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Analysis of Federal Reserve Policy and Its Impact During the Onset of the COVID-19 Outbreak

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Abstract: The situation caused by COVID-19 is a typical case where a major health event has a profound impact on the economy. Additionally, this is also the period with the most significant economic fluctuations since the economic crisis of 2008. This paper researches the impact of the COVID-19 on the United States of America economic conditions and evaluates the effectiveness of the Federal Reserve's monetary policies during the early outbreak. By selecting key timeframes, the paper analyzes fluctuations in treasury yields, stock markets, inflation, exchange rates, and unemployment obtained from Federal Reserve Economic Data. This study also assesses the Federal Reserve System's performance by examining the characteristics of policies themselves and economic response. Using the Taylor Rule, this research further explores the limitations of traditional monetary tools during unprecedented economic disruptions. The findings suggest that while the Fed's actions provided some stabilization, their overall effectiveness in reversing the economic downturn was limited, particularly in mitigating unemployment and wealth inequality.

Keywords: Monetary policy, COVID-19, Taylor rule.

1. Introduction

Full data on the impact of Corona Virus Disease 2019 (COVID-19) on economic conditions will be available in 2024, after the outbreak has subsided, giving us hindsight to study and assess the Federal Reserve (Fed)'s policymaking in the initial phase of the outbreak to mitigate the impact and the subsequent recovery of the economy.That makes the time perfect for this study.

At present, from the perspective of economics, the research on this is mainly focused on the post-epidemic economic situation and the stock market. The paper by Delardas, Orestis et al. describes the long-term impact of the epidemic on these areas by industry. It mentions that, apart from the energy, metals, mining, manufacturing, and healthcare sectors, other industries suffered significant setbacks [1]. While paper by Abdullah M. Al-Awadhi, et al. analyzes the negative impact of the pandemic on the stock market and recommends that market participants enhance risk management and forecasting capabilities during public health crises such as pandemics [2]. There are still some gaps in the field of policy evaluation, especially in the area of monetary policy. Therefore, from the perspective of omniscience after the end of the event, this paper evaluates the formulation of monetary policy in the United States in the early stage of the outbreak.

By selecting key timeframes and using advanced econometric tools, this paper assesses how forward guidance, interest rate cuts, and Quantitative Easing (QE) influenced macroeconomic

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indicators such as treasury yields, stock prices, inflation, and unemployment. Additionally, this paper explores the impact of these policies on social aspects, a pressing concern exacerbated by the crisis. This will help central banks in the future to improve their decision-making in the face of major emergencies.

In the first part, this paper first selects and divides time periods through key time points for subsequent analysis of different policies. The second part shows the economic data of the study period. The third part is an assessment of the different monetary policies of the Federal Reserve. Finally, the paper applies the Taylor Rule to examine whether monetary tools were suitable for managing the pandemic's economic fallout.

2. Selection of Timeframes

To compare and analyze the impact of the pandemic on the U.S. economy and the regulatory role of U.S. monetary policy, the most suitable and reasonable timeframes must be selected. The economic conditions before and after these timeframes can then be compared to draw conclusions.

2.1. Beginning Phase

On January 20, 2020, the U.S. officially announced its first confirmed case. However, a single COVID-19 case would not have a significant impact on the overall U.S. economy according to Raj Chetty, making this point unsuitable as a reference for framing a pre- and post-pandemic economic comparison [3].

2.2. Observation Phase

On January 29, 2020, after a two-day Federal Open Market Committee (FOMC) meeting, the Fed decided to maintain the Federal Funds Rate (FFR) target range at 1.50%-1.75% and issued forward guidance [4]. In addition, on January 31, 2020, U.S. Secretary of Health and Human Services Alex Azar declared that the COVID-19 outbreak constituted a public health emergency. These actions marked the beginning of the pandemic's more substantial impact on the U.S. economy and signified that the Fed was temporarily in a wait-and-see phase, collecting data.

2.3. Policy Impact Fluctuation Phase

On March 3, the Fed made an emergency rate cut of 50 basis points [5]. On March 15, the Fed made another emergency cut of 100 basis points and began quantitative easing (QE)[6]. On March 23, the Fed announced unlimited QE. These measures can be regarded as significant monetary policies that greatly impacted economic conditions and led to noticeable fluctuations in economic data.

