

Study of the Impact of Green Credit Policy on the Performance of Heavily Polluting Firms

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Abstract

Since the reform and opening up, China's economy has been developing rapidly, and has made remarkable achievements, but at the same time, it is also facing the problems of environmental pollution, climate anomalies and resource depletion, etc. How to realize energy saving and emission reduction while developing the economy is a major problem for China. How to realize energy saving and emission reduction while developing economy is a major problem facing China now. This project starts from the micro level, takes the financing penalty effect and investment inhibition effect as the entry point, and constructs a quasi-natural experiment with the Green Credit Guidelines issued in 2012 as the event. Selecting the data of Chinese A-share listed companies from 2008 to 2015 in CSMAR database, the DID model is used to explore the impact of green credit policy on the performance of heavy polluters, to provide suggestions for the promotion and improvement of green credit policy, and to provide a theoretical basis for the green innovation and transformation and upgrading of heavy polluters in China. The above study is of great significance to China, which is in the process of developing a low-carbon economy and promoting the realization of the "dual-carbon" goal.

Keywords

Green Credit; Business Performance; Green Transformation.

1. Introduction

In recent years, environmental pollution has become more and more serious, and problems such as resource depletion and climate anomalies have become a huge obstacle on the road to sustainable economic development. In 2018, the total global carbon emissions amounted to 34.149 billion tons, up 1.2% compared with 2017, and the ecological environment is in urgent need of governance. At present, the goal of China's economic development is to realize green, low-carbon and sustainable development, and the Party Central Committee and the State Council have always placed environmental protection in a very high position. "The 14th Five-Year Plan lists carbon peaking and carbon neutrality as one of the goals for the country's future development. General Secretary Xi Jinping emphasized at the 20th National Congress of the Communist Party of China (CPC) that the concept of ecological red line should be firmly established. This is a solemn promise made by China to the world, and demonstrates China's firm determination to actively combat environmental pollution, deeply implement the concept of green development, and promote the coordinated development of the economy and the environment. Capital is the blood of economic operation, and the development of green economy cannot be separated from financial support. Based on this, China has introduced a series of green policies, including green taxes, green subsidies, green insurance, and green policies related to the financial sector, i.e., green credit, insurance and security policies.[2]. However, due to the late start and insufficient development of China's capital market, bank

loans are still the main channel of external financing for enterprises, which makes China's green finance mainly based on green credit. By the end of 2021, China's green credit balance grew to 15.9 trillion yuan. However, during the eight years from 2014-2021, after the growth rate of green credit balance exceeded 16.6% in 2015, the growth rate in the last four years only remained around 10%, indicating that the growth rate of green credit does not match the growth of green credit scale, indirectly reflecting that there is still a lot of room for the development of green credit business of commercial banks. Vigorously promoting green credit, continuously improving green financing, and effectively guiding the flow of funds to resource-saving and environmentally friendly industries are important tasks for accelerating the transformation of the mode of economic development and promoting the construction of ecological civilization.

Existing research shows that green credit policy helps banks to avoid risks, helps enterprises to green transformation, and contributes to the sustainable development of the economy. First of all, in terms of credit risk, increasing the scale of green credit of commercial banks can effectively inhibit the rise of non-performing loan ratio, thus significantly reducing the credit risk of commercial banks.[40] Secondly, in terms of environmental risk, green credit scale of commercial banks can effectively curb the rise of non-performing loan rate, thus significantly reducing the credit risk of commercial banks. Secondly, in terms of environmental risk, the green credit policy encourages banks to invest funds in environmentally friendly and resource-saving projects, thus controlling the environmental risk of commercial banks from the source. In short, green credit is the most important element of commercial banks' environmental risk. In conclusion, green credit is an important means for commercial banks to prevent credit and environmental risks. Green credit policy significantly improves the possibility of enterprises to carry out front-end governance and green office, and accelerates the transformation of corporate environmental governance from end-to-end governance to other governance methods. Under the influence of the green credit policy, heavily polluting enterprises are able to diversify their business sectors, develop their business scope to non-polluting industries, and realize transformation and upgrading. Finally, as the main business of banks, credit business carries the burden of allocating funds, and the implementation of green credit is an important means to promote the harmonious development of the economy and the environment. Providing differentiated credit services to different enterprises helps banks flexibly adjust capital flows, control the implementation of heavily polluting projects, and realize the upgrading of industrial structure and sustainable economic development.

