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Monetary Policy and Stock Market—UK and China

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Abstract

In this report, it is said whether monetary policy will affect the stock market and how we can do to face these influences. First, this report will invest the relationship between monetary policy and stock market in UK and China. Second, we use Taylor rule to confirm the hypothesis. After the research, it shows that the monetary policy in these countries just affects the stock market not so significantly. Monetary policy has not responded strongly to bubbles or volatility in share prices.

Keywords

Monetary Policy, Stock Market, Influences

1. Introduction

The British stock exchange was produced in the late 17th century. At that time, there are numbers of government bonds and bank stocks were issued due to the establishment of the Bank of England. At that time, the British government set up a royal exchange to buy and sell government bonds, and private stock trading activities were mostly carried out in cafes. At this time, to develop the Americas, some European countries expanded their trade with Asia and waged a war of maritime hegemony. The United Kingdom announced many government securities for the war which make trading active and the transactions improved. And then, the London Stock Exchange was officially announced in 1773 at the New Jonathan Cafe. In 1802, the London Stock Exchange was approved by the British government. After the establishment of the exchange, the decentralized securities transactions concentrated on the trade. To strengthen the management of

the transfer the United Kingdom issued the first securities trading regulations in 1812. At that time, the securities listed on the stock exchange were mainly government bonds, foreign bonds, mines, and canal stocks.

After the Second World War, to heal wounds war and promote modernization of the industry, the United Kingdom required numbers of construction funds, and the issuance and trading of shares began to become active again. Some institutional investors are actively buying commodities and the turnover of stocks is increasing.

In the 1970s, the European bond market developed rapidly, and the British financial community saw this point and vigorously promoted new economic policies to activate the securities market.

In the 1980s, the UK economy rebounded, private enterprise equipment investment increased, and domestic companies issued more stocks and bonds, especially in the financial, commercial, real estate. After that time, the London Stock Exchange is far behind the Tokyo Stock Exchange, and its capital stock market's value has not entered the top 5 in the world. British government starts to take action to save the situation. Only through reform, they could reverse the passive situation and maintain the critical position in the world stock market. Then, the UK government carried out large-scale stock management reform. After entering 1990s, the British stock market has shown a new phenomenon in the world.

Looking at China now, Chinese stock history is relatively short compared to the UK, but its development speed is also breakneck. In the 1990s, the Chinese capital market multiplies and plays a prominent role in economic and social development. In the 2000s, the total market capitalization of Chinese Shanghai Stock Exchange and Shenzhen Stock Exchange reached a new high level. The total market capitalization of Chinese Shanghai and Shenzhen stocks ranked third in the world which is listed after the United States and the United Kingdom. The stock market has become an essential place for companies to raise funds and it is closely related to real economic activities.

The rapid decline of the two cities in 2008 made the average stock price of the Shanghai stock market drop to 6.31 yuan which is down 2/3 of the same period; the average stock price of Shenzhen's stock market was slightly higher, only 7.01 yuan, down 66% year-on-year. At the same time, the price-earnings ratio fell amazingly. The average price-earnings ratio in the Shanghai stock market was only 14.85 times. The average price-earnings ratio of the Shenzhen stock market also dropped to 16.72 times, 76% year-on-year. Due to the continuous plunge in the market, the stock market fundraising has fallen significantly. The large fluctuations are influenced by the sustainable growth of the real Chinese economy.

There are many advantages of using monetary policy into the stock market in the past twenty years. The financial system was used as the stabilizing in the inflation and output. Many analysts and researchers pay much more attention to the change of policy rate, unexpected turns and so on. They believe that these

changes will influence stock market returns. However, both policymakers and academics do not fully understand the effect of the stock market by using monetary policy.

Some reports illustrated that the monetary policy would have some influences on stock market's return. In the monetary policy, the stock market's performance can be influenced by many ways. First, through arbitrage, changes will have a massive impact on risk-free rates and other market rates. Second, changing monetary policy will affect output from short term to medium term. Moreover, Future cash flows will also be affected by economic activities. In the recent years, many people keep their attention on the qualitative and quantitative impact which tries to change the asset prices such as interest rates and the stock market. In this paper, it is researched that monetary policy has a little influence on the stock market in the UK and China. However, it is necessary to consider a stock market when the policy makers try to modify the recent monetary policy.

