Central Environmental Protection Supervisor, Nature of Property Rights and Corporate Financial Performance

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Abstract

After the central environmental protection inspector, the external environmental regulatory environment facing enterprises has undergone tremendous changes. This paper uses the double-difference method, using data from Shanghai and Shenzhen A-share listed companies from 2013 to 2017, to empirically test the impact of the central environmental protection inspector and its mechanism. The research results show that the financial performance of listed polluting companies has significantly improved after the central environmental supervision, but the improvement of financial performance has heterogeneity of property rights, and state-owned enterprises are significantly higher than non-state-owned enterprises. Further analysis shows that there is significant positive earnings management in state-owned listed polluting enterprises, while non-state-owned enterprises are not. This paper analyzes the impact of the central environmental protection inspector on the production and operation of the enterprise in a timely manner, and beneficially supplements the differences in earnings management of heavily polluting enterprises in the procyclical period, and supplements relevant literature.

Keywords

Environmental Inspector, Financial Performance, Earnings Management

1. Introduction

The problem of air pollution accompanying China's rapid economic growth has caused more and more attention. Since environmental pollution has caused widespread concern, prevention and control of air pollution has become an important part of national environmental protection policies. The determination of government has never been stronger.

As early as September 2013, the State Council issued the "Notice on Printing and Distributing Action Plan for Air Pollution Prevention and Control", including the steel, petrochemical, chemical, non-ferrous metal smelting, cement and so on. In order to implement the mission requirements of the State Council's "Ten Atmospheric Policies", local governments have successively issued regional air pollution control action plans. Although the local government has issued a local air pollution control action plan, based on the inertia of the "promotion championship", the "GDP-only theory" is still raging. China's political centralization and economic decentralization determine that local governments lack a central government. When there is strict supervision, there is no strong incentive to conduct compulsory pollution prevention. On January 4, 2016, the Central Environmental Supervision Team, officially unveiled and supervised the environmental protection work of the local government, which opened a new chapter in China's air pollution control. Increasingly strict environmental protection policies have led to a large number of small businesses in the heavy chemical pollution industry not being able to withstand high compliance costs and being forced to suspend production. Large-scale companies that "survive" quickly occupied blank markets and the prices of finished products rose rapidly under the market situation of insufficient supply. The large companies in the market are making a lot of money, and the "Matthew Effect" of the strong to be stronger is extremely obvious.

The emission of subsidiary pollutants in the production process of enterprises actually brings negative externalities to the society for the enterprises. Based on the assumption of rational people, companies do not have enough willingness to assume their own social responsibilities and deal with environmental pollution caused by their own production processes. Therefore, environmental regulations restrict formal and informal approaches to corporate behaviors, prompting them to internalization of negative externalities. The strict environmental protection inspection brought by the "exogenous" organization of the Central Environmental Protection Inspection Group, which was established in January 2016, is regarded as a quasi-natural experiment, and an empirical study of its policy effectiveness is based on the "follow the cost theory".

Finally, the particularity of the socialist market economy with Chinese characteristics determines that even the same policy will have very different impacts on state-owned enterprises and non-state-owned enterprises. Therefore, the focus of this study is to identify the different effects of this policy on state-owned and non-state-owned enterprises. This article analyzes its mechanism of action and influence path through the financial data of the enterprise, and provides empirical evidence for the "follow the cost theory". Based on China's national conditions, this article has thoroughly examined the different impacts of strict environmental inspections on different enterprises and different regions, using data to prove the effectiveness of policies, and provides a certain reference value for policy makers to further optimize air pollution control policies.

2. Literature Review

At present, there is little research on the financial performance of enterprises by the central environmental protection inspectors. This section aims to systematically collate and summarize the relevant literature in an attempt to explain the motivation of the company's environmental protection and its strategies when facing environmental inspections. This relationship provides literature support for theoretical analysis and empirical testing of its internal mechanism and implementation path.

2.1. Environmental Regulation

In China, the role of central government and local governments in environmental regulation has attracted researchers' attention. Besides, the relationship between environmental regulation and economic growth has always been a hot topic of research. Whether environmental regulation can restrain environmental pollution has not yet reached a consensus conclusion.

