# Research on the Impact of Green Credit on Small and Medium Commercial Banks

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Abstract: With the continuous promotion of green finance and the continuous development of green economy, green credit business has gradually become a new profit growth point for small and medium-sized joint-stock commercial banks, which continuously affects their financial performance. Based on this, we now take my country's small and medium joint-stock commercial banks as the research object, and use the panel data of my country's 10 small and medium joint-stock commercial banks to develop green credit from 2012 to 2018 to empirically analyze the impact of green credit on the financial performance of my country's small and medium-sized joint-stock commercial banks. It is concluded that the development of green credit has a positive impact on my country's small and medium joint-stock commercial banks. It also provides suggestions for improvement from three aspects: expanding the scale of loans, refining the review system, and developing diversified green credit products, so as to provide reference for my country's small and medium joint-stock commercial banks to better implement green credit policies.

*Keywords:* green finance; green credit; financial performance; small and medium commercial banks

#### 1. Introduction

In 2007, the China Banking Regulatory Commission issued the "Guiding Opinions on Credit Granting for Energy Conservation and Emission Reduction", which initiated the early exploration of my country's green credit system. The concept of green credit was formally proposed in the "Green Credit Guidelines" issued by the China Banking Regulatory Commission in 2012. Small and medium-sized joint-stock commercial banks have formally established a green credit statistical system after the release of the "Notice on Submitting Green Credit Statistical Tables", and continue to improve it through the annual self-evaluation of financial institutions. The China Banking Regulatory Commission issued the "Notice on Key Evaluation Indicators for the Implementation of Green Credit" in 2014, requiring commercial banks to conduct a self-evaluation of the implementation of green credit once a year. Driven by a series of policies, small and medium-sized joint-stock commercial banks have successively formulated green credit policies, enabling the rapid growth of green credit scale.

In view of this, this research studies whether the green credit development of small and medium joint-stock commercial banks has an impact on their financial performance in the context of the country's implementation of green finance. Thus, it is possible to find out its influence and shortcomings, and to make suggestions for improvement. Furthermore, more loan support can be

given to green enterprises. On the one hand, it can not only speed up the development of my country's green economy, but also cultivate new economic development directions in the field of green environmental protection. On the other hand, it is of great significance for improving the quality and growth potential of my country's economic development.

#### 2. Literature review

According to He and Liu (2018), green credit refers to commercial banks granting credit support to companies that comply with national industrial and environmental protection policies, while strictly controlling credit support to companies that do not comply with national industrial and environmental protection policies. <sup>[1]</sup>The financial performance of a commercial bank refers to whether a commercial bank's strategy and its implementation and execution contribute to its ultimate business goal. At present, domestic scholars have different views on the impact of green credit business on the financial performance of commercial banks. There are three main views.

First, the development of green credit business has a positive impact on the financial performance of commercial banks. He Lingyun et al. (2018) used the systematic GMM regression method to conclude that the development of green credit by commercial banks can effectively increase the return on total assets. <sup>[2]</sup>Song Yawei (2019) from the perspective of the evolution of the green credit system and the performance of social responsibilities by commercial banks, the study found that the active performance of social responsibilities and the implementation of green credit policies by commercial banks can effectively improve financial performance. <sup>[3]</sup>Zhang Lin and Lian Yonghui (2019) conducted an empirical study and found that an increase in the proportion of green credit in total loans can help increase the net interest margin of commercial banks. For smaller banks with higher liquidity levels, green credit has a stronger effect on improving bank financial performance. <sup>[4]</sup>From the perspective of the decomposition of bank income structure, the increase in the proportion of green credit in total loans can help increase the bank's return on assets, and that smaller and more liquid banks can provide green credit to improve financial performance<sup>[5]</sup>.

Second, the development of green credit has a negative impact on the financial performance of commercial banks. Li Yingxu (2015) believes that the level of implementation of green credit varies among banks, and banks that implement green credit will lose many "two high" corporate customers. Banks that do not implement green credit will take the opportunity to carve up the market share, causing the profits of banks that implement green credit to suffer damage. <sup>[6]</sup>Research by Han Fengxia et al. (2017) found that the development of green credit will introduce more credit resources to green industries at lower interest rates, restricting high-polluting industries from obtaining bank credit, and banks in the short term will lose "two highs and one overcapacity" corporate customers, Low-interest green credit cannot make up for this part of the interest income. <sup>[7]</sup>Tu Hongzhou and Tu Jinguang (2018) believe that green projects have long construction periods, large investment amounts, and face greater risk of policy fluctuations. There is a general phenomenon of "greening", quality cannot be guaranteed, and related incentive mechanisms are relatively lacking. Green credit banks face higher risks and smaller profit margins<sup>[8]</sup>.

