Linking ESG Disclosure to Firm Performance and Risk : An International Perspective

Smita Dayal [1]
Tarun Kumar Soni [2]
Ritika Aggarwal [3]
Roshni Hotwani [4]

Abstract

Purpose : The study investigated the relationship between a company's environmental, social, and governance (ESG) scores, performance, and risk for a cross-country sample across developed and emerging nations.

Methodology : The study employed a panel regression approach to assess the impact of a firm's ESG score on its performance (accounting and market) and risk. The data encompassed 1,973 firms across 17 developed and 14 emerging countries, ranging over 5 regions and 11 industries.

Findings : The results revealed a non-linear relationship between ESG scores and business performance, suggesting that ESG activities initially had a negative impact and eventually had positive long-term benefits. Furthermore, the strength of this relationship differed between developed and emerging economies. It indicated regional variances in ESG performance, with Europe and the Middle Eastern countries leading the way.

Practical Implications : The study emphasized the importance of considering country, industry, and regional factors while evaluating the impact of the ESG score. Expenditures on ESG activities could have a complex and dynamic influence on company performance, with differences observed across different contexts. Stakeholders need this information to understand how the ESG practices of organizations change over time and how they may affect their financial performance and risk. This may also have financial repercussions for creditors, regulatory bodies, and investors.

Originality : To the best of our knowledge, this is the first study to examine the impact of ESG on firm performance and risk at various levels, including country, industry, and region, in both developed and emerging economies.

Keywords : **environmental, social, and governance (ESG), panel regression, firm performance, risk, developed economies, emerging economies, stakeholder theory, sustainability, Bloomberg**

JEL Classification Codes : C23, C33, G11, G32

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[1] *Assistant Professor,* Lal Bahadur Shastri Institute of Management, 11/07 Dwarka Sector 11, New Delhi - 110 075. (Email : smitadayal@lbsim.ac.in) ; ORCID iD : https://orcid.org/0000-0003-4429-1623
[2] *Associate Professor (Corresponding Author),* FORE School of Management, Adhitam Kendra, B 18, Qutab Institutional Area, New Delhi - 110 016. (Email : tarun.soni@fsm.ac.in) ; ORCID iD : https://orcid.org/0000-0002-8684-7864
[3] *Financial Analyst,* WIPRO, 480-481, Phase III, Udyog Vihar, Sector 20, Gurugram - 122 016, Haryana. (Email : R215ritikaaggarwal@gmail.com)
[4] *Assistant Manager,* Genpact, Sector 135, Noida - 201 304, Uttar Pradesh. (Email : hotwani.roshni@gmail.com)

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Over the years, the repercussions of global warming, carbon emissions, poor working environment, and corporate scandals have manifested not only financial losses but also reputational damage, regulatory penalties, and decreased consumer trust, significantly increasing stakeholder vigilance (Camfferman & Wielhouwer, 2019). Investors seek to invest money and effort in firms committed to their environmental, social, and governance (ESG) activities (Ali et al., 2020). The term "ESG" was used in 2004 in a landmark study titled "Who Cares Wins," which was initiated by the United Nations. It provides a framework for assessing the sustainability, governance, and societal impacts of a company's financial and operational performance (Kell, 2021). The environmental aspect of ESG assesses how a firm manages its impact on the natural environment, including the use of resources, carbon emissions, and waste-management practices. The social aspect focuses on a firm's internal and external relationships with all its stakeholders, such as employees, suppliers, customers, and society, including issues such as labor standards, human rights, diversity and inclusion, and community engagement. Governance issues investigate how a business is handled, including its leadership structure, board makeup, CEO compensation, and shareholder rights (Henisz et al., 2019).

The concept of ESG investment is derived from socially responsible investing (SRI), coined in the 1960s and the 1970s (Sparkes, 2006). SRI was primarily concerned with avoiding investment in companies engaged in activities deemed harmful to society, such as tobacco, alcohol, and weapons manufacturing (Louche & Hebb, 2014). However, ESG investing goes beyond the mere avoidance of firms engaged in harmful activities and focuses more on investing in companies that meet certain environmental, social, and governance criteria (Murphy & McGrath, 2013). Therefore, ESG practices help achieve goals such as the reduction of carbon emissions, sourcing ethically created materials, and wise management of water and energy usage (Ali et al., 2020). This monitoring is possible because of the large range of metrics recorded, gathered, and assessed in ESG reporting.

Furthermore, organizations can better adjust to changing socioeconomic and environmental problems with the aid of ESG-focused activities. Firms that prioritize ESG-related initiatives seem to have a favorable effect on investors' and other stakeholders' perceptions of them (Kalia & Aggarwal, 2023). Today, many institutional investors and asset managers have integrated ESG into their investment decisions. A growing body of evidence suggests that companies that prioritize ESG considerations tend to perform better financially over the long term (Chen et al., 2023; Matos, 2020). Earlier studies on ESG have specifically focused on either firm performance or risk at the country, regional, or industry levels (Garcia et al., 2017; Galbreath, 2013; Yoon et al., 2018). Thus, previous studies have provided a partial picture, as corporate finance theories advocate considering both risks and returns concurrently.

Similarly, the current study examines the relationship between a company's ESG rankings and its financial performance, as well as its risk using alternate measures. This study provides a more granular analysis to understand how ESG impacts an individual firm after controlling for industry, group of countries, and region. Furthermore, we compared the results for developed and emerging countries. This funnel-down approach will aid in understanding the impact of ESG activities at multiple levels and, therefore, provide a more comprehensive understanding of the subject.

Literature Review and Hypotheses Development

Shareholder value was initially defined as a focus on profit maximization, but today, the notion is developing to reflect the necessity for a business to act ethically and sustainably in order to preserve its position in the economy over the long term (Zumente & Bistrova, 2021). The shareholder primacy theory holds that ESG involvement is harmful to firm value as expenses on ESG can reduce profits for shareholders. In contrast, stakeholder-focused theory advocates the benefits of ESG practices and may improve economic value by focusing on all stakeholders associated with the organization, not only shareholders (Nguyen et al., 2022).

Friedman (1970) suggested that corporate management, acting as an agent, should conduct business in line with shareholders' aims to maximize wealth. In other words, businesses should not use their resources to engage in socially responsible or environmentally friendly activities because doing so will reduce profits for their shareholders (Peng & Isa, 2020). On the other hand, according to stakeholder theory, firms should focus on all their stakeholders (such as employees, society, suppliers, and customers); for instance, happy employees will be more satisfied and enthusiastic about their tasks ; satisfied customers will be loyal ; satisfied suppliers will bring long-term relationships ; and so on.