2.4. Stabilization Phase

In April, the Fed continued its QE policies and introduced the Main Street Lending Program, maintaining the current low-interest-rate environment [7].

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3. U.S. Economic Conditions During the Early Pandemic Period

3.1. Treasury Yields

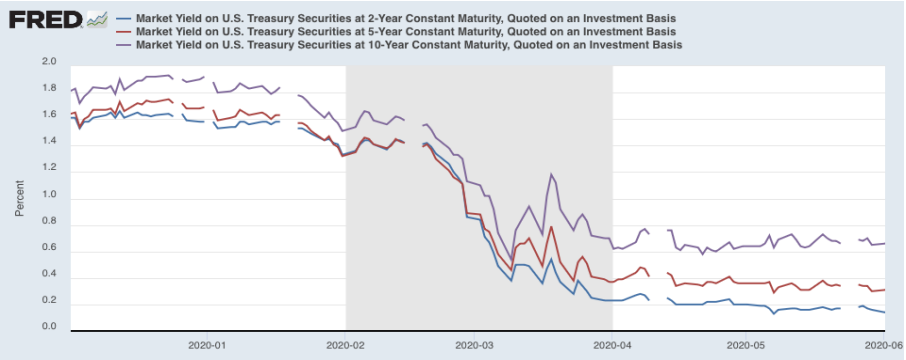

Figure 1: Market Yield on U.S. Treasury Securities

According to Figure 1, after the landmark date of January 31, 2020, U.S. Treasury yields showed a slight downward trend. There was horizontal fluctuation starting from January 31, followed by a sharp decline beginning on February 19. This was followed by significant volatility in mid-March, with yields eventually stabilizing after mid-April.

3.2. Stock Market

Figure 2: Dow Jones Industrial Average (DJIA) and standard &poors500 composite stock price Index (S&P 500)

As shown in Figure 2, starting on January 20, the stock market remained relatively stable. On January 31, the stock market showed slight growth but quickly returned to stability. On February 21, both the DJIA and S&P 500 began to fall sharply, and by February 28, the indices were still experiencing significant declines and volatility. Finally, the market began to recover on March 23.

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3.3. Inflation - Core Cost Performance Index (CPI)

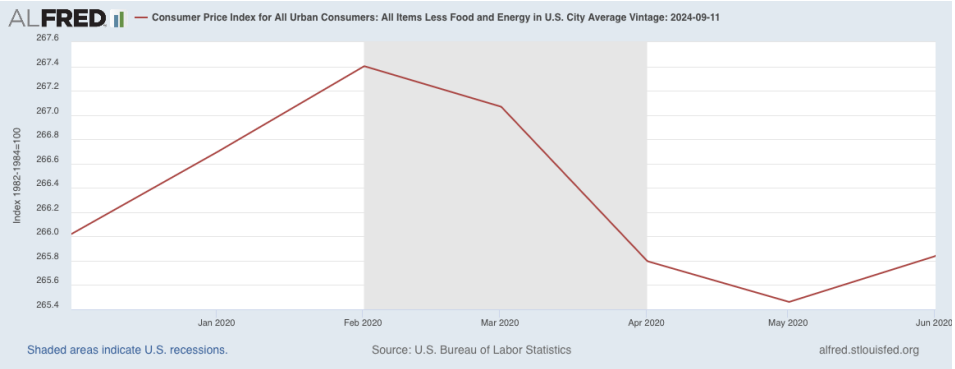

Figure 3: CPI in U.S. City Average Vintage [8]

As is known from the Figure 3, the core CPI showed a continuous decline starting in February, and it only slightly rebounded starting in June.

