

Impact of Green Credit on Industrial Structure in China

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Abstract. Since the reformation and opening up, the conflict between domestic economic development and environmental pollution has become increasingly obvious, and the structure of industry needs to be adjusted urgently. Based on the strategic background of sustainable development, green credit policy has been proposed to balance the relationship between economic development and environmental protection. Green credit adopts a differentiated credit strategy for highly polluting industries and green and energy-saving industries to support the development of green and environmental industries, forcing highly polluting and high-emission industries to upgrade their technological innovation and reduce energy consumption and pollution emissions. In the demand for green economy, China's green credit has become the main driving force to achieve high-quality development such as ecological, circular and low-carbon development of industries, and green credit has a positive effect on the upgrading of industrial structure. In the process of implementing green credit in China, there are still problems such as time lag in the improvement of industrial efficiency and obvious differences in the promotion effect in different regions, which affect the effect of green credit on the optimization and upgrading of industrial structure. It is recommended to focus green policies on the government and banking financial institutions, increase the government's green financial support, and continuously improve the green credit system of banks.

Keywords: Green credit; industrial structure optimization and upgrading; green finance.

1. Introduction

China has experienced rapid economic development in the past four decades, but the rapid economic growth has been accompanied by increasingly obvious ecological and environmental problems. As the traditional economic growth model is no longer adapted to the new era and has intensified the contradiction between economic growth and ecological protection, the transformation of China's economic model is imminent. Industrial structure upgrading is an essential solution to better achieve sustainable development. Green credit can be used to guide and promote the optimal allocation of capital, guiding the flow of capital from disadvantaged industries with high pollution and high energy consumption to advantageous industries and facilitating the optimization of industrial structure.

The importance of green development and green transformation is emphasized in the 2019 Chinese Government Work Report. Green credit is a combination of the two elements of "green" and "credit". Green credit is an essential part of green development, a new credit model that combines environmental protection with economic activities. Environmental growth is a process of continuous optimization and upgradation of industrial structure [1]. It is an extension and innovation of not only the new trend of financial industry development, but also the traditional financial business. It is oriented to sustainable development, establishes differentiated interest rates, provides targeted credit to low-carbon, energy-efficient and environment-friendly enterprises, and directs the flow of capital to green enterprises, which accelerates the upgrading of industrial structure. The upgrading of industrial structure reflects the effective use of industrial resources. The advanced industrial structure is mainly transferred from primary industry to secondary and tertiary industries, and from labor-based to technology-based.

2. Impact of Green Credit on China's Industrial Structure

2.1 Forms of Impact

Figure 1 shows that the green credit can increase the efficiency of resource allocation through the four forms: (1) capital formation mechanism, (2) capital guidance mechanism, (3) Credit catalytic mechanism, and (4) Information transmission mechanism, which will be specified respectively in this section.

