

## The Influence of China's Shadow Banking System on Monetary Policy

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**Abstract.** Studying the shadow banking system (SBS) as well as regulatory measures and reducing its risk is the objective of this study. In this study, how does SBS influence the monetary policy (MP) in China is analyzed from the following aspects. These aspects are MP objectives, monetary policy tools as well as monetary policy transmission mechanism. What's more, the SVAR model is established and verified. From the results, it can be clearly seen that for the effective play of MP, the role of SBS is an obstacle. For MP instruments, the role of the SBS is to reduce its effectiveness. For the transmission mechanism of MP, the SBS distorts this mechanism. For the effectiveness of China's MP and the real economy, these effects have brought risks and uncertainties. At the same time, the existing various disadvantages of China's MP have also been exposed. As a result, China must accelerate the reform of the MP system. In addition, as for the MP, its objectives, tools as well as transmission mechanism should be vigorously improved, so as to improve the policy's effectiveness, promote the reform of interest rate liberalization, resist as well as control the risks brought by the SBS.

### Introduction

Chinese shadow banking system (SBS) include loans of non bank financial institutions like bank credit cooperative financing, private investment and hedge funds, as well as businesses engaged in by micro credit companies, guarantee institutions, private lending and emerging online lending [1]. Since the second half of 2009, Chinese government began to shrink liquidity and adjust monetary policy (MP) because of the bank credit's excessive expansion.

For one thing, in terms of the central bank, its MP is to strictly controls the bank credit's quantity and price. For another, there are a lot of financing demands in the market, which leads to the tendency of financial institutions to take off balance sheet business, like issuing loans for enterprises through bank credit products and financial products and other similar "shadow banking" (SB) behaviors. Most of the gray areas covered by the SBS coincide with the frontier areas of financial innovation, which has the risk of lack of supervision.

However, it is necessary to see both sides of things. The characteristics of SBS may aggravate the fragility of financial system as well as lead to the outbreak of financial crisis, but it is also an inevitable process of market economy development and improvement, and an inevitable product of economic development. Developing SBS is an effective way which can help the commercial banks evade the supervision and as well as control of the central bank. In terms of the commercial banks, credit means can be enriched, blanks can be filled, financial system can be more active, and financial products can be innovate more quickly. In addition, it can also absorb idle funds to form a huge fund pool, as well as give full play to the scale effect of funds. Funds can be used more effectively. Financing procedures can become more and more convenient. As for funds, its liquidity can become better and better. In this way, the funds can be allocated more reasonably and the investment plan will be optimized. In terms of the small and medium-sized enterprises, their financing will be more convenient and faster. In addition, there will be more competition between state-owned enterprises as well as private enterprises. This kind of competition is very necessary, because it has a lot of positive effects. For example, in such a competitive environment, their productivity will be greatly improved. Once the productivity is greatly improved, their financing will become very convenient. Moreover, the whole financing market will be driven to develop in a good direction [2, 3]. However, when the business between SB and financial system is very frequent and quite dependent on each other, the impact of SB on monetary policy should be paid more attention. In addition, regulatory efforts need to be properly strengthened, and MP needs to be adjusted. In this way, the adverse factors of SBS can be greatly reduced.

Therefore, in this study, how does the SBS influence the MP in China is studied in order to find reasonable measures which can make the China's MP more effective and reduce the SBS's adverse impact. Model analysis is used to verify the results of this effect. As for the influence mechanism of SBS, China's MP regulation measures have been explored and improved. In this way, the excessive development of SBS can be controlled and the existing risk problems can be solved in time. SBS can better serve Chinese economy, produce greater economic efficiency, promote the sound development of economy, and enhance national strength.

