Research on the Effect of Credit Asset Securitization on the Liquidity of Commercial Banks

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Abstract. The securitization of credit assets provides a new financing channel for banks, and increases the investment variety of financial market. However, its wide application also has a profound impact on the bank's liquidity management. According to the empirical analysis results of this paper, when commercial banks increase the securitization ratio of credit assets, their liquidity ratio will decrease significantly, resulting in an increase in liquidity risk. Therefore, banks need to show a high degree of prudence when carrying out credit asset securitization, carry out accurate risk assessment of the securitized credit assets, and avoid the occurrence of subsequent defaults.

Keywords: commercial bank, credit asset securitization, liquidity

1 Introduction

As a financial innovation tool, credit asset securitization allows commercial banks to package loans and other credit assets and transfer them to the capital market to obtain liquidity by issuing securities [1-3]. This practice not only changes the operation mode of traditional banking business, but also provides new financing channels for banks, and increases the investment variety of financial markets [4-5]. However, the wide application of credit asset securitization has also brought profound impact on the liquidity management of banks. From a historical point of view, the securitization of credit assets began in the United States in the 1970s, and then gradually became popular around the world, especially in countries and regions with a high degree of financial marketization and liberalization. With the outbreak of the global financial crisis in 2007-2008, asset securitization has come under scrutiny because of its association with the crisis. After the crisis, the financial regulators of various countries have strengthened the supervision of the asset securitization market, especially the part involving the credit asset securitization. In the current financial environment, credit asset securitization has once again become one of the important tools to improve the liquidity of commercial banks, especially in the context of capital adequacy pressure and liquidity coverage ratio (LCR) requirements. Securitization of credit assets can help banks optimize balance sheet structure, improve liquidity position, and enhance financial stability by spreading credit risk [6-8]. However, this process may also introduce new risks, including the problem of asymmetric information in the securitization process and the possible increase in systemic risk [9-10]. The purpose of this study is to deeply explore the mechanism of the

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impact of credit asset securitization on the liquidity of commercial banks, analyze its effects in different financial systems and macroeconomic environments, and assess the related risks and regulatory challenges. Through the detailed study of credit asset securitization, this paper is expected to provide theoretical support and policy suggestions for the sound operation of the banking industry, and provide valuable references for investors and regulators.

2. Current situation of liquidity risk management of commercial banks

2.1 Policy and supervision

The Measures on Liquidity Risk Management of Commercial Banks promulgated by the China Banking and Insurance Regulatory Commission in 2018 is an important measure on liquidity risk management in the history of Chinese banking supervision. The measure clearly defines liquidity risk, stipulates how commercial banks should identify, evaluate, monitor and control liquidity risk, and requires banks to establish a comprehensive and systematic liquidity risk management system. The Measures make it clear that liquidity risks include asset liquidity risks and liability liquidity risks, as well as liquidity risks caused by insufficient market depth or market turbulence. It has strengthened the disclosure requirements for information related to liquidity risks of commercial banks and increased transparency so that investors and regulators can better understand the liquidity position of banks.

2.2 Peer deleveraging

In the field of financial supervision, interbank deleveraging means that commercial banks reduce their dependence on the debt of other financial institutions, especially reduce the use of short-term financing tools, such as interbank deposits, interbank borrowing, etc., so as to reduce the instability of the debt side. This process helps banks reduce the risk of capital chain breakage caused by market fluctuations or credit contraction, and enhance the liquidity of banks and the ability to withstand financial risks. In recent years, the China Banking and Insurance Regulatory Commission and other regulatory agencies have introduced a series of regulatory policies to promote inter-bank deleveraging by commercial banks in response to the high leverage ratio and complex capital chain in the financial market. These policies include limiting the transaction size of the interbank market, strengthening the supervision of interbank business, and improving the stability of interbank liabilities. The implementation of these measures aims to guide commercial banks to return to their roots and focus on supporting the real economy, while ensuring the sound operation of the banking sector. Through interbank deleveraging, the liquidity risk management pressure of commercial banks has been alleviated to a certain extent.

