Analysis of pros and cons of quantitive easing

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Abstract. From the financial crisis in 2008 to the impact of the COVID-19 in recent years, quantitative easing, an unconventional economic policy, has become a means for many large economies to alleviate economic recession and stimulate economic growth. QE can not only help overcome the downward pressure of the economy, but also maximize the avoidance of unemployment, inflation and other issues caused by more severe economic crises. This paper focuses on the practical process and effects of the four QEs in the United States, analyzes the pros and cons of QE, and pays attention to the consequences of the current interest rate hike in the United States. It is concluded that QE has a significant effect on stimulating economic growth and boosting the stock market in the short term, but may lead to a long-term slowdown in economic growth and inflation. This analysis enriches the explanation of the QE operation process and is conducive to the more appropriate application of this policy.

Keywords: quantitive easing, inflation, stock market, US interest rate hik.

1. Introduction

In response to the financial crisis that broke out in 2008, many developed economies, including the United States, implemented quantitative easing policies on a large scale, injecting liquidity into the market to stimulate investment and consumption, effectively alleviating the pressure of economic recession. In the following ten years, QE continued to play a role. The United States has implemented QE four times so far, and even started a new round of expansion after the impact of the COVID-19 in 2020.

QE has played a role in boosting the economy and stabilizing the market to a certain extent, and is also one of the important economic policies of the United States, creating a more conducive environment for economic recovery. However, the implementation of QE also faces risks, such as financial pressure, inflation trend, asset foam, etc. In recent years, the fourth QE has continued, and the continued interest rate hikes by the Federal Reserve have further exacerbated financial risks.

Many studies have focused on the macroeconomic impact of QE, a classic economic policy. Some researchers found that QE stimulation may have a positive impact on GDP and inflation by reducing returns and increasing asset prices to stimulate demand [1]. Yue H Y and Leung K TQE (2011) found that the inflation rate after implementation is significantly lower [2]. Haldane et al (2016) believed that QE can generate strong spillover effects through cross-border channels, mainly through financial channels [3], Yue H Y and Leung K T found that the money produced by QE cannot fully touch the real economy of the United States. QE will also have an impact on the financial market. QE has a positive impact on the U.S. medium - and long-term treasury bond bond market in the short term, stimulating the stock repurchase behavior of listed companies [4], and also leading to the rebalancing effect of the portfolio [5].

This article mainly focuses on the four QEs in the United States. Through specific data on open market operations and changes in important economic indicators, the economic background, specific measures, and implementation effects of each QE are analyzed, and the effectiveness and shortcomings of QE are analyzed from both economic growth and the stock market. The remaining parts of this article are arranged as follows: The first section is a summary and analysis of QE1-QE4 and the current situation of the Federal Reserve's interest rate hike. The second section is the pros and cons of QE, as well as the consequences of the current interest rate hike. The third section is a summary.

2. Basic Fact Analysis

2.1. What is QE

Quantitative easing (QE) was first proposed and implemented by Japan. In 1999, in order to salvage policy interest rates, close to the lower limit of nominal interest rates, the Bank of Japan proposed implementing a quantitative easing by targeting the monetary base. In 2001, the Bank of Japan began establishing a central bank foreign exchange reserve to purchase government bonds. Subsequently, several European and American countries, including the United Kingdom and the United States, have also repeatedly used this policy to alleviate economic crises.

QE is an unconventional monetary policy. When the nominal interest rate approaches 0%, the traditional monetary policy will become invalid, and the central bank will launch the extreme policy of QE to unconditionally purchase any capital from commercial banks and other financial institutions through open market operations, such as treasury bond, stocks, CMBS, etc. This operation can inject liquidity into the financial market, lower long-term interest rates, encourage banks to increase external lending, and thus increase the amount of money in the market. At the same time, this also stimulates investment and consumption, promoting the recovery of the national economy. Haldane et al. proposed that the mechanism of QE includes traditional monetary policy communication channels, such as monetary policy signals and exchange rate channels. It also includes unconventional channels, such as portfolio balance and liquidity channels.

2.2. QE1-QE4 of The US

Between 2008 and 2020, the United States launched four QEs. This section analyzes four QEs from specific operations, economic background, intuitive effects, and other aspects. Figure1 shows performance of each QE (Table 1).

