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# The Sustainability Equation: Board Diversity, Environmental Stewardship, Social Responsibility, and Governance Impact on Financial Performance in Indian Markets

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**Abstract:** *Sustainable development is essential for businesses globally to balance economic growth, environmental conservation, and social equity. The relationship between financial success and sustainability practices is a critical subject of discussion as an increasing number of organizations integrate these concepts into their operations. Using fixed-effects panel regression, this research investigates the link between sustainability (measured through environmental, social, and governance (ESG) factors) and firm value creation (FVC) in India's Nifty 500 companies from 2015 to 2023. ROA, ROE, Tobin's Q, and EVA are the metrics that are used to determine FVC, with ESG and its constituents serving as independent variables. Based on the findings, it can be concluded that overall sustainability metrics (ESG), environmental practices (including carbon emissions reduction, resource efficiency, and waste management initiatives), and governance mechanisms (such as board independence, executive compensation structures, and shareholder rights) have no statistically significant effect on firm value creation metrics. However, social factors (including employee welfare programs, community engagement, human rights policies, and diversity initiatives) demonstrate a favorable impact specifically on Return on Equity (ROE). Interestingly, the presence of gender diversity on corporate boards does not moderate this relationship between social performance and financial outcomes, suggesting that the benefits of social initiatives transcend board composition. This research contributes significantly to the evolving field of sustainability research in developing markets by challenging assumptions about direct financial returns from environmental and governance investments, while highlighting the potential value of social responsibility initiatives. The findings provide nuanced insights for policymakers developing corporate sustainability regulations, business executives allocating resources across sustainability dimensions, and investors seeking to understand the complex relationship between sustainable practices, gender representation, and financial performance in the Indian corporate landscape.*

**Keywords** Firm Value Creation, Financial Performance, Environmental Sustainability, Board Gender Diversity, Business Social Responsibility

## 1. Introduction

Sustainable development has emerged as a critical imperative for businesses worldwide, requiring a balanced approach that integrates economic growth, environmental stewardship, and social responsibility. In this context, Environmental, Social, and Governance (ESG) frameworks have become instrumental in helping companies articulate and operationalize their sustainability strategies (Whelan, 2021; Gillan et al., 2021; Dong et al., 2022; Gillan et al., 2021). ESG was first invented in a report published by United Nations Global Compact in 2004 (UN Global Compact, 2004). The letter "E" denotes the environmental

component that covers organisations' impact on global warming, carbon emissions, energy use, waste management, and natural resource conservation (Litvinenko et al., 2022). "S" stands social inclusion aspects, this embraces the enhancement of the employees relationship, the diversifying of the workforce, customer satisfaction, social welfare, and the effective running of the supply chain (Drempetic et al., 2019; UN Global Compact, 2004). Finally, the last letter in ESG, "G" talks about management-related problems like board diversity, the CEOs' compensation, anti-corruption measures, and shareholder rights (Sharma et al., 2020; UN Global Compact, 2004). In today's ever-changing business environment, one of the most important factors of ESG has lied in the corporate strategic formulation and successful decision making. Corporates today confront business sustainability risks (Kell, 2022; Ferriani & Natoli, 2020), which can take the shape of transition risks as we move toward a low-carbon economy, physical risks to their assets from climate-related disasters, or even reputational concerns (Iak, 2021). Furthermore, investors are more aware of the financial implications of sustainability related risks and opportunities and factors the same in their investment decisions (Gibson & Krueger, 2017; Park & Jang, 2021; Minkkiinen et al., 2022).

The establishment of the linkages between a company's ESG practises and firm performance has been an area of interest among academicians and practitioners since 1970s (Friede *et al.*, 2015). This study focuses into the dynamic interaction between ESG criteria and firm value creation, showing the moderating influence of board gender diversity in this scenario. Firm value creation is a comprehensive term that includes accounting, market and shareholder value components (Rothaermel, 2017; Cornell & Damodaran, 2020 ; Carroll, 2004). Accounting performance indicators, for example, growth of the top line, return on assets (ROA), return on capital employed (ROCE), and return on equity (ROE), helps to see the company's efficiency and profitability, to tell how the firm is using its assets to create returns for stakeholders successfully (Choiriyah et al., 2021; Chen et al., 2021; Kim & Li, 2021). Market performance, an important part of corporate value, is calculated using ratios like Tobin's Q, price-to-book (P/B) ratio, price-to-earnings (P/E) ratio, and enterprise multiple, which evaluate the market's opinion on the company's future profit potential (Tsai & Wu, 2021; Atan et al., 2018). Shareholder value creation concept relates to how business operations of a company lead to making gains in shareholders' profit (Miralles-Quiros et al., 2019; Ibrahim, 2019). This study aims not only to improve the level of the existing knowledge but also to recognize the role of ESG in the value creation process. Using fixed-effects panel regression, this research investigates the link between sustainability (measured through environmental, social, and governance (ESG) factors) and firm value creation (FVC) in India's Nifty 500 companies from 2015 to 2023.. Firm value creation is the dependent variable, while ESG and ESG scores—comprising environmental (E), social (S), and governance (G) factors—are used as the independent variables. Firm value creation is quantified using financial indicators (ROA and ROE), market performance (Tobin's Q), and shareholder value creation (EVA). Additionally, the study evaluates the percentage of women directors as a moderating variable, providing further complexity to the analysis. This research differs from the previous ones due to its focus on developing nation India. The time frame of 2015 to 2023 is taken to identify long-term phenomena and the resonance of ESG initiatives. By adopting a multidimensional approach to measure firm value, the study provides a comprehensive understanding of ESG's influence. The incorporation of board gender diversity as a moderating variable adds a novel dimension, examining how the presence of women directors affects the ESG-firm value relationship. The study helps to fill the void in ESG literature of developing countries and provides valuable insights for investors, policymakers, and practitioners.

