

# Research on Credit Risk of Commercial Banks in the Era of Big Data —— Taking CITIC Bank as an Example

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**ABSTRACT:** In the era of rapid development of big data, the credit business of commercial banks is deeply affected by it. In order to help commercial banks improve credit risk management level, reduce credit risk and improve the quality of credit assets. Taking CITIC Bank as an example, this paper, on the basis of analyzing the credit business structure of CITIC Bank, discusses the current risk situation of CITIC Bank, and makes in-depth research into the existing problems of CITIC Bank, so as to put forward improvement measures for the credit business risk assessment of CITIC Bank. Through research, commercial banks can better understand customers, improve the efficiency of credit approval and reduce the cost of credit, so as to better adapt to market competition.

**Keywords:** credit business, China CITIC Bank, risk assessment

## I. INTRODUCTION

Credit risk is one of the main risks faced by commercial banks, and it is of great practical significance to study the credit risk of commercial banks. Taking CITIC Bank as an example, this paper analyzes its credit business in order to provide reference for other commercial banks.

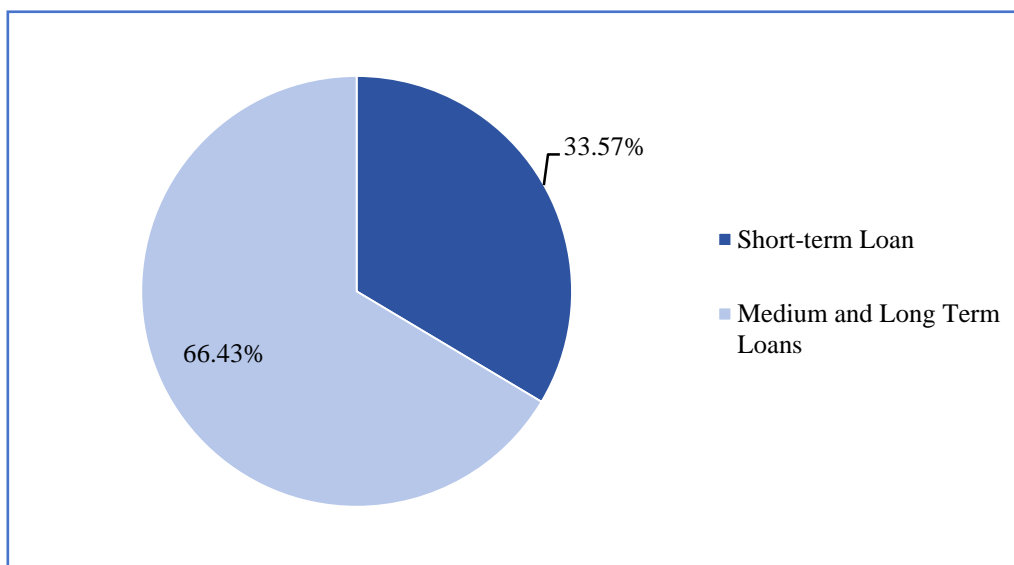
Founded in 1987, CITIC Bank is one of the earliest emerging commercial banks in China's reform and opening up, and the first commercial bank in China to participate in domestic and foreign financial market financing. After 35 years of development, CITIC Bank has become a financial group with total assets exceeding 8.5 trillion yuan and 60,000 employees, with strong comprehensive strength and brand competitiveness.

## II. STRUCTURAL ANALYSIS

### 2.1 Classification by term structure

**Table 1: Average loan balance data of CITIC Bank from 2021 to 2022**

Average Balance (million yuan)	2022	2021
Short-term Loan	1,671,528	1,558,714
Medium and Long Term Loans	3,307,556	3,107,341
Total	4,979,084	4,666,055



