Environmental Background of Independent Directors and Corporate ESG Performance

Wenli Zhang

Anhui University of Finance and Economics, Bengbu, Anhui, 233030, China

Abstract: With the development of ESG concept, ESG performance of enterprises has become an important index to evaluate their comprehensive strength. This paper aims to explore the impact of independent directors with environmental background on ESG performance of enterprises. The research results show that independent directors with environmental protection background can significantly improve the ESG performance of enterprises by improving internal control. Further analysis shows that the significant improvement effect is only reflected in state-owned enterprises and non-heavy polluting enterprises; When the proportion of independent directors with environmental protection background is higher, the ESG performance is better.

Keywords: Independent Director, Environmental Background, ESG Performance, High-Quality Development

Introduction

Under the strategic background of "dual carbon" goals, as an important force for promoting economic development, enterprises' improvement in ESG performance to promote high-quality development has attracted much attention. As an integral part of corporate governance, independent directors with environmental protection experience possess higher environmental awareness, which positively affects their abilities and decision-making, thereby influencing the ESG development strategies and performance of enterprises. Therefore, this article explores the impact of independent directors' environmental protection background on corporate ESG performance, which helps broaden the perspective of improving corporate ESG performance and has practical significance.

1. Literature Review and Research Hypotheses

In recent years, scholars have conducted rich research on the effects of the background characteristics of independent directors, verifying their influence on corporate audit quality (Gao Fenglian et al., 2020)[1], debt default (Dou Chao et al., 2022)[2], and company performance (Drobetz et al. 2018)[3]. An independent director's environmental protection background indicates a deeper understanding of the importance of environmental responsibility (Li Yi et al., 2023)[4]. Meanwhile, based on the imprinting theory, Marquis and Tilcsik (2013)[5]argue that experiences in specific periods form "imprints" that influence individual cognition, and environmental protection experience also has a significant impact on personal values (Bi Qian et al., 2019)[6]. The "imprint" of environmental protection experience enables independent directors to promote a greater focus on ESG factors in decision-making, thereby enhancing corporate ESG performance.

Therefore, this article proposes Hypothesis H1: Compared to companies without independent directors with an environmental protection background, companies that employ independent directors with such a background tend to have better ESG performance.

As supervisors of internal control, independent directors hired by enterprises can utilize their professional knowledge to facilitate corporate development. Independent directors with an environmental protection "imprint" can assist in improving the enterprise's risk management framework by reviewing its environmental risk disclosure plans, reducing environmental risks, and enhancing the quality of internal control. High-quality internal control contributes to enhancing corporate ESG performance (Lin Ziang and Qian Jinghan, 2023)[7]. The improvement in the quality of internal control can promote stricter and more transparent environmental information disclosure standards for enterprises. Independent directors with an environmental protection background can leverage these standards to restrain short-term behavior by management and integrate more positive development concepts into corporate operations and management, effectively overseeing the fulfillment of corporate environmental responsibilities and contributing to enhancing the company's environmental performance and social responsibility. The initial establishment of internal control systems aims to achieve a balance of power within the enterprise, and independent directors with an environmental protection background can fully utilize their supervisory functions to balance the interests of various shareholders and improve corporate governance.

Therefore, this article proposes Hypothesis H2: Independent directors with an environmental protection background can enhance corporate ESG performance by improving the quality of internal control.

2. Research Design

2.1 Data Source and Sample Selection

This paper takes China's Shanghai and Shenzhen A-share listed companies from 2010 to 2022 as the sample and processes the data as follows: ① Exclude companies with ST or PT status; ② Exclude financial enterprises; ③ Exclude observations with missing values in relevant variables; ④ Perform 1% winsorization for all continuous variables. The corporate ESG data is sourced from the WIND database, while the independent directors' environmental protection background data is obtained from the CSMAR database and Sina Finance. Other financial data is derived from the CSMAR database.