## 2. Literature Review and Hypothesis Development

The existing literature has probed into multiple factors that affect the value of the enterprise (Table 1). Cornell & Damodaran (2020) proved that the four essential elements of a firm's valuation are growth, profitability, investment efficiency, and risk. Even though a lot of research has been devoted to the establishment of a direct ESG impact on firm value, the results are still uncertain. Some studies propose neutral relationships (Chen et al., 2021), others posit positive associations (Kim & Li, 2021), while still, others suggest negative connections (Saygili et al., 2022). Importantly, these investigations have often struggled to pinpoint the underlying mechanisms governing this relationship. Buallay et al. (2021)

identified a significant link between ESG and ROA, yet no significant relationship between ESG and ROE. Likewise, Liu et al. (2021) identified an ambiguous association between ESG and ROI; they postulated that the strengthened correlation through financial tech is plausible. In contrast with these unfavourable results, Carnini Pulino et al. (2022) noted that increased ESG disclosure leads to higher Earnings Before Interest and Taxes (EBIT) in the top Italian listed corporations during the period 2011-2020. Market-based indicators such as Tobin's Q and stock returns have also gained attention in prior studies to measure firm performance (Tsai & Wu, 2021; Saxena, Singh, 2016; Dong, Wu, 2022; Zhou, Liu Wang, 2022; Chen, Yu, Hsiao, Lin, 2021; Deng & Cheng, 2019). Commonly used indicators in these analyses include Tobin's Q, Jensen's alpha, and Sharpe ratios (Alshehhi et al., 2018). For instance, Fatemi et al., (2018) used the Contextual Two-stage approach to assess how different ESG actions link to their level of transparency and market performance on a sample of 403 US firms between 2006 and 2011. They postulated a positive causation between ESG activities. Yu et al. (2018), examined large capital enterprises across 47 emerging and developed nations, and discovered that ESG data disclosure is incentivized alongside financial data reporting, resulting in enhanced Tobin's Q by decreasing information asymmetry and agency costs. A company's primary goal is to maximize shareholder value, and many companies measure their progress by stock price performance and dividend growth (Miralles-Quiros et al., 2019; Ibrahim, 2019). However, it is also commonly known that stock prices can be unpredictable and affected by market forces that management does not have complete control over. These reasons include shifting investor expectations and other macroeconomic and competitive considerations. Consequently, investors, board members, and firm executives frequently seek out other metrics of "value creation," ones that are less susceptible to market fluctuations. One possible alternative framework for measuring economic profit is Economic Value Added (EVA). There are very few studies that have focused on ESG and shareholder long-term value development (Gómez-Bezares et al., 2016). Gómez-Bezares et al., 2016 stated firms that integrate sustainability into their fundamental business strategies and decision-making processes are typified by greater Market Value Added but lower EVA. This study intends to contribute to the current body of knowledge by scrutinising how ESG practices, interact with and perhaps enhance a company's value proposition.

Through empirical analysis, this study aims to uncover the connections between ESG and various facets of firm value creation. The study utilizes a sample of "Nifty 500" companies in India from 2015 to 2023 using panel data regression. The study considers firm value creation as the dependent variable, while ESG as well as ESG factors which encompass environmental (E), social (S), and governance (G) scores, are regarded as the independent variables. Measurement of firm value creation incorporates financial, market performance and shareholder value creation indicators. Financial indicators include return on assets (ROA) and return on equity (ROE). Market performance is gauged through Tobin's Q. Shareholder value creation is measured through EVA. Moreover, the study introduces a moderating variable—namely, the percentage of women directors—adding an additional layer of analysis to the investigation.

***Moderation effect of 'Board Gender Diversity' on ESG and Firm Performance***

There are not many studies on the moderating role of the board gender diversity in the context of ESG and the value of the company; however, it is generally believed that more women directors on board can lead to better ESG efforts by companies (Giannarakis et al., 2014). Women also have more community characteristics than men, which leads to a different orientation toward stakeholders (Galbreath, 2016). Given that gender diversity aligns the firm's interests with its stakeholders, this diversity is crucial to good corporate governance (Zampone et al., 2022). According to stakeholder theory, a board with gender diversity is more likely to represent stakeholders (Pareek et al., 2021). In the context of risk-taking, some authors have argued that female directors are more risk-averse than men and less overconfident than men (La Rocca et al., 2023). In this line, women directors are more responsive to stakeholder needs than men (Nerantzidis et al., 2022). Governance mechanisms can play a crucial role in the relationship between ESG and Firm Performance; thus, more future studies are required to investigate the moderating role of one of the most vital governance mechanisms in the ESG–FVC nexus, namely, gender diversity.

Based on this literature review, the following hypotheses are formulated:

H0a: ESG has no impact on Return on Assets i.e $\beta_{ESG}$=0

H0a$_1$: E has no impact on Return on Assets i.e $\beta_E$=0

H0a$_2$: S has no impact on Return on Assets i.e $\beta_S$=0

H0a$_3$: G has no impact on Return on Assets i.e $\beta_G$=0

H0b: ESG has no impact on Return on Equity i.e $\beta_{ESG}$=0

H0b$_1$: E has no impact on Return on Equity i.e $\beta_E$=0

H0b$_2$: S has no impact on Return on Equity i.e $\beta_S$=0

H0b$_3$: G has no impact on Return on Equity i.e $\beta_G$=0

H0c: ESG has no impact on Tobin's Q i.e $\beta_{ESG}$=0

H0c$_1$: E has no impact on Tobin's Q i.e $\beta_E$=0

H0c$_2$: S has no impact on Tobin's Q i.e $\beta_S$=0

H0c$_3$: G has no impact on Tobin's Q i.e $\beta_G$=0

H0d: ESG has no impact on Economic Value Added i.e $\beta_{ESG}$=0

H0d$_1$: E has no impact on Economic Value Added i.e $\beta_E$=0

H0d$_2$: S has no impact on Economic Value Added i.e $\beta_S$=0

H0d$_3$: G has no impact on Economic Value Added i.e $\beta_G$=0

Note: Hypotheses H0a to H0d$_3$ are tested considering the moderating impact of board gender diversity.

**Table 1:** Empirical Studies examining ESG and Firm Value Creation

| **Empirical Studies** | | | | | |
|---|---|---|---|---|---|
| | **Name of the Study** | **Year** | **Dependent Variable** | **Independent Variable** | **Results** |
| 1 | Duque-Grisales & Aguilera-Caracuel, 2021 | 2021 | Return on assets (ROA) | ESG | Negative |
| 2 | Bodhanwala & Bodhanwala, 2019 | 2019 | Return on invested capital, Return on equity (ROE), ROA and Earnings per share | ESG | Positive |
| 3 | Havlinova & Kukacka, 2021 | 2021 | Share Price | ESG | Positive |
| 4 | Bhaskaran et al., 2020 | 2020 | Tobin's Q, ROA, ROE, Stock returns | ESG | Positive |
| 5 | Chauhan & Kumar, 2018 | 2018 | Tobin's Q, Cost of Capital, Cash Flows, Cumulative Annual Returns | ESG | Positive |
| 6 | Atif & Ali, 2021 | 2020 | Default risk | ESG | Positive |
| 7 | Miralles-Quirós et al., 2019 | 2019 | Stock Prices | ESG, E, S, G | Mixed |
| 8 | Dong et al., 2022 | 2022 | Tobin's Q | Board Diversity, ESG Composite Score | Mixed |

