Proceedings of the 3rd International Conference on Business and Policy Studies
DOI: 10.54254/2754-1169/74/20241542

# *Causes and Effects of the Interest Rate on Treasury Bounds and Cooperate Bounds Controlled by the FRB*

**Tianlai Li**[1,a,*]

[1]*Shangde Experimental School Noble Academy, Shanghai, 20131, China*
*a. ltl13862021@163.com*
**corresponding author*

***Abstract:*** This research paper focuses on the topic of the causes and effects of the interest rate on bounds and stocks controlled by the Federal Reserve Bank and the evaluation of an oil company and innovative technology company. At the beginning of this research paper, this paper introduces the background of this research paper: the changes in interest rates affect bonds and stocks, which also have an impact on their value. For investors, how to choose bonds and stocks with value through different situations caused by changes in interest rates has become a big problem for them. Also, this paper summarizes the analysis part and makes two conclusions about the topic. One is investors should be concerned about the changes in interest rates, which have an impact on the values of the bounds and stocks. The other conclusion comes out and clearly indicates that risks in investing in bonds and stocks are unpredictable.

***Keywords:*** Cuts/Raise Interest rates, Oil Science and technology innovative companies, Values

## 1. Introduction

Nowadays, with the rapid development of the finance market, it is a piece of common knowledge to people that investors have to consider buying treasury bonds and cooperate bonds, as well as stocks. And they decide which one should buy to get the most out of it successfully. However, the interest rate change by the Federal Reserve Bank (FRB), which is the central bank located in the United States, may cause the formation of fluctuations in a certain cycle to have an impact on the bonds and stocks. It has to be noticed that interest rates play an important role in finance and affect the trend of bonds and stocks in the future. As stated in the previous sentences, the topic of this research paper will focus on the causes and effects of the interest rate on treasury bonds and corporate bonds controlled by the FRB, and discuss the problem of how to choose an appropriate company between oil company and innovative technology company which decided by their values on the changes of the interest rate. To put it simply, the causes and effects of the interest rate decide the value of bonds and stocks that the entrepreneurs buy for their investments.

DOI: 10.54254/2754-1169/74/20241542

## 2. The Reason Why FRB Controls Interest Rates and Affects Government and Corporate Bonds

As stated in the previous part, it is necessary to know the definition of interest rate first. Interest rate refers to a certain proportion of the fee charged by the loan policy to the borrower for the loan. The extra cost, usually in percentage terms, that the borrower has to bear to repay. What calls for special attention is that official institutions such as central banks, commercial banks and governments can all set interest rate policies. As the first part says, FRB in the United States changes interest rates because it is an official institution. In fact, FRB can change the interest rate by raising and declining. And different ways to control its interest rate have different effects on bonds and stocks. While FRB raises the interest rate, the bonds that the investors buy can maintain positive earnings, but it can also cause the values of the bonds to go up. But the cost of capital is lower. As a result, while FRB declines the interest rate, it may happen when the situation of the economy becomes worse, it can improve economic expectations. Here is one particular example here:

"However, note that falling interest rates cannot fully explain the global stock market rally in 2020. For example, BIS (2020a) states that the effect of the fall in interest rates after March 2020 amounted to half and one-fifth of the rebound through June in the American and European stock prices, respectively. [1] Coxetal. (2020) shows that the U.S. interest rates did not decline during the V-shaped recovery of the U.S. stock market from April 2020 to June 2020. [1]Figure 1 shows that the long-term interest rates in the U.S., Germany, and Japan were almost flat from April 2020 to December 2020. This does not explain the stock price rallies in 2020 in these three countries."

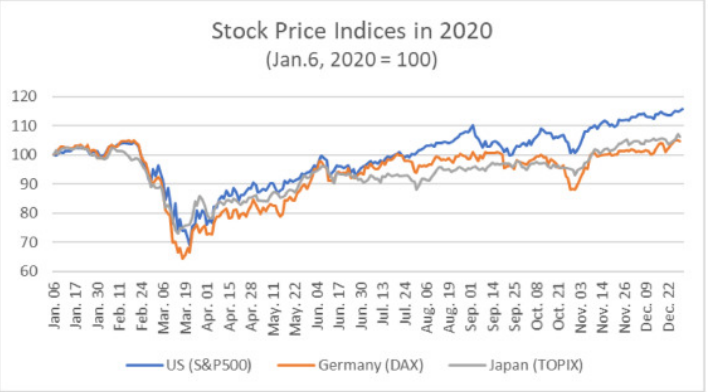


Figure 1: Stock Prices in the U.S., Germany, and Japan in 2020

Figure 1 shows the S&P 500 index (U.S.), DAX index (Germany), and TOPIX index (Japan) in 2020 with the values on January 6, 2020 set to 100 [1].

