

*Original Research*

# Differences in Board Independence's Impact on ESG with Respect to Power Constraints: Evidence from a Heterogeneity Perspective

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## Abstract

This study investigates the relationship between board independence, CEO power, and environmental, social, and corporate governance (ESG) performance of Chinese companies. The study finds that in industrial firms with significant environmental concerns, board independence fails to moderate the adverse effects of strong CEO power on ESG performance. This failure is attributed to management's excessive focus on short-term profits and lack of checks and balances. However, in non-industrial companies, the positive effect of CEO power on ESG performance can be dampened by board independence. This heterogeneity also varies among companies with different political backgrounds. Moreover, the study emphasizes the significance of potential trade-offs between short-term financial benefits and long-term sustainability objectives across regions and corporate governance methodologies.

**Keywords:** CEO power, board independence, environmental, social and governance (ESG), enterprise heterogeneity, corporate governance

## Introduction

The growing focus on sustainability and social impact in business operations is undeniable. This shift is prompting many to view business development through the lens of social responsibility. However, green initiatives at the corporate level are often intertwined with business decisions, and CEOs hold significant sway in these matters, as demonstrated by their ability

to wield power and leadership to impose their will [1-3]. Matters concerning corporate social responsibility (CSR) and environmental, social, and corporate governance (ESG) have garnered significant scrutiny in the corporate governance arena.

Previous studies have explored the factors that drive corporate greening from the viewpoint of influential decision-makers like CEOs, board members, and stakeholders. Nevertheless, these participants' endeavors to foster ESG performance within the corporate sector are still disconnected. Research has concentrated on scrutinizing the impact of CEO power, board traits, and stakeholders on business conduct and choices. It has

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been discovered that CEO duality substantially impacts the sway of CEOs [4, 5]. Since the enactment of the Sarbanes-Oxley Act in 2002, there has been mounting apprehension about agency issues arising from CEO duality, prompting escalating demands for elimination of shared leadership structures. Saudi Arabia initiated a movement in 2017 to protest the co-occurrence of the chairmanship of a company with any other executive role (Article 24 (Separation of Positions) of the Corporate Governance Regulation). Certain companies, such as Chevron (2012), argue in favor of strengthening CEO authority (CEO duality). Additionally, supporting research indicates that influential CEOs and those with political affiliations may prioritize personal goals within the company over the satisfaction of shareholders and stakeholders by leveraging their political capital. As a result, the quality of CSR initiatives may be reduced [6]. The CEO's authority greatly influences the board of directors' resource allocation decisions, particularly in terms of driving CSR investments [7]. The CEO's authority has a substantial impact on decision-making efficiency and quality, extending beyond the initiation and implementation phases and even affecting the efficiency of green inputs. By eliminating unnecessary and inefficient environmental investments, the CEO can optimize the return on investment [1]. As a senior executive, the CEO plays a vital role in advocating for corporate social responsibility and environmental conservation. The significance of a company's prioritization of environmental issues can impact its reputation and long-term business prospects. Neglecting environmental concerns could result in stakeholder retaliation through boycotts or damaging the company's reputation [8]. Moreover, reputational risk can greatly influence the decision-making conduct of independent directors, leading to excessive caution during decision-making, out of fear that poor decisions could harm the company's reputation, ultimately affecting the company's overall social responsibility and performance [9]. Therefore, the board of directors plays a vital role in a company's ESG practices, contributing to better performance and social responsibility by devising and promoting eco-friendly strategies. This not only safeguards the company's reputation but also balances the interests of all stakeholders and secures its long-term business objectives [10].

The composition of CEO power is linked to individual leadership styles and capabilities, as well as to corporate governance structure and board characteristics. However, the extent to which CEO power influences a firm's ESG performance through its interaction with board characteristics is not yet clear. This study expands upon previous research by investigating the relationship between CEO power, board characteristics, and ESG performance under generalized heterogeneity. While previous studies have concentrated on a specific firm type or region, we aim to introduce a comprehensive and inclusive theoretical structure that can account for the possible differences

among firms across various regions and types.

This study investigates the correlation between CEO power, board independence, diversity heterogeneity, and their influence on ESG performance. This research aims to enhance understanding of the interplay among these factors and their potential impact on companies' ESG performance. It presents a unique approach and valuable insights into the relationship between CEO power, board composition, and ESG performance, with a specific focus on Chinese organizations. This study highlights the significance of autonomous directors in mitigating potential negative impacts of CEO power concentration on ESG performance. Moreover, it explores the efficiency of board independence in various corporate contexts. The outcomes can provide direction for corporate governance policies aimed at promoting sustainable governance.

This study evaluates the influence of CEO power on ESG performance, utilizing a static panel and dynamic framework. It emphasizes the importance of informal power (such as political connections) in addition to formal power (such as position, equity, and prestige), which has traditionally received more attention. These informal ties can impact the CEO's decisions and behavior, ultimately affecting the firm's ESG performance [4]. Specifically, we utilized both a fixed effects model and a systematic GMM model to examine the effect of the interaction between CEO power and board independence on ESG performance as well as the individual impact of the CEO on performance.

