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Research On The Impact of Green Credit Policy On Debt Financing Costs of Green Enterprises

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Abstract:

This study examines the impact of China's green credit policies on the debt financing costs of green enterprises. Using a difference-in-differences (DID) approach, the research empirically analyzes the relationship between financing costs and the implementation of green credit policies. The results indicate that these policies significantly reduce loan financing costs for green firms. Moreover, the findings show no substantial differences in financing costs across firms of varying sizes, highlighting the inclusive and equitable effects of the policy. Multiple robustness tests confirm the reliability of the results. Overall, the study suggests that green credit policies effectively alleviate financial constraints faced by green enterprises and enhance their access to affordable credit. It further emphasizes the need to refine the green credit framework to ensure equitable financial opportunities for firms of all sizes.

Keywords: Green Credit police; Green Enterprise; Debt Finance Cost; Difference-in-Differences(DID)

1. Introduction

The idea of sustainable development has gained traction in the international community due to the serious challenges posed by ecological and environmental problems as well as global climate change. Green credit policies, as an emerging environmental regulatory tool, promote green economic development through the rational allocation of credit resources, becoming a key driver of green development in the global economy. China, the biggest developing nation in the world, is speeding up its economic transition to combat resource scarcity and pollution. An important turning point in China's green finance strategy was the publication of the Green finance Guidelines in 2012. From a financial standpoint, they support the growth of my nation's green economy by combining banks' lending choices with companies' operational and environmental performance.

Due to long-standing constraints in funding and market conditions, the potential financing needs of my country's green enterprises have previously been underserved. While the introduction of green credit policies has created financing opportunities for green enterprises, it has also imposed constraints on long-term credit for high-polluting industries [1]. Through these two pathways, capital flows are being directed toward environmentally friendly industries,

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supporting the expansion and strength of China's green sector. Given this, this study will delve into the impact of green credit policies on the debt financing costs of green enterprises and examine the effectiveness of the pathways through which green credit policies influence enterprises, providing new perspectives for understanding policy effectiveness and optimizing policy design.

2. Literature Review

Existing research primarily focuses on the impact of green credit policies on key stakeholders such as enterprises, banks, government regulators, and capital markets. Some studies indicate that green credit can reduce capital prices while driving corporate green technology innovation output [2], noting that policy performance has a differentiated promoting effect on different types of enterprises [3]. The adoption of green credit policies exerts merely a "guiding effect" on the flow of corporate funds, but reducing borrowing costs or optimizing the maturity structure cannot promote the green transformation of enterprises[4]. Furthermore, Green credit policies affect firms' debt financing costs by adjusting financing scale and credit channels, leading to higher costs for "Two-Hight" enterprises compared to environmentally friendly ones. The policy also impacts equity financing costs by reshaping firms' financial status and information disclosure[5]. While green credit policies encourage high-polluting firms to increase environmental investment to alleviate financing constraints, this positive effect may be weakened by the expansion of non-credit financing channels[6].

Overall, while green credit has proven effective in promoting firms' green development and innovation, disparities remain in its effects on financing costs, governance outcomes, and transmission mechanisms across different types of firms. Building on these insights, this paper focuses on the debt financing dimension, examining the connection between the core objectives of green credit policies and the debt financing expenses of green businesses, and accordingly proposes Research Hypothesis 1 (H1) to be empirically tested.

H1: It is hypothesized that the implementation of green credit policies is expected to reduce the debt financing costs of green enterprises.

3. Research Design

3.1 Sample Selection and Data Sources

The sample period spans from 2008 to 2022, with firm-level data obtained from the WIND database Green enterprises are identified from A-share listed companies in the Energy Conservation, Environmental Protection, and related sectors, while non-green firms are selected from the same industries not classified as green by the China Securities Regulatory Commission (CSRC). After excluding financial and insurance companies, as well as those with missing data, the final sample includes 7,275 firm-year observations, comprising 226 green firms in the treatment group and 259 non-green firms in the control group.