2. Theoretical Analysis and Research Hypotheses

2.1. Study on the Impact of Green Credit Policies on Enterprise Performance

Studies have shown that stricter energy policies reduce the financial performance of heavily polluting firms in the form of higher finance costs, lower inventory turnover, lower accounts receivable turnover. Among them, due to the increase in financing costs, the financial expenses of enterprises will also increase, which will lead to an increase in financial risks and a decrease in profits. The operating capacity index reacts to the enterprise's ability to utilize various assets to obtain profits, and the decrease of inventory turnover ratio as well as accounts receivable turnover ratio implies that the enterprise's capital turnover speed slows down, and the speed of obtaining profits also slows down. In addition, with the announcement of new environmental policies, the share prices of heavily polluting firms will tend to decline in the short term. Specifically, the green credit policy increases the risk of stock price collapse for heavily polluting firms by imposing financial constraints and reducing the quality of information disclosure.

H1: Green credit policy reduces the performance of heavily polluting firms.

2.2. Research on the Mechanism by Which Green Credit Policy Affects Enterprise Performance

Financing constraints refer to the inability of enterprises to obtain sufficient funds for production and operation due to the high cost of external financing in an incomplete market. Although the rise of venture capital, crowd funding and other financing methods has broadened the source of funds for enterprises, most enterprises mainly rely on bank loans for financing because China's capital market is not yet mature. Under the background of green credit policy, banks and other financial institutions will pay more attention to the environmental risks of enterprises when approving loans. For environmentally friendly enterprises, banks and other financial institutions will give credit support, in solving the financing difficulties of small and medium-sized enterprises at the same time can also encourage enterprises to save energy and reduce emissions; on the contrary, for the heavy pollution of the enterprise, in the pre-credit, credit, credit will face more stringent restrictions. Banks and other financial institutions in the regulatory process will also be based on the actual situation of enterprises at any time to make the decision to slow down, stop or even withdraw the loan. After the issuance of environmental labels, the financial constraints of heavily polluting enterprises increase more than other enterprises, and their debt and equity financing channels are restricted, with fewer bank loans and fewer stock issues in the future. The green credit policy increases the cost of debt financing for heavy polluters and shortens the maturity of their debt financing. Affected by the green credit policy, the interest-bearing debt financing and long-term liabilities of heavy polluters are significantly reduced. Wen et al. (2021) suggested that green credit policy reduces the bank credit allocation efficiency of heavy polluting enterprises.

Credit lines have a positive and significant effect on firms' R&D investments. Under the traditional banking development model, most of the heavy polluting enterprises belong to capital-intensive industries, which have insufficient internal financing and rely more on borrowing funds from outside to operate. Due to the existence of financing constraints, heavy polluters increase their cash holdings in order to minimize risks and avoid falling into financial crises. In the case of insufficient available funds, enterprises are forced to cut costs and abandon investment projects that may be expected to bring returns. Liu et al. (2015)[19] argued that the green credit policy can effectively inhibit the investment activities of heavily polluting enterprises in all periods. And the level of investment is positively correlated with the financial performance of enterprises. Active green investment is not only beneficial to the environment, but also brings better financial performance.

In summary, green credit policy guides the flow of funds from polluting enterprises to green environmental protection enterprises through differentiated credit operations, which leads to a significant increase in the financing cost and a significant decrease in the level of investment of heavy polluters, which in turn reduces the performance of heavy polluters. Based on this, we propose the second hypothesis:

H2: Green credit policy reduces firm performance through financing penalty effect and investment disincentive effect.

2.3. Heterogeneity Study on the Impact of Green Credit Policies on Firm Performance

Enterprises carry out production operations with the aim of making profits, but inevitably pollute the environment in the process. This creates a dilemma, namely the trade-off between corporate performance and environmental responsibility. Different industries and regions have different development conditions, and there are large differences in the pressure of environmental governance among enterprises. Green credit policies may have different impacts on enterprises with different property rights and sizes.