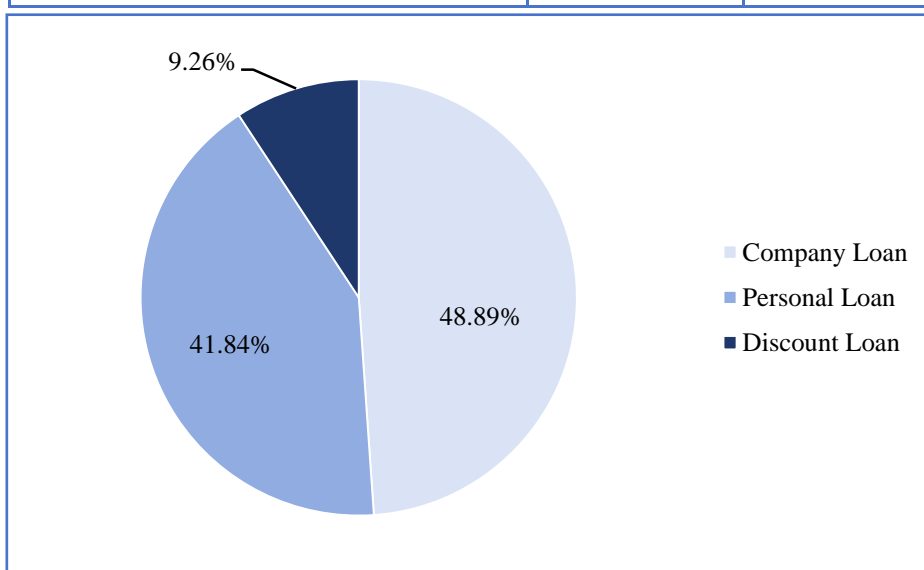
**Figure 1: Proportion of average loan balance of CITIC Bank by category in 2022**

As can be seen from Table 1, both short-term loans and medium-and long-term loans increased in 2021-2022. As can be seen from Fig. 1, in 2022, the average balance of short-term loans accounted for 33.57%, the average balance of medium-and long-term loans accounted for 66.43%, and the average balance of short-term loans was about half of that of medium-and long-term loans.

## 2.2 Classification by business category

**Table1: Average loan balance data of CITIC Bank from 2021 to 2022**

Average Balance (million yuan)	2022	2021
Company Loan	2,434,461	2,289,042
Personal Loan	2,083,366	1,970,793
Discount Loan	461,257	406,220
Total	4,979,084	4,666,055



**Figure 1: Proportion of average loan balance of CITIC Bank by category in 2022**

As can be seen from Table 2, corporate loans, personal loans and discount loans increased in 2021-2022. As can be seen from Fig. 2, the average balance of discounted loans accounts for 9.26%, the average balance of personal loans accounts for 41.84%, and the average balance of corporate loans accounts for 48.89%, with the most corporate loans and the least discounted loans.

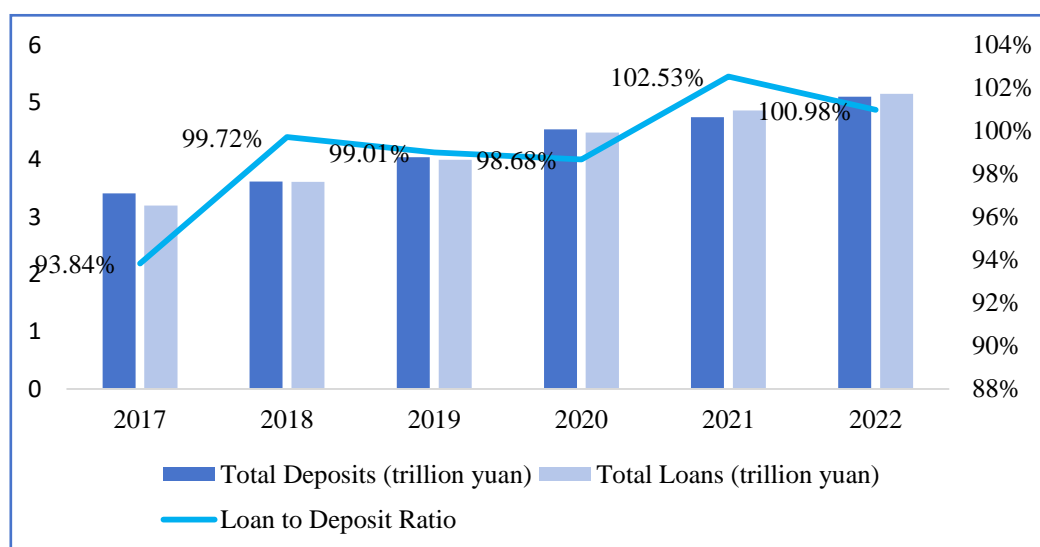
### III. RISK GENERALIZATION

This paper selects the main data of CITIC Bank from 2017 to 2018 for analysis, and evaluates the credit risk of CITIC Bank from the following four aspects to explain the basic situation of its credit risk.