Table 1. Performance of each QE

QE	Year	data
QE1	2008-2010	BUY: $1.25 trillion of mortgage-backed securities, $300 billion of U.S. treasury bond bonds and $175 billion of institutional securities, totally $172.5 million
QE2	2010-2012	BUY: long-term government bonds of $75 billion per month, totally $600 billion
QE3	2013-2014	BUY: $40 billion per month of MBS, totally $4.5 trillion
QE4	2020-present	unlimited on-demand purchases of US bonds and MBS

2.2.1. QE1

In 2007, the financial crisis broke out and a large number of financial institutions and banks in the United States went bankrupt. In 2007 and 2008, the United States had repeatedly lowered interest rates. However, it has not alleviated the subprime crisis, and multiple interest rate cuts have brought a huge financial burden to the US government. In September 2008, under the impact of the bankruptcy of Lehman Brothers, the fourth largest investment bank in the United States, the US stock market experienced a series of sharp declines, with bank call rates approaching 0% in November. So, the Federal Reserve implemented QE for the first time, announcing on November 24th the purchase of $100 billion worth of bonds issued by Freddie Mac, Fannie Mae, and the Federal Housing Loan Bank, as well as $500 billion worth of asset-backed securities guaranteed by them. At the beginning of 2009, the economic situation had not yet eased, and the Federal Reserve increased its bond buying efforts in March. Since then, the market has gradually improved. By March 2010, the Federal Reserve had purchased $1.25 trillion of mortgage-backed securities, $300 billion of U.S. treasury bond bonds and $175 billion of institutional securities, totaling $172.5 million. The total amount of securities held by the Federal Reserve increased from $496 billion in December 2008 to $2.06 trillion.

This quantitative easing has played an important role in alleviating the economic crisis. The GDP growth rate has significantly increased, from 8.9% in the fourth quarter of 2008 to 2.3% in the first quarter of 2010. But the unemployment rate is still as high as 9.8%, and long-term interest rates are gradually rising. In addition, the total liabilities of the Federal Reserve increased from $857 billion in December 2007 to $2199 billion in December 2008, nearly doubling [6].

2.2.2. QE2

After the end of QE1 in March 2010, the economy was still in a sluggish state, and the unemployment rate remained at 9% for a long time, with many economic indicators showing no improvement. Meanwhile, the Greek sovereign debt crisis erupted in 2010, exacerbating global economic turmoil. In November 2010, the United States launched its second QE, purchasing long-term government bonds of $75 billion per month. By June 2011, the entire QE implementation cycle had purchased a total of $600 billion in long-term government bonds.

Although the effect of this QE was not significant, it effectively increased investment confidence, with the US CPI rapidly rising from 1.1% in December 2010 to 3.5% in June 2011. After two rounds of QE, the unemployment rate in the United States dropped to the lowest level since the subprime crisis, which is 7.8% in September 2012, but still higher than the ideal unemployment rate of 5-6% in the United States.

2.2.3. QE3

In September 2012, although the unemployment problem in the United States improved after implementing two rounds of QE, it remained severe. The unemployment rate remained around 8% for a long time, and the real economy did not grow, facing the problem of a fiscal cliff. Meanwhile, due to the weak international economic situation, many major developed economies are facing economic recession, and the United States, Europe, and Japan have jointly chosen monetary policy to stimulate the economy. To this end, the Federal Reserve implemented its third round of QE in September, including continuing to maintain low interest rates until mid-2015 and purchasing an additional $40 billion per month of mortgage-backed securities (MBS). The QE reduction officially began on December 18, 2013 and ended on October 29, 2014 at QE3.

2.2.4. QE4

In March 2020, under the impact of COVID-19, the Federal Reserve restarted QE to maintain market stability, unlimited on-demand purchases of US bonds and MBS, and launched an unlimited quantitative easing policy. Due to the pandemic, measures such as epidemic prevention and health care have already placed a financial burden on the US government. The cost of QE worrisome the already fragile financial situation, and even after the necessary period passed, the Federal Reserve continued to purchase bonds, further increasing conflict, the Federal Reserve bought its last Treatment in March 2022, when the conflict was already 8.5% [7].

