

The Impact of ESG Indicators on Corporate Financial Performance: Evidence from Chinese Companies

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Academic editor: Sheresheva M. | Received 24 March 2025 | Accepted 26 June 2025 | Published 18 August 2025

Citation: Zhang, Y. (2025). The Impact of ESG Indicators on Corporate Financial Performance: Evidence from Chinese Companies. *BRICS Journal of Economics*, 6(3), 47–62. <https://doi.org/10.3897/brics-econ.6.e153844>

Abstract

As key actors in China's transition to a green economy, companies are aligning their business strategies with environmental, social, and governance (ESG) goals. However, there is still a lack of empirical evidence on how ESG performance impacts financial outcomes in emerging markets. This study seeks to fill this gap by investigating the relationship between ESG indicators and corporate financial performance using a panel dataset of Chinese A-share companies, listed on Shanghai and Shenzhen exchanges, over the period from 2013 to 2022.

Employing a two-way fixed-effects panel regression model, the analysis confirms a significant positive association between ESG performance and financial outcomes at the firm level. Furthermore, heterogeneity analysis reveals that this positive impact is more pronounced among NSOEs than SOEs. This differential impact is attributed to NSOEs' greater operational flexibility and responsiveness to market conditions in implementing ESG strategies.

The findings contribute to the growing body of literature on ESG, offering a large sample of context-specific evidence from China and highlighting ownership structure as a critical moderating factor. These results have practical implications for policymakers and investors seeking to promote sustainable economic growth through ESG-based practices in emerging markets.

Keywords

Corporate environmental responsibility, ESG, financial performance, sustainable development

JEL: Q01, Q50, Q20.

Introduction

Global climate change affects the economy, society and environment, leading to the global focus on “carbon peak” and “carbon neutrality.” Enterprises, which play a crucial role in reducing carbon emissions and promoting sustainability, need to balance environmental impact reduction and performance growth. ESG (Environmental, Social, and Governance) practices have become key criteria for evaluating corporate responsibility and long-term sustainability.

In pursuit of the “dual carbon” goals, companies need to move away from traditional business models and adopt more environmentally friendly and sustainable strategies. Therefore, research into how businesses can improve their performance through ESG practices in the context of “dual carbon objectives” is of significant theoretical and practical importance for guiding the transition to a greener economy and promoting coordinated economic and environmental development.

Literature Review

The concept of ESG (Environmental, Social and Governance) practices gradually evolved from the theoretical foundations of corporate social responsibility and has become a framework for evaluating companies’ ethical, environmental and governance commitments. Ratings based on ESG have emerged as quantitative tools to measure how well companies fulfill their societal obligations beyond maximizing profits. In modern corporate operations, companies are expected not only to seek financial returns, but also to take responsibility for the environment and society. Proactive engagement with ESG not only demonstrates social responsibility, but also promotes sustainable and long-term growth.

Most scholars affirm that ESG performance has a positive impact on corporate development. Studies have examined this relationship in terms of each ESG component, including governance, environmental performance and social performance. From a corporate governance perspective, Ye et al (2016) have found that strong corporate governance is positively correlated with firm value, while Liu et al (2019) have demonstrated that better environmental performance contributes to stronger financial results in highly polluted industries. In terms of social performance, a large body of literature has confirmed the value of CSR practices in driving corporate financial outcomes, both domestically and globally. For example, Sen and Mallick (2021) argue that implementing CSR enhances financial performance by improving stakeholder relations.

As ESG evaluation systems become more comprehensive, scholars are shifting their attention from individual ESG components to an integrated ESG score. In a study of financial performance, Lee and Isa (2022) have found that ESG practices have a positive impact on corporate financial outcomes. Similarly, Fu and Huang (2023) use total factor productivity (TFP) as the dependent variable to show that strong ESG

performance improves TFP by increasing R&D investment and facilitating access to financing. Zhang and Bao (2023) observe that ESG performance in private enterprises contributes to value enhancement through investment and innovation. Meng and Wang (2024) further reveal that tax incentives can amplify the positive effects of ESG performance on corporate value.