Our research suggests that CEO power has a substantial unfavorable impact on ESG performance. However, board independence mitigates the influence of CEO power. In non-industrial companies, boosting the ratio of independent directors positively affects ESG performance, thus neutralizing the negative impact of CEO power. CEO power results in lower levels of ESG performance across all politically connected firms. The negative impact can only be improved by board independence in non-politically connected firms. In addition, the study found that the composite leadership structure only has a significant impact on ESG performance in the Eastern region.

The subsequent sections are organized as follows: Section 2 gives a brief overview of the relevant literature and outlines our hypotheses. Section 3 details the data and models employed for this study, while the following section showcases the primary empirical analysis. The paper concludes by summarizing the overall study.

## Literature Review and Hypothesis

### CEO Power, Board Independence and ESG

Agency theory suggests that combining the role of CEO and board chairman would give the CEO more power over the board of directors, thus reducing the independence between the board and managers. This

dual role amplifies the negative effects of principal-agent conflict of interest and reinforces the dominant position of the CEO over management [12]. Despite this, the theory recognizes that top management can contribute to corporate social responsibility and environmental performance, and a strong CEO can foster a positive perception of the company among stakeholders and society [13, 14]. Therefore, environmental and sustainable practices significantly contribute to corporate goodwill [15, 16]. Strong CEOs inspire flexible leadership, which enhances effective management amidst dynamic business environments [17]. Notably, a strong CEO promotes eco-friendly business behavior. When a person simultaneously serves as both the CEO and chairman of the board, it can suggest that they possess more comprehensive knowledge of the firm's environmental needs both internally and externally, thus enabling them to advocate for ecologically friendly business practices. Furthermore, the joint role of CEO and chairman may enhance the promotion and achievement of environmental goals compared to when the positions are separated [18]. However, a powerful CEO may also trigger the adoption of green governance practices within firms. Conversely, excessive executive power may result in suboptimal corporate green governance and heightened environmental risk. Some studies suggest that CEOs who hold the highest control of their companies may overlook environmental management and regulation of environmental risks, along with other operational issues. The dual role of CEO and chairman of the board (CEO duality) can weaken the autonomy and independence of the board [19], potentially leading to lower priority given to environmental governance and green mergers and acquisitions.

The proportion of 'outside' (i.e., external or independent) board members determines its level of independence, a vital characteristic of a board of directors. According to the stakeholder theory, outside directors are less susceptible to pressure from shareholders and managers and their behavior is not limited by organizational constraints, unlike inside directors [20]. Therefore, as a crucial characteristic of the board of directors, board independence is essential to enhance the effectiveness of the company's board of directors [21]. Furthermore, outside directors are granted greater social responsibility and face higher reputational costs, allowing them to provide more qualitative disclosures [16]. However, they still face limitations in disclosing their social responsibility efforts. Research indicates that a lack of experience with the contextual aspects of business activities may lead them to avoid disclosing uncertain information that could pose a reputational risk or that they may not be able to report on social responsibility performance in a way that can be properly evaluated [9]. Thus, we propose the following hypothesis:

**H1:** Board independence has the potential to mitigate the environmental, social, and governance effects of CEO influence.

## Heterogeneity of Industrial Sectors

Many countries require heavily polluting enterprises to disclose environmental information. Furthermore, they are continuously raising the standards for environmental information disclosure. Studies show that China's carbon-intensive industries face high costs for pollution reduction measures, extensive technological adjustment expenses, and limited tolerance towards increased environmental regulation [22-24], making these industries more susceptible to rigorous environmental policies.

ESG performance is a crucial subject that centers on whether companies comply with environmental laws and regulations concerning environmental protection [25], energy conservation, and emission reduction in their daily operations. External factors, such as media attention and environmental regulations, also put the level of corporate sustainability governance under scrutiny. It is worth noting that the industrial sector is frequently identified as a significant contributor to environmental issues, particularly in developing economies [26, 27]. Consequently, we posit the following hypotheses regarding the correlation between CEO power and ESG:

**H2:** Independent directors and powerful CEOs in the industrial sector have an adverse impact on the environment, society, and corporate governance.

## Heterogeneity of Political Connections

The CEO holds a position of great influence within an organization. As per social network theory, firms or individuals located at the core of a social network possess greater access to higher-quality social capital [2, 28, 29]. Valuable external social relationships exist through political connections, enabling informal channels for government intervention at the firm level [30]. Transitioning firms, grappling with the impact of external environmental regulatory pressures, have established informal ties with the government to alleviate the strain [31], and thus CEOs' political relationships are an important resource that can provide firms with "green facilitation", such as access to green loans and government policy subsidies and support, and enhance the effectiveness of firms' sustainable governance, which plays an important role in the context of external environmental pressures, especially in China and other emerging economies, such informal ties may be more pronounced and compensate for weak institutional environments [32] as a source of sustainable competitive advantage for firms. In addition, CEOs with political connections can inspire outside stakeholders' confidence in the sustainable governance of the firm, indicating organizational legitimacy and resilience to risk; but on the other hand, rent-seeking politicians and strong agentic identities may protect against CSR evasion [33]. Opportunism due to revenue pressure makes it possible for companies to forgo the long-term

value of environmental protection in favor of short-term economic benefits that positively affect earnings [34], which can lead to imbalances in sustainable governance. Therefore, the existence of independent directors can monitor and control the behavior of corporate management, thus protecting the interests of the company and safeguarding shareholders' rights and market fairness. We believe that independent directors are independent and objective relative to company management, and are more likely to receive government and public supervision under the role of CEOs and independent directors with political connections. In summary, the existence of independent directors can strengthen the advantages of CEOs with political connections in sustainable governance, while reducing the environmental moral hazard of CEOs. We propose the following hypothesis:

**H3:** Board independence can have positive effects on the environment, society, and corporate governance in companies with political connections, despite CEO power.

### Regional Heterogeneity

China is a large country with notable variations in economic development among different regions. Institutional policies, management models, and sustainable governance performance also differ significantly across regions. The impact of local environmental regulations, external environments, and industry characteristics can have a significant effect on a company's ESG performance [35]. Different regions are subject to varying degrees of environmental regulations. When faced with strict local regulations, firms may choose to relocate to areas with less stringent regulations or invest in technology research and development to decrease pollutant emissions. It is more challenging for these businesses to alter their fundamental direction than it is to relocate their operations and production to other regions. The Eastern region has amassed many skilled professionals and innovations since China began its reform and opening up policies, offering favorable conditions for the eco-friendly advancement of industries [36]. Moreover, the increased level of autonomous innovation encourages the restructuring of the eastern region's capabilities, as stated by Mao, Wang [37]. This, in turn, inspires businesses to pursue environmentally friendly transformations with the support of robust governmental regulations.

Compared to the central and western regions of China, the government in the eastern region enforces more rigorous environmental protection regulations for businesses. Companies in the East have higher environmental awareness due to the more severe environmental pollution in the region. In this region, decisive CEOs can make prompt environmentally conscious decisions while adopting green governance practices to comply with regulations and reduce their impact on the environment. Additionally, the

eastern region experiences greater media attention, and independent directors adhere strictly to their monitoring responsibilities to protect their reputation under strict regulation [38], leading to an increase in both the quantity and quality of environmental disclosures [12]. We assert that the relationship between internal corporate governance mechanisms and external environmental pressures creates a mutually reinforcing connection. This symbiotic relationship is established based on effective corporate governance and reinforced internal corporate controls that result in a more comprehensive disclosure of environmental information. This helps to mitigate the issues arising from opportunistic conduct and the existence of asymmetric information. In addition, technological advancements in regions with high levels of economic development and innovation can incentivize companies to adopt environmentally-friendly production methods, thereby reducing damaging effects on the environment. Additionally, in regions experiencing high external pressures, such as intense environmental enforcement and heightened media scrutiny, companies are more likely to prioritize their green governance performance. As a result, we propose the following hypothesis:

**H4:** Board independence in the East compared to the Midwest can enable powerful CEOs to have a positive effect on the environment, greening and governance.

## Data, Methodology

### Sample and Data

Our research sample comprises firms listed on China's A-share market between 2011 and 2020. To limit the effect of outliers on parameter estimation, all continuous variables are trimmed at the 1% tail, and we omit samples of financial and delisted risky firms, as well as those with unusual financial data – for instance, missing data. We conducted observations on 2,495 firms. Please refer to Table 1 for variable sources and definitions. In defining industrial firms, industry code 06-46 is categorized as such based on the National Economic Industry Classification (GB/T4754-2017). We have chosen to select 39 broad industry categories from Chinese A-share listed companies, including but not limited to Coal mining and washing industry, oil and gas mining, ferrous metal mining and processing, nonferrous metal mining and processing, nonmetallic mining and processing industry, other mining industry, agricultural and food processing industry, food manufacturing industry, beverage manufacturing industry, tobacco products industry, textile industry, textile clothing, shoes, and hats manufacturing industry, leather, fur, feather (down), and its products industry, and more, are all included in this list. When choosing the criteria for the industrial companies we studied, we chose industry codes 06-46 based on their significance in China's economy

Table 1. Variable definition.

