

## HOW THE SHADOW BANKING EXPANSION INFLUENCES THE PROFITS OF COMMERCIAL BANKS – EVIDENCE FROM CHINA

MENG DU<sup>1,\*</sup> AND CHEN CHEN<sup>2</sup>

<sup>1</sup>School of Economics and Management  
Dalian University

No. 10, Xuefu Avenue, Jinzhou New District, Dalian 116622, P. R. China

\*Corresponding author: dm19880128@126.com

<sup>2</sup>School of Management

Guangdong University of Technology

No. 100, Waihuan Xi Road, Panyu District, Guangzhou 510006, P. R. China

chenchen052@163.com

Received October 2016; accepted January 2017

**ABSTRACT.** *We use panel data model to analyze the impacts of shadow banking expansion on the profits of Chinese commercial banks, the results show that the development of shadow banking would reduce the income of commercial banks, and we also find the reduction of spread income caused by the expansion of shadow banking is a main reason of the decrease of profits in Chinese commercial banks. The conclusion will almost be unchanged if we divide the shadow banking into the financial institution shadow banking and non-financial institution shadow banking.*

**Keywords:** Shadow banking, Commercial bank, Spread income

**1. Introduction.** The shadow banking has become the focus because of the outbreak of the subprime crisis in the United States. With the innovation of financial derivatives, shadow banking developed rapidly in 1980s. Paul McCulley firstly defines the shadow banking at the annual meeting of the Federal Reserve (FED), he thinks the shadow banking has the similar business with the commercial bank, while it does not belong to the commercial banks, and it is seldom regulated by the FED. The Financial Stability Board (FSB) gives a comprehensive definition of shadowing banking, which is credit intermediary that can provide some financial service for consumers, firms, and other financial institution. Now, the shadow banking has been an important part in the international financial system. In the United States, investment banking, hedge funds, money market funds all belong to shadow banking. As a lack of supervision by the related financial institutions, the shadow banking does not need to pay the legal deposit reserve and keep the minimum capital adequacy ratio like the commercial banks, the leverage ratio of shadow banking is very high as their credit scales are not limited once the asset maturity mismatch exists in the shadow banking, the systematic risk will raise, and it is prone to generate the financial crisis. So, some people argue the subprime crisis is mainly due to the inefficient regulation of shadow banking, and people begin to reflect the regulatory deficiencies of shadow banking.

In 1980s, the trust company can be considered as the earliest shadow banking in China and then, the shadow banking develops slowly, until the 21st century, the shadow banking achieves a rapid development, especially after the subprime crisis, the stock market does not perform very well, in the driven of high performance, a large amount of money enters into the Internet financial products, such as Yuepao and financial products of commercial banks, the scale of shadow banking becomes larger due to the rapid development of these financial products. According to the estimation by Pei and Yin, the scale of shadow

banking in China is about 26.9 trillion yuan in 2012, amounting to about half of the Gross Domestic Product (GDP) [3]. The commercial banks are the central of the whole financial system. Shadow banking does not have the limitation of deposit reserve and capital adequacy ratio due to the loose regulatory environment, it can provide a higher return than deposits in commercial banks, the attraction of deposits is declining, the spread income is the main income of Chinese commercial banks, the total return of commercial banks may drop as competed with shadow banking, while the current studies seldom pay attention to this question, This paper studies the effects of shadow banking expansion on the commercial banks from the prospective of profits, and we hope that our study would provide some theoretical ground on the future reform of Chinese commercial banks.

**2. Literature.** Our work builds on the related literature on the shadow banking. Several scholars have studied the effects of shadow banking expansion on other financial institutions. In [4], Gorton and Metrick find the profits of commercial banks decrease due to the falling scale of shadow banking during the period of the subprime crisis. We refer readers to [5], Zoltan et al. analyze the relationship between commercial banks and shadow banking, and think the shadow banking will compete with commercial banks in the part of business, such as commercial lending and household lending. [6] studies the relationship of shadow banking scale and financial market stability in theory, and the results show that the shadow banking can protect the stability of financial markets and promote the economic growth. In [7], Pan studies the effects of shadow banking expansion on the commercial banks, the results show that the development of shadow bank will contribute to the stability of commercial banks, while the commercial banks have little effects on shadow banking. [8] studies how shadow banking influences the stability of Chinese financial system, the results show that Chinese commercial banks will benefit from the development of shadow banking, while the stability of Chinese financial system will not. We refer readers to [9], Wang and Shen find that in the long run, the credit creation in shadow banking will have a good effect on macroeconomic; in the short run, as the liquidity of shadow banking is high, the expansion of shadow banking may hurt economic development. In [10] Wang and Zeng use SVAR (Structural Vector Autoregression) model to analyze the impacts of the development of shadow banking on monetary policy, the results show that shadow banking expansion would have a significance impact on credits and interest rate, and the monetary policy made by central bank becomes more difficult. [11] considers that shadow bank can reduce the profits of commercial banks; however, the effects have some lags. We refer readers to [12], Wang and Wang think that the development of shadow banking will raise the bankruptcy risk of Chinese commercial banks. In [13], Jia et al. find shadow banking expansion would contribute to the higher level of house price, and enlarge the scale of social credit.