| | | | | | |
|---|---|---|---|---|---|
| 9 | Chen et al., 2021 | 2021 | ROA, ROE, ROIC | ESG. E,S, G | Short-term Negative Impact |
| 10 | Nguyen et al., 2020 | 2020 | Share Price | Global Reporting Initiative adherent level | Negative |
| 11 | Nguyen et al., 2022 | 2022 | ROA, ROE, Tobin's Q | ESG | Positive |
| 12 | Xie et al., 2019 | 2019 | Corporate Efficiency, ROA, Tobin's Q | ESG | Positive |
| 13 | Brogi & Lagasio, 2018 | 2018 | ROA | ESG | Positive |
| 14 | Minutolo et al., 2019 | 2019 | ROA, Tobin's Q | ESG | Positive |
| 15 | Daszynska-Zygadlo et al., 2020 | 2020 | ROA, Tobin's Q | ESG | Mixed |
| 16 | Buallay et al., 2021 | 2021 | ROA, ROE, Tobin's Q | ESG, E, S, G | Mixed |
| 17 | Chams et al., 2021 | 2021 | ESG, E, S, G | Free Cash Flows, Tobin's Q | Mixed |
| 18 | Zhou et al., 2022 | 2022 | Market Value of the company, Tobin's Q | ESG | Positive |
| 19 | AYDOĞMUŞ et al., 2022 | 2022 | Tobin's Q, ROA | ESG | Positive |
| 20 | Al-Shammari et al., 2021 | 2021 | Tobin's Q | CSR | Positive |
| 21 | Carnini Pulino et al., 2022 | 2022 | EBIT | ESG | Positive |
| 22 | Junius et al., 2020 | 2020 | ROA, ROE, Tobin's Q | ESG | Not significant |
| 23 | Al Amosh et al., 2022 | 2022 | Tobin's Q, ROA, ROE | ESG | Positive |
| 24 | Velte, 2017 | 2017 | ROA, Tobin's Q | ESG | Mixed |
| 25 | Dalal & Thaker, 2019 | 2019 | ROA, Tobin's Q | ESG | Positive |

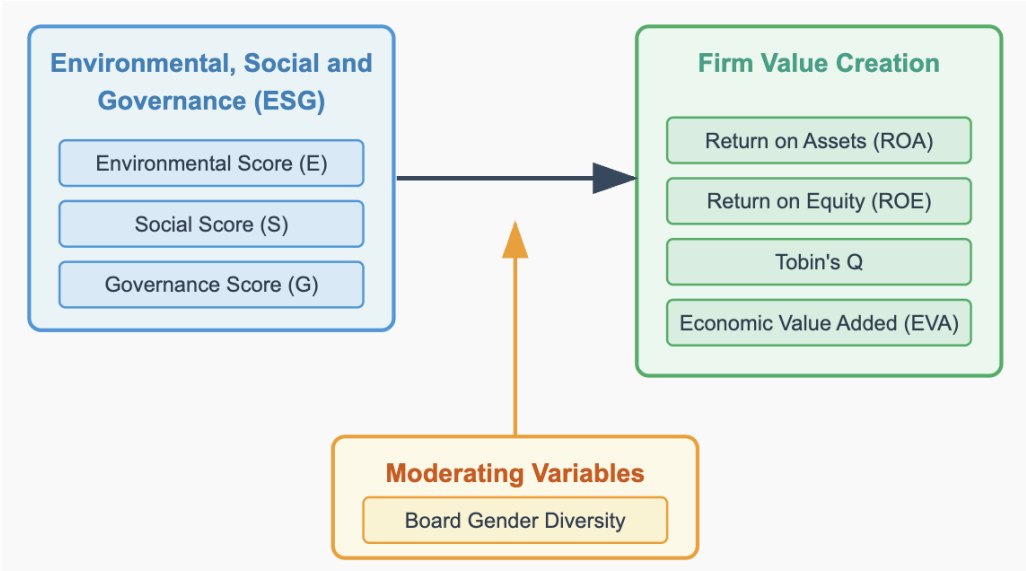


**Figure: 1** Research Framework

***Source:*** Author's Own Compilation

## 3. Research Design

This research investigates the link between sustainability (measured through environmental, social, and governance (ESG) factors) and firm value creation (FVC) in India's Nifty 500 companies from 2015 to 2023 using fixed-effects panel regression. We concentrated on the role of board gender diversity and its implication as a moderator in the relationship between ESG and FVC.

### 3.1 Data and Sample

The study utilizes a sample of "Nifty 500" companies in India from 2015 to 2023. The "Nifty 500" represents a diverse and significant subset of firms across various industries, making it an appropriate representation of the Indian corporate landscape. Bloomberg and prowess databases were used for data collection.

For the purpose of modeling the relationship between the FVC and ESG, a linear regression model in conjunction with panel fixed effects was used. FVC is the dependent variable that is being considered in this research. A number of elements, including environmental (E), social (S), and governance (G) scores, are regarded to be independent variables. ESG and ESG components are also considered to be independent variables. There are four dependent variables that are used to map the FVC. These variables are Return on Assets (ROA), Return on Equity (ROE), Tobin's Q, and Economic value added (EVA). In addition, the inquiry is augmented with an extra layer of analysis thanks to the inclusion of a moderating variable, which is specifically the proportion of female directors.

**Data Cleaning Process:**

(i) Out of 500 companies, 277 companies were used for analysis since ESG scores were available for only 277 companies.

(ii) Statistics: Longitudinal/ Panel Data : Setup and utilities: Declare data set to be panel data Strongly Balanced Panel Data was declared.

