Analysis of the Correlation between ESG Performance and Corporate Financial Performance

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Abstract: This paper employs fixed-effects models, Spearman correlation analysis, and robustness tests to analyze panel data from 25,363 manufacturing companies listed on the A-share market from 2013 to 2023, exploring the impact of ESG performance and its component dimensions on financial performance. The results indicate that overall ESG performance is significantly positively correlated with financial performance. Corporate governance (G) has the most significant positive impact on financial performance, as it directly enhances asset efficiency by optimizing governance structures and reducing agency costs. Social responsibility (S) indirectly lowers financing costs through reputation accumulation. Environmental (E) performance has weaker short-term financial effects and relies on policy coordination and long-term brand value conversion. Robustness analysis results align with benchmark regression, validating the reliability of the research conclusions. This study provides empirical evidence for governments to formulate differentiated incentive policies, for companies to optimize ESG resource allocation, and for investors to develop ESG-oriented investment strategies, holding significant implications for promoting green economic transformation and corporate sustainable development.

Keywords: ESG Performance; Manufacturing Industry; Financial Performance; Fixed Effects Model

1. Introduction

1.1 Research Background and Objectives

Ecological civilization construction is the core path for the inheritance of Chinese civilization and economic development. The 14th Five-Year Plan explicitly requires enterprises to promote a virtuous cycle between the economy and the environment through green and low-carbon transformation. Under the dual carbon goals, the government incentivizes enterprises to increase ESG investments through tax incentives and fiscal subsidies to enhance their overall competitiveness. In this context, the intrinsic connection between enterprises' environmental governance, fulfillment of social responsibilities, and optimization of corporate governance and their financial performance has become increasingly evident: while short-term environmental investments require capital accumulation, they can generate economic benefits in the long term; efficient governance structures can reduce agency costs, improve decision-making efficiency, and enhance asset effectiveness. Based on this, this study uses annual panel data from 25,363 manufacturing companies listed on the A-share market from 2013 to 2023 as its sample, aiming to reveal the interactive mechanisms between ESG performance and corporate financial performance, explore the differentiated impact pathways of different dimensions on performance, and provide theoretical basis for corporate strategic optimization.

1.2 Research Significance

This study employs fixed-effects models and Spearman correlation analysis to theoretically validate the differing impacts of ESG dimensions on financial performance, providing localized empirical evidence on the economic consequences of ESG in the manufacturing sector and enriching the theoretical framework linking sustainability to corporate performance. Practically, it provides guidance for companies to optimize resource allocation, such as strengthening corporate governance, accumulating reputational capital, and aligning with policy incentives; supports governments in formulating differentiated incentive policies to facilitate the achievement of “dual carbon” goals; and offers investors a basis for ESG investment strategies, promoting sustainable development in capital markets. This research

holds significant practical implications for advancing green economic transformation and guiding companies toward achieving a win-win outcome of social value and financial growth.

2. Literature Review and Research Hypotheses

2.1 Review of Domestic Research

A series of empirical studies based on China's policy context and industry characteristics have shown the following: Liu (2022) found that ESG practices of enterprises in the Yangtze River Delta region are closely related to financial performance under policy promotion, indicating the heterogeneity of regional policy impacts [1]; Wang et al. (2022) revealed the complex relationship between industrial enterprises' fulfillment of ESG responsibilities, competitive strategies, and financial performance [2]; An et al. (2022) analyzed the differentiated impacts of ESG systems across different industries on capital markets, starting from the carbon neutrality goal. comparing the differentiated impacts of ESG systems across different industries on capital markets [3]. In terms of improving ESG evaluation systems, the Industrial and Commercial Bank of China Green Finance Research Team (2017) developed ESG green ratings and indices to provide decision-making tools [4]; Cao and Xu (2019) studied the construction of ESG systems in the financial sector, providing theoretical support for financial institutions to integrate ESG factors [5].

