

ORIGINAL RESEARCH ARTICLE

Corporate environmental, social, and governance greenwashing behavior under Central Environmental Protection Inspection: An executive attention perspective

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Abstract: The Central Environmental Protection Inspection (CEPI) program is an important strategic deployment of China's reform in the field of environmental protection that has attracted the attention of academia. However, with respect to the impact of CEPI on corporate environmental, social, and governance (ESG) greenwashing (Gws) behavior, particularly from the perspective of executive attention, the specific manifestations and strategic adjustments of corporate executives remain to be explored in greater depth. Based on the panel data of A-share-listed companies in Shanghai and Shenzhen from 2013 to 2022, this paper employed the difference-in-differences model, with fixed year and industry effects, to examine the impact of CEPI on ESG Gws of enterprises. Empirically, it is found that CEPI can effectively inhibit corporate ESG Gws after one lagged period. For mechanistic analysis, financial slack (Fs) can positively moderate the effect of CEPI on corporate ESG Gws. In terms of the heterogeneity test, enterprises characterized by chief executive officer (CEO) duality, as well as those with executives possessing postgraduate education and financial backgrounds, exhibit a more pronounced effectiveness in curbing Gws practices. Moreover, further analysis revealed that high-powered CEOs are more actively utilizing Fs to cater to policy requirements. This research reveals the key factors in regulating enterprises' environmental behaviors and curbing ESG Gws, while expanding the application scope of attention theory in enterprise management practices. It offers distinct implications for central regulators, local governments, and individual enterprises and provides new theories and ideas for the harmonious development of economies and the environment across various countries.

Keywords: Central Environmental Protection Inspection; Financial slack; ESG greenwashing; Executive attention

1. Introduction

Against the backdrop of growing global governmental attention to sustainable development, nations worldwide have implemented a series of environmental policies aimed at improving environmental quality, thereby facilitating the achievement of Sustainable Development Goals (SDGs).¹ However, the effective enforcement of environmental policies ultimately hinges on corporate practices and implementation.

As economic entities driven by profit maximization, enterprises tend to employ various strategies to reduce their environmental compliance costs when confronted with the financial pressures imposed by environmental policies, thereby seeking to enhance their profit margins.² In this process, environmental, social, and governance (ESG) greenwashing (Gws) has emerged as one of the common tactics adopted by enterprises to respond to environmental policies—specifically, enterprises convey positive environmental trends to

the public through annual reports or ESG reports, while failing to match such claims with substantive actions.³ This type of behavior not only undermines the sustainable development of the enterprises but also hinders the attainment of the SDGs.

Extant literature demonstrates that the formulation of targeted national environmental policies constitutes a critical measure for effectively regulating corporate behavior, enhancing regulatory efficacy, and improving environmental protection outcomes.¹ Examples include Brazil's voluntary environmental policies,⁴ India's environmental information policies,⁵ and Turkey's environmentally friendly agricultural land conservation programs.⁶ However, national policies often exhibit limited effectiveness during implementation. A primary contributing factor is the significant information asymmetry between central and local governments. Driven by local interests such as regional economic development and performance evaluations, local governments may engage in selective information disclosure or lower policy implementation standards during policy execution, leading to policy distortions at the implementation stage.⁷ This, in turn, results in inadequate regulation of corporate ESG Gws practices. Existing research has rarely explored how national policies influence corporate ESG Gws behavior within this context, indicating a notable research gap.

Since 2013, China has continuously deepened reforms in environmental protection policies, with the central government repeatedly emphasizing the need to prioritize environmental protection alongside economic development. However, China has witnessed a phenomenon where local governments have implemented environmental protection standards ineffectively despite explicit central government mandates for their enhancement.⁸ To mitigate information asymmetry between the central and local governments during policy implementation, the central government launched the Central Environmental Protection Inspection (CEPI) in 2015. Its core objective is to break institutional constraints and create effective pressure mechanisms, serving as a basis for official accountability and performance evaluation. This initiative aims to urge local governments at all levels to heighten their attention to environmental protection and incentivize enterprises to practically fulfill their environmental responsibilities.⁷ Such a context provides an important research sample for this paper. On the one hand, China, as a centralized country with distinct characteristics,⁹ boasts strong coordination and policy implementation capabilities at the central government level, offering a

robust sample for studying policy implementation. On the other hand, the implementation of CEPI functions as a powerful policy tool for environmental regulation and enforcement, curbing perfunctory practices, superficial rhetoric without action, and passive compliance that lacks substantive implementation. Consequently, it exerts a more direct and effective impact on corporate ESG Gws behavior.¹⁰

In terms of theory background, most relevant studies have explored the impact of CEPI on corporate ESG Gws behaviors based on stakeholder theory,¹¹ principal-agent theory,¹² and cost-benefit theory.¹⁰ However, these studies have overlooked a critical link: for CEPI to truly exert an influence on enterprises, it must first be perceived by corporate executives, thereby shaping their subsequent behaviors. In addition, existing research has not addressed specific action pathways, such as how executives adjust corporate strategies and make targeted investment decisions after perceiving inspector-related pressures. Executive interpretation of CEPI policy is directly reflected in investment choices, including investments in environmental protection equipment, green technology research and development (R&D), and regulatory circumvention.¹³ Meanwhile, corporate financial slack (Fs) serves as a key resource for executives to translate policy perceptions into practical actions. When Fs is sufficient, enterprises are more capable of engaging in substantive ESG practices, thereby reducing the likelihood of Gws. Conversely, when Fs is insufficient, effective implementation remains challenging even if executives are attentive to policy directives.

This paper examined the impact of CEPI on corporate ESG Gws behavior from the perspective of executive attention, drawing on attention theory and utilizing panel data of Chinese A-share-listed firms in Shanghai and Shenzhen from 2013 to 2022. Concurrently, it investigated how executives respond to the impact of CEPI based on available resources, with Fs as the measurement variable. The marginal contributions of this paper are as follows: first, it explores the impact of CEPI, an external pressure mechanism, on corporate ESG Gws behavior and clarifies its key role in regulating corporate environmental conduct and curbing Gws. Second, it examines the association between CEPI and corporate Gws behavior from the perspective of managerial attention, expanding the application scope of attention theory in corporate management practices. Third, it introduces Fs as a moderating variable to investigate the influencing mechanism between CEPI and corporate Gws behavior. By fully considering the

unique role of Fs in corporate operational decision-making and in responding to external regulatory pressures, this paper explored the heterogeneous impacts of CEPI on corporate Gws behavior under varying levels of Fs, thereby improving the variable system of the study.

2. Literature review

2.1. ESG Gws

Due to the lack of unified information disclosure standards, enterprises that voluntarily release ESG reports may make selective disclosure or false disclosure for opportunistic purposes.¹⁴ The behavior of enterprises exaggerating positive information and concealing negative information will lead to a mismatch between their ESG reports and actual performance. The inconsistency between the words (“say”) and actions (“do”) of enterprises in respect of ESG leads to “greenwashing” and intensifies the degree of information asymmetry between enterprises and investors.¹⁵ Some scholars observed that certain enterprises have been repeatedly listed on the “China Greenwashing List,” exhibiting a habitual tendency toward Gws.¹⁰ Furthermore, some studies have revealed that Gws enterprises engage in mutual learning, leading to a pattern of “imitation-diffusion” in Gws behaviors across enterprises. It has also been found that underinvested firms tend to drift green due to insufficient equity checks and balances, as well as management shortsightedness.¹⁶ They then use greenwashed data to draw in investment and boost institutional shareholding, further encouraging Gws. However, the promotion’s impact is diminished once the green finance policy is put into place.¹⁷

The governance of ESG Gws behavior has been the subject of extensive inquiry by numerous academics. Some scholars think that digital transformation can stop Gws;¹⁸ others believe that institutional pressure can prevent corporate Gws.¹⁹ More academics hold that companies’ executive awareness of environmental protection is the key to reducing ESG Gws and that different environmental regulatory policies will have different effects on executive awareness of environmental protection.²⁰ They also deem that executives who are more aware of environmental protection can fully exercise their subjective initiative to lessen the likelihood of Gws behavior.²¹