## Related Work

**Research Progress Abroad.** Matthews and Xiao (2019) believed that in the early stage of development, China's financial system serves China's economy in transferring domestic savings to domestic investment [4]. However, continued financial repression, as well as an increase in the middle class and an aging population, put pressure on savings to "seek revenue." At the same time, the loans provided by financial institutions (FI) to state-owned enterprises are dominant. Political limitations, inefficiency and weak risk management practices forced SMEs to choose other sources of funding. The rapid growth of SB meets the requirement of savers' income as well as private investment. The study covers two identified topics for telephone research. The research topic "alternative strategies for reform and liberalization" covers SBS impact on credit intermediation. This study is crucial because it provides the basis for macroeconomic research to investigate "the role of China's financial system in sustaining economic growth." Gabrieli et al. (2018) applied VECM method for the analysis of the relationship between China's SBS and the implementation of MP [5]. It is also found that the operation mode of shadow bank is asymmetric, because it expands the growth of money supply, but weakens the influence of MP decision on the basis of restrictive interest rate.

**Domestic Research Progress.** Chen et al. (2018) studied how Chinese MP affects the activity of the banks' SB. The rules of endogenous conversion MP on the basis of institutional facts are established and estimated [6]. In addition to this development, the establishment of the following empirical evidence also requires two newly constructed micro bank datasets. The contractive MP from 009 to 2015 leads to the rapid increase of shadow bank loans. At the same time, for traditional bank loans, the expected decline is offset. Moreover, MP influence on total bank credit is hindered. Xu (2019) believed that in order to face the financial crisis, for the Chinese economy, a lot of economic resources has been injected by the Chinese government, and the degree of repression on China's financial industry has risen to an unprecedented level [7]. However, despite the possible adverse effects, financial repression is likely to remain in the future. For the Communist Party of China, if financial resources can be controlled, some economic and political problems that are not conducive to governance can be solved effectively and quickly. Jing (2018) believed that the magnitude of money multiplier has been greatly increased, and the rapid growth of money supply M2 has not led to the surge of consumer price index (CPI) [8]. In order to solve these problems, the SB develops quickly which can relax the assumptions in the traditional money quantity theory (QTM) to be considered. Moreover, endogeneity is introduced into money multiplier. This reveals a mechanism that links monetary authority to the distribution of credit between sectors. An important policy implication is that controlling the relative size of SB can help improve the effectiveness of Chinese MP.

**Summary of Relevant Research at Home and Abroad.** According to the current study situation of scholars in various countries, there are some research results on the meaning of SBS and how does it influence the MP. However, there are still some disputes in some links, and relevant theoretical aspects need to be improved and supplemented. First of all, the research of foreign scholars has made a more in-depth exploration on the definition, operation mechanism of the SBS, the relationship and influence with monetary policy, and has formed a consensus on the meaning of the SBS. However, if the financial market of China and developed countries is compared, many differences can be found. In addition, it can be also concluded that the financial market environment in China is not good enough, because financial instruments and products are few, the level of financial innovation is low, and the development of asset securitization and interest rate marketization is not mature. In terms of SBS, Chinese government cannot copy foreign standards. Therefore, it is necessary to compare the SBS of China with developed countries like US as well as UK, grasp the operation mechanism of the SBS on the basis of China's national conditions, start from the root, improve the intermediary objectives, tools and transmission mechanism of Chinese MP, and reduce the adverse impact of the SBS on China's MP as well as economy. At the same time, improving the MP can regulate as well as supervise the operation of the SBS more effectively, guide the healthy development of the SBS, and make Chinese economy develop better and better.

## The Mechanism Analysis of the Influence of SBS on Chinese MP

**The Impact of SBS on MP Objectives.** Assuming that under ideal conditions, no other factors are taken into account, there is a equation: money supply \* money turnover speed = market trading capital quantity. Controlling the currency turnover rate in the market is not a simple thing for the central bank. However, the economy can be adjusted by changing the money supply, but after joining the SBS, the turnover of capital will be faster and faster, and the market will flow faster and faster, making the market prefer the rapid turnover of money to the increase of money supply [9]. The SBS can result in the central bank's inability to decrease the growth rate of capital stock in the whole economy only by regulating the money supply. Besides, for intermediate target money supply as well as the MP final target, their correlation will also be weakened.

