Proceedings of the 2023 International Conference on Management Research and Economic Development
DOI: 10.54254/2754-1169/22/20230333

A Literature Study for the Spillovers of Quantitative Easing

Sirui Wang[1,a,*]

[1]*Nankai University, Tianjin 300100, China*
a.2011195@mail.nankai.edu.cn
**corresponding author*

Abstract: Quantitative easing, as an unconventional monetary policy, was often adopted by major central banks after the 2008 financial crisis. Different from the conventional monetary policy, that is, the central bank injects liquidity into the financial market by adjusting the benchmark interest rate and open market operations, the core of quantitative easing is to increase the balance sheet of banks in the short term through asset purchases and other behaviors to achieve the purpose of stimulating the economy. From 2008 to 2020, the United States adopted five quantitative easing policies to deal with economic downturn risks. While alleviating its own economic recession, it also had a strong spillover effect on China and other countries. Although quantitative easing has alleviated the economic crisis in the United States in practice, it has had an adverse impact on the entire world economy, making the whole world bear the consequences of the economic crisis together. This article summarizes scholars' research on the role, effectiveness, and spillover effects of quantitative easing policies, and summarizes the factors that affect the size of the spillover effects. Finally, through the analysis of the international transmission theory and transmission channels of inflation, it explores the impact of the US quantitative easing policy on China's inflation rate.

Keywords: quantitative easing policy, spillover effect, inflation

1. Introduction

Monetary policy is divided into two types: traditional monetary policy and non-traditional monetary policy. Traditional monetary policy means that the central bank injects liquidity into the financial market by adjusting benchmark interest rates and open market operations. However, during the economic depression, especially the financial crisis, the traditional monetary policy has little room for adjustment, and the liquidity trap makes the transmission channel of the policy ineffective. At this time, it is necessary to use unconventional monetary policy. Unconventional monetary policy is defined by Bernanke in 2009. That is, through the purchase of assets by the central bank to expand the central bank's balance sheet to promote economic growth. In the face of the 2008 economic crisis, the Bank of Japan mainly affected the liability side of the central bank's balance sheet through "quantitative easing", that is, increasing the deposit reserve ratio. The Federal Reserve, on the other hand, adopts the "credit easing" approach, which releases a large amount of liquidity by directly purchasing securities in the market, reduces the cost of borrowing in the financial market, and affects the asset side.

DOI: 10.54254/2754-1169/22/20230333

Unconventional monetary policy was divided into negative interest rate policy, new credit operations, asset purchase plan and forward guidance. It is believed that the core starting point of quantitative easing has the following three points: (1) through the purchase of large-scale assets to address the problem of the zero lower limit of short-term interest rates; (2) directly provide liquidity to the market to solve the problem of blocked transmission mechanisms; (3) to deal with the financial crisis emergency rescue under the market system.

As for quantitative easing, most scholars agree that quantitative easing is effective. Borio and Disyatat reviewed the nature, theoretical basis, reasons for implementation and some transmission channels of quantitative easing policies, and introduced the positive effects of these policies on economic recovery [1]. Krugman, Paul introduced a theoretical model of non-traditional monetary policy using Japan's QE policy as an example [2]. Joyce, M uses the UK's quantitative easing policy as an example to review how the UK expands its balance sheet through asset purchases, and explains the channels through which QE policies are transmitted, such as signal channels, confidence channels, and portfolio rebalancing channels [3].

2. Effectiveness of Quantitative Easing

Existing studies on the role of quantitative easing generally believe that quantitative easing can effectively raise asset prices and produce significant domestic wealth redistribution effects. In terms of the stock market, Lima et al. used the ARDL model, found that the QE of the central banks of the United States, the United Kingdom, and Japan promoted the rise of stock prices [4]. The U.S. stock market boomed. In the bond market, Zhang Yichun and Hu Xiao pointed out that the unconventional monetary policies of the central banks of the United States, the United Kingdom, and the European Union have lowered the interest rates of various terms, and compared with the period of the global financial crisis [5]. The QE launched in 2020 July by the Fed, the effectiveness of most tools in boosting financial markets has increased. In terms of the real estate market, Lu Xiaoming found that the effect of the Fed's QE was stronger than that of the European, Japanese, and British central banks, which not only raised real estate prices, but also produced domestic wealth redistribution effects [6].

Regarding the domestic wealth redistribution effect produced by the quantitative easing policy, the mainstream view is that QE in developed countries exacerbates the inequality of wealth distribution through the stock market, and the wealth redistribution effect through the bond market is negligible, because real estate is distributed relatively equally among different wealth classes , the rise in housing prices promotes the common growth of wealth among all classes and eases the inequality of wealth distribution [7]. Some studies also believe that the distribution ratio of real estate among different classes determines the redistribution effect of rising house prices. Rising house prices make it difficult for the poor to own real estate and widen the wealth gap between the middle class and the poor .