2.2. Studies on CEPI

There are two streams of study regarding CEPI—macro and micro perspectives. The macro-level studies focus

on urban air quality improvement,²² environmental governance,²³ and the environmental effects of local and central direct governance.^{12,24} Some scholars found that strengthening local government supervision can facilitate the effective implementation of environmental protection policies.²⁵ In addition, other scholars also verified that the intensity of local government supervision affects the effectiveness of environmental pollution control.²⁶ This new environmental protection initiative has reinforced the concept of green development among the Chinese Communist Party committees and governments at all levels, while clarifying the environmental protection responsibilities of governments and departments at all levels. Moreover, it has mitigated issues such as local protectionism that prioritizes development over environmental protection and arbitrary interference in environmental inspections by local Party committees and governments. Consequently, it has become an effective environmental regulatory tool, significantly improving air quality and reducing pollution emissions. However, some literature indicated that when confronted with difficulties in economic development, certain local governments may temporarily set aside environmental governance efforts, conduct inspections in a perfunctory manner, adopt a “one-size-fits-all” approach toward enterprises, and even engage in covering up environmental pollution incidents.²⁷

Research on micro-level effects centered on the impacts of CEPI on corporate economic activities, including the influence of executives’ prior public office experience on corporate environmental behavior following the implementation of CEPI;²⁸ the effect of government–enterprise collusion on corporate ESG performance;²⁴ and the mechanisms through which CEPI drives improvements in ESG performance.²⁹ According to these studies, CEPI has the potential to decrease the privilege of sewage discharge in public office, prevent government–enterprise collusion, encourage corporate green innovation, boost total factor productivity,³⁰ improve the performance of industries that produce a lot of pollution, and increase the positive performance of businesses in terms of green development and social responsibility fulfillment.³¹

2.3. Impact of CEPI on ESG Gws

At present, the majority of research focuses on the benefits that CEPI offers to businesses. For example, researchers have discovered that the inspection mechanism can effectively improve businesses’ environmental performance³² and ESG ratings,²⁹ both

of which in turn support the process of enterprise sustainable development. In particular, by bringing corporate executive attention and public attention, CEPI has boosted endogenous motivation and the vitality of green innovation in corporations through the synergistic effect of internal and external factors. As a result, corporate environmental performance and ESG practices have steadily improved. In addition, some researchers have examined how corporate Gws is affected by green funding and low-carbon city pilot programs in comparable policy environments. According to relevant studies, for example, corporate ESG Gws is not considerably worsened by green finance,³³ whereas it is dramatically improved by low-carbon city pilot programs.³⁴

To summarize, existing studies have corroborated the positive impact of CEPI on the improvement of corporate environmental performance and ESG ratings. Meanwhile, scholarly inquiries have been conducted into the effects of green governance-oriented policies—such as green finance initiatives and low-carbon city pilot policies—on corporate ESG Gws. Nevertheless, the mechanisms and specific effects through which the CEPI system, as another green governance-oriented policy instrument, influences corporate ESG enhancement remain to be further explored. In addition, even fewer scholars have considered incorporating Fs to explore whether CEPI exerts an impact on corporate ESG Gws.

3. Research hypothesis

Two hypotheses were proposed in this study. The first posited that CEPI significantly influences corporate ESG Gws behavior and was further divided into two competing sub-hypotheses to capture the potential direction of the effect. The second suggested that the impact of CEPI on ESG Gws behavior can be positively modulated by Fs. The hypotheses are as follows: higher environmental regulations will increase pressure on firms to protect the environment, while firms may implement ESG Gws strategies to cope with inspections.³³ First, unlike the traditional hierarchical system of the environmental protection department, CEPI is a vertical environmental protection policy, in which the central government directly grants a high degree of power to the inspection team. On the basis of “supervising enterprises” and “supervising the government,” it focuses on strengthening the “party and government co-responsibility” and “double responsibility” system of environmental protection in the inspected area.

At this time, enterprises facing such high-pressure environmental regulations may over-promote their environmental image to reduce the possibility of being inspected. Second, neoclassical economics suggest that environmental regulation tends to significantly increase the cost of firms’ compliance with the system,³⁵ i.e., environmental regulation may take up funds that firms would otherwise use for production, thus hindering firms’ development. In this case, firms may be tempted to adopt behaviors that only temporarily comply with regulations due to financial pressures,³⁶ and therefore, environmental regulations may, to some extent, have a crowding-out effect on corporate ESG practices and have reservations in implementing ESG. Third, under the attention-based view, executive attention affects corporate behavior and decision-making,³⁷ and after noticing CEPI, may engage in symbolic green behaviors in response to environmental inspections and to cater to consumers’ preference for green products.

(i) Hypothesis 1a: CEPI inspections will promote enterprises’ ESG Gws behavior.

On the contrary, CEPI may reduce corporate Gws practices. On the one hand, CEPI, by virtue of its centralized authority, has penetrated the environmental governance work of provincial and municipal party committees and governments, with the goal of vertical inspections and refining environmental governance. During the actual inspections, the “surprise inspections” allow the inspected areas to face a strong deterrent, prompting local officials to strengthen environmental law enforcement and strict supervision, and promoting enterprises to pay attention to environmental protection and consolidate the foundation of governance. Meanwhile, firms are bound by environmental regulations and are under pressure for legitimacy. When executives perceive the intensity of the policy, they will be more proactive and disclose information in a comprehensive and truthful manner to demonstrate operational compliance. This allows regulators to understand the company’s environmental protection actions, effectiveness, and planning, thus maintaining the legitimacy of the operation and enhancing the trust between regulators and the public.

On the other hand, CEPI has been effective in mobilizing public participation. It has effectively reduced information asymmetry by accepting letters and reports from the public.³⁸ If a company adopts Gws behavior that is contrary to its words and actions, the information related to the violation of the law will easily be fed back to the inspection team, leading to the intervention of the supervisory department, undoubtedly increasing the exposure risk of the company’s Gws

behavior. As a result, companies will reduce their ESG Gws behavior to enhance their legitimacy in the face of inspections.

(ii) Hypothesis 1b: CEPI will inhibit firms' ESG Gws behavior.

Organizational slack resources enable firms to secure the necessary means to address unforeseen challenges, mitigate resistance to innovative exploration, and enhance risk-bearing capacity.³⁹ Moreover, Fs—a form of slack resource operating at the financial dimension—functions as a critical “safety buffer” for enterprises to safeguard sustainable development.⁴⁰ According to the attention theory, executives may devote their attention to competitors' new strategic releases, technological advancements, or policy changes in the face of a complex and shifting market environment.³⁷ Concurrently, Fs represents a resource at executive disposal, which can be flexibly allocated in response to external pressures or opportunities. When confronted with inspectors, executives may utilize a firm's Fs to advance its green initiatives and safeguard corporate legitimacy. Thus, examining the deployment of Fs can effectively reflect the allocation of executive attention.

(iii) Hypothesis 2: The impact of CEPI on ESG Gws behavior can be positively modulated by Fs.

4. Methodology

4.1. Data sources

This study was based on the data of Chinese A-share-listed companies in Shanghai and Shenzhen. The ESG data of the samples were sourced from Bloomberg L.P. Database (hereinafter referred to as “Bloomberg”) and Shanghai Huazheng Index Information Service Co., Ltd. Given that Bloomberg's ESG scores were updated up to 2022 during the study period, the sample period was set from 2013 to 2022, enabling an effective observation of changes before and after the implementation of the policy. The remaining micro-financial data of the companies were derived from the China Stock Market and Accounting Research database. Data on CEPI were obtained from the Ministry of Ecology and Environment of the People's Republic of China. With regard to the initial sample, the following processing steps were conducted: first, observations with missing values for ESG Gws were excluded; second, observations with missing values for control variables were eliminated; finally, firms designated as ST, *ST, and those in the financial industry were excluded. In addition, all continuous variables were winsorized at the 1% and 99% levels to mitigate the impact of extreme values.