Finally, the impact of green credit on the financial performance of commercial banks has changed over time. Zhang Chen and Dong Xiaojun (2018) analyzed the nonlinear dynamic evolution model and found that there is an inverted U-shaped relationship between green credit and bank performance. When the proportion of green credit is low, the substitution effect is significant and bank performance improves; when the proportion of green credit increases, The crowding effect and risk amplification effect are gradually emerging, and the bank's performance is declining. <sup>[9]</sup>Furthermore, Wang Jianqiong and Dong Ke (2019) conducted theoretical analysis and empirical research on panel data of 12 commercial banks and found that the impact of green credit

business on the profitability of small and medium joint-stock commercial banks was not significant. Scale and asset quality show a significant inverted U-shaped relationship, and the non-performing loan ratio first increases and then decreases as the scale of green credit expands. <sup>[10]</sup>Yan Tingfeng et al. (2019) conducted an empirical analysis based on the GMM model of the dynamic panel system and found that the improvement effect of green credit on bank financial performance is weak in the short term but obvious in the long term. <sup>[11]</sup>Liao Jun et al. (2019) based on the panel VAR model research found that green credit has a long-term and significant positive promotion effect on the operating efficiency of banks, and this effect will gradually increase in a short period of time and will stabilize in the long run<sup>[12]</sup>.

The existing literature provides valuable reference and reference for this research. Based on the existing literature, the research on the impact of green credit business on the financial performance of commercial banks has achieved certain results, but there are still deficiencies. First, existing scholars have disagreements on the relationship between green credit business and bank financial performance and have not yet reached a consensus. Secondly, most of the existing scholars' researches study all commercial banks together, and seldom carry out classification and detailed research on commercial banks. In view of this, the research will take my country's small and medium joint-stock commercial banks as the research object. Based on the existing literature, collect data from the annual reports and social responsibility reports disclosed on the official websites of small and medium joint-stock commercial banks, establish multiple linear regression equations, and conduct in-depth research on green credit. The impact on the financial performance of small and medium joint-stock commercial banks depicts the path to improve the financial performance of small and medium joint-stock commercial banks. And through empirical analysis and testing, find a new strategy to make green credit have a positive impact on the financial performance of commercial banks, so that more commercial banks actively implement green credit policies.

#### 3. Theoretical analysis

Judging from the research of existing scholars, the development of green credit business will mainly have beneficial effects on small and medium joint-stock commercial banks such as increasing asset returns, reducing environmental risks, and establishing a good image. At the same time, it will also have adverse effects such as squeezing core business, losing some customers, and increasing operating costs. In general, the green credit business will have positive and negative effects.

# 3.1 Small and medium joint-stock commercial banks improve their financial performance by developing green credit

# 3.1.1 Seize green opportunities and increase asset returns.

In today's situation where the homogenization of commercial banks is increasingly serious, the development of green credit business can enable them to seize the opportunities of green economic development and gain the competitive advantages of differentiated operations to enhance their characteristics. In the process of continuous implementation of green environmental protection policies, the public's awareness of environmental protection continues to increase, and the green industry, as a new strategic industry in my country, will develop rapidly. Therefore, the green credit business has great development potential. Especially after the country continues to implement the concept of "green water and green mountains are golden mountains and silver mountains", the loan lines of enterprises with "high pollution, high pollution and overcapacity" are declining. Green

credit business may become the next profit growth point for commercial banks. At this time, commercial banks provide loans to more green and environmentally friendly enterprises and actively explore the market in the green field, which is conducive to seizing opportunities and increasing the visibility of their green brands, thereby obtaining more high-quality green credit projects and increasing their asset returns.