Back to the realistic, the changing interest rate mostly helped the economy in the USA, for instance, there are two examples of decline and increase:

DOI: 10.54254/2754-1169/74/20241542

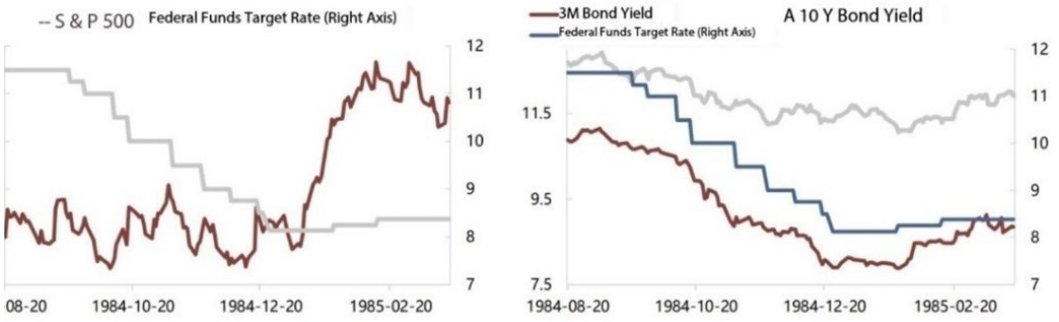


Figure 2: US stocks flattened after 1984 interest rate cut and US bonds fell significantly after the interest rate cut in 1984. [2]

Initially, it is declining. “Such rate cuts occurred in 1984 and 1995. After the Federal Reserve cut interest rates in 1984, the S&P 500 basically showed a flat state, and the bond market yield showed a significant decline, with short bonds falling more than long bonds (Chart 2 and Chart 3). After the Fed cut interest rates in 1995, the S&P 500 rose significantly and the bond market fell, especially the 10-year Treasury, where yields rose even more (Charts 4 and 5)” [2].

Table 1: U.S. Equity Returns in Years of Slower Economic Growth but Positive Returns with Expanded Interest Rates

| United States GDP (%) | 10-year Treasury yield expansion (percentage point) | S&P 500 Full Year Earnings (%) |
|---|---|---|
| 7.10% | 0.45 | 26% |
| 2.10% | 0.63 | 3% |
| 4.40% | 0.29 | 19% |
| 2.70% | 1.06 | 20% |
| 3.10% | 1.72 | -11% |
| 4.60% | 0.97 | -12% |
| 3.50% | 0.15 | 3% |
| 2.80% | 0.32 | 14% |
| 1.80% | 1.26 | 30% |
| 1.70% | 0.18 | 10% |

Then it’s increasing. “Combined with GDP and interest rate changes, this paper compares 2022 to look for the years when the overall economic growth slowed down but GDP still maintained single-digit growth, while the 10-year Treasury bond interest rate expanded. Since 1947, the overall US stock market has had an average positive return of 10.9%. The S&P 500 had negative returns in 1969 and 1977, and positive returns in the remaining years, with an 80% probability of positive returns. In years when overall economic growth slowed but GDP still maintained single-digit growth and the direction of Treasury interest rates was fully accounted for, the US stock market still had an average positive return of 4%. Based on historical statistics, this paper believes that there is an 80% probability of positive stock market returns and a 20% probability of negative stock market returns for the whole year, based on the Federal Reserve's forecast that US GDP growth will slow to 3.6% to 4.5% in 2022 and the 10-year Treasury rate will expand to about 2.2% by the end of the year. So, the path of economic growth and the 10-year Treasury rate alone isn't a good guide to what stocks will earn in 2022 as a whole. Taking the S&P 500 index as an example, in essence, the earnings of the S&P 500

DOI: 10.54254/2754-1169/74/20241542

in the United States are synthesized from the stock earnings of 500 companies, which is the result of investor sentiment and capital game under market expectations" [3].

What's more, except for this, sometimes it is smoothing when the FRB changes the interest rate, another example has been shown below:

"As suggested in Chart 1, the federal funds rate appears to have moved smoothly over most of the last three decades, especially since the mid-1980s. Several measures show how smoothly these movements have been over this period. One measure is the simple correlation between federal funds rates observed at different points in time. For instance, if values of the federal funds rate one quarter apart tend to be similar, then the estimated correlation of federal funds rates one quarter apart should be close to 1. A correlation close to 1 would be consistent with interest rate smoothing"[4].