According to the stakeholder theory, ESG operations can be incorporated or combined to improve a company's success in the market. This helps improve a firm's reputation, financial performance, and sustainability (Peng & Isa, 2020). In this regard, corporations face the organizational paradox of business sustainability (Baumann-Pauly et al., 2016) as they need to find a balance between maximizing the economic benefits of shareholders and protecting the interests of society and other stakeholders (Peng & Isa, 2020).

Customers, workers, public-interest organizations, and government regulators have been more interested in how corporations do ESG. Consequently, businesses are becoming increasingly conscious of ESG concerns. Investors have been considering this information in light of its potential benefits and threats (Khan, 2019). Several studies indicate that the application of ESG and corporate social responsibility (CSR) policies may impact a company's ability to obtain financing. There are two reasons for this finding. First, implementing ESG/CSR practices may increase stakeholder participation, restrain top executives' narrow-mindedness and entrenched attitudes, and, thus, lower agency costs (Rau & Yu, 2024). Furthermore, research has shown that a company's ESG activities are closely related to its industry, management, and owner characteristics, as well as its risk, profitability, and valuation (Gillan et al., 2021; Whittington et al., 2022).

Several studies have unequivocally shown that businesses with excellent ESG performance outperform their industry peers financially and command greater market value. We have attempted to measure firm performance in two ways: market value and accounting measures. Empirical studies have found a favorable and significant association between firm performance and ESG (Ademi & Klungseth, 2022; Bansal et al., 2021; Bahadori et al., 2021; Khan, 2022; Maji & Lohia, 2023; Melinda & Wardhani, 2020). The research also shows that technological advancement and ESG have a more significant impact on firm performance and valuation (Rastogi & Singh, 2023). However, several research studies have demonstrated that we cannot generalize the idea that high ESG ratings have a beneficial impact on business performance and value because they differ across global markets, firms, and institutional frameworks due to varied legislative regimes, social circumstances, and stakeholders. In other industries, such as healthcare, the link benefits industrialized countries while harming emerging and developing countries (Kalia & Aggarwal, 2023). In the Indian energy sector, it is negative in the short run and positive in the long run (Behl et al., 2022). In accordance with prior studies and stakeholder theory, we believe that ESG activities positively impact firm performance. Thus, our first hypothesis is as follows :

↳ **H_1 :** The firm's ESG score has a positive impact on firm performance.

Studies have also included various control variables to avoid biased results and obtain the actual impact of ESG performance on firm performance and risk. The most commonly used control variables are firm size, leverage, and net sales growth. Large companies with high earnings and rapid sales growth have more resources to devote to social and environmental projects (Bhaskaran et al., 2020). High leverage helps a firm maintain management control, but it also entails interest and debt payments, which can diminish cash and, eventually, resources for ESG expenditures (Bhaskaran et al., 2020; Naeem et al., 2022).

Another aspect of research involves studying the impact of ESG practices on a firm's risk, for which various studies have shown a negative relationship between the two (Atif & Ali, 2021; Chairani & Siregar, 2021;

da Silva, 2022; Fafaliou et al., 2022; López Prol & Kim, 2022). There is a negative relationship between ESG reputational risk and market negativity. In other words, if firms do not cater to climate risk and externalities, they find it difficult to remain in the market (Fafaliou et al., 2022). ESG reporting and practices are positively associated with the Merton distance to default (DD) and negatively associated with the credit default swap (CD) spread, implying that greater ESG disclosure equates to lower default risk — that is, the lender's risk that the borrower will default on their debt obligations (Atif & Ali, 2021). The lower the risk of default, the larger the positive gap between company value and firm obligations. In other words, the higher the DD, the lower the default risk and, consequently, the stronger the firm's stability.

ESG disclosure reduces default risk by increasing profitability and decreasing performance variability and debt expenses (Atif & Ali, 2021). Investors are more concerned with downside risks than upside risks, which directly impacts the relationship between ESG scores and volatility. Therefore, there is a more significant and negative relationship between ESG scores and downside risk than between ESG scores and volatility, which includes both upside and downside risk (Reber et al., 2022). Sharpe ratios and ESG scores/ratings also have an inverse relationship because firms with high ESG expenditures have low volatility and even lower returns. However, this does not necessarily mean that companies with high ESG portfolios will have low Sharpe ratios, although this is a common trend (López Prol & Kim, 2022).

Moreover, a negative relationship exists between ESG and beta, that is, stock volatility and systematic risk (Ciciretti et al., 2023; Trinh et al., 2023). In accordance with prior studies, we believe that ESG activities negatively affect firm risk. Thus, our next hypothesis is as follows :

- **H_2 :** The ESG activity has a negative impact on firm risk.

Sustainability ecosystems differ between developed and emerging economies (Lozano & Martínez-Ferrero, 2022). Firms from developed and emerging economies must comply with various laws and regulations, and there is a huge difference between economic and sociopolitical conditions. Environmentally conscious companies' ESG performance is more widely acknowledged in affluent countries and has a stronger impact on their financial performance than that of organizations in emerging markets. This may be because corporations in developed countries have more advanced ESG strategies and operations, and their stakeholders and investors have more confidence and trust in their ESG performance (Naeem et al., 2022).

In emerging economies, up to 40% of GDP comes from formal small and medium enterprises, which will be much higher if informal sectors are included, but lack resources that hinder the adoption of green practices (Fahad et al., 2022; Wang et al., 2023). In both emerging and developed countries, board strength, including CSR committees, gender diversity, and board autonomy, improves ESG performance. Poor legal systems and institutional and dispersed ownership have a negative influence on ESG performance in emerging nations; whereas, institutional-level issues have no meaningful effect in industrialized countries. In emerging countries, institutional elements, such as legal systems, have the most influence on corporations, whereas in mature nations, the board of directors has the most influence (Lozano & Martínez-Ferrero, 2022). This could also be due to factors such as limited resources, weak regulatory frameworks, or a lack of infrastructure to support sustainable practices (da Silva, 2022; Makkar et al., 2023).

