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ESG AS ONE AND AS THREE: COMPARATIVE EVIDENCE ON FINANCIAL AND NON-FINANCIAL PERFORMANCE WITH BRAND-IMAGE MEDIATION IN FINANCIAL PATHS

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ABSTRACT

This study examines whether ESG overall and individually influences firm outcomes through brand image in China's capital-intensive manufacturing, construction, and transportation industries. Using balanced panel data on 1,718 A-share firms from 2020 to 2023, it estimates fixed-effects regressions for ROA, Tobin's Q, and Employee Productivity, and test mediation with the Baron and Kenny procedure supplemented by 5,000-sample bootstrap confidence intervals. Aggregate ESG is significantly negative for ROA and Tobin's Q, and positive yet insignificant for employee productivity, indicating that short-term and agency cost burdens outweigh efficiency gains during the sample period. Dimension-specific analyses show environmental practice is uniformly negative; social practice is positive for ROA and Employee Productivity but insignificant for Tobin's Q; governance practice has two results yet insignificant across all models. Mediation tests, limited to the two financial measures, reveal brand image transmits a significant negative indirect effect for ESG overall. By dimension, environmental practice, the indirect effect is positive and partially offsets its direct penalty. Social and governance practice generate significant negative indirect-only effects, suggesting that the market interprets their expenditures as profit reducing signals. The findings urge managers and investors to weigh dimension-specific trade-offs rather than relying on a single overall ESG score when evaluating sustainability initiatives. While the results highlight short-term financial penalties, the findings also point to ESG's potential to generate long-term strategic value through resilience, innovation, and reputation capital.

KEYWORDS: ESG Overall And Individually Practices; Brand Image; Corporate Performance; China A-Share Capital-Intensive Firms.

1. INTRODUCTION

In the context of rising global environmental and social pressures, such as global warming, water pollution, poverty, and human rights abuses, corporations are now more and more expected to assume greater levels of environmental and social responsibility. These issues, combined with the financial reporting fraud scandals, highlight the essential role of ensuring that the firms are trusted by the population (Soltani, 2014; Adebajo *et al.*, 2016). Over the past several years, the practice of environmental, social, and governance (ESG) has become the primary pillar of corporate strategy and summarizes how firms respond to global challenges and act as a primary indicator of sustainability and trustworthiness (Liu *et al.*, 2022). The promotion of the national philosophy of development in China, including innovation, coordination, green development, openness, and sharing, has also increased the concern of governments, financial institutions, and investors about ESG considerations (Asset Management Association of China, 2018).

However, despite the general use of ESG in practice, the connection between ESG and corporate performance is a contentious issue in the literature. Current empirical studies suggest that ESG can have a positive (Velte, 2017), irrelevant (Junius *et al.*, 2020), or even a negative (Duque and 2021) impact on the performance of firms, which in turn highlights the inconsistency in the methodological scope and measurement plans. One of the most evident sources of methodological variance is the overwhelming use of a single aggregated score of ESG to assess its effect on firm performance, a measure that does not take into consideration the inherent heterogeneity of the various ESG dimensions. The environmental, social, and governance dimensions have different implementation costs and different effects, and combining the dimensions into one indicator may blur the different contributions to corporate value, as Zyglidopoulos *et al.* (2012) and Yang *et al.* (2023) argue. In addition, ESG performance is often gauged on ratings and scores provided by third-party agencies and research organizations. Although this type of composite scores offers a general assessment, the variables that make up E, S, and G are evidently dissimilar criteria of evaluation of corporate practices (Bissoondoyal *et al.*, 2023). It is therefore urgent to undertake simultaneous comparisons of the aggregated ESG index as well as the underlying dimensions under one empirical framework to better determine their individual impact on firm performance.

The discrepancies found in the past empirical

studies highlight the need to establish the important mediating variables that mediate the relationship between ESG activities and firm performance (Liu *et al.*, 2022). Modern consumers are much more sensitive to corporate ethical practices and sustainability pledges, making it critical that the brand values, including environmental awareness and inclusivity, should be consistent with real-life practices. The gap between proclaimed values and the actual practices in the sphere of environmental or social issues reveals the companies to the accusations of greenwashing, which can provoke consumer boycotts, a negative reaction, and the ultimate loss of profitability (Berrone *et al.*, 2017).

ESG initiatives send messages of ethicality, sustainability, and social responsibility and, therefore, strengthen consumer trust, corporate reputation, and brand differentiation in competitive markets (Zhao *et al.*, 2018). However, to develop strong brand image, it requires long-term investments in marketing, quality control and the customer experience. Although these initiatives can significantly increase the valuation of firms and their market performance in the long-term (Srinivasan and Hanssens, 2024; Wirtz *et al.*, 2025), they often have sluggish payoffs and can reduce short-term profit margins, which creates a structural conflict between the earnings pressure in the quarter and brand-building in the long-term. Empirical studies show that when companies are put through strict financial assessments or faced with instant valuation issues by the capital markets, managers will reduce their expenditures on advertising and customer experience to increase their short-term profitability (Srinivasan and Hanssens, 2024). Nevertheless, such short-term plans undermine brand loyalty, decrease customer loyalty, and eventually deter future sales and competitive position (Wirtz *et al.*, 2025). The resultant question in research is as follows: Is brand image a mediating factor between ESG practices and corporate financial performance?

It should be mentioned that although this study also examines the impact of ESG practices on non-financial results, especially the productivity of employees, brand image is not assumed to be a mediating variable in this particular relationship. This decision to exclude brand image as a mediator can be explained by the fact that the measurement framework and theoretical processes underpinning it need to be consistent. In the given research, brand image is conceptualised as a composite variable that is based on equal weighting of advertising expenditure, R&D expenditure, market share, and brand premium capacity ratios, thus, being mostly

used to describe brand competitiveness of a firm in the external markets (Anselmsson et al., 2014; Zhang, 2015; Sajtos et al., 2015; Ding et al., 2025). In the Resource-Based View, brand image is theorised as a rare and irreplaceable strategic resource that strengthens customer loyalty and investor confidence, which leads to a long-term improvement in the financial performance of the firms (Ullah et al., 2025). Therefore, the theoretical relationship between the brand image and financial performance indicators like Return on Assets and the Tobin's Q is strong, as it has a direct impact on financial performance as it increases market visibility and influences investor expectations. On the other hand, the internal management and human-resource practices are the primary determinants of employee productivity and no theoretical model can show the direct short-term effects of the brand image on employee productivity. In this regard, brand image as a mediator between the ESG and employee productivity is not well justified theoretically, and it may lead to bias in estimating and interpreting the results.

In an attempt to address the inadequacy of earlier research, and to bridge the gap between the theory of research and actual practice, this study aims at achieving two main goals. It starts by undertaking a systematic comparison, rooted in a unifying empirical framework, of the unique effects the aggregate ESG index, and its constituent environment, social, and governance dimensions have on financial and non-financial performance metrics. Second, it determines whether brand image is a mediating construct in the relationship between ESG practices, holistic and dimension-specific, and corporate financial performance.

The current study chooses the A-share listed companies that conduct business in the manufacturing, construction, and transportation segment of the Chinese economy as the empirical sample of studies, as traditionally related to significant environmental costs. As a corpus of current ESG reports and the Asset Management Association of China (2018) suggest, companies in these industries typically face serious compliance costs, as well as operational risks associated with ESG practices, in particular on environmental protection, energy efficiency, and safety management. Using panel data (2020-2023), this study undertakes a systematic comparison of the effect of the composite index of ESG compared to the individual dimensions of the environment, social, and governance on corporate performance. In addition, the study empirically examines the mediating role of brand

image in the causal relationship between ESG practices and financial performance. The focus on areas with high environmental pressures generates more accurate information on how corporations respond to outside regulatory, market, and resource pressures, as well as helps to address the gap in existing literature regarding the heterogeneous nature of the effects of ESG dimensions. The results of these empirical findings highlight the usefulness of the research conclusions in terms of policy and practice.

This manuscript is organized in the following way. Section 2 provides the theoretical background, and Section 3 provides a critique of the relevant literature and the research hypotheses. Section 4 elaborates the research design that includes sample selection, constructing variables, how to formulate an index, data provenance, and the empirical specification. Section 5 states and discusses the empirical findings.

The rest of this paper is organized in the following way. Section 2 presents the theoretical framework and Section 3 discusses the literature that has been used in relation to the research and elaborates the research hypotheses. Section 4 details the research design, which includes the sample selection, construction of variables, construction of indices, data source, and empirical specification. Section 5 presents the results of the empirical analysis. The final part of the paper summarizes the findings, discusses the limitations of the study and suggests future research directions.

2. THEORETICAL BACKGROUND

With the context of continued global economic change and the further entrenchment of sustainable development, the practice of ESG is increasingly becoming a part of corporate business and strategic decision-making. This is especially relevant in sectors with a high level of environmental pressure, including manufacturing, construction, and transportation, where the ESG performance is not only associated with the costs of compliance and the corporate image but also potentially influences the profitability, market value, and the productivity of the employees. Nevertheless, very different empirical results have been reported in different countries and industries. Although there are studies that indicated a positive correlation between ESG and the firm performance, others showed limited or even negative impacts. These discrepancies highlight the need to consider the ESG-firm performance nexus in various theoretical frameworks to uncover the mechanisms behind it and the possible mediating processes.

The initial theory that underlies this research is the stakeholder theory which argues that the ESG activities of firms should be responsive to the expectations and needs of a majority of stakeholders, including shareholders, employees, customers, suppliers, governments, and communities (Freeman, 1998). In the sectors that are highly exposed to environmental strains, such efforts are easily realized in terms of improvement of safety levels, environmental safeguarding, energy-conserving procedures, and compliance procedures. On the one hand, such investments can result in financial returns since they increase market awareness, achieve government subsidies, and strengthen brand image (Henisz *et al.*, 2019; Xu *et al.*, 2022). On the other hand, they are able to alleviate the workplace conditions at the same time, as they focus on the safety and wellbeing of the employees, as well as offer training and career opportunities (Matos, 2020), thus strengthening the non-financial performance indicators such as employee productivity (Chang *et al.*, 2021).

Moreover, ESG activities may be used as a relevant tool by which companies express their pledging to stakeholder requirements. Through environmental, social and governance activities, organizations are able to align their strategic goals to stakeholder interests (Kalia and Aggarwal, 2023). Under this paradigm, ESG engagement is not only seen as the realization of corporate responsibility, but also as a strategic line of investment. Regular practice of ESG helps firms to develop strong stakeholder relationships, building trust and cooperation, and eventually achieving improvements in financial and non-financial performance, which simultaneously helps to build market reputation and competitive advantage.

