

# Analysis of Factors Affecting Liquidity Risk of Listed Commercial Banks in China-- Based on the Panel Data Model

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**Abstract.** In this paper, 16 commercial banks listed on Shanghai and Shenzhen A-shares are selected as research samples and data from 2010 to 2019 are adopted. According to their mechanism of operation, scale of asset and etc, the research samples are divided into three groups. They are 16 listed commercial banks as a whole, 5 large state-owned listed commercial banks and 11 other medium and large listed commercial banks. The study makes an empirical analysis on the factors affecting the liquidity risk of listed commercial banks. Firstly, the factors affecting liquidity risk of listed commercial banks are divided into external and internal levels, and then descriptive analysis carried out on the factors at two levels. Then the stability of data is tested. After the data is tested, the panel data models applicable to 16 listed commercial banks as a whole, 5 large state-owned listed commercial banks and 11 other medium and large listed commercial banks are established through Hausman test and F test. The regression analysis of groups are conducted. Finally, according to regression analysis results, some reasonable recommendations are put forward.

## 1 Introduction

The liquidity risk of commercial banks is one of the important risks faced by commercial banks. It has the characteristics of fast transmission speed, wide spread and universal existence, so it is called the most deadly risk of commercial banks. Once liquidity risk occurs in a commercial bank, it will quickly spread to other financial institutions. That is, an outbreak of liquidity risk in a commercial bank may "bring disaster" to other banks and trigger a series of liquidity risks in other financial institutions. It will not only have a huge impact on chinese economy, but also may lead to systemic financial risks. Previous financial crises have caused huge losses of many financial institutions, and the real economy has also suffered serious impacts, which further illustrates the urgency, necessity and importance of strengthening the management of liquidity risk.

In recent years, it is very common for chinese commercial banks to suffer from potential liquidity risk. On the whole, chinese commercial banks are affected by many external and internal factors that may trigger liquidity risk. From the external perspective, it lead to unbalanced overall economic development under the influence of chinese macroeconomic expansion, low-level construction and blind expansion, which makes commercial banks more and more indebted and makes it more and more difficult to realize their assets. The situation of insolvency is an omen of liquidity risk, leading to the continuous expansion of potential liquidity risk. From the internal perspective, commercial banks still have some loopholes in their internal management. For

example, the management of internal assets is not perfect, at the same time, the management of the internal staff of bank is not enough. All of these have increased the possibility of liquidity risks in commercial banks and left hidden risks. In the report of the 19th National Congress of the Communist Party of China in 2019, it was pointed out that the prevention and control of financial risks should be put in a more important position, and a sound supervisory system should be established. Since the spread of the COVID-19 in 2020, commercial banks, as an important link of the liquidity transmission chain, will have their own liquidity safety tested by the epidemic. In the past, under the extensive management mode of "emphasizing profitability over liquidity", some commercial banks lacked the awareness of crisis and response ability of crisis. After this epidemic, the hidden dangers of liquidity risks are bound to be exposed. Once the liquidity risk triggered, it will have a bad impact on commercial banks and the entire financial market. According to the background of chinese commercial banks, the management of liquidity risk becomes more and more important. Therefore, in the context of financial risk prevention and control, it is necessary to strengthen the research on the factors affecting the liquidity risk of listed commercial banks in China. In view of the fact that the total assets of chinese listed commercial banks account for a relatively large proportion of the overall commercial banks, it can reflect the development of chinese commercial banks in general. Therefore, this article mainly studies the factors affecting the liquidity risk of chinese 16 listed commercial banks.

## 2 Literature Review

Domestic and foreign scholars have carried out a lot of research on the influencing factors of liquidity risk of commercial banks from multiple angles and have reached different conclusions.