It has also been observed that crash risk has a negative impact on ESG disclosures, although this is not consistent across nations (da Silva, 2022; Feng et al., 2022). Firms in developed countries experience a reduction in crash risk when their ESG performance is disclosed, but this relationship is not statistically significant for firms in emerging and developing economies. Additionally, the effectiveness of ESG disclosures in reducing crash risk may vary depending on the type of disclosure. In particular, it was discovered that social disclosure had the greatest effect on crash risk in businesses located in less developed nations ; whereas, governance disclosure was

found to be more successful in lowering crash risk in developed countries (da Silva, 2022; Joshi, 2021). These stakeholders may demand greater social and environmental responsibility from companies as a condition for doing business with or investing in them. Compared with corporations in industrialized countries, developing countries may experience less public pressure to provide CSR information. Consequently, companies in developing countries may be more motivated to disclose CSR information (Ali et al., 2017; Santhi et al., 2023; Soni, 2023). In line with previous studies, we believe that ESG activities have different impacts on developed and emerging countries, and we formulate the third hypothesis of our study :

↳ **H_3 :** ESG activities have a different impact on firm performance in developed and emerging countries.

Additionally, it is evident from several previous studies that different sectors, such as manufacturing and services, have different sensitivities to environmental factors. Manufacturing companies are more sensitive to environmental actions than service industries (Maji & Lohia, 2023; Soni, 2023). This sensitivity can be further drilled down to the industry level, as ESG expenditure varies due to the costs and benefits involved with their specific industry characteristics (Gupta et al., 2022). Some industries, such as oil and gas companies or companies in the fields of chemical, mining, and metal manufacturing, have a direct impact on ESG issues; hence, they are more sensitive to the ESG activities undertaken by them (Cai et al., 2012; Garcia et al., 2017; Lin et al., 2015). We believe that ESG activities have different effects on different industries, and hence, we formulate our fourth hypothesis :

↳ **H_4 :** ESG activities have different impacts on firm performance across different industries.

Therefore, this study presents a more integrated model of how ESG impacts a firm's performance and risk at various levels — an individual firm, an industry, a group of countries in a particular region, and different economies divided into developed and emerging. This funnel-down technique is unique in itself because it allows a more comprehensive assessment of the subject at hand at several levels to understand how ESG impacts performance and risk on both ends of the spectrum.

Research Methodology

Variables

The dependent variables in this study are firm performance and risk. We evaluate company performance using ratios such as return on assets (ROA), return on equity (ROE), and the price-to-earnings (PE) ratio. ROA, ROE, and PE are accounting-based measures that offer insights into firm performance. We measured firm risk using financial leverage. The independent variable of the study is the ESG score, proxied by the ESG score given by the Bloomberg database. We incorporated additional variables for control purposes. These are sales growth, net income, Tobin's *Q*, Board gender diversity score, earnings before interest and tax (EBIT), and current market capitalization (see Table 1).

Table 1. *Variable Description*

Variables	Explanation
ROA	Return on assets measured as:
	(Profit after Tax/Average total assets) *100
ROE	Return on equity measured as:

	(Profit after Tax/Common equity) *100
PE	Price to Earnings measured as:
	The market price of a share/Earnings per share
ESG Score	Measures a company's commitment to sustainability and responsible business practices.
Sales Growth	Change in revenue over a fixed period measured as:
	[(Current period sales – Prior period sales)/Prior period sales] *100
Net Income	Net Income is measured as:
	Total Revenue – Total Expenses
Tobin's *Q*	Measures whether a firm is over or undervalued and is calculated as:
	Market Value/Total Assets
Board Gender Diversity	Measures the percentage of female directors on the company's board.
EBIT	Earnings before interest and tax are measured as follows:
	EBIT = Revenue – COGS – Operating Expenses.
Current Market Capitalization	Market capitalization is Measured as:
	Total no. of shares of firm * market price of the share.

Data Sources

The data for the dependent, independent, and control variables were gathered from Bloomberg, as shown in Table 1. The final sample included nations from both developed and emerging economies (17 developed and 14 emerging). This sample includes 1,973 enterprises, with 1,417 from developed economies and 556 from emerging ones. The dataset comprises 5 regions, 11 industries, and 31 indices.

Estimation Model

A panel regression analysis was used to examine the hypotheses. Using a multivariate regression framework, we examined the relationship between ESG activities and company performance using the fixed effects method and the relationship between ESG activities and firm risk using the random effects method. The regression models used in this investigation were developed and tweaked based on prior research by Kalia and Aggarwal (2023).

To test our first hypothesis, H_1, that is, that ESG activity has a positive impact on firm performance, we built the following model:

$$ROA_{it} = \beta_0 + \beta_1 ESGScore_{it} + \beta_2 ESGScore^2_{it} + \beta_3 ESG_{it}*Country_{it} + \beta_4 ESG_{it}*Industry_i + \beta_5 ESG_{it}*Type_i + \beta_6 ESG_{it}*Region_i + \beta_7 \text{Ln}(EBIT_{it}) + \beta_8 \text{Ln}(NetIncome_{it}) + \beta_9 \text{Ln}(MarketCapitalization_{it}) + \beta_{10} BoardGenderDiversityScore_{it} + \beta_{11} TD/TE + a_{it} + e_{it} \quad (1)$$

$$ROE_{it} = \beta_0 + \beta_1 ESGScore_{it} + \beta_2 ESGScore^2_{it} + \beta_3 ESG_{it}*Country_{it} + \beta_4 ESG_{it}*Industry_i + \beta_5 ESG_{it}*Type_i + \beta_6 ESG_{it}*Region_i + \beta_7 \text{Ln}(EBIT_{it}) + \beta_8 \text{Ln}(NetIncome_{it}) + \beta_9 \text{Ln}(MarketCapitalization_{it}) + \beta_{10} BoardGenderDiversityScore_{it} + \beta_{11} TD/TE + a_{it} + e_{it} \quad (2)$$

$$PE_{it} = \beta_0 + \beta_1 ESGScore_{it} + \beta_2 ESGScore^2_{it} + \beta_3 ESG_{it}*Country_{it} + \beta_4 ESG_{it}*Industry_i + \beta_5 ESG_{it}*Type_i + \beta_6 ESG_{it}*Region_i + \beta_7 \text{Ln}(EBIT_{it}) + \beta_8 \text{Ln}(NetIncome_{it}) + \beta_9 \text{Ln}(MarketCapitalization_{it}) + \beta_{10} BoardGenderDiversityScore_{it} + \beta_{11} TD/TE + a_{it} + e_{it} \quad (3)$$

Tobin's $Q_{it} = \beta_0 + \beta_1 ESGScore_{it} + \beta_2 ESGScore^2_{it} + \beta_3 ESG_{it}*Country_{it} + \beta_4 ESG_{it}*Industry_i + \beta_5 ESG_{it}*Type_i + \beta_6 ESG_{it}*Region_i + \beta_7 \text{Ln}(EBIT_{it}) + \beta_8 \text{Ln}(NetIncome_{it}) + \beta_9 \text{Ln}(MarketCapitalization_{it}) + \beta_{10} BoardGenderDiversityScore_{it} + \beta_{11} TD/TE + a_{it} + e_{it}$ (4)

In the Equations (1–4), dependent variables, such as ROA, ROE, PE ratio, and Tobin's *Q*, are indicators of financial performance.