On the one hand, there are differences in the responses of state-owned enterprises (large enterprises) and non-state-owned enterprises (small enterprises) to green credit policies. Large firms tend to be more focused on long-term interests than small firms, and in order to be supported by the government, they have to respond positively to state policies. Brännlund et al. (1995) argue that large firms are more affected by environmental regulation than small firms. In addition, SOEs need to take on more social and environmental responsibility and take on the function of transmitting national policies. In addition to profitability, SOEs need to be concerned about their social ratings, and they will be more sensitive to external government regulation. On the other hand, the government intervenes less in non-SOEs and their business strategies tend to be more flexible. Enterprises also pay more attention to their own economic effects, and when facing the policy pressure brought by environmental regulation, they will consider their own operating conditions and weigh the policy preferences and pollution control costs, so as to maximize their benefits. On the other hand, different enterprises can enjoy different government subsidies and credit policies. Large enterprises have higher credibility and more assets available for collateralization, and banks are more inclined to finance large enterprises in order to reduce credit risks. In order to reduce credit risks, banks are more inclined to finance large enterprises. Small and medium-sized enterprises, on the other hand, have a less stable capital chain and a weaker ability to resist risks, and are in a weaker position in the competition. At the same time, state-owned enterprises are supported by the government, enjoy certain financing facilities, and have obvious advantages in obtaining government subsidies.

Smaller firms (non-SOEs) are subject to greater financing constraints than larger firms (SOEs), and thus firm performance is more affected. However, SOEs as well as large firms are more dependent on bank credit while enjoying financing facilities. Green credit policy mainly affects the performance of SOEs and large enterprises. And the effect of the penalty may not be obvious for those firms that are unable to obtain sufficient credit in the first place. Based on this, we propose a third hypothesis:

H3: There is an asymmetry in the penalizing effect of green credit policies.

3. Research Design

3.1. Data Sources

Based on the data of A-share listed companies in Shanghai and Shenzhen from 2008 to 2015, this paper provides an in-depth analysis of how green credit policy affects corporate performance.

3.2. Data Processing

- (1) Removal of financial companies.
- (2) Excluding companies with losses for two consecutive years.
- (3) All continuous variables are trimmed by 1% and 99% to exclude outlier effects.

3.3. Modeling

This paper examines the impact of green credit policy on the performance of heavily polluting firms by constructing a DID model:

$$Performance_{i,t} = \beta_0 + \beta_1 Post_t * Treat_i + \beta_2 Post_t + \beta_3 Treat_i + \sum \gamma_k Control_{i,t} + \sum Industry + \sum Year + \varepsilon_{i,t}$$

Where $Performance_{i,t}$ is the explanatory variable, referring to the study of Su Dongwei (2018) et al. In this paper, we use ROA to measure. $Post_t$ is a time dummy variable, the value is 1 when time $t \geq 2012$, otherwise it is 0. $Treat_i$ is a grouping dummy variable, according to the "Guidelines on Environmental Information Disclosure of Listed Companies" issued by China

Environmental Protection Bureau in 2010, we choose 16 heavy polluting industries such as electrolytic aluminum, petrochemical, tanning leather, etc. If the firm belongs to these 16 heavily polluted industries, we include them in the treatment group, and $Treat_{it}$ equals to 1; otherwise, we include them in the control group, and $Treat_{it}$ equals to 0. $Control_{i,t}$ is a control variable, and we select firm size ($Size_{i,t}$), leverage ratio ($LEV_{i,t}$), intangible asset ratio ($IA_{i,t}$), capital intensity ($CI_{i,t}$), senior management shareholding ($MH_{i,t}$), firm age ($Age_{i,t}$), fixed asset ratio ($FA_{i,t}$), and the size of senior management team ($Msize_{i,t}$). Σ Industry and Σ Year are industry and year fixed effects, respectively.

4. Empirical Analysis

4.1. Descriptive Statistics

As shown in Table 1, the mean value of ROA is 0.052 while the standard deviation is 0.048, which indicates that there is a large gap in the ROA of the sample firms, and the mean value of $Treat_{it}$ is 0.352, which indicates that the sample of the treatment group accounts for 35.2% of the total sample.