2.3. What is QE

Under the impact of the epidemic, after a combination of zero interest rates and quantitative easing policies, the US economy has gradually shown a trend of recovery, but this has also led to a phase of high inflation in the United States. In 2021, the Federal Reserve stated that inflation is a temporary pressure on economic recovery under QE policy and did not intervene. The outbreak of the Russo Ukrainian War in 2022 led to a sharp increase in inflationary pressure around the world, leading to the Federal Reserve's interest rate hike cycle starting in March 2022. As of August 2023, there have been 11 interest rate hikes, with a cumulative increase of 525 basis points.

Just as we can see in Table 2, from March 2022 to November 2022, due to repeatedly exceeding expectations of inflation pressure and wage growth demand, the Federal Reserve's efforts to raise interest rates were relatively aggressive, with a single rate hike ranging from 50bp to 75bp and four consecutive rate hikes of 75bp. Since November 2022, the rate hike has eased somewhat, with single rate hikes mostly reaching 25bp, as is shown in Table 2. On the one hand, this is due to the relatively

ideal degree of inflation suppression in the United States from the end of 2022 to the present. On the other hand, on the basis of economic recovery, the Federal Reserve has begun to focus on the negative impact of sustained interest rate hikes, such as tightening consumption and investment.

In the trend of significantly slowing interest rate hikes, all four interest rate hikes in 2023 were 25bp [8]. And the market generally expects the September Fed meeting to decide to keep interest rates unchanged and suspend rate hikes, but the prospects for rate hikes this year are still unclear.

Table 2. Federal Reserve Rate hike process

Time	US Fed Funds Target Rate (%)	magnitude of interest rate rises (bp)
2022.3.17	0.50	25
2022.5.5	1.00	50
2022.6.16	1.75	75
2022.7.28	2.50	75
2022.9.22	3.25	75
2022.11.3	4.00	75
2022.12.15	4.50	50
2023.2.2	4.75	25
2023.3.23	5.00	25
2023.5.4	5.25	25
2023.7.27	5.50	25

3. Pros ans cons of QE

QE can effectively stimulate recovery during economic downturns, but it also has negative effects. This section is based on the four QEs in the United States, analyzing the pros and cons of QE from the perspectives of short-term stimulus and long-term inhibitory effects on economic growth and stock market.

3.1. Pros of QE

One of the biggest advantages of QE is stimulating economic growth. The open market operation of the central bank's purchase of financial assets and treasury bond injects liquidity into the market and encourages banks to increase loan issuance to reduce interest rates and increase investment. This is particularly effective during special periods of economic instability. During the economic crisis that began in 2008, nominal interest rates approached 0%, leading to a liquidity trap and the failure of traditional monetary policies. At this time, QE, as an unconventional stimulus policy, effectively maintained the normal operation of financial institutions and markets, stimulated economic activity, and thus successfully prevented further economic collapse. From September 2008 to March 2009, the GDP growth rate in the United States remained negative and the downward trend was severe. After the implementation of QE in March 2009, GDP quickly turned positive and the economy returned to a normal growth trajectory.

QE can also boost the stock market by injecting a large amount of currency into the market, reducing financing costs, increasing investment and consumption demand, and driving stock prices up. Quantitative easing helps promote the prosperity of the US stock market, and some studies have analyzed the transmission mechanism, suggesting that the direct cause of the stock market prosperity is the stock repurchase of major listed companies. The Federal Reserve purchases a large amount of assets to support the liquidity of market makers in repurchasing bonds, and releases the liquidity of shadow currency to promote the prosperity of the bond market, thereby providing sufficient funds for stock repurchases. This was also fully reflected during the first three rounds of QE. The US and Chinese Federal Reserve bought a total of US $1.73 trillion of bond assets in QE1, and about US $1.3 trillion of assets in QE3 and QE4, providing huge funds for investors and financial institutions. At the same time, as treasury bond bonds and MBS bonds were purchased by the Federal Reserve in large quantities, the circulation of corporate bonds was insufficient, and the demand for corporate

bonds increased rapidly, bond prices rose sharply. Figure 2 shows the boom trend of the US bond market [9]. Figure 1 shows the total amount of investments and bonds with a BBB - or higher credit rating has increased significantly, which is particularly significant during QE1(Figure 1).

