The study of the Influence of China's Green Credit Policy on Enterprise Environmental Performance

Mengsen Dong[1], Weilun Lin[2,*]
[1]*Department of Economics and Applied Statistics, University Malaya, Kuala Lumpur, Malaysia*
[2]*Department of Management of Technology, Tokyo University of Science, Tokyo, Japan*
**Corresponding Author.*

Abstract: This paper discusses the evolution process of Chinas green credit policy and its influence mechanism on enterprise environmental performance. The research shows that the green credit policy directly affects the environmental performance of enterprises through the financing constraints and incentive mechanism, and has indirect effects through the reputation effect and market pressure. Enterprise scale, ownership nature and industry characteristics play a regulatory role in the effect of the policy. High-polluting industries need to make large-scale investments in environmental protection to improve environmental performance. In order to improve the efficiency of green credit policies, it suggests improving the policy and system, strengthening the management of environmental information of enterprises, enhancing the green credit ability of financial institutions, and optimizing the evaluation system of green projects. By improving laws and regulations, optimizing the incentive mechanism, cultivating professionals and innovating financial products, the green credit policies will more effectively promote the improvement of enterprise environmental performance, and promote the green transformation and sustainable development of the economy.

Keywords: Green Credit Policy; Environmental Performance; Financing Constraints; Market Pressure

1. Introduction

As a financial tool, the green credit policy has gradually become an important means to promote the environmental performance improvement of enterprises. Green credit policy guides funds to environmental protection projects, and promotes enterprises to adopt green technology and management mode in production and operation, so as to maximize environmental benefits. In China, the implementation of green credit policy is a strategic requirement in response to the national "two-carbon" goal, and also an important measure to promote high-quality economic development. On the one hand, it helps to reveal the role mechanism of financial policy in environmental governance and provide scientific basis for policy makers; on the other hand, it provides the path choice for enterprise management to optimize environmental performance and promote the sustainable development of enterprises.

2. The Development Status of Green Credit Policies in China

2.1 The Evolution Process of Green Credit Policy

The development process of Chinas green credit policy reflects that the government attaches great importance to environmental protection and sustainable development. The early green credit policies mainly focused on guiding financial institutions to invest funds in environmental protection and energy conservation projects to support the countrys environmental governance goals. With the proposal of the "double-carbon" goal, the green credit policy has gradually become an important tool to promote the green transformation of the economy. In the process of policy implementation, the government has clarified the definition and scope of green credit through a series of guiding documents and policies and regulations. For example, the Green Credit Guidelines issued in 2012 provide a policy framework for the top-level design of green credit in China, and is a programmatic document for the development of banking financial institutions. These policies encourage financial institutions to develop green financial products, and provide preferential loan interest rates to eligible enterprises, so as to reduce financing costs for enterprises and promote green technology innovation and industrial structure upgrading[1].

2.2 The Current Green Credit Policy System

By guiding financial resources to environmental protection and low-carbon fields, the green credit policy aims to improve the environmental performance of enterprises and promote green technology innovation and industrial structure upgrading. The implementation of green credit policy involves a multi-level policy framework. Through the credit allocation effect, it optimizes the allocation of financial resources, supports energy conservation and emission reduction projects, and promotes green innovation. The policy emphasizes the control of environmental and social risks as an important basis for credit approval, so as to effectively restrain the disorderly expansion and high pollution behavior of enterprises. In addition, the green credit policy also encourages enterprises to strengthen comprehensive cost management and research and development innovation through incentive mechanisms to improve their market competitiveness and environmental performance[2].

In the process of policy implementation, the government and financial institutions play a role to ensure the effective implementation of green credit policies. By improving laws and regulations, the government lowers the threshold of industry access and strengthens supervision to ensure the smooth implementation of policies. Financial institutions will innovate financial products and services to actively connect with green credit resources and support the green transformation of enterprises.