Similarly, to test our other hypothesis, H_2, that is, ESG activity has a negative impact on firm risk, we build the following model:

$Financial\ Leverage_{it} = \beta_0 + \beta_1 ESGScore_{it} + \beta_2 ESGScore^2_{it} + \beta_3 ESG_{it}*Country_{it} + \beta_4 ESG_{it}*Industry_i + \beta_5 ESG_{it}*Type_i + \beta_6 ESG_{it}*Region_i + \beta_7 \text{Ln}(EBIT_{it}) + \beta_8 \text{Ln}(NetIncome_{it}) + \beta_9 \text{Ln}(MarketCapitalization_{it}) + \beta_{10} BoardGenderDiversityScore_{it} + \beta_{11} TD/TE + a_{it} + e_{it}$ (5)

Equation 5 shows the dependent variable, financial leverage (proxy of financial risk), and its relationship with the ESG score. In the above equation, we also test whether ESG activities have different impacts on firm risk in developed and emerging countries and whether ESG activities have different impacts on firm risk across different industries. We use β_3, β_4, β_5, and β_6 as coefficients to measure ESG interaction with country, industry, type, and region, respectively. a_{it} in Equations 1–5 represents a constant term representing firms' fixed effects at the entity level. e_{it} in Equations 1–5 represents the error term capturing the unexplained variation in the models.

Empirical Analysis and Results

Table 2 presents the descriptive statistics for the key variables used in this study. In the category of financial performance, the PE ratio has a mean of 54.99 and a standard deviation of 251.94. The ROA has an average of 5.21, while the ROE stands at 14.11 on average, signifying shareholder returns; both measures exhibit noteworthy

Table 2. ***Summary Statistics***

Variable	Mean	Std. Dev.	Min.	Max.
1. Financial Performance				
PE Ratio	54.99	251.94	0.01	11932.74
ROA	5.21	8.93	–78.90	252.02
ROE	14.11	40.86	–417.87	2409.86
Tobin's *Q* Ratio	2.04	2.35	0.21	72.01
2. Financial Risk				
Financial Leverage	4.99	20.28	0.90	1813.00
3. ESG Performance				
ESG Score	3.09	1.36	0.42	7.97
4. Control Variables				
Sales Growth	7.95	74.82	–183.17	7370.47
Total Debt to Equity	146.00	1719.99	0.00	183588.90
Board Gender Diversity	4.08	2.52	0.55	10.00
LN EBIT	22.53	2.57	13.80	31.71
LN Net Income	22.22	2.57	13.51	31.41
LN Market Cap	25.27	2.49	16.68	34.43

5. Indicator Variables				
ESG*Country	57.32	45.96	0.98	246.76
ESG*Industry	16.91	12.60	0.71	75.90
ESG*Type	3.83	1.92	0.48	13.74
ESG*Region	8.72	6.24	0.42	35.85

standard deviations. The Tobin's *Q* ratio shows a mean of 2.04. Financial leverage, as a measure of financial risk, has an average of 4.99, with a considerable standard deviation of 20.28, indicating different risk-taking abilities. In the case of ESG score, a minimum ESG score of 0.47 and a maximum of 7.97, with a mean score of 3.099, were observed. Sales growth, total debt to equity, board gender diversity score, natural logarithms of market capitalization, natural logarithms of earnings before tax, and natural logarithms of net income were taken as control variables for the study. All companies in the study experienced an average sales growth of 7.946, with the highest sales growth of 7370.47. The gender diversity score revealed variances in board composition, with an average score of 4.080. As the study was conducted at several levels, we evaluated the connection of ESG with country, industry (see Figure 1), area (see Figure 2), and countries (see Figure 3).

