

# Research on the Relationship between ESG Performance and Performance of Listed Companies under the Dual Carbon Target-the Mediating Effect Model Based on Internal Control

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## ABSTRACT

Under the guidance of the dual-carbon goal, the relationship between corporate environmental, social and governance (ESG) performance and performance has received increasing attention. This study uses internal control as an intermediary variable to analyze the interaction mechanism between ESG performance and corporate performance. This paper selects the data of Shanghai and Shenzhen listed companies in the past ten years for analysis, and uses multiple regression models, intermediary effect models and other methods to empirically test the direct impact of ESG performance on corporate performance and the indirect impact through internal control. The research finds that good ESG performance can promote the improvement of corporate performance, and good internal control can strengthen corporate governance, and then effectively regulate ESG performance and corporate performance, thus indirectly promoting the improvement of financial performance. This study proves the importance and necessity of optimizing enterprise ESG performance and strengthening enterprise internal control to promote high-quality sustainable development of enterprises in the context of dual-carbon. This study provides a theoretical basis and practical guidance for enterprises to achieve a win-win situation of economic benefits and social responsibility while pursuing sustainable development.

## KEYWORDS

ESG; Corporate performance; Enterprise internal control; Sustainable development

## 1. INTRODUCTION

With the gradual advancement of the dual-carbon goal globally, ESG (Environment, Social and Governance) has emerged as an emerging investment indicator to measure the sustainable development capabilities of enterprises. The improvement of corporate performance no longer relies solely on traditional financial indicators, but increasingly involves the performance of non-financial indicators such as corporate environmental performance, social responsibility and corporate governance capabilities. This paper focuses on the relationship between ESG performance and the performance of listed companies under the dual carbon target-the mediating effect model based on internal control. The purpose of this paper is to explore the impact of ESG performance on corporate performance, and to study the moderating effect of internal control between ESG performance and corporate performance, so as to provide new ideas and strategies for enterprises to achieve high-quality development. This study not only enriches the theoretical research on ESG and corporate performance, but also provides practical guidance for enterprises to improve their ESG performance and promote a win-win situation of economic benefits and social responsibility.

## 2. THEORETICAL BASIS

ESG performance reflects the performance of enterprises in terms of environment, society and governance structure. Require enterprises to invest in environmental management, reduce the adverse effects of production and operation on the environment; pay attention to the interests of all stakeholders and establish a good interest relationship; improve the corporate governance structure to ensure the effectiveness of top-down operations. Corporate performance includes financial performance and non-financial performance, such as profitability, market share and other financial performance, corporate reputation, social contribution, environmental protection investment and other non-financial performance.

Stakeholder theory shows that effective management and meeting the interests of stakeholders have an important impact on improving corporate profitability. Good ESG performance can enhance the trust relationship between enterprises and stakeholders, improve corporate reputation, enhance overall competitiveness, and thus promote profitability. The theory of sustainable development holds that in order to achieve long-term sustainable and stable development, enterprises need to maintain the balance of environmental, social and economic development in production and operation.

Combined with stakeholder theory, ESG reports can disclose the contribution of enterprises to the environment and society. Enterprises doing these can gain the trust and goodwill of stakeholders and are more conducive to being favored by investors. All enterprises can strengthen communication and contact with stakeholders in ESG management, reform and improve the corporate governance system, so as to improve the company's ESG performance. Based on the theory of sustainable development, enterprises pay attention to environmental protection, actively undertake social responsibility and establish a good governance structure in their operation process, which not only helps to reduce the costs and risks caused by violating relevant laws and regulations, but also improves the brand value and market recognition of enterprises, so as to improve the financial performance of enterprises. ESG performance and corporate performance can influence each other. First of all, good ESG performance can directly improve corporate financial performance by reducing management operating costs and reducing corporate risks. It can also improve corporate reputation and enhance consumer trust, thereby attracting more investment and indirectly promoting the long-term development of corporate performance. At the same time, good corporate performance can enhance the company's brand image and market position, and provide broader social recognition for its further efforts in ESG. In addition, the stable growth of corporate finance can provide resource guarantee for its investment in environmental protection, social responsibility and governance structure, so higher corporate performance can be fed back to enterprises to further promote ESG construction.