#### 3.1.2 Reduce environmental risks and improve asset quality.

In production and operation, if an enterprise destroys the social environment, it will not only be sanctioned by law, but will also leave a bad impression on the public, which will affect the profit of the enterprise and indirectly increase the risk of commercial banks that lend to it. Recover the loan as scheduled. Therefore, the environmental risks faced by commercial banks mainly include reputation risk, liability risk, and credit risk. First, the reputation of commercial banks is difficult to measure by value and is an intangible asset. Damage to the reputation will directly affect the evaluation and choice of commercial banks by stakeholders. Second, liability risk. Commercial banks provide loans to enterprises and need to bear liability risks for their credit behavior. Third, credit risk. Granting credit loans to enterprises with high pollution can obtain higher returns in a relatively short period of time. However, if the enterprise has environmental pollution problems, it will not only damage the social image of commercial banks, but also face Higher credit risk. [13]Compared with these types of risks, commercial banks provide more credit funds to green and environmentally friendly enterprises with good development prospects, which is conducive to reducing environmental risks and improving the quality of assets, thereby increasing the loan recovery rate.

# 3.1.3 Establish a good image and promote long-term development.

Commercial banks actively carry out green credit business and actively assume social responsibilities, which is conducive to establishing a good social image and improving social reputation. Commercial banks that have gained a high degree of social recognition can easily form a competitive advantage that is difficult to surpass and win more support. [14] First of all, it is to obtain the support of green environmentalists and customers with strong environmental awareness. As the public's awareness of environmental protection continues to increase, commercial banks that actively support environmental protection have a higher degree of recognition, and they are more willing to cooperate with banks with a higher green reputation. <sup>[15]</sup>Second, it is easier to get support from green investors. Commercial banks actively carry out green credit business and release signals to the capital market to support green and environmentally-friendly enterprises, making information flow between commercial banks and external investors more effective, helping to attract more green investors and increasing the issuance of low-interest green bonds The success rate. Finally, obtain policy support from the government and regulatory authorities. Commercial banks actively assume social responsibilities and issue green loans in response to national policies. Government departments will provide financial subsidies and financial support. [16]In addition, it will also conduct business contacts and cooperation with commercial banks that have developed better green credit business.

# 3.2 The adverse effects of green credit on the development of small and medium joint-stock commercial banks

## 3.2.1 Generate squeeze benefits and squeeze core business.

The human and material resources available to commercial banks are limited, so it is necessary

to weigh the allocation of resources among various businesses. <sup>[17]</sup>The development of green credit business will diversify the resources of commercial banks. Commercial banks will use human, material and financial resources in non-core businesses such as providing loans to green enterprises. The corresponding resources for core competition will be reduced. The financial performance of commercial banks has a negative impact.

#### 3.2.2 Lost part of the customer base and increase the opportunity cost.

The loan resources and quotas of commercial banks are limited. While diversifying loan funds to green environmental protection industries, the loan resources obtained by enterprises with "high pollution, high pollution and overcapacity" will be correspondingly reduced, and commercial banks will lose the source of high-polluting enterprises. , And this part of the customer source may become the new customers of competitors. At the same time, the problem of passive loan renewal will occur. If the capital chain of a "high-energy, high-power and over-capacity" enterprise with a relatively high initial investment is broken, it will cause difficulties in its operations, and commercial banks may face the problem of not being able to recover the loan funds, thus suffering A huge loss.

## 3.2.3 Increased operating costs and decreased operating efficiency.

When commercial banks provide loans to green enterprises, they need to monitor the environmental protection of the enterprises. Due to the late start of my country's green economy and the lack of relevant advanced experience to learn from, commercial banks lack the corresponding technical support when assessing the environmental conditions of green enterprises, and it is inevitable that certain human and material costs will be incurred during the review process. At the same time, green credit projects have long payback periods, high management costs, large amounts of initial investment funds, and low interest rates, which make their loan costs relatively high, which will increase the operating costs of commercial banks and affect their financial performance.

Therefore, the study puts forward the following hypotheses:

Hypothesis 1: Green credit has a positive impact on the financial performance of small and medium joint-stock commercial banks

Hypothesis 2: Green credit has a negative impact on the financial performance of small and medium joint-stock commercial banks

#### 4. Research design

## 4.1 Sample selection and data sources

My country formally promulgated the green credit policy in 2007. It takes a certain amount of time for all small and medium joint-stock commercial banks to implement the national policy. Most of the small and medium joint-stock commercial banks began to disclose green credit-related data in 2012, and the relevant data was incomplete before that. In order to ensure the availability of data and the rigor and reliability of the empirical analysis results, the green credit data released by 10 small and medium joint-stock commercial banks from 2012 to 2018 are selected for research. A total of 10 valid samples and 70 observations are balanced panel data. The data comes from the social responsibility reports and annual reports disclosed on the official websites of 10 small and medium-sized joint-stock commercial banks.