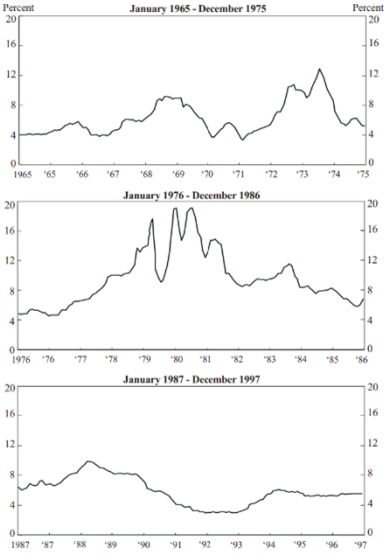


Figure 3: The federal funds rate in three different periods in US [4]

## 3. The Impact of Interest Rate Adjustment on the Value of Equity

After clarify the ways of the interest rate controlled by FRB. To start with the effects of changing interest rates on stocks, it just like the bounds, the values of stocks are also affected by interest rates. As a matter of fact, they also cause different effects. It can be divided into two perspectives. To begin with, while the interest rate is rising in a period, bonds become more attractive to investors because they offer higher yields. As a result, some investors may sell stocks and move into bonds. This could lead to less demand for the stock, which could cause the stock price to fall. From another perspective, declining the interest rate may have the opposite effect, to put it in another way, it loses the attention of the investors, resulting in the stock value. Finally, after analysing two perspectives, it can be proved to a resolution that it depends on the attraction from the investors whether the values of the stocks are increasing or decreasing. Investors have to find a good opportunity to invest in their stocks. An example has been shown below:

"In the aftermath of the 2008 subprime crisis, the Fed quickly lowered the ceiling on the federal-funds target rate (FFR) to 0.25%, rates were kept at this level for a long time thereafter, and a new round of rate increases was not launched until December 17, 2015.Table 1 shows that the impact of this round of interest rate hikes on the US stock market is not consistent, and the Federal Reserve strengthened after the subprime mortgage crisis.

Forward guidance, this round of interest rate hikes is basically in the market's expectations, the impact of interest rate hikes on the US stock market, to see whether the meeting statement exceeded market expectations at that time. If the meeting states that the future rate hike process is hawkish, the

DOI: 10.54254/2754-1169/74/20241542

US stock market may fall. Meanwhile, U.S. stocks could rise if the statement confirms that the U.S. economy is in good shape. Similarly, U.S. stocks may rise if the meeting statement confirms the shape of the US economy. If the situation worsens, U.S. stocks may fall. Of course, sometimes the day of interest rate hikes can also be affected by third parties such as overseas risk events factors, leading to the weakening of the relationship between interest rate hikes and US stocks" [5].

Table 2: Interest Rates Hike

| Date of interest rates hike | FFR upper limit | SP500 yield |
|---|---|---|
| 2015/12/16 | 0.5 | 1.4514953 |
| 2015/12/17 | 0.5 | -1.50404955 |
| 2016/12/14 | 0.75 | -0.81172 |
| 2016/12/15 | 0.75 | 0.388322801 |
| 2017/3/16 | 1 | -0.162666 |
| 2017/6/15 | 1.25 | -0.22396141 |
| 2017/12/14 | 1.5 | -0.407082637 |
| 2018/3/22 | 1.75 | -2.516289137 |
| 2018/6/14 | 2 | 0.247151097 |
| 2018/9/27 | 2.25 | 0.276327698 |
| 2018/12/20 | 2.5 | -1.57720905 |

Moreover, a statement is written below:

"Overall, the relationship between forward guidance and U.S. stocks is more pronounced. The impact of monetary policy on the economy depends heavily on expectations about the future course of policy rates, not just the current course of rates such as the federal funds rate level. The Fed's announcement of a change or no change in the operating target for the federal funds rate often implies a change in the expected path of the funds rate over the next few months, or even years. The Fed, on the other hand, uses forward guidance to communicate with markets that it is not. The recent monetary policy trend and economic situation forecast guide the market's expectation of future interest rates so that the market expectation is closer to the central bank's target expectation. Forward guidance guides market expectations, and expectations have an important impact on market behavior, in addition to the self-fulfilling characteristics of expectations, market players will take actions according to expectations, thus having an impact on the current economic and financial situation" [6].

## 4. The Choice of Oil Company and Innovative Technology Company

Then talk about the opportunities of choosing an appropriate company. Suppose there are two companies, one is an oil company which are highly profitable now and pays high dividends but is not expected to grow much in the future. The other company is an innovative technology company startup that may not be highly profitable now and currently pay low or no dividends, but is expected to grow and eventually become profitable at some point several years in the future. These can be determined its values by evaluating the changes in interest rate, in another word is using the rising and declining interest rates to analysis. Values of the Oil company can increase when the interest rate goes down. It makes people start economic activities. Except for decreasing the interest rate, in the other hand, increasing the interest rate makes the dollar stronger, which could lead to less demand for dollar-denominated commodities like oil. However, there's no denying the fact that unknown risks from third-party factors still exist. For instance, the Russo-Ukrainian War took place in Ukraine in a period of 2022 and hasn't stopped until today. In the short term, driven by the Russian and Ukrainian events, the international oil prices may still impact $130. But in the context of fed rate hikes and the global

DOI: 10.54254/2754-1169/74/20241542

economy facing a recession, deep participation in crude oil trading may face risks that cannot be ignored [7].

