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# Board Gender Diversity's Moderating Effect on Capital Structure–ESG Relationship in Ghanaian Non-financial Firms

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**Abstract**
The study examines the relationship between capital structure and ESG (Environmental, Social, and Governance) performance of listed non-financial Ghanaian firms, emphasizing the moderating role of board gender diversity. Using panel data from 16 firms enlisted on the Ghana Stock Exchange from 2015 to 2022, the research adopts a fixed-effects model. Findings reveal that debt and equity negatively impact ESG performance, challenging traditional financial theories like Modigliani and Miller's capital structure irrelevance. Surprisingly, board gender diversity does not significantly moderate the capital structure–ESG performance link. The study underscores the need for cautious capital structure decisions to mitigate informational asymmetry costs and suggests revisiting female representation on corporate boards, given its limited influence in this context. This research advances sustainability discourse by exploring unique capital market dynamics in developing countries; in Sub-Saharan Africa and providing new insights into ESG impacts of capital structure and gender diversity in Ghanaian firms.

**Keywords:** Capital Structure, Board Gender Diversity, ESG Performance, Listed Non-Financial Firms, Ghana

# Pengaruh Moderasi Keragaman Gender Dewan Direksi terhadap Hubungan Struktur Modal dan ESG di Perusahaan Non-Keuangan Ghana

**Abstrak**
Studi ini meneliti hubungan antara struktur modal dan kinerja ESG (Lingkungan, Sosial, dan Tata Kelola) dari perusahaan Ghana non-keuangan yang terdaftar, menekankan peran moderasi keragaman gender dewan. Menggunakan data panel dari 16 perusahaan yang terdaftar di Bursa Efek Ghana dari 2015 hingga 2022, penelitian ini mengadopsi model efek tetap. Temuan mengungkapkan bahwa utang dan ekuitas berdampak negatif pada kinerja ESG, menantang teori keuangan tradisional seperti struktur modal Modigliani dan Miller yang tidak relevan. Anehnya, keragaman gender dewan tidak secara signifikan memoderasi hubungan struktur modal-kinerja ESG. Studi ini menggarisbawahi perlunya keputusan struktur modal yang hati-hati untuk mengurangi biaya asimetri informasi dan menyarankan untuk meninjau kembali representasi perempuan di dewan perusahaan, mengingat pengaruhnya yang terbatas dalam konteks ini. Penelitian ini memajukan wacana keberlanjutan dengan mengeksplorasi dinamika pasar modal yang unik di negara berkembang; di Afrika Sub-Sahara dan memberikan wawasan baru tentang dampak ESG dari struktur modal dan keragaman gender di perusahaan Ghana.

**Kata Kunci:** Struktur Modal, Keberagaman Gender Dewan Direksi, Kinerja ESG, Perusahaan Non-Keuangan Yang Terdaftar, Ghana

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## INTRODUCTION

The conception of the corporate sector is essential for economic growth. Nevertheless, the lack of financial resources has been recognized as a primary cause of business failures in developing countries (Shosha, Mano, & Anamali, 2022). For instance, as of 2020, 54% of African startups failed (Statista, 2023). However, the rate differs across countries, according to Statista, 2023 report, Ghana observed about 74% of startup failure in 2020, ranking third behind Ethiopia and Rwanda with 75% each. Literature suggests that the absence of commitment and sustainability, along with the deficiency of sustainable funding are some factors contributing to the failure of startups in Africa (Atiase, et al., 2018; Odeyemi et al., 2024).

To understand the mechanisms by which companies in developing countries secure funding for their operations, it is essential to analyze the factors influencing their financing or capital structure choices. Capital structure, by its very nature, pertains to how a company elects to fund its assets. In corporate finance, companies can secure financial resources from either debt or equity capital or both to address their funding requirements (Al Amosh, Khatib, Alkurdi, & Bazhair, 2024). The determination of how to finance operations is a critical consideration, as an inadequate capital structure has the potential to undermine the firm value (Alfian & Ghozali, 2023; Ferriswara, Sayidah, & Buniarto, 2022; Khanh, Hung, Van, & Huyen, 2020). In this paper, the authors have applied three theories to explain the capital structure decision of a firm, namely Modigliani and Miller's theory, pecking order theory, and agency theory.

The theory of capital structure irrelevance proposed by Modigliani and Miller (1958) is regarded as the foundational element of contemporary capital structure theory. According to certain assumptions regarding investor behavior and capital markets, Modigliani and Miller (1958) argue that the value of a firm remains unchanged by its capital structure. To test this theory, the authors examined whether ESG performance, acting as a proxy for the firm value, increases, decreases, or does not change. A positive coefficient and significant p-values for both the debt and equity ratios show that a one-unit increase in the capital structure leads to an improvement in ESG performance. Conversely, a negative coefficient and significant p-values for the debt and equity ratio demonstrate that ESG performance decreases due to a one-unit increase in the capital structure. Both scenarios will violate the assumption underlying the theory. Additionally, if the p-values for the debt and equity ratio are not significant, it means that ESG performance stays the same whether the debt or equity ratio coefficients are positive or negative. If this is the case, then the assumption underlying the theory has been satisfied or met.

