Does Green Credit Policy Promote Corporate ESG Performance -- Evidence from Chinese A-Share Listed Companies

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Abstract. The paper uses A-share listed companies in China from 2009 to 2020 as a sample and takes the “Green Credit Guidelines” implemented in 2012 as a quasi-natural experiment to explore the impact of green credit policy on corporate ESG performance through a difference-in-differences model. The study found that green credit policy will promote the improvement of corporate ESG performance. This conclusion has passed a series of robustness tests. And from the perspective of the dynamic effect of the policy, the Guidelines had a short-term effect but was not stable in the first year after its implementation, and its effect increased year by year in the third year after its implementation, indicating that the policy has a certain timeliness. The research conclusions of this paper have important reference significance for the improvement of green credit policy.

Keywords: Green Credit Policy; Corporate ESG performance; Difference-in-differences model

1 Introduction

As global environmental and climate change issues become increasingly severe, governments and enterprises are paying more attention to environmental protection and sustainable development. Green finance has become an important means of protecting the environment, improving environmental pollution, and achieving ecological environmental governance. Green finance has a broad impact on the environment, society, and enterprises (Scholtens and Dam, 2007)[4].

Green credit is one of the important tools of green finance. In 2012, the former China Banking Regulatory Commission issued the "Notice on Printing and Distributing the Guidelines for Green Credit" (hereinafter referred to as the "Guidelines"), emphasizing the importance of green credit in the development of the real economy, adjustment of industrial structure, and prevention of environmental risks. The Guidelines provided guiding opinions and specific regulatory requirements for financial institutions to implement and manage green credit work.Since the implementation of the Guidelines in China, scholars have conducted extensive research on its effectiveness. Studies have found that green credit policies can have an impact on companies' short-term financing (Cai, 2013)[1], investment levels (Su and Lian, 2018)[6], green innovation (Wang and Wang, 2021)[7], front-end governance and green office status (Wang et al., 2021)[8], and exit risk (Lu et al., 2021)[3].

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As one of the important forms of green finance, the green credit policy aims to improve the environmental and social responsibility performance of enterprises. The environmental, social, and governance (ESG) performance of enterprises is an important criterion for evaluating their sustainability. Therefore, is there a close relationship between the green credit policy and the ESG performance of enterprises? It is particularly important to explore the policy effects of the green credit policy and the ESG performance of enterprises. In this context, this paper focuses on the relationship between the green credit policy and ESG performance, aiming to investigate the policy effects and implementation of this policy.

Compared with previous studies, this paper's marginal contribution is as follows: this paper constructs a quasi-natural experiment based on the green credit guidelines, and examines the implementation effects of the green credit policy from the perspective of enterprise ESG performance, enriching the micro-effectiveness research of the green credit policy.

2 Estimation strategy

2.1 Model Design and Construction

To study the impact of green credit policy on corporate ESG performance, this paper constructs a difference-in-differences model (DID) and regards the green credit guidelines as a "quasi-natural experiment". The difference-in-differences method compares the differences between the experimental group and the control group before and after the policy implementation, which can effectively eliminate the impact of random factors on the results and alleviate endogeneity problems. It is more suitable for this study. Therefore, the following regression model is constructed:

$$ESG_{it} = \alpha_0 + \alpha_1 \cdot DID_{it} + \alpha_2 \cdot Control_{it} + \delta_t + \mu_i + \lambda_i + \varepsilon_{it} \quad (1)$$

In the formula, the Explained variable ESG_{it} represents the ESG performance of enterprise i in year t; the core explanatory variable DID_{it} indicates whether enterprise i belongs to a restricted industry and is in the period after the policy implementation (2012 and later) in year t; $Control_{it}$ is a set of control variables, δ_t, μ_i and λ_i represent year fixed effects, individual fixed effects, and industry fixed effects respectively, and ε_{it} is a random disturbance term. This paper focuses on the difference-in-differences estimation coefficient α_1. When its sign is positive and statistically significant, it indicates that the green credit policy has promoted the ESG performance of enterprises.

2.2 Variable Description

(1) Explained Variables. The environmental, social, and governance (*ESG*) performance of the company. Following the approach of Song et al. (2022)[5] and Wang et al. (2023)[9], this paper uses the ESG rating of the Huazheng Index to measure the ESG performance of companies. According to the Huazheng ESG rating system, scores are assigned from 9 to 1 in descending order, and the average value of the four quarters is used as the annual ESG score.

(2) Core Explanatory Variable. Green credit policy (*DID*). Following Wang and Wang (2021)[7], this paper uses the "Green Credit Guidelines" as a quasi-natural experiment and

employs a policy implementation dummy variable to represent the treatment effect of the green credit policy. Specifically, when *DID* = 1, it indicates that the enterprise belongs to the restricted industry and the green credit policy has been implemented.

(3) Control Variables. Drawing on previous research, this study incorporates the following firm-level factors that may affect corporate ESG performance into the model: firm size (*Size*), firm leverage (*Lev*), return on assets (*ROA*), company age (*Age*), equity concentration (*Top1*), operating cash flow (*Cashflow*), return on equity (*ROE*), asset turnover ratio (*ATO*), and fixed asset ratio (*FIXED*).

