

The Impact of Expansionary Monetary Policy on the Economic Environment during and after an Epidemic Era: Analysis of Effects and Implications

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Abstract: This article delves into the far-reaching implications of the COVID-19 pandemic on the global economy and trade, along with the subsequent adoption of expansionary monetary policies by central banks across the world. The pandemic has unleashed a wave of economic downturns worldwide, compelling central banks to consistently reduce interest rates and implement exceedingly accommodating monetary measures to alleviate its profound impact. However, these policies are not without their own set of uncertainties and risks. Heightened apprehensions regarding inflation and income inequality have emerged as significant concerns accompanying the pursuit of ultra-loose monetary policies. As the global community grapples with the multifaceted ramifications of the pandemic, policymakers face the challenging task of striking a delicate balance between stimulating economic recovery and addressing the potential repercussions of prolonged loose monetary conditions. It is crucial to consider these complex dynamics and devise prudent strategies to navigate this uncharted territory effectively.

1. Introduction

The corona virus (COVID-19) completely disrupted the operation and growth pace of the global economic and trade system. Originally at the end of 2019, people from all walks of life predicted that 2020 will be a year of strong recovery in the global economy. The COVID-19 pandemic to the global economy, whether it is developed economies or emerging market countries, is not immune to the worst recession since the Great Depression in the 1930s. Among those developed economies, led by the United States and the Eurozone, have suffered the most. Also from the IMF's forecast data, the estimated economic recession in the United States and the Eurozone in 2020 will reach 8% and 10.2%, respectively, which is almost two to three times the average of emerging market countries. Indeed, judging from the actual data in the second quarter of 2020, such an estimate is not outrageous. According to figures released by the Bureau of Economic Analysis of the U.S. Department of Commerce and the Eurostat, the economic growth rates of the U.S. and the Eurozone in the second quarter were -9.5% and -15%, respectively, setting historical recession records.

Obviously, the impact of the new crown epidemic on the European and American economies is far beyond imagination. And such an impact seems to have not stopped.

Under the impact of the epidemic, the monetary policy space has rapidly narrowed, and major central banks need to adjust their policy frameworks to get rid of the current predicament. Since March 2020, dozens of central banks have cut interest rates or cut interest rates several times, and the world has entered the era of the lowest interest rates. The G4 (United States, Eurozone, Japan, United Kingdom) weighted average policy interest rate further dropped from 0.76% at the end of 2019 to -0.34%, approaching the lower limit of the global policy interest rate. At the same time, the major central banks accelerated their expansion to the highest level in history. As of the end of October 2020, the G4 central bank's assets have exceeded US\$22 trillion, and the intensity and speed of expansion far exceed those of the 2008 financial crisis.

Since March 2020, the financial market has fluctuated sharply. Central banks in various countries cut interest rates urgently, stepped up their asset purchase plans, restarted and innovated many policy tools during the 2008 financial crisis, and implemented ultra-loose monetary policies rarely seen in history. The ultra-loose monetary policy and extremely low interest rate environment will help smoothing the liquidity dilemma, form a combination with fiscal and public health policies, and have a certain supporting effect on economic and financial restoration. However, after this round of rapid expansion, central banks of various countries have generally been at the lower limit of policy interest rates, the monetary policy space has narrowed, the long-term effects of the policy are uncertain, and global financial vulnerabilities have been exacerbated. Because of this, the impact on the real economy has far exceeded market expectations and imagination, in order to save the economy and jobs, the United States has comprehensively introduced various monetary and fiscal policies in response to the impact of this wave of epidemics, such as interest rate cuts, quantitative easing, expansion of government expenditures, provision of preferential interest rate loans, and direct cash grants while preventing excessive interference from causing disorder and chaos in the financial market. However, extremely loose monetary and fiscal policies have also brought more uncertainty to the future recovery of the real economy and financial market stability, and even concerns about inflation and unequal income distribution.