Figure 1. ***Comparison of Measures Across Industry Types over Time***

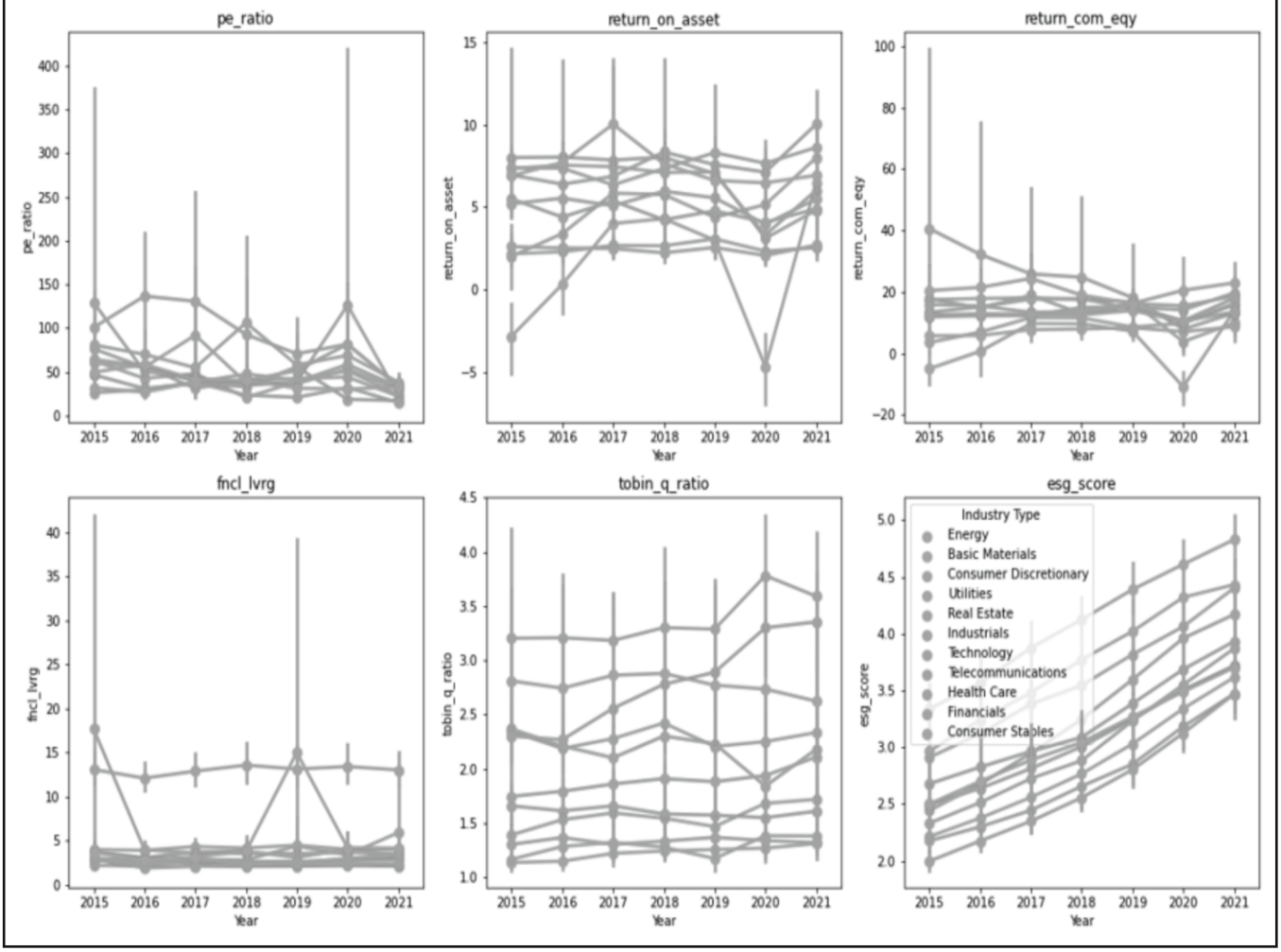

Figure 2. ***Comparison of Measures Across Regions over Time***

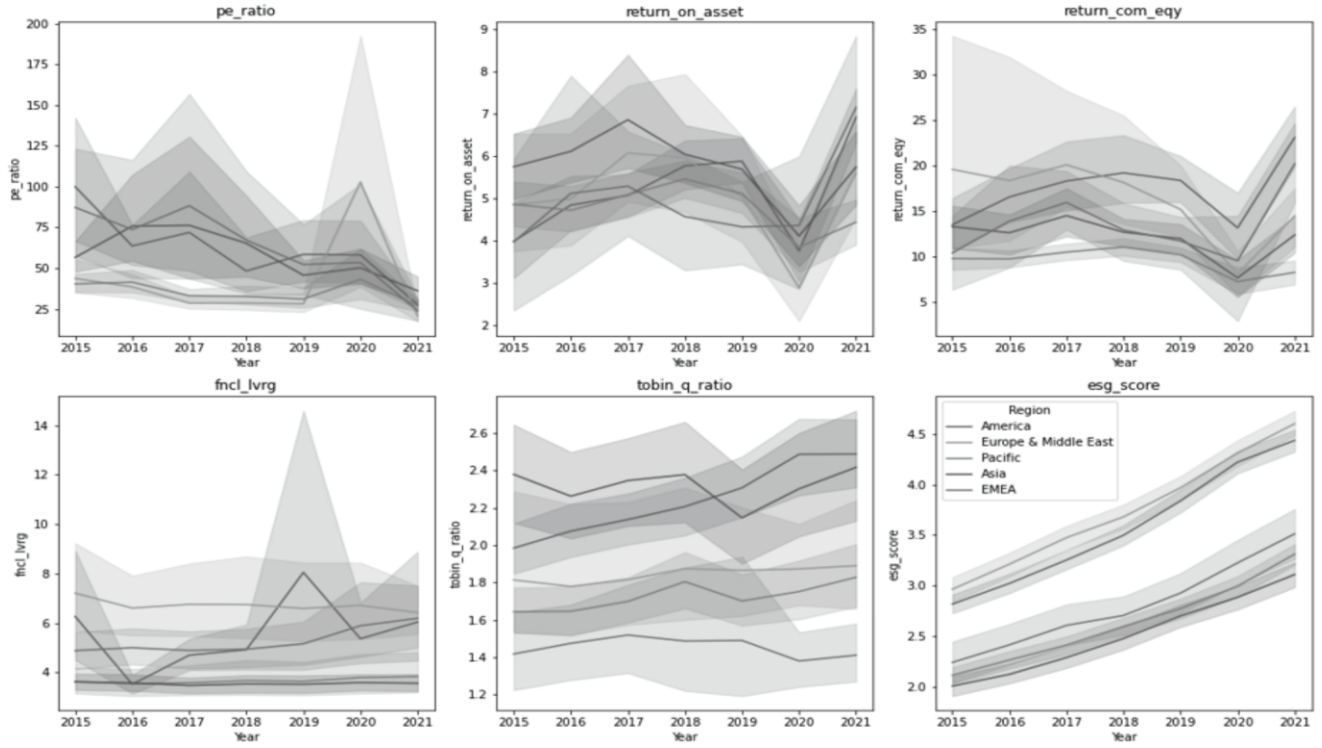

Figure 3. ***Comparison of Measures Between Developed and Emerging Countries over Time***