In the context of a perfectly efficient market, as articulated by Modigliani and Miller (1958), Myers and Majluf (1984) introduced the pecking order theory, which suggests that managers favor the utilization of internal financing over the acquisition of external financing. According to the pecking order theory, firms prioritize internal financing over debt capital, first utilizing internal funds, then resorting to debt issuance, and finally resorting to equity capital as a final option. This theory elucidates that companies tend to increase borrowing when their internally generated funds fall short of meeting investment

requirements (Shyam-Sunder and Myers, 1999). To test this theory, the authors assessed whether firms should opt for debt by evaluating the debt capacity point, that is, the coefficient of the debt ratio. If the threshold of this value is negative and significant, it suggests that opting for more debt may not favor the firm's ESG performance. The authors argued that opting for more debt beyond a certain threshold could lead to an underinvestment (debt overhang) problem. If this is the case, then the assumption underlying the theory has been satisfied. Next, the authors evaluated whether issuance of equity should be the last resort if opting for debt is indeed unfavorable. To achieve this, the authors again examined the coefficient of the equity ratio. If the sign is positive and significant, then the issuance of equity will ultimately benefit the firm. The reverse is true if the sign is negative and significant, in which case, the result will be consistent with the theory.

The agency theory is another theory of capital structure relevant to this study. It addresses the agency problem that can arise from conflicting interests between shareholders and managers (Jensen & Meckling, 1976, 2019). Losses arising from this arrangement are termed agency costs. These losses occur when both parties seek to optimize their benefits, resulting in divergent rewards. The actors (company managers) may engage in actions that serve their interests but may not align with the best interests of the other party involved (the company owners) (Adeneye et al., 2023). To test this theory, the authors examined the underlying motives behind the reported relationship between capital structure and ESG performance. The authors argued that managers, debtholders, and shareholders may have different competing interests, resulting in divergent rewards. The authors exhibited that companies that choose to take out debt will use the money for internal operations, leaving little to no money for ESG activities. This means that managers and debtholders will have different goals in the end. Similarly, firms that opt for equity issuance mean that they have less power to make crucial decisions, such as investing in ESG activities, due to the profit motive of shareholders.

From a sustainability perspective, companies globally have transcended mere profitability, now emphasizing the ramifications of their operations on the broader community, necessitating transparency with diverse stakeholders (Huang, 2022; Kim et al., 2024). A compelling argument exists for companies to enhance their accountability and transparency in their operations, thereby fostering a beneficial influence on the environment, society, and corporate governance (Wang et al., 2024). Transparency regarding the effects of a business is crucial for continual growth and the cultivation of stakeholder relationships. Lacking transparency undermines trust, and in the absence of trust, markets fail to operate effectively, leading to a decline in the legitimacy of institutions (Mooneeapen et al., 2022; Zhu & Wang, 2024). Consequently, governments, market regulators, stock exchanges, civil society, and other stakeholders consistently put a lot of pressure on companies to give them information about how their sustainability efforts affect the environment in which they operate. In addition, the Global Reporting Initiative's standards call for full disclosure of all the steps and progress made by companies to meet

their environmental, social, and governance (ESG) expectations (De Villiers et al., 2022). These represent the essence of the challenge surrounding ESG performance.

The incorporation of ESG performance into firms' financing choices, driven by sustainability issues, possesses an essential and intricate gender implication. This is because the ESG performance concept is more complex and interrelated than traditional business performance, which primarily focuses on the financial outcomes of the firms (Daugaard & Ding, 2022; Li, Wang, Sueyoshi, & Wang, 2021). According to Shakil (2021), ESG performance has improved its integration into companies' finance decisions, encompassing board gender characteristics. Mckinsey and company (2024), said the percentage of women in managerial positions increased from 37% in 2015 to 39% in 2024, while the percentage of women in entry-level positions increased from 45% in 2015 to 48% in 2024. This shows that more and more companies are making an effort to bridge the gender gap concerning women's corporate representation. Similarly, research suggests that the incorporation of board gender diversity (BGD) into corporate financial decisions has escalated due to heightened engagement in international trade (Alkhawaja, Hu, Johl, & Nadarajah, 2023). Numerous studies have evidenced the advantages of BGD in the workplace, encompassing enhanced firm performance, superior teamwork, elevated employee well-being, increased creativity and innovative thinking, along with improved governance (Martinez-Jimenez, Hernández-Ortiz, & Cabrera Fernández, 2020; Provasi & Harasheh, 2021; Zhang, 2020). Therefore, BGD is an equally important area of study in the corporate finance domain. In their study, Cantino, Devalle, and Fiandrino (2017) established the association between capital structure and ESG performance, indicating that sustainable companies experience reduced information asymmetry and improved access to financing through debt and equity. Nevertheless, the authors underscore that the relationship between capital structure and ESG performance remains ambiguous and necessitates further examination. Building on this, recent studies have been conducted on the relationship between capital structure and ESG performance in both developed and developing countries. However, the results have been contradictory and inconclusive. For instance, certain studies found a positive correlation between debt capital and ESG performance (Adeneye, Kammoun, & Ab Wahab, 2023; Al Amosh et al., 2024; Zhao & Zhang, 2024); a positive relationship between equity capital and ESG performance (De Campos-Rasera, et al., 2021; Khan, et al., 2024; Zahid, et al., 2024); a negative correlation between debt capital and ESG performance (De Campos-Rasera et al., 2021; Gahramanova & Kutlu Furtuna, 2023; Houqe, Ahmed, & Richardson, 2020); and a negative relationship between equity capital and ESG performance (Adeneye et al., 2023; Gonçalves, Dias, & Barros, 2022; La Rosa & Bernini, 2022). Conversely, other studies found no significant relationship or a nonlinear u-curve relationship between either debt or equity capital structure and ESG performance (Li, Padmanabhan, & Huang, 2024; Lindkvist & Saric, 2020).