4.2. Variable definition

4.2.1. Dependent variable

The dependent variable is ESG Gws. Bloomberg disclosure scores were adopted to measure information disclosure, while actual performance was assessed using ESG rating data from Shanghai Huazheng Index Information Service Co., Ltd.⁴¹ Bloomberg scores are widely recognized as indicators reflecting the level of information disclosure. Meanwhile, the ESG ratings, which integrate international experience with Chinese market characteristics, cover A-share-listed companies and are updated quarterly, thus serving as a commonly used assessment metric.¹⁵ After standardization, the gap was analyzed by subtracting the disclosure score from the actual performance score, with the specific calculation formula as follows:

$$GWS_{i,t} = \left(\frac{ER_{i,t} - \overline{ER}_{dis}}{\sigma_{dis}} \right) - \left(\frac{ER_{i,t} - \overline{ER}_{per}}{\sigma_{per}} \right) \quad (1)$$

where ER is the enterprise environmental rating. A company's standardized position in relation to its peers under the distribution of ER disclosure scores was measured by the first part of the equation, while its relative position under the distribution of ER actual performance scores was measured by the second. The means of the environmental disclosure and actual performance scores are denoted by \overline{ER}_{dis} and \overline{ER}_{per} , respectively, while the related standard deviations are denoted by σ_{dis} and σ_{per} .

4.2.2. Independent variable

The independent variable is the inspectorate of CEPI. Drawing on the relevant study,⁴² this paper took the implementation time of CEPI in each province as the dependent variable. According to the Ministry of Ecology and Environment announcement of CEPI implementation timelines in each province, the inspection year for each enterprise was identified according to its location. The variable *Cepi* was assigned a value of 1 for the year in which the enterprise's province was subjected to CEPI, indicating that the enterprise was inspected in that year. For all other years, *Cepi* was set to 0, indicating the absence of inspection. The impact of the inspector's arrival on the sample corporate ESG Gws was clearly distinguished in this way.

4.2.3 Moderator variable

The moderator variable is Fs. Referring to related research, the ratio of a firm's quick assets to its total liabilities was used to measure the degree of Fs.⁴³ This

ratio reflects the extent of financial resources that a firm can freely allocate and utilize.

4.2.4. Control variable

Referring to the research of Zhao and Lee¹⁰ and Shang *et al.*,⁴⁴ this study selected control variables from two aspects, corporate finance and corporate governance, to represent a corporate ESG Gws behavior. Financial variables at the company level included enterprise size (Size), current ratio (Cr), asset turnover (Ato), book-to-market ratio (Bm), audit fee (Audit fee), and salary sum (Salary sum). These indicators reflect the financial status and operating ability of an enterprise, and are one of the most critical factors affecting the development of the enterprise. In addition, these indicators also directly affect the total environmental investment and environmental behavior decisions of enterprises. For example, firm size represents a firm's market influence and sense of social responsibility. Larger firms are more likely to be noticed, and controlling for firm size can isolate the impact of the size effect on Gws. The current ratio reflects the short-term solvency and liquidity of the company. Cash flow status can affect a company's environmental investment, as companies with tight cash flows are more likely to engage in Gws to shape their environmental image.

Corporate governance variables included top shareholding concentration (Top), management shareholding ratio (Mshare), R&D personnel (Rdperson), and board size (Board). Among them,

ownership concentration and management shareholding ratio reflect the equity distribution within the company, while the size of the board of directors determines the strategic decision-making ability of a company, and the number of R&D personnel reflects the personnel structure of a company. These four indicators effectively measure the governance capacity of a company and can reflect how the company makes real environmental investment decisions, which may affect Gws behavior, under the control of various stakeholders. The description of specific indicators is summarized in Table 1.

4.3. Model construction

4.3.1. Benchmark regression

The CEPI policy is strictly exogenous to enterprises, and the actions of enterprises cannot affect its specific implementation. Meanwhile, CEPI adopts a phased approach for entering each province, autonomous region, and municipality directly under the central government, leading to differences in the inspection time faced by enterprises in different regions. Provinces that have not been inspected in the current period were used as a control group. Therefore, the basic conditions of quasi-natural experiments were met.¹⁴ The difference-in-differences (DID) method is widely recognized in the research community for its ability to mitigate endogeneity problems, reduce errors from omitted variables, and provide a detailed and accurate evaluation of the effects of national policies.¹² At the same time, CEPI inspectors have a distinct working

Table 1. Definition of variables

Variable type	Symbol	Definition
Independent variable	Cepi	Interaction terms for the inspector province dummy variable and the time dummy variable
Dependent variable	Gws	After standardization, the disclosure score was subtracted from the actual performance score
Moderator variables	Fs	Ratio of an enterprise's quick assets to total liabilities
Control variables	Size	Logarithmic value of total assets of the enterprise at the end of the year
	Cr	Current assets to current liabilities
	Ato	Ratio of operating income to average total assets
	Bm	Total assets to market capitalization
	Audit fee	Logarithmic value of corporate audit costs
	Top	Ratio of shareholding of the largest shareholder to the total number of shares
	Mshare	Management shareholding to total shares
	Rdperson	Logarithmic values for corporate R&D staff
	Board	Logarithmic value of the number of board members
	Salary sum	Logarithmic value of total employee payroll

Abbreviations: R&D: Research and development; cepi: Central environmental protection inspection; Gws: Greenwashing; Cr: Current ratio; Ato: Asset turnover, Bm: Book-to-market ratio; Fs: Financial slack.

time, which is coordinated and arranged by the central government. Characterized by a high level of authority and strong enforcement, these inspections are less susceptible to external factors and thus represent a form of effective policy impact.¹² Therefore, the DID model was employed in this study, the control variables were added, and the time and industry information were fixed to test the proposed hypotheses. To verify Hypothesis 1a, the equation for the specific model is as follows:

$$Gws_{i,t} = \alpha_0 + \alpha_1 Capi_{i,t} + \sum_j \alpha_j Control_{j,i,t} + u_t + v_i + \varepsilon_{i,t} \quad (II)$$

Given that corporate ESG performance information is generally disclosed in the subsequent year and policy interventions often exhibit lagged effects, this study used Equation III to verify Hypothesis 1b, where the CEPI variable is lagged by one period:

$$Gws_{i,t} = \alpha_0 + \alpha_1 L.Capi_{i,t} + \sum_j \alpha_j Control_{j,i,t} + u_t + v_i + \varepsilon_{i,t} \quad (III)$$

4.3.2. Mechanism regression

Based on the DID benchmark regression models (Equations II and III), the moderating variable and its interaction with the independent variable were introduced to examine the moderating effect of Fs on the relationship between CEPI and corporate ESG Gws, thereby testing Hypothesis 2. This model is expressed as Equations IV and V:

$$Gws_{i,t} = \alpha_0 + \alpha_1 Capi_{i,t} + \alpha_2 Fs_{it} + \alpha_3 Capi_{i,t} \times Fs_{it} + \sum_j \alpha_j Control_{j,i,t} + u_t + v_i + \varepsilon_{i,t} \quad (IV)$$

$$Gws_{i,t} = \alpha_0 + \alpha_1 L.Capi_{i,t} + \alpha_2 Fs_{it} + \alpha_3 Capi_{i,t} \times Fs_{it} + \sum_j \alpha_j Control_{j,i,t} + u_t + v_i + \varepsilon_{i,t} \quad (V)$$

where the subscripts *i* and *t* represent enterprises and years; *Gws_{i,t}* is the dependent variable, representing the degree of ESG Gws; *Capi_{i,t}* is the independent variable, representing the resident inspector of CEPI in the current year; *L.Capi_{i,t}* is the subsequent year of a CEPI inspection; is the *Fs* moderating variable, representing *Fs*; *Capi_{i,t} × Fs_{it}* is the interaction term of the moderator and independent variable; $\sum_j \alpha_j Control_{j,i,t}$ is the set of control variables; *u_t* is the fixed year; *v_i* is the fixed industry; and ε is the random disturbance term.

