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Analysis on the Influence of Shadow Banking on the Effectiveness of China's Monetary Policy

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***Abstract*—After more than ten years of development, shadow banking has formed a certain scale in China, during this period, the effectiveness of monetary policy to the market economy also promoted; at the same time, the shadow banking has also caused both advantages and disadvantages. In this paper, we exam 141 sets of monthly data from January 2007 to September 2018 explore a better implementation of monetary policy and the status quo of China's shadow banking management. We find that shadow banking and monetary policy have a strong negative relationship in the short term, but the long-term negative correlation is weak but the impact time is long.**

Keywords—Shadow Banking; Monetary Policy; Effectiveness; VAR model

I. INTRODUCTION

The term "shadow banking" was originally established by PIMCO executive director Paul [1]. According to the US subprime mortgage crisis and even the global economic situation, shadow banking is very different from the state-controlled physical banks. The main body will pass unsecured Commercial papers finance themselves, but commercial paper investors are likely to refuse to repurchase when the notes expire, thus putting shadow banking at risk. Although China's shadow banking started late, it has developed rapidly and can be broadly defined into three categories: credit intermediaries that are completely unregulated without financial licenses; and businesses that have financial licenses but lack supervision. What is more, a credit intermediary that does not have a financial license and is under-regulated. For the effectiveness of monetary policy, J. Y. Wu believes that although the effect in the long run is not obvious, in the short term, monetary policy has a significant influence on employment and economic growth, that is, China's monetary policy is effective [2].

II. THEORETICAL ANALYSIS

A. The Impact of Shadow Banking System on the Intermediary Target of China's Monetary Policy

As is known to all, Western developed countries mainly rely on market interest rate regulation, generally using interest rates and money supply as proxy variables for monetary policy intermediate targets. However, most of China's interest rates still have a certain degree of control; at the same time, China's central bank is currently implementing quantitative control, so this section will focus on the money supply. First, the emergence of shadow banking has greatly weakened the measurability of money supply. With the emergence and expansion of shadow banking, financial institutions such as commercial banks will choose some new financial instruments through financial innovation. These financial instruments have high profitability and strong liquidity, and their liquidity is usually between demand deposits and between time deposits, this blurs the definition of the monetary level. Secondly, according to M. L. Wang study, the emergence of shadow banking has greatly reduced the controllability of money supply [3]. With the advent of shadow banking, various financial instruments are emerging one after another. Faced with diversified investment choices and high profitability, residents will face more diversified choices in cash. This reduces the possibility of the central bank's effective control of the base currency, which also reduces the controllability of the money supply. Finally, the emergence of shadow banking has largely reduced the correlation of money supply. With the emergence of shadow banking, large-scale financial innovation will make the standard selection of money supply more challenging, and the standard of division of money supply will be blurred, which will reduce the central bank's operability of money supply. This in turn reduces the relevance of the intermediate and final goals.

B. The Impact of Shadow Banking System on the Ultimate Objectives of China's Monetary Policy

On the one hand, it has a positive impact on sustained economic growth. With the emergence of shadow banking, it has promoted the sustained growth of China's economy from an objective point of view, and made it possible to further improve the economic system. It has met the diversified needs of the public investment through financial innovation, and is conducive to the public to maintain value and increase value. These shadow banking products have solved the problem of financing difficulties for small and micro enterprises, individual merchants and farmers and herdsmen, realizing their innovation and healthy growth, and promoting economic growth. On the other hand, it also has an adverse impact on sustained economic growth. First of all, because shadow banking has the characteristics of profit-seeking, it is more inclined to choose the real estate market and stock market with higher income than the entity manufacturing industry with weak profit. This will lead to a large amount of money flow to the virtual economy. The excess crisis and the manufacturing crisis have made China's real economy difficult to develop. In addition to these, shadow banking also has a negative influence on the central bank's suppression of inflation. The emergence of shadow banking has made the original monetary policy tools to curb inflation severely challenged, resulting in the lack of regulation of the central bank's open market operations, and also prompted the central bank's rediscount policy to become more passive or even ineffective, thus weakening the central bank's suppression of currency. The effect of the expansion policy.