(iii) Hausman Test: Fixed effects model should be used

(iv) Data is Stationary

(v) No issue of autocorrelation or heteroskedasticity

### 3.2 Research Models

This paper uses eight regression models to test the hypotheses as follows:

$ROA_{i,t} = \alpha_0 + \alpha_1 ESG_{i,t} + \alpha_2 BGD + \alpha_3 FS + \alpha_4 MCap_{i,t} + \alpha_5 Beta_{i,t} + \alpha_6 LR_{i,t} + \alpha_7 CF_{i,t} + \alpha_8 R\&D_{i,t} +$ Year Fixed effects $+ E_{i,t}$

$ROA_{i,t} = \alpha_0 + \alpha_1 E/S/G_{i,t} + \alpha_2 BGD + \alpha_3 FS + \alpha_4 MCap_{i,t} + \alpha_5 Beta_{i,t} + \alpha_6 LR_{i,t} + \alpha_7 CF_{i,t} + \alpha_8 R\&D_{i,t} +$ Year Fixed effects $+ E_{i,t}$

$ROE_{i,t} = \alpha_0 + \alpha_1 ESG_{i,t} + \alpha_2 BGD + \alpha_3 FS + \alpha_4 MCap_{i,t} + \alpha_5 Beta_{i,t} + \alpha_6 LR_{i,t} + \alpha_7 CF_{i,t} + \alpha_8 R\&D_{i,t} +$ Year Fixed effects $+ E_{i,t}$

$ROE_{i,t} = \alpha_0 + \alpha_1 E/S/G_{i,t} + \alpha_2 BGD + \alpha_3 FS + \alpha_4 MCap_{i,t} + \alpha_5 Beta_{i,t} + \alpha_6 LR_{i,t} + \alpha_7 CF_{i,t} + \alpha_8 R\&D_{i,t} +$ Year Fixed effects $+ E_{i,t}$

$Tobin's\ Q_{i,t} = \alpha_0 + \alpha_1 ESG_{i,t} + \alpha_2 BGD + \alpha_3 FS + \alpha_4 MCap_{i,t} + \alpha_5 Beta_{i,t} + \alpha_6 LR_{i,t} + \alpha_7 CF_{i,t} + \alpha_8 R\&D_{i,t} +$ Year Fixed effects $+ E_{i,t}$

$Tobin's\ Q_{i,t} = \alpha_0 + \alpha_1 E/S/G_{i,t} + \alpha_2 BGD + \alpha_3 FS + \alpha_4 MCap_{i,t} + \alpha_5 Beta_{i,t} + \alpha_6 LR_{i,t} + \alpha_7 CF_{i,t} + \alpha_8 R\&D_{i,t} +$ Year Fixed effects $+ E_{i,t}$

$EVA_{i,t} = \alpha_0 + \alpha_1 ESG_{i,t} + \alpha_2 BGD + \alpha_3 FS + \alpha_4 MCap_{i,t} + \alpha_5 Beta_{i,t} + \alpha_6 LR_{i,t} + \alpha_7 CF_{i,t} + \alpha_8 R\&D_{i,t} +$ Year Fixed effects $+ E_{i,t}$

$EVA_{i,t} = \alpha_0 + \alpha_1 E/S/G_{i,t} + \alpha_2 BGD + \alpha_3 FS + \alpha_4 MCap_{i,t} + \alpha_5 Beta_{i,t} + \alpha_6 LR_{i,t} + \alpha_7 CF_{i,t} + \alpha_8 R\&D_{i,t} +$ Year Fixed effects $+ E_{i,t}$

Where,

- i refers to a firm *i*
- t the time
- BGD = Board Gender Diversity
- FS = Firm Size
- MCap = Market Capitalisation
- Beta
- LR = Leverage Ratio
- CF = Free Cash Flow
- R&D= Research and Development (R&D)
- E= Error term

**3.3 Variables**

The following are the list of variables:

**Table 2: Dependent Variables**

| Measurement | Description | Reference |
|---|---|---|
| Return on Assets | Net Income/ Average Total Assets | (Saygili, et al., 2022); (Chen et al., 2021); (Kim & Lee, 2020); (Buallay et al., 2021); (Daszynska-Zygadlo et al., 2020); (Pirtea et al., 2021) |
| Return on Equity | Net Income/ Shareholder's Equity | (Saygili, et al., 2022) |
| Tobin's Q | (Market Capitalizatin + Total Liabilities + Preferred Equity + Minority Interest) / Total Assets | (Dong et al., 2022); (Saygili, et al., 2022); (Zhou et al., 2022); (Buallay et al., 2021); (Daszynska-Zygadlo et al., 2020) |
| Economic Value Added | Economic Value Added = (Return on Capital Invested– Cost of Capital)*(Capital Invested) | (Gómez-Bezares et al., 2016) |

**Table 3:** Independent Variables

| Name | Description | Reference |
|---|---|---|
| **ESG score (ESG)** | Bloomberg Score which ranges from 0 to 100 (0- Companies don't disclose ESG; 100- Companies that disclose ESG, N/A- Companies not covered by Bloomberg). | (Zhou et al., 2022); (Chen et al., 2021); (Eliwa et al., 2021); (Kim & Lee, 2020); (Buallay et al., 2021); (Daszynska-Zygadlo et al., 2020); (Pirtea et al., 2021) |
| **Environmental 'E' Score** | Bloomberg Environmental (E) Score which ranges from 0 to 100 (0- Companies don't disclose E matters; 100- Companies that disclose E matters, N/A- Companies not covered by Bloomberg). | (Chams et al., 2021); (Vural-Yavas, 2021); (Shahbaz et al., 2020); (Giannarakis et al., 2014) |
| **Social 'S' Score** | Bloomberg Social (S) Score which ranges from 0 to 100 (0- Companies don't disclose S matters; 100- Companies that disclose S matters, N/A- Companies not covered by Bloomberg). | (Chams et al., 2021); (Vural-Yavas, 2021); (Shahbaz et al., 2020); (Giannarakis et al., 2014) |
| **Governance 'G' Score** | Bloomberg Governance (G) Score which ranges from 0 to 100 (0- Companies don't disclose G | (Chams et al., 2021); (Vural-Yavas, 2021); (Shahbaz et al., |

| | | |
|---|---|---|
| | matters; 100- Companies that disclose G matters, N/A- Companies not covered by Bloomberg). | 2020); (Giannarakis et al., 2014) |

***Source:*** Author's compilation

**Table 4:** Moderating Variable

| Name | Description | Reference |
|---|---|---|
| Board Gender Diversity | Percentage of board members who are women. | (Jiang et al., 2020); (Tariah, 2019) |