As for foreign scholars, Mohammad (2020) and others selected 145 commercial banks during the period 1996-2015 to discuss the liquidity risks faced by commercial banks. In addition, the macroeconomic and internal variables of the bank are also considered, and the regression model of random effects panel data is used to analyze the factors that affect bank liquidity risk[1]. Tran (2020) selected banks of America from 2001 to 2015 as a sample and examined the relationship between functional diversification and bank liquidity creation. Research shows that the impact of shifting to non-traditional activities on the creation of liquidity is more pronounced in large banks. Banks with insufficient liquidity creation, due to a higher proportion of non-interest income, are more likely to reduce liquidity creation [2]. Rezende (2020) et al. studied the impact of liquidity coverage ratio (LCR), which is a liquidity requirement for banks. In the case of time deposits meeting the LCR conditions, banks subject to LCR submit more bids than exempt banks, and the number of bids is also larger. These results show that liquidity affects banks' demand for monetary policy operations[3]. Abdul-Rahman (2018) and others studied the impact of financial structure on bank liquidity risk. The data set of the Malaysian banking industry is selected to compare the financial liquidity risk relationship between Islamic and traditional banking institutions. The financial structure is measured by real estate financing, financing concentration, short-term financial stability and medium-term financial stability. At the same time, in terms of liquidity risk measurement, the Basel III method is adopted, and liquidity coverage ratio (LCR) and net stable funding ratio (NSFR) are selected to quantify short-term and long-term liquidity risks respectively. Analyze the unbalanced static panel regression of 27 traditional banks and 17 Islamic banks from 1994 to 2014 to evaluate the relationship between the two. The results show that the financial structure has an impact on the liquidity risk of commercial banks[4]. Jia (2020) and others selected the four economic factors of unemployment, gross domestic product (GDP), inflation, and interest rates and the non-economic factor of management efficiency to test the correlation, and selected data from all commercial banks from 1996 to 2015, using multiple linear regression and normality test, linearity test and multicollinearity test to test the relationship between independent variables and dependent variables. Research shows that GDP and liquidity risk are negatively correlated. This means that a higher GDP growth rate may increase the liquidity risk of Malaysian commercial banks[5]. Incekara (2019) and others found that at a 99% confidence level, there is a significant negative correlation between Islamic banks' liquid assets (LA), gross domestic product (GDP) and inflation (INF) variables and liquidity risk. At the 95% confidence level, the NPL ratio has a significant positive impact on Islamic banks. At the 95% and 99% confidence levels, the relationship between the non-performing loan

rate of traditional banks and the current assets (LA) variable and liquidity risk is negative[6].

For domestic scholars, Duan and Niu (2020) examined the impact of liquidity creation on bank profitability. Research has found that the creation of liquidity is related to higher profitability. This result is valid during the normal period and during the financial crisis, and the same is true for banks of different sizes[7]. Liu (2010) et al. established a new indicator system for liquidity stress testing of commercial banks through R-type cluster analysis, and then used the entropy method to determine the weight of each indicator. Taking 14 listed banks as an example, the liquidity risk of commercial banks is rated[8].

In summary, domestic and foreign scholars study the influencing factors of liquidity risk of commercial banks mainly from the external and internal levels. The external level mainly includes the macroeconomic environment, monetary policy and etc., and the internal level mainly includes the internal factors of commercial banks themselves. By referring to the research results of domestic and foreign scholars, this paper studies the influencing factors of liquidity risk of commercial banks from the external and internal levels, establishes panel data model, and then conducts regression analysis to empirically analyze the influencing factors of liquidity risk of listed commercial banks in China.