| VARIABLES                                  | Definition and Measure   | Source                     |
|--|--|----------------------------|
| Dependent Variable                         |  |                            |
| Environmental, social and governance (ESG) | In terms of social responsibility, the focus is on employee health, gender discrimination, and community welfare expenditure. Specifically, the injury rate, turnover rate, gender ratio, and community spending are used as indicators to measure a company's actual performance in social responsibility. Additionally, compensation policies, employee protection policies, and anti-discrimination policies are employed to assess the company's capability in managing its social responsibilities.   | Blomberg                   |
| Independent Variables                      |  |                            |
| Board independence                         | Proportion of Non-executive Directors (NEDs) to total board size expressed in %.   |                            |
| CEO power                                  | Assign a value of 1 for the following criteria, otherwise 0: Serving as chairman; internal director; holding a senior title; exceeding industry median; owning company shares; institutional investor ownership below industry median; holding an advanced degree (master's or higher); holding positions outside this company.  | CNRDS                      |
| Control variables                          |  |                            |
| Media attention (NEWS)                     | Number of negative reports (times).  | CNRDS                      |
| Environmental regulation (ER)              | <p>First, the per-unit output industrial wastewater discharge (tons), SO<sub>2</sub> emissions (tons), and per-unit output industrial smoke (tons) and dust discharge (tons) of each city are standardized, as shown in equation.</p> $UE_{ij}^S = [UE_{ij} - \min(UE_j)] / [\max(UE_j) - \min(UE_j)]$ <p>Where E<sub>ij</sub> represents the per unit output emission of pollutant j in city i, UE<sub>ij</sub> is the standardized result. Max(UE<sub>j</sub>) and Min(UE<sub>j</sub>) denote the maximum and minimum per unit output emissions of pollutant j across all cities, respectively.</p> <p>To calculate the weights for each type of pollutant:</p> $W_j = UE_j / \overline{UE_j}$ <p><math>\overline{UE_j}</math>: Represents the average emission level per unit of output for the jth type of pollutant across 61 cities over the years [39].</p> $ER_i = \frac{1}{3} \sum_{j=1}^3 W_j UE_{ij}^S$ | CNRDS                      |
| Environmental information disclosure (EID) | For the following qualitative disclosures, add 1 point if disclosed and 0 if not: annual reports of listed companies, social responsibility reports, environmental reports, environmental protection philosophy, goals, management systems, education & training, specific actions, emergency mechanisms for environmental issues, honors or awards, "three simultaneous" system, key pollution monitoring units, emission standards compliance, environmental accidents, environmental violations, environmental petitions, ISO14001 certification, ISO9001 certification, wastewater discharge, COD, SO <sub>2</sub> , CO <sub>2</sub> emissions (tons), smoke and dust emissions, industrial solid waste, exhaust gas and wastewater treatment, dust treatment, solid waste utilization & disposal, noise, light pollution, radiation control, and clean production implementation [40].                        | CSMAR                      |
| Tax administration efforts (TE)            | <p>Estimate the tax revenues expected to be captured by each district according to the model below [41]:</p> $\frac{T_{i,t}}{GDP_{i,t}} = \alpha_0 + \alpha_1 \frac{IND1_{i,t}}{GDP_{i,t}} + \alpha_2 \frac{IND2_{i,t}}{GDP_{i,t}} + \alpha_3 \frac{OPEN_{i,t}}{GDP_{i,t}} + \varepsilon_{i,t}$ <ul style="list-style-type: none"> <li>• T is the local tax revenue at the end of the year for each region (100 million yuan).</li> <li>• IND1 is the value of primary sector production at the end of the year for each region.</li> <li>• IND2 is the value of secondary production at the end of the year for each region.</li> <li>• OPEN is the total amount of exports and imports by region at the end of the year (100 million yuan).</li> <li>• GDP is the gross domestic product of each region at the end of the year (100 million yuan).</li> </ul>  | China Statistical Yearbook |

and the potential influence on ESG performance. These industries constitute a fundamental sector of China's economy, comprising the mining, manufacturing, and energy sectors. Not only do these industries represent a significant portion of Gross Domestic Product (GDP), but they also face distinct challenges and opportunities concerning ESG performance. For instance, such

sectors may be under unprecedented pressure to practice environmental stewardship, social responsibility, and corporate governance. We define the political affiliation PC as 1 if either the chairman or the general manager of a firm is or has been a government official; otherwise, it takes the value of 0. We also categorize listed firms into three regions: East, Central, and West. The East

region comprises 12 provinces and autonomous regions, namely Beijing, Tianjin, Hebei, Liaoning, Shanghai, Jiangsu, Zhejiang, Fujian, Shandong, Guangdong, Guangxi, and Hainan. The central region of China comprises nine provinces and autonomous regions: Shanxi, Inner Mongolia, Jilin, Heilongjiang, Anhui, Jiangxi, Henan, Hubei, and Hunan. Similarly, Western China encompasses nine provinces and autonomous regions, namely Sichuan, Guizhou, Yunnan, Tibet, Shaanxi, Gansu, Ningxia, and Qinghai.

### Control Variable

Early scholars have focused on the impact of disclosure regulations on senior managers' power [42, 43]. The disclosure raises investor awareness of the company's situation, leading a company under scrutiny to pay more attention to green governance as a way to attract further investment. Therefore, disclosure affects CEOs' decisions concerning sustainable governance.

As the issue of global warming escalates, governments and authorities have implemented environmental regulations aimed at curbing its effects [44, 45]. To comply with various corporate social responsibility practices, including sustainable governance [46], enterprises have no choice but to implement these regulations. The implementation of environmental regulations prompts industrial firms to pursue innovations aimed at curtailing environmental pollution, which would otherwise lead to a hike in operating costs. CEOs, being the foremost decision makers of the firm, are proactively engaged in sustainable governance to trim the cost arising from avoidable pollution and stabilize the firm's expenditure on production and operation.

