

Comparison of US Quantitative Easing Monetary Policy Between 2020 and 2008

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Abstract. In March 2020, in response to the negative impact of the COVID-19 pandemic on the US economy and financial markets, the Federal Reserve resumed "unlimited" quantitative easing and launched a new monetary policy tool. This paper compares the difference between this round of QE and the last three rounds of QE in 2008 from the aspects of the current balance sheet of the Federal Reserve, the US fiscal stimulus policy and the Fed's monetary policy tools. Using the VAR model to estimate and compare the effects of the monetary policy tools in the financial market and the previous three rounds of QE. First, The Fed's balance sheet will shrink much bigger and faster than the previous cycle. Second, the Fed will act more urgently than the previous cycle to control inflation quickly to a reasonable range. Third, MBS purchases are positive for the USD and the DJIA but are negative for the VIX.

Keywords: COVID-19; US; QE; VAR.

1. Introduction

As COVID-19 spread rapidly in the United States, capital markets fluctuated wildly, a lot of economic activity was suspended, and unemployment soared. The US stock market hit bottom, triggering four circuit breakers in the short term, with the Dow at its lowest level in nearly four years. The market point to the crisis caused by COVID-19 as more serious than the 2008 financial crisis [1].

At this time, the Federal Reserve started a quantitative easing policy to stimulate. Since March 2020, the Federal Reserve has twice cut interest rates to zero and purchased large amounts of financial assets to stimulate the economy [2]. Until December 2020, the Fed's QE assets expanded by \$3.05 trillion, or about 20% of the current US GDP.

Compared with QE after the 2008 financial crisis, this round of QE has commonalities in the background, market performance, policy response and other aspects, but there are also significant differences in specific reasons, impact and other aspects. Currently, comparing this round of QE and 2008 QE, conducting empirical research on them has certain theoretical and practical significance for predicting the future operation of the Fed's monetary policy.

Quantitative easing began in 2001 in Japan, in 2008 after the financial crisis and has nearly 20 years until 2020. but comparative research of QE and 2020 QE restart results are still not very rich, mainly focusing on the 2008 global financial crisis countries and the comparison between the fed quantitative easing, 2020 restart QE background and operation summary, specifically divided into the following sections:

One is the comparison of the QE effect of the central banks in the world's major economies, such as Chen analyzed the impact of the balance sheets of central banks in major economies and concluded that the Bank of Japan and Britain are limited by asset purchases and policy tools while the ECB monetary policy is relatively passive [3]. Alper et al. analyzed the difference in the effect of QE policies of European and American central banks on cross-border credit flows [4].

The second is a comparative study of the Fed's various rounds of QE. For the analysis of the QE operation, Wang summarized the QE1-QE3 mechanism and its impact [5]. As for the analysis of QE policy tools, Bernanke believed that when financial markets operate normally and interest rate floors exist, innovative tools can become a common means to effectively alleviate financial conditions [6]. For analysis of the effect of QE, Cao believed that each round of QE has a positive stimulus effect on the US economy [7]. Kuttner compared the operations of QE1 to QE3 and concluded that the

announcement of QE1 had a strong negative impact on long-term interest rates, while QE2 and QE3 had less impact [8].

The third is the study of the Fed to restart QE in 2020. Wu et al. analyzed the effect of the epidemic on the global financial markets and the real economies of various countries and predicted the economic policies of the central banks in major economies [9]. Sheng et al. believed that this crisis will increase the trend of anti-globalization [10]. Zhong et al. analyzed the purpose of the Fed's organic "table expansion" and short-end yield control [11].

Although the existing literature has involved the comparative study of QE and QE of the Federal Reserve in various countries after the global financial crisis, few studies focus on the comparison between QE in 2020 and the various rounds of QE in 2008. Considering that there are many similarities in the background of this round of QE and QE in 2008, knowing the similarities and differences between this round of QE and the QE in 2008 is very important to study the cycle of the Fed's Q. Then the existing QE studies in 2020 focus on the background, tools, effects and rarely conduct a quantitative empirical analysis of the effects of QE in 2020.

Based on this, this paper will improve the shortcomings of previous research, giving a comprehensive comparative study on the QE and the fed in 2008 after three rounds of QE.