3 Empirical analysis

3.1 Research hypothesis

Securitization of credit assets involves complex financial instruments and risk management strategies, which puts forward higher requirements for banks' risk management ability. If

banks control risk improperly in the process of securitization, it may lead to the accumulation of credit risk, market risk and liquidity risk. Credit asset securitization involves the pooling and repackaging of loans and other credit assets into tradable securities that can be sold to investors. This practice can have significant implications for banks' liquidity, as it allows them to offload assets, freeing up capital that can then be used to fund new loans or investments. The effect of credit asset securitization on bank liquidity can be positive or negative, depending on various factors. On the positive side, securitization can help banks improve their liquidity ratios by reducing their reliance on traditional deposit funding. Additionally, by diversifying their funding sources, banks can become more resilient to liquidity shocks. However, there are also potential negative effects. For example, if banks rely excessively on securitization as a funding source, they may become vulnerable to disruptions in the securitization market. Furthermore, securitization can create incentives for banks to originate riskier loans since the risk is being transferred to investors through the securitization process. This could potentially reduce the quality of loans on banks' balance sheets, thereby affecting their liquidity. Hence, the research hypothesis of this paper are as follows:

H1a: With the increase of the securitization ratio of credit assets of commercial banks, the liquidity ratio will decrease and the liquidity risk will rise.

H1b: With the increase of the securitization ratio of credit assets of commercial banks, the liquidity ratio will increase and the liquidity risk will decline.

3.2 Sample Selection

This study takes the data of commercial banks from 2011 to 2021 as the core basis for empirical analysis, and focuses on analyzing the changing trend of their liquidity ratio and credit asset securitization ratio. The selected commercial bank samples cover a wide range of large and small banks involved in the field of asset securitization, which ensures the wide representativeness and high reference value of the samples.

3.3 Variable Selection

The variables selected in this paper are shown in the figure below:

Table 1. Overview of variables

Variable type	Variable name	Variable symbol	Variable interpretation
Explained variable	Liquidity ratio	LR	Liquid assets/liquid liabilities
Explanatory variable	Securitization ratio of credit assets	ABS	Total securitization of credit assets/total credit assets
Control variable	Return on equity	ROE	Net profit/net assets
	Non-performing loan ratio	NPLR	Non-performing loans/total loan balances
	Capital adequacy ratio	CAR	Tier 1 capital/risk-weighted assets
	Asset size	LNSIZE	The logarithm of a bank's total assets
	Whether it is a large state-owned commercial bank	SOC	Large commercial banks that are not directly controlled by the state

3.4 Descriptive Statistics

Table 2. Descriptive Statistics

variable	N	mean	p50	sd	min	max
LR	120	0.455	0.445	0.116	0.299	1.073
ABS	120	0.942	0.724	0.433	0.00310	1.992
ROE	120	0.0623	0.0227	0.108	0.000120	0.576
NPLR	120	1.324	1.249	0.305	0.846	2.338
CAR	120	11.21	11.12	0.417	10.84	13.91
LNSIZE	120	13.75	14.16	6.627	1.290	38.85
SOC	120	0.375	0	0.486	0	1

Table 2 shows the descriptive statistical results of the relevant variables of 12 banks from 2013 to 2022, and the LR(liquidity ratio) of commercial banks from 2013 to 2022 is 0.455. In terms of ABS (credit asset securitization ratio), the credit asset securitization ratio of the 12 banks over the past 10 years is 0.942, which is a high value. In addition, the average ROE (return on equity) is 0.0623, and the average LNSIZE (logarithm of asset size) is 13.75. The mean SOC was 0.375.

3.5 Correlation Analysis

In order to avoid the distortion of parameter estimation caused by multicollinearity problem and the loss of value of empirical research, this paper uses Pearson correlation coefficient test and variance inflation factor VIF to study whether there is severe multicollinearity between variables.

From Table 3, we can see the correlation coefficient and the corresponding significance of each variable. The correlation coefficient between the explanatory variable LR (liquidity ratio) and the interpreted variable ABS (credit asset securitization ratio) is -0.562 and passes the significance test at the 1% level. So we can preliminarily infer that there is a negative correlation between them. This is in line with what would be expected from hypothesis H1. In addition, in terms of explained variables and control variables, there is a negative correlation between LR (liquidity ratio) and NPLR (non-performing loan ratio), both of which are significant at the level of 1%. There was a positive correlation with other control variables.

