An Empirical Study on the Impact of Shadow Bank on Macro-economy in China

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Abstract

Under the background of 'Financial Disintermediation', we study the macroeconomic impact of China's shadow bank expansion is of great significance for improving the financial supervision system and for preventing and defusing financial risks. By constructing an index system for measuring the size of shadow banks and macroeconomic fluctuations, collecting monthly time series data from February 2011 to March 2019, using the VAR model to perform impulse response analysis, and empirically studying the major macroeconomic indicators of shadow bank expansion Dynamic effects. The study found that the expansion of shadow bank will push up the inflation rate, which is not conducive to stabilizing prices, and will weaken the effectiveness of monetary policy; however, shadow bank also provides supplementary financing channels for small and medium-sized enterprises in the physical sector, which objectively promotes Marketization of Interest Rates. Finally, based on empirical results, policy suggestions such as clearly defining the scope of shadow bank, improving shadow bank risk supervision, optimizing the currency level statistical caliber, unblocking the transmission mechanism of monetary policy, and deepening the reform of interest rate liberalization are proposed.

Keywords

Shadow bank; Macro-economy; Risk supervision; Impulse response function

Introduction

Shadow bank began to exist in the 1980s, but the subprime crisis until 2008 has attracted the attention of many scholars and investors. The definition of shadow bank was first proposed by Paul McCulley, executive director of Pacific Investment Management Co., in 2007. He believed that shadow banks are not supervised but have the function of deposit and loan of commercial banks. And they are quasi financial institutions to complete the leveraged through the non-banking institutions or channels (McCulley, 2007). Generally speaking, the shadow bank in China has entered the public view since the beginning of the twenty-first century. It has experienced three stages of rapid development, steady growth and gradual contraction in the

era of strict financial supervision. The operation mode of shadow bank in China is obviously different from that of developed countries in Europe and America. China's shadow banks are mostly financial financing institutions, acting as supplementary roles of banks. Institutions and institutions are often independent of each other. There is no complete shadow bank system and an integrated credit chain like the United States. At the same time, commercial banks in China mainly raise funds for enterprises and individuals by issuing financial products. Instead of traditional savings to provide short-term financial products to the market, in essence, it is still a retail financing mode.

The shadow bank system has its rationalization, but it must also be admitted that the financial risks brought about by its size are too large are not to be underestimated. Firstly, when shadow bank acts as a de facto credit intermediary, its financing clients are usually secondary customers who are difficult to obtain funds in traditional banks. Shadow banks can provide a lower financing threshold for these people. But it also means that shadow banks must bear a higher risk of credit default. Secondly, shadow bank is an innovative way to avoid regulation, which is more free from supervision, but the risk increases. In the face of China's huge shadow bank system, once the government tightens regulation, it will have an unimaginable impact on the overall economic operation. And shadow banks have been "forced" government financial supervision departments, strive to be included in the "regulatory sandbox" and other financial regulatory innovation pilot, and become an integral part of the entire financial system. Based on the years of game experience of our government regulators and shadow banks, we restrict the expansion of the shadow bank scale and keep the bottom line of systemic financial risks. It is practical to guide the shadow bank system to play a positive role under the "sunshine". Therefore, it is of great significance to improve the financial regulatory system, perfect the Internet financial supervision mechanism, and promote the virtuous circle of Finance and real economy.

Literature Review

The impact of the development of shadow bank on the macroeconomic is a hot topic in academic and practical circles. The definition of shadow bank is the logical starting point of its research. For example, Ba Shusong (2013) divided the shadow bank into four levels according to the statistical size: the first level includes only the financial products of commercial banks and the trust business of trust companies; the second level is the first level plus financial companies, Consumer Finance Companies and so on. The third level is the second level plus the banks' off balance sheet business and the quasi financial institutions such as small loan companies. The fourth levels are the widest, the third level plus private lending with relatively high concealment and flexible form. The notice issued by the State Council on strengthening the supervision of shadow banks puts forward that the shadow banks in China include three main categories: First, there are no financial licenses and totally unsupervised credit intermediaries, such as third party financial institutions; Second, there are no credit intermediaries with inadequate supervision, such as financing Guarantee Corporation and small loan companies. Third, Institutions holding financial licenses. But there are inadequate supervision or evasion of supervision, such as money market funds, and some financial services. Xu Shujie et al. (2018) define the shadow bank as a credit intermediary that takes part in financial functions outside the banking system and participates in the credit creation process, and the shadow business outside the prudential supervision of regulatory authorities or under supervision. It can be seen that the scope of shadow bank in China has a variety of criteria, but generally includes two categories: quasi financial institutions and business with regulatory arbitrage.