2.3 Sample Selection and Data Sources

This paper selected all A-share listed companies between 2009 and 2020 as the research object, and screened the sample according to the following criteria: (1) all listed companies in the financial insurance industry were excluded; (2) to exclude the impact of extreme cases of listed companies on the empirical results, ST, ST*, and PT listed companies with abnormal trading were excluded; (3) listed companies with missing data were excluded; (4) to exclude the impact of extreme data on the empirical results, all data were truncated at the 1% level. The data for this article are from the CSMAR database.

3 Empirical Analysis

3.1 Baseline Model Regression Results

The regression results for Equation (1) are shown in **Table 1**. Column (1) shows the estimated results without considering the control variables, and column (2) adds the regression results of the control variables to column (1). The estimated coefficients are always significantly positive below the 1% level regardless of whether the control variables are considered or not, indicating that green credit policy significantly promotes corporate ESG performance.

Table 1. Baseline Model Regression Results

	(1)	(2)
VARIABLES	ESG	ESG
DID	0.3683***	0.3483***
	(0.0775)	(0.0698)
Constant	4.0729***	0.3334
	(0.0048)	(0.4536)
Observations	30,394	30,394
R-squared	0.6019	0.6178
Id FE	Yes	Yes
Year FE	Yes	Yes
Industry FE	Yes	Yes
Controls	No	Yes

Note: The values in parentheses are t-values; ***, **, and * indicate significance at the 10%, 5%, and 1% levels, respectively."

3.2 Parallel Trend Test

An important prerequisite for using the difference-in-differences model is to satisfy the parallel trend. Therefore, this paper uses the event study method proposed by Jacobson et al. (1993)[2] for parallel trend testing. The parallel trend test results are shown in **Figure 1**. The coefficients of the time dummy variables before the green credit policy occurred are not significant, satisfying the assumption that the treatment group and control group have the same trend before the policy occurred. In the second year of implementation of green credit policy, there was a short-term effect but it was not stable. After 2016, the impact coefficient of green credit policy was significantly positive and its impact effect continued to increase, indicating that green credit policy can produce a policy effect that promotes corporate ESG performance improvement but has a certain timeliness.

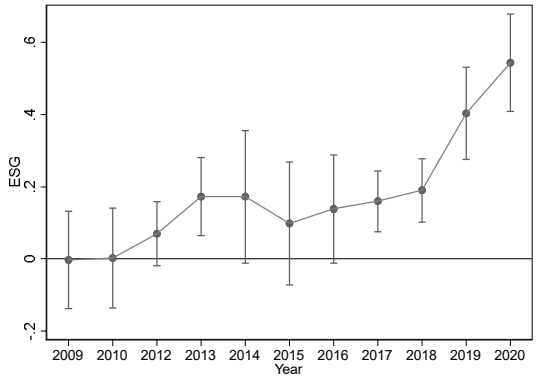

Figure 1. Parallel Trend Test

3.3 Robustness Test

Based on the results of the benchmark regressions, which indicate a significant positive contribution of green credit policies to firms' ESG performance, this paper examines the robustness of the benchmark regression results in terms of PSM-DID models, excluding the interference of other policies, and replacing the explanatory variables, respectively. The regression results are shown in **Table 2**. Among them, column (1) is the regression result of the PSM-DID model. Column (2) (3) (4) (5) is the regression result excluding the effects of the environmental protection law, low-carbon pilot policy, carbon emission trading pilot policy, green finance reform and innovation pilot zone, respectively. Column (6) is the regression result replacing the explanatory variables. The coefficient of the difference-in-differences variable (*DID*) is still all significantly positive, which to some extent indicates that the implementation of green credit policy can promote corporate ESG performance and the research conclusion is still robust.

Table 2. Robustness Test Results

VARIABLES	(1) ESG	(2) ESG	(3) ESG	(4) ESG	(5) ESG	(6) ESG_PB
DID	0.3479***	0.3819***	0.3727***	0.3691***	0.3428***	2.3521**
	(0.0711)	(0.0760)	(0.0783)	(0.0795)	(0.0865)	(0.8556)
EPL		-0.1739***				
		(0.0149)				
LC_Policy			0.0454*			
			(0.0257)			
CET_Policy				0.0536***		
				(0.0130)		
Constant	0.3126	14.9150	-0.8397***	-0.8541***	-0.8747**	-11.3983**
	(0.5226)	(10.1843)	(0.2776)	(0.2744)	(0.4030)	(4.6371)
Observations	30,017	29,848	29,848	29,848	20,415	9,873
R-squared	0.6144	0.5814	0.5852	0.5847	0.5877	0.7886
Id FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	No	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes

4 Conclusions

As an important measure to promote the healthy and sustainable development of China's economy, green credit policy has become an important engine for promoting the sustainable and high-quality development of enterprises. This paper uses the "Green Credit Guidelines" as a quasi-natural experiment and constructs a difference-in-differences model using unbalanced panel data of A-share listed companies from 2009 to 2020 to analyze the impact of green credit policy on corporate ESG performance. The study found that the implementation of green credit policy will promote the improvement of corporate ESG performance, and this conclusion has passed a series of robustness tests. And from the perspective of the dynamic effect of the policy, the "Green Credit Guidelines" had a short-term effect but was not stable in the first year after its implementation (2013), and its effect increased year by year in the third year after its implementation, indicating that the policy has a certain timeliness.

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