## 3 Data Sources and Model

### 3.1 Data Sources

By the end of 2019, there had been dozens of commercial banks listed in Shanghai and Shenzhen A-shares. Due to the different types of commercial banks, scales of assets, scopes of business, and also considering the availability of data, this paper selects 16 commercial banks listed on the Shanghai and Shenzhen A-shares as the research sample. They are Bank of China, Agricultural Bank of China, Industrial and Commercial Bank of China, China Construction Bank, Bank of Communications, Bank of Beijing, China Everbright Bank, Hua Xia Bank, Bank of Nanjing, China Minsheng Banking Corp.Ltd, Bank of Ningbo, Ping An Bank, Shanghai Pudong Development Bank, Industrial Bank Co., Ltd, China Merchants Bank and China Citic Bank. The paper selects the 10-year annual data from 2010 to 2019 to study the influencing factors of listed commercial banks in China from the external and internal levels. The external level is mainly from the three aspects of Chinese economic level, inflation and monetary policy. The selected variable indicators are: the increasing rate of GDP, the increasing rate of consumer price index and the increasing rate of general money. The internal variables are mainly selected from the five dimensions of commercial banks' asset scale, liquidity, capital situation, development capacity and profitability. In each dimension, a representative variable index is selected, which is the total asset (TA), liquidity ratio (LR), capital adequacy ratio (CAR), cost-to-income ratio (CIR) and weighted average net return (ROE). The paper divides the research sample into three groups, namely: 16 listed commercial banks as a whole, 5 large state-owned listed

commercial banks and 11 other medium and large listed commercial banks, in order to study the factors of liquidity risk of listed commercial banks in China, select an appropriate panel data model from each group to conduct regression analysis to draw conclusions. In order to reflect the liquidity risk of listed commercial banks in China more comprehensively, and the data in the annual reports of major commercial banks is available, this paper selects the non-performing loan ratio (NPL) as the dependent variable. The higher the non-performing loan ratio, the more difficult it is for commercial banks to generate enough cash flow to cover the liquidity demand, thus increasing the possibility of causing liquidity risk.

The research data in this article comes from the annual reports of commercial banks, the official website of the National Bureau of Statistics and so on. These 16 listed commercial banks include large state-owned banks, joint-stock commercial banks and city commercial banks. The total economic output accounts for a relatively high proportion of Chinese commercial banks. In 2019, the total assets of these 16 listed commercial banks accounted for the total commercial banks. The proportion of total assets has reached more than 70%, so it can basically reflect the current development of Chinese commercial banking system.

### 3.2 Variable Analysis

- Descriptive statistical analysis

Figure 1 clearly reflects the changing trends of GDP growth rate, CPI growth rate and M2 growth rate during the 10 years from 2010 to 2019. It can be seen from Figure 1 that Chinese GDP growth rate and M2 growth rate changed greatly from 2010 to 2019, mainly showing a downward trend. The CPI growth rate first increased in 2010-2011, then declined in 2011-2012, and showed a relatively flat trend after 2012. Figure 1 can reflect that the GDP growth rate in 2010 was 10.6%. Since then, the GDP growth rate has continued to decline, with a large decline from 2010 to 2011. After 2012, the GDP growth rate has fallen to less than 8%, and the downward trend has gradually flattened. The change trend of M2 growth rate is more obvious. In order to cope with the 2008 financial crisis, China adopted a very loose monetary policy, which led to the rapid growth of broad money. In 2010, the growth rate of M2 reached 19.7%. Since then, the growth rate of M2 has gradually declined, falling to a single-digit level of 8.7% in 2019.

In this paper, consumer price index (CPI) is used to represent the inflation rate (IR). In order to deal with the

financial crisis in 2008, the government put forward the idea of "expanding domestic demand and maintaining growth" and increased a large amount of investment, which planting the hidden danger of inflation. Prices rose sharply in 2011, with the CPI rising by 5.5%.

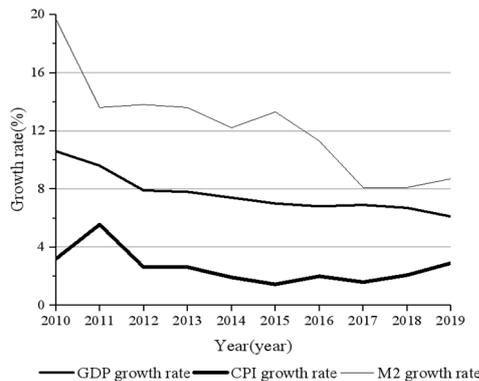
Since then, the country has adopted the policy of "stabilizing growth and making structural adjustments" instead of controlling prices, and CPI gradually fell to only 2.9% in 2019. GDP growth rate, CPI growth rate and M2 growth rate are the representative indicators of external environment.

