

# The impact of ESG performance on corporate financial performance: an empirical study of China's manufacturing industry from 2019 to 2023

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**Abstract.** As the global climate change situation continues to intensify and China's "dual carbon" strategy is deeply implemented, ESG performance has become a key indicator for measuring a company's sustainable development capability. Taking Chinese manufacturing enterprises as a sample, this paper studies the impact path and dynamic effects of ESG performance on the financial performance of manufacturing enterprises, thereby revealing and explaining the proactive behaviors of enterprises in practicing ESG. This paper adopts a two-way fixed effects model and empirically tests the impact and mechanism of ESG performance on corporate financial performance using unbalanced panel data from 2019 to 2023. The research shows that improving a company's ESG performance helps to enhance its financial performance. The improvement in ESG performance positively affects corporate financial performance by reducing financing costs, and this effect is more significant in non-heavy polluting and high-tech enterprises.

**Keywords:** manufacturing industry, corporate ESG, finance, corporate governance

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## 1. Introduction

As environmental issues such as rising global temperatures, sea level rise, and biodiversity loss continue to emerge, the transition toward green and low-carbon development has become a global consensus. In the field of investment, ESG investing has become a mainstream trend worldwide. A growing number of investment institutions increasingly favor companies with strong ESG performance, regarding ESG performance as a critical indicator for assessing long-term financial stability, risk management capabilities, and future value creation potential. There is a significant positive correlation between good corporate ESG performance and Return on Assets (ROA) [1]. The underlying mechanism is that a higher ESG rating can effectively alleviate information asymmetry between the company and its stakeholders, as well as reduce principal-agent costs [2].

This paper takes Chinese A-share manufacturing listed companies as the research sample and employs a two-way fixed effects model to empirically examine the impact and mechanism of ESG performance on corporate financial performance. This paper quantitatively analyzes the dynamic effects of ESG performance on corporate financial performance, which can provide a theoretical and empirical foundation for subsequent research.

## 2. Literature review

ESG is an abbreviation for Environment, Social, and Governance. It is an evaluation system that comprehensively assesses the performance of modern enterprises in the areas of environment, society, and governance. Scholars Tom and Alexandra argue that ESG is a set of standards used to measure an organization's environmental and social impact, encompassing three dimensions: environmental, social, and governance [3]. These specifically include climate change, greenhouse gas emissions, diversity, inclusion, and the social impact of supply chains. Regarding corporate performance, relevant research conclusions present the following four perspectives. The first is the beneficial theory. Chen et al. suggest that ESG can improve financial performance by enabling companies to maintain sustainability and win the trust of stakeholders [4]. The second perspective is the inhibitory theory. Duque-Grisales & Aguilera-Caracuel point out that companies with the highest ESG scores often have lower profits [5]. The third is the irrelevance theory, as Narula et al. found that there is no significant relationship between ESG and corporate financial performance [6]. The fourth is the non-linear relationship, where Wang Shuangjin et al. concluded that there exists a U-shaped relationship between ESG and corporate financial performance [7]. By analyzing the three ESG dimensions—Environmental (E), Social (S), and Governance (G)—this study reveals their distinct impacts on the financial performance of manufacturing enterprises. Using the latest panel data (2019–2023) and Huazheng ESG ratings, the research addresses gaps in existing studies by controlling for rating agency heterogeneity, focusing on manufacturing industry characteristics, and providing detailed dimension-specific analysis with timely data and industry-specific insights.

## 3. Research design

To investigate the impact of ESG performance on corporate financial performance, this study builds upon the research of Wang Xiaoyan et al. and constructs the following model (see Equation (1)) [8]:

$$ROA_{it} = \alpha_i + \gamma_t + \beta_1 ESG + \beta_2 Control + \varepsilon_{it} \quad (1)$$

On this basis, the impact on corporate performance is further broken down and analyzed from the three dimensions of Environment (E), Social (S), and Governance (G) (see Equation (2)).

$$ROA_{it} = \alpha_i + \gamma_t + \beta_1 E + \beta_2 S + \beta_3 G + \beta_4 Control + \varepsilon_{it} \quad (2)$$

The research sample consists of listed manufacturing companies, constructed using unbalanced panel data from 2019 to 2023. To ensure data quality and the reliability of the research conclusions, this paper excludes companies that did not disclose complete financial reports during these five years and excludes listed companies that have been subjected to special treatment (ST, \*ST, SST) to avoid interference from financial outliers in the empirical results. The core explanatory variable uses the Huazheng ESG rating data to control for heterogeneity among rating agencies. Financial data is sourced from the CSMAR database, ultimately obtaining 8,863 valid observations. Industry classification adopts the 2012 industry classification standard of the China Securities Regulatory Commission. In Model 1,  $\beta_1$  denotes the impact coefficient of ESG performance on corporate financial performance, while  $\beta_2$  represents the coefficient vector of control variables. Model 2 follows the same framework.