4.4. Correlation analysis

In this study, Pearson correlation analysis was employed to evaluate the relationships between variables. The

correlation analysis was conducted using Stata 18 (StataCorp, United States). A *p*<0.1 was considered statistically significant.

5. Empirical result analysis

Table 2 presents the descriptive statistics for each variable. The average ESG Gws value of firms was -0.444 (standard deviation = 1.231), with the lowest value being -3.250 and the highest being 2.866. This suggests that the level of ESG Gws varies greatly among firms. In addition, the negative average ESG Gws value indicates a low level of Gws. The descriptive statistics of the other variables were in line with previous comparable studies.¹⁴ The mean value of the variable *Capi* was 0.244, based on 1,291 observations in the experimental group and 3,998 observations in the control group.

The correlation analysis results revealed that the correlation coefficients among all variables were <0.8, suggesting the absence of severe multicollinearity issues between variables. The results are presented in Table 3.

5.1. Basic regression analysis

The results of the benchmark regression are presented in Table 4. The regression results for CEPI were significant regardless of the presence of control variables. Specifically, without considering lagged effects, the coefficient was positive and significant, indicating that the arrival of CEPI in the current year promotes corporate ESG Gws behaviors. With lagged effects considered, the coefficient was negative and significant, suggesting a reduction in ESG Gws behaviors in the subsequent year. The potential reasons for this phenomenon are as follows: first, ESG information disclosure is subject to a time lag. In the year when inspectors arrive, the disclosed ESG data largely reflects the previous year's performance, which may remain at a relatively high level. Second, upon the arrival of inspectors, enterprises may adopt coping strategies by exaggerating their environmental protection behaviors to reduce the likelihood of scrutiny. This can lead to a "discrepancy between commitments and actions," thereby resulting in a higher level of Gws. Third, policy interventions often have a lagged effect. When inspectors arrive, enterprises may initiate green rectification measures, but the effects may not be immediately manifested. As a result, the suppressive impact on corporate ESG Gws tends to be more observable in the following year, when firms begin to implement genuine compliance efforts in recognition of the policy's intensity.

Table 2. Descriptive statistics

Variables	N	Mean	Standard deviation	Minimum	Maximum
Gws	5,289	-0.444	1.231	-3.250	2.866
Cepi	5,289	0.244	0.429	0	1.000
Cr	5,289	1.950	1.840	0.258	18.44
Ato	5,289	0.647	0.399	0.0475	2.640
Bm	5,289	0.326	0.158	0.0152	0.860
Audit fee	5,289	14.39	0.719	12.61	16.32
Rdperson	5,289	6.235	1.454	0.693	11.15
Size	5,289	23.44	1.237	20.67	27.16
Top	5,289	36.83	15.88	6.800	77.88
Salary sum	5,289	15.84	0.733	14.05	17.78
Mshare	5,289	7.329	14.54	0	63.52
Board	5,289	2.164	0.197	1.609	2.708

Abbreviations: cepi: Central environmental protection inspection; Gws: Greenwashing; Cr: Current ratio; Ato: Asset turnover; Bm: Book-to-market ratio.

5.2. Robustness tests

5.2.1. Parallel trend test

According to a previous study,¹⁰ samples were selected from periods before and after the implementation of CEPI, and a time trend variable was constructed by assigning values from -2 to 3 according to the corresponding year. Subsequently, regression analysis was conducted using grouping variables to form interaction terms. Figure 1 presents the estimation results at the 90% confidence level. It was found that the estimated coefficients were not significant at the 10% level before the inspectors' arrival, indicating no significant difference in ESG Gws behavior among firms before the inspection. In contrast, the estimated coefficients were significantly negative at the 10% level after the inspectors' stationing, but insignificant again in the third year post-inspection. This suggests that CEPI inspections exert a time-limited suppressive effect on corporate ESG Gws. A plausible explanation is that CEPI, with the rigidity of central authority, has a strong deterrent effect on local environmental governance, prompting enterprises to undertake green transformation and genuinely practice green development. However, after the inspectors withdraw, enterprises, driven by profit motives, may revert to inconsistent behavior, once again exhibiting discrepancy between words and actions. Therefore, CEPI should be institutionalized as an ongoing mechanism, with continuous tracking and follow-up, to maintain its regulatory effects and prevent perfunctory or temporary rectification behaviors.

5.2.2. Placebo test

To control the effects of potential omitted variables, this study adopted a placebo test by randomly assigning experimental groups, following the methodology of previous studies.⁴⁵ Specifically, baseline regressions were conducted using seeds randomly drawn from the entire sample, with the randomization procedure repeated 1,000 times to ensure robustness. To account for firm-level clustering, control variables and fixed effects for industry and year were included in the regressions. The *p*-value scatter, the probability density of the estimated regression coefficients, and the benchmark regression coefficients are displayed in Figure 2. It was found that the randomized experimental group's coefficients followed a normal distribution centered around zero and were overwhelmingly insignificant at the 10% level. In contrast, the benchmark regression coefficients appeared in a limited number of results. These findings indicate that the placebo test is valid and that the observed impact of CEPI on corporate ESG Gws is unlikely to be driven by unobserved confounding factors.

5.2.3. Dynamic panel regression

The generalized method of moments (GMM) is a parameter estimation method based on moment conditions that estimate model parameters by minimizing the weighted distance between sample moments and theoretical moments. In dynamic panel data models, lagged dependent variables are introduced as regressors. However, these lagged variables are

Table 3. Correlation analysis

Variables	Gws	Cepi	Mshare	Size	Cr	Audit fee	Salary sum	Ato	Bm	Top	Board	Rdperson
Gws	1	-	-	-	-	-	-	-	-	-	-	-
Cepi	0.017	1	-	-	-	-	-	-	-	-	-	-
Mshare	0.071***	-0.007	1	-	-	-	-	-	-	-	-	-
Size	0.114***	0.006	-0.271***	1	-	-	-	-	-	-	-	-
Cr	0.029**	0.017	0.194***	-0.346***	1	-	-	-	-	-	-	-
Audit fee	0.146***	0.007	-0.203***	0.742***	-0.279***	1	-	-	-	-	-	-
Salary sum	0.095***	-0.010	0.001	0.385***	-0.045***	0.385***	1	-	-	-	-	-
Ato	0.048***	0.019	-0.050***	0.043***	-0.144***	0.112***	0.096***	1	-	-	-	-
Bm	-0.001	-0.036***	-0.137***	0.134***	0.027**	0.111***	-0.027**	-0.063***	1	-	-	-
Top	0.046***	0.007	-0.020	0.166***	-0.013	0.060***	-0.104***	0.100***	0.074***	1	-	-
Board	0.001	-0.008	-0.183***	0.198***	-0.102***	0.126***	0.127***	-0.027**	0.069***	0	1	-
Rdperson	0.045***	-0.003	0.016	0.460***	-0.129***	0.379***	0.345***	0.164***	-0.062***	0.011	0.041***	1

Notes: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Abbreviations: cepi: Central environmental protection inspection; Gws: Greenwashing; Cr: Current ratio; Ato: Asset turnover; Bm: Book-to-market ratio.

typically correlated with the error term, resulting in a bias in the traditional ordinary least squares estimation. GMM resolves this issue through the use of instrumental variables and moment conditions. Given the long panel characteristics of the sample used in this study, the dynamic panel GMM estimation method can effectively test the persistence effect of the policy, as supported by prior studies.⁴⁶ For this reason, this study established a dynamic panel model that includes a one-period lag of the dependent variable and introduces instrumental variables to mitigate endogeneity. The GMM estimation results were largely consistent with those from the benchmark regression, as illustrated in Table 5. The p -value of the second-order autocorrelation (AR 2) was higher than 0.1, suggesting that the instrumental variables were chosen effectively. Furthermore, the Hansen test did not reject the null hypothesis of instrumental validity, confirming the robustness of the model specification.

