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Research on the Impact of ESG Performance on Corporate Exports

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Abstract: The development of a green and low-carbon economy has become a crucial topic in global economic advancement. China's export trade faces a complex international landscape characterized by escalating trade frictions, rising trade protectionism, and a sluggish traditional trade environment in the post-pandemic era. This paper primarily explores the relationship between the ESG performance of Chinese A-share listed companies and their export activities. Initially, it conducts a literature analysis on the impact of ESG performance on corporate exports from the perspectives of environment, social responsibility, and corporate governance. This paper conducts empirical analyses using relevant regression models to test the hypotheses. Furthermore, in examining the transmission pathways of the impact of ESG performance on corporate exports, an intermediate variable regression model is established to analyze the specific roles played by corporate innovation as a mediator. In conclusion, the findings are as follows: (1) Overall ESG performance positively influences corporate exports, indicating that better ESG performance is conducive to enhanced export activities. (2) Enterprises with superior ESG performance can promote exports by improving their innovation capabilities.

Keywords: ESG Performance, Corporate Innovation, Corporate Exports

1. Introduction

As nations progressively implement policies aimed at mitigating carbon emissions, enterprises are urged to extend their commitment to low-carbon economic transformation beyond the realm of fulfilling corporate social responsibility. These entities must leverage pertinent corporate social responsibility standards within the framework of carbon neutrality, utilizing them as regulatory mechanisms to facilitate and compel sustainable progress. This strategic approach not only aligns with evolving environmental imperatives but also catalyzes bolstering competitive standing within the market.

Corporate Environmental, Social, and Governance (ESG) performance emerges as a pivotal metric, encompassing diverse indicators, notably carbon emissions, to evaluate a company's efficacy in navigating the landscape of carbon neutrality. This multifaceted evaluation serves as a potent avenue for corporations to discharge their social responsibility, safeguard the environment, and augment corporate governance. Adapting Chinese enterprises to the exigencies of this epoch and positioning them favourably in the emergent global trade paradigm demands heightened attention. This imperative underscores the need to elevate the standard of corporate social responsibility to preempt export disruptions stemming from environmentally conscious trade barriers [1].

ESG, encapsulating Environmental, Social, and Governance considerations, constitutes a comprehensive framework for sustainable evaluation and its broader impact on societal values. Routinely employed for the assessment of corporations, investment portfolios, or funds, this paradigm contends that the operational pursuits of a company should transcend mere economic gains. It underscores the simultaneous imperative of prioritizing activities that promote sustainable development, fulfil social responsibilities, and augment corporate governance to realize a nuanced, multidimensional developmental equilibrium.

Within China's A-share market, where companies disclose ESG information, a prevalent challenge persists in the form of the "three highs" phenomenon — characterized by elevated levels of energy consumption, emissions, and pollution among listed entities. Consequently, the imperatives of "peak carbon" and "carbon neutrality" have assumed the role of enduring strategic orientations and goal imperatives for Chinese enterprises in their pursuit of sustainable and responsible business practices [2].

This research pioneers a thorough and precise evaluation of a company's ESG-related achievements. Significantly, its distinctive contribution extends to enhancing the body of knowledge concerning the impact of corporate ESG performance, particularly within the export activities of the food manufacturing industry.

The rationale for focusing on publicly listed companies in this research is justified by their sound institutional arrangements and commendable economic performance within the Chinese context. These entities actively engage in environmental management activities, including disclosing relevant environmental information. Furthermore, their increased reliance on public financing from a diverse array of investors positions listed companies to strategically utilize environmental information for effective stakeholder management. Another justification is the ready availability of data, essential for conducting rigorous quantitative analyses.