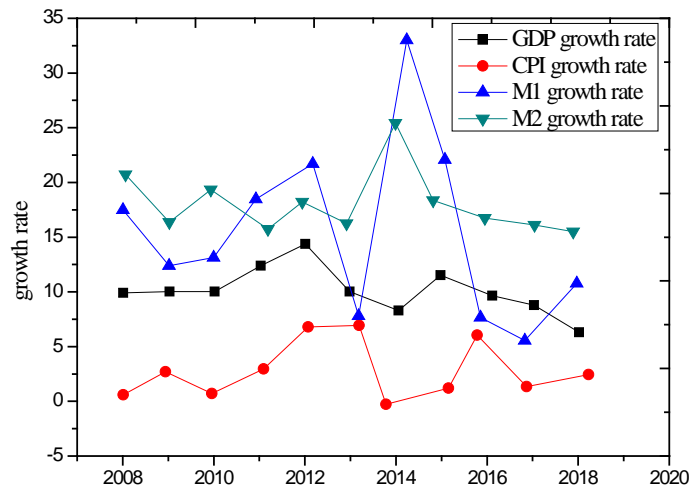


Fig. 1 Growth trend of China's GDP, CPI and money supply M1 and M2

Fig. 1 shows that the ML and M2's growth rate in China is higher than that of GDP growth rate and CPI change rate in most periods, and the correlation between money supply and GDP and CPI is weak. The deviation trend in 2014 was very significant, and the growth rate of money supply increased rapidly. At the same time, the growth rate of CPI did not rise but fell [10]. Meanwhile, the trend of GDP growth rate is also different from that of money supply growth rate. Especially from 2013 to 2015, the money supply fluctuated greatly, while the GDP growth rate did not fluctuate significantly.

**The Impact of the SBS on MP Instruments.** Companies of trust, securities, fund and other SB institutions as well as private lending absorb depositors' deposits through various shadow banking businesses, seizing the bank's capital source, while the legal deposit reserve system only restricts and regulates the deposits absorbed by traditional commercial banks. The capital resources absorbed by the SBS naturally evade the regulation of the deposit reserve system [11]. In order to expand the source of funds and guarantee the profit, commercial banks vigorously create financial products to package, transfer or sell loans, and form internal SB business. Besides, to raise much money, they cooperate with various emerging shadow banking institutions to develop and promote banking and credit financial products, but they do not have to pay the deposit reserve [12]. The combination with commercial banks or the development of business in SB outside the commercial bank system will reduce the scope of the influence of the deposit reserve system, and also lead to a great discount in the effectiveness of the central bank to adjust the credit creation ability of commercial banks by virtue of the deposit reserve policy.

As shown in Fig. 2, China frequently adjusts the deposit reserve ratio, and the central bank has raised the deposit reserve ratio 13 times in a row. Influenced by SB, the scale of credit in Chinese market is still high, and the indicators such as money supply and total market loans have not been suppressed [13]. The money supply and market loan balance are still rising steadily, and the effectiveness of the deposit reserve system is declining.