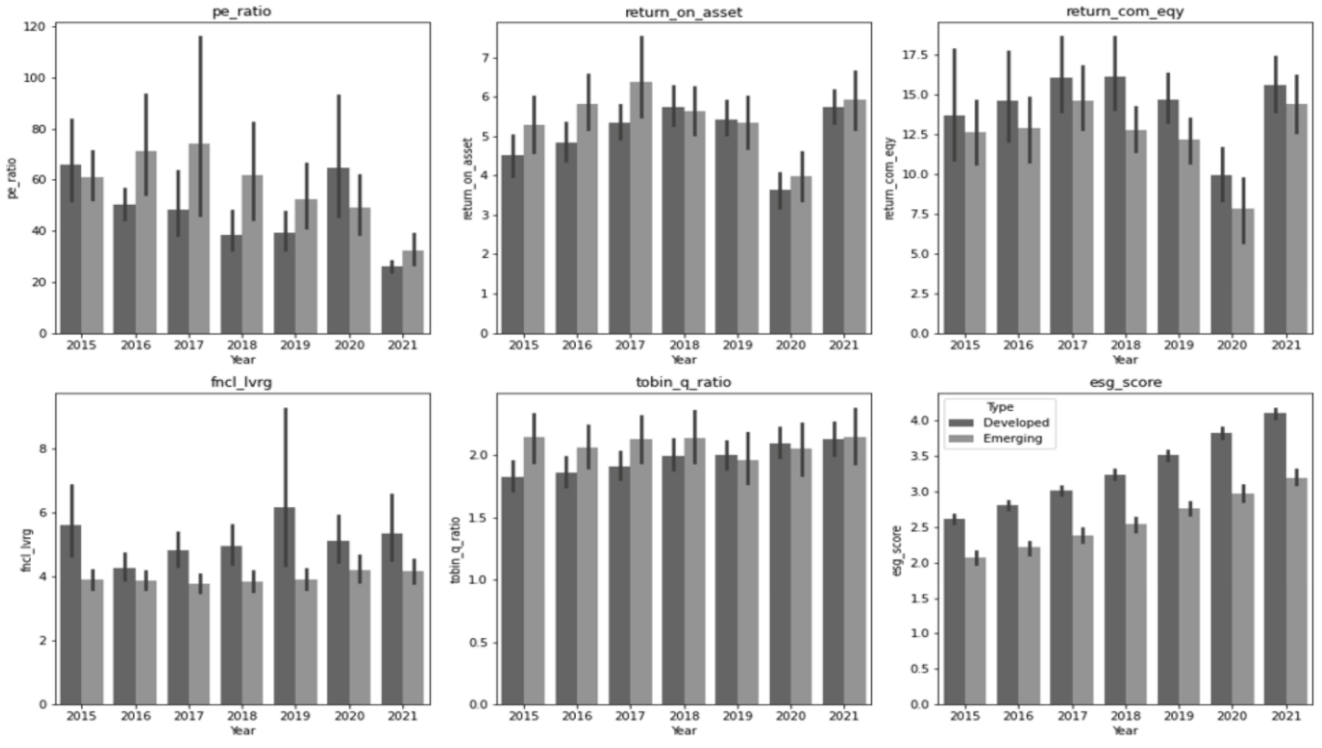

Table 3. ***Pairwise Correlation***

	PE	ROA	ROE	EBIT	Sales Growth	Net Income	Fin-leverage	Debt-to-Equity	Mkt Cap	Tobin's *Q*	Board-Gender Diversity	ESG Score
PE	1.0000											
ROA	–0.0174*	1.0000										
ROE	–0.0154*	0.6764*	1.0000									
EBIT	–0.0142	0.0533*	0.0197*	1.0000								
Sales Growth	–0.0003	0.0605*	0.0315*	0.0045	1.0000							
Net Income	–0.0129	0.0524*	0.0268*	0.6700*	0.0091	1.0000						
Fin-leverage	–0.0075	–0.0364*	0.0200*	–0.0072	0.0175*	–0.0030	1.0000					
Debt to Equity	–0.0039	–0.0299*	–0.0773*	–0.0039	–0.0018	–0.0055	0.0638*	1.0000				
Mkt-Cap	–0.0094	0.0457*	0.0227*	0.5327*	0.0003	0.8712*	–0.0057	–0.0056	1.0000			
Tobin's *Q*	0.0762*	0.6123*	0.5055*	0.0148	0.0221*	0.0060	–0.0206*	–0.0125	0.0551*	1.0000		
Board-Gender Diversity	–0.0048*	0.0289	0.0707*	–0.0691*	0.0094	–0.0697*	0.0512*	0.0180	–0.0702*	0.0512	1.0000	
ESG Score	–0.0429*	–0.0141	0.0308*	–0.0089	–0.0180*	–0.0247*	0.0115	0.0174	–0.0356*	–0.0397*	0.3989*	1.0000

Note. *Represents $p < 0.05$.

Table 3 presents a matrix of pairwise correlations between various variables. The correlation between ESG scores and board gender diversity is 0.398, indicating that companies with higher board gender diversity scores have higher ESG scores. This indicates that a relationship may exist between inclusive governance practices and ESG scores. The ESG score also has a positive and significant correlation with ROE, while it has a significant negative correlation with the PE ratio, sales growth, net income, current market capitalization, and Tobin's *Q*. This suggests that companies with higher ESG scores tend to have higher ROE, indicating their ability to generate profits efficiently. However, a lower ESG score is associated with a higher PE ratio and lower sales growth, net income, current market capitalization, and Tobin's *Q*, indicating potential risks and weaknesses in these areas for such companies. These findings suggest that companies with higher ESG scores tend to have better financial performance in terms of ROE. Additionally, the negative correlation between ESG scores and variables such as PE ratio, sales growth, net income, current market capitalization, and Tobin's *Q* indicates that companies with lower ESG scores may face challenges in these areas.

Table 4 presents the results of the 2-sample *t*-tests between companies with an ESG score below the mean value of 3 (termed worse-off companies) and above the mean value of 3 (termed better-off companies). The results indicate significant negative differences in board gender diversity, total debt-to-equity ratio, and ROE between worse-off and better-off companies. The *t*-test indicates significant positive differences in Tobin's *Q*, PE ratio, sales growth, net income, and market cap. No significant differences were observed in financial leverage, operating profits, or ROA.

Table 4. ***Two Sample T-Test***

Variables	Better Off / Worse Off Companies
ROE	–3.154*
ROA	1.518
Tobin's *Q*	4.179*

PE	4.067*
Fin-leverage	–0.827
Sales Growth	2.725*
Ln EBIT	0.170
Ln Net Income	2.236*
Ln Market Cap	2.745*
Board Gender Diversity	–23.229*
Total Debt to Equity	–2.392*

Note. * Indicates $p < 0.05$.