2. Literature Review

This paper offers an elucidation and concise review of the relevant concepts about the Environmental, Social, and Governance (ESG) philosophy, drawing on both domestic and international literature. Initially, it introduces the conceptual requirements associated with information disclosure within the ESG philosophy and proceeds to analyze literature concerning the relationship between ESG performance and export trade. Subsequently, it undertakes a review of the literature on factors influencing micro-level export activities. Two intermediary variables, namely technological innovation and financing constraints, are introduced. The paper then analyzes the literature on how ESG performance affects enterprise exports through the mediating factors of technological innovation and financing constraints, establishing a theoretical foundation for subsequent empirical research.

The ESG concept posits that corporate operational and financial investment activities should not solely be based on economic benefits and financial performance indicators. Instead, enterprises are expected to actively fulfil social responsibilities by focusing on their performance in the three dimensions of environmental sustainability, social responsibility, and governance. ESG performance is thereby integrated into the strategic framework of a company's sustainable development.

In the domain of environmental research, a thorough investigation by Yu Pei et al. examines the practices of 587 Foreign Direct Investment (FDI) enterprises in Chinese manufacturing from 2011 to 2020. Utilizing a bidirectional fixed-effects panel model, the study reveals a significant correlation, highlighting that high-quality environmental disclosure notably expands the breadth of enterprises' Outward FDI (OFDI), thereby tangibly augmenting their overall value [1]. Adding to this dialogue, Xianbing Liu and V. Anbumozhi introduce a stakeholder framework for assessing the environmental information disclosure behaviours of Chinese listed companies. Their analysis unveils a symbiotic relationship between a company's economic performance and the disclosure of information regarding environmental investment and pollution control costs. The study suggests that heightened stakeholder concerns about environmental issues serve as catalysts, fostering an environment that encourages Chinese enterprises to disclose more comprehensive environmental information, thereby prompting proactive measures for enhancing their environmental performance [2]. Moreover, Shanyong Wang, Hualong Wang, Jing Wang, and Feng Yang explore the intricate connection between environmental information disclosure and financial performance. This research not only delves into the direct impact but also scrutinizes the mediating effects of visibility and liquidity. The results highlight a positive correlation between environmental information disclosure and financial performance, elucidating the nuanced role of visibility and liquidity in mediating this relationship [3].

Within the realm of social responsibility, a comprehensive investigation led by Anastasiadou, Lindh, and Vasse delves into the influence of corporate social responsibility on consumers' purchasing intentions. The findings demonstrate a considerable enhancement of corporate image through the fulfilment of social responsibility, notably boosting consumers' inclination for cross-border purchases. This suggests that companies demonstrating robust social responsibility not only stimulate domestic consumption but also foster international consumer interest, facilitating the export of company products [4].

In the context of corporate governance, Oliver Lukason and Tiia Vissak explore the correlation between firms' export behaviour and corporate governance. Their conclusion posits that corporate governance indicators exhibit an association with export indicators, although the strength of this association varies. For precise predictions of firms' export potential, considering alternative indicators such as financial variables and the firms' internationalization progress becomes essential [5].

Concerning the influence of corporate Environmental, Social, and Governance (ESG) performance on innovation, prevailing research indicates that favourable ESG performance fosters innovative practices. Wu Lixi, utilizing panel data from A-share listed companies spanning 2010 to 2022, empirically illustrates that ESG performance significantly contributes to high-quality development in enterprises. Furthermore, exploratory innovation positively moderates the effect of ESG performance on high-quality development within companies [6]. Analyzing data from 467 Chinese manufacturing listed companies between 2016 and 2020, Liu Bin and Tan Shuqi investigate the impact of corporate social responsibility on innovation across three sub-dimensions: employees, shareholders, and society. Their findings indicate a significantly positive impact on the resilience of innovation across all three sub-dimensions [7].

Organizations prioritizing ESG considerations and allocating resources possess the potential to enhance organizational capabilities, particularly learning capabilities [8]. This, in turn, can elevate corporate governance and strengthen governance structures [9]. Furthermore, such prioritization can enhance social responsibility, and amplify research and development investment [10], thereby propelling technological innovation.