In terms of the effectiveness of the quantitative easing policy, most scholars' research focuses on the analysis of the Bank of Japan's quantitative easing policy, and there are few studies on the effectiveness of the US QE policy. Xu Hao, Zhang Jiaming analyzed the effectiveness of the US quantitative easing policy, and believed that the quantitative easing monetary policy had the greatest impact on the creation of bank liquidity, followed by the impact on long-term interest rates, and on bank credit [8]. The impact of quantitative easing monetary policy is the smallest, but the absolute impact of quantitative easing monetary policy on these three variables is very significant; in addition, bank liquidity creation is basically only affected by quantitative easing monetary policy, while bank credit is affected by quantitative easing policy, bank liquidity creation In the short term, bank liquidity creation has the greatest impact on bank credit, while in the long run, long-term interest rates have the greatest impact on bank credit. In other words, the quantitative easing policy is effective in expanding bank balance sheets, injecting liquidity into the market, and increasing asset prices. In the short term,

DOI: 10.54254/2754-1169/22/20230333

it will create liquidity and long-term interest rates to affect bank credit, stimulate the economy, and promote economic recovery.

3. Spillover Effect

After the global financial crisis in 2008, the central banks of major developed countries adopted unprecedented monetary measures, especially the ultra-large-scale quantitative easing (QE), which resulted in a large amount of international capital flowing into many emerging market economies, resulting in the excessive expansion of the financial market is the spillover effect of the monetary policies of the developed economies on the emerging economies. In the 19th century, British economists John Stuart Mill and Henry Sidgwick first proposed the concept related to "spillover effect", and then, Piguo expanded the "invisible hand" and proposed "externality". The concept of "externality" is the impact of economic actions taken by market agents on other market agents. Subsequently, most economists regard "externalities" as the essential characteristics and connotations of "spillover effects".

From the perspective of macro subjects, Some scholars believe that the large-scale asset purchases implemented by developed economies will cause excessive currency appreciation in small open economies, and imbalances may occur in emerging economies. Other scholars such as Blanchard pointed out that these unconventional monetary policies will have a positive impact on global demand [9]. There are two main transmission mechanisms for the international spillover effects of quantitative easing policies: The first transmission mechanism is the impact of QE on exchange rates [10]. The size of the central bank's balance sheet and the supply of base money will affect a country's currency The empirical evidence shows that the implementation of QE will have a large and sustained impact on the bilateral exchange rate, which in turn will affect the economy of another economy; the second mechanism is the QE of developed economies A large amount of empirical evidence shows that the Fed's QE induces capital inflows to emerging economies, such as Fratzscher et al. [11]. In addition, some scholars have studied the impact of quantitative easing on international asset prices, and found that large-scale asset purchases in developed economies have a positive effect on the overall international asset prices, which has a strong Spillover Effect.

Specifically, in terms of inflation, some scholars found that US QE led to an increase in China's inflation rate by studying short-term exchange rates, foreign exchange reserves, and commodity price indexes, but had little effect on short-term capital flows. In terms of GDP and output levels, Du Jie and Cao Weiyu used the SVAR model to study the U.S. federal funds rate or broad money supply, and found that an increase in the U.S. federal funds rate or broad money supply would have a sustained impact on China's macroeconomy by about 10% [12]. A short-term positive impact of about a month or so is manifested in a short-term rapid increase in GDP growth and price levels. In terms of exchange rates, some papers used the ARIMAX model to study the overseas financing costs of enterprises, and found that the first round of QE in the United States had the greatest impact on the depreciation of the RMB exchange rate, and China's inflation rate fell in the short term after the second round of QE , but rises in the long run. The exchange rate of the third and fourth rounds of QE to RMB is not obvious.

4. Factors Affecting the Spillover Effect

In Jin Xuejun et al.'s paper, the condition of a country's financial system determines the degree of exposure to the spillover effects of unconventional U.S. monetary policy [13]. Emerging economies differ in their ability to cope with financial shocks from quantitative easing due to the imperfections of their financial systems as well as exchange rate regimes. A country's level of financial openness affects its exposure to unconventional monetary policy shocks in developed economies, and for countries with better financial markets, they are less adversely affected by the exit of quantitative easing

DOI: 10.54254/2754-1169/22/20230333

monetary policy. Bowman et al. argued that countries with fragile banking and financial systems are more vulnerable to changes in U.S. financial indicators [14]. Countries with higher financial openness indices are more vulnerable to U.S. monetary policy changes. For emerging markets, countries with managed floating exchange rate regimes are more vulnerable than those with free floating exchange rate regimes, and countries with greater interest rate differentials with the United States are more vulnerable to U.S. monetary policy. The implementation of unconventional monetary policies, on the other hand, can cause changes in the money supply, which can affect domestic interest rates. Mishra argues that countries with more mature financial markets are less affected by the withdrawal of quantitative easing in the United States [15]. Hausman et al. argued that the exchange rate regime is one of the main factors in the heterogeneity of countries affected by U.S. monetary policy [16]. Countries with less flexible exchange rate regimes have stock indices and interest rates that are more responsive to U.S. monetary policy, and the adoption of floating exchange rates does not make a country more susceptible to U.S. monetary policy spillovers.