However, oil company seems to have a relationship with US stocks, here is an example below: "Global banks have poured financing into fossil fuel companies since the Paris climate agreement in 2015, and financial stocks have become much more correlated with crude oil. Because banks in the United States and internationally have lent heavily to the energy sector, the possibility of default has led to a significant increase in the correlation between bank stocks and crude oil price movements. Default concerns abate when crude oil prices rise, and these concerns increase when oil prices fall. And financials make up 11% of the S&P 500's total market capitalization. As a result, energy has become more correlated with overall US S&P returns since 2015"[8].


Figure 4: Correlation between financial stocks and WTI

But unfortunately, there is a clear link between a country's economic structure and its demand for oil. As economies transition to industrialization-that is, as their main economic activity shifts from agriculture to industry-the demand for energy will rise. However, as an economy moves from industry to services, the demand for energy will decline. The role of oil in the global economy has changed irreversibly since World War II [9].

In the other perspective, the value of innovative technology companies can decline through increasing the interest rate. On the contrary, a lower cost of capital occurs while decreasing the interest rate. In a word, for innovative technology companies, value is largely determined by their potential for future growth and profitability. Compared with innovative technology companies, changes in interest rates are not too volatile for oil companies.

"Such research, especially the Solow (1956) neo-classical models of economic growth, does not explicitly address the issue of entrepreneurship, which is the underlying cause for technological innovation in the Schumpeterian context. The new class of endogenous growth model pioneered by Romer (1990) recognises some aspects of entrepreneurship by modelling the process of invention and deriving the motives for invention from the microeconomic level. this paper can summarise that the Schumpeterian tradition has given rise to models that are focused on innovation as a source of economic growth. Unlike the original Schumpeterian theory, however, these models do not provide any direct test of the effect of entrepreneurial firm-formation activities on economic growth" [10].

## 5. Conclusion

From what has been discussed above, this paper can draw the conclusions. In general, the impact of interest rate changes is complex and may vary depending on the specific circumstances of each company and the overall economic environment. Obviously, with the rapid development of finance, interest rates matter to those who buy or issue bonds. The amount of risk at the time of purchase and

DOI: 10.54254/2754-1169/74/20241542

whether it will have the maximum value later is what they should consider. What's more, the changes of interest rate controlled by FRB can be attractive for entrepreneurs to pay attention to its value, and invest their money carefully when the risks happen and cannot be predicted.

## References


[1] *Nishiwaseda, Shinjuku. (2019). Money supply, opinion dispersion, and stock prices, by Shinichi Hirota, School of Commerce, Waseda University, 1-6-1, Tokyo 169-8050, Japan, page 2.*

[2] *How does a rate cut affect stocks and bonds. (2019). Cebu study overseas macro weekly | on June 11, page 4*

[3] *Fed rate hike cycle, growth stocks are still a good track, (2020). CINDA SECURITIES CO., LT, page 4.*

[4] *Jeffery D. Amato, Thomas Laubach. (2019). The Value of Interest Rate Smoothing: How the Private Sector Helps the Federal Reserve, page 48-49.*

[5] *Helen Morris. (2020). Socioscientific Issues and Multidisciplinarity in School Science Textbooks. International Journal of Science Education page 4.*

[6] *G Kéri, C Finance, A Madarasz. (2021). The impact of Federal Reserve monetary policy on US stocks--International Economy and Commodities Weekly Review under the Perspective of the New Era. No. 60 page 7.*

[7] *Laura Carraresi; Stefanie Bröring. (2021). How Does Business Model Redesign Foster Resilience in Emerging Circular Value Chains? Journal of Cleaner Production.*

[8] *Ciwei Dong et. al. (2021). Operations Strategy for Supply Chain Finance with Asset-backed Securitization: Centralization and Blockchain Adoption. International Journal of Production Economics.*

[9] *N Sim, H Zhou. (2022). The relationship between oil prices and U. S. stocks, the dollar and the U. S. economy is changing, AVIC Securities. page 18.*

[10] *Poh Kam Wong, Yuen Ping and Ho Erkko Autio. (2022). Entrepreneurship, Innovation and Economic Growth: Evidence from GEM data, DOI 10.1007/s11187-005-2000-1, page 336.*