2.2 Review of Foreign Research

Research findings by foreign scholars on the impact of ESG on corporate governance and financial performance show that Bohyun et al. (2018) found that ESG practices in Korean companies have a positive effect on financial performance [6]. Li et al. (2018) emphasized the importance of ESG information disclosure, arguing that it can enhance corporate value [7]. Ionescu et al. (2019) analyzed listed companies in the tourism industry and confirmed that ESG factors improve financial performance [8]. Mohammad et al. (2021) indicated that increased ESG disclosure aligns with trends in corporate value growth [9]. However, Nor Faezah Abdullah Sani (2020) did not find a significant correlation between ESG factors and corporate value or profitability potential in companies that consistently publish sustainability reports [10]. Bahadori et al. (2021) found that companies with high ESG scores in emerging markets have stronger profitability [11].

2.3 Research Hypotheses

This study treats ESG performance as a non-financial indicator for measuring a company's future prospects. It is based on three dimensions: environment, social responsibility, and corporate governance. The “green and low-carbon” aspect of the environmental dimension is in line with China's high-quality development strategy. At the same time, according to stakeholder theory, good ESG performance is conducive to attracting the attention of stakeholders. Therefore, this paper proposes the following hypothesis:

H1: There is a significant positive correlation between a company's overall ESG performance and its financial performance.

Breaking down the three dimensions of ESG, we arrive at the following hypotheses:

H1a: There is a significant relationship between a company's environmental performance and its financial performance.

H1b: There is a significant relationship between a company's social responsibility performance and its financial performance.

H1c: There is a significant relationship between a company's governance performance and its financial performance.

3. Sample Selection and Data Sources

The study utilized data from manufacturing companies listed on the A-share market from 2013 to 2023 as the research sample. After excluding ST, *ST, and missing data samples and applying 1% tail trimming, the final dataset comprised 25,363 samples. ESG rating data was sourced from the Huazheng ESG Rating Agency, while company financial data and other relevant information were obtained from the Guotai an database. The sample selection process and data sources underwent rigorous screening and processing, effectively ensuring the accuracy and reliability of the research.

3.1 Variable Definitions

3.1.1 Dependent variable

This study focuses on the relationship between ESG performance and corporate profitability. Referring to existing literature, it uses return on

assets (ROA) as the core proxy variable for financial performance.

3.1.2 Explanatory variables

In this study, the explanatory variable of focus is corporate ESG performance, a concept that encompasses a company's overall performance in environmental protection, social responsibility, and corporate governance. To ensure the fairness and reliability of the data, we chose to cite data provided by the Huazheng ESG rating system. The definitions of variables and symbols used in this study are shown in Table 1.

Table 1. Variable Table

Variable Type	Variable Name	Variable Symbol
Explained Variable	Return on Assets	ROA
Explanatory Variables	ESG Performance	ESG
	Environmental	E
	Society	S
	Corporate Governance	G
Control Variables	Company Size	SIZE
	Board Size	/
	Combined Position	D
	Percentage of Independent Directors	INDEP
	Debt-to-equity Ratio	LEV
	Enterprise Ownership	SOE
	Total Asset Turnover	TAT
	Sustainable Turnover Rate	STR
	Year Fixed Effects	YEAR
	Industry Fixed Effects	INDUSTRY

3.2 Model Construction

Based on the assumptions outlined earlier, this paper constructs the following fixed-effects model:

$$FP\_it = \alpha + \beta\_1\ ESG\_it + \beta\_2\ E\_it + \beta\_3\ S\_it + \beta\_4\ G\_it + 〖\gamma Controls〗\_it + 〖\delta Year〗\_t + 〖\theta Industry〗\_i + \epsilon\_it \quad (1)$$

The financial performance of firm i in year t is the dependent variable, measured by ROA. The comprehensive ESG score for firm i in year t is the core explanatory variable, reflecting the impact of the firm's overall ESG performance on financial performance. E_{it}, S_{it} and G_{it} represent the scores for the environmental, social, and corporate governance sub-dimensions, respectively. These are used as explanatory variables to analyze the independent impact of each dimension on financial performance. represents a set of control variables, such as firm size and board size, aimed at controlling for other factors that may influence financial performance. and are annual and industry dummy variables, respectively, used to control for the effects of macroeconomic environment and industry characteristics.

