Local Governmental Environmental Responsibility and Corporate Greenwashing: Quasi-experimental Evidence from China

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Abstract

The issue of greenwashing in Environmental, Social, and Governance (ESG) Disclosure has addressed global concerns in recent years. However, whether governmental environmental responsibility alleviates greenwashing remains unclear, especially for Asian economies. To explore the role of local government in it, we adopt a difference-in-differences (DID) approach to study the effect of the Natural Resources Accountability Audit (NRAA) on corporate greenwashing behavior. Based on a dataset of heavily polluted listed firms in China from 2010 to 2021, this study shows that the implementation of NRAA significantly reduces corporate greenwashing practices and ensures the reliability of corporate ESG disclosure. Intuitively, we find that environmental accountability of local government eliminates corporate greenwashing through stimulating more site visits of institutional investors, revealing the importance of external stakeholders in shaping corporate disclosure strategies. Further analysis on corporate environmental irresponsibility verifies that enterprises curtail greenwashing practices for their internal pursuit of legitimacy. Additionally, this study reveals that NRAA works more effectively for state-owned and politically unconnected enterprises and those in regions with more advanced marketization and economic development, revealing different degrees of dedications across local governments with regard to their environmental responsibilities. Our conclusions serve to extend signaling and legitimacy theory, supplying valuable implications for the elimination of corporate greenwashing practices.

Keywords: Greenwashing; ESG Disclosure; Institutional Investor; Corporate Site Visit; Environmental Responsibility

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1. Introduction

Responsibilities are heavy for each party in society in pursuit of a habitable environment. In recent years, China has witnessed rapid economic growth at the expense of considerable costs, resulting in severe damage to its resources and environment. Currently, substantial energy consumption and pollutants discharge demand different entities to shoulder their environmental responsibility. All stakeholders, like managers, governors, investors, etc., must undertake the responsibility to balance between environmental protection and economic benefits (Wu, 2015; Zeng et al., 2022). In the past decades, growing environmental pressure from various stakeholders on enterprises lead to the surge of green activities and disclosure of environmental, social and governance information in the hopes of legitimacy seeking (Qin et al., 2019; Lee & Raschke, 2023). According to the report of Governance and Accountability Institute (2022), 92% of S&P 500 firms and 70% of Russell 1,000 firms published their sustainability reports in 2020. Similar trend appears in China. As of December 2021, the aggregate value of ESG funds exceeded 220 billion yuan, representing a growth surpassing fourfold compared to the figures recorded in 2013.

However, as ESG disclosure in China remains a relatively early stage, the legislative framework pertaining to ESG reports lack standardized data and reliable scrutiny, which facilitates widespread practice of greenwashing (Du, 2015). Greenwashing is mainly embodied in the disguise of information disclosure: enterprises with greenwashing behaviors selectively disclose positive information about the company's environmental or social performance, avoiding the negative information that should be disclosed, and portraying an overly positive corporate image to the public (Lyon & Maxwell, 2011). From the perspective of internal factors within the enterprise, economic benefits are the most important driving factor. According to Berrone et al. (2017), environmental trademarks can reduce the financing costs of environmentally responsible companies. In order to gain more benefits, companies may enhance their reputation and image through greenwashing behavior (Sterbenk et al., 2022). In terms of market factors, catering to market demand is one of the driving factors.

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Firstly, companies satisfy environmental needs of consumers through greenwashing behavior. Secondly, greenwashing behavior can also be driven by the need to satisfy investors. Enterprises use greenwashing to meet investors' expectations for sustainability and socially responsible returns on investment, enhancing their competitiveness and financing ability in the capital market. Thus, some enterprises engage in greenwashing by employing deceptive strategies, like manipulating ESG transparency to meet the preference of stakeholders (Yu et al., 2020). Signaling theory asserts that corporate greenwashing behavior sends a fake signal to stakeholders that they actively undertake social and environmental responsibilities (Ambarish et al., 1987; Colombo, 2021; Li et al., 2024). However, legitimacy theory posits that firms must align with societal norms and expectations to gain legitimacy and maintain their existence (Dowling & Pfeffer, 1975; Baldini et al., 2018; Li et al., 2018; Reber et al., 2022). Greenwashing practices, once perceived by stakeholders, would considerably weaken corporate legitimacy. What worsens it is that further distrust of stakeholders in disclosure exacerbates the challenge of acquiring corporate legitimacy. In short, greenwashing behavior may positively impact enterprises in the short term, shaping their green image; consumers will be more willing to buy products or services from enterprises with good social responsibility performance, and investors will be more willing to invest in enterprises with good reputations. However, in the long run, the environmental pollution and waste of resources caused by greenwashing behavior will hurt the production and operation of enterprises, which is not conducive to the construction of corporate reputation and brand images, and ultimately undermines the profitability and sustainable operation of enterprises.

Prior studies have verified that greenwashing practices, though benefit short-term financial performance and innovation (Chen, 2008; Chiou et al., 2011; Nygaard & Silkoset, 2023), lead to the distrust from stakeholders in the long run and hinder enterprises from sustainable development (Sun et al., 2023; Nygaard & Silkoset, 2023). However, since the government acts as a decisive role in corporate behavior regulation and business ethics supervision, the fulfillment of environmental responsibility by local government serves to stimulate enterprises undertake their environmental and social responsibility (Lee et al., 2018). Nevertheless, the role of government in regulating corporate greenwashing reserves as an

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intriguing question that deserve thorough analysis. Drawing on a quasi-experiment in China, this study evaluates whether the surge in local governmental environmental responsibility helps alleviate corporate greenwashing from the perspective of ESG disclosure and performance.

In pursuit of stringent environmental governance, the National Resource Asset Audit (NRAA) serves as an instrument for central government to establish a legislative framework to lifelong responsibilities of local government for any ecological and environmental damage. It encompasses a systematic evaluation of local administrative officials, aiming to uphold their obligations pertaining to the management of natural resource assets and the preservation of ecological environments throughout their tenures. This integrated framework incorporates environmental auditing into economic accountability auditing, thus broadening the scope of governmental auditing in national governance. With resource conservation and environmental preservation incorporated into the performance evaluation for local officials, the NRAA reshape the performance principle of "only GDP target" of local officials (Li & Zhang, 2018; Chen et al., 2023), stimulating the transmission of environmental pressure to local enterprises within their jurisdictions. Since the pilot program does not guarantee the national promotion beforehand (Wang & Yang, 2021; Zeng et al., 2021), the pilot implementation of the NRAA serves as a valid instrument for us to study whether the increase in the environmental pressure of local officials lead enterprises to honestly undertake their environmental responsibility. In this paper, we concentrate on the effect of the NRAA on corporate greenwashing behavior from the perspective of ESG disclosure.

This paper aims to research whether the fulfillment of local governmental environmental responsibility induces less greenwashing behavior from the perspective of honest ESG disclosure. In practice, we adopt a staggered difference-in-differences (DID) model to evaluate whether the implement of NRAA reduce mismatch between ESG disclosure and performance. The results show that the upsurge in local governmental environmental responsibility can inhibit corporate greenwashing behavior. Importantly, we find that this inhabitation effect is transmitted through both internal and external channels, including increasing site-visit activities of institutional investors and a notable drop in corporate

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environmental irresponsibility. Further heterogeneity analysis indicates that the policy effect of the NRAA on corporate greenwashing behavior is notably pronounced within state-owned enterprises and entities devoid of political affiliations. Moreover, such effect is more discernible among firms situated in regions with advanced economic development and a high degree of marketization. Several robustness tests, like the parallel trend test and placebo test, are also conducted in this paper to strengthen the reliability of former findings.