#### 3.1 Analysis of deposit and loan ratio

**Table 3: The amount of deposits and loans of CITIC Bank from 2017 to 2022 and loan-to-deposit ratio data.**

Report Period	2017	2018	2019	2020	2021	2022
Total Deposits (trillion yuan)	3.41	3.62	4.04	4.53	4.74	5.10
Total Loans (trillion yuan)	3.20	3.61	4.00	4.47	4.86	5.15
Loan to Deposit Ratio	93.84%	99.72%	99.01%	98.68%	102.53%	100.98%



**Figure 3: Comparison chart of deposits and loans of CITIC Bank from 2017 to 2022 and loan-to-deposit ratio.**

Loan-to-deposit ratio can not only reflect the profitability of commercial banks, but also reflect the risks faced by commercial banks. As can be seen from Fig. 3, loan-to-deposit ratio of CITIC Bank is generally on the high side, with a slight decline in 2018-2020 and 2021-2022, but the overall trend is on the rise. The higher the loan-to-deposit ratio, the lower the liquidity of existing assets, and the higher the risk. It is suggested that CITIC Bank keep a certain cash deposit reserve to prevent payment crisis.

### 3.2 Analysis of capital adequacy ratio

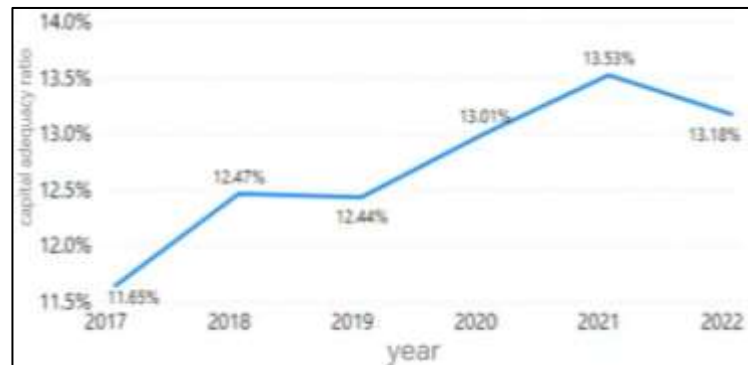


Figure 4: Trend chart of capital adequacy ratio of CITIC Bank from 2017 to 2022

As can be seen from Fig. 4, the capital adequacy ratio of CITIC Bank showed an overall upward trend from 2017 to 2022. The higher the capital adequacy ratio, the greater its ability to bear the risk of default assets and the smaller its capital risk. CITIC Bank's capital adequacy ratio is on the rise, indicating that its ability to withstand the risk of default assets has increased under the background of big data.

### 3.3 Analysis of Non-performing Loans

Table 4: Data of non-performing loans and non-performing loan ratio of CITIC Bank from 2017 to 2022.

Report Period	2017	2018	2019	2020	2021	2022
Non-performing Loans (RMB 100 million)	536.48	640.28	661.17	734.52	674.59	652.13
Bad Loan Ratio	1.68%	1.77%	1.65%	1.64%	1.39%	1.27%

