INVESTIGATING THE FACTORS DETERMINING GREEN BOND ISSUANCE IN EMERGING MARKETS: EMPHASIZING THE DIRECT AND MODERATING ROLE OF BOARD CHARACTERISTICS AND ESG PERFORMANCE

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OPEN ACCESS

How to cite this paper: Biju, A. V. N., Alora, A., Sasidharan, A., & Kallany, A. (2024). Investigating the factors determining green bond issuance in emerging markets: Emphasizing the direct and moderating role of board characteristics and ESG performance. *Corporate Ownership & Control, 21*(4), 60–74.
https://doi.org/10.22495/cocv21i4art6

ISSN Online: 1810-3057
ISSN Print: 1727-9232

Received: 06.10.2024
Accepted: 17.12.2024

JEL Classification: C50, D22, Q54
DOI: 10.22495/cocv21i4art6

Abstract

The purpose of this study is threefold. First, this paper looks into whether the characteristics of corporate boards influence green bond issuance (GBI). Second, it aims to investigate whether environmental, social, and governance (ESG) performance is the driving force behind the GBI. Third, this study examines how ESG and its dimensions moderate GBI and board characteristics. Using logistic and panel regression on a sample of firms listed on the National Stock Exchange of India (NSE) between 2012 and 2023, we find that Indian boards are still reluctant to issue green bonds, owing to the understanding that Indian investors are price-sensitive, preferring conventional brown bonds with higher returns over GBI with lower returns. However, our findings indicate that GBI in emerging economies is positively related to ESG performance implying that regulatory requirements to enhance ESG scores force firms to explore GBI. The results underscore the moderating effect of ESG on the relationship between board characteristics and GBI is positive.

Keywords: Green Bonds, ESG, Green Bond Issuance, Board Characteristics, Corporate Governance

Authors' individual contribution: Conceptualization — A.V.N.B., A.A., and A.S.; Methodology — A.V.N.B. and A.S.; Software — A.S. and A.K.; Validation — A.V.N.B., A.A., and A.S.; Formal Analysis — A.S.; Investigation — A.V.N.B. and A.A.; Resources — A.S. and A.K.; Data Curation — A.K.; Writing — A.V.N.B. and A.S.; Visualization — A.S.; Supervision — A.V.N.B.; Project Administration — A.V.N.B.; Funding Acquisition — A.V.N.B.

Declaration of conflicting interests: The Authors declare that there is no conflict of interest.

Acknowledgements: The Authors would like to acknowledge the University of Kerala (UOK) for funding this research under the seed Money for New Grant/Award Number 2447/2023/UOK dated 15.03.2023.

1. INTRODUCTION

In the context of climate change adaptation and mitigation, green bonds act as a fixed-income security that can be utilized to fund activities that contribute to climate goals. On the other hand, the issue for businesses is to demonstrate their commitment to the environment through green bond issuance (GBI) without giving the impression that they are indulging in greenwashing. The fight against global warming and greenhouse gas emissions includes using green bonds as a component. The emissions of greenhouse gases created by businesses that cover the earth cause climate change, and the effects of climate change are experienced differently and to varying degrees based on where you are in the world. On the other hand, the threat of climate change is significant for many Asian nations including Myanmar, the Philippines, Bangladesh, Vietnam, and Thailand have been among the countries that the phenomenon of climate change has hit the hardest (Miyan, 2015). Kreft et al. (2016), for instance, point out that although many countries have experienced the consequences of climate change, these countries have been among the ones that have been hit the hardest. This is because increases in economic activity lead to a rise in the demand for clean energy, leading to an increase in greenhouse gas emissions (Bekun et al., 2019).

Concurrently with the Sustainable Development Goals (SDGs)[1], governments all across the world are pushing for sustainable finance rather than conventional finance, and this is something that is institutionalized in the objectives that were highlighted in the Paris Agreement in 2015[2]. To ensure that the increase in the average temperature of the planet stays "well below" 2 degrees Celsius, it is anticipated that new investments amounting to around $55 trillion in the United States will be required (Copley, 2023). According to Bhattacharya et al. (2016) and the Organization for Economic Co-operation and Development (OECD, 2017), this investment will include incremental investments in long-term climate-friendly infrastructure. If this level of investment is fulfilled, Nassiry (2019) forecasts that the SDG will be achieved. Between 2016 and 2030, the Asian Development Bank (ADB) forecasts that the infrastructure deficit in the Asian region will amount to a total of $26.2 trillion. A total of $26.2 trillion is required to be invested by the 45 developing countries that are bank members. Of this amount, $3.6 trillion is expressly reserved for climate change adaptation and mitigation expenditures. A further $14.7 trillion is necessary to construct infrastructure or generate power (World Bank, 2017). The Association of South East Asian Nations (ASEAN) Secretariat and the United Nations Conference on Trade and Development (UNCTAD) estimate that Southeast Asia, which is a part of the Asian continent, needs a yearly investment of approximately $110 billion for infrastructure projects in the areas of water and sanitation, information and communication technology, transportation, and electricity distribution.

According to the United Nations Environment Program (UNEP) (Zadek & Robins, 2018), developments in green financing can restructure the economy, reduce total investment and operational costs, and support global sustainability goals (Nassiry, 2019). According to estimates from the Asian Development Bank, its member nations need to invest $3.6 trillion more in climate-resilient infrastructure (ADB, 2017). The development of environmentally friendly technologies and financing is an essential component in bridging this gap. According to Volz et al. (2018), the term "green finance" refers to any investment or lending activities that take into consideration the impact on the environment and promote environmental sustainability. Recent trends in China, Japan, and India reveal an exponential increase in green innovations, particularly in issuing green bonds (Barua & Chiesa, 2019). Even though the European Investment Bank (EIB) issued the first green bond in 2007; consequently, green bonds have experienced exponential growth, and the GBI for the year 2023 increased by 45%. However, this transition to sustainable energy in developing nations requires a significant investment shift away from naturally resource-intensive and polluting businesses toward technologies and business models that are more resource-efficient. According to the Global Adaptation Index, several nations in South and Southeast Asia are vulnerable to the effects of climate change. The challenge has become even more severe due to the failure of environmental, social, and governance (ESG) actions to demonstrate a commitment to enhancing the adaptive capacity of their systems to climate change (Hoque et al., 2016). There is a gap in the literature notices that the determinants of green finance initiatives of Asian countries, especially emerging economies.