Compared with the existing literature, the contributions in this paper are distinct in several aspects. First, this study presents novel evidence on eliminating corporate greenwashing through local government, broadening the research scope of governmental accountability. This study highlights the critical role of an effective audit system for managing natural resources in local government. It clarifies the effect of the NRAA on corporate greenwashing behavior from the perspective of ESG disclosure and extend theoretical perspective of corporate legitimacy. More importantly, this study demonstrates that government environmental responsibility considerably amplifies both internal and external stakeholder concerns regarding corporate legitimacy. More site visits by institutional investors and less environmental violations by enterprises are observed following the implementation of NRAA, revealing the pivotal role of external governance and internal drive in shaping corporate strategies (Abramova et al., 2020; Ilhan et al., 2023). Additionally, this paper extends the research on the factors influencing corporate greenwashing behavior from the perspective of governmental audits. Studies have explored how factors such as digital transformation (Sun et al., 2023), technological innovation and executive characteristics (Zhang et al., 2023a) affect corporate greenwashing behavior. However, there is a literature gap in the domain of the role of governmental audits on corporate greenwashing behavior. This paper addresses this gap by identifying the restraining effect of the NRAA on corporate greenwashing behavior. Last but not least, the policy of the NRAA implies an upsurge of local governmental responsibility by the central government. Our conclusions thus expand the cross-research in the field of governmental audit and environmental information disclosure, which will provide not only valuable experience for the formation and development of governmental audit systems but also theoretical references for other countries aiming to

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strengthen their governmental responsibility.

The rest of this article is arranged as follows: The next part supplies the institutional background and mechanism analysis. Methodology is outlined in the third section, including sample, data sources, measurements and model specification. We show the empirical results and several tests in the fourth section. Heterogeneity analysis is presented in the next section. The final part summarizes our works.

2. Institutional Background and Hypothesis Development

2.1 Institutional Background

Since the reform and opening up, the economy of China has experienced rapid development but with environmental quality deteriorated continually. However, the government in China has changed the way it evaluates officials' performance since the 18th National Congress of the Communist Party of China from the focus on GDP to the balance between environment and economics under the jurisdiction of officials (Yan et al., 2023), strengthening the responsibility for local governmental environmental governance. In pursuit of robust environmental governance, the National Resource Asset Audit (NRAA) functions as a legislative tool for the central government to enforce the lifelong responsibility of local governments for any ecological and environmental damage. The NRAA include a systematically evaluation on local officials through integrating environmental auditing into governmental auditing. Since 2013, the target of environmental audit has gradually shifted from audit of matters (policies or funds) to audit of people (leading cadres) (Cao et al., 2022). Leading cadres mainly refer to deputy county-level cadres above the county level, and "leaving office audit" refers to the inspection, confirmation and assessment of the auditee' s performance of duties during one's term of office (Tan et al., 2023). The key to the implementation of the NRAA lies in promotion pressure of local government officials with regard to their environmental responsibility, which ultimately improves the efficiency of resource utilization and protection the environment. As an innovative institutional arrangement in China, the

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NRAA experiences many years of improvement from pilot to full implementation.

It takes a long from the idealization to implementation of the NRAA. In November 2013, the concept of "the natural resource accountability audit" was first proposed (Kang et al., 2013). In July 2014, the "Rules for the Implementation of the Economic Responsibility Audit of Leading Party and Government Officials and Leading Officials of State-owned Enterprises" provided guidance on how to implement the pilot work. In the same year, under the overall planning of the Audit Commission, the audit institutions in many cities and counties carried out various audit work. Relevant departments put forward "the Pilot Program for the Natural Resource Accountability Audit" in November 2015, which meant the NRAA pilot work officially kicked off. In June 2017, the relevant departments issued the "Regulations on the Natural Resource Accountability Audit (Trial)", marking the gradual movement toward high standardization and institutionalization. In April 2022, the NRAA went from pilot exploration to comprehensive promotion and then to in-depth promotion. Prior to the implementation of the NRAA, both central and local governments prioritized economic performance, often at the expense of the environment. By introducing institutional ecological accountability mechanisms, the NRAA compels local leaders to prioritize environmental protection and resource conservation in their decision-making processes. Following the enactment of the NRAA, local authorities are anticipated to modify their administrative approaches, placing greater emphasis on balancing environmental preservation with economic advancement, especially with regard to stringent regulations on heavy-polluting enterprises within their jurisdictions. Therefore, the NRAA incentivizes local governments to prioritize environmental oversight and pressure enterprises with environmental responsibility, thus minimizing greenwashing practices and promoting sustainable development.

2.2 Hypothesis Development

2.2.1 The mechanism of NRAA on Corporate Greenwashing Behavior

The natural resource accountability audit (NRAA) strengthens local governmental environmental responsibility by incorporating the auditing in resource conservation and

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environmental protection into economic accountability. Since the implementation of the NRAA, many scholars have carried out active explorations around this topic from either theoretical or empirical perspective. Regarding theoretical research, existing literature mainly concentrates on policy review (Zhang, 2018) and theoretical basis (Cai et al., 2014). On the other hand, there are a few studies focusing on both macro-effect and micro-effect of NRAA, especially local environmental development and corporate environmental performance. For instance, Tan et al., (2023) presented that the NRAA significantly reduces carbon emission intensity and it has an obvious spatial spillover impact on the surrounding environmental performance; the pilot audit work has obvious control effect on air pollution (Feng et al., 2021). With regard to its micro-effects, existing studies have identified that the implementation of NRAA incentive enterprises to enhance total factor productivity (Nie et al., 2021), invest more in environmental protection (Zhang & Tan, 2019), and improve corporate environmental responsibility (Sun et al., 2021; Zhang et al., 2023a). Yan et al. (2023) find the positive effect of the NRAA on ESG performance. However, the relationship between governmental environmental responsibility and corporate greenwashing practices. Since greenwashing has become a common practice for enterprises, practical policies that effectively address this problem deserve great attention. Scholars have found that environmental tax reform (Hu et al., 2023) and ESG score rating divergence encourage enterprises to greenwashing (Lee & Raschke, 2023). On the contrary, environmental monitoring centralization (Zhang et al., 2023b) and digital finance (Zhang, 2023) serve to reduce greenwashing practices of enterprises. However, NRAA, as a legislative framework to strengthen environmental responsibility of local government by resource auditing, remains an intriguing question for us to explore.