Table 3. Correlation Analysis

	ABS	ROE	NPLR	CAR	LNSIZE	SOC	ABS
LR	1						
ABS	-0.562***	1					
ROE	0.212**	-0.0500	1				
NPLR	-0.518***	0.768***	-0.0420	1			
CAR	0.632***	-0.278***	-0.161*	-0.267***	1		
LNSIZE	0.375***	-0.450***	0.195**	-0.525***	-0.0590	1	
SOC	0.153*	0.373***	-0.00800	0.402***	-0.215**	-0.178*	1

3.6 Regression Analysis

The benchmark regression model for empirical analysis is:

$$LR_{it} = ABS_{it} + ROE_{it} + NPLR_{it} + CAR_{it} + LNSIZE_{it} + SOC_{it} + \varepsilon_{it} \quad (1)$$

where variables in Eq. (1) as shown in Table 1, and ε_{it} is a Gaussian white noise.

Table 4. Regression results

	(1) LR
ABS	-0.090***
	(0.017)
ROE	0.270*
	(0.147)
NPLR	-0.024
	(0.023)
CAR	0.166***
	(0.016)
LNSIZE	0.003***
	(0.001)
SOC	0.031**
	(0.012)
_cons	-1.372***
	(0.196)
N	120.000
r2	0.737
r2_a	0.699

Standard errors in parentheses

* p < 0.1, ** p < 0.05, *** p < 0.01

There is a negative correlation between LR (liquidity ratio) and ABS (credit asset securitization ratio) of the sample commercial banks, and the ABS coefficient is -0.090***, which passes the significance test at 1% level. Therefore, the empirical results show that with the increase of the securitization ratio of credit assets of commercial banks, the liquidity ratio will decrease significantly, that is, the liquidity risk of enterprises will increase. Thus, H1 is confirmed. In terms of control variables, except NPLR (non-performing loan ratio), all other control variables passed the significance test. This indicates that with ROE (return on net assets), CAR (capital adequacy ratio), LNSIZE (logarithm of total assets) and SOC (whether they are large state-owned commercial banks), the liquidity capacity of commercial banks will be further strengthened, which is also consistent with the above analysis.

3.7 Robustness test

In the above regression analysis, the liquidity ratio is used to measure the liquidity of commercial banks. In addition, the academic community will also use the LDR (total loans/total deposits) to measure liquidity. The higher the inventory ratio, the greater the liquidity risk of banks. We performed the regression analysis again with LDR instead of LR to

test robustness. The model formula is as follows:

$$LDR_{it} = ABS_{it} + ROE_{it} + NPLR_{it} + CAR_{it} + LNSIZE_{it} + SOC_{it} + \varepsilon_{it} \quad (2)$$

where variables in Eq. (1) as shown in Table 1, and ε_{it} is a Gaussian white noise.

The following table lists the regression results:

Table 5. Robustness test

	(1) LDR
ABS	0.096***
	(0.024)
ROE	-0.203**
	(0.096)
NPLR	0.098***
	(0.033)
CAR	-0.105***
	(0.014)
LNSIZE	-0.002**
	(0.001)
SOC	-0.043***
	(0.012)
_cons	1.601***
	(0.170)
N	120.000
r2	0.705
r2_a	0.663

As can be seen from Tables 3-5, with the increase of ABS, LDR will also increase, that is, liquidity risk will increase, which is consistent with the above analysis, and the robustness test passed.

4 Conclusions

According to the results of empirical analysis, when commercial banks increase the securitization ratio of credit assets, their liquidity ratio will decrease significantly, resulting in an increase in liquidity risk. To this end, banks need to: 1. Improve the accuracy of risk assessment, build and maintain a comprehensive data collection system, including macroeconomic data, industry dynamics, market trends and customer credit history. Leveraging big data analytics and machine learning technologies can help banks extract valuable information from massive amounts of data and more accurately predict potential risks. In addition, advanced risk assessment models, such as methods based on Monte Carlo simulation, stress testing and scenario analysis, are developed to evaluate the performance of credit asset securitization products under different economic environments and market conditions. 2. Banks need to develop a comprehensive liquidity risk management policy, which clearly defines the standards and procedures for the definition, identification,

evaluation, monitoring and control of liquidity risks. 3. Strengthening internal control and compliance management is the key to ensure the safe and sound operation of bank credit asset securitization business. Banks should establish an independent compliance department responsible for monitoring and reviewing the compliance of the securitization business of credit assets. The Department should have sufficient authority and resources to be able to carry out its responsibilities effectively.

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