Currently, rising emerging powers are challenging existing world powers. In order to deal with the above situation (usually in the war years), the government will make a large amount of fiscal expenditure, resulting in a large amount of government debt; and when the free market has insufficient demand for such bonds and its own desperate need to sell, the central bank will pass various ways to monetize debt. The current deficit of the US government will exceed 31% of GDP, and the amount of money and debt purchased by the Federal Reserve will make its debt holdings reach about 38% of GDP, which is higher than the peak of World War II. The interest rate did not rise during 1930-45. In fact, interest rates did not need to rise. Although the low interest rate environment does not bring significant direct risks to the financial system, its long-term risks are increasing-that is, cash and credit assets are no longer regarded as good wealth reserve options. This may eventually lead to major turbulence in the financial market, leaving central banks in a dilemma where they have to make a choice: either raise interest rates or depreciate the currency. Especially in the post-epidemic era, the central bank's monetary policy decisions will face greater difficulties. After the epidemic, it will take longer to repair the labour market, and there will be profound changes in employment patterns, and employment growth may lag behind economic growth. At the same time, globalization is blocked, protectionism rises, value chains shrink, and the previous low base and unlimited liquidity release are superimposed. The level of inflation may rise before the process of economic recovery. As a result, major central banks have to re-examine the decision-making logic of employment, wages, and price growth, and discuss and adjust target levels.

This paper will investigate the major effects during the epidemic of the COVID-19 and the post-

epidemic era on monetary policy around the globe and the pros and cons of expansionary monetary policy.

2. Literature Review

Barro (1986) assumes that the information and actions taken by the private sector are of both good qualities. The monetary policy game between the unions established in the human sector and the central bank is suitable for European countries, but not suitable for the real society of the United States. At the same time, Barro also found that within a limited period of time, central bank decision makers may have two types of people in charge. Policy makers with strong actions will not adopt inflationary monetary policies, while policy makers with weak actions will pretend to be strong and attempt to adopt. To enhance the trade union's reputation in light of an unforeseen inflationary policy, from the government point of view of monetary policy constrain, there are several contradicting analyses between the scholar and Canzoneri (1985) assumes that the government and trade unions each have their own different utility functions. If the government has a better ability to forecast the demand for social currency compared to trade unions, it may have substantial power and resources to maintain price stability. In such cases, government officials should adhere to established laws when addressing the issue of trade union trust, particularly when dealing with confidential matters. It is important to ensure that the government follows proper procedures and safeguards while resolving these concerns. On the other hand, Rogoff (1985) proposed a set of models to solve the problem that conservative government decision makers should adopt monetary policy without incentives for price inflation to reduce the social cost of dynamic inconsistency.

The DSGE model is one of the theoretical frameworks of modern monetary policy analysis. It is based on the dynamic general equilibrium analysis of the substantive business cycle theory and takes into account the friction of the economic system, such as: price and wage rigidity, manufacturer agency costs, and currency demand functions. One of the features of the model is to overcome Lucas's critique of policy evaluation (the critique of policy evaluation, 1976) because policy changes will change people's expectations, and people's expectations affect economic behaviours, the measurement model for policy evaluation should follow the policy changes^[1].

Generally, the restriction and optimization conditions derived from the maximum utility of households or the maximum profit of the manufacturer are nonlinear models. Logarithmic linearization is required before the optimal solution value is obtained to obtain the linearized steady state model. Then, the Taylor expansion is used to carry out a first-order expansion near the long-term stable state; then the equations of the dispersion of each endogenous variable are solved by the simultaneous formula to illustrate the fluctuation of each endogenous variable near the long-term equilibrium value^[2].

Clarida, Gali, and Gertler (1999) set up a simplified forward-looking overall model and monetary policy objective function to discuss monetary decision-making. The short-term interest rate is used as a monetary policy tool variable, and the policy objective function is a quadratic loss function for stable output and stable prices. Due to the rigidity of short-term prices, the monetary authority effectively affects short-term real interest rates, output and inflation rates, which are affected by current policies and people's expectations for future policies, and policy credibility significantly affects policy effects. Considers under discretion and under a rule with credible commitment by all means knowing the overall model, the optimal solution value of endogenous variables and the optimal interest rate rule are derived from the minimum loss of the policy objective function.

The most appropriate policy should adjust interest rates to completely offset the impact of demand-side fluctuations on production. In terms of supply-side fluctuations, the central bank does

not need to implement any countermeasures but if the natural unemployment rate is underestimated, the expansionary monetary policy may lead to a high inflation rate and no increase in output. Relatively emphasizing the ultimate policy goal of price stability can avoid excessive inflation. When the central bank implements policy rules, it will affect the setting of prices, a policy law with high credibility and a relatively emphasis on price stability can improve the short-term trade-off relationship between inflation rate and output and resulting in a better social welfare. In terms of inflationary pressure, the most appropriate policy is to partially adjust demand. Due to the uncertainty of the actual economic system, it is not easy to set the most appropriate policy rules^[3].