Corporate greenwashing practices are adopted to address the enormous pressure exerted by environmental sustainability and win environmental legitimacy. Legitimacy can be defined as "the prevailing or assumed belief that an entity's actions are desirable or appropriate within some socially constructed system of norms, values, beliefs, and definitions" (Suchman, 1995). firms must align with societal norms and expectations to gain legitimacy and maintain their existence (Lokuwaduge & Heenetigala, 2017; Baldini et al., 2018; Reber et al., 2022). Signaling theory suggests that organizations convey information, often about their qualities or

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intentions, to stakeholders through signals, including actions and disclosures (Ambarish et al., 1987; Lee & Raschke, 2023; Li et al., 2024). These signals, like ESG disclosure, reduce information asymmetry between parties and enhancing trust. However, when stakeholders observe the mismatch between disclosure and actual performance, fake signals, in fact, exacerbate the distrust of stakeholders on corporations. Legitimacy theory suggests that when stakeholders perceive greenwashing practices, corporate disclosure significantly undermines the legitimacy of corporations, eroding trust and credibility among key stakeholders such as customers, investors, and the wider community (Lee, et al. 2018; Reber et al., 2022). This erosion of legitimacy not only damages the reputation of firms but also hampers its ability to effectively engage with stakeholders in a long term. As a result, greenwashing not only tarnishes the corporate image in short run but also hinders its long-term sustainability and growth prospects by impeding efforts to build genuine trust and credibility in its environmental commitments (Seele & Gatti, 2017; Testa et al., 2018; Lee & Raschke, 2023).

With the implementation of NRAA, local government would be incentive to communicate its development goals and tasks to enterprises, aiming to promote active participation in environmental governance and enhance the likelihood of promotion (Chen et al., 2020; Zeng et al., 2021). Thus, the upsurge in local governmental environmental responsibility leads to the increase in regulatory stringency. On the one hand, local government would transfer the pressure of environmental responsibility to enterprises through either positive guidance (Abban & Hasan, 2021; Zeng et al., 2021), like environmental protection subsidies and tax incentives, or reverse force (Zeng et al., 2021; Zhang et al., 2023b), like penalties for unallowed pollutants, waste water treatment, etc. which raises the risk of dishonest behavior being publicly penalized and lowers the expected returns of greenwashing practices (Chen et al., 2020). This eventually pressures heavy polluting enterprises to regulate themselves in environmental activities and honestly disclose environmental and social information in the hopes of securing corporate sustainability. On the other hand, with the growing emphasis of government on corporate environmental responsibility, various stakeholders, particularly institutional investors, increasingly recognize the significance of precise and honest environmental disclosure (Abramova et al., 2020; Ilhan et al., 2023). Consequently, institutional investors would conduct

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more comprehensive assessments of their targeted firms, like site-visit (Su et al., 2021), to ascertain the precise climate-related risks and environmental performance. As organizations strategically formulate decisions based on their perception of regulatory pressures from different stakeholders, aiming to secure essential resources crucial for the developmental trajectory of the firm (Oliver, 1991; Ilhan et al., 2023), the heightened scrutiny from both government and institutional investment necessitates corporations to uphold transparency and accuracy in their environmental reporting to maintain stakeholder trust and credibility, thereby preventing greenwashing practices of enterprises. With the mechanism shown in Figure 1, the implementation of the NRAA thus compel heavy-polluting enterprises to disclose their ESG information in a more positive and pragmatic attitude, thus inhibiting corporate greenwashing behavior.

Based on the above analysis, we propose the following hypotheses:

Hypothesis 1

The implementation of the NRAA serves to the reduction in the greenwashing behavior of heavily polluting enterprises.

Hypothesis 2

The implementation of the NRAA reduces greenwashing practices through curtailing the corporate violations of environmental regulation.

Hypothesis 3

The implementation of the NRAA reduces greenwashing practices through stimulating the site visit of institutional investors.

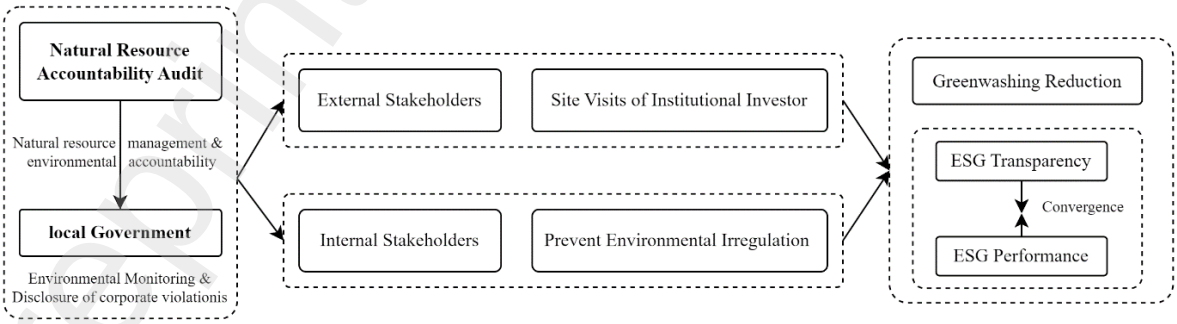

Fig.1 Mechanistic analysis diagram

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2.2.2 Heterogeneity Analysis

Since the effect of NRAA highly relies on corporate and administrative characteristics, this study further considers four factors that influence the mechanism, namely, property right nature and political connection of enterprises at the firm level, and regional economic development level and marketization degree at the regional level, to further evaluate how the effect of NRAA varies across different firms and regions.

State ownership plays an essential role in shaping corporate responses to policy implementation (Terlaak et al., 2018). Legitimacy theory asserts that corporate legitimacy will be threatened when corporate behavior is against the social value of the area where it is located. Due to the pursuit of state-owned enterprises for higher legitimacy, they have the incentive to undertake more environmental and social responsibilities (Atkinson, 2015; Yang & Jiang, 2023). While pursuing economic benefits, state-owned enterprises concentrate more on government attitude and public comments. Thus, they would strive to achieve social goals while value profit maximization less, which leads to the enthusiasm of state-owned enterprises to build corporate image through ESG activities, like green innovation (Pan et al., 2020), philanthropy (Ji et al, 2021), post-disaster ESG disclosure (Huang et al., 2022), etc. Moreover, Ji et al. (2021) and Ren et al. (2023) have shown that state-owned enterprises under government supervision face greater legitimacy pressure and receive stronger incentives to maintain perfect figures. Therefore, state-owned enterprises are more likely to standardize environmental information disclosure standards after the implementation of the NRAA, which is a persuasive way to demonstrate a great image of corporate environmental responsibility. On account of the previous analysis, the hypothesis is proposed as follows:

Hypothesis 4a

Compared to non-state-owned enterprises, the NRAA has a more obvious inhibition effect on the greenwashing behavior of state-owned enterprises.

Political connection is also of vital importance in the transmission from governmental responsibility to corporate responsibility. CEO political connection is ubiquitous and its role depends largely on the political, economic and legal environment of each country, especially

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in many emerging market countries (Zhang et al., 2014). Based on the unique institutional background in China, political connection thoroughly affects corporate behavior in many ways, especially their responses to external environmental pressures (Feng et al., 2021). According to existing research, enterprises with stronger political connection have more advantages in external financing and market expansion, which are the key factors to determine corporate performance (Sun & Zhou, 2021)**,** and stronger political connection can lead to a lower environmental tax burden (Wang & You, 2022). Executives with political backgrounds tend to have more government resources, who can easily establish a close relationship with government officials and have more convenience in protecting the environment. Therefore, during the process of disclosing environmental information, there might be a few abusive behaviors to affect the authenticity of information environment. However, enterprises without political connection may not have political asylum and can only effectively respond to policy requirements by improving information disclosure level and quality. On account of the analysis, the hypothesis is proposed as follows:

Hypothesis 4b

Compared to enterprises with political connection, the NRAA has a more obvious inhibition impact on greenwashing behavior of enterprises without political connection.