Table 1 reflects the analysis of the internal variables of the 16 listed commercial banks as a whole, 5 large state-owned listed commercial banks and 11 other medium and large listed commercial banks. The total assets (TA) represents the strength of the bank. The larger the total assets index of a listed commercial bank, the less likely the liquidity risk will occur. From the data, the total assets of state-owned listed commercial banks are generally higher than other medium and large listed commercial banks. Liquidity Ratio (LR) represents the liquidity ratio of the bank, which refers to the bank's ability to repay short-term debts. It is the ratio of total liquid assets to total liquid liabilities. The larger the indicator, the greater the liquidity and the smaller the possibility of liquidity risk. According to Chinese regulatory standards, the liquidity ratio should not be less than 25%, and all listed commercial banks in China meet the regulatory requirements. The capital adequacy ratio (CAR) is the ratio of risk-weighted assets to total assets. The larger the index is, the more sufficient the capital is and the lower the possibility of liquidity risk is. According to Chinese regulatory standards, the capital adequacy ratio of Chinese commercial banks shall not be less than 8%. According to Table 1, it can be known that the indicator meets Chinese regulatory requirements. Cost-to-income ratio (CIR) refers to the ratio of operating costs to operating income of commercial banks. The higher this index is, the higher the cost of creating the same operating income will be, indicating that the operating efficiency of commercial banks will decrease and the possibility of liquidity risk will increase. On the whole, there are a few listed commercial banks in China whose cost-income ratio exceeds 35% in some years. The return on equity (ROE) reflects the profitability of the bank. The higher the return on equity, the stronger the profitability of the commercial bank, which means that it will have more remaining funds to resist liquidity risks. According to the data in Table 1, the index of listed commercial banks in China is relatively high and stable, and the overall ability to withstand liquidity risks is relatively strong.

**Table 1** Descriptive statistics of internal factor indicators of listed commercial banks

Group	Statistics	NPL (%)	TA (trillion )	LR (%)	CAR (%)	CIR (%)	ROE (%)
16 listed commercial banks as a whole	Max.	2.39	30.11	75.07	17.52	43.41	26.65
	Min.	0.38	0.22	27.60	9.88	21.59	10.61
	Mean.	1.20	7.11	47.13	12.80	30.50	17.29
	Std.	0.43	7.20	10.27	1.59	4.43	3.75
5 large state-owned	Max.	2.39	30.11	72.92	17.52	38.59	23.44
	Min.	0.85	3.95	27.60	11.59	23.28	11.17

listed commercial banks	Mean.	1.35	16.00	45.92	14.00	29.98	16.93
	Std.	0.34	6.49	9.07	1.37	3.29	3.83
11 other medium and large listed commercial banks	Max.	2.14	7.42	75.07	16.20	43.41	26.65
	Min.	0.38	0.22	29.31	9.88	21.59	10.61
	Mean.	1.14	3.07	47.68	12.25	30.73	17.46
	Std.	0.45	2.00	10.76	1.37	4.85	3.72



**Fig1.** Changes in external factors affecting liquidity risk of listed commercial banks in China from 2010 to 2019

- Regression Analysis
- Model setting

The data selected in this paper is panel data, and the regression model of panel data is used for empirical research. Considering that the liquidity risk of listed commercial banks in China is related to their own asset scale, liquidity, capital status, development capability and profitability and other characteristic variables, as well as the overall macroeconomic environment. According to the dependent variables and independent variables selected above, the panel regression model is set as shown in formula (1):

$$NPL_{it} = \alpha + \beta_1 TA_{it} + \beta_2 LR_{it} + \beta_3 CAR_{it} + \beta_4 CIR_{it} + \beta_5 ROE_{it} + \beta_6 GDP_{it} + \beta_7 CPI_{it} + \beta_8 M2_{it} + \varepsilon_{it} \quad (1)$$

