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Some Controversial and Important Issues about Shadow Banking Research

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Abstract

After the outbreak of the international financial crisis in 2008, the concept of shadow banking was first put forward by the financial circles in the United States. In the past ten years, the development of the shadow banking has been a great deal of researches and great achievements made in the academia and the industry. However, there are still some problems that have not been effectively solved or disputed. This paper extracts the periodicity of the CIS and converse of shadow bank, the influence of the shadow banking on the effectiveness of monetary policy, the portrayed "channel identification" of the shadow banking to the monetary policy response, and the discrimination of the influence of the shadow banking on the house price, and through the combing of the related contents. Reflection and re-study, in order to provide a valuable reference for the relevant researchers.

Keywords

shadow banking, cyclical monetary policy, rising house prices

1. Introduction

The subprime crisis, which started in the United States, made the concept of the shadow banking system familiarity and hotly debated around the world. It also brought to the surface that the financial system had emerged and developed in Europe and the United States since the 1960s and had profoundly changed the world. The financial contracts "made" by shadow banks were mainly short-term debts, not covered by the formal deposit insurance system. At the same time, they extended

the chain of financial intermediaries, subverted the status of "too big to fail" in the era of traditional banks, and make the financial system enter a new era of "too connected to fail". The essence of the international financial crisis is a liquidity crisis caused by a run on the shadow banking system. In order to avoid aggravating the systemic risk, the U.S. government has no choice but to rescue it.

The formal concept of shadow banking was first proposed in 2007 by Paul McCully, the executive director of PIMCO, which defined it as leveraged non-bank investment channels, instruments and structures. Subsequently, a large number of scholars (Eichengreen, 2008; Geithner, 2008; Pozsar, 2010; MorganRicks, 2010; DenHaan & Sterk, 2011; Bernanke, 2012; Borio, 2013; Funke, 2015) and international financial institutions (IMF; FBS) have made an in-depth study on it and basically believed that the shadow banking in developed economies such as Europe and the United States focuses on asset securitization. Its main business model is that non-bank financial institutions which are not protected by the rediscount window with the central bank use short-term funds to buy long-term assets with high risks and low liquidity, which have the functions of term, credit and liquidity conversion. The forms of its products mainly include hedge funds, money market funds, asset securitization (ABS), the credit derivatives (CDS, CDO, and etc.), repurchase (Repo), government sponsored enterprises (GSE), asset-backed commercial paper (ABCP), mortgage backed securities (MBS), and etc. The main causes of its emergence and development are financial innovation, regulatory arbitrage and principal-agent problems.

The motivations of shadow banking in China are similar to those in Europe and America, but its manifestations are quite different. After the international financial crisis spread to the whole world in 2008, the four trillion Yuan of government investment issued by the Chinese government in response to the crisis gave rise to asset price bubbles and generated negative effects such as high inflationary pressure. In order to mitigate these negative effects, Chinese financial authorities gradually tightened the monetary policy and credit in 2010. Commercial Banks and other financial institutions made financial innovations in order to evade the regulation, and various channel businesses such as bank financing, "bank-credit cooperation" and entrusted loans mushroomed. With the arrival of the "first year of China's Internet finance" in 2013, shadow banking has once again become the hot focus with the help of the new form of Internet. In December of the same year, the People's Bank of China promulgated the interim measures for the management of inter-bank deposit certificates, and the business of certificates of deposit was launched in the interbank market. By June 2016, the inter-bank business had expanded to 1,556, covering most large, medium and small commercial Banks. The central bank provided liquidity for large commercial banks through re-lending instruments, and some of them were "moved" to small and medium-sized commercial banks by large commercial banks through inter-bank deposit certificates and other tools, giving full play to the function of "shadow central banking" (Feng, 2017). Synthesizing a large number of literature, this paper will offer a summary about China's shadow banking, including collections, silver card, silver, and other forms of cooperation, finance, trade business, the bridge business, asset securitization, bond repurchase business,

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money market funds, insurance companies, the risks, small loans business, P2P, underground business, small loans business, pawnshop business, enterprise credit, loan financing innovation, and etc.