Even though the global market for green bonds is developing, partly due to measures taken to reduce the effects of climate change, the academic community needs to be more well-versed in the variables that drive the issue of green bonds. Many components are involved, and some are mentioned here for reference. Zhang, Li, et al. (2021) state that GBI in the beginning are advantageous to the company because of the cheap cost of funding. This is the case since green bonds are more accessible to issue. Consequently, this leads to a decrease in the total capital cost of the company, which in turn results in an increase in the company's value. According to those who support the signalling theory, GBI would improve the company's image, subsequently impacting the market price of the company's shares. Because investors prefer sustainability, there has been an increase in the number of green bonds issued worldwide (Abakah et al., 2023; Flammer, 2021). This is because investors are more willing to purchase green bonds due to their sustainability sentiments. According to Zhang, Li, et al. (2021), the announcement of green bonds causes a market appreciation of shares. Green bonds are closely related to ESG factors; hence, the other predictors of GBI, which include corporate governance of firms, place a greater emphasis on the phenomena of GBI. Zheng et al. (2023) research indicates that each green bond issue produces an average of 20.5% of ESG appreciation. This underlines a strong ESG performance, indicating that the company paid more attention to green growth and sustainability and accorded major priority to green efforts, and vice versa. This trend showcases

[1] The SDGs include 17 global goals (https://sdgs.un.org/goals).
[2] https://unfccc.int/process-and-meetings/the-paris-agreement

that the company is more environmentally conscious. More convincingly, it has been demonstrated that the issuing of green bonds, or more specifically, the announcements of green bond issues, leads to an increase in the market price of shares (Kodiyatt et al., 2024; Cheng et al., 2022; Zheng et al., 2023; Flammer, 2020; Tang & Zhang, 2020).

Out of the noted areas discussed in the previous para, one of the pertinent topics of green bond research is the influence of GBI on corporate financial performance (CFP). In their discussion, the researchers focus on the most critical aspect of the GBI event, which increased stock prices (Tang & Zhang, 2020). Within the global stock market context, it was also demonstrated that the stock prices of green bond issuers possessed increased liquidity. Additionally, following the opinion of Zhang, Zhao, et al. (2021) about the greenium effect, also known as the green premium, is a significant factor that contributes to reducing the cost of debt associated with the GBI. The willingness of investors to purchase green bonds at interest rates that are lower than those of conventional bonds is the defining characteristic of this phenomenon. Because of this, the total cost of capital of the firm is reduced. Furthermore, Flammer (2021) documents that investors react positively to announcements of green bonds taking the help of event study methodologies. Since then due to these market forces due to GBI, the environmental performance of companies has significantly improved.

Further arguments explore the importance of GBI in developing economies; the race to the bottom (RTB) hypothesis says that developed economies are reluctant to commit to green growth because green growth is a more costly affair than conventional growth (Sadiqa et al, 2022). However, existing green bond research in developing economies focuses only on the association of GBI and its influence on market prices, even if it is minimal. It does not entirely examine the relevant factors determining GBI; whether more green bonds are issued due to the intention for more ESG scores together or for securing environmental scores social score, or governance score have yet to be investigated. Additionally, the GBI is a result of the significant influence of corporate governance, including board size, gender, and diversity, which has not yet been thoroughly examined. Fama and Jensen (1983) state that the company board has a significant role in aligning with the stakeholders' interests. However, previous literature focused more on developed economies, which proved that gender on the board and women on the board are more sensitive toward environmental actions and GBI (Galbreath, 2018). Therefore, this paper seeks to fill that gap that exists in emerging economy firms, where how corporate governance variables influence the GBI by giving a provision for the moderating role of ESG which is a very novel idea to perform research.

This paper makes the following contributions. Initially, we examine the under-researched domain of green bonds in emerging markets, explicitly identifying the factors that significantly affect firms' decisions to issue green bonds. We assess the impact of corporate governance variables, such as board gender diversity, the decisions of independent directors, chief executive officer (CEO) tenure, and board tenure, on the GBI. We examine whether a publicly traded company with superior ESG performance issues green bonds and the volume of green bonds issued by publicly traded companies with enhanced ESG practices. Secondly, we examine the impact of ESG activities on GBI. We analyze the distinct elements of ESG, encompassing environmental, social, and governance issues, that influence corporate GBI. Third, we analyze the moderating effect of ESG initiatives on the correlation between corporate governance and GBI. Fourth, this study offers actionable insights for policymakers, firms, and investors interested in enhancing sustainable finance by providing evidence on the impact of board characteristics and ESG performance on GBI. Fifth, the study integrates corporate governance and sustainable finance by investigating board characteristics' direct and indirect effects on GBI, enhancing the depth of the governance-finance literature.

Our investigation confirms a negative direct association between the board characteristics and GBI implying that Indian boards were still reluctant to issue green bonds since the understanding that the Indian investors are price sensitive, as they prefer conventional brown bonds with higher return rather than GBI with lower return. However, our findings highlighted that GBI in emerging markets is positively influenced by ESG performance. Upon checking on the moderation effect of ESG in conjunction with the direct association of board features and GBI, find a positive moderating role of ESG that influences GBI.

The rest of the paper is arranged in the following manner. Section 2 delves into the development of hypotheses and our review of the literature for theoretical underpinnings. Section 3 includes data and methodology and describes the specifics of the data and procedures utilized to produce our findings. Section 4 presents empirical findings based on our analysis and discussion. Section 5 provides a comprehensive account of the concluding remarks and policy implications.

2. LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

2.1. Green bond issuance and market prices of firms

The Green Bond Principles (GBP) of the International Capital Market Association (ICMA) define green bonds as "any type of bond instrument where the proceeds will be exclusively applied to finance or re-finance, in part or full, new and existing eligible Green Projects […] and which are aligned with the four core components of the GBP" (ICMA, 2021, p. 3). The initial component is the exclusive allocation of bond proceeds to eligible green initiatives. The second component is the procedure by which the issuer ascertains the projects' eligibility for the green projects categories. The third component is the net proceeds or a quantity equivalent to these net proceeds should be allocated to a sub-account and transmitted to a sub-portfolio designated for climate mitigation initiatives. The fourth component is that issuers should guarantee that current information regarding the utilization of proceeds is easily accessible until total allocation is achieved. These four components are mandatory for eligible green bond issuers and an annual update of this information is recommended.

One of the most prominent areas of green bond research is the implementation of signaling theory, which posits that green bonds generate market appreciations for their issuers. Nevertheless, the research conducted in the field of green bonds has demonstrated that stock returns respond to GBI in one of three ways: positively, negatively, or inconclusive (Kodiyatt et al., 2024; Cheng et al., 2022; Zheng et al., 2023; Flammer, 2020; Tang & Zhang, 2020). As a consequence of the GBI, researchers including Flammer (2021), Larcker and Watts (2020), Tang and Zhang (2020), and Zerbib (2019) have focused on the improvement of market prices. Hu et al. (2021) argued that green bonds increase the long-term value of issuing companies by improving the operational efficiency and profitability of enterprises and by expanding the stock prices of the issuing company. Flammer (2021) found that listed corporations responded favorably to the GBI announcements. These returns are more robust for securities held by long-term investors, green investors, first-time green bond issuers, and third-party-certified bonds. Tang and Zhang (2020) conducted research that investigated green bonds and their favorable stock market reaction to their issuance. Laborda and Sanchez-Guerra (2021) examined the impact of GBI on issuing firms and determined that the stock market responds favorably to GBI. Zhou and Cui (2019) illustrated that the announcement of a GBI can positively impact the profitability, operational performance, and innovation capacity of a company's stock pricing. This lends credence to the notion that GBI is positive for firms to appreciate the efficiency of operations. In the same story, Tang and Zhang (2020) observed an appreciating return in the Chinese market. Li et al. (2022) found that a pricing premium or greenium effect on corporate green bonds in comparison to conventional bonds. Bachelet et al. (2019) ultimately demonstrated that green bonds exhibit reduced price variability, higher yields, and greater liquidity than traditional bonds.