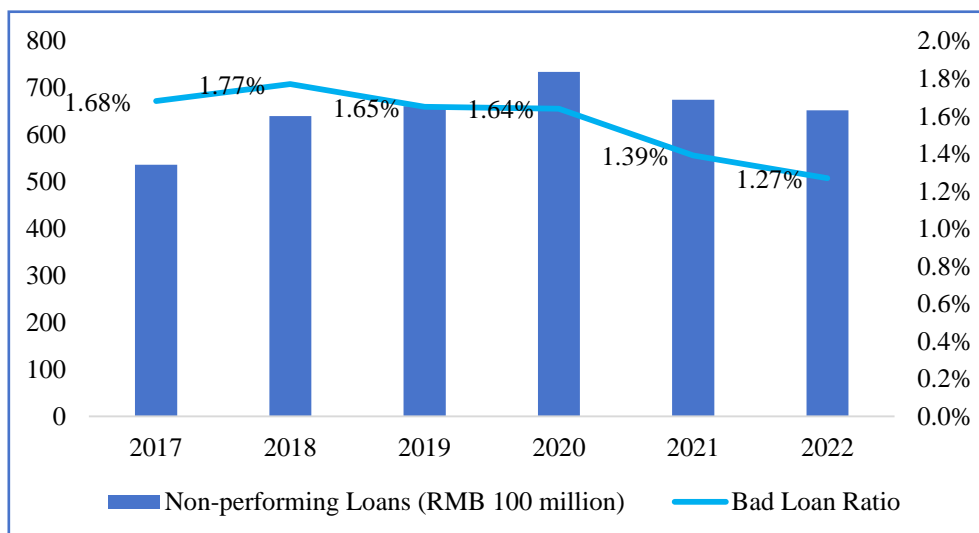
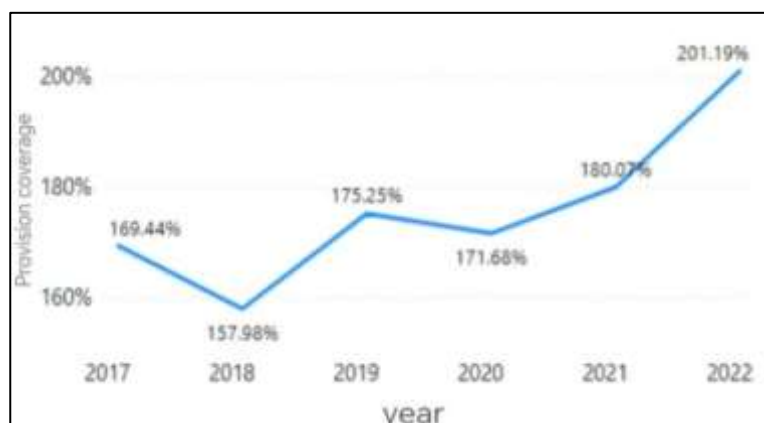


Figure 5: Comparison chart of non-performing loans and non-performing loan ratio of CITIC Bank from 2017 to 2022.

As can be seen from Fig. 5, the declining trend of non-performing loan ratio of CITIC Bank is gentle, rising slightly from 2017 to 2018, and declining year by year from 2018 to 2022. On the whole, the non-performing loan ratio of CITIC Bank shows a downward trend. It can be seen that the increase in non-performing loans has driven down the non-performing loan ratio, and the non-performing loan ratio of

CITIC Bank has continued to improve. The reason may be due to the improvement of business performance of commercial banks in recent years and the expansion of credit counter-cycle, but most of it is due to the increase of non-performing loan write-off efforts of commercial banks.

### 3.4 Analysis of Provision Coverage Ratio



**Figure 6: Trend chart of provision coverage ratio of CITIC Bank from 2017 to 2022**

As can be seen from Fig. 6, the provision coverage ratio of CITIC Bank from 2017 to 2022 generally showed an upward trend. Provision coverage ratio is actually bank loan May occur Stay, provision for doubtful debtshThe usage rate of. This indicator reflects the risk degree of bank loans from a macro perspective and Socioeconomic environment, integrity and other aspects. The increase in the provision coverage ratio of CITIC Bank indicates that its ability to make up for loan losses and prevent loan risks has improved.

## **IV. EXIST PROBLEM**

### 4.1 The credit risk management system is not perfect

The credit risk management system of CITIC Bank is not perfect, and the standardization of risk management in business systems is inconsistent. Between different subsidiaries and business departments, the information sharing level of the same customer is very low, and CITIC Bank also has several financial subsidiaries. In addition, there are many types of banking business, and different businesses have different responsible departments, and their management methods are also very different. Therefore, in the credit risk management system, different departments have different standards for the information entry of the same customer, which will affect the effect of the credit risk management system.