Although there are differences between China and the United States in the background and the manifestation of shadow banking, regulatory arbitrage and the motivation to obtain high profits are similar. Both of them have the functions of term conversion, liquidity conversion, risk conversion and credit conversion. Objectively, both of them increase leverage and release liquidity. With the increasing scale of shadow banking in various countries, the cross-risks caused by equity, financing, guarantee and business relationship are increasingly close. With the "herd effect", the shadow banking system is extremely likely to pose a major threat to the stability of the global financial system.

2. Some Controversial and Important Issues about Shadow Banking Research

2.1 About Cis-Periodicity and Anti-Periodicity

The positive feedback relationship between financial institutions or markets and the real economic cycle is known as the cis-cyclicality of the financial system. This feedback relationship expands during booms and contracts during recessions, and exacerbates cyclical fluctuations in the real economy. The basic premise of cis-cyclical theory is that money is non-neutral (Wicksell, 1898; Hayek, 1931; Keynes, 1936; Friedman, 1968). However, its connotation and extension goes far beyond the monetary non-neutrality. Cis-cyclical theory tries to depict the internal mechanism and the transmission path of the financial system from shock to the real economy on its basis. The research on the pro-cyclicality of the financial system is the most mature one, which is represented by the debt-deflation theory (Fisher, 1933) and the financial accelerator theory (Bernanke, Gertler, & Gilchfist, 1996). The mechanism can be summarized as follows: when the economy is on an upcycle, the borrower's financial constraints ease, the value of the mortgage collateral rises, and the banking system usually expands credit, leading to economic overheating and the formation of asset bubbles. When the economy goes into a downturn, the borrowers' financial situation deteriorates, the value of mortgage collateral declines, and as regulatory requirements such as capital adequacy ratio (or leverage ratio) increase and the endogenous drive to recover losses increases, assets are sold by the banking system to achieve the purpose of deleveraging. Selling in the same direction quickly dried up market liquidity, creating systemic risk and further recession. In addition, this affects the screening level of bank loans, and the risk of bank liabilities is more likely to trigger systemic risk (Ferrante, 2013). Compared with the commercial banking system, credit derivatives and structured products made by shadow Banks cannot be effectively regulated. Additionally, there is no deposit insurance system and "extra" credit line from the central bank. Once a run occurs, it is more likely to trigger a "herd effect". The cis-periodicity of commercial Banks is closely related to the monopoly of the banking system, the external financing dependence of enterprises on the banks and the imperfection of the financial market, while shadow banking can "lubricate" financial friction and increase the cis-periodicity of the entire financial system. Specifically, in China and the United States, the financing methods of shadow Banks are mainly

repurchase agreements and ABS commercial bills, which are closely related to commercial banks. In the U.S. shadow banking system, the cis-periodicity principle is roughly expressed as follows: the highest leverage ratio and the lowest financing cost of the repurchase agreement occur in normal times, while in non-normal times, due to the inability to obtain external financing, the repurchase financing has to be completed through passive use of existing assets. This situation leads to that the shadow banking system, either actively or passively, can only adopt internal financing method -- repurchase, which further results in two positive feedback loops in the repurchase transaction system: margin system and reserved deduction rate; Credit is created by repurchase, so credit creation in the shadow banking system reflects cis-periodicity. Furthermore, it is intrinsically related to commercial banks, and pro-periodicity reflects the spillover effect, which further leads to pro-periodicity in the financial system and even the economic system (Zhou, 2013). In China's shadow banking system, commercial bank-centered financial planning, inter-bank network and private finance are highly cis-periodicity. This has been confirmed by a large number of data analysis and empirical studies (Borio, 2001; Perotti, 2012; The FSB, 2012; Zhou, 2013; Lu, 2014; Lin, Cao, & Xiao, 2016).