4. Empirical Study on ESG Performance and Financial Performance

This study employs a two-tiered empirical test. On the one hand, it breaks down the ESG framework to explore the independent impact of environmental performance, social responsibility, and corporate governance on corporate financial performance. On the other hand, it assesses the overall effect of ESG comprehensive indicators on financial performance based on their overall effectiveness. This design not only demonstrates the differentiated impact paths of each dimension but also reflects the synergistic and integrated effects of the ESG system.

4.1 Construction of Comprehensive Financial Indicators

As shown in Table 2, the mean ROA is 0.038 with a standard deviation of 0.740, indicating that the profitability of the sample companies exhibits significant variability. The minimum value of -30.688 indicates that some companies suffered severe losses, while the maximum value of 108.366 shows that the highest-performing company achieved an ROA exceeding 100%. The median ROA of 0.039 is close to the mean, indicating a relatively concentrated distribution. The mean ESG composite score is 72.958 with a standard deviation of 5.029, indicating significant differences in ESG performance among companies. The median is 73.197, with most companies' ESG scores at an intermediate level. The mean for ownership structure is 0.250, with 25% of the sample being state-owned enterprises. The mean for the chairman and CEO being the same person is 0.350, with 35% of companies having the same individual serving as both chairman and CEO. The mean for board size is 8.260, with significant variation in board size across companies. The mean enterprise size is 101,184,130,650, with a minimum of 10,441,933 and a maximum of

100,700,000,000,000, indicating a wide range of sizes. The mean INSIZE is 22.046, with a broad distribution. The LEV is 0.399, with a median of 0.377. Overall debt levels are moderate, but some companies face higher risks.

Table 2. Descriptive Statistics

indicator	sample size	mean	median	standard deviation	minimum	max value
ROA	25363	0.038	0.039	0.740	-30.688	108.366
ESG	25363	72.958	73.197	5.029	44.010	90.930
E	25363	61.546	61.250	7.056	33.910	92.300
S	25363	74.626	75.499	8.101	16.440	100.000
G	25363	78.620	80.180	6.953	33.480	94.040
TAT	25363	0.611	0.539	0.390	-0.058	8.601
STR	25363	0.030	0.044	1.253	-138.533	98.694
SOE	25363	0.250	0.000	0.426	0.000	1.000
D	25363	0.346	0.000	0.471	0.000	1.000
Board Size	25363	8.260	9.000	1.557	0.000	18.000
INDEP	25363	37.812	36.360	5.574	14.290	80.000
SIZE	25363	22.046	21.891	1.201	16.161	27.638
LEV	25363	0.399	0.377	1.153	-0.195	178.345

4.2 Correlation Analysis between E, S, G, and Comprehensive Financial Performance

According to the results of the Spearman correlation analysis in Table 3, the overall ESG performance and its sub-items (environmental E, social S, and governance G) are significantly correlated with corporate financial performance (ROA), as follows:

Table 3. Spearman Correlation Analysis

Variables	E	S	G	ROA
E	1.000	0.398**	0.108**	0.021**
S	0.398**	1.000	0.089**	0.151**
G	0.108**	0.089**	1.000	0.340**
ROA	0.021**	0.151**	0.340**	1.000

The Spearman test confirmed that the overall ESG score and ROA are significantly positively correlated. The results support hypothesis H1, indicating that ESG practices can effectively enhance corporate financial performance.

Component-level analysis:

Environmental performance: The Spearman test shows that the E score is significantly positively correlated with ROA.

Social Responsibility Performance: In the Spearman test, the S score has a significant promotional effect on ROA. The results indicate that social responsibility indirectly drives financial performance by enhancing brand reputation and stakeholder trust, confirming hypothesis H1b.

Corporate Governance Performance: The Spearman test indicates that corporate governance optimization (such as independent director oversight and improved board efficiency) is the core mechanism within ESG that directly influences financial performance, strongly supporting hypothesis H1c.