## 3. RESEARCH HYPOTHESIS

China's exploration and research on ESG is still in the initial stage, and there is still a big controversy about the specific mechanism of the relationship between ESG performance and financial performance. Some scholars believe that corporate environmental responsibility will increase its economic burden and reduce the overall market competitiveness, which is not conducive to improving financial performance. Other scholars hold the opposite view, that enterprises take the initiative to actively assume ESG responsibilities and effectively disclose ESG information will help them improve their ability to control risks, so as to reasonably control management costs and improve financial performance [2]. However, in general, enterprises pay attention to ESG performance and attach importance to ESG management from the perspective of the interests of all stakeholders, to meet the interests of all stakeholders to the greatest extent, is conducive to strengthening the sustainable development of enterprises, but also conducive to promoting social stability and progress, so that enterprises and society to achieve a win-win situation. The research hypothesis of this paper is as follows:

**Hypothesis 1:** ESG performance can promote the improvement of corporate financial performance.

ESG performance includes three factors: environment, society and corporate governance. Studying the relationship between ESG performance and financial performance needs to combine the relationship between the three factors and financial performance. Good environmental performance and environmental information disclosure are conducive to improving the confidence and ability of sustainable development of enterprises and facilitating the promotion of enterprise value. Enterprises actively undertake social responsibility, help to improve the reputation of enterprises, more easily favored by investors and society, so as to improve the overall competitiveness of enterprises and promote financial performance. Good corporate governance structure can help enterprises reduce management and operation costs, better coordinate the interests of various stakeholders, so as to maintain long-term sustainable and stable profitability, and facilitate financial performance improvement. On the whole, good ESG performance is conducive to improving the environmental and social value of enterprises, prompting enterprises to formulate a more perfect governance system, so as to improve enterprise performance.

**Hypothesis 2:** A good internal control system can effectively regulate the relationship between ESG performance and financial performance.

The level of internal control has an important impact on the adjustment of the relationship between ESG performance and performance. The sound internal control of enterprises can help enterprises better avoid risks, improve the internal working environment and improve the enthusiasm of employees, thus improving enterprise performance. Based on this, a scientific and reasonable internal control system can effectively coordinate and manage the top-down management structure of enterprises, so as to better improve the corporate governance structure and promote the improvement of enterprise performance.

## **4. RESEARCH DESIGN**

### **4.1. Sample Selection**

This study selects the Shanghai and Shenzhen stock listed companies in the past ten years (2010-2020) as the research sample. Among them, some samples with missing variable data, special enterprise samples such as financial samples that are not suitable for this study, and some enterprise samples with zero internal control index (hereinafter referred to as internal control index) are eliminated, with a total of 4049 listed companies. In this study, the ESG score index and other data are from SynTao Green Finance database, and the financial performance, internal control index and other data are from the CSMAR database and the DIB database.

### **4.2. Variable Selection**

In this study, corporate performance is selected as the explanatory variable and the rate of return on total assets (ROA) is used to measure corporate performance. ESG score index (ESG), equity concentration (OC), and equity balance (EB) are used as explanatory variables, and internal control index (IC) is used as an intermediary variable. The main control variables are: solvency (DPA), development ability (DA) and company size (SIZA).

**Table 1.** Variable Definition and Interpretation

Variable Type	Variable Name	Sign	Interpretation
Dependent variable	Enterprise Performance	ROA	Rate of Return on Total Assets
Independent variable	ESG Scoring Index	ESG	Data from SynTao Green Finance
	Ownership Concentration	OC	Proportion of the largest shareholder
	Equity Balance	EB	The proportion of the second largest shareholder / The proportion of the largest shareholder
Mediator	Internal Control	IC	Data from DIB (The weighting of internal control level and risk management and control ability)
Control variable	Debt Paying Ability	DPA	Assets-liability ratio
	Development Capacity	DC	Operating Income Growth Rate
	Company Scale	SIZA	Logarithm of Total Assets

### 4.3. Model Construction

Model 1: The relationship between enterprise performance and ESG performance.

$$ROA = \alpha + \beta_1 ESG + \beta_2 OC + \beta_3 EB + \beta_4 DPA + \beta_5 DC + \beta_6 SIZA + \varepsilon$$

Among them,  $\alpha$  is the constant term to be estimated,  $\beta$  is the coefficient to be estimated, and  $\varepsilon$  is the random error term.

Model 2: The mediating effect of internal control on ESG performance and corporate performance.

$$ESG = \alpha + \beta_1 ESG + \beta_2 IC + \beta_3 OC + \beta_4 EB + \beta_5 DPA + \beta_6 DC + \beta_7 SIZA + \varepsilon$$

Among them,  $\alpha$  is the constant term to be estimated,  $\beta$  is the coefficient to be estimated, and  $\varepsilon$  is the random error term. The internal control index (IC) is added as a mediating variable to study the mediating role of internal control between ESG performance and corporate performance.