Next, the agency theory is referred to in order to explain the possible harmful or neutral consequences of ESG activities. In the ESG framework, the agency issue can come in various forms (Peng and Isa, 2020). Executives can also pursue ESG projects mainly to support their own interests at the expense of increasing firm value in the long-run (Liu and Zhang, 2023). As a result, senior managers or shareholders can over-invest in sustainable activities, thus, misallocating resources and creating a negative effect on financial performance (Barnea & Rubin, 2010). In addition, too much ESG investment may negatively impact non-financial performance, especially the productivity of employees, as it creates internal inefficiencies and makes organizational operations difficult. As an example, the adoption of new compliance strategies, employee welfare initiatives

or governance requirements often require reorganizing job duties, rearranging work flows and adding to the workload. These changes can increase the adaptation costs of staff members in the short term, upset the routine, and create a sense of overlapping responsibilities and work overload. The associated organizational stress can be transferred into psychological stress and mental exhaustion of workers and eventually reduce the work efficiency (Dima, 2021; Lin *et al.*, 2024). Therefore, agency issues can encourage firms to abandon value maximization as part of their ESG activities, which then have negative impacts on both financial and non-financial performance.

Lastly, the Resource-Based View (RBV) provides theoretical foundations of explaining the mediating factors that explain how ESG practices can affect the financial performance by focusing on the internal resources and capabilities of firms. The RBV puts much emphasis on the fact that brand image is an intangible resource that is built through time and that it possesses the attributes of rarity, inimitability and barriers to entry when established. These qualities help companies to improve brand awareness and consumer loyalty, which produce high-quality performance results. Brand image as a strategic resource helps to achieve sustained competitive advantage, and its value is manifested in the long term in terms of increased profitability and increased capital market valuation (Flores *et al.*, 2020).

Also, regular and quality ESG actions do not only respond to the expectations of the stakeholders in relation to environmental protection, social responsibility, and transparency of governance, but they also can develop a responsible and trustful corporate image in the minds of the audience and investors (Mishra, 2018; Kaur and Singh, 2023). The brand image building of the ESG in this process contributes to improving the positive market perceptions and valuation bases in the capital market, as well as strengthening the customer loyalty and bargaining power on the sales side. Such a dynamic creates a value-transformation process whereby ESG practices create a brand image accumulation process that enhances financial performance. Therefore, the RBV offers theoretical underpinning of the research design of the present study, which focuses on financial performance as its dependent variable and brand image as the main mediating variable.

3. LITERATURE REVIEW AND RESEARCH HYPOTHESIS

3.1 ESG And Financial Performance

The empirical evidence on the association between ESG practices and corporate financial performance shows mixed results, with both studies showing strong positive, negative, and statistically insignificant results. However, the most common evidence suggests that ESG practices have a positive impact on financial performance. Expanding on the theoretical framework presented in Section 2, the stakeholder theory argues that companies should not only focus on all stakeholders who they impact with their business decisions, but they should also work towards their overall well-being (Werhane and Freeman, 1999). ESG activities involve the environmental, social, and governance aspects and are meant to ensure that the corporate goals are aligned to those of stakeholders (Kalia & Aggarwal, 2023).

ESG practices may increase the financial performance in various ways. An example of such initiatives is environmental programs that may directly lower the cost and enhance profitability through such initiatives as green processes, energy efficiency, and waste recycling (Clarkson et al., 2008; Chowdhury et al., 2018). Companies can build a green competitive advantage when they formulate distinctive resources and capabilities in the management of the environment and green innovation (Chen, 2011). This is their advantage as they can enjoy the benefits of tax incentives, government subsidies, and the increasing demand of green products and services. The combined presence of these positive factors and resources helps develop competitive advantages, which subsequently lead to an increase in the market share, and finally, financial performance (Chen et al., 2017; Abrams and Hossain, 2021).

Secondly, social practices include bettering of the working environment, guaranteeing the safety and health of employees, and the availability of training and development opportunities (Matos, 2020). These types of initiatives, besides meeting stakeholder expectations, are actually concrete measures of social-capital investment that also improve the economic and social performance (Becchetti et al., 2022). In essence, they help to reduce operational risks and costs through fewer accidents at work, decreased insurance claims, compliance fines and litigation, and thus stabilised cash flow (Fotiadis et al., 2023; Chakraborty et al., 2023). Meanwhile, proper employee benefits and good working

conditions lower turnover rates among experienced personnel, the loss of which usually affects the core business operations and costs much more than compensation would. Additionally, new employees also need further training and do not produce as much value as senior employees do (Chang et al., 2021).

There are widely recognized categories of corporate governance mechanisms into which they are divided into external and internal. The cause of the external mechanisms is the capital market, the corporate control market, the labour market, and the initial stage of a firm, and are not under the direct control of a firm. The internal mechanisms include board of directors, internal control, internal audit functions, and the quality of these mechanisms is directly related to corporate financial performance (Dharmastuti and Wahyudi, 2013). Being one of the key internal processes, a properly designed and well-operating board can limit managerial behaviour, reduce agency problems, and increase the alignment of decision-making with shareholder interests, thereby improving the value of a firm and its performance (Aguilera et al., 2015; Brennan, 2020). Having diversity in the board, especially gender, enhances oversight and compliance, boosts the corporate image, and finally boosts the value of firms (Harjoto et al., 2015). Empirical studies also show that female directors have higher attendance rates, are more active in audit and governing boards, and have more conservative risk preferences, features that supplement traditionally aggressive decision-making styles and result in better financial performance (Adams and Ferreira, 2009; Croson and Gneezy, 2009; Reguera et al., 2017). Moreover, an increase in board independence and the percentage of outside directors offers objective monitoring, which helps to reduce agency and contracting costs and can greatly enhance the performance of firms when the informational acquisition cost is relatively low (Duchin et al., 2010; Qadorah and Fadzil, 2018). As a result, good governance practices reduce agency issues, improve oversight and risk management, and improve reputation and disclosure of information, which is converted into increased profitability and market valuation.

Despite the literature suggesting that the overall ESG practices and the individual dimensions can positively impact financial performance, companies that work within the China-based dual-carbon targets and a growing green transformation are facing mounting regulatory expenses and compliance costs (Freese et al., 2019; Bailey et al., 2020). With the increasing requirements of

environmental and safety standards, extra compliance costs and equipment upgrade investments can squeeze the profit margins in the short term and, therefore, undermine financial performance (Dragomir, 2020). In addition, agency problems can be further complicated by low quality of ESG disclosure, managerial short-termism, and agency incentives, which have negative implications on financial performance (Barnea and Rubin, 2010). Based on this, the following hypothesis is put forward.:

- H1: ESG practices are significantly associated with corporate financial performance.
- H1a: Environmental practices are significantly associated with corporate financial performance.
- H1b: Social practices are significantly associated with corporate financial performance.
- H1c: Governance practices are significantly associated with corporate financial performance.

3.2. ESG And Non-Financial Performance

Regarding the non-financial performance, especially the indicators of organizational effectiveness that are directly linked with the productivity of employees, the existing studies tend to show that ESG practices breed beneficial outcomes. Firms can increase employee motivation and organizational commitment by promoting a safe and healthy working environment, providing equal chances to train and grow, and considering the needs of employees and their psychological well-being, which, in turn, leads to an increase in efficiency and productivity (Matos, 2020; Becchetti et al., 2022). To be more precise, such environmental practices as the introduction of green technologies, the optimization of energy consumption, and the reduction of emissions not only reduce the health risks but also strengthen the identification of employees with corporate sustainability objectives (Shrivastava, 2018; Czichos et al., 2025). As an example, better air quality and safety of the workplace can reduce the rate of occupational disease and injury, decrease absenteeism, and, consequently, indirectly raise productivity (Raja and Iqbal, 2019).

Second, corporate social practices are important in increasing the productivity of employees. Enhancement in employee benefits, job security and work-life balance policies do not only lead to a high level of employee satisfaction, but also create a perception of care and responsibility, which can prompt more employees to engage in work (Branco and Rodrigues, 2006; Chandrasekar, 2011).

Moreover, training and development opportunities as well as engagement in community and philanthropic activities make firms, employees, and external stakeholders closer. Such activities contribute to developing a collaborative environment, minimizing the number of internal disputes, and enhancing teamwork (Matos, 2020; Adu et al., 2021; Becchetti et al., 2022). Moreover, the constant investment in a social responsibility and employee welfare enhances the organizational commitment of the employees and helps to identify them with the corporate strategic goals and to sustain high engagement and stable performances even in the conditions of external pressure and operational challenges (Ra et al., 2025).

In regards to governance practices, a sound and open governance system guarantees stability and uniformity of management systems and operational procedures. Standardized processes lessen mistakes, defects, and rework, and consequently, the load of repeated tasks on the employees is minimized (Fung, 2014; Neyestani and Juanzon, 2017). Certain and consistent regulations contribute to productivity by standardizing the processes and reducing role ambiguity, enabling the employees to understand their duties and purpose more effectively (Fischer et al., 2019). Moreover, a properly designed board of directors is capable of carrying out monitoring and control activities whilst being adaptable when making decisions to prevent bureaucratic inefficiencies. These governance mechanisms improve not only the effectiveness of supervisor but also align the managerial behavior with the interest of shareholders and the company overall, thus minimizing the agency problems (Koufopoulos et al., 2020). Within this model, companies will be able to invest in the production processes more accurately and offer the necessary assistance to employees in time, which will eventually increase the productivity.

But profitability and cash-flow pressures brought about by pandemic and the “dual-carbon” shift have made companies more pre-disposed to put scarce resources in short-term technological improvements or in profit-seeking projects. According to surveys, various companies have cut down on investment in human capital development and employee welfare and in other instances, they have even passed part of the transformation costs to the employees during the ESG transition period (Piwowar et al., 2024; Gu and He, 2023). Within the framework of this inadequate investment, some ESG initiatives can be only symbolic and not substantive, not enhancing the working conditions or motivation of the employees and, therefore, undermining their beneficial

contribution to non-financial performance, including productivity (Shahzabi et al., 2024). Therefore, the hypothesis below is proposed.:

H2: ESG practices are significantly associated with corporate non-financial performance.

H2a: Environmental practices are significantly associated with corporate non-financial performance.

H2b: Social practices are significantly associated with corporate non-financial performance.

H2c: Governance practices are significantly associated with corporate non-financial performance.