It is essential to recognize that various countries possess distinct institutional frameworks, particularly concerning their tax and bankruptcy legislation, the prevailing market for corporate governance, and the functions of banks and securities markets. Additionally, there are differences in social and cultural aspects, as well as in the rates of

economic growth. Thus, the above results cannot be extrapolated to Ghana. Because of these differences, the capital structure-ESG performance link needs to be carefully studied from the point of view of developing capital markets, especially in Sub-Saharan Africa.

BGD has become a crucial governance instrument that has garnered significant interest from directors, shareholders, and scholars in contemporary business. Empirical studies, primarily conducted in developed countries, have consistently revealed a positive relationship between BGD and ESG performance (Khemakhem et al., 2023; Mallidis et al., 2024; Odriozola et al., 2024; Paolone et al., 2024; Shakil et al., 2021). However, the impact of female directors on ESG performance seems to be more limited in developing countries, as demonstrated by some studies. For instance, Wasiuzzaman and Subramaniam's (2023) comparative investigation between developed and developing economies revealed that female directors significantly improve ESG in developed countries, but not in developing countries. This finding calls into question the role of female directors about the capital structure-ESG performance link in developing countries. Zaid et al. (2020) found that, within the Palestinian environment, women on board have no significant relationship with ESG performance, attributed to the geographically proximate cultures and gender bias in the workplace. Similarly, Husted and de Sousa-Filho (2019) discovered that the inclusion of women on boards adversely impacts ESG performance in the Latin American context. Recently, Abdelkader et al. (2024) showed that BGD negatively influences ESG performance in the South African context.

However, in this study, BGD was introduced as a moderating variable to examine how it interacts with capital structure (aggregate of debt and equity ratio) to influence ESG performance. No prior study has explored this. The authors argue that the number of women on the board of directors may have an effect. Specifically, the authors argue that the more women there are on the board, the more power they have to make capital structure decisions that improve the ESG performance of the company. On the contrary, the lower the percentage of women on the board, as is typical in developing economies such as Ghana, the less power they have in influencing capital structure decisions, and so the positive impact on ESG performance becomes negligible. The role-congruity theory can offer an explanation for the underrepresentation of female directors within an organization. This theory posits that bias against women on boards mostly arises from the notion that leadership positions generally linked to men are unsuitable for women (Eagly & Karau, 2002). The reason is that female directors differ from their male counterparts in their empathic, impulsive, caring, kind, relationship-wise sensitive, compassionate, and more socially oriented attributes (Hyun et al., 2016; Zaid et al., 2020). Some studies show that bias and the fact that female directors are seen as less important than male directors make it harder for them to be involved in organizational dynamics. This is shown by the fact that they are less interested in board activities (Trzebiatowski et al., 2023), that they have little impact on organizational transformation (Yadav & Prashar, 2022), or that they have little to contribute to strategic decision-making (Kanadlı et al., 2018).

Moreover, accounting for control variables strengthens causal arguments by ruling out other possible explanations (Li, 2021; Whited et al., 2022). This makes the connection

between independent and dependent variables clearer. In the absence of pertinent control variables, scholars express concern that their results may be vulnerable to the influence of omitted variable bias (Busenbark et al., 2022). For instance, this vulnerability arises from the difficulties in managing unobserved variables. Consequently, this study introduced four control variables, namely firm size, profitability, tangibility, and gross domestic product (GDP) growth. Firm size was expected to predict ESG performance positively, as larger companies possess the potential to achieve economies of scale relative to their counterparts. Likewise, Profitability was expected to be positive, as major firms adopted new technology and exhibited greater success in managing their expenditures to enhance their ESG performance. A negative coefficient for tangibility was anticipated due to the typical usage of tangibles by enterprises as collateral for debt financing. Finally, a positive coefficient was anticipated for GDP growth, as the effective utilization of a nation's natural and human resources contributes to its sustainability and encourages companies to adopt similar practices, thereby improving ESG performance. This study makes several contributions to both the corporate finance and sustainability literature. Firstly, the study advances scientific discourse and empirical investigation into the impact of a firm's capital structure decisions on ESG performance in developing countries. In addition, the different effects of the individual components of capital structure (debt and equity) on ESG performance enhances our understanding of how firms employ different kinds of financing to generate ESG benefits. Finally, exploring the moderating role of board gender diversity set this study apart from the others in Ghana. For example, Ayamga et al. (2024) investigated the relationship between corporate social responsibility and financial performance moderated by board independence and diversity. While they used corporate social responsibility as a predictor, the current study uses capital structure. Additionally, Luh et al. (2024) examined the relationship between gender of firm leadership and ESG performance of listed banks. While they used BGD as a predictor and focused on financial firms, the current study uses BGD as a moderator and focuses on non-financial firms. Other studies (Arhinful, Mensah, & Owusu-Sarfo, 2023; Musah & Kong, 2019; Opoku-Asante, Winful, Sharifzadeh, & Neubert, 2022), focused exclusively on the relationship between capital structure and corporate financial performance. On the contrary, the current study focuses on non-financial performance measures (ESG performance). To the best of our knowledge, no study has explored the moderating role of BGD on the relationship between capital structure and ESG performance of listed non-financial firms in Ghana.