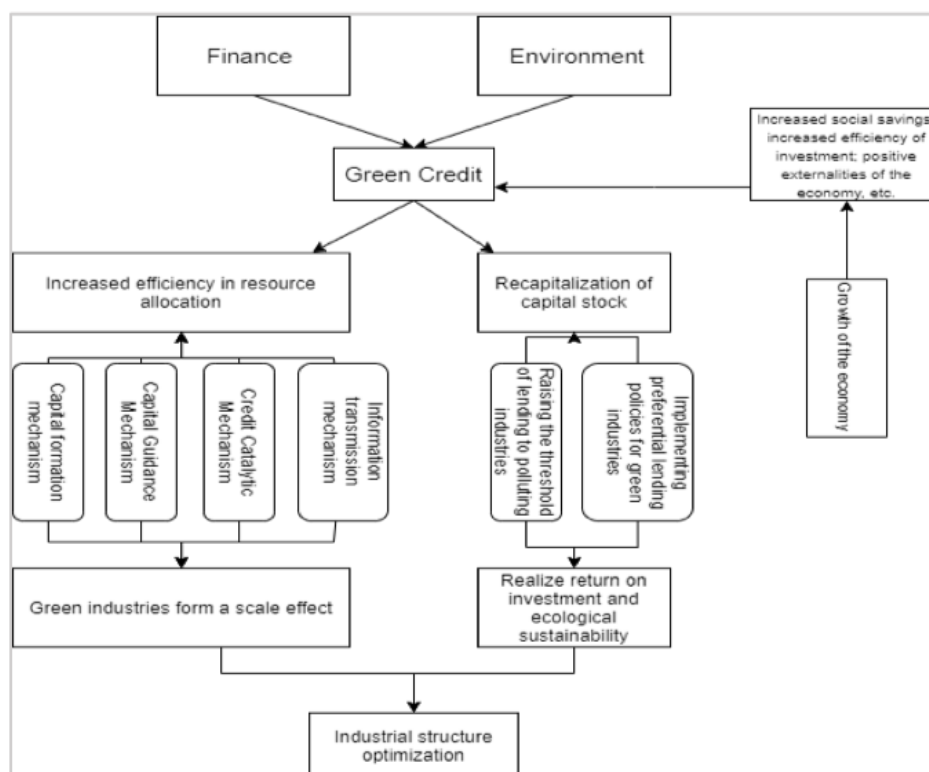


Figure 1. Mechanism of green credit's impact on industrial structure
(Photo credit: Original)

2.1.1 Capital formation mechanism

Since green credit was introduced in 2007, it has become increasingly important in the ecological economy. As an economic instrument and policy, green credit has been adopted by more and more banks and other financial institutions. Under the situation that the financial investment is crucial to the development of enterprises and the current financing method of enterprises in China is still mainly bank loans, the implementation of green credit can bring a large amount of capital to green enterprises in a short-term period and improve the capital allocation efficiency of credit in the green industry. By providing preferential policies and lowering the standards for loans to environmental industries, banks can introduce more production capital to high-tech enterprises, clean energy enterprises and other low-carbon companies to provide impetus to improve their technological innovation and further promote the optimization and upgrading of their industries [2].

2.1.2 Capital guidance mechanism

Banks, as one of the main suppliers of corporate financing, focus mainly on the revenue of enterprises when assessing the feasibility of loans. Optimizing the allocation of resources is the essential function of finance in the transformation of industrial structure [3]. After the introduction of the green credit policy, banks paid more attention to the ecological impact of enterprises and evaluated the long-term benefits of their loans. On the one hand, banks tilt their loans to environmental protection enterprises, and funds flow from highly polluting industries to environmental protection industries to promote industrial transformation and upgrading; on the other hand, loans to high-

consumption enterprises raise their lending standards or even limit its loan investment, indirectly prompting high-consumption enterprises to innovate technology and promoting their transformation into green industries, thus completing the transformation of industrial environmental development and realizing ecological economy.

2.1.3 Credit catalytic mechanism

Credit catalysis is the recycling of leisure funds from bank-derived deposits to enhance capital utilization and promoting the development of circular economy. On the one hand, banks expand the multiplier effect of green credit by lowering the lending standards of green industries; on the other hand, they segment the products and services of green credit with the current industrial structure, thus promoting structural optimization. In this process, credit generates the multiplier effect of capital in investment, which enables the revaluation of capital and promotes the rational flow of funds. The catalytic effect of credit will form a good capital circulation system.

2.1.4 Information transmission mechanism

Green credit influences the supply and demand of enterprises for green loans through methods such as preferential loans and lower standards for environment-friendly industries, thus promoting the transformation and green development of enterprises, while the implementation of green policies will also cause the competitiveness of green industries to improve. Green credit policy changes the allocation of production factors by adjusting the allocation of capital, which makes enterprises transform and develop green industries through the mechanism of policy information feedback. The increase in the supply of capital due to the policy's inclination towards green industries makes enterprises think that the development of green industries has a good prospect, prompting high energy-consuming enterprises to make adjustments according to the green policy and actively innovate towards energy-saving and environmental protection industries [4].