There are three aspects of choosing this topic: First, monetary policy would have some influence on the real economy. By researching the correlation between monetary policy and the stock market, we can investigate the monetary policy transmission mechanism. The second, it was analyzed whether monetary policy can respond to the enormous fluctuations in the stock market. Third, it should interpret the data from China and the UK; there are some differences and characteristic points in these two countries.

This paper is divided into six parts. The first one is the introduction discussed the background. The second chapter is the literature review. The third chapter shows the relationship between monetary policy, a stock market, and the Taylor rule. The primary influence of field development on monetary policy and the specific form and development form of Taylor rule. The fourth chapter analyzes the data selection of empirical research on this problem in China including the variables in Taylor rule and measurements in stock market price. The fifth chapter will make an empirical analysis of the relationship between China and UK. The sixth chapter summarizes the results of empirical analysis and puts forward policy suggestions.

Most of the existing research is based on the Taylor rule. This paper uses the extended Taylor rule to investigate the relationship between monetary policy and stock market volatility, that is, it increases the factor of asset price volatility in stock market. The result shows that monetary policy has not responded strongly to bubbles or volatility in share prices.

2. Literature Review

2.1. Foreign Empirical Research Results

Monetary policy will have an impact on the whole economy after the adjustment in the interest rate. There is a heated discussion whether the interest rate will influence the monetary system or macro-economy.

In the European country, some early researchers (Gertler & Bernanke, 1999; Gerlach & Schnabel, 2000) used to use meta-data to identify the policy. The data is suitable to analyst recent monetary policy but cannot focus on the future. Because some data like inflation cannot focus on the studies. As a result, the analyst they did is not homogeneous. Thus, it may cause some econometric problems in the same period.

Taylor further uses the rule as a central way to compare different fiscal policies under different monetary policies. This analytical construction may be regarded as a useful tool for analyzing fiscal policies in the war. It is a transition from the gold standard to a controlled monetary regime. Jinushi, Kuroki, and Miyao (2000) analyzed policy reactions in Japan by using the Taylor Rule after 1975 and conclude that monetary policy becomes more sensitive. (Peersman & Smets, 2002; Stoica & Diaconasu, 2012) analyzed policy reactions in EU countries by using the optimized Taylor rule and conclude that the evidence presented here suggests that the relatively good performance of a simple Taylor rule with coefficients of inflation and output. Voth (2000) analyzed that the defect of the Bank of Japan's monetary policy lies in ignoring the output gap.

2.2. Chinese Empirical Research Results

Peng Jie and Liu Weijiang (2004) discuss Taylor rule, asset price bubble, and monetary policy. They adapt price-earnings ratio index in the Shanghai Composite Index and the stock price bubble. It expands the Taylor rule by adding the capital market factor. Based on this, it tests the 1994-2001 China monetary policy. Wen yang's results are heartfelt. The central bank not only abandons using interest rate policy to prevent stock market bubble growing but also tolerates the light stock market foam.

Yu Yuanquan and Yu Yuanling (2008) empirically studied whether the monetary policy of China in 1996-2006 reflected the overvaluation of stock prices by the Thai baht rules. The comprehensive index which represents price and the implicit risk-return rate in the stock market is calculated by Gordon equation. The stock price factor is taken into account in the equations of static Taylor rule and dynamic Taylor rule. The research results show that China's monetary policy has no significant or less reaction to the stock price.

3. Theory

3.1. The Primary Influence of Stock Market Development on Monetary Policy

With the deep understanding of a capital market and financial innovation, the impact of the stock market on the real economy is increasing. At the same time, the stock market has a massive influence on monetary policy. Its expansion and adjustment will affect the money supplement and demand so that it will have some impact on the formulation, implementation, and transmission of monetary policy.

3.1.1. The Ultimate Effect of Stock Markets on Monetary Policy

With the development of the capital market and the expansion of direct financing, financial "disintermediation" becomes more and more prominent. With the improvement of a capital market, the scale of direct financing becomes large than before. Financial "disintermediation" phenomenon is more and more prominent. A lot of money through money market go into the capital market, changing the stock supply and demand, the volatility of price is increasing because of reducing the impact of social capital on prices. It is produced enormous effects on share price increasing. Prices and stock prices are likely to deviate from each other which would increase the difficulty of the monetary policy regulation price level. Thus, it improves the general cost and links to the monetary policy regulation between the original weakened.