Prior studies also show that green bonds do benefit equity investors. However, according to certain studies, the market does only sometimes value green bonds. For example, Lebelle et al. (2020) demonstrated that the stock returns of the firm due to GBI can range from -0.2% to -0.5%, contingent upon the asset-pricing model. Nayar and Stock (2008) have discovered that equity issue announcements negatively affect the stock market, while bond issues are found to be insignificant. Mocanu et al. (2021) identified substantial negative anomalous sustainable bond returns prior to the publication of the Sustainability Bond Guidelines by the ICMA (2021). Mathew and Sivaprasad (2024) demonstrate that stock returns are influenced by factors such as green bond issue value, bond callability, return on assets, social disclosure score, and announcements. Examining these green bond CFP associations underlines the unclear state of findings that showcases inconclusiveness and contrast in the results.

2.2. Interconnections between ESG, corporate governance, and green bond issuance

While examining the factors that determine GBI, we debate through the literature whether the intention of ESG score upgrading by the ownership has an effect. Investors are increasingly concerned about ESG disclosures, which put companies under pressure to show that they are operating responsibly by disclosing better scores and to see an upgrading momentum. From investors' perspectives, companies will allocate funds to separate initiatives that will achieve both environmental and social objectives (Biju et al., 2023). According to UNCTAD (2020) and Jones and Comfort (2020), green bonds facilitate the raising of capital for environmental initiatives. However, reasoning on how and why GBI benefit from the positive influence of improving ESG scores remains unanswered by academics. It is assumed that the benefits of green bonds attributed to environmental protection will also have positive outcomes for members of society in terms of lowering pollution levels. In addition, Hu et al. (2021) asserted that green bonds affect the long-term value of green bond issuing companies by improving the stock prices of the issuing company and improving their operational efficiency and profitability, thus suggesting that GBI will also positively impact their quality of governance practices.

The purpose of Hyun et al.'s (2020) study was to determine whether or not greenness information is present in green bond yield premiums by comparing them to brown and conventional bond yield premiums. They find no evidence of a yield premium or discount for green bonds; however, they mention that green bonds that have been certified by the Climate Bonds Initiative or subjected to an external examination incur a greenium effect. According to Nanayakkara and Colombage (2019), investors are prepared to pay a premium for green bonds since they help issuers access money and allow investors to diversify their returns. As a result, investors are satisfied with the green bonds. Green bonds offer a positive premium that is statistically significant compared to conventional bonds, which increases as the bond's greenness (Dorfleitner et al., 2022). Even though green bonds with high ESG score firms have lower yields, Immel et al. (2021) asserted that investors pick these bonds because of their sustainability sentiment or commitment towards social components. Chen and Yang (2020) showed that investors are pessimistic about negative news for companies with low ESG scores and optimistic about positive news for high ESG scores. As a risk factor, ESG may affect investors' long-term expected profits for highly rated companies (Cornell, 2021), therefore companies with excellent ESG scores can lower capital costs.

A body of research studies the pricing and sentiment dynamics of green bonds compared to conventional bonds. This research reveals that socially responsible investing is an essential fact that overlaps with green finance. The Global Sustainable Investment Alliance (GSIA) emphasizes the significance of sustainable investments within the Asian area (GSIA, 2017). Given the apparent popularity of sustainable investing or the priority that is put on it, the Association for Sustainable and Responsible Investing in Asia (ASrIA) indicates that ESG integration is the strategy that is most commonly employed in financial centres where sustainable assets are managed (ASrIA, 2014). Although the lack of consistent disclosure rules that address environmental or associated risk concerns makes it challenging to comprehend and value sustainable assets,

the valuation of sustainable assets still needs to be improved. This is consistent with the limited number of Asian financial institutions that have included ESG considerations in their decision-making processes.

Current ESG procedures, disclosures, and experience that the allocation of sustainable responsible (SR) investments captures a major portion of SR investments and ethical behaviours are based on ESG scores issued by rating agencies. The researchers like Drempetic et al. (2020) discovered a significant positive relationship between the size of a company and its ESG score. Given this finding, the question arises as to whether or not larger firms that possess a more significant amount of resources have an advantage due to how the ESG score evaluates the sustainability of corporations. Additionally, the sustainability criteria show that rating agencies do not fully understand or consistently apply sustainability principles to sustainability evaluation processes (Berg et al., 2022; Biju et al., 2023). This causes severe rating biases among the raters that cause information asymmetry finally leading to greenwashing.

In our further literature exploration, while examining the role of ESG in influencing GBI, Cicchiello et al. (2022) have investigated the factors influencing GBI. They found that corporate governance variables like independent directors and board diversity significantly influence GBIs. It is noted that ESG has evolved from corporate social responsibility (CSR), and it is said that ESG is replacing CSR (Thomas et al., 2024). Lehner et al. (2023) document that a more effective corporate governance firm implements a greater number of sustainability initiatives. A lower cost of capital is a consequence of increased sustainability, and a company with a high ESG score will engage in more environmental activities than a company with a lower ESG score.

Signaling theory suggests a signaling argument for GBI (Flammer, 2020, 2021; Fatica & Panzica, 2021; Yeow & Ng, 2021). Hence, the corporate board is interested in providing these signals to get a positive response from the market. Stakeholder, agency, and institutional theories suggest that corporate governance variables significantly impact ESG performance (Ma, Ahmad, et al., 2024). Further, resource dependence theory (Miner, 2006) also suggests that the corporate board is pivotal in advising on financing matters. GBI is a high-level policy decision which needs board approval. However, academics have yet to substantiate the role of these theories on matters relating to the decisions on GBI. Studies by Li et al. (2015) and Velte et al. (2020) specifically investigated the moderating role of CEO tenure for ESG initiatives; however, no study was found that investigated the CEO's role and tenure on GBI. Agency theory further supports the powers of the CEO to boost the firm's reputation (Barnea & Rubin, 2010).

