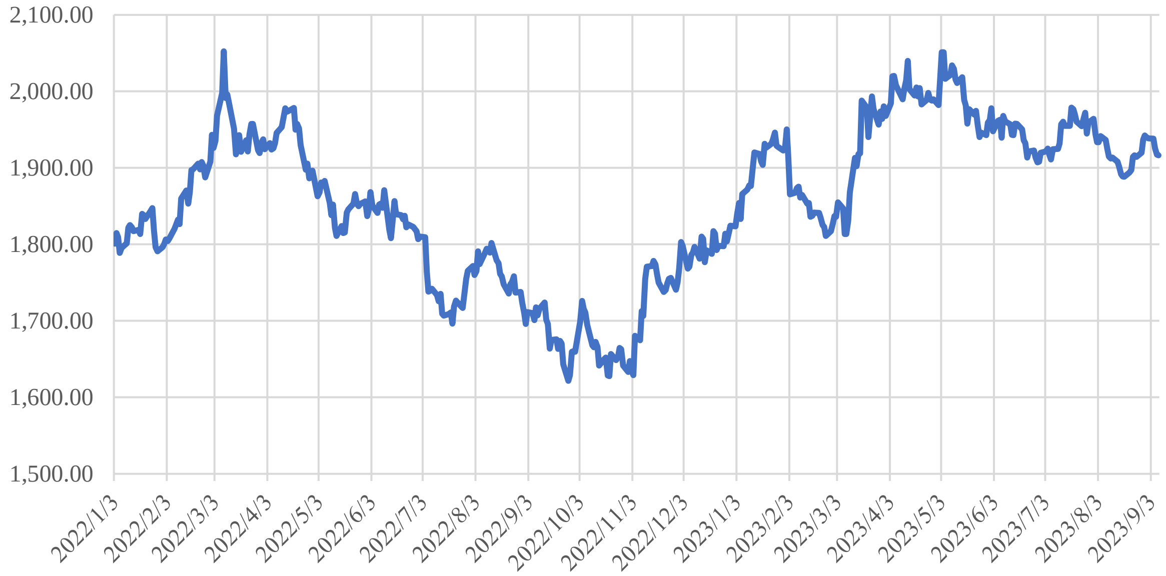

Fig. 1 the daily closing price of XAU/USD (price ratio of gold to dollar per ounce)

Before the Federal Reserve formally raises interest rates in March 2022, the price of spot gold was remain on the rise. After the Federal Reserve officially raised interest rates, the price of gold almost fall sharply. From March to May, the spot price of gold fell below 1900 from the peak of 2052.41 on March 8 and reached 1867.79 on May 3, indicating the next downward trend of gold. After the announcement of interest rate hiked in May, the trend remained slightly stable, after a decline, it still returned to its original price in June, and the downward trend was not significant. However, after the Federal Reserve's four successive high interest rate hikes of 75 basis points, the price of spot gold fell all the way from 1850.77 on June 3 to 1629.15 on November 3, ending the downward trend since the continuous interest rate hike in 2022. In December, with the effective control of the CPI index, the pace of interest rate hike by the Federal Reserve slowed down, from 75 basis points to 50 basis points. The price of gold rose inversely in December and continued to rise until February 2023, when another 25 basis points interest rate hike came. In the month from February to March 2023, gold again experienced a small decline, and this decline trend lasted only one month. After the Federal Reserve announced a 25 basis point increase in interest rates in March, the price of gold showed a slight weakening trend.

Looking at the whole trend of the spot price of gold, it can roughly divide it into three stages: January to may 2022, may to November 2022, and December 2022 to now. During the period from January to may 2022, under the joint effect of interest rate hike and the conflict between Russia and Ukraine, the price of gold will fluctuate, and the price at this time is still higher than the price at the beginning of the year. From May to November 2022, with the Fed's interest rate hiked step by step, the impact of interest rate hike increased, and the price of gold continued to fall in these six months. After December 2022, with the improvement of the stagflation in the United States, the Federal Reserve slowed down the pace of interest rate hike. At this time, the gold price showed an overall upward trend, and the impact of interest rate hike on the gold price was no longer severe.

3. Analysis of change causes and investment suggestions

3.1. Impact of interest rate increase

The interest rate hike refers to the Federal Reserve raising the federal funds rate, thereby increasing the bank interest rate. When the interest rate of bank deposits rises, investors tend to invest funds in banks to achieve the purpose of the Federal Reserve's recovery of money. At this time, the amount of money flowing into the gold market decreases, and the purchase demand for gold decreases, leading to a decline in the price of gold. For example, from March to November 2022, the total interest rate hike was 375 basis points, resulting in the price of gold falling by nearly $400 per ounce, nearly 20%.