3.3. Relationship Among ESG , Brand Image And Financial Performance

It has been known that strong ESG practices have a significant positive impact on corporate brand image and reputation, thus acting as a central competitive advantage source (Jukemura, 2018). In this sphere, environmental programs are aimed at reducing wastes, resource-conservation, and recycling in an attempt to reduce the negative environmental effects of operations, products, and services (Uhlener et al., 2012; Hoogendoorn et al., 2015). Empirical research shows that not only do such initiatives point to a sustainable development commitment, but also help firms to develop an eco-friendly brand image in the eyes of the consumers (Singh and Pandey, 2012; Yu et al., 2021). With the growing environmental consciousness, consumers are more and more willing to buy the products and services of companies that adopt environmental responsibility, so companies can gain differentiated competitive advantages using their image (Siegel and Vitalano, 2007; Dupire and Mzali, 2018). As an example, the environmental footprint of the U.S. banking industry is quite small, but banks have made it stand out in the market and capture the attention of investors and consumers through active promotion of environmental activities (Brogi & Lagasio, 2019).

Corporate social practices focus on taking into account the social effects of the business activities, especially the management of relationship with employees, suppliers, customers, communities and governments (Valiente et al., 2012). Companies express their concern about social matters through such activities as charitable giving, sponsoring education and medical projects, enhancing employee welfare, and human rights concerns, which creates a desirable brand image (Carroll and Shabana, 2010; Yu et al., 2020; Chang et al., 2021). These types of social responsibility also serve as a differentiation

tool in the highly competitive markets, where brand loyalty is promoted and consumer sensitivity to price decreases (Miltenburg, 2005; Duanmu et al., 2018).

A good corporate governance model that involves an active board of directors, open disclosure, and a vigorous audit committee is important in enhancing brand image (Ettredge et al., 2011). The presence of a properly operating board ascertains that the corporate decision-making process is in line with the expectation and ethical standards of the population under fair and transparent control, which consequently builds trust (Vo, 2008), and leads to the strengthening of the population support by communicating with communities, policymakers, and philanthropic entities (Renz, 2016). Open disclosure not only meets the regulatory standards but also enhances the trust of the investors and the general population (Fung, 2014). At the same time, a competent audit committee is able to oversee financial reporting and internal controls and prevent scandals and protect the corporate image (Marx and Els, 2009; Cohen et al., 2017). All of these governance mechanisms contribute to the improvement of operational efficiency and compliance as well as market credibility consolidation.

Despite the fact that the majority of studies available indicate that ESG practices can positively affect corporate brand image, the widespread problem of so-called greenwashing emphasizes the possible negative outcomes of this approach. Greenwashing is strategically speaking the act of overstating or faking ESG performance by firms in order to create a sustainable image with no real improvement (Berrone et al., 2017). This is much closely related to the institutional environment. The new Environmental Protection Law that came into force in China has not only raised the regulatory demands but also added some fiscal benefits like tax breaks, subsidies, and green credit. Although the objectives of these policies are to enable a green transformation, certain companies have misinterpreted them to mean a short-term greenwashing strategy of subsidies. Thus, ESG practices can significantly differ in relation to the real business practices, undermining the trust of the population and even leading to a backfiring of the ESG performance on the brand image (Zhang et al., 2024). Therefore, the hypothesis presented below is proposed:

H3: ESG practices are significantly associated with brand image.

H3a: Environmental practices are significantly associated with brand image.

H3b: Social practices are significantly associated

with brand image.

H3c: Governance practices are significantly associated with brand image.

Studies have also shown that a strong brand image may significantly improve corporate financial performance (Ali et al., 2020), and at the same time, contribute to consumer trust, identification, and loyalty. Not only would they be more likely to make repeat purchases, but also would recommend the brand to others, which would reduce the cost of acquiring customers and enhance the predictability of sales in the long term and reduce the loss of revenue (Mabkhot et al., 2017). The perspective is theoretically supported by the Resource-Based View (RBV). It assumes that brand image as an intangible asset that is accumulated over time captures rarity, inimitability and competitive advantage. At the time of its establishment, it strengthens the market awareness and customer loyalty, which can be converted into high performance results. Brand image as a key strategic asset generates long-lasting competitive advantage; the value of this strategic asset is finally reflected in increased profitability and increased capital market valuation (Flores et al., 2020).

Hence, the following hypothesis is proposed:

H4: Brand image positively affects financial performance.

The corporate ESG practices are typically in line with the goals of a wide range of stakeholders, such as consumers, suppliers, employees, shareholders, boards of directors, customers, communities, and

governments (Adebayo et al., 2014; Matos, 2020; Xu et al., 2022; Kalia and Aggarwal, 2023). The stakeholder theory suggests that the ultimate aim of any company is to facilitate the mutual prosperity of the organization and the major stakeholders and thus, the brand image and financial results of the company are improved by meeting stakeholder needs (Werhane and Freeman, 1999; Liu et al., 2022). In addition, brand image creation and reenactment also leads to consumer trust, investor interest and market acceptance. All of them enhance not only sales but also product pricing power, market share, which further directly increases financial performance (Mabkhot et al., 2017; Świtała et al., 2018; Ali et al., 2020).

Thus, the following hypotheses are proposed on the relationships between ESG overall and individual practices, brand image, and financial performance:

H5: Brand image mediates the relationship between ESG practices and financial performance.

H5a: Brand image mediates the relationship between environmental practice and financial performance.

H5b: Brand image mediates the relationship between social practice and financial performance.

H5c: Brand image mediates the relationship between governance practice and financial performance.

The research model for the presented hypothesis is shown in Table 1.

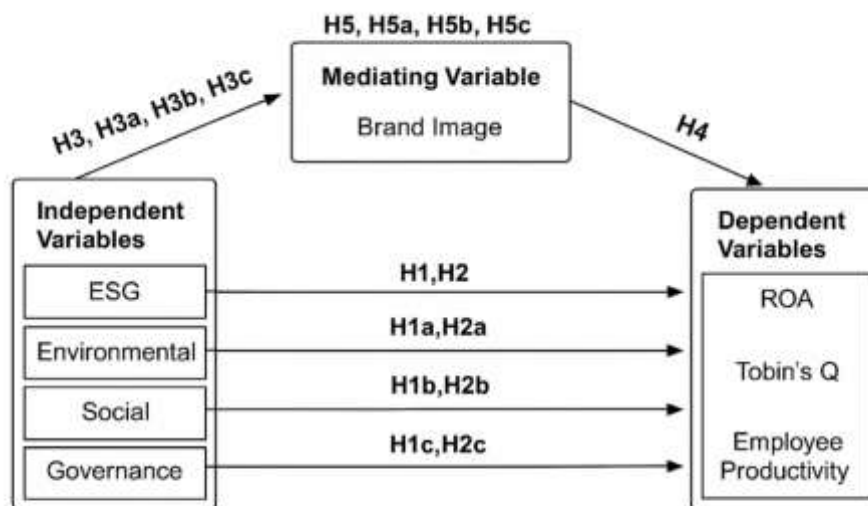


Table 1: Research Model.

4. METHODOLOGY

4.1. Data Collection

The research model of the study is designed to explore the impact of ESG practices on financial and non-financial performance of manufacturing, construction, and transportation industries in China, as well as explore the mediating effect of brand image in the relation between ESG and financial performance. The sample will be A-share listed companies in these three industries between 2020 and 2023 based on the availability of data. The criteria used to select them are as follows. First, companies that were considered as ST or *ST, and financial institutions were left out. Second, companies whose key variables values were not observed within two or more years over the period of observation were dropped. Lastly, firms that were listed in 2020 were not considered, as such young firms have comparatively short listing history, fragile operations, and immature ESG frameworks that may skew the validity of the results. All the variables were winsorized at 1 percent and 99 percent to reduce the effects of outliers. The last sample is of 1,718 firms, which gives 6,872 firm-year observations. Data on ESG were retrieved through the HuaZheng and Wind rating systems, and the data on financial performance, non-financial performance, and brand image were retrieved through the CSMAR database.

4.2. Variables And Measurement

Detailed definitions, data sources, and formulas for all variables are provided in Appendix A.

4.2.1. Independent Variable

In order to measure the overall performance of ESG and its dimensions, the present study uses the ESG rating framework developed by HuaZheng. The framework is updated quarterly or monthly and provides a complete evaluation of the ESG performance and risk levels of A-share and Hong Kong-listed companies. The ratings range between AAA and Cover nine scales, and risk classification is broken down into 4 categories- low risk, watch, warning, and severe warning- where high scores indicate high ESG performance (HuaZheng, 2024). To reduce the possibility of endogeneity and adjust the effect of ESG lag, the data of 2019-2022 were used to predict the financial and non-financial results in 2020-2023 by shifting ESG variables by one period in time (Velte, 2017; Atan et al., 2019; Naeem et al., 2022). To measure the robustness and consistent with the previous research, the Wind ESG rating was added as a secondary explanatory variable to

support the consistency of the results (Fu & Li, 2023).

4.2.2. Dependent Variable

The current study constructs its dependent variables as both financial and non-financial aspects of the organizational performance. The operationalization of financial performance involves the exploitation of an accounting-based measure, that is Return on Assets (ROA), and a market-based measure, that is, the Tobin's Q. Non-financial performance, in turn, is operationalized through a measure of employee productivity. One of the accounting measures which have been widely applied in the empirical literature is Return on Assets (ROA). It can be calculated as the ratio of the net income to the total asset base, which in turn provides a proportion of profitability of the firm in relation to the assets that it holds (Aydoğmuş et al., 2022; Liu et al., 2022). An improved ROA value is normally perceived to be a sign of improved financial performance. Since any accounting-based metric can be manipulated using earnings management practices, researchers often combine them with market-based measures like the Tobin's Q to achieve a more multidimensional measure of firm performance (Velte, 2017). The official definition of Tobin's Q is the ratio of the market value of a firm to the replacement cost of the assets (Tobin, 1969). The fact that the value of Tobin's Q is greater than one would indicate that the market price is higher than the replacement price, thus indicating that the performance is higher than what it would be based on accounting records alone (Singh et al., 2018). Based on the framework of the Balanced Scorecard that is defined by Kaplan and Norton (1992), this study uses the employee productivity as a proxy measure of non-financial performance in the internal processes dimension. In particular, employee productivity is measured in the form of operating revenue per employee, which is a measure that represents operational efficiency and resource utilisation efficacy, thus acting as an effective measure of internal process performance in the wider framework of non-financial measures (Ishikawa et al., 2022).