In this paper, the authors seek to achieve two main objectives. Firstly, the authors examined the effect of capital structure on the ESG performance of listed non-financial firms in Ghana. Secondly, the authors explored the moderating role of BGD in the relationship between capital structure and ESG performance of listed non-financial firms in Ghana. Consequently, the authors have tested two hypotheses as follows:

**H1a**: Debt capital negatively influences ESG performance.

**H1b**: Equity capital positively influences ESG performance.

**H2**: Board gender diversity negatively moderates the relationship between capital structure and ESG performance.

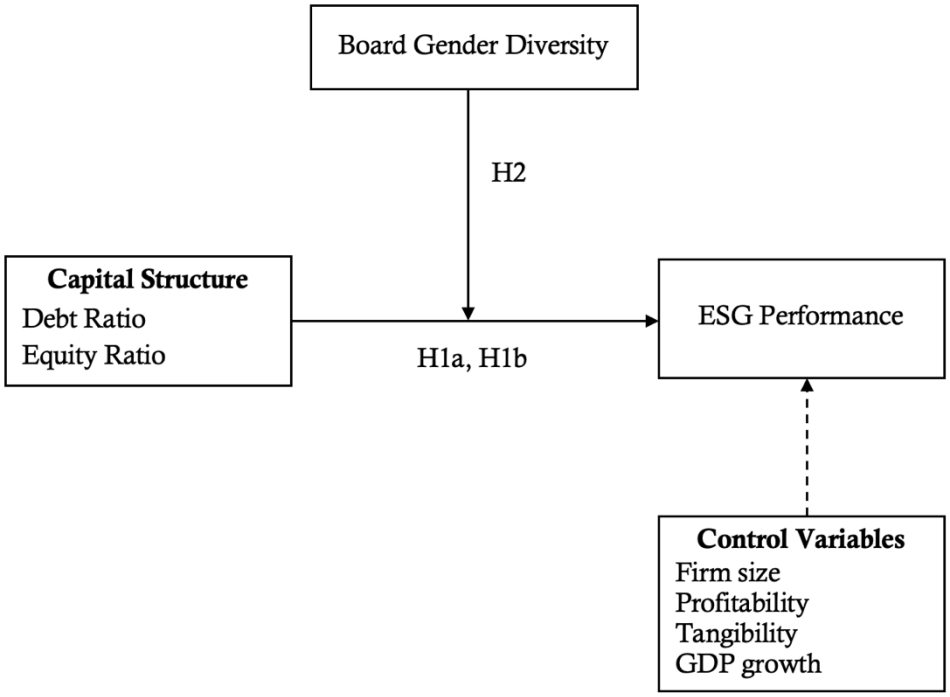


Figure 1. Research Model

## METHOD

The study sourced the capital structure data, gender diversity data, and ESG performance data from the annual reports of the listed non-financial firms in Ghana covering the period from 2015 to 2022. The authors appointed this period because it encompasses the majority of ESG reporting activities, making data retrieval easier.

The target population of the study is made up of all non-financial firms listed on the Ghana Stock Exchange (GSE). The selection of non-financial firms is predicated on their status as some of the largest and most rigorously examined entities globally. Additionally, non-financial firms were chosen because they are more influential in many areas of the Ghanaian economy and contribute significantly to its growth. Furthermore, this study selected non-financial firms because they have similar liquidity and capital structure characteristics. As of August 2024, there were 21 non-financial firms listed on the GSE. This figure, however, could not be employed for the analysis due to limitations in the data available. Consequently, purposive sampling was employed to choose a sample for the study. By implementing this technique, companies that failed to provide a minimum of five years' worth of data were excluded from the analysis. In the end, the study sampled 16 non-financial firms for the analysis. The distribution of the sample size is presented in Table 1.