#### 4.2 Variable selection and definition

In order to study the impact of green credit on the financial performance of small and medium-sized joint-stock commercial banks, the study used He Lingyun et al. (2018) to use ROA to measure bank financial performance. <sup>[18]</sup>Use ROA as the explained variable to measure the financial performance of commercial banks. The formula for calculating the return on assets is:

$$ROA = \frac{NOPAT}{AT} \times 100\% \tag{1}$$

In the formula, NOPAT is net profit and AT is total assets

The explanatory variable of the model established by the institute is the scale of green credit, which is measured by the green credit balance disclosed by small and medium joint-stock commercial banks.

The policy requirements, market risks and other external influence factors faced by small and medium joint-stock commercial banks are almost the same. In order to make the results of the empirical analysis more convincing, the study selects the internal influence factors of small and medium joint-stock commercial banks as control variables. The control variables are: total loans, non-performing loan rate, total assets. Loans are the main profit point of small and medium joint-stock commercial banks. It is assumed that the larger the size of their loans, the stronger the profitability; the non-performing loan ratio can reflect the quality of loans of small and medium joint-stock commercial banks, affect loan recovery, and further affect their financial performance; Total assets is one of the criteria for measuring the scale of small and medium joint-stock commercial banks, which will have a certain impact on the non-performing loan rate.

Among the selected explanatory variables and control variables, the three variables of green credit scale, total loans, and total assets are horizontal quantities. In order to improve the stability of the variables, the study performed logarithmic treatments on these three variables. Variable description table, see Table 1.

Variable Type	Symbol	Variable Name	
Explained Variable	ROA	Return on assets	
Explanatory	G	Green loan scale	
Variables	LC	Total loan	
Control Variable	NPL	Bad Loan Ratio	
	AT	Total assets	

Table 1 Variable meaning description table

# 4.3 Model selection and setting

The object of the study is 10 small and medium joint-stock commercial banks. The impact of developing green credit on their financial performance in 7 years is a typical panel data.

In order to verify the hypothesis proposed in the previous study, the following model is set:

$$ROA_{i,t} = \alpha_i + \beta_{1,i} \ln G_{i,t} + \beta_{2,i} \ln LC_{i,t} + \beta_{3,i} \ln AT_{i,t} + \beta_{4,i} NPL_{i,t} + \varepsilon_{i,t}$$
 (2)

#### 5. Empirical analysis

#### **5.1. Descriptive statistics**

From a single variable point of view, the median return on assets (ROA) of small and medium joint-stock commercial banks is 0.009, which is larger than the average, showing a right-skewed trend, with a standard deviation of 0.002, indicating that its volatility is small; the scale of green credit (LNG) The median is 2.388, which is smaller than the average, showing a left-skewed trend; the median of total loans (ln LC) is 6.201, which is larger than the average, showing a right-skewed trend, with a standard deviation of 0.314, indicating relatively small fluctuations; total assets The median of (ln TA) is 6.512, which is larger than the mean, showing a right-skewed trend, and the standard deviation is 0.281, indicating that the fluctuation is relatively small. From an overall point of view, the average value of green credit scale (ln G) is 2.415, indicating that small and medium joint-stock commercial banks are actively developing green credit business. The average values of total loans (ln LC) and non-performing loan ratio (NPL) were 6.146 and 1.37, respectively, indicating the overall preference of small and medium joint-stock commercial banks for loan quality. The average value of total assets (ln TA) is 6.473, indicating that small and medium joint-stock commercial banks have sufficient capital.

Statistics	ROA	lnLG	lnLC	lnAT	NPL
Mean	0.008	2.415	6.146	6.473	1.37
median	0.009	2.388	6.201	6.512	1.43
Max	0.013	3.332	6.6	6.83	6.11
Mini	0.005	1.096	5.151	5.674	0.14
St.D	0.002	0.532	0.314	0.281	0.727
Observations	70	70	70	70	70