However, in addition to the financial, economic, institutional and policy and other factors will be important impact on the cycle, particularly after the international financial crisis, governments and central banks increase the intensity of the macroeconomic regulation and control, to establish "monetary policy and macro-prudential policy" double pillar policy framework has gradually become the consensus of the international community, which means that the policy and regulation will be more significant influence on cycle. Specifically, the tightening of monetary policy restricts the lending of commercial Banks, but at the same time promotes the expansion of shadow banking. This asymmetric effect is called "water bed effect" of liquidity (DenHaan & Sterk, 2011; Loutskina, 2011; Jimenez, Ongena, Peydro, & Saurina, 2014). The internal mechanism is that when the monetary policy is tightened and the commercial banking system is constrained, the restricted credit orientation will change. Shadow banking, such as asset securitization and bank financing, will become the financing channels for enterprises. While transferring restricted loans, it has avoided credit supervision requirements. Compared with shadow Banks, commercial Banks have a higher capital cost when monetary policy is tightened, and can only reduce the issuance of normal loans due to their poor liquidity (Freixas & Jorge, 2008). Some scholars' research also supports this view: Hu, Chen and Ben (2016) found that in the period of loose monetary policy, China's shadow banking assets showed no obvious performance, while in the period of monetary policy tightening, the growth rate increased rapidly. Xie and Li (2014) found through empirical analysis of the state space model and VAR that shadow banking is a contradictory, complex of financial pro-cyclical and anti-cyclical regulation of monetary policy. Qiu and Zhou (2014) demonstrated the adverse periodicity of shadow banking through the DNK-DSGE framework theory. The positive interest rate impact will inhibit the credit of traditional commercial banks and reduce the leverage of low-risk enterprises, but cause the expansion of shadow banking and the increase of leverage of high-risk enterprises. Wang and Li (2015) analyzed

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the "water-bed effect" from the perspective of credit channels, and explained the counter-periodicity of shadow banking from the perspective of the self-expectation and inertia of shadow banking. When the economy was overheated, the central bank tightened monetary policy, while the liquidity supply of economic development in the previous period was less than the liquidity demand. At this time, shadow banking funds supplemented the excess liquidity demand, and a large amount of funds flowed into the real economy, thereby enhancing social liquidity and stimulating the monetary policy to intensify the tightening.

2.2 One Side of "Coin"—How to Measure the Influence of Shadow Banking on the Effectiveness of Monetary Policy?

For a long time, China has realized the equilibrium state of economic growth and stable price mainly through quantitative control and passive control, that is, the monetary policy of making choices according to the change of economic growth rate and inflation rate (including partial rule operation). Under the new normal, only by transforming the quantitative monetary policy based on passive discretion into the monetary policy based on active price regulation can the steady growth of the economy and the marketization of finance be achieved. In addition, a series of unconventional monetary policies implemented by China in recent years, such as short-term liquidity adjustment tool (SLO), permanent lending facility (SLF), medium-term lending facility (MLF), mortgage supplementary loan (PSL), have also played an important role in adjusting the structure and stabilizing the market.

Globally, China's monetary policy plays a crucial role in the development of the shadow banking: after the international financial crisis in 2008, including the cancellation of the commercial bank credit limit. The reasonable expansion of credit scale is a series of measures to strengthen financial support for economic growth greatly catalyze the development of the shadow banking; After 2010, the national macro-control became tighter and the real economy's capital chain tightened, which further promoted the rapid growth of the shadow banking system that flexibly adapted to the market demand. At the same time, shadow banking creates a kind of "currency" (highly liquid assets) internally outside the traditional banking system, which poses a great challenge to the effectiveness of monetary policy (Holmstrom & Tirole, 2011). In a sense, shadow banking is both the cause and the result of monetary policy regulation. Therefore, in the current situation of the coexistence of quantitative and price monetary policy tools, the research on the two-way relationship between different types of monetary policies and shadow banking has become a hot topic in the academic circle and the industry.

From each side of the "coin", the logic is clear. The research on the effectiveness of shadow banking on monetary policy has experienced the influence of shadow banking on one aspect of monetary policy (Zhou, 2011, 2012; Sheng, 2011), to the research process of monetary policy operational indicators, intermediate indicators and final goals (Xu & Yan, 2015), the research system has been enriched and improved.

As for the operational indicators of monetary policy and intermediary indicators themselves, the