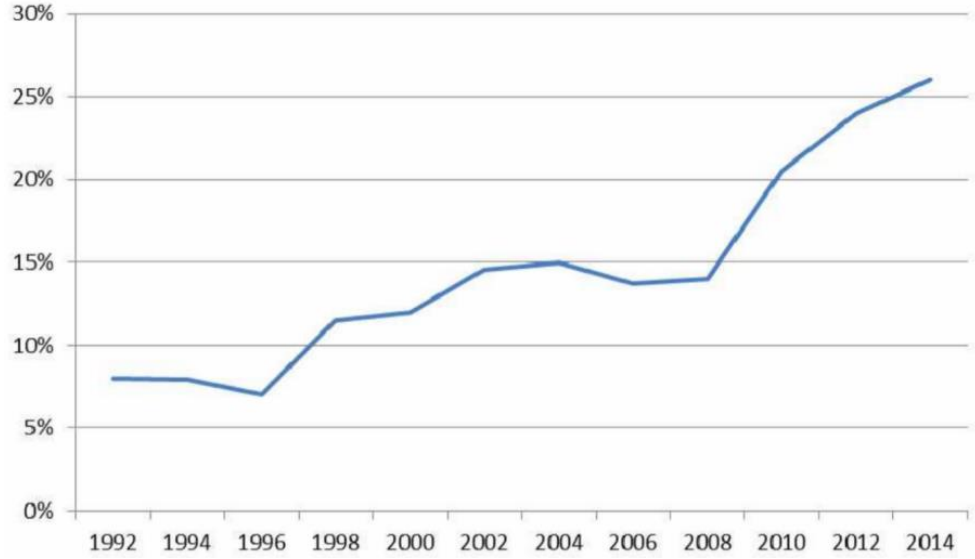


Figure 1. The proportion of total US BBB and above bonds to GDP

3.2. cons of QE

The previous section mentioned that QE can stimulate investment, promote economic growth, and alleviate recession. The channels through which QE is transmitted from the financial market to the real economy mainly include signal channels, portfolio adjustment effects, and balance sheet expansion effects (Bernarde&Reinhart, 2004) [10]. However, QE's funds have not fully entered the real economy, and the funds flowing into the real economy have not been fully used to expand physical investment. Giansante S et al. found that the decline in the yield of treasury bond caused by QE will urge banks with insufficient capital to optimize the use of regulatory capital, transfer to the portfolio of high-yield assets and low-risk weights, and no longer lend to the real economy. In addition, some companies will utilize the low investment costs brought by QE for cross market arbitrage in the stock and bond markets. Stock repurchases squeeze out future investments and weaken the role of QE in investment [11]. In addition, while stimulating the economy, in the long run, the sustained and large influx of liquid currency into the market caused by QE may also lead to currency depreciation and exacerbate inflation. Figure 2 shows the different effects of QE1 and QE4 on inflation rates. During the QE1 period, due to the sluggish economy, low demand, and deleveraging of enterprises, deflation was caused. At this time, QE effectively suppressed deflation while not causing inflation in the short term. In the later stage of QE4, the inflation rate in the United States increased. On the one hand, the implementation of zero interest rates and unlimited QE was more aggressive, leading to higher inflation risks. On the other hand, the Federal Reserve continued to purchase bonds, further increasing inflation, the Federal Reserve bulkt its last Treasury in March 2022, when inflation was already 8.5%, as is shown in figure4 [12].