4.2.3. Mediating Variable

The study focuses on the impact of Environmental, Social, and Governance (ESG) practices on financial performance and brand image is suggested as an intermediary variable. According to the empirical literature, a strong ESG performance supplements brand image and reputation, hence providing competitive advantage (Jukemura, 2018),

and a positive brand image simultaneously contributes to improved financial performance (Ali *et al.*, 2020). Brand image is operationalized based on extant scholarship (Anselmsson *et al.*, 2014; Sajtos *et al.*, 2015; Zhang, 2015; Ding *et al.*, 2025) by using four proxy measures, including the percentage of advertising spending as a factor of total expenditure, the percentage of research and development spending, market share, and the brand premiuming capacity. The composite index is calculated using an equal-weighted approach, which is embraced to give neutral baseline where a standardized weighting scheme is not in place and thus the equal contribution of each constituent indicator. When one or more of the components are significantly low or negative, the resulting composite index can be below zero; a result that is not taken as a computational artefact but as a signal of inadequate brand-related investment or poor performance.

4.2.4. Control Variable

Control variables are important in the determination of empirical findings in the statistical analysis. Without them, the correlation between the independent and dependent variables can be falsified, thus making biased inferences (Berneth & Aguinis, 2016). In line with prior research, the current research uses ten control variables: Size, Age, Leverage, Operating Revenue Growth, Operating Cash Flow Ratio, Capex-to-Total-Assets Ratio, Independent Director Ratio, Cash Assets Ratio, Concentration of Ownership, and Fixed Asset Ratio.

4.3. Model Construction

In order to examine the correlation between the environmental, social, and governance (ESG) practices, corporate performance, and brand image in the context of the Chinese construction, manufacturing, and transportation industries, and to test the hypotheses, this paper builds eight regression models. Both the models have firm fixed effects and year fixed effects, and the standard errors are clustered at the firm level. The mediation analysis uses a cluster-based bootstrap resampling process, which includes 5,000 repetitions with firms being the unit of clustering; the estimated indirect effects and the standard errors are reported. Since the effect of ESG on corporate performance is not immediate and the possibility of reverse causality is high, all the models include lagged ESG variables, which are one period behind in accordance with the current literature (Velte, 2017; Atan *et al.*, 2019; Naeem *et al.*, 2022) to reduce the endogeneity problem. Financial and non-financial performance and brand image of

firm *i* at time *t* is therefore regressed on ESG performance at time *t* -1 to assess the impact of ESG practices.

The following are the regression models.:

Model 1: This regression model seeks to examine the impact of overall ESG performance score on corporate financial performance.

$$ROA_{it} = \alpha + \beta_1 ESG \text{ Score}_{it-1} + \beta_2 ControlVariables_{it} + \mu_i + \lambda_t + \epsilon_{it};$$

$$Tobin'sQ_{it} = \alpha + \beta_1 ESG \text{ Score}_{it-1} + \beta_2 ControlVariables_{it} + \mu_i + \lambda_t + \epsilon_{it}$$

Where:

ROA_{it} comprises the returns on assets of corporations *i* at the time *t*;

Tobin'sQ_{it} presents the market-based measurement of financial performance of corporations *i* at time *t*;

ESG Score_{it-1} in all the models above represents overall ESG performance score of corporations *i* at the time *t*-1;

μ_i presents firm fixed effects;

λ_t presents year fixed effects;

ϵ_{it} indicates the error term in the regression model.

Model 1a: This regression model investigates the association of the performance of each individual pillar of ESG with corporate financial performance.

$$ROA_{it} = \alpha + \beta_1 Environmental \text{ Score}_{it-1} + \beta_2 Social \text{ Score}_{it-1} + \beta_3 Governance \text{ Score}_{it-1} + \beta_4 ControlVariables_{it} + \mu_i + \lambda_t + \epsilon_{it};$$

$$Tobin'sQ_{it} = \alpha + \beta_1 Environmental \text{ Score}_{it-1} + \beta_2 Social \text{ Score}_{it-1} + \beta_3 Governance \text{ Score}_{it-1} + \beta_4 ControlVariables_{it} + \mu_i + \lambda_t + \epsilon_{it};$$

Where:

Environmental Score_{it-1} represents the environmental performance score of corporations *i* at the time *t*-1;

Social Score_{it-1} represents the social performance score of corporations *i* at the time *t*-1;

Governance Score_{it-1} represents the corporate governance performance score of corporations *i* at the time *t*-1.

Model 2 :This regression model seeks to examine the impact of overall ESG performance score on corporate non-financial performance:

$$Employee \text{ Productivity}_{it} = \alpha + \sigma_1 ESG \text{ Score}_{it-1} + \sigma_2 ControlVariables_{it} + \mu_i + \lambda_t + \epsilon_{it}$$

Where:

Employee Productivity_{it} presents the employee productivity of non-financial performance of corporations *i* at time *t*.

Model 2a: This regression model seeks to examine the impact of individual ESG performance on corporate non-financial performance.

Employee Productivity_{it} = $\alpha + \sigma_1$ Environmental Score_{it-1} + σ_2 Social Score_{it-1} + σ_3 Governance Score_{it-1} + σ_4 Control Variables_{it} + $\mu_i + \lambda_t + \epsilon_{it}$;

Since the causal step method proposed by Baron and Kenny (1986) has certain limitations including the fact that it does not quantify indirect effects directly and that it does not test the null hypothesis indirectly, the significance of indirect effects estimated using a bootstrap method (5,000 resamples clustered at the firm level) becomes the main criterion of this study (Preacher and Hayes, 2008). The Baron and Kenny model is simply used to describe and name the kinds of mediation effects. The regression models are as shown below:

Model 3: This regression model examines the association between overall ESG performance and brand image.

Brand Image_{it} = $\alpha + \gamma_1$ ESG Score_{it-1} + γ_2 Control Variables_{it} + $\mu_i + \lambda_t + \epsilon_{it}$

Model 3a: This regression model examines the association between individual ESG performance and brand image.

Brand Image_{it} = $\alpha + \gamma_1$ Environmental Score_{it-1} + γ_2 Social Score_{it-1} + γ_3 Governance Score_{it-1} + γ_4 Control Variables_{it} + $\mu_i + \lambda_t + \epsilon_{it}$

Where:

Brand Image_{it} presents brand image score of corporations *i* at time *t*.

Model 4: This regression model examines the mediating effect of brand image on the overall ESG and financial performance relationship.

ROA_{it} = $\alpha + \delta_1$ ESG Score_{it-1} + δ_2 Brand Image_{it} + δ_3 Control Variables_{it} + $\mu_i + \lambda_t + \epsilon_{it}$;

Tobin's Q_{it} = $\alpha + \delta_1$ ESG Score_{it-1} + δ_2 Brand Image_{it} + δ_3 Control Variables_{it} + $\mu_i + \lambda_t + \epsilon_{it}$

Model 4a: This regression model examines the mediating effect of brand image on the individual ESG and financial performance relationship.

ROA_{it} = $\alpha + \delta_1$ Environmental Score_{it-1} + δ_2 Social Score_{it-1} + δ_3 Governance Score_{it-1} + δ_4 Brand Image_{it} + δ_5 Control Variables_{it} + $\mu_i + \lambda_t + \epsilon_{it}$;

Tobin's Q_{it} = $\alpha + \delta_1$ Environmental Score_{it-1} + δ_2 Social Score_{it-1} + δ_3 Governance Score_{it-1} + δ_4 Brand Image_{it} + δ_5 Control Variables_{it} + $\mu_i + \lambda_t + \epsilon_{it}$

5. EMPIRICAL ANALYSES AND FINDINGS

5.1 Descriptive Statistics

The last panel data used in this study covers the manufacturing, construction and transportation industries in China in a period of four years. It uses variables of overall and component-specific ESG indicators, financial performance measures, non-financial performance measures, and brand image. It has 1,718 publicly traded companies, and 6,872 firm-

years were obtained. Table 2 shows the descriptive statistics of the key variables, i.e. the independent, dependent, mediating and control variables.

Table 2: Description Statistics.

Variables	Obs	Mean	Std. Dev.	Min	Max	Ske w.	Kurt.
ESGRating	6872	73.57	4.661	59.84	84.57	-.227	3.365
Environmental	6872	63.064	6.35	48.94	81.86	.622	3.531
Social	6872	77.175	5.907	57.97	91.75	-.398	4.097
Governance	6872	78.764	5.374	59.09	88.08	-1.094	4.649
ROA	6872	.039	.059	-.172	.217	-.385	5.407
TobinQ A	6872	2.102	1.341	.826	8.633	2.544	10.83
Employeeproductivity	6872	14700.00	11600.00	3390.00	67200.00	2.316	9.123
BrandImage	6872	.049	.055	-.043	.243	1.33	5.085
Size	6872	22.491	1.26	20.266	26.456	.853	3.721
Age	6872	11.907	7.32	2	29	.743	2.426
Leverage	6872	.418	.18	.075	.846	.152	2.339
OperatingRevenue Growth	6872	.166	.397	-.584	2.057	2.067	9.604
OperatingNetCash Flow	6872	.114	.126	-.165	.576	.957	4.791
CapextoTotalAssets	6872	.048	.041	.001	.199	1.451	5.068
IndDirectorRatio	6872	.38	.055	.333	.571	1.127	4.098
CashAssetsRatio	6872	.151	.103	.016	.512	1.258	4.443
ConcentrationofOwnership	6872	.502	.147	.191	.869	.209	2.581
FixedAssetRatio	6872	.207	.121	.014	.567	.722	3.085

The descriptive statistics indicate that the firms in the sample exhibit moderate variation in ESG scores, with social and governance dimensions averaging higher values than environmental practices. This suggests that companies in China's capital-intensive industries emphasize workplace safety, employee welfare, and governance transparency more strongly than environmental measures, likely due to the high cost burden of compliance. Meanwhile, Tobin's Q shows considerable variation, reflecting heterogeneous market valuations across firms, while employee productivity demonstrates a wide dispersion, highlighting efficiency gaps in operational performance.

5.2. Correlation Matrix & Vif Checks

Table 3: Presents The Results Of The Correlation Analysis Of The Variables In This Study.