3.1.2. The Influence of the Stock Market on the Intermediary Goal of Monetary Policy

The interaction between the money system and the capital market enhances the ability to absorb money. Thus, the growth of the money supply cannot translate into the growth of the demand for nominal payment. At the same time, the control of the money supply is weak. After that, there are considerable changes in cash leakage rate, deposit ratio, statutory reserve ratio and excess reserve ratio. The bank of China is difficult to make accurate forecasts that the money multiplier is directly related to the measurability of money supply indicators or not. After the capital market develops to a certain extent, the circulation of money will reach a considerable scale. However, the direction and speed of cash are not sure. It will lead to the more complicated mechanism and decreases money supplement on total output. Finally, the correlation between them will reduce.

3.1.3. The Impact of Stock Markets on Monetary Policy Instruments

The stock market produces a significant effect on the choice of monetary policy tools, what's more, monetary policy tools have a different result when they use in economic activities. Firstly, the interest rate policy has much more force. The development and the interaction between money market and capital market create good phenomenon for carrying out the interest rate policy. Secondly, open market business should be enhanced. The development of the capital market provides the central bank with an operating platform for flexible regulation. It is good for a central bank to build open market business and strength the open market operations. Finally, the reserve ratio, the discount rate, and the refinancing rate will gradually weak. The interaction between money market and capital market accelerates stock market and commercial bank. After that the central bank can change the money multiplier by adjusting the deposit reserve, shrinking or expanding the credit creation scale. Moreover, the central bank can reduce its ability to improve the money supply. Financial institutions will become less dependent on the discount rate. This may impact the central bank's discount rate and lending policy.

3.2. Taylor Rule

EFREM (2007) thinks that the Taylor rule will widely use in monetary policy analyses for many years. Because this rule will have a good relationship with targets which are inflation, interest rate, output and stock market index. These indicators have the deep connection with monetary policy.

The Taylor principle was put forward in 1993, and it named by the inventor, John Taylor who is the most famous economists in Stanford University. The policymakers want to adjust the price of commodities and economic growth more stable using the Taylor rule. The adjustment means that the policymakers should take some steps to correct differences between real and expected output. After that, Taylor rule should take consideration to add the inflation. Taylor Rule has a symbolic sign that the economy will be stable and increase when the real interest rate is equal to the real equilibrium interest rate. At the same times, the actual output is the same as the potential output. Thus, this principle can perfect explain the connection between financial variables. Many countries begin to use the Taylor rule to analysis some economic problem. Besides, the central bank starts to change interest rate instead of inflation rate For example, when the inflation rate has a 1 unit increase, in response, the monetary policy should raise more than 1 unit.

There are some advantages to the Taylor rule. On the one side, it explains the relationship between the inflation rate interest rate and the output. On the other hand, Taylor rule not only uses to analyze the economic phenomenon but also can forecast the prime interest. At the same time, it is also used as the benchmark factors in currency. The Taylor rule combines the two policies which are modes of regulation and camera choice and coordinates with each other.

By keeping the continuity of policy rules, on the one hand, monetary authorities can take some steps based on people's expectations; on the other hand; they can make gradual adjustments through micro-adjustment operations to achieve the goals about the policy objectives.

According to the economic, the money supply will affect the stock price. First, the money supply will affect the commercial market and then influence the real economy. With the increasing of the financial amount, people will have more currency, and then people will find some investment opportunities so that the stock price will go up. The increase in investment spending will cause consumption increase. After that, the company's profit will increase, and the stock purchase will become much more than before, so that, the stock prices will be higher. When the bank begins to increase currency supply, the public will pay attention that they should hold more money and adjust their asset structure. On the contrary, the stock price changes will impact on currency demand. The stock price will affect wealth, trade and the substitution. The wealth effect is higher than the substitution effect. Thus, the price rises, the demand for the currency will be increased at the same time. These effects will help to strengthen the money demand instead of reducing the application for cash. The stock market is

in the monetary policy transmission through interest rates and securities and some macroeconomic implements. The central rule of Taylor rule is to treat asset prices as an endogenous variable of monetary policy.

The increasing size of the financial market and the volatility of corresponding capital flows have substantially increased in the accuracy of the money supply. Thus, the central bank has always relied on to judge the form and influence the commercial operation. When asset prices reflect changes in financial assets, it can make monetary policy work better. The real interest rate can best reflect changes in asset prices, and it is more reflect the reality of the financial operation. It is regarded as the intermediate target in monetary policy.