The influence of the NRAA on greenwashing behavior of enterprises is influenced by not only corporate characteristics, but also external environmental factors. After decades of market-oriented reform, economic development and resources abundance has shown obvious differences across different regions in China, resulting in different attitude of local government to regulating corporate environmental activities. Prior studies point out that, although environmental information disclosure has been institutionalized both legislatively and operationally, it confronts challenges stemming from insufficient and asymmetric progress across different regions (Shi et al., 2020; Li et al. 2021). In the Western region, local officials confront of higher economic pressure as well as limited resources and industries (Shi et al., 2020; Lei et al., 2023). As a result, they would tend to allow heavy polluters to produce at the margins of environmental requirements. In contrast, in the Eastern region with higher economic

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development levels, government officials are more likely to concentrate on areas due to abundant resources and industries (Lei et al., 2023). Moreover, the abundance of raw material in western area attracts more upstream industries while the distribution of downstream industries is biased to coastal area as a result of a lower trade cost (Zhong et al., 2022). After the implementation of the NRAA, officials in regions with higher economic development levels can respond more quickly to urge enterprises in their regions to actively disclose environmental information and reduce corporate greenwashing behavior. As to the analysis above, the hypothesis is proposed as follows:

Hypothesis 5a

The higher the economic development level of the region where listed enterprises are located, the more significant the inhibition impact of the NRAA on corporate greenwashing behavior.

There are great variations in market characteristics across different regions in China, we thus further consider the heterogeneity of regional marketization degree. Cheng et al. (2011) held that in regions with higher marketization degrees, all kinds of markets are more developed and the contract economy is more mature. Enterprises are willing to obtain resources through voluntary information disclosure, thus they often choose the strategy of high disclosure level. However, in areas with lower marketization degrees, enterprises have insufficient motivation to voluntarily disclose information, choosing the strategy of low disclosure level eventually. In areas with higher marketization degrees, both market supervision and law enforcement are considerably more rigorous (Zeng et al., 2021). Enterprises located in these areas receive more attention from stakeholders and also media, raising higher risk for corporate unethical behaviors. To guarantee sustainable development, enterprises always take a more active part in protecting the environment and demonstrate their legitimacy through honest disclosure. In some areas with lower marketization degrees, enterprises have fewer incentive to disclose precise and truthful information. Therefore, after the implementation of the NRAA, the policy effect may be insignificant in regions with low marketization index. Based on the above analysis, the hypothesis is then proposed as follows:

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Hypothesis 5b

The higher the marketization degrees of the areas where heavily polluting enterprises are located, the more obvious the inhibition impact of the NRAA on corporate greenwashing behavior.

3 Research Design

3.1 Sample and Data

This study targets heavily polluted industries for their essential role in environmental protection and resource restoration. The State Environmental Protection Administration proposed that the listed enterprises need to carry out environmental verification of 13 heavy pollution industries in 2003 for the first time, the Ministry of Environmental Protection formulated "Catalogue of Environmental Verification Industry Classification Management for Listed Companies" in 2008, the heavy pollution industry was subdivided into 14, and in 2010 it was further subdivided into 16. In accordance with the industry code of the Guidelines on Industry Classification of Listed Enterprises revised in 2012, we sorted out the industry standards for heavy pollution in 2003, 2008 and 2011. Referring to the existing studies (Zhang et al., 2019; Tang et al., 2013), we screen out the corresponding enterprises as a sample of heavy polluting enterprises. In this article, we followed these steps to exclude and filter samples: (1) exclude ST (suffering losses for two consecutive years) sample enterprises; (2) sample enterprises without ESG data were removed; (3) sample enterprises that lack data on control variables were deleted. The final sample consists of 217 heavy-polluting enterprises from 2011 to 2021. The NRAA pilot provides a quasi-natural experimental setting that is consistent with the conditions for use of the DID model. Since all cities have already carried out the NRAA from 2014 to 20, this study adopts the staggered difference-in-differences (DID) estimation methodology for our analysis to respond to potential endogeneity concerns. The sample data requirements for the DID model need to fulfill the following three assumptions: Linear Relationship Assumption, Stable Unit Treatment Value Assumption and Parallel Trend

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Assumption. In this paper, the parallel trend assumption will be tested. Notably, the DID method is able to eliminate the effects of time trends, overall policy and other unobserved variables, thus providing a more accurate assessment of the effect of NRAA implementation.

This study retrieves data of NRAA from the websites of national or local government audit offices (bureaus), media reports and mayor mailboxes. Corporate greenwashing behavior is calculated from Bloomberg and Huazheng ESG rating data. CEO political connection data are collected from the personal resumes of directors and supervisors in the CSMAR Database, and the missing data are supplemented by queries such as Sina Finance and enterprise check. We obtain the required financial data from the CSMAR database. This paper uses Stata 16.0 to analyze data.

3.2 Measurements of Variables

3.2.1 Greenwashing

Greenwashing occurs when an enterprise devotes more efforts and funds to portray itself as environmentally conscious through various marketing practices instead of lessening its environmental footprint (Flammer, 2021; Nygaard & Silkoset, 2023). With ESG disclosure score retrieved from the Bloomberg and ESG rating score obtained from Shanghai Huazheng, this study thus addresses the greenwashing behavior of enterprises through the mismatch between the ESG disclosure and actual ESG performance. Similar to Zhang (2022) and Liu et al. (2024), we employ the difference between normalized ESG disclosure and performance to measure the tendency of greenwashing behavior of an enterprise. As shown in Eq. (1), the former represents a normalized measure of an enterprise's position relative to its peers with regard to ESG transparency while the latter denotes a normalized measure of an enterprise's position relative to its peers with regard to ESG performance. The greater the gap between normalized disclosure and performance, the higher the degree of corporate greenwashing behavior, implying more worries for the reliability of disclosed information by firms. Specifically, $\overline{ESG_{dis}}$ is regarded as average ESG disclosure scores and $\overline{ESG_{per}}$ represents average actual performance scores. σ_{dis} and σ_{per} denote standard deviations of ESG disclosure

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scores and performance scores, respectively.

$$GW_{i,t} = \left(\frac{ESG_{disi,t} - \overline{ESG_{dis}}}{\sigma_{dis}}\right) - \left(\frac{ESG_{peri,t} - \overline{ESG_{per}}}{\sigma_{per}}\right) \quad (1)$$

3.2.2 NRAA

After reviewing official materials, we build a dummy variable "Audit" to denote the implementation of the NRAA. We assign the dummy variable (Audit) to a value of 1 when the city where the listed enterprises are located has conducted the NRAA in the observation year, otherwise, 0 is taken as the value.

3.2.3 Control Variables

This paper selects enterprise age, asset liquidity, enterprise growth, equity multiplier, audit quality, board size, executive compensation, CEO age, and proportion held by institutional investors as control variables. Besides, the year fixed effects and individual fixed effects are added into the regression. All the variables are listed and described in Table 1.