5. Impact of U.S. Quantitative Easing on China's Inflation

5.1. International Transmission of Inflation

The earliest research on the international transmission of inflation in open economies was conducted in western countries, and after the 1960s, the relevant research resulted in the international inflation theory. The core idea of this theory is that international inflation is essentially a plundering behavior of the countries that issue and export international reserve currencies in order to obtain "minting tax", while the countries that import currencies will take domestic credit behavior in order to resist or weaken the impact of foreign inflation on their foreign exchange reserves, resulting in domestic Prices rise. The international price theory can be divided into "imported inflation" and "balance of payments monetary theory" under the conditions of open economy of small countries.

The input inflation model, which is an inflation model for small countries with open economies, was first proposed by Norwegian economist Okerlost in 1970 and extended by Swedish economists G. Edgren, K. O. Fazen, and C. E. Odhner. The theoretical analysis of the input inflation model is aimed at small open economies or island economies and focuses on how domestic inflation in these countries is affected by world inflation.

A country with a small open economy is unable to actively influence prices in the international market because of the strong external dependence of its economy, but the size of its economy is not very large, so it can only passively accept it. The input inflation model divides the economic sectors of such countries into two main categories: open economy sectors and non-open economy sectors. The prices of products in the open sector of the economy are determined by the prices of products on the international market, and the prices of products in the non-open sector of the economy are determined by the domestic cost of production.

The input inflation model assumes that under the conditions of fixed exchange rate and world inflation, when the world market prices increase, the prices of products in the open sector also increase, and the rate of increase depends mainly on the world inflation rate. The domestic inflation rate is equal to the weighted average of the open sector and non-open sector inflation rates.

Therefore, the Swedish school argues that for a small open economy, it can hardly be a producer of world inflation, but often falls victim to it, so the main problem they face is how to defend themselves against external inflationary attacks and disturbances. They argue that neither the Keynesian nor the monetary school approach to inflation is applicable to a small open economy like Sweden. Based on the historical characteristics of the country's political economy and the existing economic structure, the Swedish school suggests that the main countermeasures to prevent the impact of foreign inflation should be to strengthen the flexibility of foreign economic policy in decision-making and

DOI: 10.54254/2754-1169/22/20230333

implementation, especially the exchange rate should be flexible according to the balance of payments and the specific situation of the international market. For example, when the world inflation rate rises, the appreciation is used to maintain purchasing power parity and counter its impact on the domestic economy.

Regarding the impact of the present-day U.S. unlimited quantitative easing monetary policy on developing countries, the academic community agrees that it generates imported inflation. For the impact of U.S. QE policy on China's CPI. Luo Bo points out that the large amount of liquidity put in by the QE policy in the United States has caused a large amount of capital to expand to the global financial market, which also has a positive effect on China's CPI [17]. In the global economic system, emerging economies have a different industrial status than developed countries. Since China has a high demand for commodities, the QE policy of the US will cause imported inflation to China. Ding, Lintao and Sun, Xinhua constructs a New Keynesian Phillips curve under open economy conditions and uses a state space model for estimation eventually also concludes that imported inflation occurs in China [18]. Hu Yuancheng empirically demonstrates the transmission paths and their effects on the impact of dollar depreciation on inflation in China from the cost-push channel, the capital inflow channel and the monetary expansion channel, respectively, using the SVAR model, and also concludes that China is facing greater imported inflationary pressure [19].

5.2. Channels of the Inflationary Transmission

In terms of transmission channels, Yu outlines six specific international transmission channels of inflation: demand, demand prices, liquidity and cash balances, international capital flows, interest rates, international expectations, and demonstration effects [20].

Since the U.S. and U.S. dollar financial assets have an inherent infinite inflationary motive, the reserve currency exporting and importing countries will continue to drive inflation up in this infinite cycle over and over again. The main channels of inflation transmission are international trade and the free flow of capital. Under the conditions of international trade liberalism and free flow of international capital, some literature has attributed the international transmission of inflation to the following forms: price transmission, demand pull, and liquidity transmission. Of course, some scholars have questioned the preconditions of international trade liberalism and free flow of capital, raising the issues of the existence of non-fully free trade and non-international trade goods, whether domestic resources are at full employment, and the interaction between domestic credit expansion and international inflation, arguing that domestic inflation is the result of a combination of domestic and international factors.