In summary, overall ESG performance and its component dimensions all have a positive impact on corporate financial performance, with governance (G) having the most significant promotional effect. The effects of environmental (E) and social (S) factors require further interpretation from a long-term perspective and in conjunction with policy coordination. This conclusion provides empirical evidence for companies to optimize their ESG strategies and aligns with the logic of compatibility between sustainable development and financial performance under the “dual carbon” goals.

The descriptive statistics in Table 2 show that the mean ROA of the sample companies is 0.038, with a standard deviation of 0.740; the mean ROE is 0.043, with a standard deviation of 2.458, indicating overall weak profitability and significant individual differences. In the ESG sub-items, governance has the highest mean (78.62) and the most stable standard deviation (6.95); environmental has the lowest mean (61.55); and social responsibility has the widest range (16.44–100). As shown in Table 4, the K-S test indicates that all variables significantly

deviate from normality, so the Spearman rank correlation coefficient is used to analyze the association.

Table 4. Single-Sample K-S Test

		ROA	E	S	G
Number of cases		25363	25363	25363	25363
Normal parameters a, b	mean	.03824573	61.54559	74.62559	78.62024
	standard deviation	.739750194	7.055667	8.101362	6.953149
extreme difference	Absolute	0.409	0.038	0.063	0.123
	Positive	0.409	0.038	0.040	0.085
	Negative	0-.386	-0.034	-0.063	-0.123
Test statistics		0.409	0.038	0.063	0.123
Asymptotic significance (two-tailed)		0.000c	0.000c	0.000c	0.000c

Table 5. Correlation between ESG Scores and ROA

Variables	ROA (Spearman)
ESG	0.273**
E	0.021**
S	0.151**
G	0.340**

Note: *p<0.05, **p<0.01

Table 5 shows that the Spearman test indicates significant differences in the impact of environmental (E), social (S), and governance (G) factors on financial performance. Governance (G) is the key driving factor, with a correlation coefficient of 0.340 with ROA, indicating that governance optimization directly improves asset efficiency. Social responsibility (S) follows, while the short-term effect of environment (E) is the weakest. The synergistic differences among ESG dimensions are significant, with environment and social responsibility highly synergistic, but weakly associated with governance. All tests passed at the 1% significance level (two-tailed), with a sample size of N=25363, yielding robust results.

5. Benchmark Regression Analysis

The key benchmark regression analysis in this study aims to precisely assess the impact of ESG performance on corporate financial performance. As shown in Table 6, the regression coefficient of the ESG composite score on ROA is 0.001, with a t-value of 3.351. This indicates that, after controlling for variables such as company size and debt-to-equity ratio, an increase of one unit in ESG performance leads to an average increase of 0.001 units in ROA. This confirms a positive correlation between ESG performance and financial performance, with all dimensions of ESG performance significantly associated with financial performance, thereby supporting the research hypothesis.

6. Regression Robustness Test

This study used ROE to replace ROA for robustness analysis. The results are shown in Table 7. The regression coefficient for the ESG total score was 0.002, significantly positive at the 1% level (t=4.006), consistent with the conclusions of the benchmark regression. Among the sub-indicators, the coefficient for the environmental dimension (E) was -0.001 (p<0.01), the social dimension (S) coefficient is 0.001 (p<0.01), and the governance dimension (G) coefficient is 0.003 (p<0.01), with the direction of influence consistent with the benchmark results. The core conclusions remain valid after replacing the dependent variable, indicating strong reliability and stability of the research results.