2.1.1. Central Government Environmental Regulation

From the perspective of macroeconomic growth, Grossman and Krueger (1991) proposed the environmental Kuznets curve, and they found that there is an inverted U-shaped relationship between economic growth and environmental pollution. The environmental quality first deteriorates with economic growth. Only after the inflection point will there be a balance situation between economic growth and environmental protection. The central government has formulated corresponding policies and a series of regulations for the governance of the environment.

Cui and Jiang (2019) found that the impact of the implementation of the new "Environmental Protection Law" on environmental protection investment of enterprises has always been insignificant, but it has a significant negative impact on the production scale of enterprises in the early stage of implementation. Zhai and Liu (2019) examined that environmental justice specialization can effectively promote the environmental governance of enterprises in the region, and that the enterprise conducts environmental governance by expanding overall capital investment, but corporate environmental governance investment inhibits productive capital investment. The central environmental protection inspector is also a special measure formulated by the central government to urge local governments to implement environmental supervision responsibilities.

2.1.2. Environmental Regulations of Local Governments

Although the central government has formulated a series of policies, local governments have not strictly implemented their environmental supervision responsibilities. Zhou (2007) pointed out that in the political context of "economic construction as the core", infrastructure and GDP growth occupies a more important position than environmental protection in the assessment of performance. Li and Zheng (2016) found that when the pressure of local air pollution

control is high, due to the pressure of pollution prevention, relevant persons in charge reduce the approval of fixed-asset investment projects. Local governments and officials have the motivation to sacrifice environmental protection to promote local economic growth. Shi et al. (2016) examined that in politically sensitive times, local governments have greater incentives to increase environmental protection and create a temporary "political blue sky", which will not affect long-term economic growth. Shen and Zhou (2017) showed that the central environmental protection interview has significantly improved the environmental performance of enterprises in the interviewed area.

According to the above literature, whether environmental regulations can promote economic growth or suppressing environmental pollution has not yet been agreed. Based on their own interests, local governments have not fully implemented environmental policies, affecting the effectiveness of the central government's environmental regulations.

2.2. Environmental Accounting

Pigou (2014) raised the externality of pollution. He made a clear distinction between marginal net private products and marginal net social products. The externality theory reveals the external nature of the pollution problem in an economic sense, thereby laying a theoretical foundation for future generations to use economic means to solve environmental problems. Enterprise contract theory and new institutional economics consider companies to be a combination of explicit and implicit contracts. In response to externalities, Coase (1960) proposed the famous Coase theorem: as long as property rights are clear, externalities can be negotiated Compensation is resolved, thereby internalizing external issues. Zhou and Tao (2012) pointed out on environmental issues that polluting enterprises have negative externalities to society and other enterprises. To address this negative externality, some measures must be taken to internalize externality.

2.2.1. Environmental Regulation and Corporate Environmental Governance

In the face of environmental pollution caused by enterprises, external laws and regulations and informal systems are designed to internalize negative externalities, which have affected the behavior of enterprises. Tang et al. (2013) found that the lack of environmental protection investment in China's listed companies is common. Environmental protection investment is a "passive" behavior for enterprises. In comparison, companies in heavily polluting industries have invested more than non-heavy polluting industries, and state-owned enterprises will invest more in environmental protection than non-state-owned enterprises. Hu et al. (2017) found that when the chairman and general manager work in their hometown, the enterprise's environmental investment is more, indicating that the hometown identification of the executives has a positive role in promoting environmental governance behaviors. Ji and Su (2016) pointed out that

the internalization of environmental costs of enterprises is driven by compliance purposes rather than economic benefits. Long and Wan (2017) found that the implementation of cleaner production standards significantly improved the profitability of enterprises, but did not promote corporate innovation or increase corporate subsidies.

2.2.2. Environmental Regulation and Corporate Efficiency

When enterprises have undertaken the responsibility for environmental protection, the impact of environmental governance on production efficiency has also attracted scholars' attention.