Among them, *i* represents a listed commercial bank, *i*=1, 2, 3.....16; *t* represents time, *t*=2010, 2011.....2019;  $\varepsilon_{it}$  represents a random disturbance term,  $\alpha$  represents a constant term, TA represents total assets, and LR

**Table 2** The stability test of internal variables affecting chinese listed commercial banks

Group	Statistics	Form of inspection	Statistic	Prob.**	Conclusion
16 listed commercial banks as a whole	NPL	(C,T,K)	-4.52320	0.000	stable
	TA	(C,T,K)	-6.69581	0.000	stable
	LR	(C,0,K)	-5.94083	0.000	stable
	CAR	(C,T,K)	-5.54462	0.000	stable
	CIR	(C,T,K)	-5.54743	0.000	stable
	ROE	(C,T,K)	-13.8829	0.000	stable
5 large state-owned listed commercial banks	NPL	(C,T,K)	-4.15247	0.0024	stable
	TA	(C,T,K)	-1.88845	0.0295	stable
	LR	(C,0,K)	-2.82448	0.000	stable
	CAR	(C,T,K)	-4.05676	0.000	stable
	CIR	(C,T,K)	-2.57912	0.005	stable
	ROE	(C,T,K)	-10.6460	0.000	stable
	NPL	(C,T,K)	-4.55421	0.000	stable

represents Liquidity ratio. CAR stands for capital adequacy ratio. CIR stands for cost-to-income ratio. ROE stands for weighted average return on net assets. GDP stands for GDP growth rate. M2 stands for broad money growth rate. CPI stands for consumer price index growth rate and It is used instead of the inflation rate (IR). The panel data model aims to find the significant factors affecting the liquidity risk of listed commercial banks in China from the external and internal levels.

- The stationarity test of variable

Since the data selected in this paper are panel data and there are time series, the data can only be trusted when the regression results are stable. In order to avoid false regression, the selected variables are tested for stationarity. In this study, LLC test is selected. The test results are shown in Table 2 and Table 3. consecutively.

The LLC test shows that the internal and external factors that affect the liquidity risk of chinese commercial banks are stable variables at the level of 5%, so there will be no phenomenon of "false regression", and regression analysis can be continued.

- Model determination and analysis
- Model determination

Panel data models mainly include random effects models, fixed effects models, and mixed effects models. Therefore, the panel data models applicable to the three groups must be determined separately. The paper uses Eviews software to assume that the random effects model is estimated firstly, and then uses Hausman test to determine whether to choose a random effects model or a fixed effects model. On the basis of determining the fixed effects model, the F test is used to determine whether it is a fixed effects model or a mixed effects model. The test results are shown in Table 4 and Table 5.

11 other medium and large listed commercial banks	TA	(C,T,K)	-6.61120	0.000	stable
	LR	(C,0,K)	-4.77735	0.000	stable
	CAR	(C,T,K)	-4.40961	0.000	stable
	CIR	(C,T,K)	-3.75749	0.001	stable
	ROE	(C,T,K)	-9.97363	0.000	stable

**Table 3** The stability test of external variables affecting chinese listed commercial banks

Group	Statistics	Form of inspection	Statistic	Prob.**	Conclusion
16 listed commercial banks as a whole	GDP	(C,T,K)	-7.20140	0.000	stable
	CPI	(C,0,K)	-3.49178	0.0002	stable
	M2	(C,T,K)	-5.13706	0.000	stable
5 large state-owned listed commercial banks	GDP	(C,T,K)	-4.05270	0.000	stable
	CPI	(C,0,K)	-1.95156	0.0225	stable
	M2	(C,T,K)	-2.87170	0.0020	stable
11 other medium and large listed commercial banks	GDP	(C,T,K)	-5.97109	0.000	stable
	CPI	(C,0,K)	-2.89523	0.0019	stable
	M2	(C,T,K)	-8.51474	0.0020	stable

Note: (C, T, K) is the unit root test form. C, T, and K represent intercept term, trend term and lag order term respectively.