2.2 Embodiment of the Impact

From 2017 to 2020, the green credit investment of China's major commercial banks, joint-stock commercial banks, urban commercial banks and rural commercial banks increased year by year and achieved positive growth year by year. Among them, major Chinese banks are significantly ahead of other types of banks in terms of the scale of investment in green credit.

In terms of scale, the green credit balance of major state-owned banks grew rapidly from 2017 to 2020, with the average green credit investment of the six major state-owned banks increasing from ¥640.3 billion at the end of 2017 to ¥104.02 billion in 2020, a 162-fold increase in three years, as Figure 2 shown.

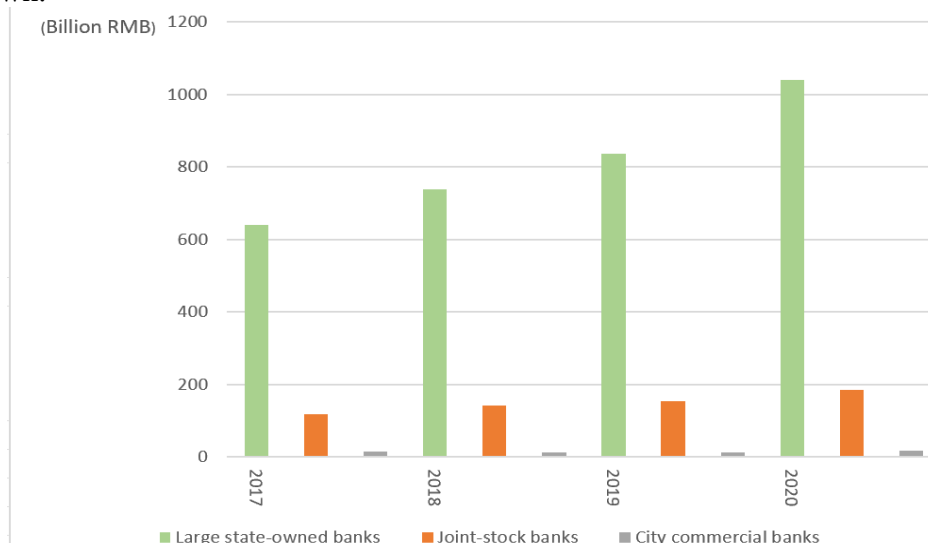


Figure 2. Scale of green credit by different financial institutions from 2017 to 2020
(Photo credit: Original)

Under the encouragement and guidance of a series of green credit policies, the business development of green credit in China is relatively impressive. In the data of green credit business of major banks in China during 2009-2017, as shown in Figure 3 (source: data responsibility report of each bank), the total amount of credit has been gradually increased year by year. The total amount of green credit of the six banks mentioned in the table has been accumulating with the increase of the year of implementation, and as the main driving force in the development process of green credit, China Development Bank has provided important impetus for the development of green credit. As of 2017, its green credit investment reached ¥1,640billion, providing strong support to promote the development of green industries. ICBC, as a major Chinese bank, has increased its green credit investment year by year, and its green credit development also ranks among the top five banks. Agricultural Bank's green credit scale was initially small, but the growth rate was high, and the scale of green credit has been in the middle in recent years. Bank of China's green credit scale has maintained a steady growth rate and the total amount has always been in the middle. in 2017, Construction Bank's green credit scale was in the third place, but the growth rate was faster. Bank of Communications initially had a higher green credit scale than only Agricultural Bank, but with the increase of years, its green credit scale is at the bottom and has a large difference with the loan scale of other banks.