3.4. Exchange Rates

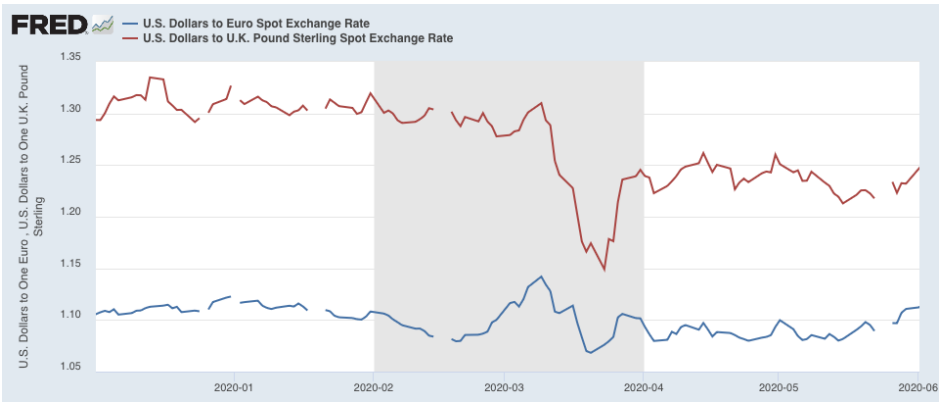

Figure 4: U.S. Exchange rate

It is evident from the Figure 4 that the U.S. dollar against the British pound and the euro began to depreciate at the beginning of February, followed by significant volatility. The dollar appreciated markedly in mid-February, only to experience a sharp depreciation around March 10. By the end of March, the exchange rate gradually returned to pre-fluctuation levels.

4. U.S. Monetary Policies Implemented After the Pandemic Outbreak

Due to the potential overlap of the effects of these policies, their impact is mainly evaluated by observing changes in key economic data within days of the policy announcements.

4.1. Forward Guidance (January 28-29, March 15)

In the context of the pandemic, interest rates were set close to zero, which is similar to the response during the 2008 financial crisis. As Blinder, et al. suggest, central bank communication plays a critical role in shaping market expectations and enhancing the predictability of monetary policy decisions [9]. At the time of Blinder's publication, forward guidance did not exist, but its role is consistent with central bank communication here. Thus, this paper uses forward guidance as an important monetary policy for analysis.

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High consistency can increase the credibility of forward guidance, reduce future uncertainty, promote consumption, and help the economy recover. However, from an overall perspective, the consistency between forward guidance and the actual policies of the Fed is not necessarily always beneficial. The Fed needs to set monetary policies such as the FFR based on current economic conditions. Due to the dynamic nature of real-world situations, appropriate monetary policies may not align with previous statements [9]. To enhance effectiveness, monetary policy also needs a certain degree of flexibility, and here, the balance between consistency and flexibility by the Fed is crucial. To achieve this balance, the Fed often uses vague expressions, which introduces the issue of the transparency and clarity of forward guidance. Therefore, this paper evaluates the effectiveness of the forward guidance implemented by the Fed during the early stages of the pandemic from the perspectives of transparency, clarity, and consistency.

4.1.1. Transparency and Clarity

The Fed clearly stated for future FFRs that the Committee decided to maintain the target range for the federal funds rate at 1.50% to 1.75%, indicating a relatively clear and unambiguous stance [4].

However, the forward guidance issued by the Fed at that time only mentioned the general economic conditions and various indicators but did not address the economic and monetary policy responses to the pandemic that had already begun to spread in the U.S. This omission would lead to public concern about the future economic outlook and policy direction, resulting in negative impacts on consumption and investment. This avoidance of the issue and vague handling reduced the transparency and clarity of the policy.

The forward guidance issued on March 15 directly responded to the impact of the pandemic, addressing the earlier issue.

4.1.2. Consistency

Using the upper and lower bounds of the federal funds target rate range and comparing them with actual FFR data, the actual rate fell below the lower bound only briefly in March during the selected February-to-June period.

Furthermore, by calculating the average between the upper and lower bounds of the federal funds target rate and comparing it with the actual FFR data, the root mean square error (RMSE) was approximately 0.125 during the February-to-June period, indicating relatively high consistency in forward guidance.

4.1.3. Subsequent Operations and Impact

By setting clear asset purchase amounts and timelines (e.g., $80 billion in Treasuries and $40 billion in Mortgage-Backed Securities (MBS) each month), the FOMC sent a signal to the market that it would continue to pursue accommodative monetary policies until its maximum employment and inflation targets were met. This clear policy signal and commitment aligned with the "flexibility" emphasized in the FAIT framework, indicating that the Fed could tolerate inflation fluctuations for some time before achieving its long-term goals. These changes in forward guidance were consistent with the new average inflation targeting framework approved by the FOMC on August 27, 2020 [10]. This framework marked the first comprehensive public review of the Fed's monetary policy tools and communication strategy, with the goal of achieving maximum employment and price stability. This demonstrates a positive attitude toward recovering from the economic shock of COVID-19.