On the basis of scope definition, Chinese scholars tried to study the influence of shadow bank on macro-economy from different angles. First, from the perspective of monetary policy and macro regulation, Gao Ran et al. (2018) verified that shadow bank would replace traditional commercial banks' credit channels based on counterfactual simulation, thereby reducing the effectiveness of macroeconomic regulation through monetary policy. Lu Minfeng and Yang Liang (2018) use the theory of monetary multiplier to determine the theory. The empirical study shows that shadow bank has a significant negative correlation with the change of money multiplier, and has a pro cyclical character. From the point of view of the impact on the real economy, Li Cun and Yang Daguang (2017) think that shadow bank can help broaden the financing channels of the real economy, optimize the investment structure of the real economy, turn idle funds into savings and enhance capital mobility, but also raise the financing cost of the real economy, cause the entity economy to hollow and aggravate the accumulation of real economic risks. Zhang Qingjun et al. (2019) found that the increase of shadow bank, financial marketization and the scale of government debt will inhibit, improve and not be conducive to the effective allocation of real economic capital. Wang Lu (2020) based on 2006-2017 years' relevant annual economic data model, we believe that shadow bank will promote the growth of GDP, but also reduce the unemployment rate, but it is not conducive to price stability. In addition, interest rate is also an important transmission channel for shadow bank to affect the financial market and macroeconomic. However, the research results of the relationship between shadow bank development and interest rate liberalization in China are not the same. Liu Yanyan (2017) from the perspective of financial stability, an empirical study finds that shadow bank has the role of promoting interest rate marketization, thus promoting the deepening of financial market and economic growth. Liu Mingkang et al. (2018) found that the development of shadow bank in China reduced the effectiveness of market-oriented interest rate reform to a certain extent in studying the relationship between the banking system and the marketization of interest rates.

To sum up, the existing literature mainly discussed the scope definition of shadow bank in China, and studied the impact of shadow bank development on monetary policy effect, real economy growth and interest rate marketization deeply. However, the conclusion is different. The possible reason is that most of the previous studies only focus on the influence mechanism of shadow bank on a certain level of macroeconomic. However, there are relatively few studies on the dynamic impact of shadow bank system on multiple levels of macro-economy. At the same time, most of the data collected from the subprime crisis in 2008 have been used for empirical analysis. Few reports have been made on comprehensive empirical studies using monthly data. This paper sets up a comprehensive index system to measure the scale of the shadow bank and macroeconomic fluctuations. Based on the monthly economic and financial statistical data provided by Wind database in February 2011 of -2019 in March, we set up the VAR model to conduct Grainger causality test and impulse response function analysis. Finally, based on the empirical results, we put forward policy recommendations from the perspective of improving the risk management of China's shadow bank, smoothing the transmission mechanism of monetary policy, and deepening the reform of interest rate marketization.

An Empirical Analysis of the Impact of Shadow Bank on the Macroeconomic in China

After the international financial crisis in 2008, the scale of shadow bank in China once grew rapidly. After.2013 years, with the introduction of relevant regulatory policies, the growth rate of shadow bank has

gradually slowed down. Especially after 2018, the formation of a new pattern of financial regulation and the introduction of a new regulation of information management, shadow bank has entered a stage of steady development. Under the new normal situation, the superposition of strict supervision and financial innovation has been achieved. The influence of shadow bank on the macro-economy is becoming increasingly complex. In this part, we use econometric methods such as ADF test, Grainger causality test, VAR model and impulse response function analysis. The short-term impact and long-term dynamic effect of shadow bank scale on major macroeconomic indicators such as money supply, interest rate, industrial added value and inflation rate are studied empirically. The software used in econometric studies is Eviews 8.0.