2. Data and Empirical Analysis

2.1 Comparative Analysis of the Fed's Balance Sheet

After the global financial crisis outbreak in 2008, the Federal Reserve conducted three rounds of quantitative easing (QE) to ease the exhaustion of liquidity and boost the economy. As a direct result, the Federal Reserve's assets expanded from \$920 billion to \$4.5 billion, a nearly fourfold increase. In this cycle, the Federal Reserve expanded its assets from \$4.2 billion to \$7 billion in three months after the outbreak began, and peaked at about \$9 billion before this round. Although the growth rate was lower than the previous cycle, it had a larger absolute size than the previous cycle. Compared to the previous cycle, the most notable feature was the speed of the Fed's expansion in this cycle: after three rounds of QE, it took six years to reach more than \$40 billion, while this cycle took more than \$8 billion in less than two years (Fig. 1).

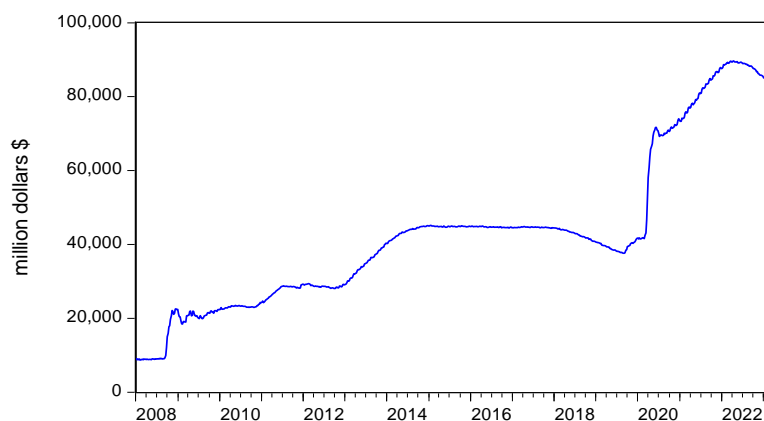


Fig. 1 Fed Balance Sheet

The substantial increase in the deposit reserve balance of commercial banks is a direct result of the Federal Reserve's balance sheet growth. American commercial banks' monetary environment went from a low reserve system to an adequate reserve system after 2008. Commercial bank reserves, which increased from less than \$10 billion to a peak of \$2.7 trillion, or 61% of total liabilities, were the largest addition to the Fed's liability side in the previous cycle. The following downturn started in 2014. On the one hand, the Federal Reserve stopped quantitative easing and began monetary normalization; on the other hand, the Federal Reserve introduced the standard overnight reverse

repurchase tool to guarantee the maintenance of the lower limit price of the federal funds rate under the path of interest rate hikes (ON RRP).

These were debt facilities in which the Fed pledges securities in its market accounts to financial institutions and absorbs dollars. Financial institutions who were unable to open accounts directly with the Fed can nonetheless deposit money there through the overnight reverse repo facility. However, as the facility was only implemented after monetary policy normalization started in the previous cycle, growth had been constrained. The Federal Reserve's liabilities climbed from \$200 billion to \$2.6 trillion, or a 12-fold rise, during this cycle. In addition to the continuous sharp growth of bank reserves, the reverse repo scale also experienced sharp growth. An indicator that financial institutions had more liquidity prior to the current round of monetary policy normalization was the peak of the aggregate of reserve balances and reverse repo balances, which peaked at 65% of all liabilities for the period. This was higher than the previous cycle (Fig. 2).

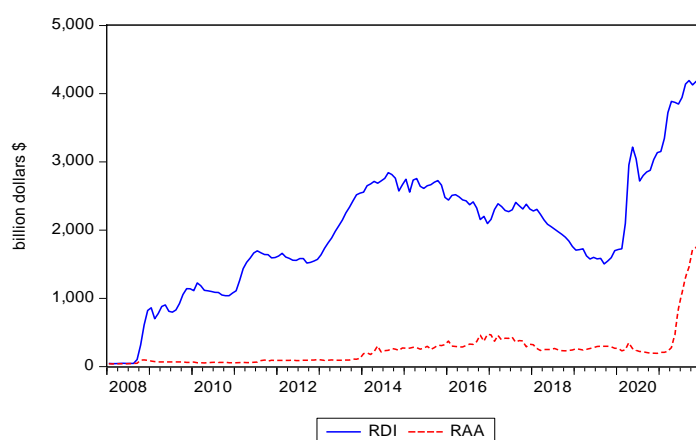


Fig. 2 Deposit institutions' reserves and Reverse Repurchase Agreements

In summary, at the peak of this easing cycle, the Fed's assets and the absolute liquidity of financial institutions were twice that of the previous cycle, and the ratio of the Fed's balance sheet to US GDP now exceeds 35%.