Sheng and Zhang (2019) believed that the productivity growth rate of enterprises in the two control areas with strict environmental regulations is significantly lower than that in non-two control areas, indicating that the policy of the two control areas has hindered productivity growth by increasing production costs. Zhang and Sheng (2019) argued that front-end pollution control has significantly improved the productivity of enterprises. Xiao et al. (2020) found that environmental regulation has a significant positive direct effect on green total factor productivity.

As mentioned above, companies would internalize external costs by actively taking social responsibility and participating in environmental governance. However, the study of environmental regulation on the production efficiency of enterprises has not yet reached a consistent conclusion.

2.3. Earnings Management

Earnings management is an important issue closely related to investor protection and the establishment of accounting standards. Therefore, earnings management is an old and vital topic in the field of accounting. Earnings management related research focuses on accrued profits.

Dechow & Dichev (2002) believed that accrual earnings management is the act of obscuring or adjusting the performance of an enterprise by changing accounting policies or accounting estimates. Accrual earnings management will not change the long-term value of the company, but it will affect the distribution of profits in each accounting period and affect the short-term judgment of investors and regulators.

2.3.1. Earnings Management in Polluting Companies

Liu and Liu (2015) based on the research of the political cost hypothesis, and empirical results prove that after the "PM2.5 burst" incident, compared with non-heavy polluting companies, heavily polluting companies have conducted significant downward earnings management. Chen and Chen (2018) found that in the face of policy uncertainty caused by changes in local leaders, local listed companies will increase the degree of earnings management to reduce policy costs that may increase in the future. The central environmental protection inspection is a change in the external environment and will bring certain uncer-

tainty to the business environment of the enterprise.

2.3.2. Industry Factors and Earnings Management

Chen (2013) showed that the degree of earnings management of cyclical industry companies is generally greater than that of non-cyclical industries; the degree of earnings management is greater than the expansion period during economic contraction, but this difference is mainly caused by cyclical industry companies. Wang et al. (2015) examined that when management expects the company's profit to be less than the industry's profit, positive earnings management and the macroeconomic growth rate have a significantly positive correlation with a procyclical characteristic. Hu and Wang (2019) found that heavy polluting enterprises that perform environmental responsibility have higher earnings quality, market value and market share. Heavy polluting enterprises with lower financial risk can significantly improve their surplus quality and market value if they fulfill environmental responsibility.

To sum up, enterprises pollute the environment from negative externalities. In order to solve this negative externality, environmental regulations are required for enterprises. Environmental regulation will affect macroeconomic efficiency and microscopic corporate behavior.

When implementing environmental regulations, local governments did not strictly implement the policies of the central government. However, the current central environmental inspection has adopted stricter supervision measures than in the past, and there is relatively little research on whether it will affect enterprises. After this central environmental protection inspection, how the heavily polluting enterprises in the pro-cyclical period will carry out earnings management is also worth discussion.

3. Theoretical Analysis and Research Assumptions

When the central government implements strict environmental inspections, local governments must strictly implement environmental protection policies. This has led to the closure of small and medium-sized enterprises in the heavy chemical industry that are difficult to meet pollutant emission levels, and the supply in the market is less than demand. The prices of finished products will rise rapidly, which will lead to the rapid growth of equity net profit margin. Research by Ji and Su (2016) shows that the higher the internalization of pollution costs will have a negative impact on corporate profitability, and research by Long and Wan (2017) showed that environmental regulation can increase the profitability of big enterprises, but it will reduce the profitability and the number of small-scale enterprises with high compliance costs. Therefore, when examining the rapid rise in operating income, there will be new findings on the difference in profitability between state-owned enterprises and non-state-owned enterprises. This paper proposes H1:

H1: Strict environmental inspections have led to a significant increase in the financial performance of the heavy chemical industry, but there are differences

between companies with different property rights.