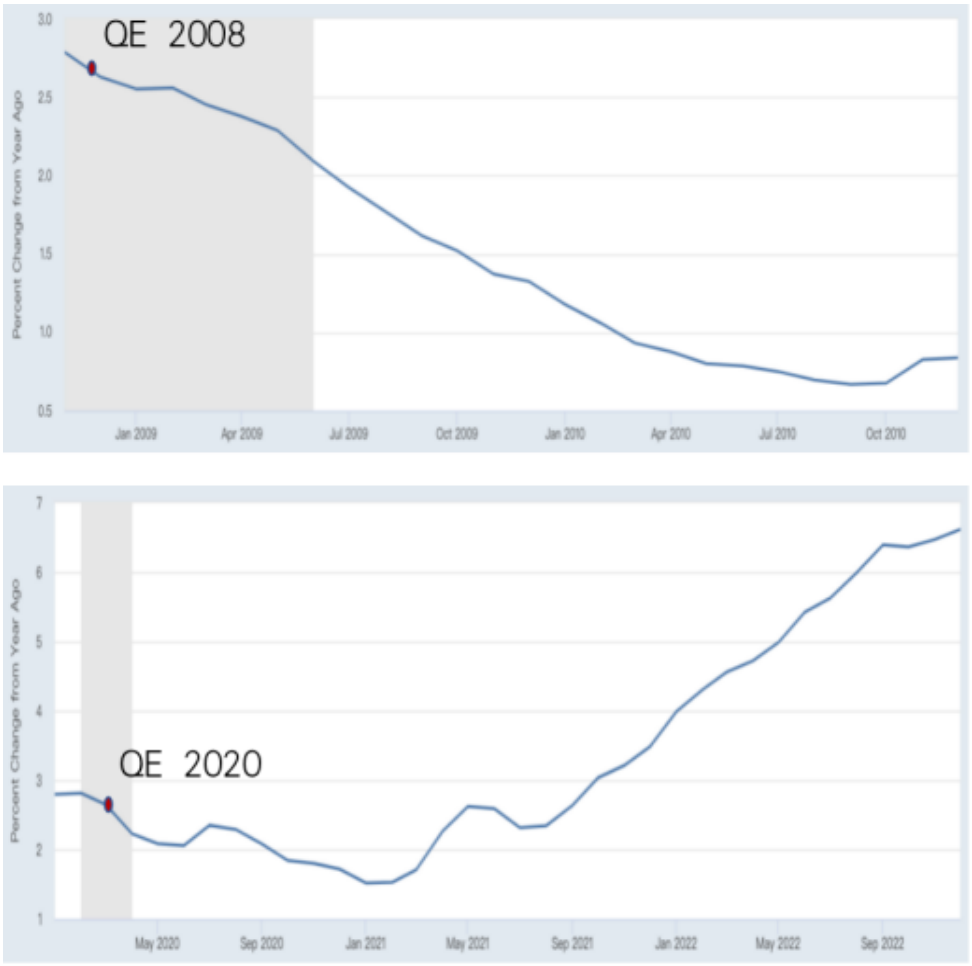


Figure 2. Sticky Price Consumer Price Index Less Food and Energy during QE1 and QE4

Also, rise in the stock market does not necessarily mean a long-term stability of the stock market. QE will increase asset foam. If the liquidity money injected by the central bank is not used for investment in industry, but is used for speculation in large quantities, such as buying stocks or real estate, it is easy to lead to asset foam. As mentioned above, the entry of a large amount of money into the financial market has led to the rise in the prices of various assets, including stocks, but this has also led to the risk of price deviation from the intrinsic value and the bursting of the foam, leading to financial market turbulence and even economic recession.

3.3. Consequences of Fed Rate hikes

The current sustained interest rate hikes by the Federal Reserve have exacerbated the turmoil in the financial market, with the most serious consequence being the triggering of a banking crisis represented by the bankruptcy of Silicon Valley banks.

After the implementation of QE in the United States in 2020, deposits at Silicon Valley banks increased significantly, from less than $80 billion to a peak of over $190 billion. At the same time, technology innovation companies are the main customers of Silicon Valley Bank. Silicon Valley Bank has absorbed a large number of non-interest-bearing current deposits from technology innovation companies and allocated a large number of long-term holding maturity bonds, accounting for up to 60% [13].

With a large amount of unstable liabilities and long-term, illiquid assets, Silicon Valley banks are very sensitive to interest rate fluctuations, and the Federal Reserve's interest rate hike has triggered huge risks. After the United States began raising interest rates in 2021, the yield on securities purchased by Silicon Valley Bank at low interest rates became negative, resulting in significant floating losses due to a significant proportion of bond holdings, resulting in a total unrealized loss of over $15 billion. In addition, technology stocks plummeted after the Federal Reserve raised interest

rates, making it difficult for technology innovation companies to raise funds, thus increasing the demand for withdrawals from banks and ultimately triggering investor runs. Starting from March 2022, deposits at Silicon Valley Bank have shifted from net inflows to net outflows. It is more difficult for Silicon Valley banks to absorb deposits and have to sell bonds, resulting in significant erosion of profits and capital. At the same time, the Silicon Valley Bank purchased a large number of treasury bond bonds and MBS when there were excess deposits. After the Federal Reserve raised interest rates, the liquidity of assets became worse, resulting in losses when selling assets. In March, the stock price of Silicon Valley Bank's parent company, Silicon Valley Bank Financial Group, plummeted by more than 60% on the 9th and 68% on the 10th, entering a suspension state.