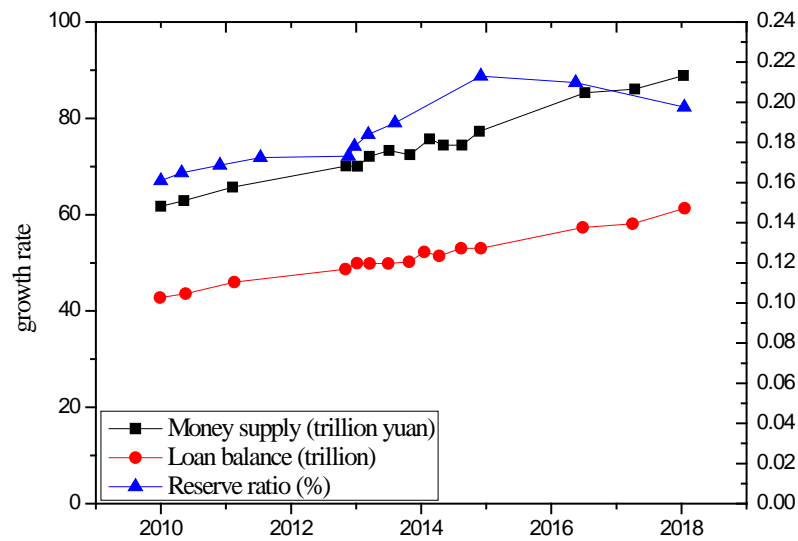


Fig. 2 Trend of money supply, loan balance and reserve ratio

The SBS is separated from the regulatory system, and its scale is unpredictable. Many financial products launched by the shadow banking system can replace deposits, which are essentially in the middle zone between demand deposits and fixed deposits, and there are no restrictions on deposit and withdrawal. However, Chinese central bank's statistical range of funds does not include such products of SBS. Moreover, this kind of financial products are more and more substitutable for money, which makes the division of currency levels fuzzy, and leads to the complexity of currency statistics and classification [14]. Finally, it makes the information resources of monetary economy grasped by the central bank sharply reduced or distorted. For the central bank, the formulation of their macro policies will be more complicated and difficult, and their macro-control ability will be greatly weakened, which makes it difficult to accurately judge the economic and financial situation, and weakens and blurs the ability of moral persuasion and window mountain guidance of the central bank's MP.

**The Influence of SBS on the Transmission Mechanism of MP.** From the perspective of commercial banks, commercial banks have been playing an essential part in economic operation. The main MP tools used by the central bank need to rely on the transmission of commercial banks to the economy and market [15]. The emergence of SBS not only makes non bank financial institutions as well as private lending organizations compete for financing and credit resources of commercial banks, but also induces commercial banks to cooperate with various shadow banking institutions, vigorously develop off balance sheet business and avoid supervision. For example, jointly developing financial products with trust companies, these activities weaken the position and role of commercial banks in the social financing system, and also decrease the importance as the main body of MP transmission [16].

As far as enterprises are concerned, the SBS has expanded the financing channels in the market. Once the government implements the tight MP as well as the commercial banks tighten the credit scale, the enterprises can timely finance and maintain the original investment through the SBS such as non bank financial institutions and private lending organizations. Monetary policy can't affect the behavior of enterprises, thus can't restrain investment activities and maintain price stability [17]. From the perspective of residents, China's inflation rate is far higher than the deposit interest rate of commercial banks, but the interest rates of financial products, private equity funds and private loans developed by the SBS in the same period are far higher than the official interest rate, which makes residents in a long-term negative interest rate state more willing to transfer bank deposits to SB products. This leads to the disintermediation of commercial banks. The central bank cannot effectively achieve the goal of regulating market liquidity by controlling interest rates. The SBS interferes with the normal exertion of MP effect.

### An Empirical Analysis of the Influence of SBS on China's MP

**Stationarity Test.** Financial time series data are often nonstationary. If VAR model is established to analyze non-stationary time series, there is the possibility of pseudo regression. Therefore, before the VAR model is established, the unit root test is carried out for the above variables to meet the data stability requirements of VAR model estimation.

If the data stability is going to be tested, many ways can be used. However, the most commonly used way is ADF unit root test. If the ADF statistics of each variable are lower than the critical value under the 5% test level, it is proved that

the variable is a stationary time series [18]. According to AIC rule, the test maximum lag order is 11. ADF test results can be clearly seen in Table 1 below.