Chen (2013) pointed out that the degree of earnings management of cyclical industries is generally greater than that of non-cyclical industries. After the central environmental supervision, the demand for the main products of listed companies in the heavily polluting industries is relatively strong, so they are relatively in the industry expansion cycle. Although the financial performance of enterprises has improved significantly, there is a gap in the improvement of financial performance between companies with different property rights. Wang et al. (2015) believed that when the company's management expects the company's profit to be less than the industry's profit, positive earnings management and macroeconomic growth rate have a significantly positive correlation with a procyclical feature. When the industry's profitability increases, many stakeholders hope that the performance of the company will also be better, so non-state-owned enterprises with poor profitability carry out earnings management to meet the requirements of stakeholders. After the central environmental supervision, the demand for the main products of listed companies in the heavily polluting industries is relatively strong, so they are relatively in the industry expansion cycle. This paper proposes H2:

H2: After strict environmental inspections, the heavy chemical industry carried out significant positive earnings management, but non-state-owned enterprises were significant, and state-owned enterprises were not.

According to H2, after the central environmental protection inspectorate, heavily polluting companies will improve their earnings management level, but this may vary between different regions. Liu and Liu (2015) showed that high-pollution companies will conduct negative earnings management in order to avoid higher political costs, so companies in air pollution prevention areas cannot conduct upward earnings management because if upward earnings adjustments are made, which will attract more social attention and face higher political costs. These companies also cannot carry out negative earnings adjustment, because companies in non-environment-friendly key inspection areas are performing positive earnings adjustment. Negative earnings adjustment will inevitably widen the profit gap between enterprises from non-environmental protection key inspection regions and not meet the needs of stakeholders. This paper proposes H3:

H3: After strict environmental inspections, the enterprises in the key areas of inspection did not perform significant earnings management, and the enterprises in the non-key areas performed significant positive earnings management.

4. Research Design

As the same environmental inspections will have different impacts on enterprises in different industries, after the PM2.5 explosion, companies in heavily polluting industries have conducted significant negative earnings management in order to avoid political costs. The heavy chemical industry is more sensitive to environmental protection. According to the annual operation status of various

industry associations announced by heavy chemical industry, the huge impact of environmental protection on the industry can also be seen, while the industry association documents of the light industrial manufacturing, service industry, and agriculture, forestry, animal husbandry and fisheries industries with less environmental pollution contribute to environmental protection. There are fewer expressions, so you can use the Differences in Differences (DID) method to examine the impact on the production and operation of the enterprise.

4.1. Variable Selection

According to previous studies, the following variables are selected in this paper. The specific variable definitions are shown in the following Table 1:

Table 1. Variable definition table.

Variable name	Symbol	Variable definitions
Equity net profit margin	Roe	Equity net profit margin for the year
Operating margin	Ros	Operating Margin for the Year
Total factor productivity	Tfp_OP	Total factor productivity calculated by Tfp_OP method
Accrued earnings management	Em	Adjusted Jones Model Calculation
Degree of pollution	Treat	1 for heavy chemical industry, 0 for non-heavy chemical industry
Strict environmental inspections	Post	2016-2017 take 1, 2013-2015 take 0
Pollution degree * strict environmental inspections	Treat * Post	Pollution degree and strict environmental inspections
Company size	Size	Natural logarithm of total assets
Total assets net profit margin	Roa	Net Profit/Total Assets
Gearing ratio	Lev	Total Liabilities/Total Assets
Cash Flow	Cfo	Net Operating Cash Flow/Total Assets of Previous Period
Nature of property right	Soe	The company's ultimate controller is 1 for the country, otherwise 0
Equity concentration	Shrer	The shareholding of the largest shareholder
Proportion of independent directors	Idrt	Proportion of independent directors to the size of the board
Age of company	Age	The natural logarithm of company's age
Number of employees	Worker	The natural logarithm of the number of employees
Accounting firm size	Audit	Big4 take 1, otherwise 0
Whether to issue additional	So	Dummy variable, take 1 for additional issuance and 0 for no additional issuance.
Whether to distribute the share	Ro	Dummy variable, take 1 for share placement, 0 for no share placement
Whether to lose money	loss	The company's loss for the year is 1, otherwise it is 0

4.2. Model Building

Based on the double-difference method used in this paper, the following model is constructed with reference to the method of Long and Wan (2017) to test the empirical results of this paper.