Index selection and data sources

First, the shadow bank scale is the core explanatory variable of the empirical research in this paper. However, the shadow bank has the characteristics of high complexity, strong concealment and cross business cooperation. The scope of the shadow bank has not been unified and standardized at home and abroad, making it difficult to estimate its regulation. The author uses the method put forward by Jiang Shichao (2019). Considering the main components of China's shadow bank and the availability of data, the scale of the shadow bank is calculated from the scale of the scale of social financing announced by the people's Bank of China. The scale of social financing refers to the total amount of funds obtained from the financial system by various sectors of the economy and sectors such as individuals in a certain period of time. Since 2011, the scale of social financing has become an important indicator of China's financial support for the real economy. It is also an important intermediary index for China's monetary policy and financial regulation. According to the main composition of the scale of social financing shown in Table 1, it can be found that the "bank loan category" belongs to the traditional commercial bank asset business, and does not belong to the shadow bank category. Because shadow bank in China is also mainly indirect financing, to some extent play the function of credit intermediaries, rarely directly involved in the securities market business, so we can eliminate "non financial enterprise stock financing". We can get a formula for estimating the size of shadow bank which is more in line with the framework of this study: the size of shadow bank = trust loan + entrusted loan + non discounted bank acceptance bill + corporate bond financing. This formula takes into account the intermediary business and off balance sheet business of the commercial banks with shadow bank, as well as the main non banking financial institutions and financial market businesses. But private lending and "underground finance" are not yet available for reliable statistics.

Table 1 Main components of social financing scale

Main composition	Bank loans	RMB loans and foreign currency loans
	Off balance sheet business of financial institutions	Trust loan, entrusted loan, non discounted bank acceptance bill
	Direct financing	Corporate bond financing and non-financial corporate equity financing

Secondly, according to the theoretical analysis before, the impact of shadow bank on the real economy, virtual economy and macro regulation should be taken into account in the selection of macroeconomic indicators. The influence of shadow bank on the real economy is mainly reflected in providing supplementary financing channels for entities, drawing lessons from Sun Sidong and Tan Shenshen (2018). The choice

of industrial added value is the proxy of real economic growth. The influence of shadow bank on virtual economy and financial deepening is carried out through interest rate channels. Therefore, Fang Xianming (2017) and Lv Sicong (2019) is used for reference. Using the weighted average interest rate of the national interbank offered rate as the proxy of interest rate. The influence of shadow bank on macroeconomic regulation is likely to weaken the effectiveness of monetary policy. Refer to Mao Yincheng (2017) and Xu Yunsong (2018), we should choose the broad money supply (M2) as the intermediary index of shadow bank's influence on monetary policy. Taking account of the stability of monetary value and promoting economic growth is the main goal of China's monetary policy, and shadow banks will also impact on price stability, for reference from Zhou Qiqing and others (2016). As a proxy variable of inflation rate, CPI is also included in the macroeconomic impact index system. In addition, the reason why the author did not choose GDP as an indicator of economic growth is the difficulty of obtaining monthly GDP data. The VAR model constructed in this paper uses monthly time series data.

To sum up, the author chooses industrial added value, interbank offered rate, money supply and consumer price index as macroeconomic indicators to be affected by shadow bank. According to the above setting, the definition of variables involved in the empirical study is shown in Table 2. Variables are selected from China's monthly time series data from February 2011 to March 2019, with a total of 98 sample observations. All the data needed are from the Wind database.