2.2 Comparative Analysis of Fiscal Stimulus Policies

In the last cycle, the US suffered a financial crisis, which started in the financial sector and spread to the real sector. Therefore, the main purpose of the US fiscal stimulus was financial rescue. At that time, the Bush government signed a financial rescue plan of up to 700 billion dollars, which was mainly used to purchase the bad assets of financial institutions to prevent the financial crisis more serious. The effect of such a fiscal stimulus is to stabilize financial leverage and prevent a rapid decline in the balance sheets of financial institutions. The current crisis caused by the epidemic mainly affects the service industry and the general public in the US. Therefore, at the beginning of the epidemic, the federal government launched a huge amount of fiscal stimulus, which was mainly used to subsidize medical institutions, the general public and small businesses affected by the epidemic. According to incomplete statistics, between March 2020 and the first half of 2021 alone, the Trump and Biden Governments introduced six rounds of fiscal stimulus bills totaling \$5.7 trillion. This led to a sharp rise in federal spending. Government spending had been bigger this cycle than in the previous easing cycle, and the stimulus package had been more about direct handouts to affected households and businesses rather than buying assets.

The immediate result of this fiscal stimulus was a surge in inflation. In the last cycle, inflation did not rise significantly, even with a huge amount of monetary stimulus combined with a modest amount of fiscal stimulus. In this easing cycle, inflation had risen much more than previously expected. As of the first half of 2022, the CPI in the US has exceeded 8% year on year, and the core PCE index, which is more closely watched by the Fed, has exceeded 5% (Fig. 3), well above the Fed's 2% inflation target.

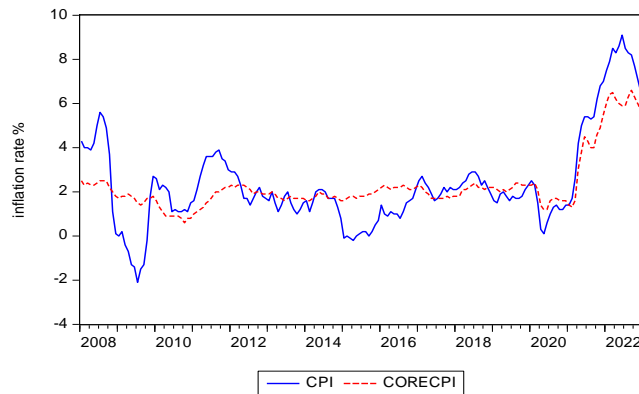


Fig. 3 Inflation rate

2.3 Analysis of the Fed's Monetary Policy Tools

This paper uses the vector autoregressive (VAR) model to analyze the effect of this QE round and the previous QE Fed's monetary policy tools. This method can estimate the dynamic change relationship between variable series without strict economic theory.

Vector autoregression (VAR) model system each endogenous variable as a function of the endogenous variables of all the system to construct the model, to univariate autoregression model to have multiple time series variables of vector autoregression model, often used to predict the interconnected time series system and analysis of random disturbance dynamic impact of the variable system. The mathematical expression for the VAR (p) model is:

$$y_t = \Phi_1 y_{t-1} + \dots + \Phi_p y_{t-p} + Hx_t + \varepsilon_t (t = 1, 2, \dots, T) \quad (1)$$

Where y_t is the column vector of k-dimensional endogenous variables, x_t is the column vector of d-dimensional exogenous variables, p is the lag order, and T is the number of samples. The k k-dimensional matrix $\Phi_1 \dots \Phi_p$ and the k d-dimensional matrix H are the coefficient matrices to be estimated. ε_t is the k-dimensional perturbation column vector that can be correlated between them, but not with their own lag value and not with the variables to the right of the equation.