**Table 4** Results of Hausman test

Null hypothesis	Group	Chi-Sq. Statistic	Prob.	Conclusion
Random effects model	16 listed commercial banks as a whole	28.406938	0.000	Reject null hypothesis
	5 large state-owned listed commercial banks	44.310868	0.000	Reject null hypothesis
	11 other medium and large listed commercial banks	17.583176	0.003	Reject null hypothesis

**Table 5** Results of F test

Null hypothesis	Group	Chi-Sq. Statistic	Prob.	Conclusion
Mixed effects model	16 listed commercial banks as a whole	147.520814	0.000	Reject null hypothesis
	5 large state-owned listed commercial banks	15.093183	0.000	Reject null hypothesis
	11 other medium and large listed commercial banks	79.293608	0.000	Reject null hypothesis

First, through Hausman test, the conclusions of the three groups are to reject the null hypothesis, choose the fixed-effects model, and then continue with the F test. The test results also reject the null hypothesis. Therefore, the panel data model applicable to the three groups of banks is shown in Table 6.

- Empirical analysis

Table 7 shows the regression results of the fixed-effect models for the three groups. From an individual point of view, each fixed-effect model has significant variables that influence liquidity risk. From the overall perspective, the values of P of the three fixed-effect models are approximately equal to 0, indicating that the influence of variables is very significant, and the values of R2 are all above 85%, indicating that the overall fitting degree is good.

## 4 Conclusions and Recommendations

This paper selects the balanced panel data of 16 listed commercial banks from 2010 to 2019 as a sample, and divides them into three groups according to their operating mechanism and asset scale: 16 listed commercial banks as a whole, 5 large state-owned listed commercial banks and 11 other medium and large listed commercial banks. According to the results of empirical analysis in Table 7 above, the following conclusions can be drawn.

In the overall group of 16 listed commercial banks, total assets (TA), capital adequacy ratio (CAR), cost-to-income ratio (CIR) and consumer price growth rate (CPI) are all three-star significant variables. The weighted average return on equity (ROE) is a two-star significant

variable. The larger the size of the bank's assets (TA), the more commercial banks have branches, the total amount of bank loans will increase, and the non-performing loan ratio will also decrease, and the possibility of triggering liquidity risks will decrease. The capital adequacy ratio (CAR) and cost-to-income ratio (CIR) are in the same direction as the non-performing loan ratio (NPL), indicating that the more capital a listed commercial bank has, the higher the cost for asset management, the lower the non-performing loan ratio, and the risk of liquidity is reduced. The weighted average return on equity (ROE) reflects the profitability of commercial banks. This indicator is negatively correlated with the non-performing loan rate. The higher the indicator, the stronger the profitability and the stronger the ability to resist risks, which reduces the non-performing loan rate. The risk of liquidity is also reduced.

In the group of 5 large state-owned listed commercial banks, Total assets (TA), weighted average return on equity (ROE) and cost-to-income ratio (CIR) are significant variables. The results of regression show that internal factors have a greater impact on the liquidity risk of Chinese large state-owned listed commercial banks. The regression coefficient of total assets is negative, indicating that it relies on its strong asset scale to resist liquidity risk. The weighted average return on equity (ROE) reflects that large state-owned commercial banks continue to increase their profitability, reduce non-performing loan rates and thus reduce liquidity risks. Cost-to-income ratio is a significant variable for one star. Compared with the other two internal factor variables, its impact is not very significant.

