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The Impact of Green Credit Policy on the Export Trade of "Two High and One Leftover" Enterprises

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Abstract

High-quality development is the "14th Five-Year" period of China's economic and social development theme, China's economic and social development has put forward new requirements. At present, the long-standing structural contradictions in China's economic development and the sloppy growth mode have not yet been fundamentally transformed, the contradiction between economic development and resources and environment is still acute, and the environmental problems caused by excessive backward production capacity need to be solved. This paper analyzes the impact of green credit policy implementation on the export trade of "two high and one leftover" enterprises based on double difference (DID) model, and the conclusion shows that The findings show that the implementation of the green credit policy has forced the "two high and one leftover" enterprises to transform and upgrade, improved the quality of their export products and suppressed the export scale of polluting enterprises. The study provides recommendations for the government's policy formulation and enterprises' production and investment activities.

Keywords

Green Credit Policy; Export Trade; Transformation and Upgrading.

1. Introduction

As the problems of global climate change and environmental pollution continue to intensify, green finance, as an important way of sustainable development, is receiving more and more attention and recognition from the international community. Green credit, as an important part of green finance, can not only effectively support the development of green industries and environment-friendly projects, but also promote the transformation of enterprises to green development and realize the win-win situation of economic and environmental benefits. As an important part of the global economy, international trade will also follow the principles of low-carbon economy. The "State Council on accelerating the establishment of a sound green low-carbon cycle development of economic system guidance" clearly proposed to establish a green trade system, optimize the trade structure and strictly control the export of highly polluting products. Therefore, it is important to adopt green production methods to participate in international trade and enhance the green reputation of China's export enterprises to ensure the stability of the supply chain and reduce export risks.

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Green credit policy refers to the measures taken by banks in the process of loan approval to give preferential loan interest rates, extend loan terms and reduce loan guarantees for eligible environmental protection projects, taking into account the environmental protection factors of enterprises. In recent years, with the continuous development of green finance, green credit policy has been improved and deepened, and the areas covered are becoming more and more extensive. At present, China's "two high and one leftover" enterprises, as important industries in China, assume important roles in national export trade and employment, and the environmental pollution problems and sustainable development of these enterprises are also of great concern. Because of their dependence on the export market, "two high and one leftover" enterprises often face higher environmental protection costs and technical difficulties once they face increased environmental pressure and green requirements, which will have an impact on their export trade and overall competitiveness. Therefore, the introduction and implementation of green credit policy is of great significance to the environment and export trade of the "two high and one leftover" enterprises. Against this background, this paper aims to explore the impact of green credit policy on the environment and export trade of "two high and one leftover" enterprises, with a view to providing useful references for relevant policy formulation and enterprise practice.

2. Literature Review

The impact of green credit policy on "two high and one leftover" enterprises is complicated and shows different results.

In terms of positive impact, the implementation of green credit policy is important for the improvement of environmental protection and technological innovation ability of "two high and one leftover" enterprises, which can help enterprises to cope with environmental pressure and raise environmental awareness, thus improving their competitiveness. helps to improve the environmental performance and competitiveness of manufacturing enterprises in China [1].Allet pointed out through his study that the implementation of green credit policy can encourage enterprises to increase their environmental investment, reduce their environmental risks and costs, and improve their environmental protection and sustainable development [2]. Zhang Yang (2020) proved that green credit policy is more effective for enterprises with serious pollution emissions, while it has less impact on enterprises with lower pollution emissions. At the same time, green credit policy can also help polluting enterprises to optimize their capital structure, improve the efficiency of capital use, and promote their sustainable development.Gorodnichenkoetal (2013) and other studies argue that financing constraints transform the complementary effects of firms' innovation investment and export decisions into substitution effects, inhibiting the expansion of firms' export scale. Credit financing can promote corporate exports and provide a better supporting role for the expansion of corporate exports and the expansion of export markets by providing long-term credit funding supply to firms [3,4].