3. Research Hypotheses and Research Design

This chapter focuses on the research hypotheses and the design of the study. This paper conducts a mechanistic analysis of how ESG performance affects corporate exports and specifically examines how ESG performance, through the mediating variables of government subsidies and technological innovation, influences corporate exports. Relevant hypotheses are formulated to establish the theoretical foundation for the empirical analysis in this paper. Additionally, the research design is outlined. Building on the research hypotheses presented earlier, this paper selects companies listed on the Shanghai and Shenzhen A-share markets as the research subjects. Using available data, this paper extracts and screens the data of A-share listed export-oriented companies from 2010 to 2022.

The chapter also provides insights into data sources and analytical tools. Variables are chosen, and a multiple regression model is established, along with a mediation regression model, to study the specific pathways through which ESG performance affects corporate exports.

3.1. Research Hypotheses

Hypothesis 1: ESG performance positively influences corporate exports. Hypothesis 2: ESG performance has a positive impact on technological innovation. Hypothesis 3: Companies with better ESG performance can enhance corporate exports by promoting technological innovation.

3.2. Research Design

Based on data availability, the sample for this study was drawn from A-share listed export-oriented companies for the years 2010 to 2022, and a screening process was applied. The ESG ratings of these companies were sourced from the Huazheng ESG Rating Database, while financial and innovation data of the listed companies were obtained from Wind [11]. The following procedures were undertaken to refine the relevant data in this study:

Exclusion of data from listed companies in the financial, insurance, and banking industries;

Exclusion of stocks from listed companies that were designated as ST or *ST during the year, delisted during the same year, or temporarily suspended from trading;

Exclusion of companies with missing observations for relevant variables in the given year;

Application of a two-tailed trimming process, removing the top and bottom 1% of observations for the study's continuous variables.

Variable Definitions: (1) Dependent Variable: In this study, the natural logarithm of overseas business revenue of listed companies (EXP) is adopted as the metric for export activities. Overseas business revenue represents the income generated by listed companies from the sale of goods and provision of services to countries and regions outside China. (2) Core Explanatory Variable: Following the approach of Liang and Xu, the ESG rating from Huazheng ESG Ratings [7] is used as a substitute variable to measure the ESG performance of listed companies. The rating index comprises 9 levels (AAA-C), with higher levels indicating more comprehensive ESG information disclosure and better ESG performance. (3) Mediating Variable: In line with the factors influencing micro-level export activities, this study introduces technological innovation (RD) as a mediating variable, measured by the logarithm of research and development (R&D) expenditure. For analytical convenience, the ratio of corporate innovation is calculated as a percentage. (4) Control Variables: Drawing on existing research literature, theoretical analysis, and considering the influencing factors of core variables along with data availability, this study, as is shown in Table 1, following the work of Qiu Muyuan and Yin Hong, controls for the following variables:

Firm size (SIZE), is represented by the natural logarithm of total assets. Return on assets (ROA), indicating the ratio of net profit to the average balance of total assets. Profitability (ROE), is expressed as the ratio of net profit to the average total asset. Corporate age (Age), representing the number of years a company has been listed. Asset turnover ratio (ATO), is calculated as the ratio of operating income to the average total assets. Institutional investor ownership ratio (INST), is denoted as the total holdings of institutional investors divided by the total outstanding shares. Big 4 Audit (Big 4), assigned a value of 1 if a company undergoes auditing by one of the Big 4 audit firms, otherwise 0. Board size (Board), is the natural logarithm of the number of board members.

Overseas background of board and executives (OverseaBack), assigned a value of 1 if board and executives have overseas backgrounds, otherwise 0. Additionally, industry dummy variables (Ind) and time dummy variables (Year) are generated to control for industry and time effects.