We find literature discussing board characteristics' effect on ESG performance (Wu et al., 2024). Additionally, certain studies indicate that the social score is influenced by the involvement of independent directors in social activities (Beji et al., 2021). The environmental consciousness of firms regarding women's involvement in decision-making has been considerably influenced by the inclusion of women in senior management and leadership positions in recent decades (Gul et al., 2011). Their role in the decision-making process has been highlighted. The above-discussed literature was available to represent the corporate governance characteristics of ESG performance. We understand that a bidirectional causality exists between ESG and GBI, both influence each other, precisely, on the one hand, firms are trying to enhance their ESG score through GBI, and on the other hand, the pressure of board decisions and other characteristics persuade the firm to GBI which enhances the ESG scores. However, the literature on the role of governance and ESG and its individual dimensions like E (environmental), S (social), and G (governance) in GBI is scant. Therefore, the following hypotheses were formulated based on the above-mentioned theoretical underpinnings on examining the effect of board characteristics on the GBI and the influence of ESG pillars on the GBI.

H1a: Board gender diversity is likely to influence green bond issuance positively.

H1b: Board tenure is likely to influence green bond issuance positively.

H1c: Chief executive officer tenure is likely to influence green bond issuance positively.

H1d: Board size is likely to influence green bond issuance positively.

H1e: Independent directors are likely to influence green bond issuance positively.

The following hypotheses were developed upon examining whether ESG performance influences the corporate GBI.

H2a: Environmental criteria (significantly influence the green bond issuance.

H2b: Social criteria significantly influence the green bond issuance.

H2c: Governance criteria significantly influence the green bond issuance.

2.3. Moderating role of ESG performance on corporate governance, and green bond issuance

Cheng et al. (2022) found that the GBI positively impacts ESG, indicating that the ESG scores of the bonds will be improved. The same results were obtained by Zheng et al. (2023), who demonstrated an average of 20.5% of ESG appreciation for each GBI. Previous research has investigated the positive determinants of ESG performance attributable to improved corporate governance (Harjoto et al., 2022). Corporate governance characteristics, such as the tenure of the CEO, gender diversity on the board, the number of independent directors, and the composition of the board of directors, affect ESG performance. The study on the moderating influence of ESG performance on the relationship between GBI and corporate governance is yet to be explored. Some contrasting arguments, like those of Sinha et al. (2022), showed that GBI would not influence ESG performance. However, the studies of Garcia et al. (2023) and Benlemlih et al. (2022) have demonstrated that GBI has the power to reduce carbon emissions. Existing research has gone through the association of board characteristics for ESG performance of firms, including studies that individually analyse the influence of corporate governance variables like CEO tenure, Board gender diversity, the role of independent directors, board size, etc. For example, Abdullah et al. (2024)

discovered the impact of CEO and board features on ESG performance. Usman et al. (2023) and Odriozola et al. (2024) contend that board diversity influences ESG performance. We identified papers such as Chang et al. (2022) that support the use of green bonds for environmental performance. However, we did not find any literature that examined the moderating influence of ESG concerning corporate governance and GBI. To test these, we propose the following hypotheses:

H3a: The environmental factors moderate the impact of board characteristics on green bond issuance.

H3b: The social factors moderate the impact of board characteristics on green bond issuance.

H3c: The governance factors moderate the impact of board characteristics on green bond issuance.

3. RESEARCH DATA AND METHODOLOGY

3.1. Data

Our sample is comprised of the firms that were listed on the National Stock Exchange of India (NSE) and our data were sourced from the Refinitiv Eikon database spanning from 2012 to 2023. This timeframe was chosen to provide a comprehensive overview of corporate GBI trends over a decade, emphasising the economic cycles and regulatory changes that may have influenced corporate behaviour regarding sustainability initiatives. The final sample comprises 200 companies covering 1000 firm-year observations resulting from extensive data collection. The final data was ascertained by diligently excluding observations with missing data, which could have created biases or mistakes in our study.

To validate the findings of our study, we applied a method called winsorization to the variables in our dataset. To reduce the influence of outliers, we winsorized 1% of the variables, which limited the extreme values in the top and bottom 1%. This stage is essential because outliers can disproportionately impact statistical analyses, resulting in inaccurate conclusions. By reducing their influence, we aim to produce more dependable and representative estimates of the correlations between board characteristics and GBI.

Within the scope of this investigation, the dependent variable pertains to the GBI (*GB*), and it is characterized as a binary variable. If the value is 1, it indicates that the company issued a green bond, whereas if the value is 0, it shows that the company did not issue a green bond. For this inquiry, the critical independent variables considered are board size (*BS*), *CEO_TENURE*, *B_TENURE*, and independent directors (*B_IND*).

Our logic for the inclusion of independent variables is as follows. There is a significant relationship between the board's size and the decision-making processes that the organization carries out. A company's board size is the proportion of directors currently serving on the board at any particular time. The independent director variable is expressed as a percentage after dividing the total number of board members by the number of independent directors. This percentage is then used to represent the independent director variable. The term of a CEO may impact the strategic efforts conducted by the business, which may include the GBI. The board's response to problems over sustainability and the GBI could be impacted by the stability and experience that a longer board tenure may suggest. This research uses *ESG* as a moderating variable to evaluate corporate governance's impact on green bonds. During our analysis, we evaluated many control variables, such as leverage (*LEV*), *GROWTH*, and the firm's size (*SIZE*). The likelihood of GBI increases because more high firms have access to a higher quantity of resources and are examined by the public with a greater degree of scrutiny. When calculating this variable, the natural logarithm of the total assets is used. The amount of debt a company carries could affect whether or not it chooses to issue green bonds. This is because highly leveraged businesses might be less willing to take on additional financial responsibilities. Therefore, the variable *LEV* — the proportion of total debt to total borrowings — is the measure that is used to calculate leverage. The extra opportunities and incentives that more excellent growth rates may provide for businesses to participate in green initiatives raise the possibility of GBI and increase the likelihood of GBI. When evaluating growth, the increase in total assets or revenues is considered. Our definition of our variables can be seen in Table 1.

Table 1. Definition of variables and source of data

Variables	*Abbreviations*	*Description and measurement*	*Source*
Dependent variable			
Green bond	*GB*	The binary variable equals 1 if the company issued a green bond and 0 otherwise.	Refinitiv Eikon database
Independent variables			
ESG score	*ESG*	The ESG score is a complete rating of the company that is derived from data that was self-reported in the areas of corporate governance, social responsibility, and the environment.	Refinitiv Eikon database
Environmental score	*E*	Weighted average relative rating derived from informed environmental data.	
Social score	*S*	Based on the social information that was provided, a weighted average relative ranking was calculated.	
Governmental score	*G*	Based on the governance information that was provided, a weighted average relative ranking was calculated.	
Board size	*BS*	The total number of directors serving on the board.	
Board independence	*B_IND*	The ratio of independent directors to the board's size.	
CEO tenure	*CEO_TENURE*	Length of time an individual serves as a CEO of a firm.	
Board tenure	*B_TENURE*	Length of time an individual serves on a board of a firm.	
Control variables			
Firm size	*SIZE*	The natural logarithm of the total assets.	Refinitiv Eikon database
Leverage	*LEV*	The proportion of total assets to borrowings.	
Green revenue	*GR*	The proportion of green revenue to total sales.	
Growth	*GROWTH*	Difference between the current sales and the past sales.	