Table 1. Descriptive statistics

| Variable | N | Mean | p50 | SD | Min | Max | Range |
|------------|------|-------|-------|-------|--------|-------|-------|
| roa w | 7138 | 0.052 | 0.046 | 0.048 | -0.083 | 0.214 | 0.297 |
| treat post | 7138 | 0.217 | 0 | 0.412 | 0 | 1 | 1 |
| post | 7138 | 0.646 | 1 | 0.478 | 0 | 1 | 1 |
| treat | 7138 | 0.352 | 0 | 0.478 | 0 | 1 | 1 |
| lassetw | 7138 | 21.95 | 21.71 | 1.276 | 19.9 | 26.33 | 6.427 |
| levw | 7138 | 0.367 | 0.353 | 0.201 | 0.021 | 0.822 | 0.801 |
| IAw | 7138 | 0.047 | 0.035 | 0.048 | 0 | 0.301 | 0.301 |
| IClw | 7138 | 12.46 | 12.43 | 1.071 | 9.63 | 15.46 | 5.828 |
| mgsharew | 7138 | 0.163 | 0.019 | 0.216 | 0 | 0.7 | 0.7 |
| lagew | 7138 | 1.684 | 1.609 | 0.601 | 0.693 | 2.773 | 2.079 |
| FAw | 7138 | 0.235 | 0.202 | 0.161 | 0.004 | 0.719 | 0.715 |
| lMsizew | 7138 | 1.848 | 1.792 | 0.351 | 1.099 | 2.708 | 1.609 |

4.2. Multiple Regression

In Table 2, columns 1 and 2 show the results of the regressions without and with control variables, respectively. The coefficients of $Post * Treat$ are -0.005 and -0.004 respectively, which are both significantly negative. This suggests that green credit has a "punitive effect" on the performance of heavy polluting firms, i.e., green credit may lead to limited sources of financing and reduce the production scale of heavy polluting firms, which ultimately affects their performance, which supports our Hypothesis I. The coefficients of columns 1 and 2 show the results of regressions without and with control variables. Table 3 also reports the effects of other control variables on firm performance. For example, leverage and capital intensity are negatively related to firm performance.

Table 2. Multiple regression

| | SA | Roa_w |
|------------|-----------|-----------|
| treat_post | 0.005** | |
| | -1.98 | |
| post | 0.122*** | |
| | -29.61 | |
| treat | 0.024*** | |
| | -3.87 | |
| lasset_w | 0.016*** | 0.007*** |
| | -9.92 | -4.29 |
| lev_w | -0.019*** | -0.081*** |
| | (-3.55) | (-18.00) |
| IA_w | -0.036* | -0.039** |
| | (-1.66) | (-2.12) |
| ICI_w | -0.003** | -0.005*** |
| | (-1.96) | (-3.89) |
| mgshare_w | -0.072*** | 0.042*** |
| | (-8.94) | -4.97 |
| lage | 0.140*** | |
| | -50.5 | |
| FA_w | -0.067*** | -0.032*** |
| | (-7.26) | (-3.91) |
| lmsize_w | 0.010*** | 0.005** |
| | -3.61 | -2.33 |
| sa1_w | | -0.034*** |
| | | (-3.35) |
| lage_w | | -0.003 |
| | | (-1.32) |
| _cons | 2.762*** | 0.099*** |
| | -71.03 | -2.77 |
| N | 7138 | 7138 |
| r2_a | | -0.131 |
| F | | 78.15 |
| year | Yes | Yes |
| indus_b | Yes | Yes |

4.3. Mechanism Testing

In this paper, the SA index is used to test whether financing constraints are a channel through which green credit affects the performance of heavily polluting firms. Referring to the study of Hadlock and Pierce (2010), the following model is used to calculate the financial constraints of listed companies:

$$SA_{i,t} = -0.737Size_{i,t} + 0.043Size_{i,t}^2 - 0.04Age_{i,t}$$

The larger the SA index is, the larger the financing constraints of the firms are. Firstly, the SA index is regressed as an explanatory variable to get the effect of green credit on financing; then it is added as an explanatory variable into the double difference model for regression to get the effect of financing on the financial performance of enterprises.

$$SA_{i,t} = \alpha_0 + \alpha_1 Post_t * Treat_i + \alpha_2 Post_t + \alpha_3 Treat_i + \sum_k \gamma_k Control_{k,i,t} + \sum Industry + \sum Year + \epsilon_{i,t}$$

$$Performance_{i,t} = \beta_0 + \beta_1 SA_{i,t} + \sum_k \gamma_k Control_{k,i,t} + \sum Industry + \sum Year + \epsilon_{i,t}$$