The model-independent variables are the Mortgage-Backed Security (MBS), and the dependent variables are US Dollar Index (USDIX), Volatility Index (VIX) and Dow Jones Industrial Average (DJIA). Data were selected as monthly data from 2008 to 2020 and data sources were selected from FRED (Related results are shown in Fig. 4).

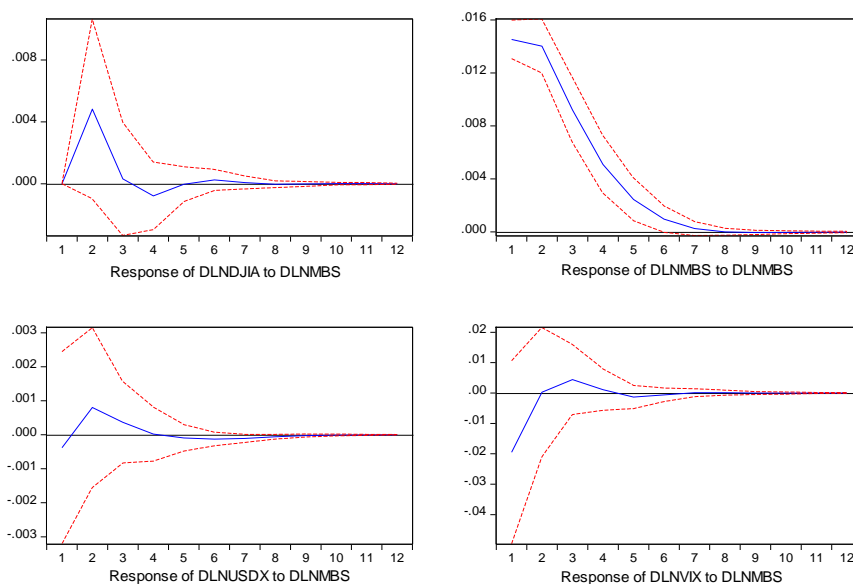


Fig. 4 Impulse response

The impact of MBS on DJIA was initially positive, peaked in the second tranche, and then tapered off. In the fourth stage, the negative shock reached its maximum. Then the negative shock gradually decreased and by the seventh stage, the shock basically disappeared. The impact of MBS on USDX was initially negative, but increased immediately and climbed to the top in the second tranche, and then tapered off. The shock basically disappeared by stage 8. The impact of MBS on VIX was initially negative but rose to zero in stage 2, reached its top in the third stage. Then the positive shock gradually decreases and by the sixth stage the shock basically disappeared.

3. Conclusion

In this paper, the comparison of this round of QE and the last three rounds of QE in 2008 makes the following conclusions: First, because at the peak of this easing cycle, the Fed's assets and the absolute liquidity of financial institutions were twice that of the previous cycle, and the ratio of the Fed's balance sheet to US GDP now exceeds 35%. In addition, Fed Chairman Colin Powell had said that "the Fed will take at least two and a half years to reach a new balance". Whether the Fed was based on returns to its normal asset ratio of 25% of GDP or based on the current normal rate of \$95 billion a month, at least \$3 trillion of assets would need to be reduced over the next two and a half years. In the last cycle, it was only about \$750 billion in two years. The scale and speed of this cycle would far exceed the previous cycle. Second, until the first half of 2022, the US CPI had exceeded 8% year on year, while the core PCE index, which the Fed is more focused on, had also exceeded 5% year on year, exceeding the Fed's inflation target of 2%. Therefore, in the context of such high inflation, when the new process of dollar monetary policy normalization starts, the Fed will act more urgently than the previous cycle to control inflation quickly to a reasonable range. Third, MBS purchases initially positive effect for the USDX and the DJIA but were negative for the VIX.

From these results, this round of QE is similar to but different from the previous QE. If we follow the development of the last cycle as the investment guidance of this cycle, we may make mistake. QE is not a universal solution to the economic recession. The biggest difference between this cycle and the previous cycle is the existence of big inflation and excessive fiscal stimulus, causing rare big inflation for decades. In addition, whether the Fed's balance sheet or the Fed's existing monetary policy tools will prompt the Fed to conduct restrictive fiscal policy in long term.

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