Table 2 Definition of variables

Variable name	Variable symbol	Variable meaning
Shadow bank scale	Y	Measured monthly growth rate of shadow bank scale
Industrial added value	GY	Monthly growth rate of industrial added value
interest rate	TY	The monthly growth rate of the weighted average interest rate of the interbank lending in China
Money supply	M2	Monthly growth rate of money supply
Inflation rate	CPI	Monthly growth rate of CPI

Data processing

1. Unit root test

Since the construction of vector autoregressive model (VAR) requires all variables to be stationary or the same order time series data, the author first uses the ADF test method in unit root test to test the stationarity of the variables, and the results are shown in Table 3.

Table 3 Unit root test results

Tested variables	Model setting (C, T, L)	ADF test value	1% critical value	5% critical value	10% critical value	conclusion
Y	(C,0,0)	-3.415325**	-3.502238	-2.892879	-2.583553	stable
M2	(C,T,0)	-3.964420**	-4.068290	-3.462912	-3.157836	stable
TY	(C,0,0)	-9.68969***	-3.500669	-2.8922	-2.583192	stable
GY	(C,0,0)	-2.896140**	-3.501445	-2.812536	-2.583371	stable

CPI	(C,0,0)	-4.716743***	-3.509281	-2.895924	-2.585172	stable

Note: *C indicates that the test pattern includes intercept items, T means trend items, and L indicates lag phase. * * and * * * respectively indicate the MacKinnon critical value of the ADF test value less than 5% and 1%, and reject the original hypothesis of unit root, that is, the test sequence is stable.*

According to the ADF test results, the ADF test value of the shadow bank scale Y is -3.415325, less than the MacKinnon critical value -2.892879 of the 5% level. Therefore, the original hypothesis of unit root is rejected at the significant level of 5%, and Y is stable. Similarly, the M2 of the money supply and the GY of industrial added value are also stable at the significant level of 5%.The interest rate TY and CPI variables are stable at 1% significant level. Therefore, the above variables have passed the stationarity test, and the VAR model can be established for analysis.

2. Selection of lag order for VAR model

When constructing the VAR model, the author tries to determine the optimal lag order by trying to select different lag orders and weighing the criteria. The result is shown in Table 4.

Table 4 Determination of optimal lag order

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-147.4618	NA	0.00001	3.278749	3.414910*	3.333727*
1	-115.0876	60.57104	0.00004	3.120164	3.937132	3.450032
2	-93.07618	38.81591	0.00005	3.184434	4.682208	3.789192
3	-50.92573	69.79752	0.00002	2.815607	4.994187	3.695255
4	-24.47441	40.95688*	0.00001*	2.784396*	5.643782	3.938934
5	-0.495315	34.55052	0.00006	2.806351	6.346544	4.235779

Note: ** indicates the optimal lag period determined according to the criteria.*

Table 4 shows that according to the SC criterion and HQ criterion, the optimal lag order is 0, and according to LR, FPE and AIC criteria, the optimal lag order is 4. The larger the lag order is, the smaller the degree of freedom. Generally, the lag order is determined according to the AIC and SC criteria. However, the results of AIC and SC criteria in Table 4 are inconsistent, so the LR test is adopted, and according to experience, the final 4 is the optimal lag order.

Grainger causality test

The purpose of this paper is to analyze whether the money supply, interest rate, industrial added value and inflation rate will change correspondingly when the scale of shadow bank changes. Therefore, before conducting the VAR model and impulse response function analysis, we first test Glenn Jain variables for the variables studied. In order to verify whether there is a short-term lag relationship between the change of shadow bank and macroeconomic variables, the lag order of Grainger causality test selection is the same as the VAR model, which is 4 order lag. The test results are shown in Table 5.