3.2. Methodology

We applied logistic regression to investigate the impact of board characteristics on GBI. When there are two alternative outcomes for a categorical outcome variable, logistic regression is meant to be used. It can model, for instance, whether a firm issues green bonds using yes, or no. Logistic regression uses independent variables to calculate the likelihood of an event occurring. It estimates the probability that the independent variables will result in the dependent variable equal to 1.

Consequently, there is a non-linear relationship between the independent factors and the outcome probability. This relationship is described by the logistic function in the logit model. Logit regression can manage non-linear correlations between the independent variables and the binary result by converting the dependent variable into log odds. Our equations for the empirical estimation framework are displayed below.

$$GB_{it} = \alpha_0 + \beta_1 BS_{it} + \beta_2 B\_IND_{it} + \beta_3 B\_TENURE_{it} + \beta_4 CEO\_TENURE_{it} + \beta_5 ESG_{it} + \beta_6 SIZE_{it} + \beta_7 LEV_{it} + \beta_8 GR_{it} + \beta_9 GROWTH_{it} + U_i + V_t + \varepsilon_{it} \quad (1)$$

$$GB_{it} = \alpha_0 + \beta_1 BS_{it} + \beta_2 B\_IND_{it} + \beta_3 B\_TENURE_{it} + \beta_4 CEO\_TENURE_{it} + \beta_5 E_{it} + \beta_6 SIZE_{it} + \beta_7 LEV_{it} + \beta_8 GR_{it} + \beta_9 GROWTH_{it} + U_i + V_t + \varepsilon_{it} \quad (2)$$

$$GB_{it} = \alpha_0 + \beta_1 BS_{it} + \beta_2 B\_IND_{it} + \beta_3 B\_TENURE_{it} + \beta_4 CEO\_TENURE_{it} + \beta_5 S_{it} + \beta_6 SIZE_{it} + \beta_7 LEV_{it} + \beta_8 GR_{it} + \beta_9 GROWTH_{it} + U_i + V_t + \varepsilon_{it} \quad (3)$$

$$GB_{it} = \alpha_0 + \beta_1 BS_{it} + \beta_2 B\_IND_{it} + \beta_3 B\_TENURE_{it} + \beta_4 CEO\_TENURE_{it} + \beta_5 G_{it} + \beta_6 SIZE_{it} + \beta_7 LEV_{it} + \beta_8 GR_{it} + \beta_9 GROWTH_{it} + U_i + V_t + \varepsilon_{it} \quad (4)$$

$$GB_{it} = \alpha_0 + \beta_1 BS_{it} + \beta_2 B\_IND_{it} + \beta_3 B\_TENURE_{it} + \beta_4 CEO\_TENURE_{it} + \beta_5 ESG_{it} + \beta_6 ESG * BS_{it} + \beta_7 ESG * B\_IND_{it} + \beta_8 ESG * B\_TENURE_{it} + \beta_9 ESG * CEO\_TENURE_{it} + \beta_{10} SIZE_{it} + \beta_{11} LEV_{it} + \beta_{12} GR_{it} + \beta_{13} GROWTH_{it} + U_i + V_t + \varepsilon_{it} \quad (5)$$

$$GB_{it} = \alpha_0 + \beta_1 BS_{it} + \beta_2 B\_IND_{it} + \beta_3 B\_TENURE_{it} + \beta_4 CEO\_TENURE_{it} + \beta_5 ESG_{it} + \beta_6 E * BS_{it} + \beta_7 E * B\_IND_{it} + \beta_8 E * B\_TENURE_{it} + \beta_9 E * CEO\_TENURE_{it} + \beta_{10} SIZE_{it} + \beta_{11} LEV_{it} + \beta_{12} GR_{it} + \beta_{13} GROWTH_{it} + U_i + V_t + \varepsilon_{it} \quad (6)$$

$$GB_{it} = \alpha_0 + \beta_1 BS_{it} + \beta_2 B\_IND_{it} + \beta_3 B\_TENURE_{it} + \beta_4 CEO\_TENURE_{it} + \beta_5 ESG_{it} + \beta_6 S * BS_{it} + \beta_7 S * B\_IND_{it} + \beta_8 S * B\_TENURE_{it} + \beta_9 S * CEO\_TENURE_{it} + \beta_{10} SIZE_{it} + \beta_{11} LEV_{it} + \beta_{12} GR_{it} + \beta_{13} GROWTH_{it} + U_i + V_t + \varepsilon_{it} \quad (7)$$

$$GB_{it} = \alpha_0 + \beta_1 BS_{it} + \beta_2 B\_IND_{it} + \beta_3 B\_TENURE_{it} + \beta_4 CEO\_TENURE_{it} + \beta_5 ESG_{it} + \beta_6 G * BS_{it} + \beta_7 G * B\_IND_{it} + \beta_8 G * B\_TENURE_{it} + \beta_9 G * CEO\_TENURE_{it} + \beta_{10} SIZE_{it} + \beta_{11} LEV_{it} + \beta_{12} GR_{it} + \beta_{13} GROWTH_{it} + U_i + V_t + \varepsilon_{it} \quad (8)$$

where, U_i and V_t are employed to account for the effects of time and industry, while ε_{it} denotes the residual term. Model 1 investigates the relationship between green bonds, ESG, and corporate governance. Model 2 explores the relationship between environmental variables and green bonds. Model 3 depicts the relationship between green bonds and social factors. The relationship between green bonds and governance factors is explicated by Model 4. The interaction effect of ESG and corporate governance factors is explained by Model 5. Model 6 explains the interaction effect of ESG factors in the association between GBI and corporate governance. The interaction effect of social and corporate governance factors is explicated by Model 7. The interaction effect of governance pillar and corporate governance factors is explained by Model 8. The three-stage least squares (3SLS) and difference-in-differences methods have been used to perform a robustness check.

4. RESEARCH RESULTS AND DISCUSSION

4.1. Summary statistics and correlation matrix

The descriptive statistics and correlation matrix of the variable utilized in the investigation are presented in Table A.1 (see Appendix). The mean, standard deviations, and number of observations for the variable used in the study are reported. The average number of firms in the sample that have issued green bonds is 59.09%, as indicated by the mean value of the dependent variable *GB* of 0.5909. The *GB* variable is likely binary; the value of 1 indicates that a company issued a green bond, while 0 indicates that it does not. In other words, approximately 59% of the 968 firms issued green bonds and others not. The board size of our sample data represents the number of directors serving on the board and the mean value of 9.768 suggests that the average board size is approximately 10 members. The mean value of 5.0155 indicates that the board has an average of five independent directors. It measures the independent directors who are not financially or materially connected to the company in any capacity beyond their board position. The average board tenure is 6.65 years, indicating that directors who are serving on the board have a tenure of 6.65 years. On average, the CEOs in the sample have been in their current positions for approximately 6.14 years implying that the average tenure of a CEO in the dataset is slightly more than six years. The mean value of ESG is 0.424 this score reflects the general level of ESG performance of the firms. The mean environmental score of 0.3866 indicates that, despite the progress of certain firms in their environmental operations, there is still

a significant amount of room for development in the overall context. The social score has an average of 0.4619 and a standard deviation of 0.3120. The average score suggests that firms perform marginally better in terms of environmental factors than in terms of social factors. The governance score has an average of 0.4002 which shows a comparatively better score which indicates transparent governance of the selected firms.