3.3 Model

Due to the inconsistency in the implementation time of the NRAA in various cities, the staggered DID model is suitable for examining the implementation effect of policies with different implementation time of individual policies and constantly changing individuals in experimental groups. Therefore, in the paper we firstly adopt the staggered DID model to conduct multiple regression analysis to test the impact of the NRAA on the heavily polluting enterprises greenwashing behavior, meanwhile, we control many other factors effecting the dependent variables. The following model (2) is used to test Hypothesis 1:

$$GW_{i,t} = \beta_0 + \beta_1 Audit_{i,t} + \sum \beta Control_{i,t} + \beta_j \sum Year + \beta_k \sum ID + \varepsilon_{i,t} \quad (2)$$

In model (2), i and t denote individual firm and year, respectively, GW represents the greenwashing behavior of each enterprise in t+1 year， Audit represents the implementation of the NRAA of firm i in t year, which is followed by a set of control variables, year fixed effects

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and individual fixed effects. $Control_{i,t}$ mainly includes all the control variables.

4. Empirical Results

4.1 Descriptive Statistics

In order to explore the effect of the NRAA on the corporate greenwashing behavior, this study first provides descriptive statistics to display the overall characteristics of our sample, as shown in Table 2. It can be observed that the average greenwashing level of listed enterprises in China is -0.0166 with a standard deviation of 1.262, the maximum greenwashing score of enterprise is 6.048 while the minimum is -3.745, showing a notable disparity among the sample enterprises regarding their inclination toward greenwashing conduct.

4.2 Pearson Correlation Analysis

Correlation tests are used to examine potential linearity problems before further tests are carried out. Table 3 presents the Pearson correlation test of the main variables in the model, in which GW and Audit take on a significant positive correlation at the level of 1%. Although contrary to Hypothesis1, the relationship between variables is influenced by many factors, so it requires further analysis. In addition, the correlation coefficient between each variable is much less than 0.6, indicating the absence of serious multicollinearity problem in this study.

4.3 Benchmark Regression Analysis

Table 4 reports the baseline regression results. Column (1) presents the influence of the NRAA (Audit) on corporate greenwashing behavior (GW). From column (1), it is observed the effect of Audit on GW is significantly negative at the 5% significance level. Then we add the necessary control variables in column (2), without the year and individual fixed effect, the regression coefficient of Audit is positive but not significant. As shown in column (3) in Table 4, after adding relevant control variables, both year and individual fixed effect, the effect of Audit on GW is significantly negative at a significance level of 5%, suggesting that the NRAA

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may effectively inhibit corporate greenwashing behavior, which complies with H1. It implies that the upsurge in local governmental environmental responsibility prevents corporate greenwashing in an effective way.

Several control variables also deserve attention. The influence of enterprise age (Age) on corporate greenwashing behavior (GW) is significantly positive at the 1% level. After implementing the NRAA, heavy-polluting enterprises will face more stringent environmental supervision, and enterprises with longer established time will have more sufficient financial and experience accumulation, which can better cope with environmental information disclosure requirements. Asset liquidity (Liquid) and equity multiplier (EM) are significantly negative at 5% and 1% respectively, indicating that stronger asset liquidity and larger equity multiplier can reduce corporate greenwashing behavior, and the higher the proportion of enterprise assets, the more funds will be used for environmental protection and information disclosure, which can effectively reduce the dishonest environmental information disclosure behavior of enterprises.

4.4 Parallel Trend Test

It is a significant prerequisite for testing with the DID model to meet the requirement that the treatment group and the control group have a common trend before the implementation of a certain policy, that is, to fulfil the prerequisite of parallel trend. That is, if there are other factors influencing firms' greenwashing behavior that are not identified, then the trends are different between the control and treatment groups. Referring to prior research (Beck et al., 2010), we adopt the event study method in order to further analyze the dynamic effect of the Audit on GW and test the parallel trend hypothesis with the year before the first entry of Audit for the first time as base year. The specific model (3) is shown as follows: pre_p denotes that the current year of city is t year before implementing the NRAA; $post_t$ denotes that the current year of city is t year after implementing the NRAA; other variables are consistent with the definition in model (2).

$$GW_{i,t} = \alpha_0 + \sum \alpha_t pre_t + \sum \alpha_t post_t + \sum \alpha Control_{i,t} + \alpha_j \sum Year + \alpha_k \sum ID + \varepsilon_{i,t} \quad (3)$$

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In order to more intuitively represent the parallel trend test results, we plot the coefficients of model and show them in Figure 2. From the parallel trend test in Figure 2, we can find that before the implementation of the policy, the coefficients of year dummies before treatment are not significant, which indicates that before the implementation of the NRAA, the change trend of greenwashing behavior of heavy-polluting enterprises is consistent regardless whether the city where the heavy-polluting enterprises are located in implements the NRAA policy, indicating that our sample meets the assumptions of parallel trend.

Moreover, for the following five years since the implementation, the influence of the NRAA on the greenwashing behavior of enterprises remained remarkably significant, indicating that the NRAA inhibits the greenwashing behavior of enterprises in a lasting way. While the policy effect in the last two years is not significant, the breakup of the COVID-19 at the end of 2019 may explain this downturn in the dynamic effect of NRAA. To sum up, the research assumptions and design in this paper meet the preconditions of staggered DID model.

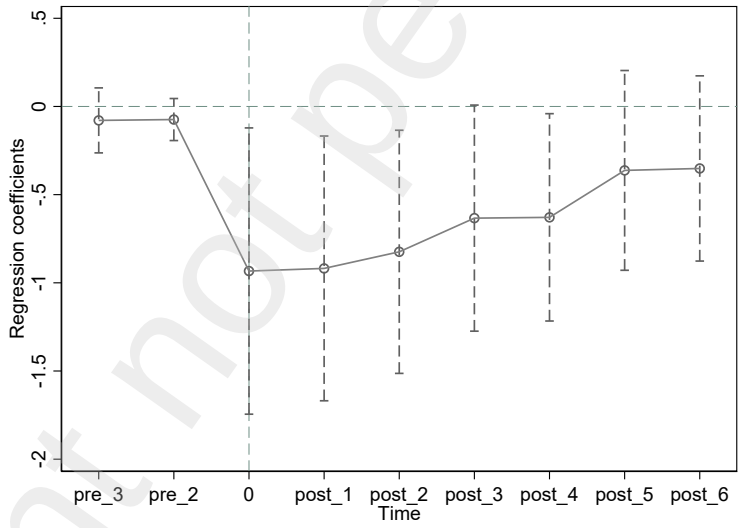

Fig.2 Parallel trend test

4.5 Placebo Test

To rule out the possibility that the influence of the NRAA on corporate greenwashing behavior is disturbed by some unobserved missing factors, a placebo test is performed in this section. Specifically, the equation is estimated again by randomly assigning the treatment of enterprises. To avoid the effects of rare events and improve the validity of our results, this

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random process is repeated 1000 times. Figure 3 shows the p value and kernel density of estimated coefficients for 1000 samples with random treatment. The DID coefficient after randomization tend to concentrated around zero while the estimated coefficient of the baseline analysis is significantly different from zero. The results show that with random treatment assumed for enterprises, there is no significant difference between treatment and control group in the placebo test, which suggests that the inhibitory influence of the NRAA on corporate greenwashing behavior is not seriously interfered by other omitted variables or other policies simultaneously implemented. Therefore, the findings of baseline results keep robust after our placebo test.