Table 5 Grainger causality test

Original hypothesis	F-Statistic	Prob.	Do you accept the original hypothesis?
M2 does not Granger Cause Y	0.31098	0.8699	accept
Y does not Granger Cause M2	3.40499	0.0124	refuse
TY does not Granger Cause Y	0.44819	0.7734	accept
Y does not Granger Cause TY	0.90732	0.4635	accept
GY does not Granger Cause Y	0.67645	0.6101	accept
Y does not Granger Cause GY	2.03978	0.096	accept
CPI does not Granger Cause Y	0.263	0.9009	accept
Y does not Granger Cause CPI	6.92959	0.0000	refuse

From table 5, we can see that the change of the scale of the shadow bank y is the Grainger reason for the change of the money supply m2 and the inflation rate CPI, but it is not the Grainger reason for the change of the interbank offered rate ty and the industrial added value GY. It needs to be explained that the Grainger causality test can only show that there is a precursor lag relationship in the statistical results before, and can not reveal the long-term equilibrium relationship. The impulse response analysis will further explore the long-term impact path of the shadow bank scale on macroeconomic variables.

Impulse response analysis

1. AR root test

After determining the optimal lag order of 4, it is necessary to test the stability of the VAR model, that is, the AR root of the characteristic equation of the model is both within the unit circle or the eigenvalue is less than 1. If the model is unstable and the standard error of the impulse response function may not be effective, the AR root test of the VAR model is performed before the impulse response function analysis. The result is shown in Figure 1. In this paper, all the AR roots of the VAR model are in the unit circle, so the model is stable, and the impulse response function analysis is reliable.

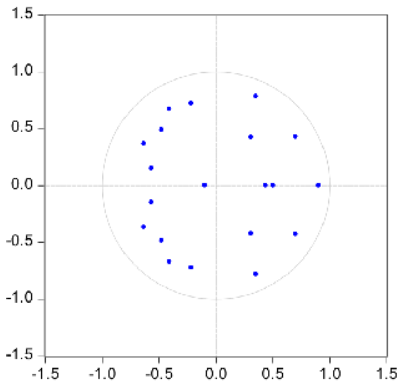


Figure 1 Results of AR root test

2. Impulse response function analysis

The impulse response analysis based on VAR model can be used to estimate the impact of the impact of a variable on other variables in different periods, that is, to describe the dynamic impact path between variables. The author makes an impulse response function analysis of the macroeconomic variables selected in this paper, so as to reveal the impact of a standard deviation of the shadow bank scale Y. The dynamic impact paths of money supply M2, interest rate TY, industrial added value GY and inflation rate CPI in the first to tenth phases after shocks are respectively analyzed.

Figure 2 is the response of the money supply M2 to the impact of a standard deviation of the shadow bank scale Y. From Figure 2, we can see that when the impact of a standard deviation of the shadow bank scale is impacted, the change of money supply is very rapid and fluctuating. The first phase rises, then reaches its peak in the second period, then decreases rapidly, reaches the trough in the third period, and rises smoothly after the fourth period. However, it is always below the horizontal axis. This shows that the impact of the expansion of shadow bank on the money supply is generally negative, but this effect is relatively stable.

Figure 3 shows that when the inflation rate CPI is affected by a standard deviation of the shadow bank scale Y, it can be seen from Figure 3 that the impact of inflation CPI on shadow bank Y is rapid, reaching its peak in the second period, and then decreasing rapidly. However, after the fourth phase, it rebounded and rebounded, and the trend was obvious. After the sixth period, it fell steadily. This indicates that the impact of the impact of a standard deviation on the inflation rate of the shadow bank Y is obvious, but it will eventually converge. Therefore, the expansion of the shadow bank scale will push up the inflation rate of China. However, price stability is an important goal of macroeconomic policy. When the inflation rate rises significantly, the state will introduce corresponding policies to curb the development of the shadow bank. In addition, consumers reduce their consumption due to excessively high commodity prices, resulting in a gradual decrease in inflation and a steady trend.