The regression equation is as follows

$$Y_{i,t} = \alpha_i + \beta_1 \text{Treat}_{i,t} \times \text{Post}_{i,t} + \beta_2 \text{Treat}_{i,t} + \beta_3 \text{Post}_{i,t} + \gamma Z_{i,t} + \varepsilon_{i,t} \tag{1}$$

In Equation (1), the dependent variables include the company's financial performance and accrued earnings management level. Treat is a dummy variable, which is 1 if it is a heavy chemical industry and 0 if it is a non-heavy chemical industry. In this article, the steel, petrochemical, chemical, non-ferrous metal smelting, cement, flat glass, and coal mining involved in the "Notice" are important. Polluting companies were regarded as heavy chemical industries, and eight industries were finally selected according to the 2012 industry classification of the CSRC. Post is a dummy variable, which is taken as 2016-2017 and 0 for 2013-2015. Since China has released a central-level environmental protection plan in 2013, the period after 2013 is selected as a better evaluation policy during the research period. The environmental protection inspection team was established on January 4, 2016, and basically covered the whole year of 2016, so it is appropriate to use 2016 as the year of policy impact. In regression analysis, this paper uses a fixed-effect model (FE), and controls the time-fixed effect and industry-fixed effect. The other control variables are represented by a matrix $Z(i, t)$. This article focuses on β_1, which represents the impact of the implementation of strict environmental inspections on the heavy chemical industry.

5. Empirical Analysis

5.1. Descriptive Statistics

This section conducts a descriptive statistical analysis of the main variables in the model, including the dependent, independent and control variables, involving the variable name, number of samples, average value, median, standard value, minimum value and max value. The specific results are shown in the following Table 2:

Table 2. Descriptive statistics of main variables.

Variable name	Number of samples	Average value	Standard deviation	Minimum value	Median	Max value
Roe	12635	0.06	0.10	−0.45	0.06	0.36
Em	9947	−0.003	0.13	−0.43	−0.01	0.51
Ros	12634	0.27	0.16	−0.01	0.23	0.79
Tfp_op	12618	5.25	0.38	4.44	5.22	6.51
Treat	12637	0.15	0.36	0.00	0.00	1.00
Post	12637	0.44	0.49	0.00	0.00	1.00

Continued

TP	12637	0.06	0.24	0.00	0.00	1.00
Size	12637	22.18	1.27	19.68	22.02	26.05
Roa	12635	0.04	0.05	−0.13	0.04	0.20
Lev	12636	0.42	0.20	0.05	0.41	0.90
Cfo	11867	0.04	0.08	−0.25	0.04	0.33
Soe	12637	0.37	0.48	0.00	0.00	1.00
Shrer	12637	0.34	0.15	0.003	0.32	0.90
Idrt	12635	0.37	0.05	0.33	0.35	0.57
Dual	12637	0.26	0.43	0.00	0.00	1.00
Age	12637	2.74	0.37	1.60	2.77	3.36
Worker	12632	7.66	10.26	4.38	7.59	11.14
Audit	12637	0.05	0.22	0.00	0.00	1.00
So	12637	0.17	0.37	0.00	0.00	1.00
Ro	12637	0.003	0.05	0.00	0.00	1.00
Loss	12637	0.08	0.27	0.00	0.00	1.00

As can be seen from Table 2 above, the observed values of the samples are basically 12637. The average equity net profit margin was 0.06, with a median of 0.06, basically balanced distribution of net profit margin business interests. The average operating profit rate of an enterprise is 0.27, the median is 0.23, the maximum is 0.79, and the minimum is −0.01. The average value of enterprise accrual earnings management is −0.003, the maximum value is 0.51, and the minimum value is −0.43, which is not much different from the data in existing literature.

5.2. Multiple Regression Analysis

5.2.1. The Analysis of H1

This paper focuses on the influence of the central environmental inspectors on the net profit margin caused by corporate interests. First perform a full sample regression, then group according to the nature of property rights. This article refers to Long and Wan (2017), and selects the following control variables: company size (Size); asset-liability ratio (Lev); cash flow (Cfo), net cash of operating activities The ratio of the flow to the total assets at the end of the previous period; the equity concentration (Shrer), the shareholding ratio of the largest shareholder in the enterprise; the nature of the property rights (Soe); and whether the loss (Loss).