## 4. Analysis and results

### 4.1. Descriptive analysis

Table 1 presents the descriptive statistical results of the main variables. From the profitability dimension, the mean Return on Assets (ROA) is 0.05, indicating that the sample enterprises are generally profitable. The maximum value reaches 140%, while the minimum value is negative, suggesting the presence of both extremely profitable enterprises and loss-making enterprises in the sample, with significant heterogeneity among the sample enterprises. From the ESG performance dimension, the mean ESG score is 73.74, indicating that the ESG performance of the sample enterprises is concentrated at an above-average level. The environmental dimension score has the lowest mean value but the largest standard deviation, indicating significant differences in environmental performance among enterprises. The social and governance dimension scores have relatively high mean values and are relatively concentrated in their distribution.

**Table 1.** Variable definition and descriptive statistics

variable	Variable definition	Obs	mean	Std.Dev.	minimum	maximum
ESG	Huazheng ESG Comprehensive Score	8,863	73.7364	4.8769	45.09	90.93
E	Huazheng E score	8,863	62.8046	7.0776	34.44	92.3
S	Huazheng S score	8,863	77.0728	7.1784	25.9	100
G	Huazheng G score	8,863	78.5783	6.4869	36.08	94.93
ROA	Return on assets	8,863	0.0572	0.0528	-0.0549	1.4076
CL	Combined levergae	8,863	2.8978	16.0763	-1.2142	913.8016
cashflow	Cash flow	8,863	-1.09e+09	1.11e+10	-4.14e+11	1.37e+11
board	The logarithm of the board size	8,863	2.2132	0.1671	1.6094	2.8903
asset	The logarithm of the total asset	8,863	22.3988	1.2078	19.1319	27.6377
TAT	Total asset turnover	8,863	0.6519	0.3583	0.0134	4.1560
TOP1	Shareholding ratio of the largest shareholder	8,863	3.4010	0.4504	1.1378	4.4913
lnage	The logarithm of the company's age	8,863	3.0860	0.2609	1.6094	4.2195
IndepDir	Ratio of independent directors to directors of the board	8,863	0.3791	0.0557	0.1429	0.8
cost	Financing cost	8,356	0.0149	0.0148	-0.0061	0.4961

### 4.2. Benchmark regression results

Table 2 presents the fixed effects model estimates of ESG performance's impact on corporate financial leverage. In Model (1) using Equation (1), the contemporaneous comprehensive ESG score is insignificant, indicating no immediate stable effect on corporate finance. Model (2) using Equation (2) decomposes ESG into environmental, social, and governance dimensions. The environmental dimension is significantly positive

at the 5% level, suggesting that improved environmental performance significantly increases corporate leverage. The social and governance dimensions are insignificant, implying no contemporaneous effects on financial leverage.

To examine dynamic effects, Models (3) and (4) incorporate one-period lagged ESG scores. Model (3) shows that the lagged comprehensive ESG score is significantly negative at the 5% level, revealing a time lag in ESG's positive impact on financial leverage. Model (4) further analyzes the heterogeneous effects of lagged dimensions: the environmental dimension is significantly negative at the 1% level, while the social and governance dimensions remain insignificant.

**Table 2.** Benchmark regression results

variable	ROA			
	(1)	(2)	(3)	(4)
ESG	-0.000126 (0.000117)			
E		0.000185** (0.00008)		
S		0.000087 (0.000077)		
G		-0.000021 (0.000092)		
L1_ESG			-0.00029** (0.00014)	
L1_E				-0.000330*** (0.000096)
L1_S				0.000135 (0.000090)
L1_G				-0.000160 (0.000112)
CL	-0.000171*** (0.000026)	-0.000191*** (0.000042)	-0.000170*** (0.000026)	-0.000190*** (0.000042)
board	0.004749 (0.007273)	0.004890 (0.009459)	0.004307 (0.007278)	0.003970 (0.009467)
asset	0.017562*** (0.001993)	0.023433*** (0.002953)	0.017920*** (0.002002)	0.024041*** (0.002957)
lnage	-0.09219*** (0.020143)	-0.14899*** (0.031228)	-0.089531*** (0.020192)	-0.143224*** (0.031329)
TOP1	-0.03143 (0.003543)	-0.012758** (0.005054)	-0.02959 (0.003547)	-0.012366** (0.005053)
TAT	0.097331*** (0.002984)	0.115107*** (0.003945)	0.097376*** (0.002983)	0.115309*** (0.003942)
IndepDir	0.07654	0.024852	0.006529	0.022186

**Table 2.** Continued

	(0.018034)	(0.023379)	(0.018057)	(0.023380)
cashflow	0.000000***	0.000000**	0.000000***	0.000000**
	(0.000000)	(0.000000)	(0.000000)	(0.000000)
N	8.7e+03	6.3e+03	8.7e+03	6.3e+03
$R^2$	0.5756	0.6050	0.5757	0.6058
F	1.3e+02	1.1e+02	1.1e+02	8.8e+01
Year	YES	YES	YES	YES
Company	YES	YES	YES	YES

Note:t-statistics in parentheses. \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

#### 4.3. Mediation effect test

Financing cost is selected as the mediating variable (cost), defined as the ratio of interest expenses, handling charges, and other financial expenses to total liabilities, following Wang [9]. Higher cost values indicate greater financing costs.