2.2 Variable Definitions

① Explanatory Variable (ESG): Drawing on the approach of Li Zengfu and Chen Jiaying (2023) [8], the Huazheng ESG score is divided by 100 to measure the corporate ESG performance. ② Explanatory Variable (EB_dum): Independent directors' environmental protection background. Based on the definition by Wang Hui et al. (2022) [9], if a company has an independent director with an environmental protection background, the value is 1, otherwise 0. ③ Control Variables: Referring to the work of Lei Lei et al. (2023) [10] and Wen Wen and Song Jianbo (2017)[11], the following variables are controlled: FirmAge (company's establishment duration), Lev (asset-liability ratio), ROA (return on assets), Tobin Q (Tobin's Q), Size (company size), TOP1 (the shareholding ratio of the largest shareholder), Indep (the proportion of independent directors on the board), SOE (enterprise nature), Dual (duality of CEO and chairman positions), Board (board size), Growth (revenue growth rate), and SA (financing constraints).

2.3 Model Specification

To test the impact of independent directors' environmental protection background on corporate ESG performance, the following model is constructed:

$$ESG_{i,t} = \alpha_0 + \alpha_1 EB\_dum_{i,t} + \alpha_2 Control_{i,t} + Industry + Year + \varepsilon_{i,t}$$

Where ESG represents the corporate ESG performance, EB_dum indicates whether the company's independent directors have an environmental protection background, Controls are the control variables, Industry represents the industry, Year represents the year, and ε is the error term.

3. Descriptive Statistics

3.1 Descriptive Statistics

Table 1: Descriptive Statistics of Key Variables

Variable	Observation value	mean value	Standard Deviation	Minimum value	Median	Maximum value
EB_dum	30826	0.393	0.488	0.000	0.000	1.000
FirmAge	30826	2.912	0.331	1.792	2.944	3.526
Top1	30826	34.631	14.747	9.125	32.411	74.451
TobinQ	30826	2.038	1.301	0.843	1.618	8.534
Growth	30826	0.169	0.375	-0.543	0.111	2.250
SA	30826	-3.819	0.252	-4.434	-3.825	-3.135
Size	30826	22.284	1.286	19.982	22.089	26.285
Lev	30826	0.427	0.201	0.057	0.421	0.882
Board	30826	2.127	0.198	1.609	2.197	2.708

Indep	30826	37.591	5.356	33.330	36.360	57.140
Dual	30826	0.271	0.444	0.000	0.000	1.000
SOE	30826	0.381	0.486	0.000	0.000	1.000

Table 1 reports the descriptive statistics of the main variables. Among them, the mean value of ESG is 0.732, indicating that the overall ESG performance of listed companies in the research sample is relatively good. The mean value of EB_dum is 0.393, indicating that 39.3% of the companies in the sample have independent directors with an environmental protection background.

3.2 Baseline Regression Analysis

Table 2 reports the results of the baseline regression analysis. In the regression results of columns (1) and (2), the regression coefficients of EB_dum are 0.0024 and 0.0021, both significant at the 1% level. This indicates that compared to companies that do not employ independent directors with an environmental protection background, companies that do have a better ESG performance. This preliminary verifies the validity of Hypothesis H1.

Table 2: Benchmark Regression Results

	(1)	(2)
	ESG	ESG
EB_dum	0.0024***	0.0021***
	(4.1098)	(3.7564)
Controls	Yes	Yes
_cons	0.5194***	0.4319***
	(50.5343)	(39.0938)
Industry	No	Yes
Year	No	Yes
N	30826	30826
R^2_a	0.1000	0.1790

Note: The values in parentheses are t-values; *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively. The same applies to the following.

3.3 Endogeneity Test

3.3.1 Heckman Two-Stage Model

Drawing on the approach of Zhou Kaitang et al. (2017) [12], we use the average proportion of independent directors with an environmental protection background in the same industry in the previous year (L.EB_ratio_mean) as an instrumental variable. Panel A, column (1) of Table 3 reports the estimation results of the first stage, showing that the estimated coefficient of L.EB_ratio_mean is significantly positive. Panel A, column (2) of Table 3 reports the estimation results of the second stage, indicating that imr is significant at the 1% level, suggesting that there is an endogeneity issue in the original regression analysis. However, the estimated coefficient of EB_dum remains significant at the 10% level, indicating that Hypothesis H1 still holds after considering the endogeneity issue.

3.3.2 PSM (Propensity Score Matching)

Using all control variables as matching variables, we match independent directors with an environmental protection background to those without, obtaining a matched sample. Panel A, column (3) of Table 3 presents the PSM results, showing that the estimated coefficient of EB_dum remains significantly positive, indicating that the previous conclusion still holds after controlling for differences in company characteristics.