When the central bank selects a specific narrow monetary aggregate reserves or monetary base as a policy tool variable, fluctuations in currency demand will increase the range of interest rate fluctuations and therefore, the central bank prefers a specific short-term interest rate. On the other hand, because the uncertainty of the parameters, it may weaken the response of policy tool to random fluctuations in the economic system, the central bank may formulate an interest rate policy rule with relatively small interest rate fluctuations and slowly adjust interest rates toward the target value^[4].

An economic structure model should be used to simulate economic development and formulate corresponding monetary policies. In summary, scholars have improved the Taylor rule mainly on several ways. Firstly, introducing the expected inflation and expected output gap into the Taylor rule by constructing a forward-looking model to reflect the forward-looking behaviour of the monetary authority. Monetary policy rules greatly enhance the transparency and credibility of monetary policy decisions (Svensson, 1999). Secondly, by simulating real economic behavior through a complex macroeconomic structural model, we can examine the suitability of the simple Taylor rule in various central banks worldwide. However, the uncertainty of the economic structure model itself may greatly affect the estimated results of monetary policy rules, such as Batini and Nelson (2000). Haldane and Batini (1999) believe that when facing with instability, the simple Taylor rule is more robust than the Taylor rule with macroeconomic structure model constraints, and simple rules are easier to understand by the public, which helps the central bank guide public expectations. It has more advantages in credibility and supervision. Thirdly, taking into account the central bank's interest rate smoothing behaviour, introduce a lagged interest rate variable to test the degree of central bank interest rate on smoothing, such as King (2000).

3. Main controlling tools of Expansionary Monetary Policy

During the epidemic, the Federal Reserve, the European Central Bank and others continued to restart by innovating and developing a series of policy tools for financial institutions and financial markets such as asset purchase. Major central banks increase the money supply by purchasing assets such as treasury bonds and inject liquidity into the market. Facing the impact of the epidemic, the Federal Reserve rapidly expanded its balance sheet and announced a launch of a US\$700 billion quantitative easing program to purchase US Treasury bonds and home mortgage-backed bonds (MBS). Immediately, the Fed further increased its easing and announced unlimited quantitative easing to purchase assets on demand. The European Central Bank has further increased the size of its original asset purchases as well where it launched the Pandemic Emergency Purchase Program (PEPP) with a total amount of 750 billion euros. Under the PEPP framework, the European Central Bank's purchase of underlying assets has been further expanded, and most of the funds are still used to purchase government bonds, and for the first time Greek debt has been added to the scope of the plan, while the scope of corporate bond purchases has been expanded to include non-financial commercial paper.

Secondly, in order to increase banks' liquidity, the central bank provides emergency credit to

banks to supplement liquidity. The Fed directly provides short-term credit to banks through discount windows and regular discount windows to maintain bank liquidity. The European Central Bank provided liquidity support to banks through tools such as targeted long-term refinancing operations (TLTRO III), and reduced the implementation threshold of TLTRO III to zero. In addition, the European Central Bank has also established a new "Pandemic Emergency Long-term Refinancing Operations" (PELTROs) tool to further relax the restrictions on both areas which are eligibility and quantity of banks applying for loans. However, the discount window and long-term refinancing operations are passive operating tools, and the actual application scale and commercial intentions are not dominated by the central bank^[5].

Thirdly, in order to increase the liquidity support of other financial institutions, the Fed has adopted a series of liquidity support programs for different financial institutions. For traders, the Federal Reserve has restarted the Primary Dealer Credit Facility (PDCF). This tool was first adopted during the 2008 financial crisis as when institutions and individuals avoided high-risk assets and hoarded cash, they improved their financing capabilities by providing low-interest loans to primary dealers, thereby increasing market liquidity and ensuring the credit market is operating, and the Federal Reserve provided 24 primary dealers with 90-day low-interest loans during the epidemic.