In China, spread income is always the most important part of profits in Chinese commercial banks, the shadow banking can provide a higher rate than commercial banks due to the looser regulation, and it will weaken the probability of commercial banks. To our best knowledge, the related literature almost focuses on the effects of shadow banking expansion on the stability of commercial banks, while few scholars concern on how shadow banking affects the profits. In this paper, we uses Chinese list banks as samples to study the above questions. In addition, our contributions are two-fold: first, we test the relationship between shadow banking scale and commercial banks profits; second, we analyze why shadow banking expansion would decrease the profits of Chinese commercial banks. We hope the results would provide some policy suggestion for the regulation of shadow banking and the future development of commercial banks.

**3. Empirical Setting.** The scale of shadow banking data is from Pei and Yin, because they divide the shadow banking into financial institution shadow banking (Fina.sh) and

non-financial institution shadow banking (*Non-fina\_sh*). Based on the principle of credit creation, financial institution shadow banking scale is estimated by the social financing scale, and non-financial institution shadow banking scale is estimated by the financial support of small and medium-sized enterprises, the data of shadow banking scale estimated by Pei and Yin is more accurate than others'. Other data used in this paper is downloaded from the China Stock Market Accounting Research (CSMAR) database for 2007-2013, which is developed by the GTA company at Shenzhen. Considering the availability of data, we select sixteen Chinese list banks as samples, and our econometric model can be written as follows:

$$Roa_{i,t} = \beta_0 + \beta_1 Sh_t + \beta_2 F_{i,t} + \varepsilon_{i,t} \quad (1)$$

where the dependent variable  $Roa_{i,t}$  is the Return on Assets (ROA) of the  $i$ th bank at the year of  $t$ ,  $Sh_t$  reflects the shadow banking scale, and it includes two parts: financial institution shadow banking scale and non-financial institution shadow banking scale.  $F_{i,t}$  are the control variables, and they are explained next.

We choose several variables as explanatory variables related on the profits of commercial banks, and they are capital adequacy ratio, loan-deposit ratio, non-performing loans, Herfindahl-Hirschman index, and GDP growth. Capital adequacy ratio ( $Car$ ) is the ratio of bank capital to its risk assets, the higher ratio of bank capital shows that the banks have a lower leverage ratio, so, the level of risk is low, and it would improve the reputation of the commercial banks. Loan-deposit ratio ( $Ltdra$ ) is the ratio of loans to deposits, and the higher LDR shows the stronger profitability. Non-performing loans ( $Nplra$ ) may weaken the profitability of commercial banks. Herfindahl-Hirschman Index (HHI) reflects the monopoly power of the bank market. GDP is the growth of gross domestic product.

**4. Econometric Results.** We use panel date model to estimate Equation (1), and at the same time, we control the time-fixed effects and individual-fixed effects. Table 1 displays the estimation results.

The results suggest that enlarging shadow banking would significantly reduce the profits of commercial banks in China, and so are the scale of financial institution shadow banking and non-financial institution shadow, and the only differences are the significance of coefficients. The capital adequacy ratio and non-performing loans are likely to affect the profits of commercial banks significantly, and other control variables do not have effects on the profits of commercial banks.

In China, spread income is still the main source of commercial banks profits. According to Chinese financial statistics yearbook, more than half profits are from spread income, is the shortfall of spread income caused by shadow banking expansion the main reason of the profits reduction of commercial banks? Next, we will test this question.

Columns (4)-(6) display the results of the effects of shadow banking scale on spread income of commercial banks. We find the estimated coefficients for all variables of the shadow banking scale are significant at the 10% level, and it is notable that the coefficients of  $Sh$  and  $Fina\_sh$  are much larger than  $Non-fina\_sh$ , the empirical results show that the spread income would decrease for the reason of the expansion of shadow banking, especially for the financial shadow banking, while the spread income is less affected by non-financial shadow banking, and it accords with our expectation. In China, most of shadow banking is financial institution shadow banking, non-financial institution shadow banking only occupies a very small percentage of shadow banking system, non-financial institution shadow banking can weaken the spread income, but the impact is limited because of its low scale, and the financial institution shadow banking expansion is the main reason of the decrease of spread income. Our results suggest that the expansion of the shadow banking would reduce the profits of commercial banks though the channel of spread income in China.