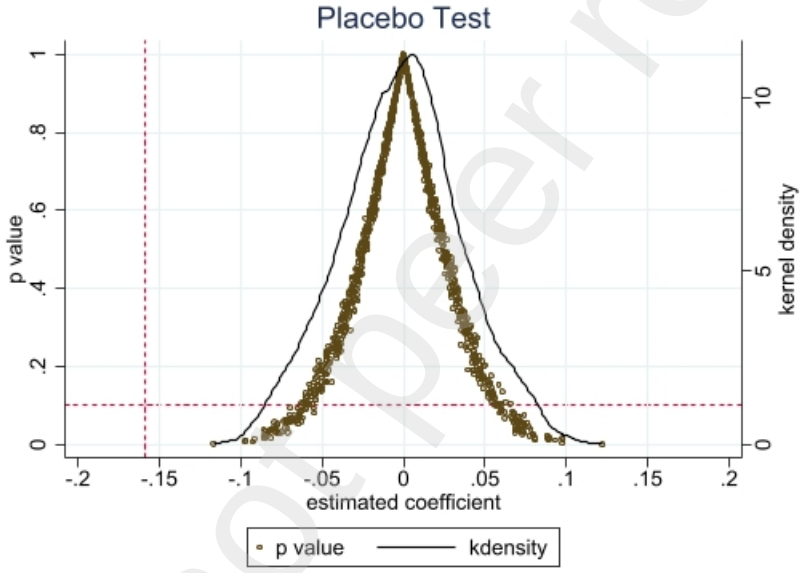

Fig.3 Placebo test

Note. The dash line denotes estimated in baseline analysis while the others represent the results of placebo tests.

5 Further Analysis

5.1 Mechanism Analysis

Although the finding on the prevention of NRAA on greenwashing practices is intriguing, the mechanism behind it deserves our further thorough analysis. This study addresses it from the dual perspective of external governance and internal drive. Specially, we examine the site-visit of institutional investors to reveal higher external pressure and corporate environmental

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irresponsibility to verify the internal pursuit of legitimacy.

5.1.1 Site-visit of Institutional Investors

Perception of enterprises for the necessity to disclose reliable ESG information greatly lies on the attention and trust of institutional investor (Jiang & Yuan, 2018; Zhao et al., 2023). Institutional investors place more emphasis on the truthful information of enterprises that they believe with greater risk of environmental irresponsibility. Site-visit serves as an important way for investor to know exactly what enterprises have prepared for environmental stringency and how enterprises have done to improve their environmental performance. Through face-to-face interactions, institutional investors can scrutinize managers' attitudes towards environmental sustainability and ethical values, potentially inducing more transparent and responsible corporate practices. Literature suggests that site visits by investors promote firm innovation and improve the quality of monitoring, signaling to firms the importance of genuine environmental efforts over superficial claims. Columns (1)-(2) in Table 5 supply the result for the site-visit probability of institutional investor. We find that the implementation of NRAA significantly and strongly stimulate the site-visit of institutional investors. Specially, the probability of enterprises receiving site-visit of institutional investors increase by 44.7 percent after the implementation of NRAA. This study thus verifies site-visit of institutional investors as an efficient mechanism to deter greenwashing practices and encourage genuine environmental stewardship.

5.1.2 Corporate Environmental Irresponsibility

Stringency in environmental supervision serve as one essential incentive of enterprises to reduce unethical ESG behavior (Zeng et al., 2022). Local government employ various monitoring instruments and public disclosure of corporate irresponsibility for resource restoration and environmental protection. Thus, the punitive measures enacted by local governments against corporate environmental irresponsibility not only elevate the anticipated production costs but also induce lasting adverse effects on other corporate stakeholders (Zhang et al., 2023b). To avoid unexpected loss in either capital or reputation, enterprises would reduce their unethical practices through preventing violence of environmental regulations disclosed

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by local government. Therefore, we first examine the impact of NRAA implementation on corporate violence of environmental regulations. Columns (3)-(4) in Table 5 present the results, showing that the implementation of NRAA drives heavily polluted enterprises to reduce violence behavior disclosed by local government, indicating their pursuit of legitimacy. This finding verifies that firms strive to reduce greenwashing behavior in the hopes of a higher level of legitimacy after the increase in the environmental responsibility of local government.

5.2 Heterogeneity of Enterprise Characteristics

5.2.1 Difference in Enterprise Ownership

To further examine the different influence of the NRAA on enterprises with different property rights, we first divide sample enterprises into two groups for further analysis. Column (1) in Table 6 presents the consults of state-owned enterprises while column (2) reports the results for non-state-owned enterprises. It is found that for state-owned enterprises, the regression coefficient of Audit is significantly positive at the 10% level, while the regression results in the non-state-owned enterprise group are not significant. And the absolute value of the coefficient in the state-owned enterprises is larger than that in non-state-owned enterprises, denoting that the NRAA has a more obvious inhibitory influence on greenwashing behavior of state-owned enterprises, which supports H4a. A possible explanation could be as follows. With the responsibility to fulfill the provisions of central governmental, state-owned enterprises have to assist the government by performing additional social functions, like a high level of environmental disclosure. Besides, the managers in state-owned enterprises will be more likely to consider political promotion, which motivates them to actively respond to the environmental regulatory requirements and improve the transparency and reliability of environmental information. Therefore, as a result of additional governmental responsibility and promotion mechanism, state-owned enterprises would tend to disclose their information accurately and truthfully for the sake of corporate brand building and sustainable development.

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5.2.2 Difference in Political Connection

With the economic transition to a green economy, enterprises may actively seek political resources to circumvent government environmental regulations. Thus, the influence of the NRAA on greenwashing behavior may differ between enterprises with and without political connection. On account of the practice of research (Zhou et al., 2018), if the CEO of an enterprise is or was a member of either the National People's Congress or a member of the Chinese People's Political Consultative Conference or a government official, the political connection (PC) is 1, otherwise 0. Columns (3) and (4) in Table 6 present the regression results. The regression estimate of Audit of enterprises without political connection is -0.175 and it is significantly negative at the 5% level, denoting that enterprises without political connection are more susceptible to the NRAA. Under the strict supervision of relevant policies, enterprises without political connection will minimize their greenwashing behavior, which supports H4b. For enterprises with political connection, which is presented in column (3), the coefficient of Audit is 0.120, indicating that when enterprises have political connection, the implementation of the NRAA has promoted corporate greenwashing behavior and reduced the enterprises' sustainable development performance, which denotes that the environmental protection policy has not played a sufficient restraint role. Although political connection can help enterprises obtain a wide range of political resources through contact with the government, it is also easy to breed inertia among enterprises and executives. The "asylum effect" of political connection weakens the effect of the NRAA, and even makes it work in the opposite direction.