For money market funds, the Federal Reserve established the Money Market Mutual Fund Liquidity Facility (MMLF). At the beginning of the outbreak, investors worried that the risk would further spread to the financial market and collectively withdrew from the money market funds. In order to cope with a large number of redemption transactions, money market funds have to dump their holdings in a large amount in the secondary market. In the case of unequal buying and selling orders, the prices of a large number of high-quality assets have fallen, further exacerbating the collapse of the financial market. The Federal Reserve established MMLF to assist financial institutions in undertaking money market fund assets and to inject liquidity into the market. Compared with the Federal Reserve, other central banks such as the European Central Bank seldom use and practice such tools.

Furthermore, for the local governments, the Federal Reserve launched the Municipal Liquidity Facility (MLF) to provide short-term credit support of up to US\$500 billion by purchasing short-term bills from state and local governments affected by the epidemic. For enterprises, the Federal Reserve has innovatively provided primary market corporate credit facility (PMCCF) and secondary market corporate credit facility (SMCCF) to purchase newly issued corporate bonds and provide enterprises with a financing scale of up to 750 billion U.S. dollars. Credit facilities through commercial paper (CPFF) provides discounts for qualified commercial papers, and provides short-term liquidity for enterprises' daily operations. At the same time, the Federal Reserve also launched the "Main Street Lending Program" to expand the scope of potential borrowing companies through new loan facility (MSNLF), extended loan facility, and priority loan facility (MSPLF). It provides loans up to 600 billion U.S. dollars. For individual residents, the Federal Reserve restarts an important tool during the subprime mortgage crisis. Periodic Asset Backed Securities Credit Facility (TALF) provides financing facilities for individuals with qualified collateral to alleviate personal liquidity problems and the resulting auto loans and credit card loans.

In order to cope with the difficulty of the post-epidemic era, the Fed has made two core changes and firstly, it puts more emphasis on full employment, comparing to the maximum level of employment of shortfalls and to the maximum level of employment. Secondly, it implements a more flexible average inflation target system. The Fed has increased its tolerance for inflation, revised the symmetric inflation target to an average inflation target, and is committed to maintaining the average inflation at 2% for a certain period of time. The Fed revised its monetary policy framework, to a certain extent, alleviating the contradiction between employment and

inflation goals. Under the impact of the epidemic, the Bank of England began to evaluate policy options including negative interest rates, expanded asset purchase plans, and the inclusion of higher-risk securities. The Bank of Canada compares different monetary policy frameworks and conducts an assessment of inflation and price stability tools and it can choose to establish a target path for the overall price level instead of the inflation rate, thereby making monetary policy more effective. In addition, other central banks such as the Reserve Bank of Australia have also begun to reassess monetary policy frameworks.

For the next few years, negative real interest rates will become the norm. The Eurozone and the Bank of Japan's policy interest rates have reached historically low levels of -0.5% and -0.1%. The benchmark interest rates of Denmark, Switzerland, Hungary and other countries are negative. The United States, the United Kingdom, Canada and other countries have entered the era of zero interest rates or are approaching zero.

The sovereign bond yields of more than ten countries and regions including Europe have fallen into negative values, and the US federal funds interest rate futures also once indicated that the possibility of negative federal funds interest rates has increased. Although there is frequent good news about vaccine research and development, and the global economy is beginning to show signs of recovery, it is undeniable that global monetary policy will still be in an ultra-easy state for some time to come. Insufficient momentum for sustainable economic growth, huge fiscal deficits and debt levels have made the exit of ultra-loose monetary policy difficult. Only low interest rates, nominal and negative real interest rates can underpin economic recovery and offset part of the rescue costs, and gradually realize the return of policy to normalization.

The adjustment of monetary policy in the post-epidemic era focuses on several directions. Firstly, for the asset purchases and forward-looking guidance remain the main options for monetary policy. Especially in the transition period from the shock of the epidemic to the post-epidemic era, the internal and external economic and financial prospects are highly uncertain, and the important position of forward-looking guidance will be further elevated. The central bank's policy communication needs to be more precise, flexible and effective, and promote market expectations. Positively interact with policy intentions. And secondly is to focus on the control of long-term interest rates. Long-term bonds are more closely related to commercial interest rates and the real economy. The central bank needs to pay attention to the rise in long-term interest rates, adjust the asset purchase and repurchase structure, and do not rule out the possibility of yield curve control under special circumstances. Thirdly, as market liquidity conditions tend to stabilize, some emergency liquidity support tools may be withdrawn and therefore attentions should be paid to the possible spill over effects and financial fluctuations that may be triggered by differences in economic policy cycles in various countries.