Table 3 illustrates the mediation test results. Column (1) shows that ESG score negatively affects ROA ( $\beta = -0.0003$ ,  $p < 0.05$ ). Column (2) indicates that ESG significantly reduces financing cost ( $\beta = -0.0001$ ,  $p < 0.01$ ). In Column (3), after including both ESG and financing cost, the coefficient of financing cost is  $-0.5629$  ( $p < 0.01$ ), while ESG's coefficient decreases to  $-0.0003$  ( $p < 0.10$ ). These results suggest that financing cost partially mediates the ESG-financial performance relationship, with a mediation effect of approximately 18.76%. Better ESG performance lowers financing costs, yet this benefit does not fully offset ESG investment costs in the short term.

**Table 3.** Mediation effect test results of financing cost

variable	ROA(1)	Cost(2)	ROA(3)
ESG	-0.0003**	-0.0001***	-0.0003*
	(-2.04)	(-3.50)	(-1.92)
Cost			-0.5629***
			(-6.28)
cons	-0.0336	-0.0608***	-0.1286
	(-0.29)	(-2.86)	(-1.07)
N	6,283	8,139	5,974
$R^2$	0.716	0.693	0.713
adj. $R^2$	0.605	0.597	0.598
Year	YES	YES	YES
Company	YES	YES	YES

#### 4.4. Robustness test

To verify the robustness of the results, this paper re-estimates the model by replacing the dependent variable. Return on Equity (ROE) is constructed as an alternative measure of financial performance. As shown in Column (1) of Table 4, the regression coefficient of ESG on ROE is  $-0.0009$ , remaining significantly negative

at the 1% level, which is highly consistent with the direction of ESG's impact on ROA in the benchmark regression. This result confirms that the negative impact of ESG performance on corporate profitability is methodologically robust and remains explanatory even when the measurement of the dependent variable is altered.

**Table 4.** Robustness and endogeneity test results

variable	Replaced dependent variable	
	ROE	
ESG	-0.0009***	(0.0002)
cons	-0.5416***	(0.1333)
N	8,659	
$R^2$	0.6281	
adj. $R^2$	0.5182	
F	121.7445	
Year	YES	
Company	YES	

#### 4.5. Heterogeneity test

**Table 5.** Heterogeneity test results

variable	POLLUTION = 1 (ROA)		TECH = 1 (ROA)	
	(1)	(2)	(3)	(4)
ESG	-0.0004**	0.0001	-0.0004**	-0.0000
	(0.0002)	(0.0001)	(0.0002)	(0.0001)
cons	-0.0451	-0.1419**	-0.4350***	-0.2417***
	(0.1649)	(0.0821)	(0.0739)	(0.0605)
N	3099	5555	4237	4550
$R^2$	0.6357	0.7013	0.6567	0.6845
adj. $R^2$	0.5258	0.6128	0.5554	0.5917
F	41.4709	102.1790	119.6215	73.5706
Year	YES	YES	YES	YES
Company	YES	YES	YES	YES

Heterogeneity is examined across pollution and technology attributes. For pollution attribute, sample firms are classified into heavily polluting and non-heavily polluting groups based on the Environmental Protection Verification Industry Classification List. Table 5 shows that ESG performance significantly negatively affects

financial performance in heavily polluting firms ( $p < 0.05$ ), while the effect is insignificant in non-heavy polluting firms. For technology attribute, firms are divided into technology-based and non-technology-based groups according to high-tech enterprise criteria [10]. ESG performance exhibits a significant negative effect on financial performance in technology-based firms ( $p < 0.05$ ), but not in non-technology-based firms.

## 5. Conclusion

This paper theoretically discusses the impact mechanism of corporate ESG performance on financial performance. Taking A-share manufacturing listed companies in China from 2019 to 2023 as the research object, it empirically examines the correlation between ESG ratings and corporate financial performance, as well as the heterogeneous characteristics exhibited. From a theoretical perspective, it elaborates on the pathways through which ESG performance influences corporate financial performance, further enriching the stakeholder theory that explains proactive ESG behaviors and providing empirical evidence.

The factors influencing ESG are highly diverse and interrelated. This paper only controls for internal factors such as the ownership structure, scale, executive characteristics, corporate governance, and organizational strategy of enterprises, while paying insufficient attention to external factors such as national strategies, policy orientations, industry characteristics, and the attention of institutional investors. This paper only selects manufacturing enterprises as the research object and fails to explore the heterogeneity of the impact of ESG performance on financial performance across different industries.

The economic benefits of ESG are significant, as good ESG performance can enhance a company's brand image and reputation, and also make it easier to obtain low-cost financing. In the future, enterprises should conduct an in-depth analysis of the influencing factors of ESG, including the external policy environment, industry trends, and internal ownership structure, enterprise scale, and executive characteristics, and formulate targeted strategies to address the challenges posed by different factors.

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