On the negative side, for export-oriented "two high and one surplus" enterprises, the implementation of green credit policy often requires higher environmental protection costs and technical difficulties, which may have some impact on their export trade and overall competitiveness. Zhang et al. (2020) found that during the implementation of green credit policy, some "two high and one leftover" enterprises may face a shortage of capital, which may lead to restrictions on production and operation activities, thus negatively affecting the long-term development of the enterprises [5]. In addition, the implementation of green credit policy may increase the financial cost and environmental protection input cost of enterprises, which further increases the operating pressure of enterprises. Financing constraints also have an impact on the export trade of polluting firms. Several studies have shown that financing

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constraints impose limitations on firms' export trade activities. For example, a study by Wang, Haixia et al. (2021) found that an increase in the degree of financing constraints reduces the export size and market share of polluting firms [6]. In addition, financing constraints may also lead to a lack of innovation capacity of firms, which in turn affects their product quality and competitiveness, thus negatively affecting export trade.

In summary, existing studies on green credit and export trade mainly focus on economic growth (T. Xie and J. Liu, 2019) and environmental financing (L. Shu, 2022) at the macro level, but there are few in-depth and detailed studies based on the micro level to explore the effects of green credit policies on the export trade of "two high and one surplus" enterprises. There is a need to further deepen and improve both the depth of research and the selection of quality indicators [7]. The analysis of the impact of green credit policy on the export scale of enterprises can not only provide reference for policy makers to optimize the design and implementation of green credit policy, but also provide guidance for enterprises to meet the dual challenges of environmental requirements and export trade.

3. Theoretical Analysis and Research Hypothesis

Green credit policy, as a financial instrument, provides incentives for enterprises to invest more in environmental protection by offering favorable financing terms or granting preferential interest rates on loans. Due to the requirements of the policy, banks that can provide green credit to enterprises often set stricter environmental protection thresholds in the lending process. In order to meet these requirements, enterprises introduce advanced environmental protection technologies and equipment, improve production processes, optimize energy use efficiency, and use more environmentally friendly production materials and energy, as well as strengthen environmental management measures. These environmental protection requirements force polluting enterprises to reduce emissions in the production process, to control pollutants, manage waste, etc., prompting companies to adopt more environmentally friendly practices in the production process of their products, and upgrades in technological innovation can reduce resource consumption, waste generation and pollutant emissions, thereby improving the quality and environmental performance of products. In addition, as consumer awareness of environmental protection increases and market demand for environmentally friendly products increases, the share of green, environmentally friendly products increases year by year. The green credit policy has put polluting companies under pressure from the environmental requirements of domestic and international markets, so companies have to improve product quality and environmental performance in order to adapt to changes in market demand. Under the signal of cleaner production released by the green credit policy, polluting enterprises choose to upgrade their production technology and improve their clean production capacity to maintain their market position and gain more market share. Under the effect of the Porter effect of the green credit policy, enterprises increase their investment in R&D, improve their production efficiency, and finally improve the quality of their export products. Based on this, this paper proposes the first research hypothesis:

H1: The implementation of the green credit policy to force the "two high and one leftover" enterprises to transform and upgrade, and improve the quality of their export products.

The export decisions of enterprises and their scale are driven by their profit maximization goals. The implementation of the green credit policy has led to an increase in environmental costs and a decrease in the scale of financing for the "two high and one surplus" enterprises. Environmental costs include the construction of environmental protection facilities, pollutant treatment and emission reduction measures. As these enterprises usually suffer from environmental pollution and resource waste, they need to invest a lot of capital and resources to improve their environmental performance in order to meet the environmental requirements