Table 5 presents the results of the panel regression analyses examining the impact of ESG scores on different metrics: ROE, ROA, Tobin's *Q*, PE Ratio, and financial leverage. This study incorporated a panel regression from 2015 to 2021. The results reveal that ESG scores have a significant negative relationship with Tobin's *Q* and PE ratio. On the other hand, the squared ESG score has a positive and significant relationship with ROA, Tobin's *Q*, and the PE ratio, indicating a quadratic or non-linear relationship between firm performance and ESG score. The ESG score and squared ESG scores have a positive relationship with ROE, but this is not significant. In the case of financial leverage, the ESG score is positive, and the squared ESG score has a negative relationship; however, in both cases, it is not significant. If we look at the interaction of ESG and country, the PE ratio has a significant negative relationship, and financial leverage has a significant positive relationship. Furthermore, the interaction of ESG and industry has a significant relationship with Tobin's *Q*, the PE ratio, and financial leverage, which is positive for Tobin's *Q* and the PE ratio and negative for financial leverage. ESG and region interaction indicators have a significant negative relationship with ROE.

Table 5. *Regression Results*

Variables	ROE	ROA	Tobin's *Q*	PE	Fin Leverage
ESG Score	0.36	–1.47	–3.09***	–3.7***	1.11
	(0.715)	(0.143)	(0.002)	(0)	(0.269)
ESG Score Squared	1.23	3.13***	4.06***	4.38***	–0.78
	(0.218)	–0.002	(0)	(0)	(0.435)
ESG* Country	–0.5	–0.99	–1.81*	–3.11***	2.15**
	(0.619)	(0.324)	(0.071)	(0.002)	(0.031)
ESG* Industry	–1.02	–0.1	2.96***	2.38**	–1.66*
	(0.309)	(0.917)	(0.003)	(0.017)	(0.096)
ESG* Type	–1.16	–1.94*	–0.86	1.7*	–1.71*
	(0.244)	(0.053)	(0.392)	(0.088)	(0.087)
ESG* Region	–2.65***	–1.28	0.41	2.35	–0.64
	(0.008)	(0.201)	(0.679)	(0.019)	(0.525)
Ln EBIT	–1.14	2.96***	–0.82	–8.77***	1.51
	(0.256)	(0.003)	(0.413)	(0)	(0.131)
Ln Net Income	21.01***	40.39***	–2.06**	–7.6***	–1.08
	(0)	(0)	(0.039)	(0)	(0.281)
Ln Market Cap	–2.13**	–4.37***	32.72***	–1.95*	–0.57

	(0.033)	(0)	(0)	(0.051)	(0.566)
Board Gender Diversity	0.34	–1.03	–2.93***	2.68***	–0.29
	(0.73)	(0.301)	(0.003)	(0.007)	(0.772)
Total Debt to Equity	10.79***	3.02***	1.83*	0.15	15.7***
	(0)	(0.003)	(0.068)	(0.881)	(0)
Constant	–7.85***	–19.26***	–29.39***	16.2***	0.14
	(0)	(0)	(0)	(0)	(0.885)
Hausman Test	196.66***	1021.43***	863.61***	283.93***	16.86*
	(0)	(0)	(0)	(0)	(0.0774)

Note. The table presents the results of the quadratic regression of ROE, ROA, Tobin's *Q*, PE Ratio, and Financial leverage on ESG scores. The variables are defined in Table 2. The figures above parenthesis values are *t*-statistics for ROE, ROA, Tobin's *Q*, and PE Ratio, and *z* statistics for financial leverage. The figures in the parenthesis are *p*-values: ***represents $p < 0.01$, **represents $p < 0.05$, and *represents $p < 0.1$.

Discussion and Implications

These findings suggest that ESG factors play a role in influencing financial performance, particularly when considering interactions with country, industry, and region. Companies must consider these relationships when evaluating their ESG practices and their impact on key financial metrics. As a greater number of companies inculcate substantial ESG activities, they need to understand how these activities impact their performance and risk. The results indicate that the ESG score has a significant negative relationship with the firm's market performance (Tobin's *Q* and PE ratio) ; whereas, the squared ESG score has a significant positive relationship with the firm's market performance proxied by Tobin's *Q* and PE ratio and a significant negative relationship with the firm's accounting performance proxied by ROA. These findings indicate that the first hypothesis (H_1) is accepted if we consider a firm's market performance. This is in line with previous studies that have examined the non-linear relationship between a firm's ESG scores and its financial and market performance (Agarwal et al., 2023; Bansal et al., 2021; Dayal & Gupta, 2024; Huang et al., 2022; Nareswari et al., 2023; Nollet et al., 2016; Pu, 2023). This shows that in the initial year, ESG expenses act as a burner for firm profits, and the firm only reaps its benefits in later years. ESG disclosure acts as a proxy for the firm's ESG activities, and the firm's decision-making considers how the disclosures address stakeholder concerns, which is in line with stakeholder theory, which suggests that firms that invest in ESG activities are more likely to have a sustainable financial position (Freeman, 1984).

The results also suggest that even though ESG activities have a negative impact on profits in the short term, in the long term, firms that prioritize ESG are better equipped to identify and mitigate risks, enhancing their resilience against regulatory penalties and environmental challenges. The positive impact can be attributed to several factors, including improvement in brand value and reputation when firms prioritize ESG, leading to increased consumer loyalty and trust, as explained by the legitimacy theory, which postulates that firms that act in line with societal expectations gain legitimacy and enhance their long-term viability (Gómez-Martínez et al., 2018). Additionally, because ESG aligns with employee values, companies that embrace it attract top personnel, boosting productivity and engagement. Moreover, these companies often find it easier to access capital as investors increasingly favor firms with strong ESG profiles (Bansal et al., 2021).

The ESG and squared ESG scores show a positive but insignificant relationship with accounting performance captured through ROE; thus, we reject the second hypothesis (H_2). This suggests that although the relationship is not strong enough, there is a tendency for higher ESG scores to be associated with higher ROE, which is in line

with previous studies by Naeem et al. (2022) and Bansal et al. (2021). Furthermore, ESG score has a positive relationship with financial leverage, indicating that companies with higher ESG scores tend to have more debt to fund their ESG activities. This result is in line with those of the previous studies by Ray and Goel (2023) and Nega (2017).