Table 1. *Sample distribution by industry*

| Industries | Number of Firms |
|---|---|

| | |
|---|---|
| Agriculture | 2 |
| Energy | 3 |
| Fast-moving consumer goods manufacturing | 1 |
| Food and Beverages | 2 |
| Industrial | 1 |
| Information technology | 1 |
| Mining | 2 |
| Printing and publishing | 3 |
| Telecommunication | 1 |
| **Total** | **16** |

**Variable measurements**

The variable measurements are the independent variable (capital structure), dependent variable (ESG performance), moderator (gender diversity), and firm-specific and country-level control variables. The authors divided the independent variable, capital structure, into two components: debt and equity capital. Debt capital was measured using the debt ratio, which divides total debt by total asset, in line with Adeneye et al. (2023). Conversely, equity capital was measured using the equity ratio, which divides total equity by total asset, per Al Amosh et al. (2024). These two capital structure data were retrieved from the sampled companies' annual reports. ESG performance was used as the dependent variable. The authors followed the Ghana Stock Exchange (GSE) (2022) ESG disclosures guidance manual in compiling the ESG performance data. The ESG score varies from 0 for companies providing no ESG items to 100 percent for those disclosing all ESG items by the Global Reporting Initiative (GRI) standard. Environment, social, and governance. The authors checked the performance of each ESG factor (environment, social, and governance) by juxtaposing the companies' annual reports with the criteria outlined in the GSE disclosure manual checklist.

**Moderator**

The study measured BGD as the ratio of women on the board of directors in line with previous studies (Abdelkader, Gao, & Elamer, 2024; Manita, Bruna, Dang, & Houanti, 2018). The data was collected from the corporate governance section of the annual report.

**Control variables**

To develop a robust model, the study included firm-specific and country-level variables that have been documented to affect ESG performance. The study included firm-specific factors like profitability (net income divided by total assets), tangibility (tangible assets divided by total assets), and firm size (natural log of total assets). On the other hand, the country-level variable included was the annual growth in nominal gross domestic product (GDP), consistent with Adeneye et al. (2023).

**Econometric Model Specification**

The general regression model can be expressed in the form:

$$Y_{it} = \alpha_i + \beta_i X_{it} + \varepsilon_{it} \quad [1]$$

Where *i* denotes the cross-sectional unit; *t* denotes the time series unit; *Y* denotes the dependent variable; *X* denotes the set of predictor/explanatory variables; $\beta$ denotes the coefficient of the predictors; and $\varepsilon$ is the stochastic error term. Substituting the study variables into equation (1) gives the new regression model for testing the two research hypotheses as follows:

$$ESG_{it} = \beta_0 + \beta_1 ESG_{it-1} + \beta_2 DR_{it} + \beta_3 ER_{it} + \beta_4 BGD_{it} + \beta_5 (CS * BGD)_{it} + \beta_6 FS_{it} + \beta_7 PR_{it} + \beta_8 TAN_{it} + \beta_9 GDP_{it} + \eta_t + \gamma_i + \varepsilon_{it} \quad [2]$$

Where ESG denotes ESG performance for firm *i* in time *t*; DR denotes debt ratio for firm *i* in time *t*; ER denotes equity ratio for firm *i* in time *t;* BGD denotes board gender diversity for firm *i* in time *t*; CS *BGD denotes the interaction between capital structure and gender diversity for firm *i* in time *t*; PR, FS, TAN, and GDP denote profitability, firm size, tangibility, and gross domestic product (control variables) respectively for firm *i* in time *t*; $\eta_t$ denotes the unobserved firm fixed-effects and $\gamma_i$ denotes time-specific effects. The analysis was conducted using the EViews software. A positive coefficient was anticipated for $\beta_1$, suggesting that the prior year's ESG performance should guide management in implementing efforts to enhance the current year's ESG performance. A negative coefficient for $\beta_2$ was anticipated, as companies that incur debt to fund their operations will have minimal resources available for ESG initiatives. Conversely, $\beta_3$ was anticipated to be positive, since shareholders value sustainability initiatives and are therefore inclined to invest additional capital in companies that prioritize ESG reporting. The sign of $\beta_5$ was expected to be negative, as the interaction between capital structure and BGD might reduce the ESG performance of companies due to competing priorities between the vision of female directors and shareholders. Similarly, $\beta_6$ was expected to predict ESG performance positively, as larger companies possess the potential to achieve economies of scale relative to their counterparts. Likewise, $\beta_7$ was expected to be positive, as major firms adopt new technology and exhibit greater success in managing their expenditures to enhance their ESG performance. A negative coefficient for $\beta_8$ was anticipated due to the typical usage of tangibles by enterprises as collateral for debt financing. Finally, a positive coefficient was anticipated for $B_9$, as the effective utilization of a nation's natural and human resources contributes to its sustainability and encourages companies to adopt similar practices, thereby improving ESG performance. In this study, the number of listed non-financial firms sampled was very small. This prevented the application of the generalized method of moment (GMM) or panel dynamic model, as the number of instruments exceeded the number of observations, thereby violating an important Roodman (2009) criterion. By Manita et al. (2018) and Zhao and Zhang (2024), equation [2] was originally generated utilizing a fixed-effects model for panel data, as they contend that this approach eliminates time-invariant heterogeneity within the dataset. However, a fixed-effects model may be inadequate to address the endogeneity concerns. Consequently, in accordance with

Adeneye and Kammoun (2022) and Khan et al. (2024), a one-year lagged dependent variable (ESG) was included in Equation [2]. The fundamental premise is that ESG performance takes time to materialize due to the requirement for substantial investment. Equation [2] was generated using robust standard errors to address residual heteroscedasticity concerns.