5.2.4. Sample size expansion

To further ensure the robustness of the results, this study expanded the sample size for testing. Given that some enterprises reported missing data on R&D personnel, the corresponding control variable was excluded to retain the original dataset. Subsequently, observations with missing values for other variables are excluded. This approach reduces data exclusion, thereby expanding the sample size for robustness testing. According to the test results (Table 6), the impact of CEPI on corporate ESG Gws remained significant, robust, and consistent with the previous findings. All independent variable coefficients were statistically significant at least at the 10% level.

5.3. Mechanism tests

Fs is a flexible resource available to executives, enabling them to respond to external pressures or opportunities. This resource affects the intensity of corporate green governance and thus serves a moderating role. When executives pay attention to CEPI policy, corporates with greater Fs are better positioned to allocate resources toward effective green governance, thereby reducing the risk of Gws. From the perspective of executive attention, enterprises with different degrees of Fs are likely to exhibit different behavioral responses.

This study conducted a moderating effect test for Fs, with the results shown in Table 7. The findings indicate that Fs significantly contributes to curbing ESG Gws in the year following the implementation of

Table 4. Benchmark regression

Variables	Gws			
	1	2	3	4
Cepi	0.083*** (2.64)	-	0.084*** (2.68)	-
L. Cepi	-	-0.069* (-1.65)	-	-0.090** (-2.19)
Mshare	-	-	0.009*** (4.43)	0.009*** (3.74)
Size	-	-	0.073 (1.54)	0.098* (1.90)
Cr	-	-	0.057*** (3.40)	0.059*** (3.16)
Audit fee	-	-	0.223*** (3.29)	0.225*** (3.06)
Salary sum	-	-	0.108** (2.22)	0.114** (2.16)
Ato	-	-	0.155* (1.82)	0.247*** (2.70)
Bm	-	-	-0.251 (-1.36)	-0.200 (-0.99)
Top	-	-	0.001 (0.67)	0.001 (0.39)
Board	-	-	-0.123 (-0.83)	-0.159 (-0.97)
Rdperson	-	-	-0.049 (-1.60)	-0.052 (-1.57)
Constant	-0.464*** (-14.70)	-0.468*** (-13.58)	-6.777*** (-6.90)	-7.465*** (-7.02)
Year effect	Controlled	Controlled	Controlled	Controlled
Industry effect	Controlled	Controlled	Controlled	Controlled
Observations	5,286	4,011	5,286	4,011
R-squared	0.036	0.051	0.078	0.099

Notes: Column 1 of Gws reports the results of Cepi without control variables; Column 2 of Gws reports the results of one-period lagged Cepi without control variables; Column 3 of Gws reports the results of Cepi with control variables; Column 4 of Gws reports the results of one-period lagged Cepi with control variables. The *t*-values of the two-sided *t*-test corresponding to the robust standard error of firm-level clustering is in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Abbreviations: Gws: Greenwashing; Cr: Current ratio; Ato: Asset turnover; Bm: Book-to-market ratio.

CEPI. However, no significant moderating effect was observed in the year of CEPI's introduction. A plausible explanation is that, under the high pressure of inspection, firms may refrain from substantive corrective actions and instead adopt symbolic green disclosures to appease inspectors. Such superficial disclosures, characterized

by "all words and no action," require minimal financial resources and help reduce compliance costs, making Gws an attractive short-term strategy. Nonetheless, in the long run, reliance on symbolic practices can lead to reputational damage, regulatory punishment, and, ultimately, performance deterioration.

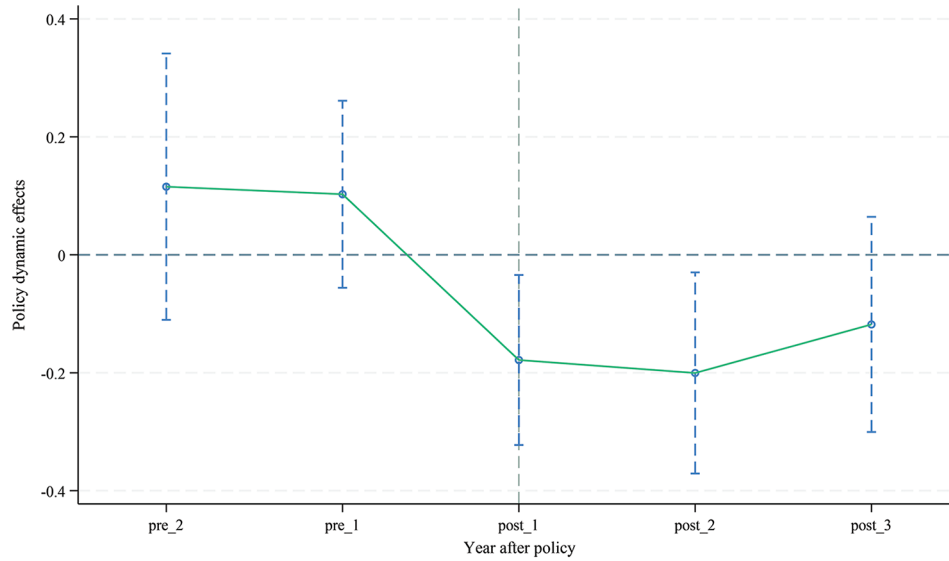


Figure 1. Parallel trend test

Table 5. Dynamic panel of the generalized method of moments

Variables	Gws	
	1	2
L. Gws	0.377*** (3.14)	0.375*** (3.15)
L. Cepi	-0.087** (-2.11)	-
Cepi	-	0.081** (2.08)
Control variables	Controlled	Controlled
Year effect	Controlled	Controlled
Sample size	4,013	4,013
AR 1	0.000	0.000
AR 2	0.337	0.346
Hansen	0.837	0.834

Notes: Columns 1 and 2 of Gws report the GMM regression results for the one-period lagged Cepi and the normal Cepi. z-statistics are presented in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Abbreviations: cepi: Central environmental protection inspection; Gws: Greenwashing.

5.4. Heterogeneity analysis

5.4.1. Executive heterogeneity analysis

(a) CEO duality

CEO duality empowers executives with greater decision-making power. This study conducted a subgroup test of CEO duality, with the results presented in Table 8. The results indicate that CEPI exerts a significant impact on

Table 6. Expanded sample size test

Variables	Gws	
	1	2
Cepi	0.054* (1.84)	-
L. Cepi	-	-0.064* (-1.76)
Control variables	Controlled	Controlled
Year effect	Controlled	Controlled
Industry effects	Controlled	Controlled
Observations	7,357	6,023
R-squared	0.062	0.077

Notes: Column 1 of Gws reports the results of the normal Cepi and removes the control variables from the R&D personnel; Column 2 of Gws reports the results of the one-period lagged Cepi and removes the control variables from the R&D personnel. Firm-level clustering robust standard errors are presented in parentheses and correspond to the t-values of the two-sided t-test. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Abbreviations: cepi: Central environmental protection inspection; Gws: Greenwashing.

the ESG Gws behaviors of firms characterized by CEO duality. A plausible explanation is that, during the early stage of CEPI implementation, some enterprises may have misjudged the central government's firm attitude and resolute determination toward environmental rectification. Consequently, CEOs adopted passive coping strategies. To minimize the impact of inspections on daily operations, some CEOs even harbored a fluke mentality, further intensifying ESG Gws behaviors.