The interaction between ESG scores and country has a significant negative relationship with Tobin's *Q* and the PE ratio while having a significant positive relationship with financial leverage. This indicates that the influence of ESG scores on Tobin's *Q*, PE ratio, and financial leverage varies by country; thus, we accept the third hypothesis (H_3). The interaction between ESG scores and industry has a significant positive relationship with Tobin's *Q* and PE ratio, which is also in line with the previous study by Alareeni and Hamdan (2020). This indicates that ESG scores influence Tobin's *Q* and the PE ratio, which is more pronounced in certain industries; that is, specific industries with higher ESG have higher PE ratios and Tobin's *Q*. The significant negative relationship between financial leverage and the interaction between ESG scores and industry implies that companies with higher ESG scores may have lower financial leverage in certain industries. This allows us to accept the fourth hypothesis (H_4). The interaction between ESG scores and region has a significant negative relationship with ROE, which suggests that the impact of ESG scores on ROE differs by region.

The findings have several implications for firms, industries, investors, and policymakers regarding the influence of ESG activities. First, from the firm's perspective, there is a pressing need to shift the mindset that ESG activities impact firm performance. Although there may be a negative impact on profitability in the short term, in the long run, a firm's market perception changes with its ESG investments. The long-run benefits accrue on account of higher resilience to macro risks and benefit from positive brand value and customer loyalty. Additionally, firms with higher ESG scores have the opportunity to obtain higher debt financing (financial leverage) to fund their sustainability efforts. Companies within highly ESG-sensitive sectors should differentiate themselves from their peers based on their ESG commitment. Second, from the investors' perspective, it seems imperative to assess the country-specific implications of ESG, especially while investing in a portfolio consisting of multinational stocks. When evaluating ESG-related risks and opportunities, investors should consider the regulatory environment and cultural context of the nation in which a company operates, as evidenced by the differing effects of ESG activities on financial metrics, such as Tobin's *Q*, PE ratio, and financial leverage. Investors should also consider industry-specific ESG aspects when making investment decisions, as there are notable variations in companies' ESG scores across different industries. ESG-focused investment prospects may be stronger in industries such as technology, healthcare, and energy, which are more sensitive to environmental issues. Third, policymakers' perspective can incentivize firms to invest in ESG activities while standardizing ESG reporting requirements. Policymakers should also consider industry-specific requirements while advocating sustainability. This will help to create a more level-playing field for firms.

Conclusion

This study reveals that ESG factors significantly influence financial performance, particularly when interacting with countries, industries, and regions. Companies must consider these relationships when evaluating their ESG practices and their impacts on key financial metrics. This is the first study to measure the impact of ESG on a firm's performance and risk at various levels, including the country, industry, region, and developed and emerging economies. The results show a non-linear relationship between ESG and firm performance, with ESG expenses acting as a burner for firm profits in the initial year and reaping benefits in later years. Firms that prioritize ESG activities are more resilient to future turmoil and are able to enhance their reputation and brand loyalty among customers.

Additionally, ESG commitment differs across industries and nations, underscoring the need for businesses to

modify their ESG activities. Although the study indicates that ESG scores and firm performance are positively correlated, accounting metrics indicate a negligible relationship, suggesting that future studies explore other financial and non-financial metrics to better understand this relationship. Overall, the study indicates that businesses that integrate ESG frameworks into their overall investment strategy experience a higher chance of long-term financial success and investor trust.

Limitations of the Study and Scope for Future Research

These findings have important research and managerial implications, highlighting the importance of considering regional, industrial, and country-specific factors when assessing the impact of ESG scores on financial performance and risk. However, future studies should consider other metrics, such as stock price volatility, cost of capital, and customer retention rates, while examining the relationship between performance and ESG to avoid biased results at the firm level. Future research may also control for external economic factors such as inflation, market volatility, and geopolitical risks, which could also affect financial performance. In addition, the non-linear nature of the relationship between ESG and firm performance highlights the need to determine the optimal level of ESG commitments, which can have a positive impact on firm performance in the long run. Future studies can explore the optimal level of ESG investments by a firm while also considering country-, region-, and industry-level factors. The results reveal that ESG practices can reduce firm risk, which can help firms raise higher debt in the capital structure. This can have multiple benefits, including control retention, lower taxes, financial leverage, easy access to cheaper sources of finance, and so on.

Future research could explore the specific reasons for these variations and their implications for companies operating in different areas. The financial benefits of ESG may not be fully represented in many emerging markets as ESG guidelines are not yet completely incorporated into corporate plans. The early phases of ESG adoption in these markets, where advantages are still being felt, might not be fully covered by the research. Finally, future studies could also explore the underlying mechanisms driving these relationships to provide a more comprehensive understanding of the link between ESG and financial performance.

Authors' Contribution

Dr. Smita Dayal conceived the idea and developed the quantitative design to undertake the empirical study. Ritika Aggarwal and Roshni Hotwani extracted research papers with high reputations, filtered these based on keywords, gathered data, and generated concepts and codes relevant to the study design. Dr. Tarun Kumar Soni and Smita Dayal verified the analytical methods and supervised the study. The numerical computations were done by Smita Dayal and Tarun Kumar Soni using Stata software. Dr. Tarun Kumar Soni and Smita Dayal wrote the manuscript in consultation with all the other authors.

Conflict of Interest

The authors certify that they have no affiliations with or involvement in any organization or entity with any financial interest or non-financial interest in the subject matter or materials discussed in this manuscript.

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About the Authors

Smita Dayal is an Assistant Professor at Lal Bahadur Shastri Institute of Management with over 13 years of teaching and research experience. She has completed her B.Com (Hons) from Shri Ram College of Commerce, Delhi University, an MBA in Finance from Amity Business School, and a Ph.D. in Finance from Mumbai University.

Tarun K. Soni holds a Doctorate in Finance from the Arun Jaitley National Institute of Financial Management, Ministry of Finance, and has more than 12 years of teaching and research experience. He has collaborated with notable institutions/think tanks on public policy concerns, including the Ministry of Finance, the Prime Minister's Office, and Niti Aayog. He is an avid researcher who has produced research papers in Scopus-indexed and ABDC-listed publications.

Ritika Aggarwal is a financial analyst with WIPRO in India. An experienced individual with a track record of working in the utility industry. She has experience in SAP-BASIS, SAP-HANA, SAP-CRM, Power BI, Tableau, Advanced Excel, MS PowerPoint, MS Access, MS Publisher, Python, and SQL.

Roshni Hotwani is working as an Assistant Manager in the Financial Planning and Analysis (FP&A) division. She holds a B.Com (Honors) from Banaras Hindu University and a PGDM in Research & Business Analytics.