Table 6. Basic Regression Results

Model	Unstandardized coefficient B	Standard error	Standardized coefficient Beta	t	Significance
Constant	-0.271	0.009	/	-29.454	0.000
ESG	0.001	0.000	0.073	3.351	0.001
E	-0.001	0.000	-0.106	-10.321	0.000
S	0.001	0.000	0.082	6.929	0.000
G	0.003	0.000	0.279	19.823	0.000
TST	0.025	0.001	0.176	30.551	0.000
STR	0.004	0.000	0.086	14.895	0.000
SOE	-0.018	0.001	-0.137	-21.601	0.000

D	0.000	0.001	0.003	0.581	0.561
Board Size	4.735E-5	0.000	0.001	0.183	0.855
INDEP	-0.001	0.000	-0.055	-7.871	0.000
SIZE	-3.936E-14	0.000	-0.023	-3.221	0.001
lnsize	0.002	0.000	0.052	6.668	0.000
LEV	-0.002	0.000	-0.049	-8.418	0.000

Dependent variable: ROA

Table 7. Robustness Analysis Results

Model	Unstandardized coefficient B	Standard error	Standardized coefficient Beta	t	Significance
Constant	-0.502	0.016		-32.306	0.000
ESG	-0.001	0.000	-0.100	-9.572	0.000
E	0.002	0.000	0.089	4.006	0.000
S	0.001	0.000	0.056	4.643	0.000
G	0.003	0.000	0.196	13.714	0.000
TST	0.052	0.001	0.218	37.295	0.000
STR	0.006	0.000	0.086	14.696	0.000
SOE	-0.027	0.001	-0.123	-19.045	0.000
D	0.001	0.001	0.005	0.818	0.413
Board Size	0.000	0.000	-0.004	-0.501	0.616
INDEP	-0.001	0.000	-0.049	-6.914	0.000
SIZE	-1.176E-14	0.000	-0.004	-0.569	0.569
lnsize	0.010	0.001	0.133	16.823	0.000
LEV	-0.001	0.000	-0.007	-1.189	0.234

Dependent variable: ROE.

7. Conclusions and Implications

Based on annual sample data from 25,363 A-share listed companies from 2013 to 2023, the study found that the environmental (E), social (S), and governance (G) aspects of a company are all significantly correlated with financial performance, and that overall ESG performance has a significant positive effect on comprehensive financial performance.

The specific implications are as follows: Companies should integrate ESG frameworks, prioritize strengthening corporate governance, optimize board structures, enhance the supervisory effectiveness of independent directors, reduce agency costs, and improve decision-making transparency and efficiency. At the same time, they should balance short-term environmental investments with long-term value conversion, apply energy-saving and emission-reduction technologies, explore circular economy models, convert green costs into brand premiums, accumulate reputation capital through social responsibility practices, and enhance stakeholder trust. Governments can refine incentive measures, design differentiated tax incentives and green credit support policies for non-state-owned enterprises, low-carbon transition industries, and eastern region enterprises to leverage their leading effects; promote the standardization of ESG evaluation criteria, improve mandatory disclosure systems, reduce subjective biases of rating agencies, and enhance the comparability and credibility of market data. Investors should incorporate ESG performance into the core framework of investment decisions, focus on companies with excellent governance levels, use ESG factors to screen out long-term risks, and combine dynamic tracking of environmental and social responsibility performance to identify investment targets with both sustainable development potential and financial resilience, thereby achieving the dual objectives of stable returns and social value.

8. Limitations of the Study and Future Prospects

The limitations of this study primarily lie in the scope of the sample, variable measurement, causality, and the financial effects of environmental performance. The sample is limited to A-share listed manufacturing companies, and the applicability of the conclusions across industries and to non-listed companies requires further validation. ESG scores rely on third-party institutions, which may introduce subjectivity, and financial

performance metrics focus on short-term profitability, failing to fully capture the long-term impacts of non-financial value. The bidirectional causal relationship between ESG and financial performance requires further exploration using methods such as instrumental variables or lagged models. The financial effects of environmental performance are not immediately apparent in the short term and require longer-term data to analyze their lagged and policy synergy effects.

Future research could be expanded to include cross-industry comparisons to explore the differentiated impact of ESG on different industries; dynamic panel models or event studies could be used to reveal the long-term economic consequences of ESG; the synergistic effects of ESG on technological innovation and green supply chain management could be examined; and multi-source ESG data and composite financial indicators could be introduced to enhance the robustness and explanatory power of the research.

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