## FINDING AND DISCUSSION

### Descriptive Statistics

Table 2 displays the mean, median, standard deviation, minimum, and maximum values for the research variables. The mean for the capital structure components is 0.577 for the debt ratio and 0.293 for the equity ratio, respectively. This suggests that non-financial firms employ more debt financing than equity financing, as evidenced by the mean debt ratio being higher than the mean equity ratio. The mean for ESG performance is 0.474 with a standard deviation of 0.230, suggesting that the non-financial firms' ESG performance is below average when compared with ESG scores in developed countries (e.g., Odriozola, Blanco-González, and Baraibar-Diez (2024) reported a mean of 0.619). In addition, the lowest ESG performance score is 0.050, and the highest is 0.920, suggesting a lack of uniformity regarding firms' ESG practices. The average score for board gender diversity (BGD) is 0.159, suggesting that less than a quarter of women are on the board of directors, which is not encouraging when compared to 0.256 reported by Abdelkader et al. (2024) for South Africa. The study also included four control variables in the analysis to lessen the problem of omitted variable bias. The mean for the firm-level variables is 7.901 for firm size, 0.036 for profitability proxied as return on assets, and 0.461 for tangibility. On the other hand, GDP growth, representing the country-level variable, has a mean of 5.121.

Table 2. *Results of descriptive statistics*

| Variables | N | Median | Mean | Std. Deviation | Minimum | Maximum |
|---|---|---|---|---|---|---|
| Debt ratio | 134 | 0.680 | 0.577 | 0.488 | -0.880 | 1.430 |
| Equity ratio | 134 | 0.290 | 0.293 | 0.306 | -0.430 | 0.950 |
| ESG performance | 134 | 0.455 | 0.474 | 0.230 | 0.050 | 0.920 |
| BGD | 134 | 0.130 | 0.159 | 0.148 | 0.000 | 0.600 |
| Firm size | 134 | 8.170 | 7.901 | 0.910 | 4.980 | 9.320 |
| Profitability | 134 | 0.040 | 0.036 | 0.219 | -0.750 | 0.640 |
| Tangibility | 134 | 0.430 | 0.461 | 0.260 | 0.010 | 0.930 |
| GDP growth | 134 | 6.200 | 5.121 | 2.756 | 0.510 | 9.290 |

### Correlation Analysis

The correlation analysis was performed to determine the degree of association between two variables and to detect any multicollinearity problem in the data using the variance inflation factor (VIF). Table 3 shows the results of the Pearson correlation matrix. Accordingly, ESG performance correlates negatively with the debt ratio. Board gender diversity correlates positively with ESG performance. Furthermore, the firm-level control variables, such as firm size, correlate positively with debt ratio and ESG; profitability correlates negatively

with debt ratio and positively with equity ratio; and tangibility correlates negatively with equity ratio and profitability. Overall, there is no issue of multicollinearity in the correlation matrix, as indicated by the VIF values being less than 10 (Field, 2018), and the regression analysis results that follow are valid and reliable.

Table 3. *Correlation matrix*

| Variable | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| (1) DR | 1 | | | | | | | |
| (2) ER | -0.595** | 1 | | | | | | |
| (3) ESG | -0.33** | 0.144 | 1 | | | | | |
| (4) BGD | -0.051 | -0.074 | 0.280** | 1 | | | | |
| (5) FS | 0.241** | 0.095 | 0.240** | -0.011 | 1 | | | |
| (6) PR | -0.377** | 0.702** | 0.135 | 0.018 | 0.056 | 1 | | |
| (7) TAN | 0.170 | -0.258** | 0.028 | 0.003 | 0.161 | -0.331** | 1 | |
| (8) GDP | -0.079 | 0.124 | -0.085 | 0.017 | -0.077 | 0.117 | -0.034 | 1 |
| VIF | 1.40 | 1.13 | 1.08 | 1.10 | 1.09 | 1.02 | 1.00 | |

Note: ** denotes significance at the 0.01 level.

**Multivariate Regression Results**

Table 4 presents the results of the fixed-effects model as specified in equation [2]. To address heteroscedasticity and time series autocorrelation within each firm, t-statistics utilize robust standard errors.

Table 4. *Fixed-effects model results*

| **Variables** | **Coefficient** | **t-statistic** | **p-value** |
|---|---|---|---|
| EGSt-1 | -0.191*** | -2.295 | 0.024 |
| DR | -0.358*** | -4.472 | 0.000 |
| ER | -0.258*** | -2.599 | 0.011 |
| BGD | 0.033 | 0.142 | 0.888 |
| CS*BGD | 0.426 | 1.333 | 0.186 |
| FS | 0.087*** | 4.012 | 0.000 |
| PR | 0.136 | 1.192 | 0.961 |
| TAN | -0.003 | -0.049 | 0.136 |
| GDP | 0.016 | 1.505 | 0.849 |
| Constant | 0.032 | 0.166 | 0.849 |
| R-squared | 0.474 | | |
| F-statistic | 5.233*** | | |

Note: *** denotes significance at the 0.05 level.