In the group of 11 other medium and large listed commercial banks, compared with the listed commercial banks, there is a significant variable of gross domestic product growth rate (GDP). The change direction of GDP growth rate is consistent with the non-performing loan rate, indicating that as the GDP growth rate indicator increases, the non-performing loan rate also rises, and the greater the possibility of triggering liquidity risks. In this group, the direction of asset size (TA) is positive, indicating that 11 other medium and large listed commercial banks may neglect risk management in the process of asset expansion, leading to an increase in the rate of non-performing loans and triggering liquidity risks.

According to the above empirical results and

**Table 6** Panel models applicable to listed commercial banks in China

Group	16 listed commercial banks as a whole	5 large state-owned listed commercial banks	11 other medium and large listed commercial banks
Applicable model	Fixed effects model	Fixed effects model	Fixed effects model

**Table 7** The regression results of the fixed effect model of listed commercial banks in China

Group	Significant variable	Coefficient	Std.Error	t-Statistic	Prob.	R <sup>2</sup>	F
16 listed commercial banks as a whole	TA	-0.044***	0.010	-4.463	0.000	0.861	36.725
	CAR	-0.0465**	0.018	-2.545	0.0121		
	ROE	-0.107***	0.009	-12.331	0.000		
	CIR	-0.039***	0.008	-5.113	0.000		
	CPI	-0.079***	0.020	-3.915	0.0001		
	TA	-0.049***	0.018	-2.741	0.0094		

conclusions, in order to reduce the possibility of liquidity risk in Chinese listed commercial banks, this paper puts forward the following recommendations from the external and internal levels.

From an external perspective, the first is to maintain stable economic growth. Stable economic growth is conducive to reducing the liquidity risk of commercial banks. It is not only necessary to maintain stable economic growth, but also to prevent and control prices to avoid substantial changes. Once the inflation rate rises, it may also trigger liquidity risks. The second is to maintain the stability of monetary policy. Especially in the current situation that commercial banks are generally facing pressure of deposit, for the flexibility and initiative of liquidity management, it is necessary to continue to maintain a prudent monetary policy. Judging from the current economic development at home and abroad, maintaining the stability and continuity of monetary policy is conducive to eliminating the uncertain factors of the current market micro entities, and it is also conducive to reducing excessive volatility in the process of economic recovery, thereby avoiding the liquidity risk of banks that may be caused by possible changes in monetary policy.

From an internal perspective, the first is to reduce the banks' non-performing loan rate and strengthen the review of customer loan information. The increase in bank non-performing loans, the increase in non-performing loan ratios, and the reduction of loans that can be recovered in the future will reduce future cash inflows and increase the probability of liquidity risks. According to the official website of the Chinese banking and insurance regulatory bureau, as of 2019, the non-performing loan rate of Chinese banking industry is on the rise. Therefore, Chinese commercial banks must take measures to strictly implement loan access and customer list management, and guide loans to customers with good credit. At the same time, it has stepped up efforts to clean up and rectify non-performing loans, promote the securitization of non-performing loans and market-based debt-to-equity swaps, so as to invigorate banks' funds. The second is to enhance the profitability of banks and strengthen the ability to resist risks. Chinese commercial banks should continuously improve their own asset management, continuously improve their profitability, and be able to have more sufficient funds, so that they can more effectively resist liquidity risks.

5 large state-owned listed commercial banks	ROE	-0.121***	0.015	-7.824	0.000	0.881	22.721
	CIR	-0.034*	0.020	-1.714	0.0949		
11 other medium and large listed commercial banks	TA	0.146***	0.030	4.940	0.000	0.927	64.302
	CAR	-0.048***	0.015	-3.072	0.0028		
	ROE	-0.062***	0.009	-6.939489	0.000		
	CIR	-0.036***	0.007	-5.408	0.000		
	GDP	0.114***	0.033	3.497	0.0007		
	CPI	-0.091***	0.0189	-4.850	0.000		

(Note: \*\*\*, \*\*, \* are single coefficients that are significant at the 1%, 5% and 10% significance levels)

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