Table 3. Financing constraint effects

| | SA | Roa_w |
|------------|-----------|-----------|
| treat_post | 0.005** | |
| | -1.98 | |
| post | 0.122*** | |
| | -29.61 | |
| treat | 0.024*** | |
| | -3.87 | |
| lasset_w | 0.016*** | 0.007*** |
| | -9.92 | -4.29 |
| lev_w | -0.019*** | -0.081*** |
| | (-3.55) | (-18.00) |
| IA_w | -0.036* | -0.039** |
| | (-1.66) | (-2.12) |
| ICI_w | -0.003** | -0.005*** |
| | (-1.96) | (-3.89) |
| mgshare_w | -0.072*** | 0.042*** |
| | (-8.94) | -4.97 |
| lage | 0.140** | |
| | -50.5 | |
| FA_w | -0.067*** | -0.032*** |
| | (-7.26) | (-3.91) |
| lmsize_w | 0.010*** | 0.005** |
| | -3.61 | -2.33 |
| sa_w | | -0.034*** |
| | | (-3.35) |
| lage_w | | -0.003 |
| | | (-1.32) |
| _cons | 2.762*** | 0.099*** |
| | -71.03 | -2.77 |
| N | 7138 | 7138 |
| r2_a | | -0.131 |
| F | | 78.15 |
| year | Yes | Yes |
| indus_b | Yes | Yes |

Table 3 reports the regression results for the effect of financing constraints. In the first stage, the coefficient of *Treat* Post* is 0.005, which is significantly positive. The results indicate that

green credit increases the financing constraints of heavily polluting firms. In the second stage, the SA index is significantly negatively related to firm performance. This indicates that financing constraints reduce firm performance. The above results indicate that increasing corporate financing constraints is one of the channels through which green credit policy reduces the performance of heavy polluting firms, which supports hypothesis two.

In order to test whether corporate investment is a channel through which green credit policy affects the performance of heavy polluters, we introduced the INV index to measure corporate investment: $INV_{i,t} = Cash_LA_{i,t} / Assets_{i,t}$ where $Cash_LA_{i,t}$ is the cash payment of long-term assets in the current year, and $Assets_{i,t}$ is the initial total assets. The larger the INV index is, the higher the level of corporate investment is. Then, we tested the role of corporate investment by first regressing the INV index as an explanatory variable to get the effect of green credit on investment; and then regressing it as an explanatory variable by adding it to the double difference model to get the effect of investment on corporate financial performance.

$$INV_{i,t} = \alpha_0 + \alpha_1 Post_i * Treat_i + \alpha_2 Post_t + \alpha_3 Treat_t + \sum_k \gamma_k Control_{k,i,t} + \sum Industry + \sum Year + \epsilon_{i,t}$$

$$Performance_{i,t} = \beta_0 + \beta_1 INV_{i,t} + \sum_k \gamma_k Control_{k,i,t} + \sum Industry + \sum Year + \epsilon_{i,t}$$

Table 4. Investment disincentive effects

| | (1) | (2) |
|------------|-----------|-----------|
| | INV_w | Roa_w |
| treat_post | -0.016*** | |
| | (-5.04) | |
| post | -0.033*** | |
| | (-8.00) | |
| treat | 0.018*** | |
| | (4.74) | |
| lasset_w | 0.006*** | 0.007*** |
| | (4.62) | (9.14) |
| lev_w | 0.008 | -0.093*** |
| | (1.35) | (-25.82) |
| IA_w | 0.197*** | -0.049*** |
| | (8.73) | (-3.50) |
| ICI_w | 0.004*** | -0.005*** |
| | (2.72) | (-6.03) |
| mgshare_w | 0.006 | 0.011*** |
| | (1.04) | (2.77) |
| lage_w | -0.025*** | 0.000 |
| | (-11.72) | (0.12) |
| FA_w | 0.020** | -0.028*** |
| | (2.16) | (-4.86) |
| lMsize_w | 0.004 | 0.006*** |
| | (1.19) | (3.01) |
| INV_w | | 0.047*** |
| | | (6.91) |
| _cons | -0.039 | -0.032* |
| | (-1.37) | (-1.76) |
| N | 7138 | 7138 |
| r2_a | | |
| F | | |
| year | Yes | Yes |
| indus_b | Yes | Yes |

Table 4 reports a two-stage mechanistic analysis of firms' investment, where in the first stage, the coefficient of $Treat_i * Post_t$ is significantly negative at -0.016. This indicates that green credit reduces the level of investment in heavily polluting firms. In the second stage, INV index is significantly positively correlated with firm performance. This indicates that the investment level of firms contributes to the performance of firms. To sum up, green credit prompts firms to change their investment behavior and reduce their investment level, which in turn affects firms' performance. Therefore, firms' investment is also a channel through which green credit affects firm performance, which supports hypothesis two.