However, a smaller segment of literature points to the potential negative or non-linear effects of ESG performance on corporate development. Marsat and Williams (2016) argue that when the costs of fulfilling social responsibilities outweigh the financial gains, firms may divert resources away from their core business activities, thereby reducing performance. Nollet et al. (2016) propose a U-shaped relationship, where ESG initially undermines profitability or reputation but generates long-term benefits once implementation matures. Atan et al. (2018) found no significant relationship between corporate social responsibility (CSR) and firm performance in areas they explored.

Although ESG has been increasingly embedded in corporate strategy and management, having been discussed in academic literature for over 30 years, there is still no consensus on its performance implications (Tarmuji et al., 2016). The empirical findings remain divided, reflecting two conflicting schools of thought. From the neoclassical economics perspective, ESG investment is often seen as an externality or managers' self-serving actions, leading to either negligible or negative effects on performance (Atan et al., 2018; Duque & Caracuel, 2021). In contrast, proponents of the stakeholder theory and signaling theory argue that ESG disclosures enhance transparency, reduce information asymmetry and agency costs, and strengthen corporate reputation and stakeholder trust, thus yielding positive financial results (Fatemi et al., 2015).

In summary, while there is a growing body of research supporting the value-enhancing role of ESG, divergent findings emphasize the importance of contextual factors, measurement approaches, as well as moderators such as ownership structures, industry types, and regulatory environments.

Theoretical analysis and research hypotheses

Corporate sustainability performance, reflected in environmental, social, and governance (ESG) indicators has emerged as a key determinant of long-term financial success. The theoretical framework for understanding the relationship between ESG and performance rests on four main pillars: the resource-based approach, stakeholder theory, signalling theory, and agent theory.

Environmental performance reflects a firm's ability to implement sustainable management practices and to innovate in terms of pollution control and resource efficiency (Yang & Zhou, 2004). According to the resource-based view (Hu, 2012), investments in green technologies and clean production systems serve as strategic assets, enhancing technological innovation, product differentiation, and operational

efficiency (Xiao et al., 2022). Dynamic modeling of green finance supports this logic, showing that “green” investments lead to long-term financial and ecological benefits by optimizing capital allocation and enhancing innovation capability (Steblyanskaya et al., 2021). Empirical findings confirm the critical role of environmental regulation and tax policies in shaping the innovation-finance-performance triad (Ding & Petrovskaya, 2022).

Social performance addresses a firm’s engagement with diverse stakeholders—including employees, communities, suppliers, and customers—to build reputational capital (Li & Xiao, 2009). Stakeholder theory posits that fulfilling social responsibilities enhances trust, reduces relational risk, and improves operational resilience. Moreover, social initiatives help to bridge information asymmetries, creating signaling effects that bolster transparency and long-term cooperation (Zhang et al., 2013). Studies have shown that CSR-oriented firms enjoy greater investment and customer loyalty, especially in ESG-conscious markets (Steblyanskaya et al., 2023). Cross-national analysis in China and Russia reveals that consistent ESG disclosures positively correlate with investor confidence and market valuations (Steblyanskaya et al., 2019).

Governance performance, meanwhile, involves internal controls, audit mechanisms, and strategic alignment within the framework of modern agency theory. (Li et al., 2019). Strong governance reduces transaction costs and minimizes managerial opportunism. Firms with transparent governance are more likely to implement ESG practices proactively, in line with regulatory expectations and social norms (Du et al., 2019; Li et al., 2022). The growing linkage between green finance and corporate ESG behaviors has been documented as a channel through which capital markets reward well-governed, ESG-committed firms (Zhang, 2023). ESG-aligned financial instruments, such as green bonds and sustainable loans, also act as mechanisms to reduce compliance costs and improve access to responsible investments (Huang, 2024).

Thus, research has shown that ESG performance not only mitigates business risks but also enhances technological innovation, stakeholder trust and regulatory alignment, which jointly contribute to improving financial performance.

Hypothesis 1 therefore proposes:

H1: Ceteris paribus, firms that have better ESG performance tend to achieve stronger financial results.

Optimum ownership structures and operational mechanisms of private enterprises allow for greater flexibility and efficiency in their management and decision-making. This agility not only enables them to quickly adopt and implement ESG-related policies and practices but also helps them maintain competitiveness in the market. Moreover, private enterprises are generally more influenced by the market and must satisfy investors’ expectations regarding ESG. Market pressures encourage them to adopt ESG more actively, attract responsible investment, and enhance stock value, thereby improving overall enterprise performance. State-owned companies, on the other hand, are often subject to management and policy restrictions, which may result in more challenges in implementing ESG.