This essay uses the Taylor rule as a target in the stock market:

Where i is the log of the interest rate, is the actual inflation, is the desired level of the inflation, is the actual output and is the potential one. The Taylor rule shows that the interest rate starts to hit a target inflation rate and to build excess demand to zero. Monetary policy is stationary. For example, when the β is positive, the increasing of the interest rate will offset by the increasing of the inflation. In the prior report, the Taylor rule would have different meanings about the implements. This was either the P/E or the implied equity premium. This was shown as the target value. It was said that this was always equal to an estimation of value. It is greater than its own target value and monetary policy should adjust economic bubble by increasing the interest rate and γ is positive. In contrast, if the is implied equity premium and it is smaller than it owns target value, a monetary policy will be decreasing the interest rate and the γ is negative.

The Extended Taylor rule model

Where is the year-to-year ftse index change for stock market volatility. This equation will account the relationship between asset price and monetary policy. Thus, it can explain the stock market and monetary policy will affect each other or not.

Taylor rule has a clear policy implication which is monetary authorities should adjust the trend of interest rates according to the changes in the inflation gap and output gap and maintain the stability of equilibrium interest rates. Taylor rule can not only well summarize the fundamental factors which may affect monetary policy, but also reflect the basic goal in monetary policy which is stabilizing the real output near the potential output level in the short term and controlling the inflation rate effectively in the long term.

4. Data

4.1. Data Description

The test of Taylor rule is mainly divided into historical analysis method and reflection function method. It is not suitable for monetary policy to apply for the original Taylor rule directly. To test the relationship between the monetary system and stock market, we have added the volatility of asset prices as the consideration of monetary policy in the traditional Taylor rule test.

4.1.1. Interest Rate

It is a federal funds rate in the United States which was adopted by the currency market in 1993. As a fully market-oriented interest rate, the benchmark interest rate plays a fundamental role in the whole interest rate system and the price system in financial products. It can accurately show the supply and demand relationship between the monetary and business market. It also has a strong correlation with other interest rates. This report should select the seven-day inter-bank lending rate and select the quarterly data to test the reaction function in UK and China. The sample range is from the first quarter of 1990 to the fourth quarter of 2018. The real long-term equilibrium interest rate is obtained by calculating the average real interest rate of the sample. Due to the significant fluctuation of data, the median of the real interest rate of the example is selected as the real long-term equilibrium interest rate.

4.1.2. Inflation

Inflation rate can usually be measured by a variety of indicators, including consumer price index, core price index excluding energy and necessities and GDP deflator. In this paper, the consumer price index CPI is selected as the cross-calculation index of inflation.

4.1.3. Output Gap

In this report, the trend elimination method is chosen to calculate the real GDP through seasonal adjustment, then calculate the potential GDP through HP filtering. After that, it will figure the output gap which is consisted of the actual and potential output. Thus, the output gap will have some differences between the log of the RGDP and the trend value obtained by the Hodrick-Prescott filter (the smoothing parameter set to 1600).

4.1.4. FTSE

The change in the FTSE 100 as the leading indicator of stock price volatility will remove the trend, obtain the potential value and calculate the gap, as a consideration of Taylor's rule.

4.1.5. Exchange Rate

The exchange rate is showed in the central bank policy rate at the end of this period.

4.1.6. Asset Price

Asset price will divide quarterly in the equity index of the native stock market. This variable is no available for all the sample over the entire period.

4.2. Data Processing

The data of inflation rate, interest rate, GDP and exchange rate collect from IMF. The data of FTSE and asset price collect from WIND. The data range is from the first quarter of 1990 to the second quarter of 2018. The missing data

was being replaced by the mean of that variable. Before estimation, we have taken the logarithm for each data, and the descriptive statistics of the main variable shows in Table 1.

5. Empirical Findings

In this chapter we used OLS model to estimate the relationship between stock market and monetary policy.

In Figure 1, the inflation and output gap have similar behavior. The interest rate stays stable until 2008. The reason is the economic crisis was broken out in that year. After that, the interest rate is steady. It shows that there is no obvious relationship between the fluctuate of inflation rate, output gap and interest rate. Then, we used the OLS test to examine the stock market and monetary policy.