4.4. Heterogeneity Test

Table 5. State-owned versus non-state-owned enterprises

| | (1) State-owned enterprises | (2) Non-state enterprises |
|------------|-----------------------------|---------------------------|
| | roa_w | roa |
| treat_post | -0.019*** (-6.94) | 0.006* (1.91) |
| post | -0.007* (-1.78) | -0.019*** (-4.70) |
| treat | 0.009** (2.20) | 0.007** (2.07) |
| lasset_w | 0.005*** (4.08) | 0.011*** (8.49) |
| lev_w | -0.099*** (-17.85) | -0.103*** (-18.98) |
| IA_w | -0.033* (-1.67) | |
| ICI_w | -0.001 (-0.41) | |
| mgshare_w | 0.074** (2.01) | 0.011** (2.25) |
| lage_w | -0.004* (-1.68) | 0.001 (0.55) |
| FA_w | -0.037*** (-4.14) | -0.026*** (-2.93) |
| lmsize_w | 0.007** (2.30) | |
| IA | | -0.054*** (-2.61) |
| ICI | | -0.007*** (-5.82) |
| lmsize | | 0.008*** (3.07) |
| _cons | -0.041 (-1.44) | -0.077*** (-2.74) |
| N | 2493 | 4645 |
| r2_a | | |
| F | | |
| year | Yes | Yes |

Table 6. Large Enterprises and small business

| | (1) Large enterprises | (2) Small enterprises |
|------------|-----------------------|-----------------------|
| | roa_w | roa_w |
| treat_post | -0.008*** | 0.001 |
| | (-3.16) | (0.49) |
| post | -0.010*** | -0.010** |
| | (-2.97) | (-2.45) |
| treat | 0.006* | 0.010*** |
| | (1.70) | (2.94) |
| lasset_w | 0.006*** | 0.008*** |
| | (5.01) | (4.05) |
| lev_w | -0.102*** | -0.081*** |
| | (-20.62) | (-14.84) |
| IA_w | -0.050** | -0.035* |
| | (-2.53) | (-1.71) |
| ICI_w | -0.004*** | -0.006*** |
| | (-3.40) | (-4.64) |
| mgshare_w | 0.009 | 0.017*** |
| | (1.24) | (3.43) |
| lage_w | 0.001 | -0.004** |
| | (0.50) | (-2.04) |
| FA_w | -0.040*** | -0.020** |
| | (-4.88) | (-2.22) |
| lmsize_w | 0.009*** | 0.001 |
| | (3.40) | (0.43) |
| _cons | 0.001 | -0.024 |
| | (0.02) | (-0.61) |
| N | 3574 | 3564 |
| r2_a | | |
| F | | |
| year | Yes | Yes |
| indus_b | Yes | Yes |

In order to investigate whether the relationship between green credit policy and the performance of heavy polluters is affected by property rights, we divide the sample into state-owned and non-state-owned firms. Large-cap and small-cap subsamples. Enterprises controlled by the state are state-owned enterprises, otherwise they are non-state-owned enterprises. To investigate whether the relationship between green credit policy and the performance of heavy polluters is affected by firm size, we divide the sample into large-cap and small-cap firms, where a firm is large-cap if its market capitalization is higher than the median of the sample firms, and small-cap otherwise. Tables 5 and 6 report the effects of green credit on property rights and firm size. The coefficients on the interaction terms are significantly negative for SOEs and large firms and insignificant for non-SOEs and small firms. The findings suggest that SOEs and large cap firms are more likely to access credit facilities through financial institutions through their business credit and reputation than non-SOEs and small cap firms. Therefore, the "penalizing effect" of the green credit policy mainly affects State-owned enterprises and large-cap companies, which supports hypothesis three.