CEOs bear significant responsibility for corporate decision-making, and some have been dismissed for handling media crises related to ESG issues [47]. However, due to insufficient regulation of ESG information [36], available data on the matter is scarce and unreliable. Therefore, reporting on ESG issues may have a greater impact than reporting on other company-related outcomes. Reporting on ESG information motivates CEOs to emphasize sustainability in their companies.

To more thoroughly assess the effect of CEO duality on ESG performance under external monitoring pressure, this paper references existing literature and introduces the following control variables: (1) Tax administration effort (TE), (2) Environmental information disclosure (EID), (3) Media attention (NEWS), and (4) Environmental regulation (ER).

### Empirical Models

This paper focuses on the impact of strong CEOs on firms' ESG performance, moderated by dynamic environments as well as board independence. We construct a fixed-effects model in multiple dimensions

as we consider the correlation between different sample clusters within the sample, in addition, our static panel model incorporates clustering robust standard error (clustering standard error). Based on the theoretical analysis and hypotheses, this study constructs the following empirical models:

$$ESG_{i,t} = \alpha_0 + \alpha_1 CEO\ power_{i,t} + \delta_1 Control_{i,t} + \sum YEAR + \sum IND + \sum Province + \varepsilon_{i,t} \quad (1)$$

$$ESG_{i,t} = \beta_0 + \beta_1 CEO\ power_{i,t} + \beta_2 CEO\ power * Independence + \beta_3 Independence + \theta_1 Control_{i,t} + \sum YEAR + \sum IND + \sum Province + \varepsilon_{i,t} \quad (2)$$

ESG represents the ESG performance of the firm, CEO power represents the CEO power of the firm, CEO power\*Independence represents the interaction term between CEO power and board independence, and Controls denotes the control variables.  $\alpha$  and  $\beta$  are the regression coefficients, respectively, and  $\varepsilon$  is the random disturbance term.

## Empirical Analysis

### Descriptive Statistics

Table 2 displays the findings of the descriptive statistics analysis. The analysis reveals that corporate ESG performance values range between a minimum of 11.77 and a maximum of 51.90, with a mean value of 27.68, indicating an insignificant overall difference. Conversely, the CEO power values range between a minimum of 0.125 and a maximum of 0.875, with a mean value of 0.479, significantly varying overall, suggesting an overabundance of CEO influence in some listed companies.

### Static Panel Model Estimation Results

Table 3 indicates that CEO power has a negative and statistically significant impact on ESG performance. However, CEO power\*INDEPENDENCE has a positive and statistically significant moderating effect, revealing that the relationship between composite leadership structure and firms' ESG performance varies compared to the independent structure [48]. This implies that an increase in the proportion of independent directors on the board of the company leads to a stronger positive correlation between CEO power and ESG performance.

### Dynamic Panel Model: GMM Estimation Results

The system GMM estimation follows Roodman [49] standard procedure, with the exception of implementing a forward orthogonal transformation to address

Table 2. Descriptive statistics.

|              | (1)   | (2)   | (3)      | (4)     | (5)   |
|--------------|-------|-------|----------|---------|-------|
| VARIABLES    | N     | Mean  | Std. Dev | Min     | Max   |
| ESG          | 10950 | 27.68 | 8.779    | 11.77   | 51.90 |
| CEO power    | 10950 | 0.479 | 0.167    | 0.125   | 0.875 |
| INDEPENDENCE | 10950 | 0.374 | 0.0584   | 0.313   | 0.571 |
| ER           | 10950 | 0.538 | 0.499    | 0.00425 | 1.857 |
| EDI          | 10950 | 0.628 | 0.334    | 0.0667  | 1.433 |
| NEWS         | 10950 | 49.17 | 67.95    | 3       | 445   |
| TE           | 10950 | 1.035 | 0.206    | 0.647   | 1.495 |

missing data samples in the difference transformation. Furthermore, we utilize Windmeijer's [50] method to correct for standard errors and minimize the issue of finite sample bias. Since instrumental diffusion may lead to overfitting of instrumental variables and weaken the Hansen overidentification and Difference-in-Hansen tests for instrumental validity and externality, we adopt a "Collapsing" method. In this approach, the instrumental vectors are combined into smaller sets by addition, and for each instrumental vector that is considered endogenous or non-strictly endogenous, we implement the "collapsing" method. For any variable deemed endogenous or not strictly exogenous, we restrict the number of instruments utilized to just the closest delay permissible.

Systematic GMM estimation tests comprise the Arellano-Bond test, assuming no second-order serial correlation in the first-differenced residuals, the Hansen over-identification test with the original assumption of robust instrumental variables, and the Hansen over-

identification test with the original assumption of exogenous instruments. The Difference-in-Hansen test is also applied. The model must satisfy the requirement that all tests cannot reject their original hypothesis. Table 4 presents the estimated outcomes of the system GMM alongside relevant test results and p-values. According to Table 4, the instrumental variables' robustness and exogeneity can be demonstrated via Hansen and the Difference-in-Hansen test.