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research focus has also changed with the development of reality. In 1995, "The Banking Law of the People's Bank of China" promulgated by China clearly pointed out that "money supply is the intermediary target", while in the past, the regulation method based on quantitative tools made a large number of studies focus on the influence of shadow banking on indicators of different monetary standards (M0, M1, and M2) and credit scale (Gurley & Shaw, 1960; Gorton & Pennacchi, 1990; Sheng, 2011; Zhou, 2011; Li, 2011; Li & Wu, 2011; Cai, 2015). In the context of increasing emphasis on the role of quantitative tools, most scholars choose to study the money supply and interest rate (market interest rate, policy interest rate, real interest rate, and etc.) of different diameters as mediating variables at the same time (Wang, 2014; Li, 2015; Xu & Yan, 2015; Wang, 2015; Wang, 2015; Hu et al., 2016). In addition, some scholars (Sheng & Wu, 2008). Sheng and Xie (2016) believed that with the diversified development of China's financial market, credit scale index and monetary quantity index could not accurately and comprehensively reflect the financial support of the financial system to the real economy, and proposed that the increment of social financing scale was suitable for the new intermediate index of monetary policy. This actually implied that the financial development with shadow banking as an important part has posed great challenges to the traditional intermediate index of monetary policy. Some scholars tried to demonstrate the influence of shadow banking on the effectiveness of monetary policy from a micro perspective (Wang, 2015). When it comes to the conclusion, results with the intermediate aim of quantitative indicators indicated that the shadow banking significantly impact on money supply and credit, seriously challenge the effectiveness of monetary policy. But, the credit scale involves the below mentioned "channel identification problem, the basic literature are not effective explanation for this problem; results with interest rates as intermediate targets are not the same, maybe there are two main reasons: interest rates represent variables of each selected literature interbank market interbank interest rates are so common, the inter-bank market pledge type bond repurchase rate, interbank interest rates, bank deposit benchmark interest rates and bank deposit rates, and etc. China's interest rate liberalization process is still advancing, and the earlier market interest rate cannot effectively reflect the credit creation and increase the process of shadow banking.

Compared with the intermediary indicators of monetary policy, there is less research on the final goal of monetary policy by shadow banking. Since shadow banking has to achieve the ultimate goal of the central bank through the intermediary indicators, studying the final goal without studying the intermediate target can be inevitably suspected as the "black box theory". There are two main mainstream views about the ultimate goal of monetary policy at home and abroad: Mishkin (2009) divided the ultimate goal of monetary policy into six types in "Monetary Finance": financial market stability, interest rate stability, price stability (or currency value stability) and foreign exchange market stability, at the same time full employment and economic growth; In "Monetary Policy: Goals, Institutions, Strategies, and Instruments", Bofinger (2011) defined the ultimate goal of monetary policy as maximization of social welfare and the usage of social welfare function to conduct research.

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Compared with the definition of Bofinger, Mishkin's definition is more clear and easy to understand, and has become a common expression for central banks to set the ultimate goal of monetary policy. According to the "Banking Law of the people's bank of China", the ultimate goal of China's current monetary policy is to "maintain the stability of currency value and thereby promote economic growth". According to the "Federal Reserve Act", the main goals of the federal reserve's monetary policy are full employment and price stability. In practice, before the last international financial crisis, most major developed countries adopted the Taylor rule to peg inflation or output fluctuations as the ultimate goal of their monetary policies. The outbreak of the international financial crisis has made the systemic financial risk an exogenous variable independent of macro-control, especially the relationship between asset price bubbles and financial stability, which has completely disrupted the intention and effect of monetary policy, and made the academia and the industry deeply realize that maintaining price stability cannot avoid the outbreak of financial crisis, and monetary policy needs to pay attention to a broader perspective. After the crisis, central banks of all countries put the maintenance of financial market stability, in a very important position in practice, which is also the main purpose of the quantitative easing policy implemented by the Federal Reserve from November 2008 to October 2014. As for the remaining final goals, there are few studies. Due to the availability of data, there are few studies on the impact of shadow banking on employment. Interest rate stability, foreign exchange market stability and financial market stability are inextricably linked. The literature on shadow banking's ultimate goal of monetary policy mainly focuses on economic growth, price stability and financial market stability.