5.3 Heterogeneity of Regional Characteristics

5.3.1 Difference in Regional Economic Development Level

Considering the difference in regional development level, environmental quality and other factors, the impact of the NRAA on greenwashing behavior may vary across regions with different macro-environments. According to the policy and economic development level as well as the geographical location of provinces and cities, we divide the country into three regions (Hong Kong, Taiwan, and Macao excluded): Eastern region, central region and western

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region. Table 7 reveals that the coefficient of Audit is negative but insignificant in the central and western regions. While in the more developed eastern region, the effect of Audit on GW is significantly negative at the level of 10%. The results indicate that the NRAA has a consistently negative impact on the greenwashing behavior of enterprises across different regions. While the economic development level is higher, the effectiveness of NRAA become more notable with regard to its inhibitory impact on corporate greenwashing practices. With a relatively higher level of economic development and a more rigorous legal supervision system, the NRAA has a more obvious inhibition impact on corporate greenwashing behavior in the eastern region. By contrast, the natural resource endowment in central and western region is relatively superior. Thus, the region development may depend more on non-renewable natural resources, heavy-polluting enterprises located in these regions may tend to falsely report the real environmental performance to avoid environmental regulations or penalties, so the effect of the NRAA on corporate greenwashing behavior is not obvious.

5.2.2 Difference in Regional Marketization Level

The influence of government on corporate behavior may vary depending on the level of regional marketization. This study thus draws on the China Provincial Marketization Index Report (2021) to further analyze the influence of the NRAA on corporate greenwashing behavior. Specifically, based on the median marketization level of each region as the dividing line, the sample enterprises are divided into two groups, namely, enterprises in region with a high marketization level and enterprises in region with a low marketization level. The regression results are shown in columns (4) and (5) in Table 7, for the enterprises in the high marketization level region where they are located, the coefficient of Audit is significantly negative at the 5% level, and the NRAA significantly inhibits corporate greenwashing behavior, while for those in the region with a low marketization level, the explanatory variable (Audit) has no significant effect on the greenwashing behavior of enterprises, supporting H5b. A possible explanation could be as follows. The high marketization level means that the region has rich innovation resources, relatively strong innovation ability and a perfect legal system.

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Local enterprises also have relatively high environmental regulation ability, which always shows the real environmental information disclosure status, and promotes the sustainable development of their enterprises. For those enterprises located in areas with low marketization levels, the government has a higher degree of intervention, and the local heavily polluting enterprises are more passively accepting the policy, rather than actively carrying out the policy. Therefore, the effect of the NRAA will be greatly weakened, and the effect on inhibiting greenwashing behavior is not obvious. To sum up, improving the degree of marketization is conducive to strengthening the implementation effect of the NRAA and restraining corporate greenwashing behavior.

6. Conclusions and Limitations

6.1 Conclusions

This study explores whether increased environmental responsibility of local government reshape greenwashing behavior of enterprises. Focusing on heavily polluting enterprises listed in China, this paper verifies that the implementation of the NRAA is conductive to corporate environmental behavior through the improvement of the responsibility of local government officials. The contributions of this paper are remarkable in three aspects for Asian economies. Firstly, through identifying the suppressing effect of the NRAA on greenwashing practices, this study supplies a valuable implication that the fulfillment of local officials regarding the management of natural resource assets promotes sustainable economic and social development by regulating corporate environmental activities. Importantly, this study identifies the essential roles of external governance and internal drive within this mechanism. We find that the upsurge in site-visit of institutional investor may serve to explain why corporations change their greenwashing behavior after the implementation of NRAA. The preference of institutional investor to site visit conforms to a heightened emphasis on information reliability in response to escalating environmental uncertainty (Zhou & Gan, 2022; Song, & Xian, 2024). Consistent with the finding of similar research (Zhang, 2022), our conclusions reflect the effectiveness of local governmental environmental responsibility in prompting corporations to genuinely fulfill

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their own environmental obligations, supplying important implications for policy makers with regard to green transition.

Secondly, our findings strongly extend the signaling and legitimacy theory. Enterprise managers frequently factor external legitimacy pressures into their decision-making processes, particularly with regard to signal (Lee & Raschke, 2023; Reber et al., 2022; Li et al., 2024). Stakeholder pressure compels enterprises to uphold transparency standards, thereby fostering trust and credibility in environmental reporting. The commitment to disclosure reliability reflects a strategic response to stakeholder expectations and regulatory demands, aligning with corporate sustainability objectives (Testa et al., 2018; Huang et al.., 2022). As a result, enterprises would strive to minimize their greenwashing practices after recognizing the considerably adverse impact on corporate reputation and stakeholder relationships (Zhang, 2022; Lee & Raschke, 2023). This study thus conforms to legitimacy theory by demonstrating that local government's environmental responsibility motivates corporations to more actively and genuinely fulfill their own environmental obligations.

Third, our findings suggest that the effectiveness of policy implementation is influenced by the diverse characteristics of enterprises as well as regional nuances. On the one hand, due to the promotion expectation of managers, the NRAA has a more significant inhibiting impact on regulating the greenwashing behavior of state-owned enterprises. Similarly, enterprises without political connection will strictly abide by environmental policies and regulations for the lack of lobby capability. The "Shelter effect" of political connection weakens the policy effect of enterprises with political connection, and even promotes the greenwashing behavior of enterprises. On the other hand, in regions with high economic development and marketization levels, a rigorous supervision system compels enterprises to honestly invest in environmental protection, which improves the effectiveness of policies. This underscores the significance of tailoring policy approaches to accommodate the inherent heterogeneity across enterprises and regions, thereby optimizing outcomes and fostering sustainable development.

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Tables

Table 1. Type and description of variables

Variable Type	Variable Name	Variable Description	Variable Symbol
Dependent variables	Greenwashing	The gap between the ESG disclosure score and the actual ESG performance score	GW
Explanatory variables	NRAA	A dummy variable is set to value 1 when the city has implemented the NRAA in that year, otherwise 0 is taken	Audit
Control variables	Enterprise age	The number of years since the enterprise was established	Age
	Asset liquidity	Current assets/current liabilities of an enterprise	Liquid
	Enterprise growth	(Operating income in current year - operating income in the last year)/operating income in the last year	Growth
	Equity multiplier	Total assets/total shareholders' equity	EM
	Audit quality	A dummy variable is set to value 1 if auditors belong to four major accounting firms, otherwise 0	SD
	Board size	The number of board members	Board
	Executive salary	The natural logarithm of the salary of the top three executives	Salary
	CEO age	The natural logarithm of CEO age	CEOage
	Institutional investors	Shares held by all institutional investors	Insti

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Table 2. Descriptive statistics

Variable	Obs	Mean	Std.Dev.	Min	Max
GW	2,227	-0.0166	1.262	-3.745	6.048
Audit	2,227	0.481	0.500	0	1
Age	2,227	19.02	5.189	4	37
Liquid	2,227	1.526	2.412	0.0936	68.97
Growth	2,227	0.271	3.394	-0.814	140.2
SD	2,227	0.0849	0.279	0	1
Board	2,227	9.636	2.138	4	18
EM	2,227	2.223	9.350	-339.2	82.92
Salary	2,227	6.276	0.427	0	7.839
Insti	2,227	59.69	20.81	0.000600	155.7
CEOage	2,227	1.704	0.0505	1.491	1.857

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Table3. Pearson Correlation Matrix