This is not only a dilemma for Silicon Valley banks, but also a crisis for the entire US banking industry. Since the Federal Reserve's aggressive interest rate hike, bond yields have grown rapidly, leading to a significant reduction in the assets purchased by financial institutions during periods of low interest rates. The financial structural deficiencies of some commercial banks may lead to significant risks. At the same time, the instability of the financial market, coupled with the collapse of Silicon Valley banks, has led to a loss of confidence among the public, thus accelerating the deterioration of bank liquidity.

4. Conclusion

After the above analysis and elaboration, the following conclusions can be drawn:

Firstly, the regularity of the four QEs in the United States suggests that QE, as a non-compliant policy, can to some extent alleviate the pressure of short-term economic recession and stimulate economic recovery.

Second, QE plays a significant role in stimulating economic growth and boosting the stock market in the short term. However, due to the incomplete access of funds to the real economy, it may lead to long-term economic growth slowdown and inflation. In addition, the continuous rise of the stock market may also lead to the emergence of asset foam in the long term.

Thirdly, the fourth QE gradually weakened, and at this time, the Federal Reserve continued to raise interest rates, which may exacerbate the instability of the financial market and lead to a banking crisis.

Fourthly, QE is an effective and effective tool during economic crises, but in order times, its positive impact on economic growth and adverse effects is challenging to measure Consulting its high cost, it should be used with caution.

References

[1] Bridges J, Thomas R. The Impact of QE on The UK Economy–Some Supportive Monetarist Arithmetic (2012).

[2] Yue H Y, Leung K T. The Effects of Quantitative Easing on Inflation Rate: A Possible Explanation on the Phenomenon. European Journal of Economics, Finance and Administrative Sciences 41 (11), 34 – 40 (2011).

[3] Haldane, Andrew, Matt Roberts-Sklar, Chris Young, and Tomasz Wieladek. "QE: The Story so Far." SSRN Electronic Journal: SSRN Electronic Journal. Web.

[4] Ugai H. Effects of the Quantitative Easing Policy: A Survey of Empirical Analyses. Monetary and economic studies-Bank of Japan 25 (1), 1(2007).

[5] BayStreet Forum. From QE1 to QE4- Detailed Explanation of Quantitative Easing Policy. April 23, 2020. Retrieved on September 23, 2023. Retrieved from: https: //www.sohu.com/a/390363061_727283.

[6] The Economist. Quantitative easing cost hundreds of billions. Was it worth it?. August 8, 2023. Retrieved on September 23, 2023. Retrieved from: https: //www-economist-com.ezproxy.cul.columbia.edu/leaders/2023/07/31/quantitative-easing-cost-hundreds-of-billions-was-it-worth-it.

[7] Chinese Business Strategy. The bankruptcy wave of American giants is here. August 14, 2023. Retrieved on September 23, 2023.Retrieved from: https://finance.ifeng.com/c/8SDyifYDEXJ.

[8] Weale M, Wieladek T. Financial Effects of QE and Conventional Monetary Policy Compared. Journal of International Money and Finance 127,102673 (2022).

[9] Qin Qingpeng Research on the Impact of Quantitative Easing Policies in the United States on Its Stock Market. Shandong University of Finance and Economics (2016).

[10] Bernanke B. What the Fed Did and Why: Supporting the Recovery and Sustaining Price Stability. Washington Post, 4 (2010).

[11] Elgouacem A, Zago R. Share Buybacks, Monetary Policy and the Cost of Debt. Monetary Policy and the Cost of Debt (2019).

[12] Economic Research. Sticky Price Consumer Price Index Less Food and Energy. Aug, 2023. Retrieved from: https://baijiahao.baidu.com/s?id=1768924478712140639&wfr=spider&for=pc.