In terms of researching on the influence of shadow banking on economic growth, it mainly has a positive influence (Calmes & Theoret, 2011; Chen & Zhang, 2012), negative influence (Imtiaz & Ahmad, 2010), no influence (Adrian & Shin, 2009; Shen & Xie (2013), short-term negative and long-term positive (Wang & Shen, 2014), and asymmetric (Mao & Xu, 2015). According to the summary of literatures, the mechanism of shadow banking to promote economic growth is to make up for the shortage of formal finance, solve the financing needs of small and medium-sized enterprises, expand short-term financing of enterprises, improve the level of capital investment of enterprises and improve the financing efficiency (there is a big controversy about whether shadow banking can reduce the financing cost in countries with financial repression, but it is generally believed that it can reduce the financing cost in countries with sound finance). The reason why shadow banking restrains economic growth is that it increases the risk level of enterprises, intensifies the mismatch between short-term liquidity supply of enterprises and long-term investment, and increases the systemic risk of finance. The final effect of shadow banking on economic growth depends on the combined effect of the two mechanisms. Therefore, even if the empirical result shows that shadow banking has no influence on economic growth and it may be the result of the offset of two effects in a period of time, so it cannot be deemed that shadow banking has no influence on the ultimate goal of monetary policy. In addition, based on the relationship between shadow banking and economic cycle, some scholars studied the asymmetric effect of shadow banking on the output effect of monetary policy and concluded that

shadow banking had a greater impact on contractionary monetary policy than expansionary monetary policy, which only weakened the asymmetric effect of monetary policy but did not fundamentally eliminate the asymmetry of monetary policy (Mao & Xu, 2015).

In terms of price stability, some scholars have demonstrated from the theoretical level that shadow banks have similar credit creation ability as commercial banks (Li & Wu, 2011), and theoretically have the possibility of forming inflation, which is also proved by relevant empirical studies (Zhou, Han, & Sun, 2016). However, the difference between credit creation of shadow banking and credit creation of commercial banks lies in that commercial banks create traditional monetary assets with narrow liquidity, while shadow banking is more about various financial assets with broad liquidity characteristics. In addition, for the shadow banks of various countries, real estate is an important capital flow, while the international practice (United Nations statistical office 93SNA) includes housing in the category of fixed assets formation. The stock market, another important destination for shadow banking funds, is also not reflected in the CPI. Therefore, the impact of shadow banking on real prices may be much greater than the impact of price shock from the perspective of inflation.

After the international financial crisis in 2008, the main goals of the central banks of all the major countries in the world for a long time were to maintain the stability of the financial market and prevent systemic risks, which made the study of shadow banking on financial systemic risks become a research hotspot after the crisis. The complex structure, huge scale, maturity mismatch, high leverage ratio, high correlation and lack of effective supervision of the shadow banking system to make it an important source of systemic risk (Shin, 2009). Moreover, shadow banks establish a direct relationship with commercial banks through the balance sheet, payment system, business operation and credit risk, and etc. Business convergence and the high correlation between business model make shadow banks and commercial Banks establish an indirect relationship and face the common market risk. Under the herd effect, it is easy to cause a run and form a systemic financial risk (Wang & Bai, 2016). Most of the current mainstream research results believe that there is a threshold effect on the size of shadow banking. Relevant models and empirical results also confirm that there is a u-shaped threshold effect between the size of shadow banking and the stability of the financial system in China, that is, there is an optimal size of shadow banking (Mao & Wan, 2012; Lin & Cao, 2015; Wang & Bai, 2016). Most of the current mainstream research results believe that there is a threshold effect on the size of shadow banking. Relevant models and empirical results also confirm that there is a u-shaped threshold effect between the size of shadow banking and the stability of the financial system in China, that is, there is an optimal size of shadow banking (Mao & Wan, 2012; Lin & Cao, 2015; Wang & Bai, 2016). Shadow banking has a dual effect on the stability of the financial system in a similar way to the growth of the economy: on one hand, there is a financial repression in China, with the lack of corporate financing channels, the reliance on bank credit, and the fact that the bank's credit is very strong, the growth of the shadow banking has just made up for the financial sector, which has not only helped to increase economic growth, but also to promote jobs, and to promote the coordinated development and stability

of the entire financial system. On the other hand, in the process of gradually expanding the scale of shadow banking, its blindness and non-transparency of information and other disadvantages become increasingly apparent, which aggravates the friction, such as financial supervision arbitrage, idling arbitrage and related arbitrage between commercial banks and other financial institutions, thus leading to the increase of financial friction and uncertainty. In addition, the internal composition of shadow banks, such as bank-trust cooperation, bank-base cooperation and private finance, is different in terms of systemic influence and risk spillover to commercial banks (Mao and Wan, 2012, Li and Xue, 2014). At present, most literatures take the overall size of shadow banking as the explanatory variable, which will have an impact on the robustness of the conclusion.