	GW	Audit	Age	Liquid	Growth	SD	Board	EM	Salary	Investors	CEOage
GW	1										
Audit	0.196***	1									
Age	0.119***	0.478***	1								
Liquid	-0.047**	0.0110	-0.077***	1							
Growth	0.0280	-0.0230	0.00300	-0.00800	1						
SD	0.209***	0.0320	-0.0160	-0.059***	-0.0140	1					
EM	-0.00300	-0.041*	0.00600	-0.0280	0.00300	0.0100	0.0160	1			
Salary	0.097***	0.189***	0.166***	-0.044**	-0.00600	0.172***	0.062***	0.0160	1		
Insti	0.244***	0.0100	-0.073***	-0.117***	0.051**	0.201***	0.234***	0.00500	0.042**	1	
CEOage	0.113***	0.136***	0.083***	-0.048**	-0.0250	0.068***	0.073***	-0.00400	0.091***	0.131***	1

Note. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

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Table 4. Benchmark Regression Analysis

	(1)	(2)	(3)
Audit	-0.152** (0.071)	0.052(0.059)	-0.158**(0.071)
Age		0.071***(0.009)	0.141***(0.015)
Liquid		-0.016(0.010)	-0.016**(0.008)
Growth		0.009(0.006)	0.009(0.006)
SD		0.068(0.127)	-0.371(0.227)
Board		0.004(0.016)	0.013(0.023)
EM		-0.002(0.002)	-0.002***(0.001)
Insti		0.005***(0.002)	-0.002(0.003)
Salary		0.121*(0.062)	0.079(0.057)
CEOage		-0.060(0.531)	-0.961(0.815)
Constant	-0.317***(0.062)	-2.370**(0.961)	-1.113(1.443)
Year FE	Y	N	Y
Firm FE	Y	N	Y
N	2227	2227	2227
adj. R^2	0.160	0.109	0.167

Note. The table shows the effect of Audit on GW. Robust standard error is displayed in this table. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

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Table 5. Results of Mechanism Analysis

	Site-visit of Institutional Investors		Corporate Environmental Irresponsibility	
	(1)	(2)	(3)	(4)
Audit	0.447***(0.117)	0.447**(0.188)	-0.395***(0.142)	-0.395*(0.207)
Age	-0.062***(0.011)	-0.062**(0.026)	0.006(0.014)	0.006(0.020)
Liquid	0.041**(0.021)	0.041(0.037)	-0.082*(0.045)	-0.082(0.073)
Growth	-0.033(0.047)	-0.033(0.035)	0.021(0.014)	0.021**(0.009)
SD	-2.000***(0.302)	-2.000***(0.631)	-0.110(0.253)	-0.110(0.454)
Board	-0.105***(0.026)	-0.105(0.068)	0.018(0.030)	0.018(0.048)
EM	0.002(0.006)	0.002(0.003)	-0.009*(0.005)	-0.009**(0.004)
Insti	-0.006**(0.002)	-0.006(0.006)	-0.015***(0.003)	-0.015***(0.004)
Salary	1.319***(0.177)	1.319***(0.420)	-0.313***(0.120)	-0.313(0.191)
CEOage	0.693(0.984)	0.693(2.225)	-0.566(1.200)	-0.566(1.557)
Constant	-8.192***(1.944)	-8.192**(4.128)	2.032(2.126)	2.032(2.919)
Cluster	N	Y	N	Y
N	2227	2227	2227	2227
Pseudo R^2	0.0701	0.0701	0.0270	0.0270

Note. This table present the result for mechanism analysis. Corporate environmental irresponsibility denotes the probability of disclosed of corporate environmental irresponsibility by local government. Site-visit of institutional investors refer to the probability of site-visit by institutional investors. Column (1) and (3) present the result of logit model without cluster while column (2) and (4) are with firm clusters. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

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Table 6. Results of Enterprise Characteristics Heterogeneity

	(1)	(2)	(3)	(4)
	State-owned	Non-state-owned	PC	Non-PC
Audit	-0.157*(0.083)	-0.137(0.143)	0.120(0.139)	-0.175**(0.077)
Age	0.150***(0.018)	0.112***(0.033)	-0.038(0.056)	0.148***(0.016)
Liquid	-0.033(0.021)	-0.015***(0.005)	0.117(0.083)	-0.018**(0.009)
Growth	0.007*(0.004)	0.020(0.020)	0.060***(0.007)	0.006*(0.004)
SD	-0.474(0.300)	-0.191(0.220)	0.000(.)	-0.355(0.248)
Board	0.023(0.027)	0.022(0.038)	-0.049(0.061)	0.024(0.022)
EM	-0.001(0.002)	-0.002***(0.000)	0.028(0.160)	-0.001**(0.001)
Insti	-0.002(0.004)	-0.003(0.004)	0.008(0.011)	-0.003(0.003)
Salary	0.096*(0.050)	0.276(0.262)	0.049(0.409)	0.064(0.049)
CEOage	-1.470(1.120)	0.076(1.280)	7.878***(2.344)	-1.266(0.845)
Constant	-0.545(1.938)	-3.810(2.757)	-13.032**(4.826)	-0.668(1.493)
Year	Y	Y	Y	Y
Firm	Y	Y	Y	Y
N	1526	701	182	2045
adj. R^2	0.199	0.144	0.200	0.170

Note. Robust standard error is displayed in this table. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

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Table 7. Results of Regional Characteristics Heterogeneity

	(1) Eastern	(2) Central	(3) Western	(4) High marketization	(5) Low marketization
Audit	-0.176*(0.102)	-0.208(0.142)	-0.084(0.121)	-0.236**(0.107)	-0.128(0.101)
Age	0.170***(0.025)	0.108***(0.025)	0.115***(0.025)	0.156***(0.027)	0.124***(0.020)
Liquid	-0.039**(0.018)	-0.001(0.006)	-0.034(0.022)	0.012(0.030)	-0.018**(0.007)
Growth	-0.002(0.007)	0.021***(0.006)	0.008(0.007)	0.043(0.034)	0.008(0.006)
SD	-0.434(0.336)	-0.237*(0.120)	-0.315(0.414)	-0.819***(0.312)	-0.009(0.164)
Board	-0.008(0.038)	0.002(0.024)	0.052(0.038)	0.040(0.035)	0.031(0.023)
EM	-0.015(0.013)	-0.000(0.002)	-0.002*(0.001)	-0.007(0.009)	-0.002**(0.001)
Insti	0.004(0.004)	-0.003(0.005)	-0.011**(0.005)	0.003(0.005)	-0.004(0.004)
Salary	-0.105(0.317)	0.250(0.323)	0.086(0.064)	-0.080(0.271)	0.089(0.058)
CEOage	-0.457(1.281)	-1.927(1.264)	-1.416(1.392)	-0.696(1.328)	-0.881(0.987)
Constant	-1.336(3.060)	0.051(2.661)	0.167(2.379)	-1.185(2.860)	-1.161(1.784)
Year	Y	Y	Y	Y	Y
Firm	Y	Y	Y	Y	Y
N	1101	470	583	1127	1100
adj. R^2	0.196	0.167	0.157	0.187	0.138

Note. Robust standard error is displayed in this table. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively

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