From the regression results in Table 3, it can be seen that when the explanatory variable is Roe, there are 11,860 observations when performing full sample regression and the goodness of fit after adjustment is 0.09. The regression coefficient of the key variable Treat * Post (the crossover term between pollution level and strict environmental inspection), which is the focus of this article, is 0.04,

Table 3. Multiple regression analysis of H1.

	(1)	(2)	(3)
	Roe	Roe Soe = 0	Roe Soe = 1
Treat	0.154*** (3.228)	0.245*** (4.304)	−0.031 (−0.677)
Post	−0.021*** (−2.977)	−0.024** (−2.460)	−0.022* (−1.782)
TP	0.040*** (6.650)	0.015** (2.138)	0.065*** (7.005)
Size	0.037*** (7.465)	0.032*** (5.717)	0.033*** (2.945)
Lev	−0.160*** (−9.078)	−0.113*** (−5.371)	−0.251*** (−7.452)
Cfo	0.204*** (11.765)	0.204*** (9.636)	0.204*** (6.788)
Soe	−0.058*** (−3.071)		
Shrer	0.080*** (3.324)	0.096*** (3.433)	0.059 (1.211)
Idrt	−0.037 (−1.131)	0.026 (0.622)	−0.107** (−2.061)
Dual	−0.002 (−0.582)	−0.000 (−0.026)	−0.007 (−0.754)
Age	0.005 (0.228)	0.019 (0.703)	−0.010 (−0.228)
Worker	−0.011** (−2.409)	−0.001 (−0.128)	−0.027*** (−3.327)
Audit	0.011 (0.969)	0.007 (0.525)	0.019 (1.203)
_cons	−0.692*** (−6.030)	−0.815*** (−6.460)	−0.326 (−1.232)
Industry	Yes	Yes	Yes
Year	Yes	Yes	Yes
N	11860	7246	4614
adj. R-sq	0.095	0.091	0.117

Note: The numbers in parentheses are P values, *** indicates a significance level of 0.01, ** indicates a significance level of 0.05, and * indicates a significance level of 0.1.

which passes the test at a significance level of 1%, indicating that strict environmental inspection has significantly improved net interest rate of heavy chemical industry. From the results of group regression, the state-owned enterprise's key variable Treat * Post was 0.06, which passed the test at a significance level of 1%. While the non-state-owned company's key variable Treat * Post was 0.01, which was only significant passing the test at 5% level. This shows that strict environmental inspections have significantly increased the net interest rate of state-owned

and non-state-owned enterprises in the heavy chemical industry, but the financial performance of state-owned enterprises has been more significantly improved.

5.2.2. The Analysis of H2

This article uses the adjusted Jones model to measure the degree of corporate earnings management. The selection method of the control variable refers to the selection method of the control variable by Chen (2013). The company's size (Size); total net asset interest rate (Roa); asset-liability ratio (Lev); cash flow (Cfo), current operating cash The ratio of net flow to total assets at the end of the previous period; equity concentration (Shrer), the shareholding of the largest shareholder in the company; the proportion of independent directors (Idrt), the proportion of the number of independent directors to the size of the board of directors;), If the chairman and general manager are the same person, take 1, otherwise 0; property of property (Soe), a dummy variable, take 1 if the actual controller of the enterprise is state-owned, otherwise 0; whether it is a loss (loss) Take 1 for non-loss, take 0; for external auditor type (Audit), take 1 for big four, take 0 for non-big four; whether to issue rights (Ro), take 1 for rights issue, take 0 for no rights issue; whether to issue additional shares (So), add issue Take 1 and 0 if no additional issue. The specific results are shown in the following table:

From the regression results in Table 4, it can be seen that when the explanatory variable is Em (Accumulated Earnings Management) for full sample regression, there are 9533 observations, and the adjusted goodness of fit is 0.204. Column (1), the regression coefficient of the key variable "Treat * Post" (the cross term between pollution level and strict environmental inspection) is 0.024 when the full sample is returned. It passes the test at a significance level of 1%. Of environmental protection, inspectors have enabled heavy chemical companies to perform significant accrual surplus management. Heavier polluting companies in cyclical industries have a higher degree of earnings management, which is consistent with the conclusion of Chen (2013).