The results in Table 4 show that the lagged dependent variable (ESG performance) is negative and statistically significant at the 0.05 level. This finding indicates that a percentage change in the previous year's ESG performance reduced the current year's ESG performance by about 19.1 percent. This could be due to firms' reluctance to allocate substantial investment toward ESG activities. In terms of the capital structure components, the debt ratio has a negative and significant effect on ESG performance, providing support

for H1a. In other words, a percentage increase in debt ratio decreased firms' ESG performance by 35.8 percent. This suggests that overdependence on debt financing is not healthy for firms to improve their ESG performance. This finding contrasts with the Modigliani and Miller (1958) theory of capital structure irrelevance, which posits that the value of a firm remains unchanged by its capital structure. The current study demonstrates that the debt ratio hurts the firm value (ESG performance). Additionally, the finding is consistent with the pecking order theory by Myers and Majluf (1984). The pecking order theory elucidates the asymmetrical relationship between a firm's value and its debt, positioning the latter as a viable solution. Nonetheless, the findings suggest that in situations where companies encounter asymmetry associated with their risk profile, opting for debt is an unfavorable decision. The incurrence of additional debt that surpasses the firm's debt capacity (0.358) will lead to a decline in its overall value (ESG performance). Too much debt results in the underinvestment dilemma, often referred to as the 'debt overhang' issue. This scenario implies that numerous promising projects might be overlooked, as the issuance of additional debt at the appropriate moment is hindered by the current debt obligations. Empirically, the finding is in line with previous studies that reported a negative relationship between debt financing and ESG performance (de Campos-Rasera et al., 2021; Gahramanova & Kutlu Furtuna, 2023; Zhao & Zhang, 2024).

Similarly, the equity ratio has a negative and significant effect on ESG performance, failing to support H1b. This suggests that a percentage increase in equity financing decreased firms' ESG performance by 25.8 percent. This finding is not in line with the Modigliani and Miller (1958) theory of capital structure irrelevance, since the value of the firm (ESG performance) is negatively affected by the equity ratio, violating the assumption that the firm's value remains unchanged. The finding, however, supports the pecking order theory by Myers and Majluf (1984). According to this theory, equity is often regarded as a less favorable means of capital acquisition, as managers tend to believe they possess superior knowledge regarding the firm's conditions and information compared to the stockholders and potential investors. To issue equity shares, investors perceive that the company is overvalued and that managers are capitalizing on this inflated valuation. Consequently, investors would assign diminished significance to the newly issued equity. This leads to a decline in ESG performance. Empirically, the finding does not support the positive relationship between equity financing and ESG performance (Adeneye et al., 2023; Al Amosh et al., 2024; Gonçalves et al., 2022).

Specifically, firms in Ghana obtain little benefit from engaging in ESG activities as the level of their debt financing increases. This could be reasoned by the fact that when firms have a huge debt facility to service, they are mandated to make optimum use of scarce financial resources, such as investing in tangible assets (plants, machinery, and equipment) to improve their business operations and generate more revenues. This commitment leaves little or no room for the firms to participate in ESG activities. To avoid default risks, the firms may have channeled resources meant for ESG activities to other areas of business operations, thereby mitigating agency cost. This finding supports the agency theory (Jensen & Meckling, 2019) by demonstrating that corporate firms prioritize profit, granting

management the freedom to choose the most effective strategy to safeguard investors' funds. Furthermore, the negative relationship between equity financing and ESG performance is quite surprising. Despite predictions of a positive relationship, the reported negative relationship offers some novel insights. Firstly, Ghanaian firms' increased access to equity capital reduces their ESG activities. This is because, in a developing country where the majority of corporate firms are foreign-owned, shareholders may be less concerned about ESG activities and more profit-oriented. Secondly, the profit motive of shareholders limits managers' autonomy in crucial finance decisions, potentially causing conflict between debt and equity holders, a finding that aligns with agency theory. Consistent with Al Amosh et al. (2024), the opportunism of shareholders is likely to prioritize the maximization of personal gain, detrimentally impacting the larger stakeholder group and adversely affecting companies' ESG performance.

Regarding the control variables, firm size has a positive and significant effect on ESG performance, supporting previous studies (Adeneye et al., 2023; Abdelkader et al., 2024). This finding indicates that firm size is a determinant of firms' ESG performance. Particularly, larger corporate firms typically face pressure to disclose their ESG activities by global standards. Profitability, tangibility, and GDP have no significant effect on ESG performance, suggesting that these variables are not determinants of firms' ESG performance. The R-squared, which measures the percentage of variance in ESG performance that is explained by the regressors, is satisfactory. In addition, the F-statistic (model fit estimator) is significant at the 0.05 level.