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Table1: Variable Type

Variable Type	Name	Symbol	Definition
Dependent Variable	Export	EXP	Natural logarithm of overseas business revenue
Independent Variable	ESG Performance	ESG	HuaZhong ESG Rating Index
Mediating Variable	Technical Innovation	RD	Natural logarithm of R&D investment
Control Variables	Enterprise Size	SIZE	Natural logarithm of total assets
	Net Profit Margin	ROA	Net profit/average total assets
	Asset Turnover Ratio	ATO	Operating income/average total assets
	Institutional Investor Holdings	INST	Total shares held by institutional investors/float shares
	Big 4 Status	Big 4	1 if audited by the Big 4, 0 otherwise
	Board Size	Board	Natural logarithm of the number of board members
	Overseas Background of Board and Supervisory High Executives	OverseaBack	1 if board and supervisory high executives have overseas background, 0 otherwise

4. Empirical Analysis

In this chapter, an empirical analysis of the impact of ESG performance on corporate exports is conducted based on the research design outlined in the previous chapter. Firstly, a multiple regression model is established to analyze the influence of corporate ESG performance on exports. The regression results are examined to validate the earlier hypotheses, and robustness tests are conducted to ensure the reliability of the model. Secondly, by introducing a technological innovation mediating variable, a mediation analysis model is constructed to explore the specific pathways through which ESG performance affects corporate exports.

4.1. Descriptive Statistical Analysis

Within the realm of explanatory variables, the ESG performance (Environmental, Social, and Governance) observed in the sampled companies displays a broad spectrum. As is shown in Table 2, the maximum value, equivalent to an AA level, reaches 90.4, while the minimum, corresponding to a C level, registers at 44.67. The computed average ESG performance stands at 73.255, reflecting a B level. This analysis reveals that the overall ESG performance across the sampled companies lacks uniformity, showcasing significant variability with a standard deviation of 5.198.

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Table 2: Descriptive Statistical Analysis

VARIABLES	(1) N	(2) mean	(3) sd	(4) min	(5) max
EXP	15106	19.373	2.045	12.712	24.285
ESG	15106	73.255	5.198	44.670	90.400
Size	15106	22.258	1.152	19.872	26.218
ROA	15106	0.043	0.058	-0.231	0.222
ATO	15106	0.661	0.354	0.073	2.629
INST	15106	42.270	24.514	0.326	93.630
Big4	15106	0.053	0.224	0.000	1.000
Board	15106	2.110	0.194	1.386	2.890
OverseaBack	15106	0.551	0.497	0.000	1.000

4.2. Correlation Statistical Analysis

In this study, a preliminary assessment of the relationships between key variables is conducted through correlation statistical analysis. As observed from the correlation coefficients in Table 3, the correlation between a company's ESG performance and its export volume is significant at the 1% level of significance, with a positive coefficient. This indicates that as the ESG performance of a company improves, its export business volume also increases. Despite the relatively small values of the correlation coefficients from the correlation test analysis, and each value being significantly below 10 in the VIF test, statistically, there is no apparent issue of multicollinearity. However, acknowledging the limitations inherent in correlation tests, as their results may diverge significantly from reality, further analysis through multiple regression is imperative. This additional step is essential to validate and explore the relationships between variables more comprehensively.

Table 3: Correlation Statistical Analysis

Variables	EXP	ESG	Size	ROA	ATO	INST	Big4	Board	OverseaBack
EXP	1.000								
ESG	0.104***	1.000							
Size	0.512***	0.166***	1.000						
ROA	0.025***	0.222***	-0.024***	1.000					
ATO	0.299***	0.057***	0.120***	0.202***	1.000				
INST	0.206***	0.103***	0.362***	0.123***	0.158***	1.000			
Big4	0.173***	0.090***	0.277***	0.021**	0.033***	0.186***	1.000		
Board	0.101***	0.036***	0.236***	0.002	0.057***	0.176***	0.051***	1.000	
OverseaBack	0.042***	-0.004	0.023***	0.065***	-0.009	0.022***	0.064***	0.082***	1.000

*** p<0.01, ** p<0.05, * p<0.1
*, **, *** represent significant at the level of 10%, 5% and 1% respectively. (the same below)

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4.3. Multiple Regression Analysis

To further examine the impact of corporate ESG performance on a firm's exports, this study employs Stata 16 software to conduct empirical testing using a multiple linear regression model on the sample data. This approach aims to validate the hypotheses proposed in this paper. Table 4 presents the relationship between corporate ESG performance and a firm's exports.