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of the government and financial institutions. At the same time, as green credit policies tend to support enterprises that meet environmental requirements, financing support is reduced for those with poorer environmental performance. These additional environmental costs and reduced financing have become a burden for the "two high and one leftover" enterprises, which has led to higher costs and financial constraints for the "two high and one leftover" enterprises, weakening their competitiveness in the export market and limiting their production and export scale. Secondly, the international market for environmental issues continue to increase concern, the demand for environmentally friendly products continue to increase, more and more countries and regions to adopt stricter environmental standards and regulations for imported products, those who can not meet the environmental standards and requirements of enterprises face market access barriers, resulting in a reduction in their export orders or banned. The change in demand for environmentally friendly products in the international market has an impact on the competitiveness of the "two high and one leftover" enterprises. Compared to green enterprises that can quickly adapt to environmental trends and provide high quality environmentally friendly products, those high polluting enterprises that cannot meet environmental requirements may face the squeeze from competitors that meet environmental standards, reducing their export share and market share. Based on this, this paper proposes a second research hypothesis:

H2: The green credit policy inhibits the expansion of exports of the "two high and one leftover" enterprises and reduces their export scale.

4. Organization of the Text

4.1. Data Sources

This paper examines whether the implementation of green credit policy affects the export trade of "two high and one leftover" enterprises by analyzing the extent to which the green credit amount of banks supports the credit funds of export enterprises based on the panel data of annual reports and social responsibility reports disclosed by 30 listed banks on their official websites from 2000 to 2021, using the matched data from China Industrial Enterprise Database, China Customs Database and China Industrial Enterprise Pollution Emission Database.

4.2. Sample Selection and Model Setting

Explanatory variables.

Green credit scale (GC), measured by the green credit balance disclosed by banks each year. According to the bank social responsibility report, green credit refers to loans invested in ecological protection, energy conservation and environmental protection, resource recycling and other green economic fields.

Polluting enterprises (HPF),This paper takes the A-share listed companies in Shanghai and Shenzhen in China between 2000 and 2021 as the research object, and classifies 16 heavy polluting sub-sectors such as steel, thermal power, cement, etc., which are covered in the Guide to Environmental Information Disclosure for Listed Companies issued by the Ministry of Environmental Protection in 2010, into the corresponding secondary industries according to the classification criteria of the 2001 Industry Classification Guidelines for Listed Companies of the Securities and Futures Commission. industries, and then determine whether the listed companies have the attributes of heavy polluting industries.

Explained variables.

Logarithm of enterprise export value (Ltvalue) This paper uses the logarithm of annual export value (in US dollars) of enterprises in the customs database to measure export size, and uses the ratio of export delivery value (in thousands of dollars) to their main business in the database of Chinese industrial enterprises as an alternative indicator for robustness testing.

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Control variables.

The control variables in this paper are selected as firm fixed assets (Fxpro), industry average fixed cost (Fixind), capital adequacy ratio (CAR), firm size (Size), and return on total assets (ROA). The specific definitions of the above table quantities can be found in Table 1.

Model setting.

The basic setup of this paper using the double difference (DID) model is as follows:

$$Ltvalue_{it} = \alpha_0 + \alpha_1 HPF_i * \mathrm{GC}_t + \gamma_0 Controls_{s,t} + \gamma_1 Controls_{i,t} + \lambda_t + \lambda_i + \varepsilon_{it} \quad (1)$$

where the explanatory variable $Ltvalue_{it}$ is expressed as the logarithm of firm-level annual exports in US dollars, the explanatory variable $HPF_i * \mathrm{GC}_t$ is the cross-product of the treatment group variables and the policy variables, and its coefficient measures the impact of the policy implementation on polluting firms, which is denoted as $Treat_i = 1$ for highly polluting firms and $Treat_i = 0$ for non-polluting firms, and $Controls_{i,t}$ denotes the characteristic variables of the firm dimension used to reflect economic fundamentals, including firm fixed assets, capital adequacy ratio, firm size, return on total assets, etc. Where i,t denotes firm and year, λ_t is year fixed effect, λ_i is firm fixed effect, and ε_{it} is residual term.