Table 2 Descriptive statistics of variables

## **5.2.** Analysis of regression results.

Table 3 shows the regression results of the impact of green credit scale on the financial performance of small and medium joint-stock commercial banks, and the explained variable is the return on assets (ROA). It can be seen from the table that the regression coefficient of the green credit scale (ln G) is 0.001328, which is greater than zero. Hypothesis 1 is established, indicating that the green credit policy has a positive effect on the financial performance of small and medium joint-stock commercial banks and can better improve the small and medium joint-stock commercial banks. Financial performance. The regression coefficient of total assets (ln AT) is 0.007189, which is greater than zero, indicating that assets have a positive effect on the financial performance of small and medium joint-stock commercial banks. The increase in total assets will help small and medium joint-stock commercial banks increase their profitability. The regression coefficient of total loans (ln LC) is -0.00472, which is less than zero, indicating that total loans have a negative impact on the financial performance of small and medium-sized joint-stock commercial banks. Based on the fact that the scale of green credit has a positive effect on the financial performance of small and medium-sized joint-stock commercial banks, it can be seen that among the total loans, the negative impact on financial performance may be loans from enterprises with high energy consumption, high pollution and overcapacity. The regression coefficient of the non-performing loan ratio (NPL) is -0.001307, which is less than zero, indicating that the non-performing loan ratio has a negative impact on the financial performance of small and medium joint-stock commercial banks. It means that the development of green credit business can improve the asset quality of small and medium joint-stock commercial banks. The higher the asset quality of small and medium-sized joint-stock commercial banks, the stronger their profitability, which can bring them a good social reputation and improve their social image.

Table 3 Regression results of the impact of green credit on the financial performance of small and medium joint-stock commercial banks

Variable	Coefficients	P
lnG	0.001328	0.0062***
lnLC	-0.00472	0.1371*
lnAT	0.007189	0.0346***
NPL	-0.001307	0.0000***

# 6. Conclusions and policy recommendations

The study uses 10 small and medium joint-stock commercial banks that carry out green credit as a sample, and analyzes relevant data from 2012 to 2018 to study the impact of green credit business on the financial performance of small and medium joint-stock commercial banks. The main conclusion is that the green credit development of small and medium-sized joint-stock commercial banks has no significant impact on their financial performance, but it has a positive impact, and green credit business can improve their financial performance. The main reasons for the insignificance: First, green credit is small in scale, long in term, and low in liquidity, making it impossible to achieve large-scale profits in the short term. Second, the green credit review and management mechanism is not perfect. Third, the development of green credit business is relatively simple, with relatively few related financial products, and lack of relevant professionals. In order to enable small and medium-sized joint-stock commercial banks to better implement green credit policies, based on the results of the research, the following suggestions are put forward.

Government departments can support the development of green credit business by small and medium-sized joint-stock commercial banks through tax and fee concessions, financial subsidies and other welfare policies, share the credit risk borne by providing loans for environmental protection projects, and enable them to develop green credit business risk resistance. It is effectively enhanced. <sup>119</sup>As a result, it is possible to reduce the cost of green credit business for small and medium-sized joint-stock commercial banks and increase profitability. It can strengthen its enthusiasm for developing green credit business, grant more loans to green environmental protection enterprises, achieve the purpose of expanding the scale of green credit, increase its total capital, and have a more significant positive impact on its financial performance.

The government and relevant departments should cooperate to increase investment in human and financial resources, establish a complete green credit review system, and further refine the relevant evaluation standards in order to reduce the direct costs of small and medium joint-stock commercial banks in identifying green enterprises and increase loans the quality of. In addition, after issuing green loans, small and medium-sized joint-stock commercial banks should set up a professional "green credit business environmental risk management" team to conduct all-round dynamic follow-up and management of the green environmental protection enterprise loans after the loans have been issued. For example, timely follow-up of environmental risks arising in the process of project construction or operation, so that small and medium joint-stock commercial banks can respond positively in a timely manner and reduce environmental risks faced by loans.

Small and medium joint-stock commercial banks should, under the guidance of the green credit system, enrich their green credit products, reduce loans to polluting enterprises, and reduce their

non-performing loan ratios. On the one hand, combining the market demand for green credit business, integrating green environmental protection and social responsibility has developed a variety of green credit products. On the other hand, it is necessary to take into account both social and economic benefits, and expand the scale of green credit, so that financial performance can be improved. At the same time, small and medium-sized joint-stock commercial banks should adjust their internal organizational structure, reduce the number of professionals in the "two highs and one overcapacity" business, cultivate a group of professionals for the development of green credit business, and strengthen their understanding of green credit policies and green enterprises. Recognition ability. So as to achieve more efficient implementation of green credit policies, and improve their own competitive advantages and competitiveness.

In short, green credit business has positive and negative effects on small and medium joint-stock commercial banks. As long as small and medium-sized joint-stock commercial banks take effective measures, not only will the green credit business have a significant positive impact on their financial performance, but it will also accelerate my country's economy. The pace of transition to green.

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