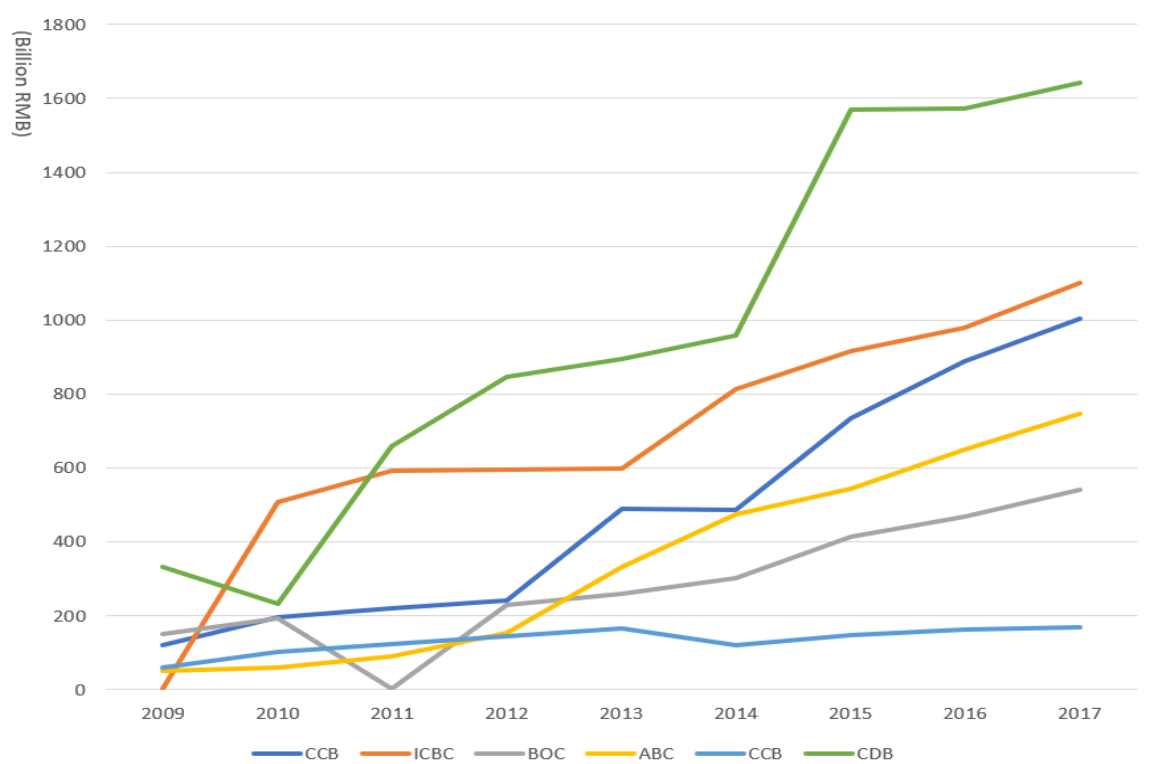


Figure 3. Green credit business data of major banks in China
(Photo credit: Original)

The restructuring and upgrading of industrial structure are essentially a dynamical evolutionary process of three industries, often characterized by changes in income and labor force. As reflected by Figure 4, during the period of 2007-2020, China's industrial structure adjustment gradually tends to change to the service industry. During this period, the first industry has always been at a low level and shows a small downward trend, with a large gap between the proportion of secondary and tertiary industries. While the secondary and tertiary industries accounted for a higher proportion, and the proportion of tertiary industry output value steadily increased, which means that in the process of China's industrial restructuring, capital, labor and other factors gradually transferred from industries

with lower input and output to industries with higher input and output, thus making the industrial structure continue to develop to high-productivity industries [5].

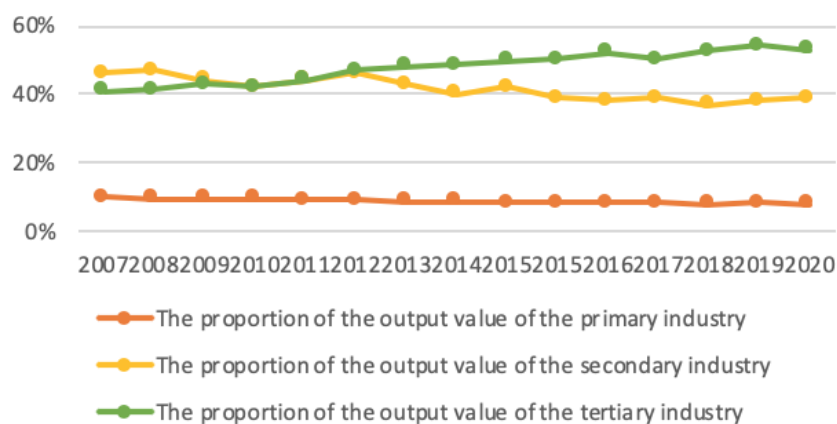


Figure 4. Proportion of output value of three industries
(Photo credit: Original)