III. RESEARCH HYPOTHESIS

With regard to the analysis of the effectiveness of shadow banking and monetary policy, J. Yu constructed a VAR model based on theoretical analysis and data from 2000 to 2010, which concluded that shadow banking would interfere with the money supply in the short term [4]. The impact of prices has weakened the effect of monetary policy. Z. Wang and H. Zeng empirically and VAR empirical analysis show that the monetary authorities should adjust the original monetary policy response function and exercise more stringent monetary policies to eliminate the adverse effects caused by the disorderly expansion of shadow banking [5]. W. Chen and B. F. Wang said that the time lag of shadow banking can interfere with the implementation of monetary policy, which is not conducive to achieving the ultimate goal of monetary policy [6]. In summary, based on the above research results combined with China's current situation, this paper proposes the following assumptions:

Hypothesis: The money supply is negatively correlated with the size of the shadow banking.

Hypothesis 2: The gross national product and resident price index are negatively correlated with the size of the shadow banking.

IV. DATA AND METHODOLOGY

A. Variable Selection and Data Source

Shadow Banking Agent Variable: Calculate the total value of shadow banking per month, that is, the total value of social financing minus the value of RMB loans minus the value of foreign currency loans, and then compare the value of shadow banking with the same period of the previous year to obtain its year-on-year growth rate (RSB), which can effectively reflect the scale of shadow banking.

Monetary Policy Effectiveness Proxy Variable: To explore whether external factors interfere with the effectiveness of monetary policy, then the monetary policy intermediate target and the ultimate objectives need to be considered. First, according to the previous analysis, the M2 year-on-year growth rate will be selected as the proxy indicator (RM2) of the money supply. In addition, the ultimate objectives of China's monetary policy to promote the steady rise of the economy can be reflected by the economic growth rate, to maintain the price is not subject to large fluctuations can be reflected by the consumer price index. Therefore, the monthly GDP growth rate of industrial added value is used as the representative data. The consumer price index selects the monthly growth rate data, and then the ultimate objectives data is simplified. The two data are subtracted to get the final goal of monetary policy. The size of the indicator, expressed in COE.

In this paper, a total of 141 sets of monthly data from January 2007 to September 2018 were set as raw data, and the original data collected were all from the official website of the NBSPRC and the official website of the PBOC.

B. Set Model and Empirical Test

The vector auto-regressive (VAR) modeling idea is to construct a model by using each endogenous variable in the system as a function of the hysteresis value of all endogenous variables in the system to estimate the dynamic relationship between all endogenous variables. The general expression for the VAR(q) model is:

$$yt = A_1 y_{t-1} + ... + A_q y_{t-q} + Bx_t + \varepsilon_t \ (t = 1,2,...,T)$$

In order to successfully establish the VAR model and make its regression results effective, the three data variables will be tested using the ADF unit root test method before the model is built. After setting the next-order difference with the intercept term and the trend term, all the variables become stationary, indicating that there may be a cointegration relationship among the variables, and the cointegration test can be performed.

Before setting the VAR model, you must also choose the optimal lag order for the model. The best lag period length should be determined to be 2 using the Eviews software.

TABLE I. LAG ORDER TABLE

Lag	LogL	LR	FPE	AIC	SC	HQ
0	661.4815	N.A	4.3866e-78	9.9922e-02	10.057e-40	10.018e-70
1	429.9966	449.0458	0.1545e-85	6.6465e-66	6.9073e-49*	6.7525e-38
2	408.8520	40.06353	0.1288e-12*	6.4639e-40*	6.9203e-11	6.6493e-91*

a. *represents the optimal lag order selected in each column

In addition, the VAR characteristic root stability needs to be tested. It can be seen from Fig. 1 that all the roots are inside the unit circle, so the constructed VAR model satisfies the stability condition, so that the impulse response and the variance decomposition analysis can be performed.