In the model 1, it is a basis Taylor rule. The t-statistic of the parameter values estimated by the model is all significant at the 0.01level. Furthermore, the result

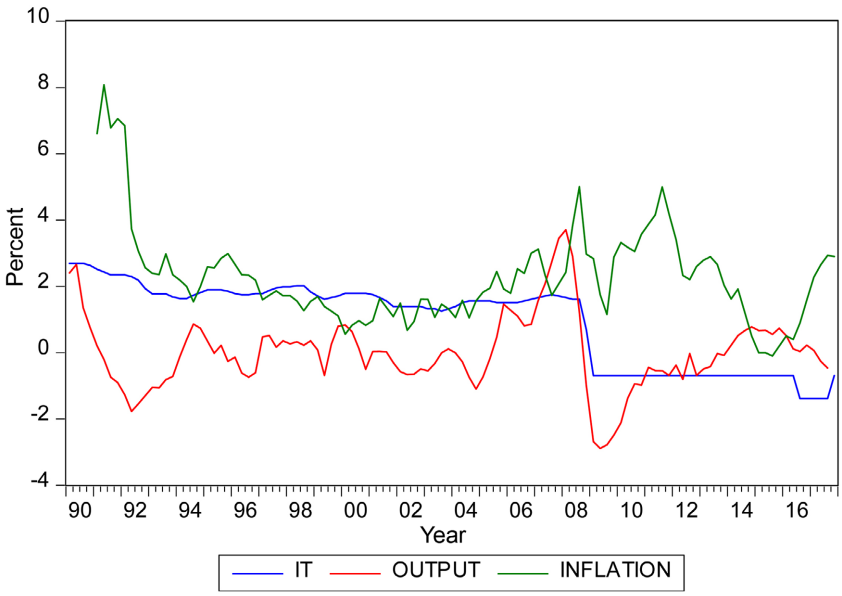

Figure 1. The fluctuation of interest rate, output gap and inflation. Source: IMF.

Table 1. The descriptive statistics of the main variable.

Variable	Mean	Max	Min	Sd
Interest Rate	1.45	2.35	0.99	0.48
Inflation	4.41	4.80	3.69	0.3
real GDP	15.17	16.97	11.70	1.22
Exchange Rate	1.96	2.16	1.55	0.16
FTSE	8.48	8.95	7.60	0.34
Asset Price	3.26	4.31	2.46	0.50

Source: IMF, WIND.

in this model is considerable difference to the estimations of the Taylor rule. Because the ratio of the rise in the Taylor rule is more than 1, it will illustrate that the monetary policy is stationary, However, in model 1, the ratio of the boom is 0.16. It shows that the monetary system in the UK is not stable (Table 2).

The coefficient and significant output is higher than the inflation. It will state that if the actual production has 1 unit higher, the interest rate will also rise by the 2.02 unit.

The weighting factors of inflation adjustment factors and output gap adjustment factors in Taylor's rule can reflect the short-term balance between the central bank's economic growth and price stability dilemma, and indicate the central bank's preference for monetary policy.

To strengthen our impression of our model, we just analysis the variability of the dependent variable.

As we can see in the Figure 2, the fitted data underestimates, the actual data and then overestimates it after 2008. From the data, it shows that something happened in 2008. Then, Chow Test can be used to solve this problem. Look at Table 3.

The null hypothesis is there is no break. However, the statistics in the graph show that there is an economic bubble and it plays an vital role in the monetary policy. Look at Table 4.

Table 2. Static Taylor rules, OLS estimation.

	Model 1	Modle 2	Model 3	Model 4	Model 5
C	0.55*** (2.63)	0.55*** (2.61)	0.55*** (2.60)	0.55 (1.32)	0.66 (1.26)
INFLATION	0.16** (2.02)	0.16** (2.02)	0.16** (1.95)	0.16 (1.13)	0.12 (0.62)
OUTPUT	0.29*** (2.71)	0.29*** (2.73)	0.05*** (2.68)	0.29** (2.29)	0.29*** (2.38)
S (−1)		0.01 (0.36)	0.71 (0.35)	0.01 (0.46)	0.03 (0.28)
S (−2)			0.87 (0.17)		
AdjR	0.07	0.06	0.05	0.06	0.01
F	4.04	3.29	2.45	3.29	
DW	0.03	0.03	0.03	0.03	0.07

Table 3. Static Taylor rules.