Table 3: Further Analysis

Panei A:	Endogeneity test			Panel B:	Robustness check		Panel C:	Mechanism test	
	(1)	(2)	(3)		(1)	(2)		(1)	(2)
	EB_dum	ESG	ESG		ESG	ESG		ESG	ESG
EB_dum		0.0011*	0.0015***	EB_dum		0.0011*	EB_dum	-0.0102***	
		(1.8205)	(2.6295)			(1.6812)		(-3.2765)	

L.EB_ratio_mean	4.5704***			EB_ratio	0.0072***		EB_ratio		-0.0166**
	(24.0087)				(5.9027)				(-2.3886)
imr		-0.0187***					IC	0.0066***	0.0067***
		(-7.7913)						(20.8683)	(22.0951)
							EB_dum×IC	0.0018***	
								(3.8872)	
							EB_ratio×IC		0.0037***
									(3.4706)
Controls	Yes	Yes	Yes	Controls	Yes	Yes	Controls	Yes	Yes
_cons	-3.5203***	0.6010***	0.4930***	_cons	0.4981***	0.4947***	_cons	0.4646***	0.4629***
	(-11.2393)	(45.4897)	(40.3919)		(44.7463)	(35.3420)		(41.6130)	(41.5627)
Industry	Yes	Yes	Yes	Industry	Yes	Yes	Industry	Yes	Yes
Year	Yes	Yes	Yes	Year	Yes	Yes	Year	Yes	Yes
N	26083	26083	26638	N	30826	22083	N	30826	30826
R^2_a		0.1346	0.2042	R^2_a	0.2019	0.2078	R^2_a	0.2214	0.2219

3.4 Robustness Checks

3.4.1 Alternative Explanatory Variable

By replacing the explanatory variable with the proportion of independent directors with an environmental protection background (EB_ratio), Panel B, column (1) of Table 3 shows that the estimated coefficient of EB_ratio is 0.0072, significantly positive at the 1% level, indicating that Hypothesis H1 still holds.

3.4.2 Change in Sample Interval

In 2015, the newly revised Environmental Protection Law came into effect. Therefore, the research sample was changed to start from 2015. Panel B, column (2) of Table 3 shows that the estimated coefficient of EB_num is 0.0011, significantly positive at the 10% level, consistent with the baseline regression results.

3.5 Mechanism Analysis

Using the enterprise internal control score from the DIB database divided by 100 (IC) as a proxy for internal control quality, the regression results in Panel C of Table 3 show that the regression coefficients of EB_dum × IC and EB_ratio × IC are both significantly positive, validating Hypothesis H2.

3.6 Heterogeneity Analysis

Table 4 reports the regression results grouped by the nature of ownership (state-owned vs. private-owned) and whether the company is a heavy polluter. Columns (1) and (2) show the regression results for state-owned and private-owned enterprises, while columns (3) and (4) present the results for non-heavy polluting and heavy polluting enterprises. The results indicate that the significant improvement effect of independent directors with an environmental protection background on a company's ESG performance is only evident in state-owned enterprises and non-heavy polluting enterprises, but not significant in non-state-owned enterprises and heavy polluting enterprises.

Table 4: Heterogeneity Analysis

	(1)	(2)	(3)	(4)
	ESG	ESG	ESG	ESG
EB_dum	0.0022***	0.0011	0.0020***	0.0014
	(2.5941)	(1.5045)	(3.1600)	(1.3082)
Controls	Yes	Yes	Yes	Yes
_cons	0.4573***	0.5164***	0.5115***	0.4726***
	(25.2358)	(34.5180)	(40.3139)	(21.5830)
Industry	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes

N	11744	19082	21777	9049
R^2_a	0.2783	0.1659	0.2200	0.1648

4 Conclusion

In the context of the "dual carbon" strategy, corporate ESG performance has attracted much attention. This study finds that independent directors with an environmental protection background can significantly improve a company's ESG performance. This significant effect is particularly evident in state-owned enterprises and non-heavy polluting enterprises. The mechanism analysis suggests that independent directors with an environmental protection background can enhance a company's ESG performance by improving the quality of internal control. This study provides insights into enhancing the capabilities of independent directors and promoting high-quality corporate development.

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Author Introduction:

Wenli Zhang (2000-), female, born in Bozhou City, Anhui Province. She is a postgraduate student at the School of Accountancy, Anhui University of Finance and Economics. Her research interests are in corporate governance and finance.