Hypotheses 2 therefore proposes:

H2: Ceteris paribus, the impact of ESG indicators on private enterprise performance is stronger than on state-owned enterprise performance.

Research methodology

Sample selection and data sources

This study uses a sample of Chinese A-share companies listed on the Shanghai and Shenzhen exchanges over a 10-year period between 2013 and 2022. To ensure data quality and the accuracy of the research, the study uses Stata software to process the data and

(1) excludes companies categorized as ST (firms that have incurred losses in two consecutive years and are under special surveillance), *ST (firms that have suffered losses in three consecutive years or have received a warning about delisting), and those operating in the financial industry;

(2) removes company observations with missing values for key variables;

(3) applies 1% winsorization to continuously distributed variables in both tails to mitigate the influence of outliers on the regression estimates.

Following these procedures, an unbalanced panel dataset comprising 20,878 observations over a 10-year period was obtained. Data for this study were sourced from the CSMAR database.

Variable definitions

Dependent variable. The study investigates the impact of corporate ESG indicators on financial performance. Return on Assets (ROA) is selected as the dependent variable. ROA reflects the net profit generated by a company based on its assets over a given period. It is directly related to profitability and asset efficiency, and offers the advantages of completeness, sustainability, and comparability. Therefore, ROA is used to measure corporate financial performance.

Key independent variable. The key independent variable in this study is the corporate ESG indicator. The Huazheng's (Sino-Securities Index Information Service Co., Ltd.) ESG ratings are used as proxies for ESG indicators because of their close alignment with the Chinese markets, broad coverage and high timeliness.

Control variables. Corporate financial performance is influenced by a variety of factors that together determine the outcomes observed. To avoid estimation bias caused by omitted variables, the analysis uses a variety of financial and corporate governance metrics as control variables. These include, but are not limited to, firm size, leverage (debt-to-asset ratio), cash flow from operations, duality (combined roles of CEO and board chair), the shareholding ratio of the largest shareholder, and the age of

the company. The definitions of these variables and their explanations are provided in Table 1 below.

Table 1. Variable descriptions

Variable Types	Names	Symbols	Definitions
Dependent variable	Return on assets	ROA	Net profit / Total assets
Independent variable	Corporate environmental responsibility	ESG	ESG rating provided by Sino-Securities Index Information Service Co., Ltd.
Control variables	Company size	Size	Natural logarithm of total assets
	Financial leverage	Lev	(Net profit + Income tax expenses + Financial expenses) / (Net profit + Income tax expenses)
	Operating cash flow	Cashflow	Net cash flow from operating activities / Total assets
	Dual role	Dual	Equals 1 if the chairman of the board doubles as the CEO; otherwise, 0
	Shareholding ratio of the largest shareholder	TOP1	The number of shares held by the largest shareholder / Total number of shares
	Company age	Age	Natural logarithm of the company's age

Source: Compiled by the author

Model specification

In line with the empirical objectives, a two-way fixed effects model is constructed as shown in Model 1:

$$ROA_{i,t} = \beta_0 + \beta_1 \cdot ESG_{i,t} + \beta_2 \cdot Size_{i,t} + \beta_3 \cdot Lev_{i,t} + \beta_4 \cdot Cashflow_{i,t} + \beta_5 \cdot Dual_{i,t} + \beta_6 \cdot Top1_{i,t} + \beta_7 \cdot Age_{i,t} + \sum Company + \sum Year + \varepsilon_{i,t} \quad (1)$$

where i – individual listed companies; t – year; ROA – dependent variable representing corporate financial performance; ESG – corporate ESG indicators; $Size$, Lev , $Cashflow$, $Dual$, $TOP1$, Age – control variables; $\sum Company$ – individual fixed effects for the companies; $\sum Year$ – time fixed effects for the years; β_0 – constant term; β_{1-7} – coefficients for the variables; $\varepsilon_{i,t}$ – random error term.

Empirical analysis

Descriptive statistics

To provide a more thorough understanding of the variables and their values used in this study, Table 2 presents the descriptive statistics for the main variables.