***Source:*** Author's compilation

**Table 5:** Control Variables

| Name | Measurement | Reference |
|---|---|---|
| Firm Size | Natural logarithm of Total Assets | (Aouadi & Marsat, 2016); (Wahba & Elsayed, 2015); (Zhou et al., 2022); (Profitlich et al., 2021); (Eliwa et al., 2021); (Chams et al., 2021); (Kim & Lee, 2020) |
| Market Capitalisation | Difference between the current year from Year of incorporation | (Aouadi & Marsat, 2016); (Wahba & Elsayed 2015); (Zhou et al., 2022) |
| Beta | Beta factor (BETA) is derived on the basis of the capital asset pricing model. | (Bhaskaran et al., 2020); (Whelan & Atz, 2021); (Chams et al., 2021) |
| Leverage Ratio | Total Debt / Total Assets | (Kim & Lee, 2020); (Habermann & Fischer, 2021); (Dong et al., 2022); (Profitlich et al., 2021); (Eliwa et al., 2021) |
| Free Cash Flow | Net cash flow/ Sales | (Clarkson et al., 2008) |
| Research and Development (R&D) | R&D expenses/ Total Sales | (McWilliams & Siegel, 2000), (Barnett & Salomon, 2012); (Jha & Rangarajan, 2020) |

***Source:*** Author's compilation

## 4. Empirical Analysis

This research analyses the correlations among ESG, E, S, G, and FVC for the Nifty 500 firms in India from 2015 to 2023. This study also investigated the moderating influence of gender diversity on boards of directors, which is another facet of the interaction among ESG, E, S, G, and FVC. This study used a fixed effects panel data regression model to assess the correlations among these factors. ESG issues have a diverse association with several FVC metrics. The findings demonstrated that the ESG, E, and G scores had a relatively little influence on ROA, ROE, Tobin's Q, and EVA (Tables 6 to 13). Table 9 demonstrates a significant positive association between ROE and S scores. Businesses that provide supplementary information on their social initiatives are likely to achieve greater returns on equity. Table 14, available here, offers a succinct overview of the findings. The study further investigates the moderating influence of gender diversity on boards on these linkages. The findings suggest that the percentage of female directors does not seem to influence the association between ESG and FVC (Tables 6 to 9). The lack of moderation may result from cultural and institutional influences, since the strategic core of Indian firms is still integrating gender diversity and ESG initiatives. As a great deal of research posits that women directors can bring about the existence of different points of view in corporations because they might concentrate the issues of social integrity, it can be concluded that the success of this role in companies is very much dependent on the country where the company does business (Campopiano et al., 2022; Byron & Post, 2016). More specifically, in developed countries, female directors can actively improve ESG. However, in developing countries, their credibility is generally questioned (Wasiuzzaman & Subramaniam, 2023). Women in less developed countries occupy a low percentage of the seats on corporate boards, which leads to a higher possibility of gender-based discrimination and controls in decision-making (Husted & Sousa-Filho). A number of related factors like institutional frameworks, the

social-cultural conditions, and the inner gender stereotype prejudices have an impact on women's contributions on board (Gangadharan et al., 2016; Sarkar & Selarka, 2021). The study implies that companies should focus on enhancing social initiatives for immediate financial benefits while not overlooking environmental and governance aspects. Comparing these findings with prior research, the minor impact of ESG, E, and G scores on ROA, ROE, Tobin's Q, and EVA is consistent with the mixed results reported in the literature. Buallay et al. (2021) and Liu et al. (2021) also found inconclusive relationships between ESG and financial performance, which could be due to the varying contexts and metrics used in different studies. The substantial positive connection between social (S) scores and ROE aligns with the findings of Carnini Pulino et al. (2022), who noted that enhanced social disclosure leads to higher financial performance. It is possible to justify this conclusion by pointing out that social aspects such as employee relations, diversity, and community participation are becoming more important. These characteristics are likely to enhance a company's image and operational efficiency, which in turn will increase returns on equity.

**Table 6:** ESG Impact on ROA

| **RETURN_ON_ ASSET** | **Coef.** | **St.Err.** | **t-value** | **p-value** | **[95% Conf** | **Interval]** | **Sig** |
|---|---|---|---|---|---|---|---|
| lnESG | .46 | 2.549 | 0.18 | .857 | -4.577 | 5.496 | |
| LnWomenDirectorBRD | .701 | .908 | 0.77 | .441 | -1.093 | 2.496 | |
| lnBeta | .398 | .376 | 1.06 | .291 | -.344 | 1.14 | |
| lnCashflow | 1.151 | .446 | 2.58 | .011 | .269 | 2.032 | ** |
| lnRDExp | .123 | .202 | 0.61 | .545 | -.277 | .522 | |
| lntotalassets | .405 | 3.305 | 0.12 | .903 | -6.125 | 6.934 | |
| Levratio | .569 | .3 | 1.90 | .059 | -.023 | 1.161 | * |
| 2015 | 0 | . | . | . | . | . | |
| 2016 | .771 | .917 | 0.84 | .402 | -1.041 | 2.583 | |
| 2017 | -.238 | .947 | -0.25 | .802 | -2.109 | 1.632 | |
| 2018 | -.418 | 1.098 | -0.38 | .704 | -2.589 | 1.752 | |
| 2019 | .115 | 1.168 | 0.10 | .922 | -2.193 | 2.423 | |
| 2020 | -2.228 | 1.952 | -1.14 | .256 | -6.086 | 1.629 | |
| 2021 | -3.921 | 3.142 | -1.25 | .214 | -10.13 | 2.288 | |
| 2022 | .043 | 2.632 | 0.02 | .987 | -5.158 | 5.243 | |
| Constant | -6.392 | 37.948 | -0.17 | .866 | -81.374 | 68.59 | |

| | | | |
|---|---|---|---|
| Dep Mean Var | 11.262 | SD dependent var | 7.504 |
| R^2 | 0.110 | No. of observations | 486 |
| F-test | 2.507 | Probability > F | 0.004 |
| Akaike Info criterion (AIC) | 2676.164 | Bayesian Info criterion (BIC) | 2734.771 |