The correlation matrix indicates that green bonds are positively correlated with ESG factors. CEO tenure is negatively correlated with green bonds among the corporate governance factors. Green bonds are positively but not significantly correlated with green revenue, social, and governance factors. Board size is positively and significantly correlated with green bonds among the control variables, whereas leverage is negatively and significantly correlated with green bonds.

4.2. Empirical results

4.2.1. Impact of board characteristics on green bond issuance

Table 2 illustrates the results of the study on the impact of board characteristics on green bonds. While delving into the results part, Model 3 indicates that the tenure of the CEO hurts GBI which is inconsistent with Zheng et al. (2023), who find a positive significance. Nevertheless, the theories of entrenchment and agency are substantiated by a negative correlation between CEO tenure and GBI. This implies that organizations with CEOs who have served for an extended period are less inclined to GBI. CEOs who have been in office for an extended period may resist green change and green growth, preferring to maintain the status quo rather than pursue innovative green initiatives, such as issuing green bonds. This could indicate a discrepancy between the CEO's interests and the overall broader corporate objectives concerning sustainability. In support of our results, agency theory suggests entrenched CEOs may prioritize their interests over the firm's long-term value. If the CEO's agenda does not coincide with sustainability initiatives, they may deprioritize GBI, resulting in lower adoption rates among firms with long-tenured CEOs. The concentration of authority within firms when the CEO also serves as chairman can create problems in promoting sustainability. CEOs with extended tenures may become entrenched in established procedures, putting short-term financial performance ahead of long-term sustainability goals like GBI. ESG considerations, which necessitate a commitment to transparency, stakeholder involvement, and environmental responsibility, might conflict with the interests of entrenched leadership. Thus, in cases of CEO duality, the negative relationship between CEO tenure and GBI may be increased due to ineffective board monitoring. Our findings are consistent with the *H1c*, so the hypothesis is accepted. The presence of board members and independent directors does not substantially influence the decision to GBI, as evidenced by the positive and insignificant relationship between the board of directors and board independence in Models 1 and 2 and GBI. Furthermore, our results in Model 4 suggest that the likelihood of GBI by firms in emerging markets is not significantly influenced by their board tenure. To recapitulate this section, we accept *H1c* and reject *H1a, H1b*, and *H1e*. Our results underscore the fact that the emerging economy firm's boards are still reluctant to issue GBI, noting the fact that emerging market investors greater preference for conventional bonds over GBI because price-sensitive investors prefer conventional brown bonds to give more returns rather than lower returns by green bonds. Moreover, we get the support that GBI does not influence the market return of firms similar to the developed economies, for instance, the study by Kodiyatt et al. (2024) from Indian GBI. We contrast the results of Garcia et al. (2023) who found that corporate boards positively influence GBI.

Table 2. Impact of board characteristics on green bond issuance

Variables	*GB*				
	(1)	*(2)*	*(3)*	*(4)*	*(5)*
SIZE	0.0704**	0.0687**	0.1332***	0.1251***	0.1407***
	(2.45)	(2.54)	(4.57)	(4.30)	(3.99)
LEV	-1.0301**	-1.0369**	-1.2505***	-1.0033**	-1.0673**
	(-2.42)	(-2.42)	(-2.85)	(-2.28)	(-2.37)
GROWTH	-0.0004	-0.0004	-0.0002	-0.0004	-0.0002
	(-0.26)	(-0.26)	(-0.13)	(-0.22)	(-0.15)
ESG	0.0052**	0.0055**	0.0070***	0.0073***	0.0081***
	(2.23)	(2.31)	(2.87)	(3.02)	(3.24)
BS	0.0118				0.0012
	(0.59)				(0.03)
GR		0.0034	0.0037	0.0052	0.0060
		(0.46)	(0.48)	(0.68)	(0.78)
B_IND		0.0306			-0.0039
		(0.97)			(-0.06)
CEO_TENURE			-0.0356***		-0.0566***
			(-3.56)		(-4.75)
B_TENURE				0.0278	0.0775***
				(1.53)	(3.24)
Constant	-0.7138**	-0.7413**	-1.1317***	-1.4685***	-1.6704***
	(-2.19)	(-2.27)	(-3.00)	(-3.61)	(-4.00)
No. of obs.	968.00	968.00	968.01	968.02	968.03
R-squared	0.33	0.35	0.38	0.39	0.40

*Note: The dependent variable, GB, is either 1 or 0 depending on whether the firm issues green bonds. B_TENURE, BS, B_IND, and CEO_TENURE are the independent variables. Industry and year-fixed effects are accounted for in all regressions. T-statistics are enclosed in parentheses. The symbols ***, **, and * indicate significance at the 1%, 5%, and 10% levels, correspondingly.*

Firm size is positively associated with green bonds among the control variables in Models 1–5. According to Berg et al. (2022), the pressure to incorporate sustainable practices has increased for larger firms, which are more visible and subject to greater scrutiny from regulators, investors, and the public. To address stakeholder demands for environmentally responsible behaviour and to enhance the legitimacy of the firm, green bonds may be issued. The ESG score of a company is positively and significantly correlated with the GBI, as demonstrated by Model 1. This suggests that organizations that demonstrate superior ESG performance are more inclined to issue green bonds. Companies that have higher ESG scores are more likely to respond to stakeholder demands for sustainability, which may result in the GBI as a demonstration of their commitment to responsible practices. Hence, our results confirm with stakeholder and legitimacy theory which implies that firms aim to maintain legitimacy by aligning their actions with societal norms and values. If a company has already achieved a high score on ESG metrics, issuing green bonds can serve as a strategy to strengthen its commitment to sustainability.

4.2.2. Impact of ESG performance on green bond issuance

The impact of ESG performance on the GBI is illustrated in Table 3. Model 1 demonstrates that green bonds are positively influenced by ESG performance. The positive and significant influence of ESG variables, particularly the environmental (*E*) in Model 2, social (*S*) in Model 3, and governance (*G*) in Model 4 components, is consistent with stakeholder theory. Our findings are consistent with those of Zheng et al. (2023); results underline that GBI positively influences the appreciation of ESG scores of Indian firms. It implies that the GBI is indicative of an increase in ESG scores, as they are associated with ESG criteria. The importance of managing relationships with a variety of stakeholders, such as employees, customers, suppliers, communities, and the environment, is underscored by this approach. Companies that achieve higher ESG metrics scores are more likely to cultivate more robust relationships with these stakeholders, which in turn leads to long-term sustainability. Our findings are consistent with those of Wu et al. (2024), which indicate a positive significance between green finance initiatives and ESG performance.