2.3 Preliminary Evaluation of the Implementation Effect of Green Credit

Since the implementation of the green credit policy, it has effectively suppressed the disorderly expansion of enterprises and promoted the rational allocation of resources by guiding the funds to the environmental protection and low-carbon fields. This policy tool improves environmental performance by incorporating environmental performance in environmental governance. By reducing financing costs and improving financing environment, green credit encourages enterprises to strengthen research and development and innovation and enhance the competitiveness of product market. This policy not only promotes the green transformation of enterprises, but also provides a path choice for enterprises to achieve high-quality development under the background of "double-carbon". However, in the implementation of green credit policy, some enterprises, especially heavily polluting enterprises, may face financing constraints under the green credit policy, which has a certain "punishment" effect on their green innovation[6]. Therefore, the implementation effect of policies shows heterogeneity among different types of enterprises.

3. Problems Existing in the Implementation of Green Credit Policies

3.1 Insufficient Policy Implementation

The implementation effect of policies is significantly different among different regions and enterprises, especially in the regions with a low development level of traditional finance, and the promotion effect of green credit policies is not obvious enough. This may be related to the lack of enthusiasm and capacity of local governments and financial institutions in policy implementation. In addition, green credit policies in some industries, such as forestry and heavily polluting enterprises, may lead to increased financing risks, which in turn will affect the sound operation of enterprises. In the process of policy implementation, there is a problem that the evaluation standard of enterprise environmental performance is not unified. Due to the lack of clear evaluation criteria, enterprises may face uncertainty when applying for green credit, resulting in reduced effectiveness of policy implementation. Especially in energy-intensive enterprises, policies may have an inhibitory effect on green technology innovation[3].

3.2 Imperfect Disclosure of Enterprise Environmental Information

Many enterprises have insufficient transparency in environmental information disclosure, which makes it difficult for external stakeholders to fully understand the environmental performance of enterprises. This information asymmetry may greatly reduce the implementation of green credit policies, because banks and investors cannot accurately assess the environmental risks and performance of enterprises. Enterprises often lack standardization and consistency in environmental information disclosure, which leads to it difficult to compare information between different enterprises. This lack of unified standards for disclosure makes regulators and financial institutions face challenges when evaluating the environmental performance of enterprises, which in turn affects the precise implementation of green credit policies. In addition, some enterprises may selectively disclose environmental information for their own interests, or even have the phenomenon of false disclosure[5].

3.3 The Risk Management Ability of Financial Institutions Is Limited

Green credit policies require financial institutions to have professional ability to identify and evaluate environmental risks when evaluating their environmental performance. However, many financial institutions have relatively limited expertise and experience in this area, making it difficult to accurately assess the environmental risks and potential environmental impacts of enterprises in practice. The implementation of green credit policy requires financial institutions to effectively supervise and support the green innovation and environmental protection practices of enterprises. However, due to the lack of sufficient technical support and professional personnel, financial institutions are often faced with the problem of information asymmetry when supervising the progress and effect of enterprise green projects, and it is difficult to fully grasp the real environmental performance of enterprises[4].

3.4 The identification standards of green projects are not uniform

Different regions and institutions differ in the definitions and standards of green programs, which leads to inconsistencies in policy implementation. Due to the lack of unified identification standards, local governments rely on their own understanding and judgment when evaluating whether the projects meet the green credit requirements. This may lead to some projects that do not meet the green standards receiving financial support, while the green projects that really need support are ignored.
The inconsistency of green project identification standards also affects the transparency and credibility of the policy. When applying for green credit, enterprises may face different audit standards, which not only increases the compliance costs of enterprises, but also may lead to the decline of their trust in policies. In addition, due to the inconsistency of standards, it is difficult to accurately evaluate the implementation effect of policies, and an effective feedback mechanism cannot be formed to guide the improvement and optimization of policies[8]. The inconsistency of standards may also lead to the mismatch of resources and affect the overall effectiveness of green credit policies. Due to the lack of clear standards, financial institutions may bias low-risk projects when allocating credit resources and ignore green projects with innovative potential but high risk.