Table 4: Multiple Regression Analysis

	(1)	(2)
	export	export
ESG	0.043***	0.007***
	(14.01)	(2.79)
Size		0.898***
		(63.83)
ROA		-0.512**
		(-2.11)
ATO		1.356***
		(31.82)
INST		-0.000
		(-0.36)
Big4		0.293***
		(4.74)
Board		-0.167**
		(-2.35)
OverseaBack		0.246***
		(8.39)
_cons	16.231***	-1.828***
	(72.24)	(-5.36)
Industry fixed effects	Yes	Yes
Time fixed effects	Yes	Yes
N	15106	15106
R2	0.140	0.408
Adj. R2	0.136	0.405

*** p<0.01, ** p<0.05, * p<0.1

Regression results indicate that in the first column, the regression analysis of corporate ESG performance on export shows a positive correlation between ESG performance and export, with a coefficient of 0.043. The correlation is significant at the 1% level, suggesting that as corporate ESG performance improves, it contributes to the enhancement of export activities. Hypothesis 1 is confirmed. In the second column, after introducing all control variables, the regression results show that the coefficient of ESG is positive and significant at the 1% level, validating Hypothesis 1, which posits that an improvement in corporate ESG performance leads to an increase in export business.

4.4. Analysis of Impact Channels Based on the Mediation Effect Model

A regression is performed between the corporate innovation mediating variable and corporate ESG performance. Further regressions involve corporate export with the corporate innovation mediating

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variable and the aforementioned core explanatory variable (ESG). This approach examines the impact of corporate ESG performance on export after incorporating the mediating variable while controlling for time and industry-fixed effects. Accordingly, the study constructs the following equations and conducts corresponding regression analyses as detailed in Table 5.

$$EXP = a0 + a1ESG + a2Controli + \sum aiInd + \sum aj\,Year + \varepsilon \tag{1}$$

$$RD = b0 + b1ESG + b2Controli + \sum biInd + \sum bj\,Year + \varepsilon \tag{2}$$

$$EXP = c0 + c1ESG + c2Controli + \sum ciInd + \sum cj\,Year + \varepsilon \tag{3}$$

Table 5: Multiple Regression Analysis Of Mediating Effects

	(1) EXP	(2) RD	(3) EXP
ESG	0.007***	0.013***	0.005*
	(2.79)	(10.63)	(1.81)
RD			0.198***
			(11.39)
Size	0.898***	0.819***	0.736***
	(63.83)	(124.57)	(36.83)
ROA	-0.512**	1.733***	-0.856***
	(-2.11)	(15.25)	(-3.51)
ATO	1.356***	0.470***	1.263***
	(31.82)	(23.59)	(29.23)
INST	-0.000	-0.000	-0.000
	(-0.36)	(-0.66)	(-0.30)
Big4	0.293***	0.095***	0.274***
	(4.74)	(3.28)	(4.45)
Board	-0.167**	0.109***	-0.188***
	(-2.35)	(3.29)	(-2.66)
OverseaBack	0.246***	0.076***	0.231***
	(8.39)	(5.54)	(7.91)
_cons	-1.828***	-1.560***	-1.519***
	(-5.36)	(-9.79)	(-4.46)
Industry fixed effects	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes
N	15106	15106	15106
R2	0.408	0.690	0.413
Adj. R2	0.405	0.688	0.410

Concerning the dependent variable, the average value of corporate exports is noted at 19.373, indicating noteworthy variability between the minimum and maximum values. This underscore substantial differences in export activities among diverse enterprises.