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
(1)ESGRating	1.000																	
(2)Environmental	0.463 ***	1.000																
(3)Social	0.483 ***	0.410 ***	1.000															
(4)Governance	0.467 ***	0.167 ***	0.125 ***	1.000														
(5)ROA	0.203 ***	0.023 *	0.126 ***	0.302 ***	1.000													
(6)TobinQ_A	0.035 ***	-0.10 1***	0.011	0.114 ***	0.352 ***	1.000												
(7)Employeeproductivity	0.053 ***	0.159 ***	0.088 ***	0.020	0.131 ***	-0.11 2***	1.000											
(8)BrandImage	0.097 ***	-0.08 0***	0.029 **	0.162 ***	0.250 ***	0.328 ***	-0.22 9***	1.000										
(9)Size	0.213 ***	0.373 ***	0.210 ***	0.078 ***	0.070 ***	-0.25 4***	0.439 ***	-0.12 3***	1.000									
(10)Age	-0.05 4***	0.116 ***	-0.04 0***	-0.04 9***	-0.06 8***	-0.18 9***	0.226 ***	-0.17 3***	0.429 ***	1.000								
(11)Leverage	-0.07 1***	0.150 ***	0.089 ***	-0.31 1***	-0.36 9***	-0.29 4***	0.244 ***	-0.33 1***	0.446 ***	0.191 ***	1.000							
(12)OperatingRevenueGrowth	-0.02 1*	-0.02 9**	-0.03 8***	-0.03 8***	-0.04 4***	0.008	-0.03 6***	0.026 **	-0.04 5***	-0.01 0	0.051 ***	1.000						
(13)OperatingNetCashFlowRatio	0.091 ***	0.075 ***	0.032 ***	0.122 ***	0.431 ***	0.123 ***	0.043 ***	0.139 ***	0.153 ***	0.043 ***	-0.14 9***	-0.13 1***	1.00 0					
(14)CapextoTotalAssetsRatio	0.060 ***	0.039 ***	0.055 ***	0.073 ***	0.125 ***	0.104 ***	-0.07 4***	-0.00 4	0.040 ***	-0.19 3***	0.016	-0.11 6***	0.24 3***	1.000				
(15)IndDirectorRatio	0.064 ***	0.041 ***	0.010	0.076 ***	-0.04 0***	0.010	0.010	0.027 **	0.021 *	-0.05 6***	0.048 ***	-0.01 3	-0.0 17	0.017	1.000			
(16)CashAssetsRatio	0.126 ***	0.000	0.018	0.226 ***	0.251 ***	0.200 ***	0.007	0.220 ***	-0.07 3***	0.011	-0.31 9***	0.029 **	0.08 1***	-0.12 9***	-0.02 8**	1.000		
(17)ConcentrationofOwnership	0.152 ***	0.071 ***	0.059 ***	0.157 ***	0.207 ***	0.070 ***	0.105 ***	0.030 **	0.167 ***	-0.17 8***	-0.00 1	0.004	0.15 0***	0.043 ***	0.050 ***	0.081 ***	1.0 00	
(18)FixedAssetRatio	-0.04 9***	0.047 ***	-0.05 4***	-0.05 2***	-0.04 7***	-0.09 5***	-0.10 7***	-0.21 7***	0.012	0.034 ***	0.007	-0.15 8***	0.37 0***	0.338 ***	-0.00 9	-0.28 0***	0.0 13	1.0 00

Notes: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

5.2.1. Table 3 Correlation Matrix

The correlation test shows that there are a few significant relationships. ESG in general is positively associated with ROA and Tobin’s Q but the correlation is not very strong, indicating that there are other factors that mediate the performance and ESG relationship. Social practices are found to be more correlated with profitability and productivity than either environmental practices or governance practices and the theoretical argument that employee welfare and community initiatives generate higher short-term payoffs is confirmed. The fact that brand image and financial outcomes have a significant positive relationship supports the view that the brand image is a strategic resource. The negative associations, like the association between the age of firms and the performance indicators, indicate that younger firms can adjust to ESG programs and

market requirements more rapidly.

Variance Inflation Factor (VIF) results show that all values are well below the threshold of 10, confirming the absence of multicollinearity among explanatory variables. This ensures that regression estimates are reliable and not distorted by overlapping effects of independent variables. For managers and policymakers, this adds confidence that the study’s results reflect genuine relationships between ESG dimensions, brand image, and firm performance, rather than being artifacts of statistical overlap.

5.3 Regression Results

5.3.1 ESG Overall And Individually → Financial And Non-Financial Performance

Table 5 presents the results of overall ESG

performance, while Table 6 disaggregates the analysis by environmental, social, and governance dimensions.

The findings show that total ESG performance has a negative and statistically significant impact on ROA and Tobin's Q, thus, proving that, in the short run, ESG practices reduce profitability and market value. This effect is an indicator of the compliance, governance reform and sustainability reporting cost burden in capital intensive industries. Interestingly, ESG does not seem to have a major impact on employee productivity, which suggests that operational efficiency does not start gaining short-term advantages through ESG efforts.

The division of ESG into its individual dimensions (Table 6) highlights significant differences. The overall trend in environmental practices is a negative correlation on financial and non-financial performance, which supports the idea that the high cost of pollution control, energy-efficiency improvements and regulatory compliance puts significant strain on short-term performance of firms.

Social practices, on the other hand, have a positive effect on ROA and employee productivity, which is the practical benefits of safety at the workplace, training, and employee well-being. The results show that social programs improve internal efficiency and organizational morale even though the effect they have on the Tobin's Q is not significant. The practices of governance, however, are statistically insignificant in all the measures considered, indicating that the reforms in the board structure or disclosure practices did not bring any measurable financial or operations benefits during the observed time.

Collectively, these findings shed some light on a trade-off between the cost burden of ESG and its potential payoff. Managers ought to realize that compliance on the environment can reduce short run returns, but investments in social programs can produce immediate productivity and profits. As a result, investors and policymakers are advised not to use aggregate ESG scores in isolation and, instead, the contribution of each dimension should be assessed.

	(1)	(2)	(3)
	ROA	TobinQ_A	Employeeproductivity
ESGRating	-0.000352**	-0.00950***	-896.8
	(-2.23)	(-3.25)	(-0.54)
Size	0.0308***	-1.395***	519311.0***
	(6.87)	(-13.60)	(8.17)
Age	-0.0129***	-0.0563	-137613.6***
	(-2.81)	(-1.21)	(-3.67)
Leverage	-0.147***	1.037***	-163786.4
	(-10.69)	(4.57)	(-1.33)
OperatingRevenueGrowth	0.00909***	0.00892	-61624.5*
	(4.10)	(0.25)	(-1.88)
OperatingNetCashFlowRatio	0.124***	0.521***	734491.0***
	(16.35)	(4.63)	(8.24)
CapextoTotalAssetsRatio	-0.0108	2.035***	-1034487.9***
	(-0.47)	(4.64)	(-3.59)
IndDirectorRatio	-0.00309	0.0910	51468.5
	(-0.14)	(0.27)	(0.22)
CashAssetsRatio	-0.0201*	0.0920	50088.2
	(-1.76)	(0.39)	(0.42)
ConcentrationofOwnership	0.0293	-0.554	311071.8
	(1.61)	(-1.36)	(1.53)
FixedAssetRatio	-0.111***	-0.618**	-686582.6***
	(-7.16)	(-2.08)	(-3.88)
_cons	-0.416***	34.60***	-8506531.9***
	(-3.70)	(14.12)	(-5.89)
Control	Yes	Yes	Yes
Company	Yes	Yes	Yes
Year	Yes	Yes	Yes
N	6872	6872	6872
F	45.127***	20.288***	14.282***
p	0.000	0.000	0.000
r2	0.741	0.825	0.931
r2_a	0.653	0.766	0.907

t statistics in parentheses

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

Regression results show that aggregate ESG scores have a negative correlation with both the

return on assets and the Tobin's Q, which implies that in the short term ESG initiatives create cost liabilities that outweigh their efficiency benefits. The resultant outcome highlights the direct compliance and governance spending of the capital-intensive industries in China. However, the impact of ESG on employee productivity is not statistically significant,

indicating that employee productivity is not affected by ESG engagement in the short run to a large extent. The control variables are as expected whereby firm size and cash flow have a positive impact on performance, and leverage and fixed asset ratios have a negative impact.

Table 5: ESG→ Financial And Non-Financial Performance.

	(1)	(2)	(3)
	ROA	TobinQ_A	Employeeproductivity
Environmental	-0.000355*** (-2.99)	-0.0127*** (-5.01)	-3029.3** (-2.43)
Social	0.000300** (2.38)	0.00278 (1.25)	3500.2** (2.46)
Governance	-0.0000375 (-0.25)	0.00252 (0.92)	95.05 (0.06)
Size	0.0316*** (7.03)	-1.367*** (-13.50)	526460.9*** (8.34)
Age	-0.0124*** (-2.69)	-0.0510 (-1.14)	-133411.5*** (-3.60)
Leverage	-0.149*** (-10.72)	1.016*** (4.48)	-175354.9 (-1.42)
OperatingRevenueGrowth	0.00912*** (4.12)	0.00517 (0.15)	-60917.3* (-1.86)
OperatingNetCashFlowRatio	0.124*** (16.40)	0.524*** (4.67)	734666.3*** (8.28)
CapextoTotalAssetsRatio	-0.0118 (-0.51)	1.968*** (4.54)	-1043819.7*** (-3.65)
IndDirectorRatio	-0.00426 (-0.20)	0.0658 (0.20)	39832.2 (0.17)
CashAssetsRatio	-0.0201* (-1.77)	0.0854 (0.36)	48337.7 (0.40)
ConcentrationofOwnership	0.0296* (1.65)	-0.503 (-1.24)	306157.0 (1.52)
FixedAssetRatio	-0.110*** (-7.09)	-0.576* (-1.95)	-669765.1*** (-3.80)
_cons	-0.464*** (-4.19)	33.60*** (13.93)	-8861101.6*** (-6.25)
Control	Yes	Yes	Yes
Company	Yes	Yes	Yes
Year	Yes	Yes	Yes
N	6872	6872	6872
F	38.715***	18.694***	11.859***
p	0.000	0.000	0.000
r2	0.741	0.825	0.931
r2_a	0.653	0.767	0.908

t statistics in parentheses
* p < 0.1, ** p < 0.05, *** p < 0.01.

Table 6 E,S,G→ Financial And Non-Financial Performance.

Breaking down of ESG into its parts brings about more specific results. All investigated outcomes show a negative correlation in all environmental practices, which proves that pollution reduction, energy-saving activities, and compliance costs are used to reduce profitability, valuation and productivity. In contrast, social practices increase the value of assets and employee efficiency, indicating

the benefits that are borne by workplace safety programs, employee training schemes, and welfare programs; however, their impact on the value of Tobin's Q is not statistically significant, which indicates the potential that the capital markets underestimate these social investments. Governance practices, though, do not show any statistically significant impacts on any outcome, suggesting that board reforms and disclosure efforts might take a long temporal horizon before being translated into a quantifiable financial or operational benefit.

5.3.2. Mediating Role Of Brand Image In ESG Overall And Financial Performance

Based on the regression findings in Tables 7-10, brand image has a statistically significant negative relationship with overall ESG performance (-0.000151^{**}), which means that ESG practices did not positively affect brand image but, instead, had a negative impact. On the other hand, the brand image presents a strong positive impact on the financial performance as reflected by returns on assets (ROA = 0.438^{***}), and the Tobin's Q (2.730^{**}). These results prove the hypotheses H3 and H4 all together.