### 4.2 Lack of risk governance structure

Although CITIC Bank has set up a department responsible for risk management, which can enhance its risk management ability, there is a lot of business overlap between the department in charge of risk section and the departments led by other competent banks, and the responsibilities are unclear, which is likely to cause inefficiency in the organization of risk management structure.

### 4.3 Irrational incentive and restraint mechanisms

The performance evaluation system of CITIC Bank has some shortcomings in index setting and evaluation methods, that is, "one size fits all". Although different evaluation indexes and evaluation methods are set for different posts, there is no difference in work content for the same post, which leads to some risk

management practitioners still facing work pressure, thus affecting the objectivity of their risk management. The current performance evaluation of CITIC Bank also ignores the overall evaluation of the team, which may lead to the lack of cooperation spirit among the members of the team, thus reducing the efficiency of the whole working group.

## **V. IMPROVEMENT MEASURES**

### **5.1 To build a sound credit risk management system**

Under the background of informationization, the risk management system based on big data and cloud computing has unique significance for the management and control of credit risk. In the credit risk management system, it is necessary to build a standardized and unified database, and classify and screen the data in the database according to the data in the database to ensure the continuous optimization and update of the credit risk management system. On the basis of establishing a sound credit risk management system, CITIC Bank can effectively solve the problems of information asymmetry between the operating layer and customers, lax credit business review, inaccurate loan risk division, lax post-loan fund management and so on.

### **5.2 Cultivate a healthy culture of credit risk management of CITIC Bank**

Corporate culture is a kind of collective consciousness, which has been recognized by all employees in the process of enterprise operation. As far as commercial banks are concerned, it is the core of the bank's business process and a basic concept and criterion gradually developed in the market economy environment. It is necessary for CITIC Bank to make a training plan for its own risk management culture, extract the essence of its own business philosophy and risk management philosophy, learn from each other, and combine it with its own development to form a risk management culture with its own characteristics. After the initial formation of credit risk management in enterprises, it can gradually penetrate into the daily work of grass-roots managers through practical work.

### **5.3 Establish a good risk management system**

A good risk management system can effectively solve the conflict between bank development and risk management, and ensure its healthy development. CITIC Bank can build a perfect risk management system, which can well solve the problems of management's weak awareness of risk prevention and serious short-term behavior.

## **VI. CONCLUSION**

To sum up, under the background of big data, with the continuous development of network technology, our society and life have completely entered the digital age. By analyzing the credit risk of CITIC Bank, we know more about the importance of credit risk to commercial banks and banks. As an important financial institution in the market, credit business is its core business, so it is of great significance for commercial banks to strengthen credit risk management and continuously improve their credit risk prevention and control capabilities.

## **REFERENCES**

- [1]. Hang Lina. *Research on the Risk Prevention of Small and Micro Enterprise Loans in M Branch of China CITIC Bank* [D]. Yangzhou University, 2023.
- [2]. Hu Yangzan, Chen Huijie. *Research on Credit Risk of Commercial Banks under the Background of Big Data* [J]. Journal of Hengyang Normal University, 2023,44(02):99-107.

- [3]. Wang Wei, Wang Jinling. *The Influence of Financial Technology on Credit Risk Control of Commercial Banks* [J]. National Circulation Economy, 2023,(04):157-160.
- [4]. Chen Pan. *Analysis of Credit Risk Management of Commercial Banks Under the Background of Big Data* [J]. Fortune Today, 2022,(15):34-36.
- [5]. Luo Junlin. *Research on Credit Risk Control of Commercial Banks Under the Background of Financial Technology-taking Bank A as an Example* [J]. National Circulation Economy, 2021,(21):154-156.
- [6]. Liu Nan, Wang Xiaojuan. *Research on Credit Risk Assessment of Commercial Banks-Taking Jinshang Bank as an Example* [J]. Industrial Innovation Research, 2023,(17):111-113.
- [7]. Jia yuan. *Research on the Optimization of Epidemic Risk Management in Commercial Banks* [D]. Jiangxi university of finance and economics, 2023. doi: 10.7175/d.cnki.gjxcu.20080.000000000606

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