China's green credit investment has ranked first in the world for many years in a row, and clean energy production reached 300 billion for the first time at the end of 2020, which has exceeded the total amount of loans in high energy-consuming fields such as coal, steel and non-ferrous metals in the same period. The non-performing rate of Chinese bank loans is below 1.6%, and the balance of green credit of 21 major banks in China reached 1,250 billion at the end of the first quarter of 2021, accounting for 9.3% of all loans, of which the balance of loans for energy-saving and environmental protection industries, renewable consulting sources and green transportation accounted for more than 70%. The overall quality of China's green credit assets is good, with a low non-performing loan ratio of 0.7% for five consecutive years, thus reflecting the obvious environmental benefits of green credit. In the proportion of green credit funds to the total investment in green projects 21 major banks of green credit can save more than 300 million tons of coal per year, reducing carbon dioxide. While carbon emissions currently range from 10 to 11 billion tons per year, green credits can reduce CO₂ emissions by 700 million tons per year and promote ecological restoration. China's environmental responsibility is beginning to cover many highly polluting industries such as petrochemicals, heavy metals, and medical waste, making a significant contribution to supporting ecological civilization and peak carbon emissions. In 2020, China's main financial indicators are running as expected and the financial system is in a dry and smooth operation. On the one hand, it is the annual target for money and credit growth creation. By the end of 2020, the broad money supply rose by 10% year-on-year, the cumulative trip of RMB loans was ¥196,100,000, up 2.8 trillion-yuan year-on-year, and the People's Bank promoted the good development of the real economy by reducing the storage reserve ratio three times. On the other hand, is the loan structure has been optimized to help the development of manufacturing and small and micro enterprises. 2020 China's manufacturing long-term loan balance growth reached 35.2%, achieving 14 consecutive months of growth. 2020, China continued to promote the interest rate market stock floating interest rates, loan pricing benchmark conversion by the completion, as of the end of 2020, China's enterprise loans weighted average interest rate reached 4.61%, down 0.51% year-over-year.

The above statistics confirm that there is a close relationship between green credit and industrial transformation. The increase in green credit support has led to a more pronounced degree of industrial transformation. Green credit can provide funds for environmental protection enterprises through relevant mechanisms to promote the transformation and upgrading of enterprises and reduce waste emissions. However, the effect of green credit on industrial upgrading has a time lag, and there is a large difference in the promotion effect of green credit on different regions of China [6].

3. Suggestions

3.1 Government Support

The relevant national departments need to improve laws and regulations, enhance law enforcement to ensure the effective implementation of green credit policies and improve the reward and punishment mechanism to support the development of green finance and restrict high-pollution and high-energy industries [7]. Thus, it can provide an external environment for green credit, and this process also needs to pay attention to the construction of information sharing platforms, play the role of environmental protection supervision, and timely disclosure of environmental governance information to provide green credit implementation information support. In addition, the country needs to pay attention to the cultivation of relevant talents and introduce financial talents in the field of green credit so that they can participate in green investment.

3.2 Improving the Reward and Punishment Mechanism

The green credit policy penalizes high polluting companies with quantitative credit rationing and interest rate mechanisms. The penalized companies will innovate technologically because of the impact of environmental regulations and the increase in production costs, and will spend more money on improving production technology, increasing the share of innovation costs and reducing environmental pollution. The banks that accept the Equator Principles are mostly reputable international banks that are in the public eye, because a good reputation can make the company more profitable [8]. At the same time, highly polluting enterprises will be forced to upgrade their technology, and those that cannot achieve technological upgrading and thus meet the goal of energy saving and emission reduction will be gradually eliminated in the process of industrial restructuring. The interference of local protectionism with judicial independence has further diminished the power of the already lightly punished legislation in the judiciary, making environmental crime a lucrative industry [9]. In order to further enhance the effectiveness of China's green credit policy, the system related to green credit must be further improved to internalize the environmental losses and economic losses caused by highly polluting enterprises and make them part of the production costs of enterprises, thus increasing the financing costs, opportunity costs and governance costs of enterprises under the original production model. At the same time, a clear penalty system for high-polluting enterprises should be established to strictly control the polluting emission behaviors of high-polluting enterprises and the environmental consequences they cause, to reduce their financing sources at the source and further squeeze their development space.