**** p<.01, ** p<.05, * p<.1*

**Table 7:** E/S/G impact on ROA

| RETURN_ON_ ASSET | Coef. | St.Err. | t-value | p-value | [95% Conf | Interval] | Sig |
|---|---|---|---|---|---|---|---|
| lnEnvScore | -.271 | .354 | -0.76 | .446 | -.971 | .429 | |
| lnSocialScore | 3.021 | 1.293 | 2.34 | .021 | .467 | 5.575 | ** |
| lnGovScore | -5.609 | 5.492 | -1.02 | .309 | -16.463 | 5.246 | |
| LnWomenDirectorBRD | .263 | .892 | 0.29 | .768 | -1.499 | 2.025 | |
| lnBeta | .436 | .381 | 1.14 | .255 | -.317 | 1.189 | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| lnCashflow | 1.251 | .442 | 2.83 | .005 | .378 | 2.125 | *** |
| lnRDExp | .191 | .202 | 0.95 | .345 | -.207 | .59 | |
| Lntotalassets | .179 | 3.445 | 0.05 | .959 | -6.629 | 6.987 | |
| Levratio | .496 | .317 | 1.56 | .12 | -.131 | 1.124 | |
| 2015 | 0 | . | . | . | . | . | |
| 2016 | .568 | .974 | 0.58 | .561 | -1.357 | 2.493 | |
| 2017 | -.65 | 1.023 | -0.64 | .526 | -2.672 | 1.371 | |
| 2018 | -.627 | 1.162 | -0.54 | .59 | -2.924 | 1.67 | |
| 2019 | -.272 | 1.251 | -0.22 | .828 | -2.745 | 2.2 | |
| 2020 | -2.946 | 2.023 | -1.46 | .148 | -6.944 | 1.053 | |
| 2021 | -4.724 | 3.258 | -1.45 | .149 | -11.164 | 1.715 | |
| 2022 | -.749 | 2.832 | -0.26 | .792 | -6.345 | 4.848 | |
| Constant | 13.134 | 30.269 | 0.43 | .665 | -46.685 | 72.953 | |

| | | | |
|---|---|---|---|
| Dep Mean Var | 11.282 | SD dependent var | 7.575 |
| R^2 | 0.148 | No. of observations | 472 |
| F-test | 3.235 | Probability > F | 0.000 |
| Akaike Info criterion (AIC) | 2589.938 | Bayesian Info criterion (BIC) | 2656.450 |

*** p<.01, ** p<.05, * p<.1

**Table 8:** ESG impact on ROE

| RETURN_COM_EQY | Coef. | St.Err. | t-value | p-value | [95% Conf | Interval] | Sig |
|---|---|---|---|---|---|---|---|
| lnESG | 3.05 | 4.716 | 0.65 | .519 | -6.268 | 12.368 | |
| LnWomenDirectorBRD | 1.629 | 1.93 | 0.84 | .4 | -2.185 | 5.444 | |
| lnBeta | .537 | .568 | 0.95 | .346 | -.584 | 1.659 | |
| lnCashflow | 1.774 | .688 | 2.58 | .011 | .414 | 3.134 | ** |
| lnRDExp | .032 | .342 | 0.09 | .926 | -.645 | .708 | |
| lntotalassets | .304 | 4.865 | 0.06 | .95 | -9.308 | 9.917 | |
| Levratio | -.236 | .478 | -0.49 | .622 | -1.18 | .708 | |
| 2015b | 0 | . | . | . | . | . | |
| 2016 | -1.544 | 2.147 | -0.72 | .473 | -5.786 | 2.698 | |
| 2017 | -4.566 | 2.319 | -1.97 | .051 | -9.149 | .017 | * |
| 2018 | -5.564 | 2.59 | -2.15 | .033 | -10.682 | -.446 | ** |
| 2019 | -5.245 | 2.727 | -1.92 | .056 | -10.634 | .144 | * |
| 2020 | -8.733 | 3.818 | -2.29 | .024 | -16.277 | -1.189 | ** |
| 2021 | -11.1 | 4.78 | -2.32 | .022 | -20.545 | -1.656 | ** |
| 2022 | -4.59 | 4.485 | -1.02 | .308 | -13.452 | 4.272 | |
| Constant | -4.882 | 56.07 | -0.09 | .931 | -115.676 | 105.913 | |

| | | | |
|---|---|---|---|
| Dep Mean Var | 20.207 | SD dependent var | 13.675 |
| R^2 | 0.116 | No. of observations | 485 |
| F-test | 2.694 | Probability > F | 0.002 |
| Akaike Info criterion (AIC) | 3247.666 | Bayesian Info criterion (BIC) | 3306.244 |

*** p<.01, ** p<.05, * p<.1

**Table 9:** E/S/G impact on ROE

| **RETURN_COM_EQY** | **Coef.** | **St.Err.** | **t-value** | **p-value** | **[95% Conf** | **Interval]** | **Sig** |
|---|---|---|---|---|---|---|---|
| lnEnvScore | -1.068 | .748 | -1.43 | .156 | -2.547 | .411 | |
| lnSocialScore | 6.954 | 2.089 | 3.33 | .001 | 2.826 | 11.082 | *** |
| lnGovScore | -11.445 | 8.973 | -1.28 | .204 | -29.179 | 6.289 | |
| LnWomenDirectorBRD | .773 | 1.894 | 0.41 | .684 | -2.97 | 4.515 | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| lnBeta | .582 | .582 | 1.00 | .319 | -.569 | 1.733 | |
| lnCashflow | 1.963 | .685 | 2.87 | .005 | .61 | 3.317 | *** |
| lnRDExp | .159 | .333 | 0.48 | .633 | -.499 | .818 | |
| lntotalassets | -.15 | 5.121 | -0.03 | .977 | -10.271 | 9.971 | |
| levratio | -.351 | .514 | -0.68 | .497 | -1.367 | .666 | |
| 2015b | 0 | . | . | . | . | . | |
| 2016 | -1.837 | 2.225 | -0.83 | .41 | -6.235 | 2.56 | |
| 2017 | -5.117 | 2.434 | -2.10 | .037 | -9.928 | -.307 | ** |
| 2018 | -5.672 | 2.683 | -2.11 | .036 | -10.975 | -.37 | ** |
| 2019 | -5.49 | 2.828 | -1.94 | .054 | -11.079 | .098 | * |
| 2020 | -9.562 | 3.923 | -2.44 | .016 | -17.315 | -1.809 | ** |
| 2021 | -11.904 | 4.922 | -2.42 | .017 | -21.631 | -2.177 | ** |
| 2022 | -5.33 | 4.711 | -1.13 | .26 | -14.64 | 3.981 | |
| Constant | 41.307 | 48.325 | 0.85 | .394 | -54.2 | 136.815 | |

| | | | |
|---|---|---|---|
| Dep Mean Var | 20.254 | SD dependent var | 13.793 |
| R^2 | 0.166 | No. of observations | 471 |
| F-test | 3.568 | Probability > F | 0.000 |
| Akaike Info criterion (AIC) | 3138.351 | Bayesian Info criterion (BIC) | 3204.829 |