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4.2. Interest Rate Cuts (March 3, March 15)

4.2.1. Impact on Consumption and Investment

Based on core CPI (267.068-265.796) and housing start data (104500-84900) between March 2020 and May 2020 [8], both indicators continued to decline after the policies were announced, showing that the rate cuts were insufficient to reverse the economic downturn and the loss of consumer confidence caused by the pandemic.

4.2.2. Impact on Unemployment

The actual U.S. unemployment rate soared from 4.4% in March to 14.8% in April. Given that the natural unemployment rate in the U.S. is between 4.0% and 5.0% [8], this indicates that even after accounting for the natural rate of unemployment, there was nearly a 10% increase in the unemployment rate, a significant figure. This suggests that the interest rate cuts had little effect on reducing unemployment.

4.3. Quantitative Easing (March 15, March 23)

4.3.1. Impact on Financial Markets

As shown in Section 2.2, the QE policy announced on March 15 helped ease the sharp decline in the stock market, while the unlimited QE announced on March 23 led to a significant market rebound. Although part of this recovery may be attributed to a market bottom, the unlimited QE played a dominant role.

4.3.2. Macroeconomic Impact

As shown in Section 2.1, Treasury yields rose significantly after the QE announcements on both March 15 and March 23, but both increases were followed by a short-term decline.

4.3.3. Impact on Inequality

As Bell, et al. mentioned, QE acts largely through longer-term interest rates, leading to a significant reduction in interest income for retirees who rely on savings as a source of income [11]. Furthermore, the article pointed out that QE exacerbated wealth inequality by driving up asset prices, particularly in the stock and real estate markets. The unlimited QE in March further expanded these effects, intensifying the wealth effect and deepening inequality.

5. Taylor Rule

5.1. Coefficient

Based on data published by the Fed, the coefficients used in this paper follow the 2019 data, with an inflation gap coefficient of 1.5 and an output gap coefficient of 0.5[12]. Therefore, the Taylor rule formula is:

$$i_t = r^* + \pi_t + 1.5(\pi_t - \pi^*) + 0.5\tilde{Y}_t \quad (1)$$

Where r^* and π^* are both set to the default 2%. The year-on-year rate of change in core Personal Consumption Expenditures (PCE) is used for π_t according to Carvalho, et al. [13].

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5.2. Application of Taylor Rule

Based on the calculations, the predicted interest rates for April, July, and October 2020 were -4.72%, -0.97%, and -0.29%, respectively. Clearly, the Fed could not use negative values as interest rates, which means the Taylor rule was ineffective during the initial phase of the pandemic.

5.3. Inertia Parameter

According to Fuentes-Albero and Roberts, the inertia parameter used by the Federal Reserve in 2020 was typically set at 0.85 [14]. This parameter reflects the interest rate smoothing approach, where the current policy rate heavily depends on the previous period's rate. The high inertia of 0.85 indicates that the Fed's policy adjustments were gradual, ensuring that interest rates moved slowly toward the target, avoiding large and sudden changes. This implies a relatively high degree of policy lag but also reflects a more conservative approach. The 0.85 inertia parameter helps manage economic fluctuations more smoothly, especially during times of uncertainty like the COVID-19 crisis.

6. Conclusion

The analysis in this paper shows that although the Federal Reserve's quick monetary policy actions, including forward guidance, interest rate cuts, and quantitative easing, helped to stabilize financial markets during the early stages of the COVID-19 pandemic, they were less successful in tackling deeper structural economic problems. While there was temporary stabilization in treasury yields and stock markets, unemployment reached historically high levels, and core inflation continued to decline, revealing ongoing weaknesses in consumer confidence and investment.

Additionally, the implementation of unlimited QE worsened wealth inequality by primarily benefiting asset holders, especially in the stock and real estate markets. The Taylor Rule, a traditional guide for setting interest rates, was ineffective in this crisis, as the predicted rates entered negative territory, highlighting the need for new monetary frameworks during such exceptional events.

In conclusion, the Federal Reserve's policies provided short-term relief but fell short of fully mitigating the economic damage caused by the pandemic. Future policy efforts should consider a wider range of tools to address both market liquidity and deeper issues like inequality and labor market disruptions.

However, there are also some limitations in this paper. The separate analysis of each monetary policy does not deal with the elimination of the impact caused by other policies. In addition, as this paper is mainly qualitative analysis, lack of analysis of the superimposed impact of various monetary policies, for the combination of the overall monetary policies, there is no way to give good suggestions.

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