Additionally, Table 3 and Table 4 demonstrates that CEO power has a significant positive impact on ESG. Moreover, the interaction between CEO power and independent directors' proportion positively affects ESG. This finding supports H1, as well as previous research. Combs, Ketchen [51] reached a similar conclusion that greater board independence and effective CEO monitoring can enhance a firm's competitive advantage.

## Heterogeneity Regression Analysis

### *Heterogeneity of Industrial Sectors*

Table 5 reveals that boosting CEO authority in industrial firms can harm their ESG performance. The findings confirm H2, and this can be attributed to the distinct qualities of industrial firms and managerial myopia. Such firms frequently manage intricate production processes, face risky environmental and social responsibilities, and experience protracted payback periods. In this scenario, CEOs may face pressure from shareholders to prioritize short-term profit maximization, disregarding the long-term effects of ESG factors. Additionally, an excess of CEO power may result in over-centralized decision-making, inadequate monitoring, and a lack of balance, weakening the emphasis on ESG goals. Furthermore, certain independent directors are susceptible to reputational risk and may feel concerned that their improper decision-making will have adverse effects on the enterprise as a whole [9]. This anxiety about their own economic interests may cause them to divert their attention from the long-term influence of ESG factors, leading to a circumstance where board independence

Table 3. Static panel model estimation.

|                        | (1)                 | (2)                 |
|------------------------|---------------------|---------------------|
| Variable               | ESG                 | ESG                 |
| CEO power              | -0.026*<br>(0.144)  | 2.483**<br>(1.214)  |
| INDEPENDENCE           |                     | 0.146<br>(2.478)    |
| CEO power*INDEPENDENCE |                     | 6.693**<br>(3.117)  |
| Controls               | YES                 | YES                 |
| Industry dummies       | YES                 | YES                 |
| Year dummies           | YES                 | YES                 |
| Province dummies       | YES                 | YES                 |
| _cons                  | 23.986***<br>(.567) | 25.336***<br>(.587) |

Note: Standard errors are in parentheses \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Table 4. System GMM Estimation Results.

| Variable   | ESG                 | ESG                  |
|--|---------------------|----------------------|
| L.ESG  | 0.221***<br>(0.000) | 0.271***<br>(0.000)  |
| CEO power  | -0.136**<br>(0.041) | 48.062**<br>(0.034)  |
| INDEPENDENCE   |                     | 81.931*<br>(0.051)   |
| CEO power*INDEPENDENCE   |                     | 124.547**<br>(0.031) |
| Controls   | YES                 | YES                  |
| Year FE  | YES                 | YES                  |
| Number of instruments  | 26                  | 26                   |
| Number of obs  | 5576                | 5576                 |
| AR(1) p-value  | 0.000               | 0.032                |
| AR(2) p-value  | 0.320               | 0.130                |
| Sargan tests of overidentifying restrictions (p-value)               | 0.231               | 0.487                |
| Hansen tests of overidentifying restrictions (p-value)               | 0.128               | 0.403                |
| Difference-in-Hansen exogeneity of instruments tests (p-value range) | 0.281               | 0.187                |

Note: The p-values are in parentheses \*\*\*p<0.01; \*\*p<0.05; \*p<0.1

is compromised. Consequently, such directors are more likely to succumb to the trap of managerial myopia. On the other hand, non-industrial firms may experience an improvement in their ESG performance as CEO power becomes stronger. Such firms usually encounter reduced environmental risks and shorter decision-making cycles. Adopting a management structure with a powerful CEO, including CEO duality, can enhance the impetus of strategic decision-making while ensuring whole-hearted support for ESG goals. Furthermore, directors who are independent, and therefore unencumbered by familiarity with the environmental aspects of business operations, are more inclined to effectively evaluate and disclose ESG factors. This, in turn, aids in achieving a company's social responsibility and enhancing its overall social performance.

#### Corporate Political Connections

The political connection theory suggests that the CEO's social connections facilitate the expansion of the firm's finance accessibility, which is crucial to its success. Additionally, CEOs with political connections, particularly stronger ones, can promote green innovation [52] and positively impact corporate green governance. The findings of Table 6 reveal the regression results for CEOs with and without political connections. The regression analysis indicates that companies with a political background and CEOs with high levels of power exhibit lower levels of ESG performance. However, this negative effect is moderated in firms

Table 5. The regression results for industrial and non-industrial enterprises.