The sustainability theory may also be employed to interpret the substantial positive influence of the environmental component (Gillen et al., 2021). This theory posits that organizations implementing sustainable practices are more adept at mitigating the risks associated with environmental regulations, limited resources, and climate change. The results suggest that firms with effective environmental practices experience cost reductions (Thomas et al., 2024). Similarly, the social component in Model 3 advantageous influence may be associated with the social capital theory (Thomas et al., 2024). Companies that allocate resources to social initiatives, including employee welfare, community engagement, and equitable practices, establish social capital. This capital can enhance employee productivity, customer satisfaction, and firm performance. This component's importance implies that stakeholders increasingly value and compensate organizations that are dedicated to social responsibility (Rahman et al., 2023).

Effective governance practices in Model 4 are considered to be essential for harmonizing shareholders' interests with management's, reducing agency costs, and enhancing the firm's performance. Nevertheless, the reduced importance of this component may indicate that governance quality, as it is represented in this model, is less significant or that other governance factors that need to be incorporated into the model may be more critical Tahmid et al. (2022). In this section of results, we document that based on our results, we accept *H2a*, *H2b,* and *H2c*. both ESG together and individual dimensions that positively influence the GBI.

Table 3. The influence of ESG performance on green bond issuance

Variables	***GB***			
	(1)	***(2)***	***(3)***	***(4)***
GROWTH	-0.0088**	-0.0084*	-0.0086**	-0.0088**
	(-2.03)	(-1.94)	(-1.98)	(-2.03)
SIZE	0.1994***	0.1987***	0.2010***	0.2040***
	(4.16)	(4.14)	(4.20)	(4.26)
LEV	-0.9763**	-1.0348**	-1.0272**	-1.0201**
	(-2.05)	(-2.19)	(-2.17)	(-2.14)
BS	-0.0068	-0.0076	-0.0084	-0.0126
	(-0.21)	(-0.24)	(-0.26)	(-0.40)
ESG	0.8035***			
	(3.13)			
E		0.8760***		
		(3.55)		
S			0.0055**	
			(2.38)	
G				0.0045*
				(1.84)
Constant	-2.2822***	-2.2389***	-2.1781***	-2.1186***
	(-3.41)	(-3.36)	(-3.27)	(-3.17)
No. of obs.	968	968	968	968
R-squared	0.20	0.23	0.25	0.29

*Note: The dependent variable, GB, is either 1 or 0, contingent upon whether the firm issues green bonds. ESG, E, S, and G are the independent variables. All regressions incorporate industry and year-fixed effects. T-statistics are embedded in parentheses. The symbols ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.*

4.2.3. Investigating the moderation effect of ESG on the impact of corporate governance on green bond issuance

The moderation effect of ESG on the direct association of corporate governance and GBI is reported in Table 4. We observe that the impact of board tenure on green bonds is positively moderated by *ESG*, *E*, *S*, and *G* in Models 5–8. Our findings are confirming *H3a–H3c*. ESG performance has moderated positively along with board tenure for GBI. It implies that the longer-serving boards are more likely to have a deeper awareness of stakeholder expectations, especially regarding sustainability. Companies are coming under more pressure from stakeholders to implement sustainable practices; therefore, a board incorporating ESG considerations into its governance may better align stakeholders' demands with company plans.

Table 4. Moderation effect of ESG on the impact of corporate board and green bond issuance

Variables	*GB*			
	(5)	*(6)*	*(7)*	*(8)*
SIZE	0.1404***	0.1398***	0.1407***	0.1437***
	(3.96)	(3.93)	(3.97)	(4.06)
LEV	-1.0695**	-1.1406**	-1.1196**	-1.0750**
	(-2.36)	(-2.54)	(-2.49)	(-2.37)
GROWTH	-0.0002	-0.0002	-0.0003	-0.0004
	(-0.15)	(-0.13)	(-0.18)	(-0.22)
GR	0.0060	0.0060	0.0053	0.0058
	(0.78)	(0.78)	(0.69)	(0.75)
BS	-0.0008	-0.0136	-0.0072	0.0152
	(-0.02)	(-0.31)	(-0.15)	(0.33)
B_IND	-0.0039	-0.0051	-0.0076	-0.0020
	(-0.07)	(-0.09)	(-0.13)	(-0.03)
B_TENURE	0.0775***	0.0800***	0.0761***	0.0739***
	(3.24)	(3.32)	(3.19)	(3.11)
CEO_TENURE	-0.0566***	-0.0587***	-0.0560***	-0.0551***
	(-4.75)	(-4.90)	(-4.72)	(-4.63)
ESG	0.0076			
	(1.00)			
*ESG * BS*	0.0000			
	(0.07)			
*ESG * B_IND*	0.0017			
	(1.43)			
*ESG * B_TENURE*	0.0019***			
	(2.77)			
*ESG * CEO_TENURE*	-0.0009***			
	(-2.84)			
E		0.0051		
		(0.74)		
*E * BS*		0.0004		
		(0.63)		
*E * B_IND*		0.0018		
		(1.61)		
*E * B_TENURE*		0.0012*		
		(1.84)		
*E * CEO_TENURE*		-0.0008**		
		(-2.45)		
S			0.0039	
			(0.54)	
*S * BS*			0.0002	
			(0.23)	
*S * B_IND*			0.0007	
			(0.68)	
*S * B_TENURE*			0.0016***	
			(2.61)	
*S * CEO_TENURE*			-0.0009***	
			(-2.95)	
G				0.0087
				(1.22)
*G * BS*				-0.0004
				(-0.64)
*G * B_IND*				0.0018
				(1.64)
*G * B_TENURE*				0.0028*
				(1.65)
*G * CEO_TENURE*				-0.0006**
				(-2.05)
Constant	-1.6456***	-1.4964***	-1.4659***	-1.6945***
	(-2.95)	(-2.85)	(-2.66)	(-3.16)
R-squared	0.15	0.21	0.33	0.41

*Note: The dependent variable, GB, is either 1 or 0 depending on whether the firm issues green bonds. B_TENURE, BS, B_IND, and CEO_TENURE are the independent variables. Industry and year-fixed effects are accounted for in all regressions. T-statistics are enclosed in parentheses. The symbols ***, **, and * indicate significance at the 1%, 5%, and 10% levels, correspondingly.*

The issuing of green bonds from the idea of corporate boards, which is frequently seen as a pledge to environmental responsibility and efforts to improve ESG scores is prevalent in the green growth of firms (Nair Biju et al., 2024). The impact of board tenure is thus positively moderated by the presence of ESG factors, which strengthen the board's capacity to address stakeholder concerns. Board members with long tenure who understand environmental risks and possibilities can support green financing techniques that support the sustainability objectives of their firm (Abdullah et al., 2024). Longer serving boards can benefit from their existing ties with stakeholders and their ability to support green bond projects. Long-serving boards with a strong commitment to good governance can make well-informed choices about green funding.