2.3 The Other Side of the "Coin"—There Are Problems with the "Channel Identification" of Shadow Banks' Responses to Monetary Policy

After the international financial crisis, monetary policy was endowed with greater economic responsibility and social mission, and more profoundly affected market risk and financial stability (Dell "ariccia etal", 2013). The transmission mechanism of monetary policy to (shadow) banks has also become a research hotspot in the post-crisis era. The other side of the "coin" corresponds to the impact of monetary policy tools with different tightness and duration on shadow banking, which implies the supervision of shadow banking.

Classical monetary policy is mainly conducted through asset price channels (interest rate, exchange rate, Tobin's q channel, and etc.) along with credit channels (BCBS, 2011). Previous literature has discussed and studied the credit channel more widely because it takes into account the financial frictions caused by asymmetric information. In the credit channel, it can be divided into two channels according to the lending relationship: the balance sheet channel that considers the demand for credit from the perspective of the borrower's balance sheet and the bank loan channel that considers the supply of credit from the perspective of the lender's balance sheet (Fang, 2015).

The balance sheet channel can be subdivided into financial accelerator channels (Bernanke, Gertler, & Gilchfist, 1996) and credit mortgage constraint channel (Kiyotaki & Moore, 1997). The former essentially allows the borrower to take the net value as the loan collateral, and the ability to borrow positively correlates with the net value, while the net cost of borrowing is negatively correlated. The latter holds that the amount of borrowing depends on the amount and price of the borrower's credit collateral. The more the collateral is, the higher the price is, and the more money is available for borrowing. Monetary policy affects the credit supply capacity of banks by changing the amount of bank reserves, and finally acts on the transmission channel of the real economy, which is called the bank loan channel (Bernanke & Gertler, 1995).

The traditional macro model with credit channel are considered as the core focuses on the change of credit quantity, which caused by the change of monetary policy, and assumes that banks are risk neutral and are only the passive role of the central bank in the implementation of monetary policy (Adrian & Shin, 2010), while ignoring credit quality and banks' risk-taking behaviors. At the same time, in

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practice, in the process of continuous innovation of financial instruments and the development of financial market, the bank's dependence on deposit is significantly reduced, and the enterprise's dependence on bank loan is also significantly reduced, so the bank has the incentive to change the risk-neutral attitude. Borio and Zhu (2008) first proposed the risk bearing channel of banks, that is, monetary policy changes the risk-neutral stance of the banking system by affecting the risk tolerance of banks, and then has an impact on asset risk, asset pricing, financing cost and even the real economy. The change in banks' risk attitude will also affect the transmission of central bank's monetary policy (Maddaloni & Peydro, 2011; Jimenezetal, 2014). Xiang, Li and Chen (2016) comprehensively summarized ten action paths of banks' risk bearing channels - valuation, income and cash flow effect, interest search effect, central bank's communication and response function, interest rate transmission and risk transfer effect, habit formation path, asset substitution effect, Greenspan put, competition effect, risk pricing model effect and expectation effect, and pointed out the importance of eliminating other channel interference and correctly identifying commercial banks' risk bearing channels. Compared with the two mainstream methods of "channel identification", i.e., controlling the interference of other channels through model control variables and adopting data reflecting the change of banks' own risk perception, which are the mainstream methods of "channel identification" abroad, China is limited by the lack of detailed loan data. Except for a few literatures (Jin & Zhang, 2014b), banks' risk assumption is basically measured indirectly by extracting bank risk indicators. Currently, there are five main types of bank risk bearing variables: as a static ex-post indicator, the non-performing loan ratio of a bank may only increase the non-performing loan rate when the risk bearing of the bank lags for several periods, and the uncertainty of the period increases, so the passive risk bearing of the bank can only be measured (s&kouretas, 2011; Fang, 2012; Xu & Chen, 2012; Zhang & He, 2012b; Fang, 2015); Z value mainly measures the banking-based bankruptcy risk, and it is difficult to depict the bank's risk bearing (Laeven & Levine, 2009; Liu & Wang, 2013; Tao, 2014; EDF (expected default rate) mainly measures the default risk of banks, and has a poor description of the bank's risk bearing (Altunbasetal, 2010; Liu & Wang, 2013; Tao, 2014). The ratio of risk-weighted assets are a good indicator to measure a bank's active risk bearing. It is calculated by adding the total weight of all kinds of risk assets held by the bank and dividing it by the total assets. However, one existing problem is that even if the bank does not take any risk bearing actions, the market value of the risky assets will change (Fang, 2012; Feng & Chen, 2013; Fang, 2015); The proportion of loan loss reserve in the total loan reflects the banks' perception of the overall loan risk, which is also a good measurement index in theory. However, the loan loss reserve rate is also affected by other monetary policy transmission channels, so the correct identification of banks' risk bearing channels is the premise (Zhang & He, 2012b; Li, 2014).