Regarding the mediation effects, the ROA model indicates that the overall impact of ESG on financial performance is quite negative ($c = -0.000352^{**}$). Once brand image is included as a mediating variable, the direct effect is negative but its value is smaller ($c' = -0.000286^*$), whereas the bootstrap indirect effect is also negative ($a \times b = -0.000066^{**}$), which means that brand image partially mediates the relationship between ESG and ROA. The same pattern appears in the Tobin's Q model; the total effect is negative and significant ($c = -0.00950^{***}$) and the direct effect is negative but attenuated when the brand image is controlled ($c = -0.00908^{***}$) and the indirect effect is again significantly negative ($a \times b = -0.000413^{**}$). These findings confirm a partial mediation model, thus confirming hypothesis H5 in the two financial performance indices.

Based on the analysis of the mediation, the ESG ratings have a negative impact on brand image which subsequently produces a significant positive impact on ROA. The correlation between the indirect pathway is statistically significant, which means that a part of the negative effect of ESG on profitability is alleviated by the positive effect mediated by brand image. However, the overall net impact is still negative, which highlights the point that, despite the fact that ESG practices can strengthen corporate reputation, the short-term fiscal consequences of ESG practices outweigh the reputation gains in the short term.

The mediation analysis proves that ESG ratings lower the Tobin's Q both directly and indirectly. Though better brand image has a strong positive impact on market valuation, the intermediary effect is negative since the original impact of ESG on brand image is negative. This is an indication that investors are yet to internalize the ESG initiatives by firms as value-adding, even when they can support brand reputation. Bootstrap tests support the strength of this negative mediation, which supports the finding that ESG spending is viewed as a short-term expense and not a long-term strategic resource.

5.3.3. Mediating Role Of Brand Image In ESG Individual And Financial Performance

The regression results in Tables 11-14 first test hypotheses H3a-H3c regarding the relationship between ESG dimensions and brand image. Along path a, environmental practices exert a significant positive effect on brand image ($\gamma_1 = 0.000095^*$), consistent with the expectation of H3a. By contrast, social practices and governance practices show significant negative effects ($\gamma_2 = -0.000156^{***}$, $\gamma_3 = -0.000154^{**}$). Although negative, these results are still aligned with the predictions of H3b and H3c. Further testing of H4 reveals that brand image consistently exerts a significant positive effect in both financial performance models. The coefficient is 0.447^{***} for ROA and 2.919^{***} for Tobin's Q. The bootstrap resampling with 5,000 iterations confirms these findings, supporting the hypothesis that a strong brand image enhances financial performance.

The mediation analysis of H5a-c reveals the complex mechanisms through which ESG dimensions influence financial performance via brand image. For environmental practices, the ROA model shows a significantly negative total effect ($c = -0.000355^{***}$). After controlling for brand image, the direct effect becomes even more negative ($c' = -0.000398^{***}$), while the bootstrap test indicates a significant positive indirect effect ($a \times b = 0.000042^*$). A similar pattern is observed in the Tobin's Q model ($c = -0.0127^{***}$, $c' = -0.0130^{***}$; $a \times b = 0.000277^*$). These results suggest that the negative direct effect of environmental practices coexists with a positive indirect effect through brand image, forming a suppression mediation. Hence, the mediation hypothesis for environmental practices is supported (H5a supported).

In the path analysis of social practices, the ROA model shows a significantly positive total effect ($c = 0.000300^{**}$). After including brand image, the direct effect becomes stronger ($c' = 0.000370^{***}$), while the indirect effect is significantly negative ($a \times b = -0.000070^{***}$), constituting a typical suppression mediation. In the Tobin's Q model, both the total and direct effects are insignificant, yet the indirect effect remains significantly negative ($a \times b = -0.000456^{**}$), indicating an indirect-only mediation. Thus, the mediation hypothesis for social practices is supported (H5b supported).

For governance practices, both the ROA and Tobin's Q models show insignificant total and direct effects. However, the bootstrap results reveal consistently negative indirect effects (ROA: $a \times b = -0.000069^{**}$; TQ: $a \times b = -0.000450^{**}$). This indicates that brand image serves as a significant negative

transmission channel between governance practices and financial performance, representing an indirect-only mediation. Therefore, the mediation hypothesis for governance practices is also supported (H5c supported).

The mediation analysis of environmental, social, and governance practices offers nuanced insights into how brand image channels ESG's effects on financial outcomes. Environmental practices show a suppression effect: while they directly harm ROA and Tobin's Q due to high compliance and investment costs, they indirectly enhance both outcomes by improving brand image. This indicates that environmental actions are costly in the short run but provide reputational benefits that partially offset the negative direct impact. In contrast, social practices yield positive direct effects on ROA and Tobin's Q, but their indirect effects through brand image are negative, suggesting that markets and external stakeholders may undervalue social spending. Governance practices show no significant direct effects but exhibit small negative mediation through brand image, implying that governance reforms may not yet translate into visible reputational or financial gains within the short horizon of this study.

The bootstrap tests reinforce these patterns: the indirect effect of environmental practices is weakly positive, social practices are negatively mediated, and governance practices also show negative mediation. Collectively, these findings highlight the heterogeneous roles of ESG dimensions: environmental efforts face a cost benefit paradox, social initiatives are beneficial internally but overlooked externally, and governance outcomes are slow to materialize. For managers, this suggests the need to strategically communicate ESG activities to stakeholders, ensuring that both environmental and social initiatives are appropriately recognized in the marketplace.

To ensure robustness, the analysis substitutes HuaZheng ESG scores with Wind ESG ratings. The results remain consistent in both overall and dimension specific models: ESG overall continues to show negative associations with ROA and Tobin's Q, and environmental practices remain detrimental across outcomes. Social practices retain their positive effect on ROA and productivity, while governance remains insignificant. The stability of signs and significance levels across rating systems confirms that the findings are not an artifact of measurement but reflect genuine patterns in the data.

These robustness results strengthen confidence in the study's conclusions. Specifically, they underscore

that the short-term penalties of ESG adoption in capital-intensive industries are systematic rather than rating specific, while also affirming that only social practices deliver immediate efficiency and profitability gains. For policymakers, this consistency highlights the urgency of designing incentives or supportive regulations that can help firms bear the upfront costs of environmental investments until reputational and long-term payoffs are realized.

6. DISCUSSION

The findings of this study reveal a consistent short-term penalty of ESG practices on firm performance. Both ROA and Tobin's Q decline with higher ESG scores (-0.000352^{**} and -0.00950^{***} , respectively), while no significant effect is observed on employee productivity. When ESG is disaggregated, environmental practices exert the most detrimental effects, significantly reducing ROA (-0.000355^{***}), Tobin's Q (-0.0127^{***}), and productivity (-3029.3^{**}). By contrast, social practices contribute positively to ROA (0.000300^{**}) and productivity (3500.2^{**}), though their impact on Tobin's Q is statistically insignificant. Governance practices remain consistently insignificant across all models. These results highlight a divergence between internal operational outcomes and external market valuation: while social initiatives strengthen efficiency and profitability, capital markets continue to discount ESG engagement as a cost burden rather than a value-creating activity.

The mediation analysis further confirms this paradox. Brand image, although positively linked to ROA (0.438^{***}) and Tobin's Q (2.730^{***}), is negatively influenced by ESG (-0.000151^{**}). This produces significant negative indirect effects on both ROA ($a \times b = -0.000066^{**}$) and Tobin's Q ($a \times b = -0.000413^{**}$). At the dimension level, environmental practices display a suppression effect: despite direct negative impacts, they indirectly enhance performance through brand image ($a \times b = 0.000042^{*}$ for ROA, 0.000277^{*} for Tobin's Q). In contrast, social and governance practices show negative indirect effects via brand image, suggesting that stakeholders may undervalue social spending and governance reforms in the short term. These patterns were robust when ESG scores were replaced with the Wind database, confirming that the findings are systematic rather than dependent on a single rating source.

The negative short-term association of environmental practices aligns with earlier evidence that pollution control and compliance increase operating costs in emerging markets (Zhang *et al.*, 2022). However, the suppression effect where

environmental practices indirectly improve performance via brand image was less expected, underscoring the reputational value of visible green actions. Similarly, the insignificant role of governance contradicts prior Western-focused studies (Dhaliwal et al., 2019) that found governance reforms enhance investor confidence. This divergence may reflect contextual differences in China's regulatory environment, where governance reforms remain compliance-oriented rather than strategically transformative.

The results broadly support studies that highlight ESG's heterogeneous impacts. In line with Chen et al. (2023), social practices in this study yield immediate operational benefits, reinforcing the idea that employee welfare and safety enhance productivity. By contrast, the persistent market undervaluation of ESG investments echoes findings by Li and Wang (2022), who argue that Chinese capital markets penalize ESG initiatives due to limited disclosure quality and high uncertainty around long-term payoffs.

The findings can be explained by the dual nature of ESG investments. In capital-intensive industries, upfront costs of environmental and governance practices are high, while measurable financial benefits are delayed. Social initiatives, however, provide direct gains by improving workforce morale and efficiency. The mediation patterns suggest that even when ESG enhances reputation, these reputational benefits are not yet sufficiently strong to counterbalance cost perceptions in the short run.

This study has several limitations. First, the four-year horizon (2020–2023) may be too short to capture the delayed payoffs of ESG, particularly for governance reforms and green technology investments. Second, the reliance on secondary ESG ratings (HuaZheng, Wind) introduces potential measurement bias, although robustness checks mitigate this concern. Third, the study focuses on listed firms in manufacturing, construction, and transportation, limiting generalizability to other sectors such as services or technology. Finally, the mediation model captures only brand image as a channel; other mediators, such as stakeholder trust or regulatory compliance, were not included.

Nevertheless, despite the limitations mentioned above, the current results can be generalized to other developing economies that have similar industrial structure and regulatory frameworks. The negative effects of implementing ESG in the short term will be felt across the capital-intensive industries of the world, but the positive impact of socially oriented practices seems to be universal due to its direct

impact on employee welfare. However, the results of governance probably vary significantly depending on the differences in the institutional maturity and the strength of investor-protection systems in different jurisdictions.

5.4.1. Long-Term ESG Benefits: From Penalty To Potential

The results highlight short term cost implications, but a growing body of evidence has shown that there are huge long term dividend returns to ESG adoption. Recent studies (e.g., Sun and Xu, 2023; He et al., 2024; Liu et al., 2025) also highlight the idea that ESG investments increase resilience during the crisis by strengthening the stability of the supply chain and reducing the risk of regulation. As an example, companies with better environmental and governance ratings had less severe disruptions during the COVID-19 pandemic (Sun and Xu, 2023). In the same way, the companies focused on ESGs show a higher level of innovation mostly in the field of green technologies and energy-saving, which enhances the competitive advantage in international markets (He et al., 2024). In addition, long-term ESG involvement builds the reputation capital thus creating trust in the consumer and brand loyalty (Liu et al., 2025).