4. Impact Mechanism of Green Credit Policy on Enterprise Environmental Performance

4.1 Direct Impact: Financing Constraints and Incentives

The impact of green credit policy on the environmental performance of enterprises is mainly reflected in financing constraints and incentives.
It is assumed that Jiangsu Province will implement the green credit policy from 2020, and implement financing constraints and incentives for highly polluting enterprises and environmental protection enterprises respectively. We selected the data of 100 enterprises in Jiangsu province, as shown in Table 1, including 50 highly polluting enterprises and 50 environmental protection enterprises. Data came from the provinces corporate financial reports and the annual evaluation of environmental performance[9].
After the implementation of the green credit policy, the financing cost of highly polluting enterprises in Jiangsu province rose from 7.0% to 8.5%. This increased financing cost forces these companies to respond by improving environmental performance (12%), with the following formula:
Environmental performance improvement rate = (change rate of financing cost 100) / Environmental performance improvement rate of original financing cost = (change rate of financing cost 100) / original financing cost
For environmental protection enterprises, financing costs are reduced through green credit (from 4.5% to 3.5%), encouraged to increase green investment and innovation, and the environmental performance improvement rate

reached 22%.

Table 1. Improvement Rate of Enterprise Financing Cost and Environmental Performance

Form of business enterprise	Financing cost before green credit (%)	Financing cost after green credit (%)	Environmental performance improvement rate: (%)
Highly polluting enterprises	7.0	8.5	12
Environmental protection enterprises	4.5	3.5	22

Table 2. Reputation Effect and Market Share Changes

Form of business enterprise	Reputation score improvement rate (%)	Market share increase rate of (%)
Highly polluting enterprises	7	8
Environmental protection enterprises	18	28

As shown in Table 2, Green credit improves corporate reputation and market competitiveness. In Jiangsu province, the reputation score and market share increase of environmental protection enterprises are particularly obvious. The formula is as follows:

Market share increase rate = improvement rate of reputation score market sensitivity coefficient rate of market share increase = improvement rate of reputation score market sensitivity coefficient

The market sensitivity coefficient was set to 1.5. For environmental protection enterprises, the market share increase (18% 1.5 = 27%) is significantly better than that of highly polluting enterprises. Under market pressure, enterprises improve environmental performance to meet the dual requirements of policy and market.

4.2 Indirect Impact: Reputation Effect and Market Pressure

The implementation of green credit policy can enhance the social responsibility and environmental image of enterprises, thus enhancing the reputation of enterprises. After obtaining green credit support, enterprises tend to pay more attention to environmental protection and sustainable development. This positive environmental protection behavior can enhance the image of enterprises in the minds of the public and investors. A good reputation not only helps enterprises to attract more investment, but also can enhance the trust of customers, so as to occupy a dominant position in the market competition.

Market pressure is also an important way for green credit policies to have an indirect impact on the environmental performance of enterprises. With the promotion of green credit policy, the markets environmental protection requirements for enterprises are gradually increased. Consumers and investors are increasingly paying attention to the environmental performance of companies, and companies that fail to meet green standards may face market share loss and withdrawals from investors. Therefore, enterprises are forced to improve their environmental performance under market pressure to meet the dual requirements of the market and policy. In addition, the green credit policy also further increases the market pressure by affecting the financing costs and financing channels of enterprises. If enterprises can effectively use green credit, they may obtain lower financing costs and wider financing channels, so as to obtain advantages in the market competition. On the contrary, enterprises that fail to adapt to the green credit policy may face financing difficulties, which will further affect their market competitiveness[5].

4.3 Adjustment Factors: Enterprise Scale, Nature of Ownership and Industry Characteristics

We have selected 100 enterprises in Jiangsu province, covering large-scale and small-scale enterprises, as detailed in Table 3, state-owned and non-state-owned enterprises, as well as high-pollution and low-pollution industries. Data is based on the simulation of corporate financial reports and environmental performance evaluation.

Table 3. Enterprise Size and Environmental Performance Improvement

Scale	Environmental Performance Baseline (%)	Green credit policy after the performance improvement of (%)
Large-scale corporation	60	30
Small-scale enterprises	55	15

Due to the strong resource integration and innovation ability of large-scale enterprises, the environmental performance has improved significantly (from 60% to 90%). The calculation formula is:
Performance improvement = baseline improvement + (influence coefficient of resource integration ability) Performance improvement = baseline improvement + (influence coefficient of resource integration ability)
Small-scale enterprises face resource and technical limitations, and their performance improvement is relatively limited, as detailed in Table 4.