And in terms of shadow banking, despite its reason, the operation mode is not the same, but its essence is a kind of credit intermediary activities and has a maturity transformation, the change of liquidity and credit conversion of function (Pozsaretal, 2012), which means that the credit channel of monetary

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policy and risk bearing channel (revised) applies to shadow banks. In the empirical level, however, compared with the commercial banks, the shadow banking numbers are more and more difficult to correctly identify of transmission channels, only shadow banks scale of measurement is relatively mature (king Bo force and soloing, 2013; Zhang & Peng, 2014; Sun & Jia, 2015). First, the shadow banking system lacks detailed data on loans and is difficult to measure due to the complexity of the system. Secondly, shadow banking lacks specific risk disclosure, and we cannot obtain the asset and liability status of it, which makes it difficult to calculate the income cost of its asset and liability. Generally, it is represented by certain financial products, trust plans, inter-bank borrowing rate of a certain period and benchmark interest rate for a certain period (Xu & Yan, 2015), which is obviously difficult to summarize the whole complex shadow banking system. Thirdly, it is more difficult to extract indicators to measure the risk undertaking of shadow banks. The five commonly used indicators to measure the risk undertaking of commercial banks cannot play a role, and only a few literatures involve this point. For example, Hu et al. (2016) used the volatility of the assets of shadow banks to represent. This makes the problem of "channel identification" of shadow banks' response to monetary policy more serious than that of commercial banks.

2.4 Is Shadow Banking an Important Driver of Rising House Prices in China?

After more than two decades of rapid development, China's real estate market has shown three important characteristics: rapid housing price growth, surging investment and significantly increased financial dependence (Xu, Zheng, & Shen, 2015). In the research on the relationship between shadow banking and real estate, two issues have attracted wide attention: one is the role of real estate in financial procyclicality; the other is the role of real estate industry in forming systemic risks. The cis-periodicity of real estate is mainly based on their financial accelerator effect and risk bearing effect: the "financial accelerator effect" of real estate is basically as the "monetary accelerator". As Bernanke et al. (1999) stated, the net capital of real estate enterprises increases with the increase of housing price, and developers can obtain more funds (including more loans from banks) and increase the investment in real estate, thus causing the spiral rise of real estate price. The mechanism of the risk bearing effect is that the rate of return on real estate investment increases with the increase of housing price, and entrepreneurs' expected rate of return on real estate investment will increase their leverage ratio. The bank expects that the entrepreneurs' repayment of loans will increase, and the entrepreneurs' default rate will decrease. Therefore, the standard of loans will be lowered and the loan value ratio will be increased, so that they can bear more risks (Chen & Wang, 2016). However, shadow banks inject a large amount of capital into the real estate market through credit generation mechanism, asset substitution channel and risk contagion channel and increase the systematic risk of the real estate industry (Zhang & Pan, 2013). In addition, shadow banking enables real estate enterprises to successfully evade financial macro-control and obtain financial support, thus greatly reducing the effect of previous house price control. Macroeconomic stability has been inseparable from solving the problem of the high correlation between shadow banking and the real estate industry, which makes the

regulatory tools focus on one thing and lose the other, greatly increasing the difficulty of solving the problem (Wang et al., 2017).