**** p<.01, ** p<.05, * p<.1*

**Table 10:** ESG impact on Tobin's Q

| **lnTobinsQ** | **Coef.** | **St.Err.** | **t-value** | **p-value** | **[95% Conf** | **Interval]** | **Sig** |
|---|---|---|---|---|---|---|---|
| lnESG | .039 | .035 | 1.14 | .257 | -.029 | .108 | |
| lnWomenDirectorBRD | -.05 | .031 | -1.63 | .106 | -.111 | .011 | |
| Lnmarketcap | .8 | .042 | 19.08 | 0 | .717 | .883 | *** |
| lnBeta | .003 | .003 | 1.00 | .32 | -.003 | .008 | |
| Lntotalassets | -.769 | .043 | -17.69 | 0 | -.855 | -.683 | *** |
| lnCashflow | .006 | .003 | 2.30 | .023 | .001 | .011 | ** |
| lnRDExp | -.001 | .003 | -0.43 | .667 | -.008 | .005 | |
| Levratio | .016 | .006 | 2.68 | .008 | .004 | .027 | *** |
| 2015b | 0 | . | . | . | . | . | |
| 2016 | -.01 | .011 | -0.95 | .342 | -.031 | .011 | |
| 2017 | -.015 | .017 | -0.86 | .39 | -.048 | .019 | |
| 2018 | -.013 | .019 | -0.68 | .498 | -.051 | .025 | |
| 2019 | -.022 | .026 | -0.84 | .4 | -.073 | .029 | |
| 2020 | -.031 | .034 | -0.92 | .359 | -.099 | .036 | |
| 2021 | -.017 | .032 | -0.52 | .606 | -.08 | .047 | |
| 2022 | -.005 | .04 | -0.12 | .908 | -.083 | .074 | |
| Constant | -.181 | .452 | -0.40 | .689 | -1.074 | .712 | |

| | | | |
|---|---|---|---|
| Dep Mean Var | 1.079 | SD dependent var | 0.712 |
| R^2 | 0.949 | No. of observations | 486 |
| F-test | 230.061 | Probability > F | 0.000 |
| Akaike Info criterion (AIC) | -1463.644 | Bayesian Info criterion (BIC) | -1400.851 |

**** p<.01, ** p<.05, * p<.1*

**Table 11**: E/S/G impact on Tobin's Q

| **lnTobinsQ** | **Coef.** | **St.Err.** | **t-value** | **p-value** | **[95% Conf** | **Interval]** | **Sig** |
|---|---|---|---|---|---|---|---|
| lnEnvScore | -.002 | .004 | -0.34 | .731 | -.01 | .007 | |
| lnSocialScore | .024 | .016 | 1.52 | .131 | -.007 | .055 | |
| lnGovScore | .022 | .106 | 0.20 | .84 | -.189 | .232 | |
| lnWomenDirectorBRD | -.052 | .031 | -1.67 | .097 | -.114 | .01 | * |
| lnmarketcap | .794 | .043 | 18.29 | 0 | .709 | .88 | *** |
| lnBeta | .003 | .003 | 1.00 | .318 | -.003 | .01 | |
| lnCashflow | .007 | .002 | 2.91 | .004 | .002 | .012 | *** |
| lnRDExp | -.001 | .004 | -0.23 | .819 | -.008 | .006 | |
| lntotalassets | -.769 | .043 | -17.87 | 0 | -.854 | -.684 | *** |
| Levratio | .015 | .006 | 2.37 | .019 | .003 | .027 | ** |
| 2015b | 0 | . | . | . | . | . | |
| 2016 | -.014 | .011 | -1.30 | .197 | -.036 | .007 | |
| 2017 | -.017 | .018 | -0.96 | .337 | -.053 | .018 | |
| 2018 | -.015 | .021 | -0.73 | .468 | -.056 | .026 | |
| 2019 | -.024 | .027 | -0.88 | .382 | -.077 | .03 | |
| 2020 | -.037 | .035 | -1.07 | .288 | -.105 | .032 | |
| 2021 | -.02 | .032 | -0.62 | .537 | -.084 | .044 | |
| 2022 | -.006 | .041 | -0.15 | .88 | -.088 | .076 | |
| Constant | -.14 | .448 | -0.31 | .754 | -1.026 | .745 | |

| | | | |
|---|---|---|---|
| Dep Mean Var | 1.078 | SD dependent var | 0.718 |
| R^2 | 0.948 | No. of observations | 472 |
| F-test | 179.048 | Probability > F | 0.000 |
| Akaike Info criterion (AIC) | -1415.272 | Bayesian Info criterion (BIC) | -1344.604 |

**** p<.01, ** p<.05, * p<.1*

**Table 12: ESG impact on EVA**

| **lnEVA** | **Coef.** | **St.Err.** | **t-value** | **p-value** | **[95% Conf** | **Interval]** | **Sig** |
|---|---|---|---|---|---|---|---|
| lnESG | -.229 | .605 | -0.38 | .706 | -1.427 | .969 | |
| lnWomenDirectorBRD | .289 | .185 | 1.56 | .122 | -.078 | .655 | |
| lnmarketcap | .72 | .163 | 4.41 | 0 | .397 | 1.044 | *** |
| lnBeta | 0 | .035 | -0.01 | .99 | -.07 | .07 | |
| lnCashflow | .06 | .06 | 1.00 | .32 | -.059 | .18 | |
| lntotalassets | -.535 | .431 | -1.24 | .217 | -1.389 | .318 | |
| lnRDExp | .051 | .032 | 1.59 | .115 | -.013 | .114 | |
| Levratio | .023 | .048 | 0.47 | .64 | -.073 | .119 | |
| 2015b | 0 | . | . | . | . | . | |
| 2016 | .123 | .104 | 1.18 | .242 | -.084 | .33 | |
| 2017 | -.177 | .182 | -0.97 | .333 | -.537 | .183 | |
| 2018 | .004 | .222 | 0.02 | .984 | -.436 | .445 | |
| 2019 | .037 | .222 | 0.16 | .87 | -.404 | .477 | |
| 2020 | -.139 | .364 | -0.38 | .703 | -.859 | .581 | |
| 2021 | .516 | .268 | 1.92 | .057 | -.015 | 1.047 | * |
| 2022 | .708 | .323 | 2.19 | .031 | .068 | 1.349 | ** |
| Constant | 4.654 | 3.5 | 1.33 | .186 | -2.278 | 11.585 | |

| | | | |
|---|---|---|---|
| Dep Mean Var | 7.852 | SD dependent var | 1.651 |
| R^2 | 0.357 | No. of observations | 293 |

| | | | |
|---|---|---|---|
| F-test | 9.183 | Probability > F | 0.000 |
| Akaike Info criterion (AIC) | 421.168 | Bayesian Info criterion (BIC) | 476.371 |
| *** p<.01, ** p<.05, * p<.1 | | | |