Table 1. Variable description

	Variable Name	Variable Symbols	Variable Definition
Explanatory variables	Green credit	*GC*	Green credit balance
	Polluting enterprises	*HPF*	Treat=1 for polluters, Treat=0 for non-polluters
Explained variables	Export amount	*Ltvalue*	Log annual export value of enterprises
Control variables	Corporate fixed assets	*Fxpro*	Percentage of corporate fixed assets
	Industry average fixed costs	*Fixind*	The average of the fixed costs
	Capital adequacy ratio	*CAR*	Ratio of total capital to its risk-weighted assets
	Enterprise size	*Size*	Total enterprise assets are taken as the natural logarithm
	Return on total assets	*ROA*	Net profit/average total assets

5. Empirical Results

5.1. Descriptive Statistics

According to the previous paper, the implementation of green credit policy has an impact on the trade scale and product quality of the exports of "two high and one surplus" enterprises. The implementation of the green credit policy has led to a significant suppression of the size and development of polluting enterprises. The mean value of return on capital (ROA) for the overall sample is 2.318 and the median value is 2.879. The median value is relatively larger, indicating that the ROA of the sample is left-skewed, and the standard deviation is 0.177, indicating that the ROA is less volatile.

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Table 2. Meaning of variables and descriptive statistics results

Variable Name	Number of samples	Average	SD	Min	Max
Ltvalue	398	1.88	.031	0.76	1.69
HPF	398	39.19	1.76	25.28	41.34
GC	398	.008	.002	0	.013
Fxpro	398	2.172	.37	2.15	3.7
Fixind	398	79.297	1.82	42.19	116.235
CAR	398	24.272	1.132	19.189	51.09
Size	398	18.99	1.78	8.77	23.62
ROA	398	2.318	0.177	0.39	2.91

5.2. Descriptive Statistics

Columns (1)-(6) of Table 3 show the results of the analysis of the baseline regression model of this paper, where columns (1)-(2) show the regression results with the logarithm of export amount (in USD) as the explanatory variable, and the regression coefficient of the cross product term of the dummy variable of green credit balance and polluting enterprises is significantly negative at the 1% level, which indicates that the green credit policy imposes strict environmental requirements and restrictions on polluting enterprises, making them need to invest more in environmental protection measures and the application of green technologies in the production process. This increased environmental protection cost may lead to greater operational pressure and cost burden on enterprises in their export business, thus limiting the growth of their export amount. The implementation of green credit policies has encouraged polluting companies to transform and upgrade their products to improve their environmental performance and quality. In this process, enterprises may need to engage in technological innovation and production process improvement, which requires more capital and resources. Such capital investment and resource deployment may lead to restrictions on the expansion of enterprises in export markets, which may have a negative impact on the export amount.

Table 3. Baseline regression of the impact of green credit policy on firm export size

	(1) Ltvalue	(2) Ltvalue	(3) Ltvalue	(4) Ltvalue	(5) Ltvalue	(6) Ltvalue
Ltvalue	-0.018	-2.464**	-0.759	-0.663	-1.267*	-0.026
	(-0.027)	(-2.398)	(-1.532)	(-1.042)	(-1.943)	(-0.147)
HPF	Yes	Yes	Yes	No	No	Yes
GC	0.927***	0.706***	0.298***	0.259*	0.188***	-0.487**
	(6.527)	(3.283)	(2.911)	(1.193)	(2.208)	(-2.208)
Fxpro	0.000	-0.000	-0.004***	0.009***	0.000	-0.000
	(0.132)	(-0.297)	(-3.259)	(5.197)	(0.081)	(-0.068)
Fixind	0.020***	0.024***	0.001	0.003	0.002	0.001
	(5.429)	(6.640)	(0.614)	(0.976)	(1.294)	(1.064)
CAR	0.029	0.287	0.287 *	-0.598	-0.876	0.579
	(0.827)	(1.477)	(1.859)	(-0.797)	(-1.487)	(0.386)
ROA	-2.328*	-1.817	-0.998	3.498***	6.698***	10.498***
	(-2.080)	(-0.944)	(-1.086)	(2.973)	(7.297)	(18.586)
N	96	179	198	207	228	318
R2	0.885	0.883	0.803	0.847	0.823	0.812