## 5. EMPIRICAL RESULTS AND ANALYSIS

### 5.1. Descriptive Statistical Results

**Table 2.** Descriptive Statistical Results

Variable	Sample Size	Mean Value	SD	Max	Min
ROA	4049	6.07	8.92	71.23	-69.61
ESG	4049	19.13	5.97	88	3
OC	4049	33.42	14.67	89.26	3.13
EB	4049	4.01	6.67	39.37	0.01
IC	4049	647.33	86.50	934.17	184.22
DPA	4049	0.48	0.20	1.67	0.01
DA	4049	0.56	6.83	435.60	-2.43
SIZA	4049	23.20	1.52	28.51	20.18

According to the results of descriptive statistics, the standard deviation of enterprise performance (ROA) is 8.92. It can be seen that the performance of listed companies is quite different. The mean ESG index (ESG) is 19.13, the standard deviation is 5.97, and the maximum and minimum spans are slightly larger, indicating that the ESG performance of listed companies in the sample is quite different. There is a big gap between the importance and participation of enterprises in ESG performance. The difference between ownership concentration and equity balance is large, indicating that the governance structure of sample listed companies is very different. The maximum and minimum values of the internal control index (IC) also have a large span, indicating that the internal control level of the sample listed companies is uneven, and the polarization is more serious.

## 5.2. Multiple Regression Analysis

**Table 3.** Multiple Regression Analysis Results

Variable	Coefficient	Standard Error	T Value	Significance
ESG	0.500	0.006	5.257	0.0001
OC	0.064	0.389	6.146	0.0001
EB	0.071	0.232	3.183	0.0002
IC	0.034	0.002	18.667	0.0001
DPA	0.050	0.056	3.454	0.0000
DA	0.056	0.055	5.649	0.0000
SIZA	0.185	0.009	6.337	0.0000

According to the results of regression analysis, it can be seen that ESG performance (ESG) and Internal Control (IC) significantly affect corporate performance. The coefficient of ESG performance is 0.5, indicating that for every unit increase in ESG performance, the average increase in corporate performance is 0.5 units, and the significance level of ESG performance is 0.0001, indicating that it is positively correlated with corporate performance and very significant. The Internal Control coefficient of the enterprise is 0.064, indicating that for every unit of increase in the Internal Control, the performance of the enterprise will increase by 0.064 units. The significance level of Internal Control is 0.0001, indicating that there is a positive correlation between Internal Control and corporate performance, and the relationship is significant. The significance level of ownership concentration is 0.0001, indicating that the shareholding ratio of the largest shareholder is positively correlated with corporate performance. The significance level of the Equity Balance degree is 0.0002, indicating that the proportion of the second largest shareholder's shareholding and the proportion of the first largest shareholder's shareholding have a significant positive correlation with corporate performance. Debt paying ability and other control variables are not specifically quantified in the results, but many control variables still have a potential impact on corporate performance. The above regression analysis results reveal the significant positive impact of ESG performance and internal control on corporate performance, which confirms the establishment of the above hypothesis.

## 6. CONCLUSIONS AND SUGGESTIONS

Based on the empirical analysis of the relationship between ESG performance and corporate performance of the samples of Shanghai and Shenzhen listed companies from 2010 to 2020, this study draws the following conclusions: First of all, the ESG performance of enterprises has a significant role in promoting the improvement of corporate performance. Therefore, enterprises should pay attention to and meet the interests of stakeholders as much as possible in the process of business development, attach importance to the fulfillment of social responsibilities, and strengthen the improvement of corporate governance system. Secondly, the stronger the internal control ability of the enterprise, the more complete the corporate governance structure, so as to improve the ESG

performance of the enterprise. At the same time, there is a significant positive correlation between internal control ability and enterprise performance. Therefore, strengthening internal control can also promote the improvement of enterprise performance, which proves that strengthening internal control can effectively regulate the influence mechanism of ESG performance and performance.

According to the above research conclusions, the following suggestions are put forward: First, enterprises should incorporate ESG responsibility into long-term strategic development plans, formulate relevant ESG responsibility fulfillment and disclosure systems, and improve the awareness of environmental protection and social responsibility of enterprises, so as to ensure the stable and continuous ESG performance scores of enterprises. Second, enterprises should strengthen internal control management. A sound internal control system is conducive to improving corporate performance, and the impact of ownership structure on corporate governance structure is very significant. Therefore, enterprises can improve the quality of internal control by adjusting the ownership structure, and can also strengthen the internal control awareness of management by formulating an institutional system to help enterprises manage and control risks scientifically, thereby improving corporate performance. Third, the government should further strengthen the improvement of ESG information disclosure policies and systems, formulate relevant laws and regulations, clarify the reward and punishment system, and make "voluntary disclosure" become "mandatory disclosure." Establish a complete ESG evaluation system to give full play to the market mechanism.

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