4.5. Robustness Tests

Table 7. Parallel trend test

| | (1) |
|-----------|-----------|
| | roa_w |
| Pre_3 | -0.000 |
| | (-0.11) |
| Pre_2 | -0.002 |
| | (-0.48) |
| Pre_1 | -0.004 |
| | (-1.04) |
| Post_1 | -0.005 |
| | (-1.24) |
| Post_2 | -0.004 |
| | (-0.93) |
| Post_3 | -0.006 |
| | (-1.60) |
| Post_4 | -0.009** |
| | (-2.22) |
| lasset_w | 0.008*** |
| | (4.70) |
| lev_w | -0.081*** |
| | (-18.01) |
| IA_w | -0.038** |
| | (-2.05) |
| lcl_w | -0.005*** |
| | (-3.75) |
| mgshare_w | 0.046*** |
| | (5.40) |
| lage_w | -0.001 |
| | (-0.41) |
| FA_w | -0.031*** |
| | (-3.84) |
| lmsize_w | 0.005** |
| | (2.22) |
| _cons | -0.031 |
| | (-0.88) |
| N | 7138 |
| r2_a | -0.121 |
| F | 34.915 |
| year | Yes |
| indus_b | Yes |

Table 7 reports the regression results of the parallel trend test. There is no significant difference between the treatment and control groups in terms of firm performance before the implementation of the green credit policy. These results indicate that the parallel trend assumption is satisfied.

5. Conclusion and Suggestions

Taking 2008-2019 as the research interval, this paper examined the impact of green finance on the performance of listed enterprises in China by using the DID model. The study found that after the promulgation of the guidelines, the performance of heavy polluting enterprises has declined more than that of non-heavy polluting enterprises, and non-state-owned and small heavy polluting enterprises have been more affected. The dynamic effect found that the inhibitory effect of the policy on the performance has a certain time lag, and the inhibitory effect became more significant from the third year and increased year by year, while the inhibitory effect weakened from the fifth year after the implementation of the policy. The mechanism inspection shows that after the implementation of the guidelines, it does not improve the performance of the enterprise. It may be the green innovation of the enterprise and enhance the core competitiveness, and the policies, in consideration of environmental protection, which will bring negative impact on the enterprise performance. Further research found that the improvement of marketization level and the enhancement of corporate social responsibility can alleviate the inhibitory effect of policy on corporate performance.

Based on the above conclusion, this paper puts forward the following policy Suggestions:

(1) From the government point of view, should intensify enterprise environmental pollution penalties, establish and improve the enterprise environmental information disclosure mechanism, improve the level of information disclosure, through the establishment of information service platform to the public timely and accurate open enterprise environmental protection situation and pollution penalties, play supervision by public opinion, and share enterprise environmental data, provide reference for the bank green credit audit process. First, considering the large differences in economic development and marketization level in China, the government should formulate the effectiveness of green financial policies according to local conditions, avoid banks wasting credit resources to meet the total green credit target; second, green credit policies have a certain negative effect on the performance of some heavily polluting enterprises. The government should introduce the corresponding incentive measures, while inhibiting heavy polluting enterprises from investing in pollution projects, while providing corresponding financial support for green transformation, mobilize the enthusiasm of green lifting and polluting enterprises; Finally, to improve the green credit system, strengthen the construction of green credit risk management indicators and system, Guarantee the green letters.

(2) From the bank point of view, should establish and perfect the green credit management system, differentiated green credit credit policy, break the traditional financial discrimination, balance good state-owned and non-state, large and small heavy pollution listed companies financing position, give environmental protection enterprises should have green credit support, avoid rent-seeking activities lead to green credit resources waste, improve the efficiency of green credit capital allocation at the same time expand the coverage of green credit. We will strictly control the review process of heavily polluting enterprises or projects, raise the threshold of green credit financing, monitor the use of green credit funds in real time, strengthen risk management, avoid environmental pollution problems in the implementation process of projects, and threaten the safety of bank credit funds. Banks should strengthen the innovation of green financial instruments, improve the service capabilities and professional capabilities of green business, and reduce the information asymmetry between banks and enterprises through the establishment of an information platform.

(3) From the enterprise point of view, should strengthen corporate green governance, set up the concept of green innovation long-term development, actively carry out green innovation research and development activities, the more research and development funds for high gold content of green invention patent rather than green utility model patent, improve the quality

of green innovation patent rather than quantity, bring "innovation compensation benefit", thus improve the enterprise core competitiveness. Mobilize the enthusiasm and initiative of enterprises in green environmental protection, strengthen the supervision of stakeholders over the environmental conditions of enterprises, avoid managers from investing in projects that may cause environmental pollution, improve the investment efficiency of enterprises, and reduce the operational risks of enterprises. As market subjects, enterprises should actively assume social responsibilities, improve the level of enterprise environmental information disclosure, reduce and establish a good relationship with the information asymmetry with banks, investors and other market entities, and finally achieve the "win-win" of enterprise performance and social benefits.

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