However, from the results of group regression, the key variable Treat * Post of non-state-owned enterprises in column (2) passed the test at a significance level of 5%. In column (3), the key variable of the state-owned enterprise, Treat * Post, failed to pass the significance test, which echoes the result of H2. That is, strict environmental protection inspections have caused non-state-owned enterprises in the heavy chemical industry to make less profit than state-owned enterprises. Non-state-owned enterprises with poor capabilities are conducting positive earnings management to meet the requirements of stakeholders. In the group regression, non-state-owned polluting companies with poor financial performance have a higher degree of earnings management, which is basically consistent with the conclusion of Wang et al. (2015).

5.2.3. The Analysis of H3

The "26 + 2" cities designated by the State Council for key inspections are listed

Table 4. Multiple regression analysis of H2.

	(1)	(2)	(3)
	Em	Em Soe = 0	Em Soe = 1
Treat	0.106 (1.614)	0.016 (0.187)	0.092 (1.185)
Post	−0.027*** (−4.591)	−0.033*** (−3.393)	−0.017** (−2.370)
TP	0.024*** (2.787)	0.027** (2.026)	0.018 (1.559)
Size	0.039*** (5.640)	0.043*** (4.340)	0.031** (2.357)
Roa	0.498*** (6.475)	0.526*** (5.017)	0.407*** (3.769)
Lev	−0.193*** (−6.803)	−0.197*** (−5.151)	−0.173*** (−4.024)
Cfo	−0.695*** (−21.168)	−0.646*** (−14.307)	−0.810*** (−18.939)
Shrer	0.095** (2.422)	0.088* (1.782)	0.088 (1.114)
Idrt	−0.048 (−1.018)	−0.086 (−1.235)	−0.069 (−1.053)
Dual	0.003 (0.449)	0.002 (0.204)	−0.000 (−0.004)
Soe	−0.030 (−1.332)		
Audit	0.000 (0.002)	0.000 (0.015)	0.004 (0.155)
So	0.055*** (11.656)	0.065*** (9.778)	0.038*** (5.849)
Ro	0.007 (0.396)	0.046* (1.942)	−0.018 (−0.766)
Loss	0.001 (0.132)	0.004 (0.315)	−0.010 (−0.927)
_cons	−0.883*** (−5.410)	−0.852*** (−3.955)	−0.692** (−2.215)
Industry	Yes	Yes	Yes
Year	Yes	Yes	Yes
N	9533	5597	3936
adj. R-sq	0.204	0.202	0.238

Note: The numbers in parentheses are P values, *** indicates a significance level of 0.01, ** indicates a significance level of 0.05, and * indicates a significance level of 0.1.

as regions with more environmental protection inspection tasks. First, perform a full sample regression, and then perform group regression based on the nature

of the property rights of the enterprise and the key areas of supervision. The specific results are shown in the following table:

From Table 5 according to the regression results of whether it is a key area of

Table 5. Multiple regression analysis of H3.