F	LOG likelihood ratio	Wald
309.4126	248.3955	928.2378

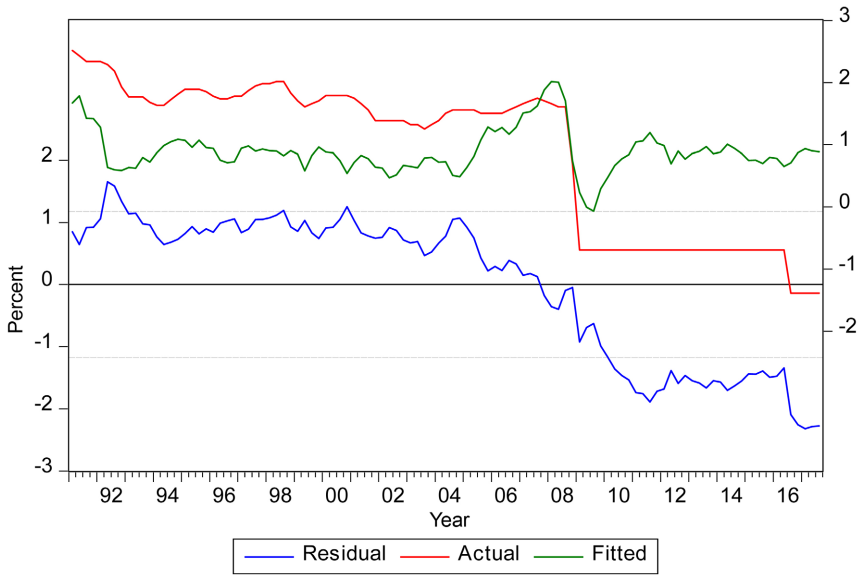

Figure 2. The variability of the dependent variable.

Table 4. The descriptive statistics.

Mean	Median	Maximum	Minimum	St
2.14e−16	0.6629	1.6486	−2.3315	1.1625

According to the essay, the asset price is an important factor to test the relationship between monetary policy and the stock market. As we can see in the model 2, the adjusted R-square is more sensitive, compared to model 1, it shows that the adjusted R-square decreases from 0.07 to 0.06. This means that model 2 can explain the dependent variable better. Later, the *t*-value of s (−1) is 0.36. It shows that we have mild significant. It can be concluded that the asset price volatility can provide more information into the model. To make our result accurately, it takes the s (−2) into consideration in model 3. In this model, it will be founded that s (−2) is closed to the rejection rejoin which is the same as s (−1). Thus, we can consider the first lag in our model. To test whether the equation suffers from heteroscedasticity and serial correlation, we should test our model. The first test is the normality one who calls the Jarque Bera test. It uses to test the normality distribution in the residual. The result is that, from the graph, the Jarque Bera test rejects the hypothesis of normality in the distribution of the residuals. Then the next test is the White test for heteroscedasticity. The F-statistic is 2.396, and the R-square is 19.4586. This illustrates that the rejection of the null hypothesis and our model is heteroskedastic. The last test is the LM test which wants to test the serial correlation. The null is residuals are not serially correlated. The F test is 3140.774, and it is a substantial evidence to reject the null hypothesis. As a result, it is said that the model has both correlation and heteroscedasticity. For solving these problems, it may use the Newey-West to re-estimating the formula. It has a result in the model in the mode 4. By using

the robust standard errors, there will be no variables entering in the model. Lastly, some people are worried about the inflation and output gap to influence the asset price volatility; the GMM test is used in model 5. In the model 5, the coefficient of s (−1) is positive and just a little significant. This is strong evidence that the asset price volatility will have an impact the interest rate indirectly. Look at Table 5.

In the model 1, it is the foundation of OLS estimation in the Taylor Rule. The t statistic in interest rate, inflation and output are significant in the 1% level. It is explained that the inflation and output have a close relationship with the interest rate. In this model, the inflation coefficient is less than 0.01 which is far lower than 1. This shows that the monetary policy in China is not stable which is the same as in the UK.

There is another similar point between the UK and China is that the coefficient for inflation is higher than the output. It shows that central bank pays more attention to the inflation. Because, during these years, inflation has much more impact on the Chinese economy.

Then, there is a picture of the variability of the dependent variable. Look at Figure 3.

As we can see in the picture, the actual line and the fitted line show not oblivious different. Some years, the fitted line is overestimated, and another year, the fitted line is underestimated. Compare to UK's model; there isn't the significant decline in 2008. However, the actual and fitted lines declined apparently in 1997. In 1997, the Asian economic crisis was broken out and influenced many countries in the Asian area.

Then, the Chow Test will be used in examining the break. First, we used the Chow in 2008. Look at Table 6.

Table 5. Dynamic Taylor rules, OLS estimation.