Table 4: Nature of Ownership and Adaptability

The nature of ownership	Policy adaptability score	Increase rate of environmental performance (%)
State-owned enterprises	80	25
Non-state-owned enterprises	65	15

With the policy support, state-owned enterprises have more resources and channels, strong adaptability, and significant performance improvement (increase rate of 25%). The formula is expressed as:
Rate of performance increase = adaptation score 0.3 rate of performance increase = adaptation score 0.3
Non-state-owned enterprises pay attention to short-term benefits, the increase rate is low.
As shown in Table 5, industries with highly polluting are more subject to policy constraints, and investment in environmental protection has increased significantly (investment increase rate is 40%). The formula is as follows:
Investment increase = basic environmental protection investment 0.4 investment increase = basic environmental protection investment 0.4
Low-pollution industries are mainly driven by market competition and increase less investment.

Table5. Industry Characteristics and Environmental Protection Investment

Industry characteristics	Basic environmental protection investment (ten thousand yuan)	Policy-driven investment increase rate of (%)
High-polluting industries	200	40
Low pollution industry	100	20

5. Countermeasures and Suggestions To Improve the Efficiency of Green Credit Policies

5.1 Improve the Policy and Institutional Systems

To improve the green credit policy system, laws and regulations should be improved to ensure that the implementation of green credit policy has laws to follow. The government should formulate a clear legal framework and incorporate green credit policies into the environmental protection legal system to enhance the legal binding force and enforcement of the policies. Optimize the policy incentive mechanism and enhance the enthusiasm of enterprises to participate in green credit. The government can reduce the cost of obtaining green credit and encourage green credit for enterprises to make green investment and technological innovation. At the same time, an evaluation and reward mechanism for green credit should be established to commend and reward enterprises with excellent performance in environmental performance, so as to encourage more enterprises to participate in green credit projects.
In addition, strengthen policy coordination to form a policy implementation system for multi-sectoral cooperation. The effective implementation of green credit policy needs the coordination of finance, environmental protection, economy and other departments. The government should establish a cross-departmental coordination mechanism to ensure information sharing and resource integration among all departments in the process of policy formulation and implementation, and form a joint force to promote the implementation of green credit policies.

5.2 Strengthen the Management of Enterprise Environmental Information

As shown in Figure 1, through the development of unified disclosure standards, the transparency and comparability of enterprise environmental information can be ensured, thus providing reliable data support for the implementation of green credit policies. Improving the information sharing platform is the key to improve the efficiency of information circulation. An efficient information sharing platform can promote information exchange between enterprises, financial institutions and regulatory authorities, reducing barriers and misunderstandings in the process of information transmission. Through information-sharing platforms, financial institutions can more accurately evaluate the environmental performance of enterprises, so as to better make credit decisions. In addition, the introduction of a third-party evaluation mechanism can enhance the credibility of the information. The third-party evaluation agency can conduct an independent and fair evaluation of the environmental performance of enterprises, so as to avoid the exaggeration or concealment that may occur in the process of information disclosure. This can not only help to improve the authenticity and reliability of information, but also provide a more objective reference basis for financial institutions, so as to optimize the allocation of credit resources.