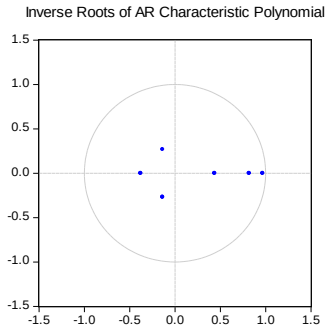

Fig. 1. VAR Characteristic Root Stability Test of RSB, RM2 and COE

V. RESULTS AND DISCUSSIONS

Firstly, the Johansen cointegration test is based on the co-integration test of regression coefficients. The importance of cointegration test is to test whether the causal relationship shown by the regression equation is pseudo-regression, that is, whether there is a stable relationship inside the variable. As can be seen from the results in Table 1, there is a certain long-term and stable cointegration relationship in the variables.

TABLE II. UNRESTRICTED COINTEGRATION RANK TEST

	Eigenvalue	Trace Statistic	0.05 Criticle value	Prob.**
None*	0.335098	94.33820	42.91525	0.0000
At most 1*	0.184050	37.61012	25.87211	0.0011
At most 2	0.064968	9.337252	12.51798	0.1606

Secondly, after the VAR model with a lag period of 2 has been established, the impulse response graphs of the impact of the shadow banking standard deviation on the money supply, economic trends and consumer price index are explained in turn.

We can see the impact of RSB on RM2 changes, and the implementation of a standard deviation impact on RSB will reduce the controllability of RM2, which indicates that the existence of shadow banking will increase the difficulty of central bank supervision of supply of money. When the shadow banking affects the ultimate objectives of monetary policy, it can be discerned from Fig.3 that after a standard deviation impact is applied to the RSB, the COE begins to be negatively affected, which indicates that most of the RSB investment in monetary funds is concealed and profit-seeking. In reality, shadow banking may have a greater effect on the ultimate objectives of monetary policy.

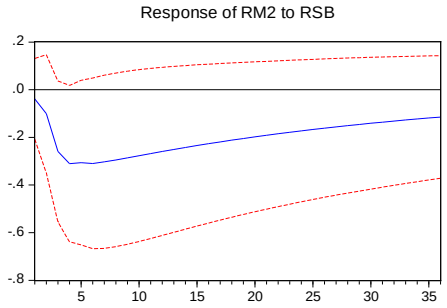

Fig. 2. Response of RM2 to RSB

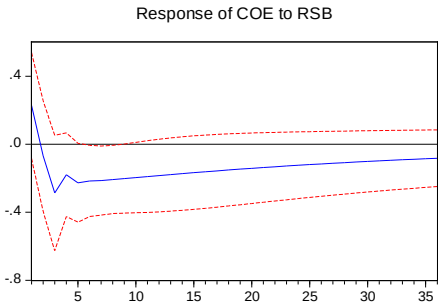

Fig. 3. Response of COE to RSB

VI. CONCLUSION

Relevant suggestions for shadow banking: First, we must formulate a shadow banking supervision program and gradually strengthen its supervision, effectively monitor and control the operation of shadow banking. In addition, the relevant financial regulatory agencies should stipulate the upper limit of the loan interest rate of the shadow banking and reduce the risk of funds. Secondly, it should give appropriate and positive guidance to the future development direction and innovation of shadow banking, and become a useful supplement to traditional financial institutions. Finally, institutions and departments within the shadow banking system should strengthen self-discipline.

Relevant suggestions for monetary policy: First, the amount of money generated by the shadow banking business is included in the statistical caliber of the money supply, which helps to ensure the effectiveness of the monetary policy, and is also conducive to the central bank's supervision of the amount of money. Second, optimize the monetary policy transmission channel. First of all, we should gradually standardize and control traditional commercial banks and credit companies to cooperate with wealth management products, improve screening standards, and optimize their business quality. In

addition, we will give more support to small and micro enterprises and private enterprises to reduce their financial resources for shadow banking. The dependence of intermediaries; Finally, the establishment of a financing structure dominated by traditional commercial banks will fundamentally strengthen and strengthen the main position and important role of commercial banks in China.

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