While implementing green credit, in addition to imposing loan penalties on high-polluting enterprises, it should also strengthen loan incentives for energy-saving and environment-friendly enterprises, give them lower loan interest rates, reduce their financing costs, promote inter-enterprise capital flows, encourage technological innovation, improve production while reducing pollution emissions, and thus promote the adjustment and upgrading of industrial structures. For example, for environment-friendly enterprises, after assessing their environmental risks and confirming that the risks meet the standards, they are given preferential interest rates or provided with corresponding loan subsidies, so as to stimulate the innovation enthusiasm of such enterprises, promote their further technological transformation on the original basis, improve productivity levels, form competitive advantages, and promote the flow of capital and capital formation.

3.3 Building a Linkage and Complementary Mechanism

Enterprises need to do a good job in environmental management, actively establish a linkage mechanism between financial performance and environmental performance, and pay attention to the introduction of high-tech, reasonable procurement of raw materials, thus reducing energy consumption and pollutant emissions, and promoting the green development of industry. In addition, the government needs to further improve the evaluation system to guide enterprises to have environmental awareness and effectively reduce pollutant emissions.

3.4 Innovating Credit Tools to Reduce Credit Risks

Currently, the green credit services of financial institutions mainly focus on credit services with funds invested in the field of energy conservation and environmental protection and green industries [10]. At present, China's green credit policy has achieved some results in the process of implementation, but because the current green credit in China lacks direct financing tools, more indirect financing tools are used, and the resulting problem is that, with the rapid development of green industries and the diversification of green industry needs change, the traditional green credit product model is difficult to adapt, and innovation is urgently needed. Therefore, on the basis of the existing green credit, by drawing on the successful experience of foreign countries and taking into account China's national conditions and the development of green industries, it should innovate on the basis of traditional green credit products and gradually explore new green credit instruments that meet the actual situation in China.

Financial institutions ought to increase the variety of credit instruments to cater to the needs of different enterprises in the process of green credit product innovation in order to attract enterprises to apply for green credit and improve the attractiveness of green credit to promote the development of green credit. The continuous development of green credit can effectively enable enterprises to improve their innovation ability and increase their productivity, while also allowing them to transform into environmentally friendly enterprises. Ultimately, pollution reduction and energy savings will be achieved, and the structure of the entire industry will be upgraded.

4. Conclusion

To sum up, financial institutions play a decisive role in the process of credit fund allocation. Green credit adopts differentiated credit strategies for highly polluting industries and green energy-saving industries, supports the development of green industries, and pushes high-polluting and high-emission industries to carry out technological transformation and upgrading, and reduce energy consumption and pollution emissions. Under the requirement of green economy, green credit in China has become the main driving force to realize high-quality development such as ecological, circular and low-carbon industries, and green credit has a positive effect on industrial structure upgrading. The development of green credit helps industrial upgrading and promotes financial innovation. However, solving the problems faced by the industrial development of different regions is a long-term and arduous challenge that requires the joint efforts of multiple subjects such as the government, financial institutions and enterprises. In this context, financial institutions are required to continuously strengthen the allocation of funds, target the differences in credit fund allocation for different types of enterprises, adopt a government-led and market-led approach, explore a new model of green development, and financial institutions should both fulfill their social responsibility and take green development as their business belief, attach great importance to the development of green credit business, accelerate financial innovation, help industrial upgrading, and continuously promote green credit to realize industrial transformation and development, which is of great significance to the sustainable development of China.

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