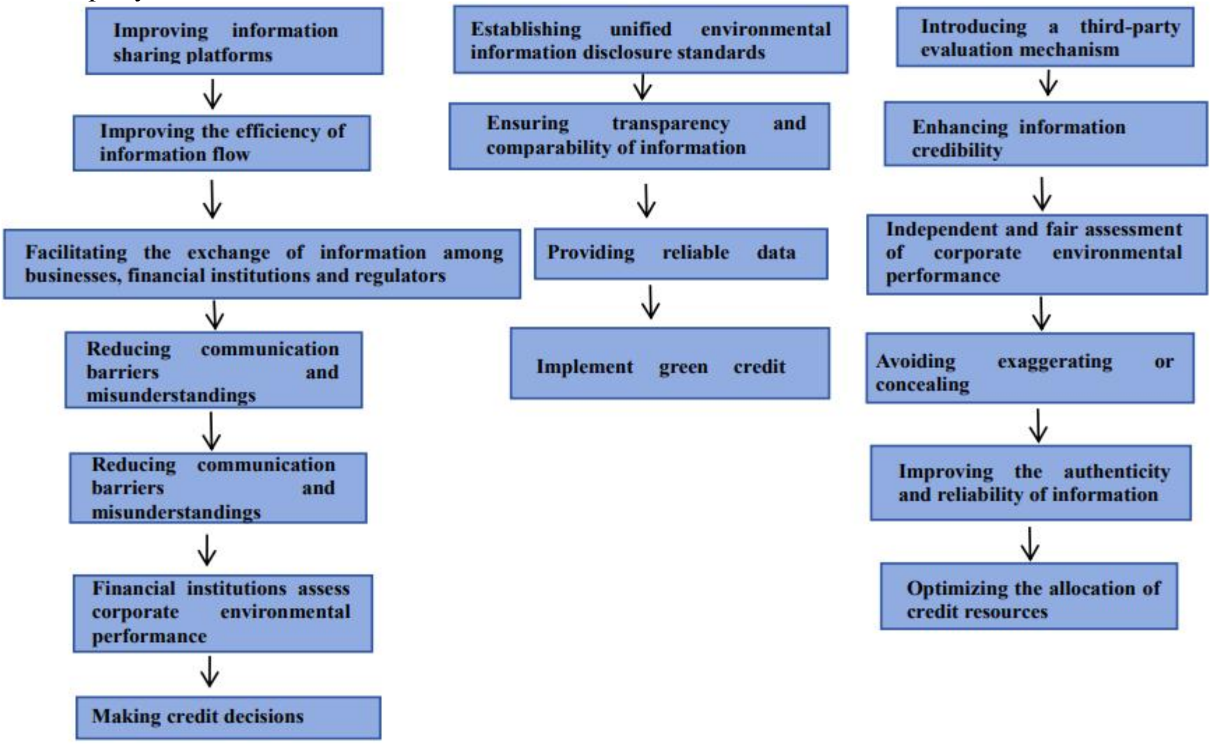

Figure 1. Flowchart of Information Sharing and Disclosure

5.3 Enhance the Green Credit Capacity of Financial Institutions

Financial institutions should improve their internal management system, establish a sound risk assessment system, incorporate environmental risks into the credit decision-making process, and ensure that the flow of credit funds goes to projects in line with the green development goals. Cultivating professionals is the key to improving the green credit ability. Financial institutions should pay attention to the training of professionals in the field of green finance, and improve their employees understanding and implementation ability of green credit policies through internal training and external cooperation. At the same time, financial institutions can cooperate with universities and research institutions to establish green financial talent training bases, and provide more talents with professional knowledge and practical experience for the industry[10]. Finally, financial institutions should actively explore and develop diversified green financial products to meet the financing needs of different enterprises. For example, green credit products for small and micro businesses can help them better achieve sustainable development by reducing financing costs and simplifying the application process. In addition, financial institutions can also use digital financial technology to enhance the innovation ability and market competitiveness of green credit products, and promote the green transformation of enterprises.

5.4 Optimize the Green Project Evaluation System

At present, the definition and classification of green projects are different in different regions and industries, leading to different evaluation criteria and affecting the effective implementation of policies. By developing unified classification standards, we can ensure a consistent basis for evaluating green projects, thus improving the transparency and operability of policies. Establishing a dynamic evaluation mechanism is the key to optimize the evaluation system. The environmental performance of green projects has the characteristics of dynamic change, and the traditional static evaluation method is difficult to fully reflect the actual effect of projects. Therefore, a dynamic evaluation mechanism is needed to be introduced to regularly track and evaluate the environmental performance of the project in order to timely adjust the credit support strategies. In addition, by setting industry benchmarks, reasonable performance targets and evaluation standards can be set for different types of green projects to help enterprises clarify the direction of improvement. The establishment of industry benchmarks requires the joint participation of the government, industry associations and enterprises to ensure its scientific nature and feasibility.

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