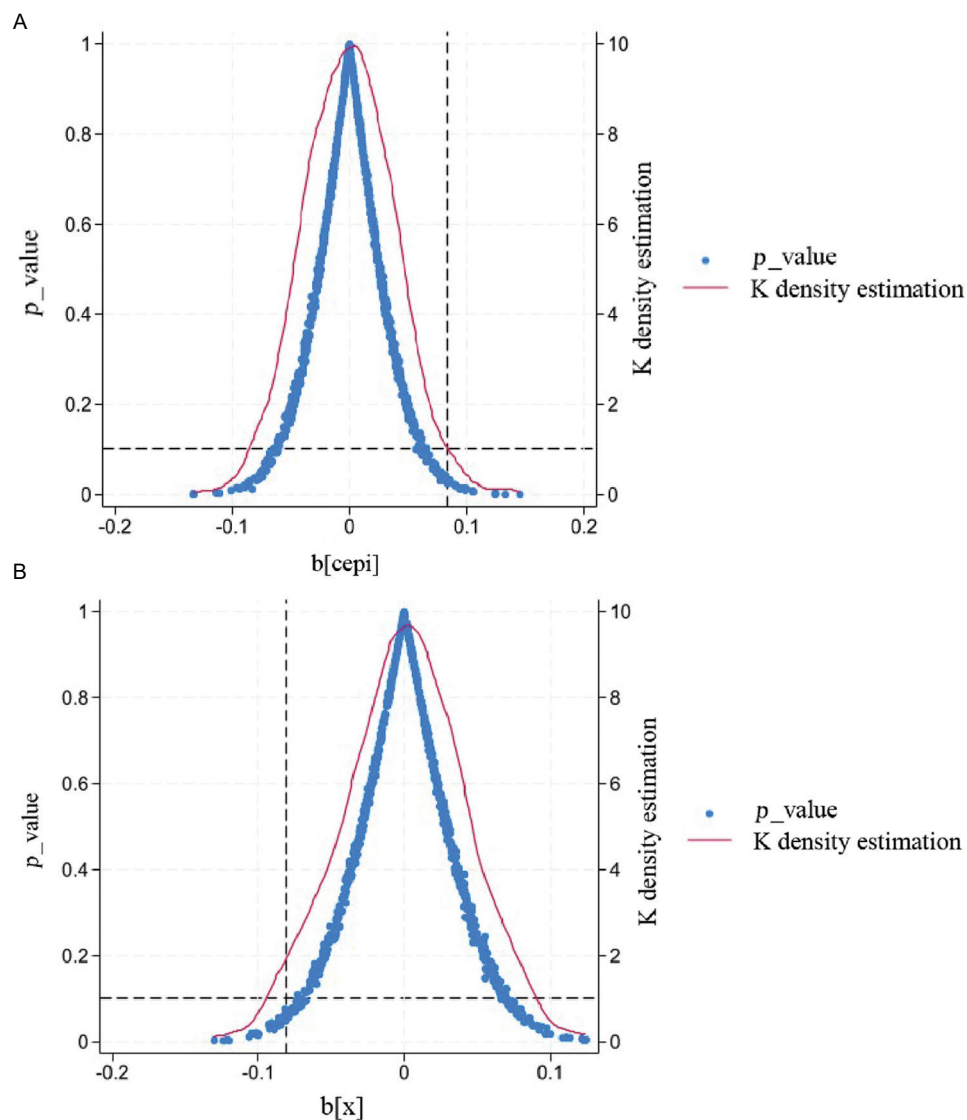


Figure 2. Placebo tests for (A) the variable Cepi and (B) the one-period lagged variable Cepi (x)
Abbreviation: Cepi: Central environmental protection inspection.

Their aim was to maintain the existing corporate image, prevent the company from falling into rectification predicaments due to inspections, and avoid reputational damage. However, as CEPI enforcement deepens, its high execution capacity and unwavering determination to rectification have made CEOs profoundly aware of the severity of non-compliance. Under such circumstances, CEOs have begun to respond promptly, proactively adjusting business strategies to significantly reduce ESG Gws behaviors and focus on enhancing the authenticity, completeness, and accuracy of information disclosure. They strive to meet the requirements of CEPI, protect corporate and personal reputations, and avoid severe penalties for environmental violations.

(b) Academic background

Executives with highly educated backgrounds can address problems from different perspectives due to their diversified knowledge systems, providing rich and diverse ideas and solutions in the decision-making process.⁴⁷ This study conducted a heterogeneity test on the background of executives with postgraduate degrees. The results indicate that the presence of postgraduate-educated executives significantly influences firm responses both during and after the arrival of inspectors (Table 8). A potential reason is that, as the internal and external environments change, enterprises must dynamically adjust their strategic goals and decisions. Executives with postgraduate backgrounds tend to

Table 7. Mechanism tests

Variables	Gws	
	1	2
L. Cepi	-0.053 (-1.23)	-
Cepi	-	0.053 (1.34)
Fs	0.064 (1.42)	0.035 (0.99)
Cepi* Fs	0.042** (2.14)	0.020 (1.00)
Mshare	0.009*** (3.95)	0.009*** (4.27)
Size	0.088* (1.73)	0.070 (1.46)
Cr	0.004 (0.10)	0.025 (0.87)
Audit fee	0.240*** (3.32)	0.229*** (3.37)
Salary sum	0.099* (1.92)	0.104** (2.12)
Ato	0.187** (2.11)	0.143* (1.66)
Bm	-0.269 (-1.37)	-0.251 (-1.36)
Top	0.002 (0.72)	0.002 (0.78)
Board	-0.121 (-0.77)	-0.135 (-0.90)
Rdperson	-0.054* (-1.69)	-0.048 (-1.57)
Constant	-7.211*** (-6.98)	-6.676*** (-6.77)
Year effect	Controlled	Controlled
Industry effect	Controlled	Controlled
R-squared	0.092	0.078

Notes: Columns 1 and 2 of Gws report the regression results for the one-period lagged Cepi and the normal Cepi, respectively, after including the interaction terms for financial slack and CEPI. Firm-level clustering robust standard errors are presented in parentheses and correspond to the *t*-values of the two-sided *t*-test. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Abbreviations: Fs: Financial slack; cepi: Central environmental protection inspection; Gws: Greenwashing; Cr: Current ratio; Ato: Asset turnover, Bm: Book-to-market ratio.

approach issues more comprehensively, conduct more in-depth analyses, and adapt strategies more flexibly, thereby enabling firms to respond more effectively to avoid risks.⁴⁵

(c) Financial background

Executives with a financial background, relying on their professional expertise, have unique advantages in investment risk management, enabling them to conduct diversified investments and allocate rational corporate funds.⁴⁸ This study conducted a subgroup regression based on whether executives have financial backgrounds. As shown in columns 9–12 in Table 8, firms with executives possessing financial backgrounds tend to adopt Gws strategies at the early stage of CEPI implementation. These firms engage in embellished or symbolic disclosures to reduce the likelihood of being inspected. However, as the inspection process advances and the CEPI mechanism demonstrates its regulatory rigor and governance determination, these enterprises are compelled to align with compliance requirements by implementing substantive green transformation measures. They progressively abandon Gws practices while adhering to standardized protocols for truthful information disclosure. As evidenced in Table 8, enterprises with financially experienced executives exhibit superior adaptability when confronting environmental crises, demonstrating a capacity to dynamically adjust their strategic responses in accordance with evolving regulatory circumstances.