| Variable   | Industrial enterprise |                      | Non-industrial enterprises |                     |
|--|-----------------------|----------------------|----------------------------|---------------------|
|  |                       |                      |                            |                     |
| L.ESG  | 0.324***<br>(0.000)   | 0.718***<br>(0.000)  | 5.721***<br>(0.000)        | 6.329***<br>(0.000) |
| CEO power  | -3.213*<br>(0.083)    | -9.037**<br>(0.047)  | -4.227*<br>(0.063)         | 10.891*<br>(0.065)  |
| INDEPENDENCE   |                       | 9.696<br>(0.264)     |                            | 16.850**<br>(0.038) |
| CEO*INDEPENDENCE   |                       | -24.963**<br>(0.039) |                            | 13.250*<br>(0.055)  |
| Controls   | YES                   | YES                  | YES                        | YES                 |
| Year effect  | YES                   | YES                  | YES                        | YES                 |
| Number of instruments  | 41                    | 41                   | 38                         | 38                  |
| Number of obs  | 4681                  | 4681                 | 1734                       | 1734                |
| AR(1) p-value  | 0.000                 | 0.000                | 0.000                      | 0.000               |
| AR(2) p-value  | 0.892                 | 0.707                | 0.751                      | 0.966               |
| Sargan tests of overidentifying restrictions (p-value)               | 0.112                 | 0.341                | 0.281                      | 0.619               |
| Hansen tests of overidentifying restrictions (p-value)               | 0.211                 | 0.181                | 0.358                      | 0.182               |
| Difference-in-Hansen exogeneity of instruments tests (p-value range) | 0.326                 | 0.918                | 0.226                      | 0.332               |

Note: The p-values are in parentheses \*\*\*p<0.01; \*\*p<0.05; \*p<0.1



without a political background. Thus, the result does not support H3. CEOs with political connections and significant power often secure valuable resources beyond government support and green investments [52]. However, the low demand for rent-seeking politicians and powerful agents to engage in CSR activities for reputation-building purposes is due to the high cost of implementing CSR [33]. Meanwhile, the possibility of firms abandoning the long-term benefits of environmental protection due to opportunism derived from revenue pressures, and the likelihood of influential CEOs prioritizing short-term financial gains, is high [34]. According to political connection theory, CEOs in dominant positions may gain increased access to resources and privileges as a result of the unique status of SOEs and their alignment with the government. As a consequence, this may amplify their influence and hinder the efficacy of checks and balances on them from board independence [53].

#### *Test According to the Company's Region*

Table 7 displays the results of the regression analysis conducted to identify regional heterogeneity. The findings reveal that firms with dominant CEOs promote ESG performance in the eastern region, whereas in the western region, the impact of CEO power is not significant. In the central region, a non-significant effect is observed, supporting H4. The study highlights the significance of local environmental regulations for firms to consider. Environmental regulations are

more stringent in eastern China, specifically in Beijing, Shanghai, and Guangdong. As a result, businesses must prioritize environmental considerations during their production and business activities. Centralized authority in the form of a CEO allows for quicker decision-making, including investments in eco-friendly technologies and adjustments to production processes, all in the interest of better compliance with environmental regulations. Additionally, the competition among companies in eastern China is intense, and the market environment is complex. Thus, a strong CEO can enhance decision-making efficiency and execution, leading to a better competitive edge against rivals. Powerful CEOs are likely to implement ESG-friendly strategies and adjust quickly to environmental changes to maintain the competitive advantage. Additionally, an increasing number of companies are placing greater emphasis on social responsibility and sustainable development regarding the concept of corporate social responsibility (CSR). Resolute CEOs can heighten corporate leadership's recognition of environmental, social, and governance (ESG) values as a significant component of corporate strategy, thereby facilitating improved dissemination and implementation of ESG values throughout the organization and promoting ESG sustainability.

## **Discussion and Conclusions**

This study investigates how board independence moderates the relationship between CEO power

Table 6. Concerning the regression outcomes related to political background.

| Variable   | Political background |                      | No political background |                     |
|--|----------------------|----------------------|-------------------------|---------------------|
| L.ESG  | 0.671***<br>(0.000)  | 0.991***<br>(0.000)  | 0.261***<br>(0.000)     | 0.665**<br>(0.012)  |
| CEO power  | -36.231**<br>(0.041) | -24.058**<br>(0.017) | -5.198**<br>(0.032)     | -4.918*<br>(0.078)  |
| INDEPENDENCE   |                      | 0.049<br>(0.997)     |                         | 27.767**<br>(0.028) |
| CEO power*INDEPENDENCE   |                      | -56.886**<br>(0.030) |                         | 11.088*<br>(0.082)  |
| Controls   | YES                  | YES                  | YES                     | YES                 |
| Year effect  | YES                  | YES                  | YES                     | YES                 |
| Number of instruments  | 28.000               | 28.000               | 26.000                  | 26.000              |
| Number of obs  | 1344.000             | 1344.000             | 2856.000                | 2856.000            |
| AR(1) p-value  | 0.000                | 0.000                | 0.000                   | 0.003               |
| AR(2) p-value  | 0.472                | 0.580                | 0.325                   | 0.492               |
| Sargan tests of overidentifying restrictions (p-value)               | 0.109                | 0.552                | 0.252                   | 0.303               |
| Hansen tests of overidentifying restrictions (p-value)               | 0.112                | 0.154                | 0.182                   | 0.338               |
| Difference-in-Hansen exogeneity of instruments tests (p-value range) | 0.231                | 0.936                | 0.282                   | 0.171               |

Note: The p-values are in parentheses \*\*\*p<0.01; \*\*p<0.05; \*p<0.1

Table 7. The regression results for the eastern, central, and western regions.