6. Conclusion

Overall, quantitative easing has been effective in releasing large amounts of liquidity into the market through large-scale asset purchases by central banks, raising asset prices, stimulating bank credit, and promoting domestic wealth redistribution. The implementation of quantitative easing in developed economies such as the U.S. also has significant spillover effects, affecting inflation and output levels in other economies through term spreads, short-term exchange rates, foreign exchange reserves, commodity prices and short-term capital flow channels, and also affecting exchange rates and corporate exports in developing countries, and even macroeconomic impacts. The size of the spillover effect is mainly determined by the degree of trade openness, financial stability, financial openness, soundness of the banking system, exchange rate system and other factors in the affected countries. The U.S. quantitative easing policy has brought imported inflation to China through a combination of factors such as demand, demand prices, liquidity and cash balances, international capital flows, interest rates, international expectations and demonstration effects. These related studies can provide the basis for

DOI: 10.54254/2754-1169/22/20230333

China to effectively respond to the new round of "unlimited" quantitative easing in the United States. China can use the large amount of liquidity released internationally to recover from the impact of the epidemic as soon as possible, stabilize prices, increase output and maintain macroeconomic balance. At the same time, we should pay attention to the possible adverse impact of the U.S. quantitative easing on exports, such as the appreciation of the RMB, and prevent the problem before it happens.

References

[1] *Borio, C., & Disyatat, P.: Unconventional Monetary Policies: An Appraisal. Social Science Research Network (2009).*

[2] *Krugman, P., Dominquez, M., & Rogoff, K.: It's Baaack: Japan's Slump and the Return of the Liquidity Trap. Brookings Papers on Economic Activity, 29(2), 137 (1998).*

[3] *Joyce, A., Tong, H., & Woods, J.: The United Kingdom's quantitative easing policy: design, operation and impact. Bank of England Quarterly Bulletin, 51(3), 200–212 (2011).*

[4] *Lima, C., & Cracau, D.: The Pacific Alliance and its economic impact on regional trade and investment: Evaluation and perspectives. RePEc: Research Papers in Economics (2016).*

[5] *Zhang, Y., Hu, X.: Optimal monetary policy framework in macroprudential perspective. Financial Research, 5, 30-40 (2010).*

[6] *Lu, X.: A comparative analysis of the characteristics, effects and impacts of quantitative easing policies in the euro area and the United States. International Financial Studies, 4, 45-51 (2015).*

[7] *Slacalek, J., Lenza, M.: Quantitative easing did not increase inequality in the euro area. Research Bulletin, 54 (2019).*

[8] *Xu, H., Zhang, J.: Re-examination of the effectiveness and transmission mechanism of quantitative easing monetary policy in the United States. Statistics and Decision Making, 36(19), 136-140 (2020).*

[9] *Blanchard, F., Flint, D.: The Geopolitics of China's Maritime Silk Road Initiative. Geopolitics, 22(2), 223–245 (2017).*

[10] *Powell, M.: Journal of Brand Management: year end review 2018. Journal of Brand Management, 25(6), 494–499 (2018).*

[11] *Bartkiewicz, P.: The Impact of Quantitative Easing on Emerging Markets – Literature Review. E-Finanse (2018).*

[12] *Du, J., Cao, Y.: A time-varying study on the impact of U.S. monetary policy on China's economy. Economic Vertical, 10, 101-109 (2019).*

[13] *Jin, X., Cao, Y.: A review of research on quantitative easing monetary policy. Zhejiang Social Science, 11, 143-150+161 (2016).*

[14] *Bowman et al.: Assessment of the validity of reviewed studies. ResearchGate (2014).*

[15] *Mishra, P.: Railway Budget 2014-15: Analysis, eSocialSciences (2014).*

[16] *Axel, H.: An integrative taxonomic approach to resolving some difficult questions in the Larentiinae of the Mediterranean region, Lepidoptera, Geometridae (2013).*

[17] *Luo, B., Shen, Z., Chang, H.: Reflections on the current inflation in China. Financial Theory and Practice, 2, 58-61 (2011).*

[18] *Ding, L., Sun, X.: The dynamic impact of U.S. quantitative easing monetary policy on China's inflation. Financial Development Research, 9, 46-50 (2012).*

[19] *Hu, Y., Zuo, L.: Does the implementation of negative nominal interest rate policy really work? Based on data from Japan and insights. Jiangxi Social Science, 42(07), 66-76 (2022).*

[20] *Yu, S., Zheng, Z.: Study on the spillover effect of U.S. quantitative easing policy on China's economy. Journal of Southeast University (Philosophy and Social Science Edition), 15(05), 55-60+135 (2013).*