	Model 1	Model 2	Model 3	Model 4	Model 5
C	2.22*** (65.33)	1.96*** (44.15)	1.96*** (71.12)	1.73*** (23.51)	1.96*** (24.29)
Inflation	−0.01*** (−2.64)	0.01 (0.93)	0.01 (1.40)	0.01* (0.65)	0.01 (1.21)
Output	3.63*** (11.68)	1.87*** (5.78)	0.39*** (1.73)	0.20*** (3.17)	1.90 (3.98)
S (−1)		0.02 (0.11)	0.01 (0.22)	0.01 (0.08)	0.01 (1.35)
S (−2)			0.02 (0.31)		
AdjR	0.64	0.40	0.02	0.40	0.03
F	69.82	12.00	0.72	12.00	
Dw	0.11	0.15	0.10	0.15	

Figure 3. The variability of the dependent variable.

Table 6. Dynamic Taylor rules.

F	LOG likelihood ratio	Wald
13.370	34.593	40.109

In the result, the F statistic is lower, so that it illustrates that the economic bubble in 2008 doesn't make huge effect on Chinese economy.

Then, it is reported that there is an Asian economy crisis in 1997. Maybe it will make more influence on the economy.

Look at **Table 7**, Compare to the result which is test in 2008, the F statistic is higher. Thus, China may suffer more from the Asian financial crisis and may loss much more. Furthermore, it illustrates that Chinese monetary policy take some effective steps to control the economy bubble.

Following the examine we done before, it must add asset price in the basic formula in the model 2. Now, it may focus on the adjust R-square. It shows a decline trend from 0.64 to 0.40. It means that this model can translate the variability of the dependent variable. After that, the coefficient of the s (−1) should be noticed. The t statistic is just 0.11 so that the asset price is just a little significant with the interest rate. Moreover, it means that maybe another factor in asset price can affect the interest rate.

Therefore, it is necessary to re estimate the model by adding the second lag of asset price in model 3. From the model 3, the s (−2) is close to the rejection region which is the same as s (−1). Thus, we need to only consider the s (−1).

Then, we need to check if the equation will suffer heteroscedasticity and serial correlation, there are some test should do again. First the Jarque Bera test is used to exam. Look at **Table 8**.

In the result, it is founded that the normality doesn't appear in the residuals. After that, the white test is used to be examined the heteroskedastic, and the

Table 7. Dynamic Taylor rules.

F	LOG likelihood ratio	Wald
23.791	53.873	71.372

Table 8. The descriptive statistics.

Mean	Median	Maximum	Minimum	St
3.36e−16	−0.0254	−0.2483	0.197	0.123

F-statistic is 4.092 so that the residuals are heteroskedastic. The last check is the LM test which used to discover the residuals are serial correlation or not. The f-statistic is 168.447 which shows that they are serially correlated. In conclusion, our models have both heteroscedasticity and serial correlated. This result is the same as UK's.

It will be used by the Newey-West to obtain the standard errors in the model 4. In the model 4, it is reported that the model is significant and has the expected sign. So, it can be concluded that asset price volatility will affect by both inflation and output. To decrease these impacts, it is used GMM to adjust in model 5. As we can see in the model 5, the S (−1) is confident to a little significant. This may be the evidence that the asset price will have a small bit effect monetary policy.

In this part, it shows that the data examine in two countries which are England and China. There are some similar and different points in these two countries. The similarity is that monetary policy in two countries has a little relationship with asset prices after analyzing. The difference is that China suffers more from Asian economic bubble in 1997 and England may have more effect on the global economic crisis in 2008.

6. Conclusion

The empirical results show that monetary policy has not responded significantly to equity markets. As a result, monetary policy has not responded positively to stock price volatility by suppressing bubbles or stock prices.

However, some experts hold the view that central bank should respond to stock market price volatility. First, there are many factors which may affect the volatility of the stock market such as basic points and the non-basic economic factors. The inefficient regulatory system and irrational behaviors of investors play an important role in the stock market. Second, the volatility of stock price has a close relationship with the real economy. When stock prices rise too high out of touch with underlying economic factors, the fire brigade should actively poke fun at interest rates to avoid deviations in stock prices. Bubbles like the shock of higher oil prices or a change in government fiscal policy can destabilize the economy. Excessive stock market price rises can lead to capital and property debt increasing. Thus, the monetary policymakers in the central bank should pay

more attention to the fluctuation of the stock market price, but it should not be regarded as the only decisive factor in monetary policy decision-making.