Table 2. Descriptive statistics of the variables used in the model

Variable	Obs	Mean	Std. Dev.	Min	Max
ROA	20878	.043	.053	-.183	.204
ESG	20878	73.597	5.159	58.18	84.77
Size	20878	22.561	1.293	20.28	26.52
Lev	20878	1.381	1.29	0	9.955
Cashflow	20878	.062	.076	-.156	.305
Dual	20878	.273	.445	0	1
TOP1	20878	34.012	14.826	8.45	74.45
Age	20878	2.14	.772	.693	3.332

Source: author's calculations

The dependent variable ROA has an average value of 0.043 and a standard deviation of 0.053, indicating considerable variability. The minimum value is -0.183, suggesting that some companies incur losses, while the maximum value is 0.204, indicating significant differences in asset returns across firms and years. The key independent variable ESG has an average score of 73.597, with a standard deviation of 5.159. This implies that there are notable variations among companies in their emphasis on environmental responsibility. The maximum ESG score of 84.77 suggest significant potential for improvement.

Correlation analysis

Pearson correlation tests were conducted between the variables; the results are shown in Table 3.

The correlation coefficient between corporate ESG indicators and financial performance is 0.178, which is significantly positive at 10% level, suggesting a generally positive relationship between the two.

ESG indicators are significantly positively correlated at 10% level with firm size, cash flow from operating activities, and the shareholding ratio of the largest shareholder. They are significantly negatively correlated with the debt ratio and duality at the same level. No significant correlations are observed between ESG performance and the age of the company.

Corporate financial performance is significantly positively correlated at the 10% level with cash flow from operating activities, duality, and the shareholding ratio of the largest shareholder, and significantly negatively correlated at the same level with firm size, debt ratio, and firm age.

Table 3. Pearson correlation analysis

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(1) ROA	1.000							
(2) ESG	0.178* (0.000)	1.000						
(3) Size	-0.031* (0.000)	0.227* (0.000)	1.000					
(4) Lev	-0.189* (0.000)	-0.064* (0.000)	0.108* (0.000)	1.000				
(5) Cashflow	0.484* (0.000)	0.079* (0.000)	0.039* (0.000)	-0.086* (0.000)	1.000			
(6) Dual	0.023* (0.001)	-0.026* (0.000)	-0.176* (0.000)	-0.041* (0.000)	0.002 (0.751)	1.000		
(7) TOP1	0.109* (0.000)	0.086* (0.000)	0.213* (0.000)	-0.010 (0.130)	0.086* (0.000)	-0.073* (0.000)	1.000	
(8) Age	-0.124* (0.000)	-0.003 (0.695)	0.462* (0.000)	0.098* (0.000)	-0.020* (0.003)	-0.241* (0.000)	0.003 (0.666)	1.000

Note: *** p<0.01, ** p<0.05, * p<0.10. Source: author’s calculations

Regression analysis

Regression analysis was conducted to examine the relationship between corporate ESG indicators and financial performance, using a previously specified model. The results are shown in Table 4 below.

Model (1) does not include control variables; Model (2) adds control variables to Model (1); and Model (3) further incorporates time fixed effects based on Model (2). From Model (1) to Model (3), the R^2 increases from 0.004 to 0.133, indicating an improved model fit.

The regression results show that the ESG coefficient is 0.001. This is significantly positive at 1% level, meaning that corporate ESG indicator is significantly and positively associated with financial performance. By taking on environmental responsibilities, firms can reduce environmental risks, financing costs, and potential costs related to environmental litigation and penalties. They can also enhance core competitiveness by upgrading equipment, developing green technologies and improving energy efficiency. These measures will ultimately boost profitability.

Table 4. Fixed effects regression results

	(1)	(2)	(3)
	ROA	ROA	ROA
ESG	0.001*** (8.589)	0.001*** (8.042)	0.001*** (8.371)
Size		0.007*** (7.834)	0.006*** (7.113)
Lev		-0.003*** (-10.777)	-0.003*** (-10.472)
Cashflow		0.199*** (41.294)	0.203*** (41.883)
Dual		0.001 (1.372)	0.001 (1.287)
TOP1		0.000*** (4.166)	0.000*** (4.282)
Age		-0.023*** (-20.036)	-0.022*** (-13.858)
Constant	-0.012 (-1.872)	-0.121*** (-6.756)	-0.122*** (-6.093)
N	20878	20878	20878
R ²	0.004	0.128	0.133
Company	YES	YES	YES
Year	NO	NO	YES

Note: *** p<0.01, ** p<0.05, * p<0.10. Source: author's calculations

Moreover, as public concerns for sustainable development and social responsibility grow, firms with a strong ESG performance are more likely to attract investors and customers who prioritize environmental and social considerations, thereby enhancing their market reputation and brand value. An increase of one unit in the ESG score corresponds to an increase of 0.001 units in financial performance, thus supporting *H1*. The empirical results support the viewpoints of Velte (2017), Li et al. (2018), and Miralles-Quirós et al. (2018), who argue that corporate ESG performance enhances value rather than being a cost to shareholders.