**Table 13:** E/S/G impact on EVA

| **lnEVA** | **Coef.** | **St.Err.** | **t-value** | **p-value** | **[95% Conf** | **Interval]** | **Sig** |
|---|---|---|---|---|---|---|---|
| lnWomenDirectorBRD | .28 | .191 | 1.46 | .146 | -.099 | .659 | |
| lnEnvScore | -.012 | .073 | -0.16 | .873 | -.156 | .132 | |
| lnSocialScore | .282 | .172 | 1.64 | .103 | -.058 | .622 | |
| lnGovScore | -.346 | 1.222 | -0.28 | .778 | -2.767 | 2.075 | |
| lnmarketcap | .618 | .182 | 3.39 | .001 | .257 | .979 | *** |
| lnBeta | .009 | .039 | 0.24 | .811 | -.068 | .087 | |
| lnCashflow | .085 | .059 | 1.44 | .152 | -.032 | .203 | |
| lnRDExp | .056 | .031 | 1.82 | .071 | -.005 | .118 | * |
| lntotalassets | -.568 | .471 | -1.21 | .23 | -1.502 | .365 | |
| Levratio | .026 | .049 | 0.54 | .592 | -.071 | .124 | |
| 2015b | 0 | . | . | . | . | . | |
| 2016 | .064 | .102 | 0.63 | .533 | -.139 | .267 | |
| 2017 | -.241 | .172 | -1.40 | .164 | -.582 | .1 | |
| 2018 | -.046 | .23 | -0.20 | .843 | -.501 | .41 | |
| 2019 | -.033 | .241 | -0.14 | .89 | -.511 | .444 | |
| 2020 | -.267 | .377 | -0.71 | .481 | -1.014 | .48 | |
| 2021 | .367 | .292 | 1.26 | .211 | -.211 | .946 | |
| 2022 | .575 | .335 | 1.72 | .089 | -.088 | 1.238 | * |
| Constant | 5.948 | 6.178 | 0.96 | .338 | -6.288 | 18.183 | |

| | | | |
|---|---|---|---|
| Dep Mean Var | 7.873 | SD dependent var | 1.657 |
| R^2 | 0.370 | No. of observations | 288 |
| F-test | 9.598 | Probability > F | 0.000 |
| Akaike Info criterion (AIC) | 417.153 | Bayesian Info criterion (BIC) | 479.423 |

**Table 14:** Summary of Findings

| Hypothesis | Description | Result |
|---|---|---|
| H0a | ESG has no impact on Return on Assets i.e $\beta_{ESG}$=0 | Accept |
| $H0a_1$ | E has no impact on Return on Assets i.e $\beta_E$=0 | Accept |
| $H0a_2$ | S has no impact on Return on Assets i.e β_S=0 | Reject |
| $H0a_3$ | G has no impact on Return on Assets i.e $\boldsymbol{\beta_G}$=0 | Accept |
| H0b | ESG has no impact on Return on Equity i.e $\boldsymbol{\beta_{ESG}}$=0 | Accept |
| $H0b_1$ | E has no impact on Return on Equity i.e $\boldsymbol{\beta_E}$=0 | Accept |
| $H0b_2$ | S has no impact on Return on Equity i.e $\boldsymbol{\beta_S}$=0 | Accept |
| $H0b_3$ | G has no impact on Return on Equity i.e $\boldsymbol{\beta_G}$=0 | Accept |
| H0c | ESG has no impact on Tobin's Q i.e $\boldsymbol{\beta_{ESG}}$=0 | Accept |
| $H0c_1$ | E has no impact on Tobin's Q i.e $\beta_E$=0 | Accept |
| $H0c_2$ | S has no impact on Tobin's Q i.e $\boldsymbol{\beta_S}$=0 | Accept |
| $H0c_3$ | G has no impact on Tobin's Q i.e $\boldsymbol{\beta_G}$=0 | Accept |
| H0d | ESG has no impact on Economic Value Added i.e $\boldsymbol{\beta_{ESG}}$=0 | Accept |
| $H0d_1$ | E has no impact on Economic Value Added i.e $\boldsymbol{\beta_E}$=0 | Accept |
| $H0d_2$ | S has no impact on Economic Value Added i.e $\boldsymbol{\beta_S}$=0 | Accept |
| $H0d_3$ | G has no impact on Economic Value Added i.e $\boldsymbol{\beta_G}$=0 | Accept |

## 5. Conclusion

This study investigates the links between ESG, ESG factors and FVC for Nifty 500 companies in India from 2015 to 2023. The research also analyses the moderating impact of board gender diversity on these correlations. Utilizing a fixed effects panel data regression model, the study gives valuable insights into how ESG practices influence different financial performance measures like as ROA, ROE, Tobin's Q, and EVA. While social activities demonstrate a clear beneficial influence on ROE, environmental and governance variables do not exhibit a significant immediate effect on the financial indicators analysed. Additionally, board gender diversity does not appear to mitigate these associations, underscoring the need for a more integrated approach to maximise the potential benefits of gender-diverse boards in increasing ESG-related financial outcomes. Companies should analyse the special influence of social activities on financial performance and consider strengthening their social disclosures and initiatives. This can mean more engagement with community projects, improved labor practices, and better consumer interactions. However, corporations should not disregard environmental and governance components, even if the financial gains are not immediately obvious. There is a need to develop a more advantageous regulatory environment that promotes ESG initiatives, mainly in environmental and governance sectors, to guarantee that these measures materialise into financial returns. The findings indicate for future research to explore the long-term implications of ESG policies on financial performance and to understand better the pathways via which gender diversity on boards could influence company outcomes. This empirical inquiry gives important insights but is not without constraints. Its cross-sectional methodology lowers the capacity to demonstrate causal linkages between ESG factors and FVC. Additionally, the employment of various data sources could produce measurement inaccuracies, decreasing the quality of the results. The study's special emphasis on Indian enterprises may restrict the generalizability of the findings to other locations with diverse situations. The potential endogeneity of variables and the complexity of the model also influence the conclusions. Furthermore, the study's period can ignore growing market situations. While it offers information on the connection between ESG concerns and gender diversity, these

limitations advise cautious interpretation and underline the need for future investigation to overcome these deficiencies.

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