In some practice experience, economy crisis reminds people of noticing problems with the stock market. For example, the most important reason for the Asian financial crisis is that central bank ignores the supervision in the stock market. Thus, the central bank should take some suitable actions to intervene in stock prices as a stable currency. The monetary authority should control the fluctuation of asset price level through the interest rate and money supply to achieve the overall coordinated and stable development of macro-economy.

Most of the existing research is based on the Taylor rule. It is applied in the contradiction between monetary policy and the stock market. Because of the impact of the American financial crisis in 2008, there are many challenges and questions by using monetary policy. It is reported that the correlation between monetary policy and currency fluctuations is very complex. For instance, the change of long-term interest rates or inflation expectations is an important reason to affect the real economy and income level. Therefore, we must strengthen monetary policy, asset price fluctuations of the current relevance and prospective research to make a good influence in monetary policy and asset price volatility. Furthermore, if asset price volatility will get more understanding, it will help assess and prevent the impact of the virtual economy bubble on the real economy.

Based on a series of empirical tests, some conclusions and policy innovations about monetary policy are obtained. First, we need to increase our response to inflation, reverse the long-standing negative real interest rate and prevent the impact of the virtual economy on the real economy. A country's central bank's response and sensitivity to inflation will have a huge impact on the overall financial environment of a country's economy. The central bank's monetary policy is largely adjusted for changes in inflation targets and output gaps, but in the last decade, nominal interest rates have been insufficiently responsive to both inflation and output gaps, especially inflation. When the response coefficient of interest rate to inflation is less than 1, the increase of nominal interest rate will be less than the increase of inflation rate, forming an economic environment in which real interest rate is negative, which greatly promotes the overall demand driven by investment expansion and credit expansion, and also causes the sharp expansion of asset prices and the widening of the gap between residents' wealth. It is suggested that in the future monetary policy practice, the central bank should increase its response to inflation, reverse the macro-environment of negative real interest rate, and increase the power of virtual economies such as Banks and securities to serve the real economy. Second, the weight of asset prices should be appropriately included in the target function of the central bank. The excessive volatility of asset prices has an increasing key to a country's real economy. Like the stock market, the further development of the housing market, asset value already occupies a higher proportion in GDP, assets value has already

become residents and an important part of enterprise wealth, asset price volatility will inevitably lead to sharp fluctuations in consumption and investment, to keep prices stable monetary policy and the steady growth of the national economic policy goals. Due to the increasing influence of the stock market on the economy, it is suggested that the central bank should increase the weight of asset price response when formulating monetary policy, and improve the foresight and predictability of monetary policy response to asset price changes. Under the condition of the existence of a capital market, the money supply will flow between the real economy and the virtual economy represented by the capital market. Inevitably, monetary policy will have an impact on asset prices, and the sharp fluctuation of asset prices will, in turn, affect the effectiveness of monetary policy and the stable development of the real economy. We should strengthen monitoring of asset price volatility and capital flows, establish an early-warning indicator system for large fluctuations in asset prices, prevent the illegal inflow of credit funds into the capital market, and improve the foresight and effectiveness of monetary policy. Third, we will give high priority to protecting the legitimate rights and interests of investors, especially public investors. This is not only the basis of supervision but also the basis of sustainable development of the market. The capital market is a market that depends on the confidence of market participants. Only market participants, especially investors, have their interests fully protected. Providers of funds, users of funds and various kinds of market intermediaries are actively involved, and the capital market can operate smoothly, develop steadily and optimize resources. The function of improving the efficiency of resource allocation and management makes the capital market enter a virtuous circle and embark on the road to sustainable development. Not only that but also to actively build investors education long-term mechanism. With the rapid development of the industry and the introduction of new wealth management products, a significant number of investors have increased their participation in the financial markets, but a significant number, especially small and medium investors, are less risk-conscious and rule-resistant than they are in the financial markets. We should actively build an education system for investors with more diversified levels and more extensive coverage, further improving the pertinence and effectively enhancing investors' awareness of self-protection. Fourth, the goal in this essay is that when examining the correlation between monetary policy and the stock market, it uses Taylor rule model to conduct the empirical analysis of the correlation between monetary policy and the stock market, and the data selection has been updated to the recent year 2018. Also, the output gap estimation method is more accurate, and HP filtering method is used. There are some shortcomings in the essay which are limited by data processing ability and metering analysis ability, and only the simplest OLS regression method and instrumental variable method used to estimate. There is still some space for improvement in the metering method.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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