To deepen the analysis, ESG indicator is further broken down into three components: environmental responsibility (Escore), social responsibility (Score), and governance structure (Gscore). The detailed findings are summarized in Table 5.

Table 5. Results of further regression analysis

	(1)	(2)	(3)
	ROA	ROA	ROA
Escore	-0.000 (-1.793)		
Size	0.007*** (8.011)	0.007*** (7.358)	0.007*** (7.545)
Lev	-0.003*** (-10.738)	-0.003*** (-10.618)	-0.003*** (-10.420)
Cashflow	0.203*** (41.742)	0.203*** (41.833)	0.202*** (41.816)
Dual	0.001 (1.376)	0.001 (1.303)	0.001 (1.376)
TOP1	0.000*** (4.359)	0.000*** (4.405)	0.000*** (4.158)
Age	-0.023*** (-14.336)	-0.023*** (-14.354)	-0.021*** (-13.240)
Sscore		0.000*** (4.802)	
Gscore			0.001*** (10.645)
Constant	-0.080*** (-4.085)	-0.091*** (-4.642)	-0.130*** (-6.525)
N	20878	20878	20878
R ²	0.130	0.131	0.135
Company	YES	YES	YES
Year	YES	YES	YES

Note: *** p<0.01, ** p<0.05, * p<0.10. Source: author's calculations

The results suggest that environmental responsibility (Escore) does not significantly impact financial performance. This can be explained by substantial initial investments in environmental sustainability measures that can negatively affect short-term financial performance. It may be concluded that companies need to be more proactive in their environmental efforts.

By contrast, both social responsibility (Sscore) and governance structures (Gscore) have a significant positive impact on financial performance at 1% level, underscoring

the importance of active social responsibility practices and robust internal governance structures for performance improvement.

Heterogeneity analysis

The heterogeneity test explores whether the impact of ESG performance on financial outcomes differs between state-owned enterprises (SOEs) and non-state-owned enterprises (NSOEs). The specific regression results are presented in Table 6.

Table 6. Results of subgroup regression analysis

	(1)	(2)
	State-owned companies	Non-state-owned companies
ESG	0.000** (2.996)	0.001*** (6.422)
Size	-0.002 (-1.711)	0.013*** (9.991)
Lev	-0.002*** (-6.581)	-0.003*** (-8.141)
Cashflow	0.164*** (25.350)	0.220*** (33.462)
Dual	0.001 (0.656)	0.001 (0.566)
TOP1	-0.000 (-0.184)	0.000*** (4.896)
Age	-0.009** (-2.923)	-0.019*** (-8.421)
Constant	0.083* (2.444)	-0.297*** (-7.485)
N	7375	13503
R ²	0.632	0.576
Company	YES	YES
Year	YES	YES

Note: *** p<0.01, ** p<0.05, * p<0.10. Source: author's calculations

The regression results show that, for SOEs (state-owned enterprises), the ESG coefficient is statistically significant at 5% level, indicating a positive relationship

between ESG engagement and financial performance. However, for NSOES (non-state-owned entities), the ESG coefficient is 0.001, significant at 1%. This confirms that, while ESG indicators were positively associated with firm performance for both ownership structures (SOEs and NSOEs), the magnitude of this effect was greater for NSEOs, thus supporting H2.

This asymmetry suggests that NSOEs benefit more substantially from ESG integration. Their typically leaner organizational structure and higher managerial autonomy allow for more agile decision-making and rapid alignment with ESG priorities. For example, Jinko Solar, a leading Chinese private photovoltaics company, has aggressively pursued ESG strategies such as recycling solar panels and conducting carbon audits of its supply chain, contributing to environmental gains and increased profit margins. Likewise, BYD, another private automotive manufacturer, outperforms state-owned companies in adopting ESG initiatives such as battery recycling systems and obtaining green vehicle certification.