3.2 Model Specification

This study examines how green credit police affect the debt financing costs of green listed businesses using the DID model. The regression model that follows is created:

$$Cost = \beta_0 + \beta_1 * Treated \times Post + \alpha_1 * X_{it} + \delta_i + \mu_t + \epsilon_{it} \quad (1)$$

Here, the dependent variable Cost denotes the debt financing cost of firms; The group dummy variable, Treated, is equal to 1 if the company is part of the green enterprise treatment group and 0 otherwise; The time dummy variable, $Post$, is equal to 1 during the post-policy period (i.e., after 2012) and 0 otherwise; X_{it} represents a set of control variables that may affect firms' financing costs; δ_i denotes firm fixed effects; μ_t denotes time fixed effects; ϵ_{it} is the random error term.

3.3 Variable Selection

The dependent variable is the corporate debt financing cost. In this study, the cost of debt financing is defined as the ratio of financial expenses to total liabilities (at the end of the period). This definition is based on the methodology that was utilized by Li and Liu [7]. Additionally, this study incorporates control variables chosen from two dimensions: firm-level financial and governance features that could affect corporate risk-taking. Firm size (Size); leverage (Lev); profitability (Roa); cash flow (Cashflow); the proportion of fixed assets (Fixed); firm growth (Growth), the growth rate of operating revenue are examples of financial variables. Firm age (FirmAge), which is calculated as the natural logarithm of the number of years since establishment, is the governance variable.

4. Empirical Results and Analysis

4.1 Benchmark Regression Analysis

This study evaluates the impact of green credit rules on the debt financing costs of green-listed companies using a difference-in-differences model. Table 1 displays the regression analysis's findings. The Benchmark Regression without control variables is shown in Column Cost(1), whereas the results are shown in Column Cost(2) with the addition of control variables. As indicated in Table 1, the core explanatory variable's coefficients are consistently negative in both models. The coefficient increases

from -0.0027 to -0.0031 upon including control variables, further supporting the robustness of the results. These findings imply that green credit policies are essential for lowering the cost of debt financing for green-listed businesses.

Table 1. Regression Results

variables	*Treated* × *Post*	Size	Lev	Roa	Cashflow	Fixed	Growth	FirmAge	_cons	R2
Cost(1)	-0.0027*** (-3.58)								0.0186*** (64.87)	0.5754
Cost(2)	-0.0031*** (-4.44)	-0.0014*** (-3.39)	0.029*** (14.34)	-0.0354*** (-6.9)	0.0069** (2.25)	0.0433*** (19.28)	-0.0004 (-0.88)	0.0097*** (3.22)	-0.0036 (-0.29)	0.6386

4.2 Parallel Trends Test

To verify the core identifying assumption of the DID framework—the parallel trend assumption—this study applies an event study approach to compare debt financing cost trends between the treatment and control groups before the green credit policy was implemented. Results show that both groups followed similar financing cost trajectories in the pre-policy period, indicating no systematic differences before the intervention. After the policy introduction, however, their trends diverged significantly, with the treatment group experiencing a notable cost decline relative to the control group. These findings strongly support the validity of the parallel trend assumption and confirm that the observed effects stem from the green credit policy rather than pre-existing differences (as shown in Figure 1).