Table 1. ADF checklist 1

Variable name	Test type (C, T, L)	5% critical value	ADF	P value	Stationarity
SB	(0, 0, 1)	-1.944286	0.913998	0.9026	Unstable
M1	(0, 0, 0)	-2.892536	3.145329	1.0000	Unstable
LOAN	(C, T, 0)	-3.457808	0.351859	0.9987	Unstable
INT	(C, 0, 0)	-2.892200	-4.70769	0.0001	Stable
CPI	(0, 0, 1)	-1.944286	-0.284115	0.5811	Unstable
Y	(C, T, 0)	-3.457808	-4.975842	0.0005	Stable

It can be seen from the above results that except INT and Y, other variables all have unit root process. In order to eliminate the influence of heteroscedasticity, the first-order difference is applied to the above non-stationary data series, and the shadow banking variable after the difference is calculated as DLSB, the money supply variable as DLM1, the loan variable as DLLOAN, the price level as DLCPI, and the ADF test is carried out again. The results can be seen in Table 2 below:

Table 2. ADF inspection table 2

Variable name	Test type (C, T, L)	5% critical value	ADF	P value	Stationarity
DLM1	(C, 0, 0)	-2.892536	-12.49236	0.0001	Stable
DLSB	(0, 0, 0)	-1.944286	-5.678690	0.0000	Stable
DLLOAN	(C, T, 5)	-3.47436	-3.633218	0.0326	Stable
INT	(C, 0, 0)	-2.892200	-4.70769	0.0001	Stable
DLCPI	(0, 0, 1)	-1.944286	-12.64479	0.0000	Stable
Y	(C, T, 0)	-3.457808	-4.975842	0.0005	Stable

It can be seen from the test results that under the standard of 5% confidence interval, there is no unit root in DLM1, DLSB, DLLOAN, INT, DLCPI, and Y. All of the above variables are stationary variables, so VAR model can be established for analysis.

In order to analyze the impact of SB on the interest rate as well as credit channels of MP transmission, two VAR models are constructed in this study. Among them, model 1 does not contain shadow banking variables, and model 2 contains shadow banking variables [19]. Through the comparison between the two models, the changes of monetary policy in the transmission structure after considering the shadow banking factors can be seen.

**The Stability Test of Vector Autoregressive Model.** If the impulse response of the model is going to be checked, the stability test of the VAR model is essential.

Table 3. AR root table of VAR model stability test

Root	Modulus
0.842106	0.842106
0.507013-0.574937i	0.766560
0.507013+0.574937i	0.766560
-0.756706	0.756706
-0.008466-0.753451i	0.753499
-0.008466+0.753451i	0.753499
-0.495992-0.399843i	0.637089
-0.495992+0.399843i	0.637089
-0.582212	0.582212
0.431400	0.431400
-0.092742-0.275673i	0.290855
-0.092742+0.275673i	0.290855
0.060957-0.232658i	0.240511
0.060957+0.232658i	0.240511

From the data point of view, according to Table 3, the reciprocal of AR root module is less than 1, which proves that VAR model is stable.

## Conclusion

In this study, the impact of SBS on Chinese MP is analyzed from three aspects. First of all, it is the impact of SBS on MP objectives, that is, the credit creation function of SBS increases money supply, reduces the correlation between

money supply and final objectives, reduces the correlation between interest rate and asset price, and weakens the excess reserve demand of commercial banks. Secondly, the impact of SBS on MP instruments are to narrow the scope and strength of deposit reserve, reduce the dependence of commercial banks and other financial institutions on rediscount, impact on the price of securities traded in the open market operation of the central bank, and make the effectiveness of selective MP instruments of the central bank decline. Finally, the influence of the SBS on the transmission mechanism of MP reduces the importance of traditional commercial banks as the main body of monetary policy transmission, reduces the controllability of monetary policy transmission and increases the uncertainty of MP transmission delay.

From the impact of SB on the ultimate goal of MP transmission, the development of China's SBS can promote the increase of total output to a certain extent. Through continuous innovation, SB improves the efficiency of China's financial market, makes up for the shortcomings of traditional commercial banking business, widens the financing channels for enterprises and residents, and promotes the economic development. However, the risks contained in this, the structural impact, the distortion of the industrial structure, will also have a negative impact on the smooth operation of the economy. In addition, SB will increase the uncertainty of price fluctuation and increase the difficulty of MP regulation.

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