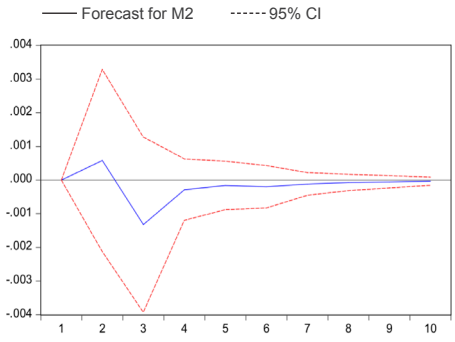


Figure 2 Impulse response analysis of Y to M2

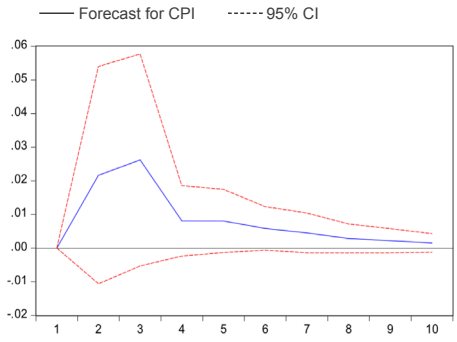


Figure 3 Impulse response analysis of Y to CPI

Figure 4 describes the response of interest rate TY to the impact of a standard deviation of the shadow bank scale Y. From Figure 4, we can see that interest rate will have a positive effect quickly, and this effect will last for three periods, and it will begin to decline after the third period and gradually weaken at a relatively stable rate in the fourth stage. The expansion of shadow bank will lead to an increase in interest rates, because the

development of shadow bank will accelerate the "disintermediation" of traditional banks, and the social idle funds flow from the traditional banking system to the shadow bank system. This makes traditional banks have to raise interest rates to attract savings deposits, so that the price of funds is getting closer to the equilibrium interest rate determined by the market. Thus breaking the artificial low interest rate regulation and promoting the marketization of interest rate.

Figure 5 depicts the response of the industrial added value GY to a standard deviation of the shadow bank scale Y. From Figure 5, we can see that GY will immediately produce a transient negative effect. It will disappear rapidly after the second period and turn to a positive effect. The positive effect will reach the maximum value in the fifth period. However, after the fifth period, this effect continues to fluctuate, rapidly descending and gradually rising until eighth peaks reach another small peak. The ninth period also rebounded. This shows that the impact of shadow bank Y on industrial added value has a short-term inhibitory effect, but has a long-term role in promoting, although the impact is unstable and fluctuating, but overall tends to rise.

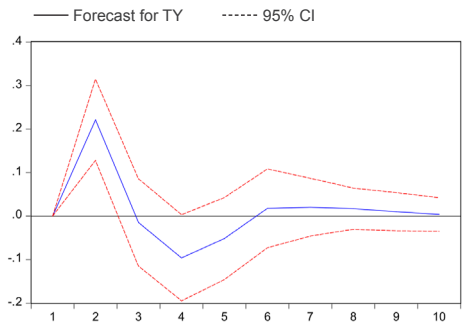


Figure 4 Impulse response analysis of Y to TY

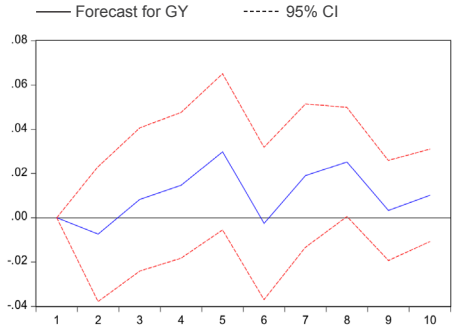


Figure 5 Impulse response analysis of Y to GY

Conclusions and Policy Recommendations

Based on the results of Grainger causality test and impulse response function analysis, the influence of the expansion of the shadow bank scale on the macroeconomic indicators can be obtained within the sample area. The main conclusions and economic explanations are summarized as follows. The change of shadow bank size is the Grainger reason for the change of money supply M2. Impulse response function also shows that the impact of shadow bank will lead to the fluctuation of money supply M2 and affect the measurability of M2 as an intermediary index of monetary policy. Shadow bank will divert part of bank loans, and the credit created by shadow banks has not been included in the statistics of the current money supply. Therefore, the development of shadow bank will affect the effectiveness of monetary policy. Second, the scale change of shadow bank is the Grainger reason for the change of inflation rate. In the long run, the development of shadow bank will push up China's inflation rate and is not conducive to stabilizing prices. Third, shadow bank will have an impact on financial deepening and virtual economy. Increasing market competition between banks, other financial institutions and shadow banks will cause interest rate volatility to rise. In the long run, there will be a positive effect on the level of market interest rates with the return of capital prices, that is, the process of marketization of interest rates will be promoted in China. Fourth, for the real economy, based on the impulse response analysis results, shadow bank expansion has a positive effect on industrial added value. From a practical perspective, shadow bank has become a supplementary financing channel for small and

medium enterprises in China's substantive departments, to a certain extent, which has promoted the growth of enterprises and investment growth, thereby contributing to the development of China's real economy.