As the scale of government debt continues to rise and remain high, in order to ensure the scale of funds required for fiscal stimulus, the central bank must continue to purchase government bonds on a large scale and maintain low interest rates to reduce the cost of debt. The role of the central bank and monetary policy are more dependent on fiscal policy. From a broad perspective, the Fed's implementation of unlimited QE in coordination with fiscal expenditures can be regarded as the prototype of government debt monetization to a certain extent.

The role of the central bank in the post-epidemic era is difficult to return to normal. The epidemic has caused a deep bond between monetary policy and fiscal policy, and the boundary between the two has become more blurred, and the independence of monetary policy has been weakened. In the post-epidemic era, it is difficult for huge government debts to quickly return to pre-epidemic levels. Once long-term interest rates rise, the central bank will have to increase government bond purchases to stabilize interest rates. Maintaining moderate long-term interest rates will also become an important goal of the central bank. At the same time, in terms of promoting

economic recovery and sustained growth, the role of monetary policy has declined significantly, and it is more of a supplement and support to fiscal policy.

4. Impacts of Expansionary Monetary Policy

First of all, from the perspective of the actual environment, the Fed's rapid and large-scale rescue measures have quickly stabilized the global financial market. For example, the U.S. stock indexes led by Dow Jones, S&P 500 and Nasdaq have not only rebounded strongly back to near historical highs, but have even continued to set new highs. Compared with the early stage of the epidemic, the U.S. stock index frequently triggered the circuit breaker, and the panic situation of the Dow Jones plummeting by a thousand points at every turn, seemed to be two completely different worlds. The stabilizing financial market not only greatly reduces the pressure on companies to raise funds, but also promotes the increase in consumption willingness of companies and the people through the effect of wealth. In other words, although the global epidemic is still severe, with the rapid boost in financial market confidence in the short term, it is also contributing bit by bit to the recovery of the real economy. However, the strength of the recovery between the two is very different, and it is inevitable that people will feel a serious decoupling between the real economy and the financial market.

On the other hand, the rapid recovery of the short-term financial market may bring some positive effects, but it may also aggravate the volatility of the financial market. Especially under the premise that the real economy has been slow to keep up, soaring prices of financial assets are often not a good thing. Although the Fed's extremely loose monetary policy will help boost financial market conditions in the short term, it may also stimulate more venture capital, and thus causes financial market imbalances or causes violent fluctuations.

The IMF once issued a Global Financial Stability report to simulate and test the corporate debt status of eight major economies, including the United States, and pointed out that these eight major economies may face high levels of debt default risk companies in 2021. The reason is that in the corporate debt structure of the eight major economies, speculative-grade debt and high-risk debt account for a very high proportion, and the total will be as high as US\$19 trillion, which is an about 40% of GDP. Among them, speculative bonds refer to non-investment grade junk bonds or high-yield bonds, while high-risk bonds generally refer to corporate bonds with an Interest Coverage Ratio (ICR) less than 1, both of which have relatively high default risks. Although the United States ranks only fifth among the eight major economies, the proportion of these two types of corporate debt to GDP in 2021 is also close to 40% of the overall average.

5. Conclusion

It is undeniable that, based on past historical experience, the Fed's practice of printing a large amount of money to save the economy, although it can play a good role in stabilizing the situation in the short term, it also has a positive effect on the financial market. However, in the long run, it may also derive problems such as increasing the risk of debt default, accelerating the flow of international hot money, disrupting the financial order of emerging markets, deepening inflation concerns, and widening the gap between the rich and the poor. The experiences of advanced countries in Europe and the United States after the 2008 financial tsunami, or the Lost Decade of Japan earlier, are all stark examples.

In addition, judging from the impact of the epidemic, the severe decoupling of the financial market and real economy in disguise has caused the financial asset bubble to become bigger and bigger, which may also be another issue that should not be underestimated. All of these will not only add more financial chaos to the world, but also increase the difficulty of operating the policies

of various governments, and make the future economy full of higher risks and uncertainties.

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