[13] China News Network. Five Questions: Understanding the History of the Bankruptcy of Silicon Valley Bank. March 14, 2023. Retrieved on September 23, 2023. Retrieved from: http://finance.people.com.cn/n1/2023/0314/c1004-32643970.html.

[14] Giansante S, Fatouh M, Ongena S. Does Quantitative Easing Boost Bank Lending to the Real Economy or Cause Other Bank Asset Reallocation? The case of the UK (2020).

[15] Miyakoshi T, Shimada J, Li K W. The Dynamic Effects of Quantitative Easing on Stock Price: Evidence from Asian Emerging Markets, 2001–2016. International Review of Economics & Finance 49, 548 - 567 (2017).

[16] Zhang Wenting, Xu Ruihui, Xiong Wentao. The Impact of Quantitative Easing on the Real Economy: A Review and Reflection. Financial Market Research (07), 1-11 (2022).

[17] Krishnamurthy A, Vissing-Jorgensen A. The Effects of Quantitative Easing on Interest Rates: Channels and Implications for Policy. National Bureau of Economic Research (2011).

[18] Rodnyansky A, Darmouni O M. The Effects of Quantitative Easing on Bank Lending Behavior. The Review of Financial Studies 30 (11), 3858 - 3887 (2017).

[19] Shenwan Hongyuan Macro. Shen Wanhongyuan: How many more rate hikes does the Taylor rule point to the Federal Reserve?. June 17, 2023. Retrieved on September 23, 2023.Retrieved from: https: //baijiahao.baidu.com/s?id=1768924478712140639&wfr=spider&for=pc.

[20] SINA finance. The Epic Rate Raising Cycle of the Federal Reserve: Reasons, Effects, Countermeasures, and Prospects. November 7, 2022. Retrieved on September 23, 2023.Retrieved from: https: //baijiahao.baidu.com/s?id=1748808837811276757&wfr=spider&for=pc.

[21] All weather technology. How to respond to data improvement? This month, the Federal Reserve may significantly change its expectations: GDP growth rate will double this year, and interest rate cuts for next year will be lowered. September 7, 2023. Retrieved on September 23, 2023.Retrieved from: http: //app.myzaker.com/news/article. php?pk=64f8bd398e9f0979005301da.

[22] Cailian Society - Deep. The interest rate hike should stop! Xiaomo: If the Federal Reserve takes further action, consumers will be in danger. September 7, 2023. Retrieved on September 23, 2023. Retrieved from: http: //app.myzaker.com/news/article.php?pk=64f9322c8e9f09182b7d202c.

[23] SINA finance. The Epic Rate Raising Cycle of the Federal Reserve: Reasons, Effects, Countermeasures, and Prospects. November 7, 2022. Retrieved on September 23, 2023. Retrieved from: https://baijiahao.baidu.com/s?id=1748808837811276757&wfr=spider&for=pc.

[24] Vivian. Quantitive easing. August 2, 2019. Retrieved on September 23, 2023. Retrieved from: https: //zhuanlan.zhihu.com/p/76292890.

[25] SINA finance. Inventory of the Bankruptcy Crisis in Silicon Valley: Where Did the "Black Swan" Come from?. March 13, 2023. Retrieved on September 23, 2023. Retrieved from: https: //baijiahao.baidu.com/s?id=1760233148240816178&wfr=spider&for=pc.

[26] CCTV News Client. Federal Reserve Rate Hikes Again Experts: Fears of further exacerbating the banking crisis. March 23, 2023. Retrieved on September 23, 2023. Retrieved from: http://www.takungpao.com/news/232111/2023/0323/832173.html.

[27] Economic information daily. The banking crisis continues, and there are differences in expectations for the Federal Reserve to raise interest rates. March 31, 2023. Retrieved on September 23, 2023. Retrieved from: https://www.ndrc.gov.cn/fggz/lywzjw/jwtz/202303/t20230331_1353018_ext.html.

[28] Economic Situation Report Network. What is the root cause of the collapse of Silicon Valley banks?. April 12, 2023. Retrieved on September 23, 2023. Retrieved from: http://www.china-cer.com.cn/guwen/2023041224098.html.

[29] CBN. The bankruptcy of Silicon Valley Bank is not accidental. March 13, 2023. Retrieved on September 23, 2023. Retrieved from: https: //m.yicai.com/news/101699816.html.