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The Effect of Green Credit Policies on Enterprise Performance

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Abstract. In view of the formal implementation of the Green Credit Guidelines in 2012, this paper uses the data of A-share listed companies from 2009 to 2017 and adopts the difference of differences model to study the influence of green credit policies on the return on total assets of restricted and encouraged enterprises, and finds that green credit policies have inhibitory effect and incentive effect. The results show that the inhibition effect of green credit policy leads to a significant decline in the total return on assets of restricted and eliminated enterprises, but the incentive enterprises benefit from the incentive effect of green credit policy and achieve performance improvement.

Keywords: Green Credit Policy; Enterprise Performance; Return on Total Assets; Double Effect.

1. Introduction

As the world's largest developing country, China's rapid economic growth has brought a series of environmental challenges. Therefore, the Chinese government has put forward a new development concept to promote sustainable and green economic and social development. The promotion of green credit has become a strategic choice, aiming to steer resources towards environmental protection and sustainable projects through financial means, and promote the transformation of the economy in a more environmentally friendly and sustainable direction. The "Green Credit Guidelines" (hereinafter referred to as "Guidelines") promulgated by the China Banking Regulatory Commission in 2012 is a typical green credit policy. Green credit policy is an important practical exploration to guide green development through financial resource allocation[1]. As the specific application of government environmental regulation in the allocation of financial credit resources, green finance policy is gradually affecting the financial behavior of enterprises.

Research on the impact of green credit policies on corporate performance can provide practical guidance for enterprises. After enterprises understand the possible impact of policies on them, they can better adjust their business strategies, grasp market opportunities, and improve their competitiveness. Understanding the specific path of policy impact on corporate performance can help companies make more effective use of green finance support to promote sustainable development. By exploring the business strategy and behavior changes of enterprises guided by green credit policies, we can better understand the incentive effect of environment-friendly policies on corporate decision-making, provide theoretical support for the formulation of relevant policies, and help the government formulate and adjust relevant policies more accurately to better achieve the win-win goal of environmental protection and economic development. In view of this, this paper examines the impact of green credit policies on corporate performance.

2. Literature Review

In the past, scholars have rarely discussed the impact of green credit policies on corporate performance, and no consensus has been reached on this. Some scholars believe that the restriction of green credit policies on corporate debt financing intensifies the financial risks of enterprises, thus inhibiting the improvement of corporate performance. In particular, for China's heavily polluting enterprises, green credit policies further aggravate their credit constraints, thus inhibiting the business performance of such enterprises[2]. Green credit policies also increase the financing costs of heavily polluting enterprises and reduce the financial performance of these enterprises[3].

However, some scholars have put forward the opposite view, believing that the implementation of green credit policies will have a positive impact on corporate performance. Zheng Lihui et al. (2024) found that the implementation of green credit policies significantly promoted the improvement of the environmental performance of enterprises, especially the environmental performance of heavily polluting enterprises, and this promotion effect would vary according to the different ownership and capital density of enterprises[4]. Specifically, state-owned enterprises have seen more significant improvements in environmental performance, while capital-intensive enterprises have benefited more. The research results of Huang Xinhuan et al. (2023) show that the government's implementation of the green credit subsidy policy can encourage enterprises to increase green research and development efforts and green credit lines, thereby improving the profits of enterprises[5]. In addition, the study of Liu Yan et al. (2023) pointed out that in the long run, green credit policies significantly improved the financial performance of enterprises. In this process, corporate environmental social responsibility plays an intermediary role [6]. It should be noted that in the process of improving the financial performance of enterprises by green credit policies, financing constraints play a negative regulatory role, while the new Environmental Protection Law plays a positive regulatory role.

3. Research Design

3.1. Model Setting

Based on the content of green credit policy, this paper classifies polluting enterprises and environmental protection enterprises into four different enterprise groups, which are obviously different in the direction of policy impact. Specifically, according to the policy content, this study divides the sample of enterprises into four groups: restricted elimination, encouraged elimination, non-restricted elimination and non-encouraged elimination. According to the definition of Hu Tianyang and Tu Zhengge (2022), enterprises of restricted elimination include enterprises with high pollution and emission and overcapacity, which are the objects of green credit policy. Encouraging enterprises include clean enterprises such as environmental protection, energy conservation and emission reduction, which are the main objects of support for green credit policies. In the model, non-restricted and non-encouraged enterprises are used as the control group of restricted and encouraged enterprises respectively[7].