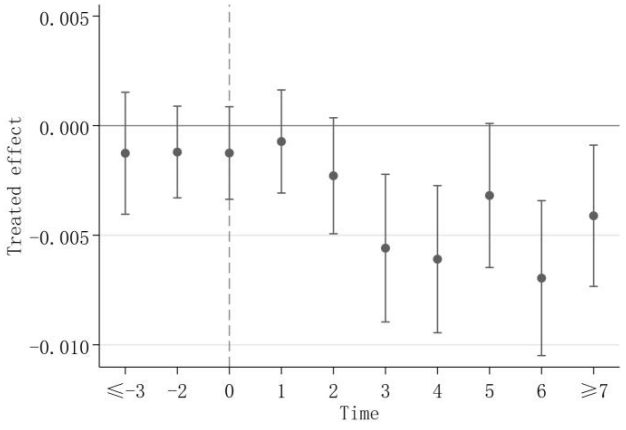

Fig. 1 Parallel Trend Test

4.3 Placebo Test

A placebo test was conducted using random sampling, where pseudo-treatment and control groups were created, and the procedure was repeated 1,000 times. The results reveal that most of the estimated coefficients are near zero, with p-values exceeding 0.1, suggesting no statistical significance at the 10% level. As shown in Figure 2, the Benchmark Regression results stand out as outliers, implying that the observed findings are unlikely to have occurred by chance. This further strengthens the robustness of the Benchmark Regression outcomes.

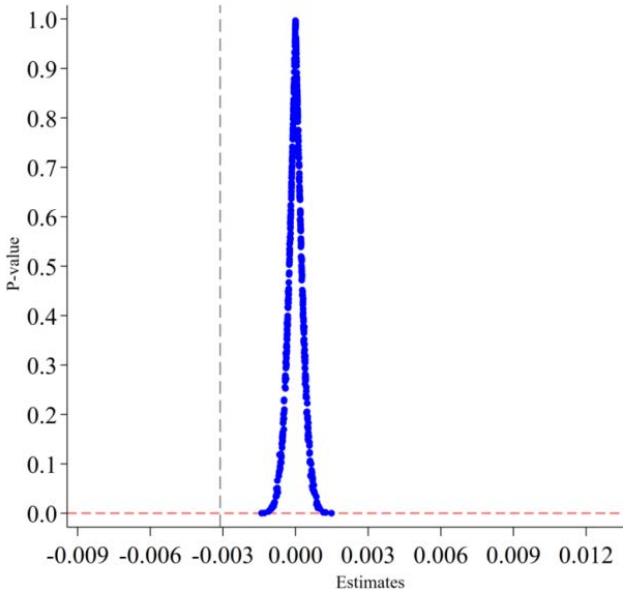

Fig. 2 Placebo Test

4.4 PSM-DID Test

The PSM-DID method is applied for robustness checks in the following analysis. To verify the reliability of the matching results, balance tests are conducted on the matched samples. The results, presented in Table 2, show a substantial reduction in the standardized bias, and the t-statistics for the variables are mostly insignificant, indicating a good matching performance and no significant systematic differences between the treatment and control groups after matching, thereby passing the balance test.

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Table 2. PSM Balance Test

Variables	Match Unmatch	Mean		%Bias	%Reduct |Bias|	T-test	
		Treated	Control			T	P>|T|
Size	U	22.679	22.809	-9.8	59.8	-4.19	0.000
	M	22.680	22.628	4.0		1.64	0.100
Lev	U	0.523	0.509	7.3	96.8	3.54	0.002
	M	0.523	0.523	-0.3		-0.11	0.911
Roa	U	0.038	0.041	-5.3	94.8	-2.25	0.024
	M	0.038	0.038	0.3		0.12	0.908
Cashflow	U	0.053	0.048	7.5	80.5	3.20	0.001
	M	0.053	0.052	1.5		0.61	0.544
Fixed	U	0.286	0.219	37.3	91.7	15.85	0.000
	M	0.285	0.280	3.1		1.24	0.215
Growth	U	0.163	0.137	7.5	95.5	3.20	0.001
	M	0.161	0.161	0.3		0.14	0.829
FirmAge	U	2.906	2.961	-16.2	66.3	-6.88	0.000
	M	2.906	2.888	5.5		2.20	0.028