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6. Conclusion and Policy Recommendations

This paper aims to explore the impact of green credit policies on firms' export behavior. Through the empirical study, the conclusions are as follows: First, green credit policy influences exporters' investment and R&D decisions through the dual restrictions of environmental access threshold and credit quota, promotes the reallocation of resources within the industry, and pushes polluting enterprises to increase their investment in science and technology and achieve enterprise transformation and upgrading. This move lays the foundation for dealing with green barriers in importing countries, improving environmental performance of exporting enterprises, achieving high-quality development of China's exports and improving the green reputation of exporting enterprises. Second, the implementation of the green credit policy has inhibited the export scale of polluting enterprises. To better implement the green credit policy, based on the concluding study, this paper suggests that:

First, the government should further improve the green credit policy framework by providing attractive financial incentives, such as lowering loan interest rates and offering favorable loan terms, in order to encourage polluting enterprises to actively transform and upgrade their products. Through incentives, enterprises should be guided to incorporate environmental considerations into the whole process of product design, production and management to improve the environmental performance and competitiveness of their products.

Second, the government can promote the establishment of a unified green assessment and certification system to provide enterprises with reliable environmental standards and certification mechanisms. By meeting green assessment and certification requirements, enterprises can obtain more green credit support and market recognition, which in turn will promote the transformation and upgrading of their products. At the same time, the government should also strengthen the supervision of assessment and certification agencies to ensure their independence, impartiality and scientificity.

Third, companies should strengthen their supply chain management and establish partnerships with suppliers that are consistent with their environmental awareness. By requiring suppliers to comply with environmental standards and requirements, companies can ensure the environmental performance of raw materials and components, and improve the environmental performance of the final product. Companies should also focus on enhancing their brand value by making environmental protection a part of their core values and brand image. By strengthening the promotion of corporate social responsibility and sustainability, companies can build a good corporate image and attract more environmentally conscious customers and partners.

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References

[1] Godfrey, P.C.; Merrill, C.B.; Hansen, J.M. The Relationship between Corporate Social Responsibility and Shareholder Value: An Empirical Test of the Risk Management Hypothesis. Strateg. Manag. J. 2009, 30, 425–445, doi:10.1002/smj.750.

[2] Allet, M.; Hudon, M. Green Microfinance: Characteristics of Microfinance Institutions Involved in Environmental Management. J. Bus. Ethics 2015, 126, 395–414, doi:10.1007/s10551-013-1942-5.

[3] G. Tuna, V.C. Gungor and K. Gulez (2014). An autonomous wireless sensor network deployment system using moving robots for human existence detection in case of disasters. Ad Hoc Networks, vol.13, no.1, p.54-68.

ISSN: 2688-9323

[4] Wang, F.; Yang, S.; Reisner, A.; Liu, N. Does Green Credit Policy Work in China? The Correlation between Green Credit and Corporate Environmental Information Disclosure Quality. Sustainability 2019, 11, 733, doi:10.3390/su11030733.

[5] Nguyen, J. The Relationship between Net Interest Margin and Noninterest Income Using a System Estimation Approach. J. Bank. Finance 2012, 36, 2429–2437, doi:10.1016/j.jbankfin.2012.04.017.

[6] PHAM, T.K.K. The Impact of Ownership Structure on Credit Risk of Commercial Banks: An Empirical Study in Vietnam. J. Asian Finance Econ. Bus. 2021, 8, 195–201, doi:10.13106/JAFEB.2021. VOL8. NO7.0195.

[7] Ashraf, B.N.; Zheng, C.; Jiang, C.; Qian, N. Capital Regulation, Deposit Insurance and Bank Risk: International Evidence from Normal and Crisis Periods. Res. Int. Bus. Finance 2020, 52, 101188, doi:10.1016/j.ribaf.2020.101188.