| Variable   | Eastern region      |                     | Central region      |                     | Western region      |                     |
|--|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| L.ESG  | 0.723***<br>(0.001) | 0.533**<br>(0.021)  | 0.862***<br>(0.003) | 0.514***<br>(0.000) | 0.682***<br>(0.008) | 0.813***<br>(0.000) |
| CEO power  | 41.821**<br>(0.042) | 31.589*<br>(0.074)  | 0.819<br>(0.129)    | 0.678<br>(0.472)    | 0.129**<br>(0.029)  | 4.562<br>(0.472)    |
| INDEPENDENCE   |                     | 59.680*<br>(0.061)  |                     | 13.444<br>(0.188)   |                     | 12.472<br>(0.326)   |
| CEO power*INDEPENDENCE   |                     | 78.631**<br>(0.026) |                     | 58.756<br>(0.463)   |                     | -10.870<br>(0.322)  |
| Year effect  | YES                 | YES                 | YES                 | YES                 | YES                 | YES                 |
| Number of instruments  | 26.000              | 26.000              | 23.000              | 23.000              | 26.000              | 26.000              |
| Number of obs  | 3870.000            | 3870.000            | 1054.000            | 1054.000            | 795.000             | 795.000             |
| AR (1) p-value   | 0.000               | 0.000               | 0.000               | 0.020               | 0.000               | 0.000               |
| AR (2) p-value   | 0.203               | 0.193               | 0.624               | 0.565               | 0.102               | 0.938               |
| Sargan tests of overidentifying restrictions (p-value)               | 0.239               | 0.429               | 0.129               | 0.182               | 0.328               | 0.333               |
| Hansen tests of overidentifying restrictions (p-value)               | 0.107               | 0.176               | 0.188               | 0.235               | 0.326               | 0.160               |
| Difference-in-Hansen exogeneity of instruments tests (p-value range) | 0.632               | 0.235               | 0.124               | 0.235               | 0.374               | 0.188               |

Note: The p-values are in parentheses \*\*\*p<0.01; \*\*p<0.05; \*p<0.1

and ESG performance. Results show that CEO power significantly affects ESG performance in diverse external environments. Additionally, board independence moderates the relationship between CEO power and ESG performance, with a moderating effect.

While previous studies have explored the impact of CEO power and board independence on ESG performance, limited research has investigated the impact of joint leadership structure and board independence on ESG performance in various settings. Consequently, this study contributes to the existing literature on CEO power and board independence by addressing the knowledge gap regarding the joint influence of board independence and CEO power.

The research demonstrates that CEO power has a noteworthy impact on ESG performance across varying external environments. Additionally, board independence plays a moderating role in the association between CEO power and ESG performance. This implies that boards of directors possess the capability to regulate CEO power, decrease agency and environmental costs, and stimulate ESG performance in specific situations. Nonetheless, firm CEOs in the industrial sector exhibit a negative effect on ESG performance. This phenomenon can create economic challenges for firms in achieving long-term sustainability. Over-centralized decision-making power may cause firms to overlook their long-term environmental responsibilities, thereby impacting their economic stability and market reputation. Meanwhile, the CEO's political connections, which

play a key role in providing access to resources and government interventions as a means of obtaining high-quality social capital, may also lead to an over-reliance on political connections, which affects the firm's ability to innovate and its long-term economic performance. These issues could arise from agency problems stemming from information asymmetry, causing the board's independence to waver, ultimately undermining their regulatory role. Furthermore, companies operating in the Eastern region may encounter heightened competition in both domestic and global markets, along with increasingly rigorous environmental regulations and greater demands for social responsibility. Consequently, robust CEO leadership and independent board structures have a positive impact on ESG performance. These elements may also influence the decision-making approaches of CEOs, the composition of boards, and the associated corporate governance protocols.

The findings of this study align with agency and management theory, and carry significant policy implications. Our focus should be on managing informal relationships between midwestern and industrial firms in a normative manner. Our recommendation is that industrial firms with political affiliations steer clear of rent-seeking behavior and overinvestment. Instead, they should strive for balance between achieving economic efficiency and meeting sustainable development goals. The top executives of corporations should undergo scrutiny to guarantee the soundness and adherence of their choices, as well as the efficient utilization of their

political assets. In regions with lower environmental standards, governments should bolster compliance management, enhance local environmental systems, provide green subsidies to local industries, and prioritize disclosing corporate environmental data. Public education on greening also needs improvement. These reports provide market participants and other stakeholders with relevant information.

The study's narrowed focus on China may restrict the generalizability of its findings to other nations or regions. Future research should investigate the effects of both internal corporate governance mechanisms and external environments on sustainable governance. Prior research indicates that a country's degree of corporate governance is associated with its level of economic development. Therefore, political and cultural factors may impact the quality of corporate governance mechanisms within a country. Differences across countries exist in the influence of CEO power on sustainable governance. Hence, future research should explore the extent of variation in sustainable corporate governance across different systems and between developed and emerging countries. Additionally, investigating the mechanisms employed to restrict CEO misconduct is a vital aspect of effective corporate governance.

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### Conflict of Interest

The authors declare no conflict of interest.

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