According to the above conclusion, the scale expansion of China's shadow bank will weaken the effectiveness of monetary policy, and bring challenges to financial regulation and price stability. But it will also "Forced" the marketization of interest rates and the development of inclusive finance to a certain extent. Therefore, we should further improve the financial regulatory system and monetary policy transmission mechanism, and deepen the reform of interest rate marketization. We should enhance the risk management and control capabilities of various financial institutions to shadow bank business, strengthen information disclosure and enhance information transparency, and create a financial, technological, and innovative development environment that is defensive, safe, inclusive and open, and achieve a balance between risk prevention and innovation.

Clearly define the scope of shadow bank and improve the risk supervision of shadow bank

Empirical research shows that the expansion of China's shadow bank has a significant impact on macroeconomic indicators, which is not conducive to price stability, and increases the difficulty of macroeconomic regulation and risk prevention and control. While shadow bank is inherently "avoidance of supervision". Defining the scope of shadow bank from the legal perspective is the premise of effective supervision. China has only roughly listed the scope of shadow bank in the document on strengthening the supervision of shadow bank, which has not been consistent with the reality of financial development, and the effectiveness of the document is lower than that of the law. It is suggested that we should draw lessons from the United States' Dodd-Frank Act, the European Union's Money Market Fund Regulations and other laws and regulations, combine with the reality of China's financial supervision, clarify the criteria and business boundaries of shadow bank in China, and integrate them into professional supervision. At the same time, we should build a "Double Peak" financial supervision system combining macro prudential supervision and micro behavior supervision. We should further clarify the division of responsibilities between the Financial Stability Development Committee, People's Bank of China, China Banking and Insurance Regulatory Commission, China Securities Regulatory Commission and the local financial supervision departments. Improve the uniformity and effectiveness of the supervision of these banking institutions, trust companies, securities companies, fund companies, financial asset investment companies, Internet financial platforms, and fintech companies with shadow banking attributes and their business supervision. Whether online or offline, the industry should accept the supervision of unified standards and adhere to the principles of licensed operation and the matching of business scale and risk control capabilities, so as to effectively prevent regulatory arbitrage. For financial derivatives with high risk and easy to generate asset bubbles, we should introduce targeted "strict supervision" measures to improve the "penetration" of regulation, and make special rectification of P2P net loan risks. We should continue to "risk clearing" as the goal, guide the net loan platform to exit or orderly transform into a small network loan company. At the same time, we should actively introduce professional financial Asset Management Co to participate in the disposal of net loan bad assets, slow down and solve risks in the process of repaying the shadow bank in the network lending platform, protect the legitimate rights and interests of investors, and improve the long-term mechanism of

Internet financial supervision. Keep the bottom line of systemic financial risks.

Optimize the level of monetary statistics and smooth the transmission mechanism of monetary policy

Empirical research shows that under the current monetary level statistics, the expansion of China's shadow bank has negative effect on the central bank's macroeconomic regulation and control with the money supply M2 as the intermediate target, which will weaken the effectiveness of monetary policy. The fact that credit creation of shadow bank has not been counted in the intermediate target of monetary policy may affect the measurability of the target and increase the time lag of monetary policy. Moreover, this impact will further increase with the development of Internet Finance and financial technology. Therefore, it is recommended that the central bank optimize the existing monetary level division and comprehensive financial statistics system, and expand the statistical scope of the scale of social financing according to the actual situation of shadow bank and financial innovation. We will gradually add new forms such as the compliant Internet financial platform, the network small loan company, the regional financial market and the gold exchange to join the statistics of the scale of social financing, and integrate it with the monetary supply of all levels into the basis of monetary policy making, so as to improve the accuracy of macro regulation of monetary policy. We should strengthen the unified supervision of the off balance sheet activities and intermediary businesses of the commercial banks with the shadow bank nature, optimize the balance sheet of banks, enhance the controllability of the credit transmission mechanism, reduce the external lag of monetary policy, control every process of the capital chain in time, and meet the needs of social financing so as to promote the steady growth of the economy.