All these understanding put ESG as a short-term penalty with a long-term potential. Environmental compliance and governance reforms will impose an initial financial cost upon profitability, but in the long run, these investments will foster resilience, novelty, and reputational benefits that will position the companies to succeed in the long term. To policy makers and managers, the implication is clear, using subsidies, tax breaks or disclosure systems to assist firms in the expensive transition phase can unlock the long-term value of ESG to firms and to society.

6. CONCLUSIONS AND SUGGESTIONS

The current research is based on the data analysis of 1, 718 publicly listed companies in the manufacturing, construction, and transportation industries in China between the year 2020 and 2023. The initial question that it explores is whether the overall Environmental, Social and Governance (ESG) practices and their respective dimensions are related to financial and non-financial performance. Second, it is based on the stakeholder theory and resource-based view as it tests the mediating role of brand image between the relationship between ESG practices and financial performance.

Empirical evidence shows that aggregate ESG scores are strongly and negatively linked with

financial performance in both the Return on Assets (ROA) model and the Tobin's Q, but not with regard to employee productivity. These findings indicate that in the capital-intensive and highly regulated manufacturing, construction, and transportation sectors, ESG initiatives only cause short-term cost liabilities throughout the sample period and their projected returns have not been realized in measurable performance improvement.

Dimensional level analysis shows that environmental practices have a strong negative relationship with all the three outcome variables, which are the short-term financial and efficiency strains related to environmental governance and technological upgrading. Social practices are, in turn, related to substantial positive changes in ROA and staff productivity, but insignificant in terms of the Tobin's Q, which means that these programs enhance internal efficiency and performance on the basis of accounting, but are not yet fully appreciated by capital markets. Although they have positive coefficients, governance practices are not statistically significant in all the models, indicating that the financial or productivity benefits, which were achieved by improving governance mechanisms within the sample period, were not stable.

In turn, the usage of aggregate ESG measures can therefore hide significant dimension-specific differences, and deny firms clear prioritization in action. The dominance of short-term cost impact of environmental and governance practices explains why there is a negative total relationship between ESG and financial performance, and the positive impact of social practices is only seen in the dimension-specific analysis.

Further mediation analysis shows that overall ESG performance and brand image have a significant negative relationship, but brand image has a significant positive relationship with financial performance. In line with the Baron and Kenny model, the direct impact of ESG on the financial performance is negative and becomes muted when brand image is added. Bootstrap resampling does verify that the indirect effect of ESG in brand image is negative and significant. These outcomes suggest that in both ROA and the Tobin's Q, brand image acts as a partial mediator between ESG and financial performance; that is, the overall ESG performance does not positively affect brand image, but reputational capital already held by a firm to some extent cushions markets against skepticism and financial strain, related to ESG activities.

The patterns of mediation effects on the ESG dimensions are different. On environmental

practices, there is a suppression effect of both ROA and the Tobin's Q, whereby the direct effect of environmental investment is negative, but the indirect effect is positive, indicating that the environmental investment has a short-term financial cost, and at the same time, the investment has reputational benefits through brand image. The social practices in the ROA model show the suppression effect and in the Tobin's Q, the indirect effect is significant and direct effect and total effects are insignificant implying that in the capital market, the effect of social practices is passed on through the negative reputational channel. In both models, governance practices have indirect-only mediation with very negative indirect effects, which means that in the sample period, the governance improvements were more apt to be viewed externally as indicators of tight profit margins, thus reducing financial performance via the brand image channel.

Even though this research provides a systematic examination of the nexus between ESG practice and corporate performance in the Chinese manufacturing, construction, and transportation industries, there are still a number of limitations. The sample is limited to 2020-2023, and the results primarily represent short-term impacts in the presence of a pandemic shock and a rapid change in regulations; hence, one should be cautious when extrapolating such results to the long-term. Second, the authors consider only capital-time and highly regulated industries, where environmental and governance expenses are more prominent and may enhance the adverse impact of ESG on performance; the mechanisms may vary in service-based industries and technology-based industries. Lastly, the mediation analysis only concentrates on the brand image, as ESG can affect the performance in other ways. Future studies should thus build on the model specification and further the identification of other mechanisms.

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Appendix A

Variable	Measurement
Independent Variable	
ESG	According to ESG rating "C-AAA", 9 grade ratings are assigned 0-100
Environmental	According to ESG rating "C-AAA", 9 grade ratings are assigned 0-100
Social	According to ESG rating "C-AAA", 9 grade ratings are assigned 0-100
Governance	According to ESG rating "C-AAA", 9 grade ratings are assigned 0-100
Dependent Variable	
ROA	$\frac{\text{Net Income}}{\text{Total Assets}}$
Tobin's Q	$\frac{\text{Market Value of Assets}}{\text{Replacement of Capital}}$
Employee Productivity	$\frac{\text{Operating Revenue}}{\text{Total Number of Employees}}$
Control Variable	
Size	Natural logarithms of total assets
Age	Years of business operation
Leverage	$\frac{\text{Total debt}}{\text{Equity}}$
Operating Revenue Growth	$\frac{\text{Revenue}_t - \text{Revenue}_{t-1}}{\text{Revenue}_{t-1}}$
Operating Cash Flow Ratio	$\frac{\text{OperatingNetCashFlow}}{\text{CurrentLiability}}$
Capex to Total Assets Ratio	$\frac{\text{Capital Expenditure}}{\text{Total Assets}}$
Ind Director Ratio	$\frac{\text{Number of independent directors}}{\text{Board size}}$
Cash Assets Ratio	$\frac{\text{Cash and cash equivalents at the end of the period}}{\text{Total Assets}}$
Concentration of Ownership	Shareholding ratio of the top three shareholders
Fixed Asset Ratio	$\frac{\text{Net fixed assets}}{\text{Total Assets}}$
Mediating Variable	
Brand Image	$25\% \times \left(\frac{\text{Sales expenses}}{\text{OperatingRevenue}} \right) + 25\% \times \left(\frac{\text{R\&D Expenditure}}{\text{OperatingRevenue}} \right) + 25\% \times \left(\frac{\text{Firm Revenue}_t}{\text{Industry Revenue}_t} \right) + 25\% \times (\text{FirmGrossMargin}_t - \text{IndustryGrossMargin}_t)$

Appendix Table A1: Variable Measurement

Table 4

The values of variance inflation factors are given in Table 4. VIF is used to test the correlation between independent variables. Since the VIF value is less than 10, there is no multicollinearity between the explanatory variables.

Table6:

Variable	VIF	1/VIF
Size	1.99	0.5033
ESGRating	1.88	0.5313
Leverage	1.76	0.5669
Governance	1.51	0.6629
FixedAssetRatio	1.54	0.6494
Environmental	1.51	0.6622
Age	1.50	0.6669
Social	1.43	0.6974
OperatingNetCashFlowRatio	1.40	0.7143
CashAssetsRatio	1.29	0.7728
BrandImage	1.27	0.7857
CapextoTotalAssetsRatio	1.25	0.7983
ConcentrationofOwnership	1.17	0.8570
OperatingRevenueGrowth	1.04	0.9570
IndDirectorRatio	1.02	0.9791
Mean VIF	1.44	

	(1)	(2)	(3)
	ROA	BrandImage	ROA
ESGRating	- 0.000352**	-0.000151**	-0.000286*
	(-2.23)	(-2.26)	(-1.85)
BrandImage			0.438***
			(7.35)
Size	0.0308***	0.00248	0.0298***
	(6.87)	(1.38)	(6.74)
Age	-0.0129***	0.00329	-0.0143***
	(-2.81)	(1.47)	(-2.85)
Leverage	-0.147***	-0.0290***	-0.135***
	(-10.69)	(-5.44)	(-9.83)
OperatingRevenueGrowth	0.00909***	-0.000396	0.00926***
	(4.10)	(-0.39)	(4.13)
OperatingNetCashFlowRatio	0.124***	0.0206***	0.115***
	(16.35)	(6.15)	(15.37)
CapextoTotalAssetsRatio	-0.0108	0.0186*	-0.0190
	(-0.47)	(1.74)	(-0.87)
IndDirectorRatio	-0.00309	0.0150*	-0.00968
	(-0.14)	(1.80)	(-0.46)
CashAssetsRatio	-0.0201*	0.00103	-0.0206*
	(-1.76)	(0.22)	(-1.83)
ConcentrationofOwnership	0.0293	0.0250***	0.0183
	(1.61)	(3.18)	(1.03)
FixedAssetRatio	-0.111***	-0.0153**	-0.105***
	(-7.16)	(-2.12)	(-7.03)
_cons	-0.416***	-0.0416	-0.398***
	(-3.70)	(-0.86)	(-3.53)
Company	Yes	Yes	Yes
Year	Yes	Yes	Yes
N	6872	6872	6872
F	45.13	7.78	50.60
p	0.000	0.000	0.000
r2	0.741	0.949	0.749

t statistics in parentheses
* p < 0.1, ** p < 0.05, *** p < 0.01.

Table 7: Mediating Role of Brand Image (ESG,ROA)

	(1)	(2)	(3)
	TobinQ_A	BrandImage	TobinQ_A
ESGRating	-0.00950***	-0.000151**	-0.00908***
	(-3.25)	(-2.26)	(-3.11)
BrandImage			2.730***
			(4.06)
Size	-1.395***	0.00248	-1.401***
	(-13.60)	(1.38)	(-13.68)
Age	-0.0563	0.00329	-0.0653
	(-1.21)	(1.47)	(-1.39)
Leverage	1.037***	-0.0290***	1.116***
	(4.57)	(-5.44)	(4.90)
OperatingRevenueGrowth	0.00892	-0.000396	0.0100
	(0.25)	(-0.39)	(0.28)
OperatingNetCashFlowRatio	0.521***	0.0206***	0.465***
	(4.63)	(6.15)	(4.05)
CapextoTotalAssetsRatio	2.035***	0.0186*	1.984***
	(4.64)	(1.74)	(4.54)
IndDirectorRatio	0.0910	0.0150*	0.0499
	(0.27)	(1.80)	(0.15)
CashAssetsRatio	0.0920	0.00103	0.0892
	(0.39)	(0.22)	(0.38)
ConcentrationofOwnership	-0.554	0.0250***	-0.622
	(-1.36)	(3.18)	(-1.53)
FixedAssetRatio	-0.618**	-0.0153**	-0.576*
	(-2.08)	(-2.12)	(-1.95)

_cons	34.60*** (14.12)	-0.0416 (-0.86)	34.72*** (14.17)
Company	Yes	Yes	Yes
Year	Yes	Yes	Yes
N	6872	6872	6872
F	20.29	7.78	19.55
p	0.000	0.000	0.000
r2	0.825	0.949	0.825
t statistics in parentheses * p < 0.1, ** p < 0.05, *** p < 0.01			

Table 8: Mediating Role of Brand Image (ESG, Tobin's Q).