	(1)	(2)	(3)
	Em	Em Nokey area	Em Key area
Treat	0.106 (1.614)	0.016 (0.214)	−0.021 (−0.240)
Post	−0.027*** (−4.591)	−0.027*** (−4.105)	−0.021* (−1.754)
TP	0.024*** (2.787)	0.023** (2.234)	0.023 (1.538)
Size	0.039*** (5.640)	0.038*** (5.092)	0.036* (1.782)
Roa	0.498*** (6.475)	0.491*** (5.893)	0.521*** (2.785)
Lev	−0.193*** (−6.803)	−0.210*** (−7.027)	−0.115 (−1.500)
Cfo	−0.695*** (−21.168)	−0.689*** (−19.230)	−0.745*** (−8.986)
Shrer	0.095** (2.422)	0.086** (2.008)	0.168* (1.801)
Idrt	−0.048 (−1.018)	−0.069 (−1.316)	0.054 (0.498)
Dual	0.003 (0.449)	0.005 (0.672)	−0.012 (−0.782)
Soe	−0.030 (−1.332)	−0.044* (−1.737)	0.051 (1.458)
Audit	0.000 (0.002)	0.016 (0.703)	−0.032 (−1.099)
So	0.055*** (11.656)	0.058*** (10.881)	0.044*** (4.206)
Ro	0.007 (0.396)	0.012 (0.602)	−0.030 (−1.390)
Loss	0.001 (0.132)	0.002 (0.293)	−0.014 (−0.652)
_cons	−0.883*** (−5.410)	−0.735*** (−4.325)	−0.938** (−2.150)
Industry	Yes	Yes	Yes
Year	Yes	Yes	Yes
N	9533	7948	1585
adj. R-sq	0.204	0.201	0.238

Note: The numbers in parentheses are P values, *** indicates a significance level of 0.01, ** indicates a significance level of 0.05, and * indicates a significance level of 0.1.

environmental inspection, it can be seen that in column (2), heavy chemical companies in non-key areas of environmental inspection have performed significant positive earnings management, and the key variable Treat * Post regression coefficient 0.023, and passed the test at a significance level of 5%. In column (3) of the group regression, the heavy chemical companies in the key areas of environmental protection inspection have not performed significant earnings management, which is also consistent with the assumption H3.

5.3. Robustness Test

After the implementation of strict environmental inspections, small enterprises were forced to shut down because they did not meet environmental protection requirements, the market supply was reduced, and the prices of finished products of heavy chemical companies naturally increased under the same demand. Long and Wan (2017) investigated the impact of cleaner production standards on a company's operating margin (Ros), so this article refers to its research method, and selects Ros as the dependent variable. Regression results show that Ros of heavily polluting enterprises increased significantly after the central environmental inspection.

Before the central environmental inspection, state-owned enterprises made more environmental protection investments than non-state-owned enterprises. Therefore, the production and operation activities of state-owned polluting enterprises were less affected by the central environmental inspection, and total factor productivity was selected as an alternative indicator of financial performance. The full sample regression results are consistent with the results of Zhang and Sheng (2019), which significantly improves the productivity of enterprises. While the group regression results show that the total factor productivity of state-owned listed polluting enterprises has increased significantly, while that of non-state-owned polluting enterprises is not significant, which is consistent with the result of Hypothesis 1.

6. Research Results, Deficiencies and Prospects

This paper tests the robustness of the research results by using different variable measurement methods. Based on the market environment after the central environmental inspection, this paper studies the changes in financial performance of heavily polluting enterprises, and enriches the existing literature on the research of the central environmental inspection.

First, non-state-owned enterprises should earnestly invest in environmental protection and improve their environmental governance. In a fair market-oriented environment, environmental protection capital expenditures by enterprises can ensure the normal production and operation of the enterprise, improve the financial performance of the enterprise, and help improve the local ecological environment. State-owned enterprises should also continue to make stable and continuous environmental capital expenditures, take the initiative to

undertake more policy tasks, and contribute their due power to ecological environmental protection.

Second, this article is limited to data reasons and does not discuss environmental investment among listed polluting companies. In future research, the relationship between corporate environmental investment and corporate financial performance should be explored. Existing literature makes useful contributions. In future research, richer heterogeneity tests should be conducted between environmental inspectors and earnings management.

Third, we must focus on establishing a normalized institutional guarantee for environmental protection inspectors. Reducing the problem of information asymmetry can cut off collusion between government and enterprises between local governments and non-state-owned enterprises, and urge local governments to act in accordance with laws and regulations. In addition, it is necessary to optimize the promotion evaluation system, and pay more attention to the diverse evaluation indicators such as the local ecological environment, industrial structure, and legal environment. Even if local governments face the pressure from the central environmental supervision team, they must insist on doing things according to law. They must not increase the targets of higher levels.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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