By contrast, SOEs, which often have large resource bases, tend to be constrained by bureaucratic oversight and strict compliance procedures that can hinder timely ESG transformations. These enterprises are subject to multiple layers of supervision, resulting in slower response times and implementation cycles for ESG initiatives. Studies by Ding and Petrovskaya (2022) show that SOEs are often slow to adapt to environmental taxation policies due to the complexities of their internal governance.

Furthermore, empirical studies comparing ESG ratings and financial performance across sectors have found that private companies consistently outperform state-owned enterprises in terms of translating ESG actions into financial outcomes. This is particularly true in innovation-led industries (Stebelskaya et al., 2019)

Conclusion

This study uses panel data from Chinese A-share listed companies (2013-2022) to analyze the relationship between ESG indicators and financial performance, with a particular focus on heterogeneity by ownership structure. The main findings are as follows.

First, there is a statistically significant and positive correlation between ESG performance and corporate financial outcomes. Enterprises that actively assume environmental, social, and governance responsibilities—such as reducing emissions, ensuring labor rights, and improving transparency—demonstrate higher levels of technological innovation and operational efficiency. These improvements lead to enhanced product development capabilities, cost reduction, and, ultimately, improved financial performance.

Second, the relationship between ESG and financial performance is more pronounced in non-state-owned enterprises (NSOEs) than in state-owned enterprises (SOEs). NSOEs appear to derive greater financial benefit from ESG engagement thanks to their organizational flexibility, faster decision-making processes, and

higher responsiveness to market dynamics. In contrast, SOEs, though resource-rich, often operate under more rigid governance frameworks, which can slow down the implementation of ESG-related strategies.

In view of these results, several policy recommendations are proposed:

For private enterprises, policy instruments should focus on encouraging ESG innovation through market-based instruments, such as tax incentives for green R&D, ESG-linked financing mechanisms, and preferential treatment in government procurement for firms with a high ESG rating. This will help them to be more agile and responsive to ESG issues, contributing to the national “dual carbon” goals.

For state-owned enterprises, reforms should target governance streamlining and enhanced ESG accountability. Policymakers may consider implementing mandatory ESG disclosure standards, performance-linked executive compensations tied to ESG benchmarks, and independent supervisory boards to oversee ESG integration. These measures can help overcome bureaucratic inertia and promote a culture of sustainable innovation within SOEs.

At the systemic level, regulators should facilitate the development of a unified ESG evaluation framework, industry-specific ESG benchmarks, and sectoral green transformation roadmaps. Such policies will ensure consistency in ESG reporting, reduce greenwashing, and encourage enterprises of all types to align their strategies with national and global sustainability agendas.

In conclusion, ESG engagement and financial performance are not only positively linked but also mutually reinforcing. To foster long-term corporate resilience and societal benefit, both enterprise managers and policymakers must recognize ESG performance as a strategic imperative. Integrating ESG into core governance and economic planning can enhance firm competitiveness, support national sustainability objectives, and contribute meaningfully to global ecological stewardship.

Limitations and Future Research

This study offers empirical evidence on the relationship between ESG indicators and financial performance, drawing on a decade of data from Chinese A-share listed firms. It highlights ownership structure as a key moderating factor and provides policy-relevant insights into the role of ESG in promoting sustainable corporate growth.

Nevertheless, several limitations remain. Firstly, the analysis relies on Huazheng ESG ratings, which are widely used but may not fully reflect the qualitative aspects of ESG, such as corporate culture or stakeholder engagement. Future studies could incorporate alternative data sources or qualitative metrics to improve the assessment of ESG performance.

Secondly, this study does not specifically examine the internal factors—such as cost-efficiency, innovation, or reputation—that contribute to ESG’s impact on financial outcomes. Investigating these channels would deepen understanding of how ESG translates into value creation.

Finally, the focus on Chinese firms may limit the applicability of the findings to other regulatory or cultural contexts. Future research could expand the analysis to include international or comparative studies and explore the role of government policies in shaping the relationship between ESG and performance.

Despite these limitations, the study contributes to ESG scholarship by providing large-scale, context-specific evidence and offering practical guidance for firms and policymakers navigating sustainability in emerging economies.

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