This study evaluates the effect of restricted and encouraged enterprises under the green credit policy by using the difference-difference method. When evaluating the impact of green credit policy on enterprises supporting environmental protection, the encouraged enterprises were taken as the treatment group and the non-encouraged enterprises as the control group. In the assessment of the impact of green credit policy on polluting industries, restricted phase-out enterprises are taken as the treatment group, and non-restricted phase-out enterprises are taken as the control group.

In order to investigate the impact of green credit policies on corporate performance, the following differential model is constructed:

$$Y_{it} = \alpha_0 + \beta_1 treat_i \times period_t + \beta_2 x_{it} + \lambda_i + \nu_i + \varepsilon_{it} \quad (1)$$

Where, i represents the enterprise, t represents the year, Y_{it} is the total return on assets (ROA) of enterprise i in the year t, $preiod_t$ is the virtual variable of time, representing the implementation time of the green credit policy, and the value is 1 after 2012. $treat_i$ is a dummy variable to distinguish between the treatment group and the control group. When the effect of green credit policy on the encouraged enterprises is investigated, $treat_i$ represents the encouraged enterprises and 0 represents the non-encouraged enterprises. When examining the impact of green credit policy on restricted enterprises, $treat_i$=1 represents restricted enterprises, and $treat_i$=0 represents non-restricted enterprises. $preiod_t \times treat_i$ is the core explanatory variable of this paper, coefficient β_1 represents the impact of green credit policy on total return on assets, and x_{it} is a series of characteristic variables at the enterprise level. λ_i is the fixed effect of the individual firm, which is used to control the influence

factors that do not change with time at the firm level. v_i is the year fixed effect. ε_{it} is a random error term.

3.2. Variable Selection

3.2.1. Enterprise Performance

When selecting the standard of enterprise performance data, it is necessary to select the key indicators that can represent the overall profitability of the enterprise. The rate of return on total assets can reflect the income level of all the assets of an enterprise, and can also cover the factors of enterprise operating efficiency, operating risk and management level. Therefore, choosing return on total assets (ROA) to measure enterprise performance is a comprehensive and accurate choice.

3.2.2. Green Credit Policy

Policy dummy variable ($treat_i$) : Referring to the practice of Xie Qiaoxin et al. (2021)[8], the Green Credit Guidelines of 2012 are regarded as a policy impact. Considering the differences of industries, the research samples in this paper are divided into experimental group and control group.

3.2.3. Control Variables

With reference to relevant literature, the following variables are controlled: the listed years of the enterprise, the shareholding ratio of the top ten shareholders, the current ratio, the quick ratio, the asset-liability ratio, the growth rate of operating income, the turnover rate of total assets, the ratio of fixed assets, the proportion of financial activities, the proportion of independent directors, and the total assets.

4. Analysis of Empirical Results

4.1. Descriptive Analysis

Table 1. Descriptive statistics of variables

Variable	N	Mean	Standard Deviation	Minimum	Maximum
$treat_1$	10761	0.052969	0.223982	0	1
$treat_2$	10761	0.225258	0.417771	0	1
$preiod_t$	10761	0.670848	0.469927	0	1
$treat_1 \times preiod_t$	10761	0.036242	0.186900	0	1
$treat_2 \times preiod_t$	10761	0.151194	0.358255	0	1
ROA	10761	0.036305	0.255419	-8.462556	12.76339
lnage	10761	2.782836	0.351528	0	3.610918
shareholdingratio	10751	0.544933	0.161609	0	1
currentratio	10761	1.868771	3.189352	0.002382	204.742
quickratio	10761	1.373682	2.690405	0.002380	158.245
assetratio	10761	0.532161	0.782522	0.007080	58.08223
growthrate	10761	2.313832	61.740950	-11.92446	4882.519
turnover	10759	0.689770	0.600596	0.001409	11.27436
capitalratio	10761	0.249177	0.186661	0	0.970921
finanal	10761	0.034903	20.827880	-1742.634	136.2471
directors	10751	0.370264	0.056403	0	0.800000
lntotalasset	10751	22.39717	1.409237	14.75859	28.50873
SA	10751	4.466824	1.720474	-2.350996	13.33721
RD	7240	0.016385	0.019487	0	0.262360

Table 1 shows the analysis results of descriptive statistics on variables in this paper. The mean value of enterprise performance (ROA) is 0.036, the maximum value is 12.76, and the minimum value is -8.46, indicating that there is a large performance difference among different enterprises. The mean value of the explanatory variable ($treat_1$) is 0.053, indicating that 5.3% of enterprises are restricted by green credit. The mean of explanatory variable ($treat_2$) is 0.225, indicating that 22.5% of enterprises

are encouraged by green credit. The mean value of the time variable ($preiod_t$) is 0.67, indicating that the sample after the release of the Green Credit Directive accounts for 6% of the total sample. The mean value of the intersection term ($treat_1 \times preiod_t$) concerned in this paper is 0.036, indicating that after the implementation of green credit policy, 3.6% of enterprises are restricted by green credit, thus affecting enterprise performance. The mean value of the intersection term ($treat_2 \times preiod_t$) is 0.151, indicating that 15.1% of enterprises are encouraged by green credit after the implementation of green credit policy, which has an impact on enterprise performance. All control variables are within a reasonable range.