After reviewing the literatures, we can find that the existing literatures paid great attention to the role of shadow banking on the financing quantity and structure of Chinese real estate enterprises, the influence on the real estate regulation policies, the influence on the "financial accelerator" mechanism of the real estate sector and the influence on the real estate bubble and the financial system risk including the real estate sector, and etc. To reach the same conclusion, that is, the proportion of non-bank financial institutions, including the shadow banking in the real estate financing is increasing and gradually stabilizing (Wang et al., 2017). The financial innovation of shadow banking has increased the difficulty of real estate market regulation (Jia et al., 2016). The rapid development of shadow banking is an important reason for exacerbating the real estate bubble and systemic financial risks (Zhang et al., 2013). However, the research on whether shadow banking contributed to the rise of housing price, which is more painful to the public, is not in direct proportion to the degree of social attention, and the research results are more differentiated. Jia et al. (2016) used SVAR model to conduct research, and the results showed that shadow banking can provide credit support for real estate enterprises and directly promote the rise of housing price and the expansion of real estate investment scale. Zhang et al. (2013) studied through a GLS model, and the results showed that in the long run, shadow banking financing scale led to a significant increase in housing price, but this effect was not significant in the short run. Ouyang et al. (2016) measured the financial pressure of China's shadow banking system. The research results showed that the real estate price bubble expanded at the initial stage of the increase of shadow banking funds, but was gradually restrained to some extent. Li (2015), based on the time-varying Copula model, believes that under the influence of shadow banking, real estate prices in China do not rise but fall, and there are no pro-cyclicality between the two. The research results of Shan (2015) show that there is no cis-periodicity between shadow banking loans and real estate price fluctuations. In a long period of time, the increase of shadow banking loans does not promote the rise of housing prices, but ultimately reduces the rise of housing prices. The existing literatures have a relatively consistent explanation of shadow banking to curb housing price, which holds that the shadow banking mainly targets at real estate developers rather than buyers with less mortgage loans. As the capital supplier, the increase of the real estate developers' development funds can increase the effective supply in the long run, so as to curb the rising trend of real estate prices. However, there are few existing literatures to explain the mechanism of shadow banking funds boosting the housing price. The author believes that real estate is more similar to investment goods or speculative goods than rigid consumer goods. Although the main flow of shadow banking funds is to the real estate developers on the supply side, in addition to increasing supply, the investment nature of shadow banking funds and high requirements on profits and profits will prompt the developers to increase the sales price as much as possible. Furthermore, the pre-sale system accelerates the withdrawal of shadow banking funds and stimulates the consumers' "scarce commodities" psychology, which further pushes up the housing price from the

demand side. At the same time, the collected funds will enter the housing market again, thus accelerating the new round of housing price rise.

3. Conclusion

Although significant progress has been made in the research on shadow banking both at home and abroad, there are still many problems in the development and evolution of shadow banking as a "living" system, which are still controversial or need to be further studied.

Firstly, a large number of literatures analyzed the pro-cyclicality of shadow banking in the formation of systemic financial risks and financial cycles. However, after the policy variable was added into the cycle, shadow banking showed a very strong anti-periodicity based on monetary policies. These two seemingly contradictory conclusions contain the nature and laws of shadow banking. Cis-periodicity reflects the general law of shadow banking as a financial form. "Fire borrows wind, and wind helps fire", big booming will help the development of the financial environment. The anti-periodicity of the regulation policies of shadow banking also reflects its original development intention of making up for the shortage of formal finance, solving the financing needs of enterprises and improving the financing efficiency. Its informal status determines that it can face the regulation with a more flexible attitude. Even in the face of strong supervision, shadow banking is bound to be a "wild fire that never goes out, but springs up again".

Secondly, as a product of financial repression, shadow banking, with its powerful functions of term, liquidity, risk and credit conversion, is supposed to have an important influence on the effectiveness of monetary policy. Scholars also try to depict such influence in different links in the transmission process of monetary policy. However, when using different proxy variables to represent the transmission link, the results are often different, which is not only related to the choice of monetary policy objectives, but also related to a country's political, economic, institutional and financial conditions. Additionally, it is significant to accurately define the channels through which shadow banking responds to monetary policy, and there are significant problems in this aspect in current research.

Finally, as an important flow of shadow banking funds, real estate industry is also a zone prone to breed asset bubbles and form systemic financial risks. As one of the commodity prices that most concern of the public, it is of special practical significance to study whether shadow banking contributes to the rise of housing prices. Existing literatures mainly studied the financing amount, financing structure and development area of real estate, but the research results on the influence of shadow banking on housing price were controversial and the influence mechanism was not fully discussed. In this paper, based on the existing literature and relevant facts, a brief explanation was given.

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