After the interest rate increase, the US dollar can be deposited in the bank to obtain more interest. Without raising the interest rate in other countries, the US dollar will appreciate. Because gold is usually priced in US dollars, the appreciation of the US dollar represents the decline in the price of gold. At the same time, the appreciation of the US dollar will reduce the monetary value of gold, leading to the decline in the value of gold. As shown in Fig.2 below, during the period from March to November 2022, when the Federal Reserve continued to raise interest rates, the dollar index (DXY) rose, and the price of gold fell sharply during this period.

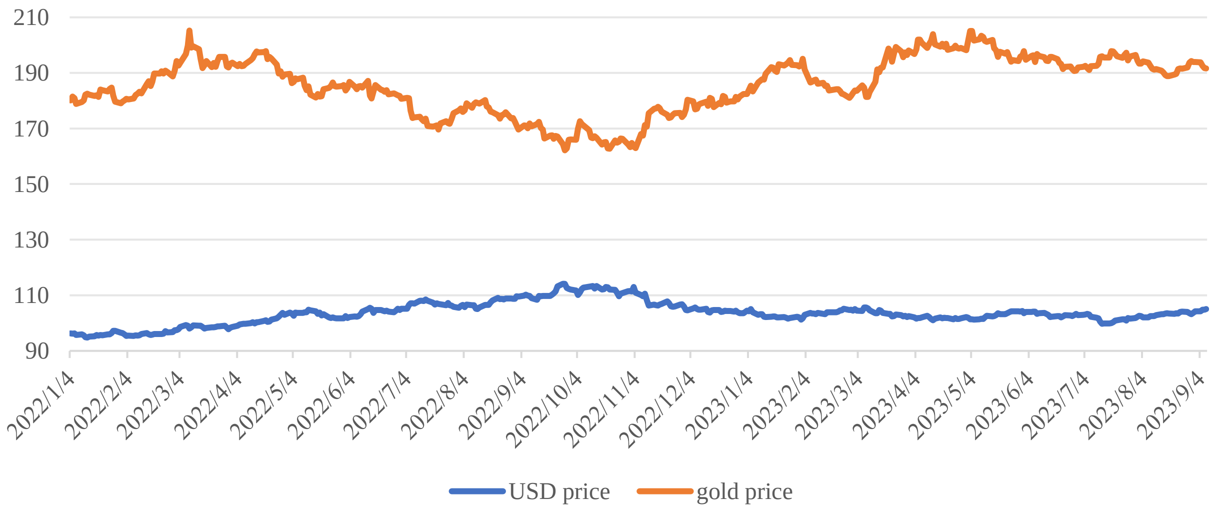

Fig.2 US dollar and gold price trends(the dollar index and the price ratio of gold to dollar every ten ounce)

As a means of curbing inflation, raising interest rates will reduce the amount of money in the market, thereby reducing the inflation rate, and affect the price of gold through the control of inflation.

Interest rate hike is a means to deal with inflation. When it is observed that the inflation rate remains high, there is a high possibility that the Federal Reserve will choose to raise interest rates in the future. The general index used to measure inflation is CPI (consumer price index). The investment suggestion at this time is: since the impact of interest rate hike will usually lead to the decline of gold price, it is suitable to short gold at the early stage of interest rate hike. When the policy of raising interest rates will stop depends on the degree of inflation control and the decisions made by the Federal Reserve on this basis. For example, on November 2, 2022, the Federal Reserve announced that it would continue to raise interest rates by 75 basis points, but announced at the subsequent press conference that it would slow down the rate of interest rate increase in the future. Considering the role of market expectations, it is not appropriate to be long when the interest rate hike is coming to an end. From the change trend of gold price, it can be seen that the gold price will rebound on November 3, 2022. Therefore, when the rate of interest rate hike slows down, it is no longer suitable to be short, but more suitable to be long.

3.2. Impact of inflation

Inflation will lead to the rise of prices and the decline of the purchasing power of money. Investors will tend to invest in financial products that can avoid risks. As a safe haven product, gold will increase the demand of investors during inflation. As shown in the figure3, the supply of gold remained basically stable after 2010, and the supply of gold fluctuated between 1000 and 1300 every quarter. When the supply is stable, the price of gold depends on demand, so the price of gold will rise.