Moreover, the effect of the interaction between capital structure and board gender diversity is positive but insignificant. This suggests that the relationship between capital structure and ESG performance is not moderated by board gender diversity, thereby failing to support H2. This could be linked to insufficient female participation on boards, gender discrimination, and widespread unfavorable gender stereotypes in developing countries (Husted & de Sousa-Filho, 2019), which corroborates the role congruity theory of prejudice against female directors (Eagly & Karau, 2002). Because of their compassionate and socially oriented attributes (Bristy, How, & Verhoeven, 2021; Hyun, Yang, Jung, & Hong, 2016), women on corporate boards may challenge the profit motive of shareholders in favor of ESG activities. The study aimed to fill a unique research gap in this area, and to date, no empirical studies have either supported or refuted this finding. Many previous studies have concentrated on the direct correlation between board gender diversity and ESG performance, reporting varying outcomes. For example, past studies in developed countries have demonstrated that diverse groups often exhibit enhanced governance over their decision-making processes and maintain autonomy from external pressures, resulting in diminished agency costs and, consequently, increased ESG performance (Khemakhem, Arroyo, & Montecinos, 2023; Mallidis, Giannarakis, & Sariannidis, 2024; Odriozola et al., 2024; Paolone, Pozzoli, Chhabra, & Di Vaio, 2024; Shakil, 2021). However, this appears not to be the case for Ghanaian firms.

In addition, women usually have a shorter tenure on corporate boards, which limits their legitimacy and ability to influence capital structure decisions over the long term. This

finding contradicts previous research, which suggests that women tend to be more risk-averse, potentially reducing the risk of financial or ethical regulatory breaches under their supervision (Shakil, 2021; Yadav & Prashar, 2022). This difference could be attributed to geographically distinct cultures and the nature of the firm's business operations, which could justify the exclusion or minimization of women on corporate boards, in line with Zaid, Wang, Adib, Sahyouni, and Abuhijleh (2020) findings in the Palestinian context.

## CONCLUSION

This study was conducted to investigate the relationship between capital structure and ESG performance and to explore the role of board gender diversity in this relationship, aiming to improve upon the inconsistent findings in the literature. Panel data were retrieved from the annual reports of sixteen listed non-financial firms on the Ghana Stock Exchange from 2015 to 2022. The study results, based on the fixed-effects model, demonstrate that both debt and equity capital have negative effects on ESG performance. In addition, the presence of women on the board of directors has no significant effect on the relationship between capital structure and ESG performance. Furthermore, the size of a firm is a determinant of ESG performance. However, profitability and tangibility are not determinants of ESG performance. Finally, GDP growth is not a determinant of ESG performance. This study makes several contributions to both the corporate finance and sustainability literature. Firstly, the study advances scientific discourse and empirical investigation into the impact of a firm's capital structure decisions on ESG performance in developing countries. The negative relationship between capital structure and ESG performance enhances our understanding of how ESG performance varies with the optimal debt and equity level through the lens of the Modigliani and Miller (1958) theory of capital structure irrelevance, pecking order theory, and agency theory. In addition, the different effects of the individual components of capital structure (debt and equity) on ESG performance enhances our understanding of how firms employ different kinds of financing to generate ESG benefits. Specifically, the negative effects of the debt and equity ratio on ESG performance did not support the Modigliani and Miller (1958) theory of capital structure irrelevance. Instead, they supported the pecking order theory and agency theory. Thus, this study builds on previous research in developing countries, particularly in Sub-Saharan Africa, where capital markets are distinct from those in developed countries. Finally, exploring the moderating role of board gender diversity sets this study apart. This study is among the first to document the extent to which board gender diversity influences the relationship between capital structure and ESG performance of listed non-financial firms in Ghana. By doing so, it contributes to the corporate governance literature by demonstrating that the presence of women on the board of directors does not affect the capital structure–ESG performance nexus. This result improves our understanding that male and female directors play different roles when it comes to making corporate strategic decisions. Such a finding confirms the role-congruity theory of prejudice against women on corporate boards. In this way, the study enriches the discourse on board gender diversity in corporate governance studies within the context of Ghana.

Practically, managers should view corporate finance decisions not only as instruments for addressing profit exploitation but also as indicators of sound governance, which are essential for reducing the costs of debt and equity financing. Furthermore, given the lack of a significant moderating effect of board gender diversity, managers should reduce the number of women appointed to corporate boards. To enhance the capital structure–ESG performance relationship, managers should prioritize other firm-level factors, such as increasing the firm's asset base instead of devoting significant resources to enhancing gender parity. This study has a few limitations that are worthy of note. Firstly, the number of listed non-financial firms on the Ghana Stock Exchange (GSE) is relatively small due to the delisting of some firms for violating the regulator's rules. The small sample size affected the analytical technique by switching from the GMM estimator to the fixed-effects model. In the future, when more firms enlist in the (GSE), a similar study with a large sample should be conducted to build upon the current study. In addition, the results apply to non-financial firms in Ghana only and should not be generalized to firms in other developing countries. The study did not consider the broader institutional environment. Future research should consider studying the moderating role of institutional quality in the capital structure–ESG performance nexus. Finally, future research should conduct a cross-country study focusing on selected sub-Saharan African countries to compare and contrast the results for improved firm and investor decision-making.

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