5.4.2. Enterprise ownership

State-owned enterprises (SOEs), unlike private enterprises, are not solely driven by the pursuit of economic benefits; they also bear responsibilities related to environmental governance as mandated by the government.⁴⁹ Considering that the impact of CEPI on corporate ESG Gws may differ significantly depending on the nature of the enterprise, this study examined the two types of enterprises with different property rights in groups, with the results shown in Table 9. The findings demonstrate that, when lagged by one period, the effect of CEPI is significantly negative for SOEs, but not significant for private firms. This indicates that CEPI is more effective in curbing ESG Gws behaviors among SOEs. A potential reason is that SOEs are subject to stricter regulation from the government and regulatory bodies following CEPI implementation. Moreover, SOEs face heightened expectations from industry

Table 8. Heterogeneity test for executive background

Variables	Gws					
	1	2	3	4	5	6
	CEO duality	Without CEO duality	CEO duality	Without CEO duality	Executives have post-graduate backgrounds	Executives without post-graduate backgrounds
Cepi	0.153** (2.17)	0.054 (1.41)	-	-	0.078** (2.31)	0.079 (0.98)
L. Cepi	-	-	-0.237*** (-2.76)	-0.047 (-0.96)	-	-
Control variables	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled
Year effect	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled
Industry effects	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled
Observations	1,202	3,893	898	2,958	4,688	596
R-squared	0.161	0.080	0.192	0.102	0.080	0.293
	Gws					
	7	8	9	10	11	12
	Executives have post-graduate backgrounds	Executives without post-graduate backgrounds	Executives have financial backgrounds	Executives without financial backgrounds	Executives have financial backgrounds	Executives without financial backgrounds
Cepi	-	-	0.091** (2.32)	0.057 (0.87)	-	-
L. Cepi	-0.079* (-1.78)	-0.164 (-1.55)	-	-	-0.087* (-1.77)	-0.080 (-1.05)
Control variables	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled
Year effect	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled
Industry effects	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled
Observations	3,534	474	3,656	1,624	2,807	1,196
R-squared	0.102	0.314	0.085	0.120	0.107	0.137

Notes: Columns 1 and 2 of GWS report the Cepi results of firms with and without CEO duality, respectively; Columns 3 and 4 of GWS report the one-period lagged Cepi results of firms with and without CEO duality, respectively; Columns 5 and 6 of GWS report the Cepi results of firms with and without postgraduate-educated executives, respectively; Columns 7 and 8 of GWS report the one-period lagged Cepi results of firms with and without postgraduate-educated executives, respectively; Columns 9 and 10 of GWS report the Cepi results of firms with and without financial-background executives, respectively; Columns 11 and 12 of GWS report the one-period lagged Cepi results of firms with and without financial-background executives, respectively. Firm-level clustering robust standard errors are presented in parentheses and correspond to the *t*-values of the two-sided *t*-test. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Abbreviations: CEO: Chief Executive Officer; cepi: Central environmental protection inspection; Gws: Greenwashing.

associations, the media, and the public regarding their ESG performance, curbing their Gws behavior under these stronger binding forces.

5.4.3. Regional heterogeneity

Clarifying regional differences in environmental regulatory governance is of great significance for guiding the future direction of the CEPI system. In general, more developed regions have orderly market

competition, higher degrees of development, and more robust legal systems, all of which can create a favorable market environment for enterprise environmental governance.⁵⁰ However, China's regional economic development remains unbalanced, with a clear disparity between the eastern and non-eastern regions in terms of development speed, economic strength, market environments, and industrial structure. These differences may affect the effectiveness of CEPI governance across

regions. Therefore, this study grouped the samples based on region, eastern vs. non-eastern, with results shown in Table 10. The results showed that at the beginning of CEPI inspection, ESG Gws behavior in eastern firms did not significantly intensify; at the later stage, the overall suppression effect was weaker than that in non-eastern regions. This may be attributed to the eastern region's more advanced economic development, mature market system, favorable competitive environment, stricter local environmental regulation, and greater enterprise emphasis on environmental responsibility. Consequently, the level of ESG Gws was relatively

low, with fewer potential environmental problems. In contrast, the results also showed that firms in non-eastern region, where economy development is relatively lagging, exhibited more pronounced ESG Gws behaviors, particularly in the early stages of inspection. Some firms attempted to conceal non-compliance through Gws to attract ESG investments or avoid scrutiny. However, faced with strong regulatory enforcement and the deterrence effect of CEPI, these enterprises were eventually compelled to undergo rectification, resulting in a more substantial reduction in ESG Gws levels.

Table 9. Enterprise ownership

Variables	Gws	
	1	2
Nature of business	State enterprise	Private enterprise
L. Cepi	-0.156*** (-2.70)	-0.058 (-0.99)
Control variables	Controlled	Controlled
Year effect	Controlled	Controlled
Industry effects	Controlled	Controlled
Observations	1,959	2,046
R-squared	0.148	0.115

Note: Firm-level clustering robust standard errors are presented in parentheses and correspond to the *t*-values of the two-sided *t*-test. **p*<0.1, ***p*<0.05, ****p*<0.01.

Abbreviations: cepi: Central environmental protection inspection; Gws: Greenwashing.

6. Further analysis: CEO power and Fs allocation

All decision-making and innovative activities of enterprises are based on resources. At the same time, the state of resources within an enterprise constrains its subsequent development and decision-making. Abundant resources give managers the autonomy to make decisions and respond promptly to policy shocks. To enable the flexible deployment of resources, a high degree of power in the hands of managers is essential.

Power embodies the ability of individual actors to exert their influence and is an important factor in determining the efficiency of resource allocation and strategic decision-making.⁵¹ As a core leader of an enterprise, the CEO plays a pivotal role in shaping the firm's development strategy, leading product selection

Table 10. Regional heterogeneity

Variables	Gws			
	1	2	3	4
Whether in an eastern region	Yes	No	Yes	No
Cepi	0.048 (1.31)	0.196*** (3.03)	-	-
L. Cepi	-	-	-0.085* (-1.76)	-0.241*** (-2.73)
Control variables	Controlled	Controlled	Controlled	Controlled
Year effect	Controlled	Controlled	Controlled	Controlled
Industry effects	Controlled	Controlled	Controlled	Controlled
Observations	3,671	1,612	2,790	1,218
R-squared	0.120	0.118	0.146	0.136

Notes: A small number of firms have registered addresses outside of the country. Columns 1 and 2 of GWS report the Cepi results of firms located in eastern and non-eastern regions, respectively; Columns 3 and 4 of GWS report the one-period lagged Cepi results located in eastern and non-eastern regions, respectively. Firm-level clustering robust standard errors are presented in parentheses and correspond to the *t*-values of the two-sided *t*-test. **p*<0.1, ***p*<0.05, ****p*<0.01.

Abbreviations: cepi: Central environmental protection inspection; Gws: Greenwashing.

and R&D, and promoting policy implementation.⁵² The CEO's level of power significantly influences the allocation of corporate resources and the firm's strategic direction. A highly empowered CEO can directly use Fs to support initiatives aligned with long-term goals. Greater access to diverse resources also enhances the CEO's ability to integrate information and make rational decisions that improve corporate performance and reduce misconduct. Moreover, powerful CEOs are more capable of translating personal vision and intent into executable corporate strategies, which influences the level of green production and the credibility of corporate ESG disclosures. Meanwhile, CEOs with higher power often factor in reputational considerations, leading to a reduced emphasis on short-term gains and greater caution in ensuring alignment between corporate words and actions. This suppresses short-termism and promotes consistency in ESG commitments. From a psychological perspective, the pursuit of power is deeply rooted in human nature.⁵³ Once attained, individuals tend to preserve or expand their power. Accordingly, high-power CEOs are particularly attentive to maintaining their authority, which is closely tied to the firm's compliance record, reputation, and aligning with the board's expectations. In the context of stringent environmental protection policies, such CEOs are more inclined to steer their firms away from pollution and Gws practices. This paper argues that high-power CEOs use Fs to align with policy requirements to mitigate risks.