When inflation occurs, the price of gold will rise. There are many factors affecting the formation of inflation: the occurrence of unexpected events, such as the new crown epidemic in 2020; Policy changes, such as the expansionary monetary policy adopted by the US government in 2021 and 2022. The occurrence of inflation is difficult to predict, but the impact of inflation is relatively easy to determine. The price of gold will generally rise, but after inflation is the response policy of various countries. Therefore, the impact of inflation is not long-term, and it is more suitable for investors to make short-term investment, such as short at the beginning of inflation and long when inflation is restrained.

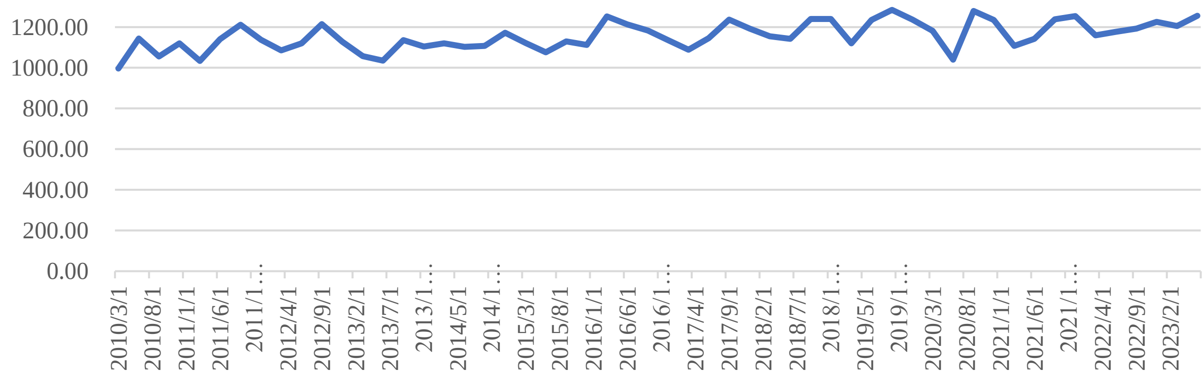

Fig.3 Total gold supply per quarter(Unit: ton)

3.3. Impact of regional conflict

The most influential event in 2022 is the conflict between Russia and Ukraine. Taking this as an example, first of all, the monetary attribute and risk aversion function of gold make it the first choice when the international environment is turbulent. Therefore, after the conflict between Russia and Ukraine, investors are in need of risk aversion, and the demand for gold rises, and the price of gold rises accordingly.

On the other hand, the conflict between Russia and Ukraine has led to an increase in the price of bulk energy commodities, namely oil. Due to the reduction of oil supply and the sanctions policy against Russia, the price of oil rose sharply after February 2022. Oil and gold are both bulk commodities and are both denominated in US dollars. When the price of oil rises, generally, the price of gold will also rise. In addition, the rise in oil prices will also lead to inflation, which will further lead to the rise in the price of gold.

From the perspective of the impact of international relations, regional conflicts will affect the foreign and economic policies of countries, thus affecting the price of gold. On the other hand, regional conflicts will affect the supply of gold to a certain extent. When regional conflicts affect local gold mining, the supply of gold will decline, leading to the rise of gold prices.

Regional conflicts are accidental events and unpredictable. Investors cannot determine the time and place of occurrence. However, when regional conflicts occur, the demand for gold will rise due to the hedging nature of gold. At this time, it is suitable to be long. However, we should always pay attention to the promulgation of various policies and the changes of various indicators. The impact of the event is not long-term. After the event, the impact reaches the maximum, and then gradually decreases. Finally, it is no longer an influencing factor. Therefore, short-term investment is preferred for emergencies such as regional conflicts.

4. Conclusion

In the modern financial market, gold, as an important financial product and monetary product, is very important to study its price change. This paper studies the price change of gold when the interest rate in the United States, to determine the influencing factors of gold.

Combined with the nature of gold, the research of scholars from various countries, and the analysis of the actual changes in gold prices, this paper draws the following conclusion: the Fed's interest rate hike will have a negative impact on gold prices. In the early stage of interest rate hike and the case of continued high-intensity interest rate hike, gold prices are most affected, and at the end of interest rate hike, gold prices are more affected by other factors. In addition, inflation and regional conflicts also have a negative impact on the price of gold.

To sum up, when stagflation occurs in the United States, the possibility of the Federal Reserve raising interest rates increases. At this time, we can pay close attention to the gold price. It is appropriate to short at the beginning of the interest rate increase and long at the end. While regional conflict events are unpredictable. When they occur, they have the greatest impact and are suitable for long. However, the impact decreases with time, and it is not suitable for investment after a period of time.

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