4.2. Baseline Regression Result

Table 2 shows the benchmark regression results of the impact of green credit policies on corporate performance. The return on total assets of enterprises is taken as the dependent variable, the restricted elimination class and the encouraged class are taken as the treatment group, and the permitted class is taken as the control group. Columns (1) and (3) respectively show the fixed effect regression results of ROA of restricted and encouraged enterprises for independent dependent variables. The coefficients of $treat_i \times preiod_t$ were -0.0302 and 0.0025, and were statistically significant at 1% and 5% level, respectively, which was consistent with the expected results in this paper.

Table 2. Baseline regression results

	(1)	(2)	(3)	(4)
	Restrict		Support	
$treat_i \times preiod_t$	-0.0302*** (0.0036)	-0.0315*** (0.0041)	0.0025** (0.0016)	0.0043** (0.0018)
lnage		-0.0085 (0.0085		-0.0114 (0.0085)
shareholdingratio		0.0540*** (0.0057)		0.0538*** (0.0057)
currentratio		-0.0076*** (0.0018)		-0.0073*** (0.0018)
quickratio		0.0084*** (0.0021)		0.0081*** (0.0021)
assetratio		-0.1100*** (0.005)		-0.1111*** (0.0059)
growthrate		0.0016*** (0.0004)		0.0017*** (0.0004)
turnover		0.0394*** (0.0025)		0.0400*** (0.0025)
capitalratio		-0.0514*** (0.0061)		-0.0514*** (0.0061)
finanal		0.0042*** (0.0007)		0.0042*** (0.0007)
directors		-0.0015 (0.0132)		0.0008 (0.0133)
lntotalasset		0.0103*** (0.0013)		0.0104*** (0.0013)
_cons	0.0370*** (0.0003)	-0.1556*** (0.0367)	0.0355*** (0.0004)	-0.1529*** (0.0369)
Control variable	No	Yes	No	Yes
Year	control	control	control	control
Firm	control	control	control	control
N	9,004	9,004	9,004	9,004
R^2	0.5388	0.6345	0.5339	0.6311
adj.R^2	0.4754	0.5775	0.4698	0.5737

In Table 2, column (2) shows the impact of green credit policy on total return on assets of restricted phase-out enterprises compared with non-restricted phase-out enterprises after adding enterprise-level control variables and controlling individual and year fixed effects. The results show that the

green credit policy reduces the total return on assets of the restricted and eliminated enterprises by 3.15%, and passes the significance test of 1%. At the same time, column (4) of Table 2 shows the impact of green credit policy on the total return on assets of encouraged enterprises compared with non-encouraged enterprises after controlling variables at the firm level and controlling the fixed effects of individuals and years. The results show that the green credit policy causes the total return on assets of encouraged enterprises to increase by 0.43%, and passes the significance level test of 5%. From the results of the impact on restricted and encouraged enterprises, the green credit policy has an inhibitory effect on restricted and eliminated enterprises, and an incentive effect on encouraged enterprises. Therefore, green credit policies have a double impact on corporate performance. The benchmark regression results show that the green credit policy has compressed the financing space of polluting enterprises by restricting or even refusing loans, reduced capital investment, and led to the decline of the total return on assets of restricted and eliminated enterprises. At the same time, the policy supports energy-saving and environmental protection enterprises by granting credit concessions and simplifying the approval process, increasing capital investment, and improving the total return on assets of encouraged enterprises. Therefore, green credit policies affect the performance of enterprises with significant incentive and inhibition effects.

5. Research Conclusion

Based on the data of Shanghai and Shenzhen A-share listed companies from 2009 to 2017, this paper uses the differential differential model to study the impact of green credit policy on the return on total assets of restricted and encouraged enterprises from the perspective of corporate performance, and finds that green credit policy has inhibitory effect on restricted and encouraged enterprises, respectively. The specific research results show that the inhibition effect of green credit policy leads to a significant decline in the total return on assets of restricted and eliminated enterprises. However, the encouraging enterprises benefited from the incentive effect of green credit policy and achieved the improvement of enterprise performance.

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