In this study, CEO power (Power) was further measured through a principal component analysis incorporating four dimensions: organizational power, expert power, ownership power, and reputational power (Table 11). The first principal component was adopted as a composite indicator of CEO power.⁵⁴ In addition, a tertile grouping of CEO power was employed. Firms in the top one-third were classified as the high-power group, while those in the bottom two-thirds constitute the low-power group. The corresponding regression results are presented in Table 12. In the high-power CEO group, the interaction term between CEPI and Fs yielded a significant coefficient of 0.061, whereas it was insignificant with a coefficient of 0.014 in the low-power CEO group. In addition, the interaction term between CEPI and Fs in the full sample exhibited a significant coefficient of 0.042. These results suggest that in the high-power CEO group, Fs plays a stronger positive moderating role in the inhibitory effect of CEPI on corporate ESG Gws. A plausible explanation is that greater CEO power enables more direct utilization of

Table 11. Indicators for Chief Executive Officer power measurement

Power dimension	Symbols	Interpretation of indicators
Organizational power	Dual	Whether to be the chairman of the board of directors at the same time; yes=1, no=0
	Insider	Whether it is an internal director of the company; yes=1, no=0
Expert power	Rank	Whether or not you have a high title, yes=1, no=0
	Tenure	Whether the tenure exceeds the industry median; yes=1, no=0
Ownership power	CEO share	Whether to hold the Company's equity; yes=1, no=0
	Institute share	Whether institutional investor ownership is below the industry median; yes=1, no=0
Reputational power	Education	Whether you have a high degree or not, master's degree or above=1, others=0
	Part-time job	Whether to work part-time outside the enterprise, yes=1, no=0

Table 12. CEO power grouping

Variables	Gws	
	(1)	(2)
Level of CEO authority	High power	Low power
L. Cepi	-0.058 (-0.96)	-0.088 (-1.29)
Fs	-0.003 (-0.04)	0.181** (2.57)
Cepi × Fs	0.061** (2.01)	0.014 (0.39)
Control variables	Controlled	Controlled
Year effect	Controlled	Controlled
Industry effects	Controlled	Controlled
Observations	2,081	1,896
R-squared	0.137	0.124

Note: Firm-level clustering robust standard errors are presented in parentheses and correspond to the *t*-values of the two-sided *t*-test. **p*<0.1, ***p*<0.05, ****p*<0.01.

Abbreviations: CEO: Chief Executive Officer; Fs: Financial slack; cepi: Central environmental protection inspection; Gws: Greenwashing.

Fs to implement initiatives that align with regulatory expectations. To avoid regulatory penalties, high-power CEOs may leverage Fs to drive corporate green upgrading and reduce pollutant emissions. Under such circumstances of green production, ESG Gws becomes inherently unnecessary.

7. Conclusion and implications

7.1. Conclusion

This study employed panel data of Chinese A-share-listed firms in Shanghai and Shenzhen from 2013 to 2022 to empirically analyze the impact of CEPI on corporate ESG Gws behaviors and the moderating role of Fs between the two using a two-way fixed effects model. Based on this analysis, the study further examined the heterogeneity of different firms to draw the following conclusions:

- (i) The impact of CEPI inspections on corporate ESG Gws behavior exhibits clear temporal differences. During the inspection year, the regression coefficient is 0.084 with a $p < 0.01$, indicating a significant increase in corporate ESG Gws behaviors. This may be attributed to the lag in information disclosure and the lagged effects of corporate coping strategies and policy responses. These findings support hypothesis 1a, but only limited to the year of the inspection. However, in the following year, the regression coefficient is -0.09 , with a $p < 0.05$, suggesting a significant suppression of corporate ESG Gws behavior. This supports hypothesis 1b, which holds only after the second year of the inspection, indicating that as CEPI enforcement continues and deepens, enterprises begin to take environmental compliance more seriously, reducing inconsistency between words and actions. This effect likely results from mounting policy pressure, which prompts enterprises to implement green rectification measures, although with a delayed effect. Furthermore, a series of robustness tests confirms that the impact of CEPI on corporate ESG Gws behaviors is robust and reliable, indicating that the research findings have strong credibility and generalizability.
- (ii) From the executive attention perspective, Fs plays a moderating role in the relationship between CEPI and corporate ESG Gws. Specifically, in the one-period lag model, the coefficient of the interaction term between Fs and CEPI is 0.042 with a $p < 0.05$, indicating that Fs enhances the inhibitory effect of inspections on corporate ESG Gws. This finding

supports hypothesis 2. When firms possess higher levels of Fs, executives tend to pay more attention to driving environmental performance in environment-related decision-making and resource allocation. However, the insignificant role of Fs during the inspection year reflects the complexity and short-sightedness of firms' initial coping strategies. This finding emphasizes the importance of Fs in facilitating environmental governance and provides an option for firms to respond to environmental policy pressures through financial strategies.

- (iii) The heterogeneity analysis reveals that enterprises of different ownership types and in different regions exhibit significant differences in their responses to CEPI. Specifically, SOEs and enterprises located in central and western regions show a more pronounced reduction in ESG Gws behaviors. In addition, the analysis of executive heterogeneity indicates that enterprises with CEO duality, as well as those with executives possessing financial backgrounds and postgraduate degrees, perform more effectively in environmental information disclosure and environmental protection. Further analysis finds that CEOs with higher power are more proactive in leveraging Fs to meet policy requirements. This offers a new perspective for understanding how different enterprises respond to environmental policies and provides targeted policy recommendations for policymakers.

7.2. Implications

This paper finds that the CEPI system has a far-reaching impact on corporate ESG Gws. These findings have different insights and significance for the corresponding central supervision, local governments, and individual enterprises, contributing new theories and ideas for the harmonious development of China's economy and environment.

In the context of CEPI becoming the norm, enterprises should start from the following aspects to enhance environmental protection and practice the goals of CEPI with high quality. First of all, the ESG vision should be strengthened. Enterprises should deeply recognize the key significance of ESG concepts for their sustainable development, actively promoting substantive green changes, reducing symbolic environmental protection behaviors, and enhancing their long-term competitiveness and social responsibility. Second, the disclosure process should be standardized. Firms should ensure detailed and truthful disclosure of their ESG policies, measures, performance, and future plans in accordance with

relevant standards and guidelines. Actively engaging third-party professional organizations for audits and verifications can improve the credibility and reliability of information, enhance market trust, and reduce the risk of information asymmetry. Third, Fs should be strategically leveraged. Enterprises should adopt prudent investment strategies and optimize resource allocation to maintain adequate Fs. This allows enterprises to enhance resilience against unforeseen policy shifts and external risks. By aligning financial planning with both organizational fiscal capacities and regulatory compliance requirements, firms can systematically allocate surplus capital toward green technology R&D, environmental protection infrastructure development, and environmental management system upgrades. Such strategic financial deployment not only circumvents Gws allegations but also preemptively addresses potential regulatory penalties, fostering long-term value creation through environmentally conscientious operational paradigms. Finally, executive leadership should be enhanced. Enterprises should prioritize the recruitment of senior executives with postgraduate qualifications and specialized financial expertise. Such individuals, leveraging their profound academic foundations, professional financial acumen, and expansive industry insights, are capable of effectively navigating crises amid complex and evolving risk landscapes. In firms led by high-power CEOs, centralized authority can offer operational flexibility and facilitate efficient decision implementation. However, to avoid governance risks associated with concentrated power, it is critical that boards of directors—as a cornerstone of corporate governance—rigorously oversee the formulation and execution of strategic decisions. This includes proactively identifying and rectifying latent deviations to prevent material errors stemming from subjective judgment failures or managerial overreach.

To mitigate localized pollution issues and achieve high-quality compliance with CEPI objectives, government authorities should consider the following strategies:

- (i) Sustain the refinement of inspection mechanisms. Given the pronounced impact of CEPI on corporate behavior—coupled with tendencies among some firms toward short-term compliance—regulators must ensure inspection continuity and adaptability through enhanced follow-up reviews and long-term oversight. This approach can prevent regression in rectification efforts and combats superficial responses, thereby solidifying inspection outcomes and fostering sustained corporate green transformation.

- (ii) Strengthen policy synergy and guidance. Governments should enhance coordination between environmental inspections and other environmental/industrial policies to achieve synergistic effects. By leveraging tax incentives, fiscal subsidies, and green finance mechanisms, authorities can incentivize corporate environmental responsibility, reduce green transition costs, and elevate firms' proactive engagement in ecological governance.
- (iii) Implement precision-based differentiated regulation. Accounting for corporate heterogeneity, regulators should intensify supervision and post-rectification feedback for private enterprises, non-eastern-region firms, and those with limited Fs. In addition, pre-inspection data collection on corporate and executive profiles can inform tailored regulatory strategies, improving environmental governance efficiency and precision.

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Conflict of interest

The authors declare that they have no competing interests.

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Writing—review & editing: All author

Availability of data

Data are available from the corresponding author upon reasonable request.

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