4.5 Heterogeneity Analysis by Firm Size

Numerous studies indicate a favorable correlation between loan availability and firm size. Due to factors like information asymmetry, increased default risk, and weaker bargaining power, smaller firms typically face higher debt spreads and interest rates, resulting in overall higher debt financing costs when compared to larger firms. In contrast, larger firms are more likely to access credit financing [8]. The mean value of firm size is used as the threshold in this paper, defining firms with size above the mean as large green enterprises and those below the mean as small green enterprises, and conducts a heterogeneity test based on firm size. The heterogeneity analysis results are reported in Table 3. Firm and Year fixed effects are included. The results show that among green enterprises, there is no significant difference in debt financing costs across firms of different sizes. One plausible explanation is that the Green Credit Guidelines require banks to prioritize factors such as project type, environmental risk, and social risk as core variables in credit assessment. Under comparable green compliance, bank pricing thus tends to be based on "projects" rather than "firm size." This institutional design reduces the financing cost differences that might otherwise arise from firm size, thereby explaining the regression results.

Table 3. Heterogeneity Analysis

	Large Firms	Small Firms
Treated × *Post*	-0.0024** (0.001)	-0.0023** (0.001)
Control variables	Control	Control
R2	0.75	0.64

5. Conclusion

The research findings of this paper indicate that, after the implementation of the policy, the debt financing costs of green enterprises significantly decreased, and no significant differences were found across enterprises of different sizes. The conclusions remain robust when validated through parallel trend tests, placebo tests, and PSM-DID tests. This suggests that the green credit policy plays a positive role in alleviating financing constraints and reducing financing costs for green enterprises. Regulatory authorities should further consolidate the institutional framework for green finance and guide banks to optimize the green credit pricing mechanism, so as to ensure that green enterprises can consistently and stably access low-

cost debt financing. The heterogeneity analysis shows that the absence of difference in debt financing costs across green enterprises of different sizes highlights the policy's fairness and inclusiveness, effectively preventing size factors from unfairly influencing financing opportunities. The significance of this study lies in supplementing the research on the micro-level impacts of green finance policies and offers empirical data regarding the efficacy of green credit schemes.

References

[1] Zhang, S., Wu, Z., Wang, Y., & Hao, Y. J. J. o. e. m. (2021). Fostering green development with green finance: An empirical study on the environmental effect of green credit policy in China. 296, 113159.

[2] Li Qiang, & Chen Shanman. (2023). Green Credit Policy, Financing Cost and Enterprise Green Technology Innovation %J On Economic Problems. (08), 67-73+120. doi:10.16011/j.cnki.jjwt.2023.08.008

[3] Ding Jie, LI Zhongfei, & HUANG Jinbo. (2022). Can Green Credit Policies Promote Enterprise Green Innovation? A Policy Effect Differentiation Perspective %J Journal of Financial Research. (12), 55-73. doi:Cnki:Sun:Jryj.0.2022-12-004

[4] Shu Limin, & Liao Jinghua. (2022). End-of-Pipe Treatment or Green Transformation? —The Impact of Green Crediton Environmental Protection Investment Enterprises in Heavy Polluting Industries %J Studies of International Finance. (04), 12-22. doi:10.16475/j.cnki.1006-1029.2022.04.001

[5] Zhang, M., Zhang, X., Song, Y., & Zhu, J. J. J. o. C. P. (2022). Exploring the impact of green credit policies on corporate financing costs based on the data of Chinese A-share listed companies from 2008 to 2019. 375, 134012.

[6] GUO Junjie, & Fang Ying. (2022). Green Credit, Financing Structure and Corporate Environmental Investment %J The Journal of World Economy. 45(08), 57-80. doi:10.19985/j.cnki.cassjwe.2022.08.008

[7] Li Guangzi, & Liu Li. (2009). Green Credit and Enterprise Financialization: Theoretical Analysis and Empirical Test %J Journal of Financial Research. (12), 137-150. doi:Cnki:Sun:Jryj.0.2009-12-013

[8] Zhang Jie, Liu Yuanchun, Zhai Fuxin, & Lu Zhe. (2013). Bank Discrimination, Commercial Credit, and Enterprise Development %J The Journal of World Economy. 36(09), 94-126. doi:10.19985/j.cnki.cassjwe.2013.09.006