	(1)	(2)
	b	se
Indirect	-0.000066**	0.000031
a	-0.000151**	0.000067
b	0.437765***	0.058939
Obs	6872	
* p < 0.1, ** p < 0.05, *** p < 0.01		

Table 9: Bootstrap Mediation Results (ESG ,ROA)

	(1)	(2)
	b	se
Indirect	-0.000413**	0.000207
a	-0.000151**	0.000067
b	2.729689***	0.675531
Obs	6872	
* p < 0.1, ** p < 0.05, *** p < 0.01		

Table 10: Bootstrap Mediation Results (ESG Tobin's Q).

	(1)	(2)	(3)
	ROA	BrandImage	ROA
Environmental	-0.000355*** (-2.99)	0.0000950* (1.76)	-0.000398*** (-3.46)
Social	0.000300** (2.38)	-0.000156*** (-2.98)	0.000370*** (3.00)
Governance	-0.0000375 (-0.25)	-0.000154** (-2.41)	0.0000314 (0.21)
BrandImage			0.447*** (7.50)
Size	0.0316*** (7.03)	0.00231 (1.27)	0.0306*** (6.94)
Age	-0.0124*** (-2.69)	0.00321 (1.39)	-0.0138*** (-2.72)
Leverage	-0.149*** (-10.72)	-0.0294*** (-5.50)	-0.136*** (-9.85)
OperatingRevenueGrowth	0.00912*** (4.12)	-0.000405 (-0.40)	0.00930*** (4.16)
OperatingNetCashFlowRatio	0.124*** (16.40)	0.0203*** (6.03)	0.115*** (15.40)
CapextoTotalAssetsRatio	-0.0118 (-0.51)	0.0198* (1.84)	-0.0207 (-0.95)
IndDirectorRatio	-0.00426 (-0.20)	0.0158* (1.89)	-0.0113 (-0.54)
CashAssetsRatio	-0.0201* (-1.77)	0.00154 (0.33)	-0.0208* (-1.87)
ConcentrationofOwnership	0.0296* (1.65)	0.0251*** (3.19)	0.0184 (1.05)
FixedAssetRatio	-0.110*** (-7.09)	-0.0158** (-2.19)	-0.103*** (-6.94)
_cons	-0.464*** (-4.19)	-0.0298 (-0.61)	-0.450*** (-4.05)
Company	Yes	Yes	Yes
Year	Yes	Yes	Yes
N	6872	6872	6872

F	38.72	8.34	44.43
p	0.000	0.000	0.000
r2	0.741	0.949	0.749
t statistics in parentheses * p < 0.1, ** p < 0.05, *** p < 0.01			

Table 11: Mediating Role of Brand Image (E,S,G,ROA).

	(1)	(2)	(3)
	TobinQ_A	BrandImage	TobinQ_A
Environmental	-0.0127*** (-5.01)	0.0000950* (1.76)	-0.0130*** (-5.11)
Social	0.00278 (1.25)	-0.000156*** (-2.98)	0.00324 (1.46)
Governance	0.00252 (0.92)	-0.000154** (-2.41)	0.00297 (1.09)
BrandImage			2.919*** (4.35)
Size	-1.367*** (-13.50)	0.00231 (1.27)	-1.374*** (-13.57)
Age	-0.0510 (-1.14)	0.00321 (1.39)	-0.0603 (-1.32)
Leverage	1.016*** (4.48)	-0.0294*** (-5.50)	1.102*** (4.84)
OperatingRevenueGrowth	0.00517 (0.15)	-0.000405 (-0.40)	0.00635 (0.18)
OperatingNetCashFlowRatio	0.524*** (4.67)	0.0203*** (6.03)	0.465*** (4.05)
CapextoTotalAssetsRatio	1.968*** (4.54)	0.0198* (1.84)	1.911*** (4.42)
IndDirectorRatio	0.0658 (0.20)	0.0158* (1.89)	0.0196 (0.06)
CashAssetsRatio	0.0854 (0.36)	0.00154 (0.33)	0.0809 (0.35)
ConcentrationofOwnership	-0.503 (-1.24)	0.0251*** (3.19)	-0.576 (-1.42)
FixedAssetRatio	-0.576* (-1.95)	-0.0158** (-2.19)	-0.530* (-1.80)
_cons	33.60*** (13.93)	-0.0298 (-0.61)	33.69*** (13.96)
Company	Yes	Yes	Yes
Year	Yes	Yes	Yes
N	6872	6872	6872
F	18.69	8.34	18.25
p	0.000	0.000	0.000
r2	0.825	0.949	0.826
t statistics in parentheses * p < 0.1, ** p < 0.05, *** p < 0.01			

Table 12: Mediating Role of Brand Image (E,S,G,Tobin's Q)

	(1)	
	b	se
Indirect_E	0.000042*	0.000024
Indirect_S	-0.000070***	0.000025
Indirect_G	-0.000069**	0.000030
a_E	0.000095*	0.000053
a_S	-0.000156***	0.000052
a_G	-0.000154**	0.000064
b	0.446853***	0.058872
Obs	6872	
* p < 0.1, ** p < 0.05, *** p < 0.01		

Table 13: Bootstrap Mediation Results (E,S,G,ROA)

	(1)	
	b	se
Indirect_E	0.000277	0.000174

Indirect_S	-0.000456**	0.000183
Indirect_G	-0.000450**	0.000214
a_E	0.000095*	0.000053
a_S	-0.000156***	0.000052
a_G	-0.000154**	0.000064
b	2.919023***	0.672922
Obs	6872	

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

Table 14: Bootstrap Mediation Results (E,S,G ,Tobin's Q) Robustness Tests

For robustness checks, this study adopts a one-variable-at-a-time replacement strategy, keeping the overall model structure and control variables unchanged while substituting only the core independent variable. Given the potential differences across ESG rating systems in terms of scoring logic, coverage, and disclosure weights, the HuaZheng ESG composite score used in the main models is replaced with the ESG composite score provided by the Wind database. The empirical results reported in Tables 15 and 16 show no changes in the signs or significance levels of the parameters, thereby confirming the robustness of the findings.

	(1)	(2)	(3)
	ROA	TobinQ_A	Employeeproductivity
ESGRating	-0.00221*	-0.108***	7526.9
	(-1.83)	(-4.23)	(0.60)
Size	0.0317***	-1.412***	501507.8***
	(7.13)	(-13.60)	(7.88)
Age	-0.000488	-0.335***	-47069.8
	(-0.13)	(-4.68)	(-1.34)
Leverage	-0.148***	1.040***	-150811.9
	(-10.73)	(4.55)	(-1.20)
OperatingRevenueGrowth	0.00938***	0.00902	-62532.2*
	(4.20)	(0.25)	(-1.89)
OperatingNetCashFlowRatio	0.123***	0.524***	706812.3***
	(16.09)	(4.62)	(8.31)
CapextoTotalAssetsRatio	-0.0174	2.126***	-1065799.7***
	(-0.75)	(4.79)	(-3.64)
IndDirectorRatio	-0.0118	-0.0396	16766.8
	(-0.56)	(-0.12)	(0.07)
CashAssetsRatio	-0.0250**	0.142	43098.6
	(-2.27)	(0.60)	(0.35)
ConcentrationofOwnership	0.0320*	-0.447	330377.0
	(1.77)	(-1.09)	(1.62)
FixedAssetRatio	-0.113***	-0.601**	-695973.0***
	(-7.42)	(-1.98)	(-3.87)
_cons	-0.592***	38.30***	-9288937.6***
	(-5.46)	(14.57)	(-6.44)
Control	Yes	Yes	Yes
Company	Yes	Yes	Yes
Year	Yes	Yes	Yes
N	6788	6788	6788
F	43.414***	21.383***	13.463***
p	0.000	0.000	0.000
r2	0.741	0.827	0.932
r2_a	0.654	0.769	0.909

t statistics in parentheses
* p < 0.1, ** p < 0.05, *** p < 0.01

Table 15: Robustness Check (ESG)

	(1)	(2)	(3)
	ROA	TobinQ_A	Employeeproductivity
Environmental	-0.00118**	-0.0504***	-7059.0**
	(-2.49)	(-4.68)	(-2.25)
Social	0.00000661**	0.000789	14897.7***
	(2.12)	(0.07)	(2.63)
Governance	-0.000405	0.0186	927.2
	(-0.50)	(1.27)	(0.11)
Size	0.0320***	-1.401***	503045.1***

	(7.19)	(-13.48)	(7.92)
Age	-0.000493	-0.335***	-45934.3
	(-0.13)	(-4.72)	(-1.30)
Leverage	-0.148***	1.036***	-149446.7
	(-10.72)	(4.53)	(-1.20)
OperatingRevenueGrowth	0.00940***	0.0103	-62547.2*
	(4.21)	(0.29)	(-1.89)
OperatingNetCashFlowRatio	0.122***	0.520***	706947.0***
	(16.10)	(4.58)	(8.35)
CapextoTotalAssetsRatio	-0.0173	2.130***	-1070053.9***
	(-0.74)	(4.82)	(-3.66)
IndDirectorRatio	-0.0116	-0.0315	23496.1
	(-0.55)	(-0.09)	(0.10)
CashAssetsRatio	-0.0255**	0.123	39566.5
	(-2.31)	(0.53)	(0.32)
ConcentrationofOwnership	0.0306*	-0.513	313687.9
	(1.69)	(-1.24)	(1.54)
FixedAssetRatio	-0.113***	-0.596**	-693669.9***
	(-7.43)	(-1.96)	(-3.86)
_cons	-0.607***	37.65***	-9271707.9***
	(-5.58)	(14.39)	(-6.44)
Control	Yes	Yes	Yes
Company	Yes	Yes	Yes
Year	Yes	Yes	Yes
N	6788	6788	6788
F	36.939***	18.795***	12.065***
p	0.000	0.000	0.000
r2	0.742	0.828	0.932
r2_a	0.654	0.769	0.909
t statistics in parentheses			
* p < 0.1, ** p < 0.05, *** p < 0.01			

Table 16 Robustness Check (E,S,G)