The relationship between CEO tenure and GBI in Models 1–4 is negatively influenced by ESG factors, highlighting the complexity of leadership dynamics in sustainability. Long-serving CEOs risk becoming entrenched and putting their interests ahead of those of stakeholders and shareholders (Ma, Pu, et al., 2024). This entrenchment may cause short-term success measurements to precede long-term sustainability objectives. This entrenchment is counterbalanced when ESG considerations are present, emphasizing how crucial it is to match CEO incentives with sustainable practices. Because CEOs with longer tenures may be reluctant to pursue projects that do not immediately correspond with their objectives, ESG thus negatively moderates the effect of CEO tenure in Model 5 on the issuing of green bonds. CEOs with long tenures might be less likely to fund green initiatives because they see them as risky or expensive. ESG factors emphasize the importance of these investments and draw attention to the CEO's possible resistance to implementing sustainable practices.

4.3. Robustness check

Table 5 reports the result of the endogeneity test. Model 1 reports the impact of board characteristics on green bonds. Probit regression is meant only for binary dependent variables, allowing researchers to model the likelihood of an event occurring (for example, whether a firm issues a green bond). Probit models use an underlying latent variable that generates the seen binary outcome, making them appropriate for situations where the actual response variable is not readily observable. Probit regression gives marginal effects, which aid in understanding how changes in independent variables affect the chance of the dependent variable being 1. This is especially valuable for understanding the impact of endogeneity on outcomes. The probability of the outcome is directly correlated with the significant positive coefficients (e.g., *SIZE, B_TENURE, ESG, E, S,* and *G*), whereas the significant negative coefficients (e.g., *LEV* and *CEO_TENURE*) suggest an inverse relationship. Non-significant coefficients (such as those for *GROWTH, GR, BS*, and *B_IND*) suggest that the dependent variable's probability is not significantly affected. Our findings are consistent with the main findings in the baseline model.

Table 5. Result of robustness check using probit model

Variables	*GB*
SIZE	0.0850***
	(3.99)
LEV	-0.6736**
	(-2.40)
GROWTH	-0.0001
	(-0.06)
GR	0.0030
	(0.64)
BS	0.0061
	(0.27)
B_IND	-0.0022
	(-0.06)
B_TENURE	0.0511***
	(3.41)
CEO_TENURE	-0.0409***
	(-5.60)
ESG	0.1152***
	(5.49)
E	0.0168***
	(2.74)
S	0.0584***
	(5.80)
G	0.0345***
	(5.08)
Constant	-0.9655***
	(-3.84)
No. of obs.	895
R-squared	0.50

*Note: All regressions incorporate industry and year-fixed effects. T-statistics are embedded in parentheses. The symbols ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.*

5. CONCLUSION

We investigate whether the corporate board characteristics influence GBI, which stimulates the green growth of firms after considering ESG performance, which moderates the association between the former and the latter in the emerging economy. First, we investigate the direct relationship of corporate board influence on GBI. Our findings suggest that the GBI in India is adversely affected by the corporate board. To be more specific, our findings verify that the tenure of the CEO has a detrimental effect on the growth of the business in India. Subsequently, we examine the influence of ESG performance on GBI. Green bonds are positively motivated due to the attempt to upgrade ESG performance. The individual dimensions such as environmental in social and governance variables have a positive and significant influence on the model components in GBI, which is consistent with stakeholder theory. Third, we evaluate the moderating influence of ESG in both the total and individual dimensions, E, S, and G scores, on the relationship between board characteristics and GBI. We observe that the impact of board tenure on green bonds is positively moderated by ESG, E, S, and G in Models 1–4. Our findings substantiate the notion that the ESG score serves as the catalyst for GBI in emerging economies, rather than corporate governance's influence which is value-reducing. Furthermore, with due importance to our results, we suggest policymakers must consider the moderating function of ESG performance, which has a positive impact on the association between the influence of the corporate board and GBI.

The study focuses on GBI in emerging markets and its determinants. We warn the readers that our emerging market findings may not apply to advanced markets with differing regulatory frameworks, investor profiles, and market dynamics. Future research should assess the determinants of GBI between emerging and developed markets, identifying universal causes and context-specific differences. The study focuses on certain board features, like tenure. Other board features, such as diversity, sustainability expertise, and gender composition that could substantially impact GBI, have not been investigated. The analysis may need to consider sector-specific variations in GBI, as firms such as energy and real estate may have different drivers and restrictions than technology or services. A longitudinal study looking at the evolution of GBI determinants over time would help reflect the shifting priorities and maturity of ESG practices in emerging markets.

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APPENDIX

Table A.1. Descriptive statistics and correlation matrix

Variable	*Obs.*	*Mean*	*Std. dev.*	*GB*	*SIZE*	*LEV*	*GROWTH*	*GR*	*BS*	*B_IND*	*B_TENURE*	*CEO_TENURE*	*ESG*	*E*	*S*	*G*
GB	968	0.5909	0.4919	1												
SIZE	968	12.4403	2.7729	0.0835*	1											
LEV	968	0.1245	0.1616	-0.0648*	0.2505*	1										
GROWTH	968	-1.7005	46.0008	-0.0116	0.015	0.0254	1									
GR	968	1.2241	9.1184	0.0021	0.0152	0.1374*	-0.0069	1								
BS	968	9.7996	3.8427	0.0594	0.4960*	0.0094	0.03	-0.0173	1							
B_IND	968	5.0155	2.3200	0.0599	0.3840*	-0.0145	0.0258	-0.0723*	0.8353*	1						
B_TENURE	968	6.6496	3.9035	0.0436	-0.0441	-0.1277*	0.0179	-0.1024*	0.2421*	0.4071*	1					
CEO_TENURE	968	6.1412	6.9812	-0.1102*	0.0583	-0.041	0.0224	-0.0381	0.0582	0.1422*	0.4853*	1				
ESG	968	0.4245	0.2848	0.0738*	-0.0374	-0.0926*	-0.0434	-0.0614	-0.1342*	-0.1443*	-0.0987*	-0.0422	1			
E	968	0.3866	0.3044	0.0805*	-0.0388	-0.0501	-0.0458	-0.0446	-0.1214*	-0.1313*	-0.0908*	-0.0108	0.9060*	1		
S	968	0.4619	0.3120	0.0443	-0.029	-0.0847*	-0.0444	-0.0437	-0.1158*	-0.1281*	-0.1050*	-0.057	0.9672*	0.8818*	1	
G	968	0.4002	0.3014	0.0597	-0.0496	-0.1085*	-0.0266	-0.0891*	-0.1324*	-0.1413*	-0.0789*	-0.0527	0.8529*	0.6266*	0.7400*	1

*Note: * Denotes significance at 5% level.*