The ensuing presentation of results concentrates on the mediation analysis regression in this study. The foundational regression model (1) corroborates earlier findings, confirming the positive and substantial impact of corporate ESG performance on export activities, even after considering the fixed effects of other unobserved variables. In column (2), it becomes apparent that corporate ESG performance influences the intermediate variable—firm innovation (RD). The coefficient linked to

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the impact of corporate ESG performance on firm innovation is positively and statistically significant at the 1% level, signifying a notable promotional effect of corporate ESG performance on firm innovation, thereby supporting Hypothesis 2.

Column (3) extends the analysis by regressing the dependent variable against the intermediate variable, firm innovation (RD), and the core explanatory variable, ESG. The coefficient of firm innovation (RD) concerning export activities is significantly positive, offering empirical validation for Hypothesis 3. The mediation model analysis suggests that corporate ESG performance can shape export activities through the promotion of firm innovation. Specifically, companies with robust ESG performance can elevate their export activities by nurturing innovation capabilities.

5. Potential Solutions

The ESG concept offers a multidimensional approach to balanced corporate development, promoting the harmonious coordination of economic, environmental, and social benefits. Using A-share listed companies as samples and employing ESG rating data from Huazheng and financial data from Wind, this study constructed an unbalanced panel regression model to examine the relationship between corporate ESG performance and exports. The key findings are as follows:

Firstly, overall corporate ESG performance has a positive impact on exports. A higher ESG score correlates with more favorable export outcomes. Disclosing ESG performance to consumers allows them to gain a comprehensive understanding of the company's management, exported products, quality, and market competitiveness, thus fostering trust and facilitating exports compared to non-disclosing enterprises.

Secondly, companies with superior ESG performance promote exports by enhancing innovation capabilities. Positive ESG performance signals proactive environmental and social responsibility actions to stakeholders, conveying positive corporate images and generating optimism about future development among stakeholders and consumers.

This paper utilized a literature review, empirical research, and comparative research methods to study the impact of corporate ESG performance on exports.

(1) Literature Review: Collected and organized relevant studies on corporate ESG performance and its impact on exports. Summarized the concepts and evaluation systems of ESG, and analyzed factors influencing corporate exports, introducing government subsidies and financing constraints as mediating variables to clarify the research approach and content.

(2) Empirical Research: Constructed multiple regression and mediation models, and processed data using Stata 16. Conducted descriptive statistics and correlation analysis for key variables in the empirical model. Performed multiple linear regression and mediation model regressions to validate the hypotheses of the study.

6. Conclusion

The study investigates the relationship between corporate ESG performance and export activities, exploring the impact under different ownership structures. The results are summarized as follows.

Firstly, overall ESG performance positively influences a company's export activities. A higher ESG score corresponds to better ESG performance, providing a favourable environment for exports. Strong ESG performance serves as a means for companies to demonstrate their effective operations and management to relevant stakeholders and consumers. Stakeholders and consumers can assess the company's future operational conditions by examining the ESG reports disclosed by the company and evaluating the scores across various indicators.

Secondly, companies with superior ESG performance stimulate export activities through enhanced innovation capabilities. Positive ESG performance signals a company's proactive engagement in

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environmental protection and fulfilling social responsibilities, projecting a positive image of the company's operational and financial performance to external audiences. This positive image, in turn, fosters optimism among stakeholders and consumers about the company's future development. According to the technology gap theory, the improvement in social responsibility performance requires support from technological innovation. Therefore, companies tend to boost their innovation initiatives when fulfilling social responsibilities. Additionally, when all companies engage in ESG information disclosure, intensified competition forces them to enhance competitiveness through process improvements, the development of new technologies, and the production of reliable, safe, and environmentally friendly products, ultimately elevating their brand image and promoting export activities.

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