Deepen the reform of interest rate marketization and enhance the efficiency of financial resources allocation

Empirical research shows that shadow bank will have an impact on China's financial deepening and virtual economy. Shadow banks enhance the market level of interest rate objectively by increasing competition in financial markets. Interest rate is the price of funds and an important reference standard for pricing financial products. It helps to play the decisive role of the market in the allocation of financial resources, ease the problem of "financial suppression" and optimize the allocation of resources in developing countries. Interest rate marketization reform has been carried out in China for more than 20 years. With the introduction of LPR interest rate, it is about to enter the final "deep water area". Next, the government should guide all kinds of financial institutions to raise interest rate pricing and risk management level. Financial institutions should enhance their sensitivity to interest rate fluctuations under market conditions, reasonably determine and dynamically adjust the interest rate pricing level according to the risk characteristics and maturity structure of financial products, and guide funds to flow to more efficient economic entities and enhance the allocation efficiency of financial resources. We should integrate interest rate risk into the comprehensive risk management system, enhance the coping ability of interest rate market risk monitoring and early-warning and interest rate volatility through "stress testing". We should strengthen the financial literacy and interest rate risk education of all kinds of financial institutions' clients, so that they can understand the "rigidity" of breaking interest rates. To realize the importance of interest rate risk pricing to enhance the efficiency of resource

allocation, we should promote the transparency of private lending rates, curb usury, and create a favorable financial environment for deepening the reform of interest rate marketization.

Building and improving the information disclosure system to promote inclusive financial development

Empirical tests show that shadow bank has played a complementary role in supporting the financing of small and micro enterprises and other inclusive financial sectors. However, low transparency also has a negative impact on financial stability and macro regulation. We should establish a complete and timely information collection and processing platform to enhance the transparency of information. In particular, we should continue to promote the Internet financial platform such as net loan access to the central bank's credit information database and the nationwide Internet banking registration and disclosure service platform, and improve the information disclosure standard, which is convenient for financial consumers to grasp the latest and the most complete market information. It also provides important reference for formulating and implementing monetary policy, reducing the internal and external time lag of policies, and improving the effect of macro-control. When making clear the specific content, frequency and mode of information disclosure of shadow banks, we should implement sub category supervision according to the different characteristics of shadow bank business or products, and propose differentiated information disclosure requirements. It is necessary to make sufficient risk disclosure and disclosure of risk prevention and control measures. The information disclosed must be accurate and complete. At the same time, KYC must be strictly implemented. On the basis of risk assessment, only high risk product information can be introduced to investors who meet the risk tolerance capability. For financial innovation products and businesses, a financial and technological supervision system suitable for them should be constructed. Explore the "supervision sandbox" pilot, use information disclosure, product publicity, social supervision and other flexible management methods, strive to create inclusive and prudent financial and technological innovation regulatory tools, and pay attention to protect the legitimate rights and interests of investors and financial consumers; for the net loan industry, we should take information disclosure as the starting point, promote information sharing and digital credit building, and reduce the risk control cost of the network loan platform. Prevent and control the risk of multi lending and fraud, and promote the transformation of industries and better services for small and micro enterprises and other key elements of Inclusive Finance (Zhou & Yan, 2016). In addition, we should strengthen the supervision of credit rating agencies, improve the independence, objectivity and impartiality of the third party credit rating, provide quality credit rating services to all kinds of financial institutions and businesses, solve the problem of asymmetric information, and promote inclusive financial development.

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