TABLE 1. Impacts of shadow banking expansion

OBS	(1) ROA	(2) ROA	(3) ROA	(4) Income	(5) Income	(6) Income
Sh	-0.447*** (-3.19)			-831.703** (-2.37)		
Fina_sh		-0.351*** (-2.82)			-580.646* (-1.93)	
Non-fina_sh			-0.517* (-1.92)			-0.000** (-2.36)
Car	0.024*** (3.86)	0.026*** (3.97)	0.024*** (3.86)	-12.562 (-0.79)	-9.854 (-0.63)	-10.142 (-0.63)
Ltdra	-0.002 (-0.44)	-0.004 (-0.79)	-0.002 (-0.30)	5.116 (0.91)	5.730 (1.01)	3.241 (0.58)
Nplra	-0.021*** (-3.22)	-0.019*** (-2.83)	-0.020*** (-2.98)	-29.294* (-1.85)	-28.235* (-1.79)	-25.828 (-1.62)
HHI	-12.986 (-1.64)	-11.605 (-1.41)	-12.740 (-1.59)	-0.000 (-1.07)	-0.000 (-0.92)	-0.000 (-1.05)
GDP	0.875 (0.46)	0.280 (0.12)	0.797 (0.40)	-0.000*** (-2.37)	-0.000* (-1.88)	-0.000*** (-2.86)
Constant	3.038** (2.55)	2.990** (2.41)	2.929** (2.43)	5515.867* (1.98)	5001.836* (1.78)	5558.874* (1.96)
Adj-R2	0.428	0.380	0.413	0.241	0.240	0.222
N	96	96	96	96	96	96

Notes: \*, \*\* and \*\*\* indicate significance levels of 10, 5 and 1 percent respectively, ( ) indicates the t-value, N indicates the number of observations, Adj-R2 is abbreviation of the adjusted R-square.

**5. Conclusion.** This paper has examined how shadow banking expansion affects the profits of Chinese commercial banks. The expansion of shadow banking would reduce the profits of commercial banks, and the results are unchanged when we divide the shadow banking into financial institution shadow banking and non-financial institution shadow banking. The spread income decreased by the enlarging scale of shadow banking is a main reason why the profits fall dramatically in Chinese list banks.

## REFERENCES

- [1] P. McCulley, *Reflections*, PIMCO Global Central Bank Focus, 2007.
- [2] FSB, *Shadow Banking: Scoping the Issues*, Financial Stability Board, 2011.
- [3] P. Pei and W. Yin, Credit creation of Chinese shadow banking and scale estimation, *Economic Management Journal*, vol.36, no.3, pp.98-107, 2014.
- [4] G. Gorton and A. Metrick, The run on repo and the panic of 2007-2008, *Yale Working Paper*, 2009.
- [5] P. Zoltan, T. Adrian, A. Ashcraft and H. Boesky, *Shadow Banking*, Federal Reserve Bank of New York Staff Report, 2010.
- [6] N. Gennaioli, A. Shleifer and R. Vishny, A model of shadow banking, *Journal of Finance*, vol.68, no.4, pp.1331-1363, 2013.
- [7] P. Pan, *Research on the Effect of Shadow Banking on the Stability of Chinese Commercial Banks*, Master Thesis, University of Southwest Finance & Economy, 2013.
- [8] C. Liu and Y. Ma, The effect of shadow banking system on the Chinese financial development and stability: Based on the data from 2002 to 2012, *Economist*, no.4, pp.72-80, 2014.
- [9] X. Wang and Y. Shen, Do the shadow banking affect the development of Chinese economy?, *Research on Financial and Economic Issues*, vol.365, no.4, pp.49-55, 2014.
- [10] Z. Wang and H. Zeng, The impact of shadow banking on monetary: Theory and empirical analysis, *Studies of International Finance*, no.12, pp.58-67, 2014.

- [11] N. Ding, The effect of shadow banking on commercial banks' profits in the process of interest rate marketization, *Macroeconomics*, no.7, pp.26-35, 2015.
- [12] J. Wang and R. Wang, Will the shadow banking increase the bank's bankruptcy risk? – An empirical analysis based on data of the listed banks in China, *Journal of Financial Development Research*, no.6, pp.3-10, 2016.
- [13] S. Jia, Z. Dong and W. Chen, Shadow banking, monetary policy and real estate market, *Modern Economic Science*, vol.38, no.3, pp.13-19, 2016.