



## **Moderating Role of Financial Performance on The Relationship Between Board Attributes and Corporate Sustainability Disclosure Compliance**

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### **ABSTRACT**

The concept of financial performance is of great concern to stakeholders. This empirical paper investigates the moderating role of financial performance on the link between board attributes and corporate sustainability disclosure compliance (CSDC). The going concern of a company depends on its ability to generate returns from operating, investing, and financing activities. Thus, it is crucially important to explore the extent to which a firm's financial performance strengthens the influence of firm-level determinants of CSDC. The sample for the current study consists of 118 Nigerian-listed companies over seven years between 2011 and 2017. The dynamic GMM regression analysis is used for data analysis. The GMM results reveal the moderating effect of return on assets and return on equity on the influence of firm and board attributes on CSDC, evident from significant positive interaction with board size, board independence, gender diversity and audit committee. This implies that when firms gain financial strength to engage in more sustainable activities, this increases the level of corporate sustainability disclosure compliance.

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## INTRODUCTION

Corporate sustainability activities serve as a model through which corporations can be assessed under the 'triple bottom line approach, namely, environmental, economic and social performance. These dimensions provide the means through which firms respond to their immediate society's social and environmental needs (Joshua et al., 2018; Maas et al., 2016). In this manner, the contribution of a firm towards sustainable development is ensured by corporate sustainability disclosure (Liao et al., 2018). The firms ascertain the protection of various stakeholders by securing their interests through corporate sustainability disclosure. Thus, corporate sustainability disclosure has become one of the main agendas in the firms' strategic decision-making in this modern business world. It is observed that issues regarding corporate sustainability disclosure drew the attention of the policymakers and regulatory authorities and are considered an integral part of corporate governance mechanisms such as the board of directors agendas (Harjoto et al., 2018). At this time, the awareness of stakeholders and pressure from the media compelled the firms to integrate sustainability into their business model. To respond to this concern, many developed countries are focusing more on corporate sustainability disclosure to retain and satisfy the need of valuable stakeholders. However, like other developing countries, the extent of compliance with sustainability disclosure requirements as contained in the Nigerian CG code is at its embryonic stage and confronted with inadequate resources, insecurity, weak governance structure, lack of education, wrongly channeled corporate governance policies, and lack of interest regarding sustainability issues (Awodiran, 2019). These adverse issues are affecting the firm's daily activities as well as the community.

In Nigeria, firms need to understand the concern of stakeholders regarding various social, economic, environmental, and corporate governance issues and address those concerns in the firm strategic decision-making process. Due to increasing pressure from stakeholders, being a part of top-level management, the board of directors is responsible to protect stakeholders' interests by considering the corporate sustainability disclosure agendas. The descriptive approach of the legitimacy theory also posits that firms focus on corporate sustainability disclosure to exhibit a socially responsible image to legitimize their activities to their group of stakeholders. Firms reveal information regarding the influence of their operations on the overall natural environment and react to extenuating environmental footprint. Firms use corporate sustainability disclosure to deal with their stakeholders and assure them that they are liable for their operational actions. Through corporate sustainability disclosure, firms obtain and keep corporate legitimacy. These efforts can enhance the financial performance of the firms (Kurina, Darlis, & Putr, 2020).

As a consequence of growing environmental issues, the sound financial performance of the firm could be one of the possible solutions to foster and integrate corporate sustainability disclosure by providing investment funding to upgrade the firm's social and environmental performance (Scholtens, 2008). Moreover, financial performance is a crucial concern of the various stakeholders due to its impetus to a firm's going concern (Charles et al., 2018). Thus, a firm's financial performance is reflected in its ability to generate operating, investing, and financing returns to ensure continuous value creation and wealth maximization (Ajibola et al., 2018). However, businesses in Nigeria are currently faced with some challenges, ranging from insufficient access to funds, inconsistent government policies and high cost of business operations. The country has recorded a 61% rate of failure in business start-ups for nine consecutive years (Business Day, 2020). These challenges motivate this study to understand the role of sound financial performance on the link between board attributes and CSDC in Nigeria.

The empirical research findings on the link between financial performances on board attributes and corporate disclosures have been explored and show varied results. For instance, clear evidence of the relationship between board attributes and financial performance has been reported by researchers. However, still debatable (Kamaludin et al., 2020; Naseem et al., 2019; Saba et al., 2020; Tahtamouni et al., 2020). Similarly, a number of researchers have posited the association between financial performance and corporate sustainability disclosure compliance observed (Clarkson et al., 2011; Deswanto and Siregar, 2018; Farag et al., 2014; Kansal et al., 2014; Modugu, 2017). As discussed above, it is worth noting from the current literature that the link between board attributes and corporate disclosure with financial performance has been a focus of many researchers. Based on the strong foundation provided by past

studies, it will be an interesting opportunity to understand the effect of financial performance on the relationship between board attributes variables with CSDC, especially in Nigeria.

This study is motivated by the effort and enthusiasm shown by the Central Bank of Nigeria to strengthen the capital base of the Nigerian commercial banks to ensure going concern and improved performance. However, there is still evidence of poor corporate performance leading to liquidation, takeover, and, in some cases, merger and acquisition (SEC, 2014). The CBN provides alternative funding opportunities to other non-financial sectors of the economy through the development financing scheme. The project is designed to boost economic growth through the supply of finance to various sectors of the economy. Thus such efforts by the regulatory authorities have a direct link with corporate sustainability activities, as CSDCs require financial commitments in most cases. Thus, the main objective of this study is to explore the moderating effect of financial performance on the link between board attribute variables with CSDC and whether or not financial performance strengthens this relationship. To address this objective, the current study is based on a sample size of 118 Nigerian listed firms covering a period from 2011 to 2017, consisting of 826 firm-year observations. Moreover, through GMM estimations, the study's findings reveal strong evidence for the moderating effect of return on assets and equity on the board attributes influencing CSDC in the Nigerian context.

The contribution of this paper is threefold. Firstly, this study contributes to the existing literature on board attributes, CSDC, and financial performance. Secondly, this study provides empirical evidence to expatiate financial performance's contribution to compliance with sustainability disclosure requirements as contained in the Nigerian CG code. Thirdly, this study can be helpful for policymakers and corporate leaders to understand how the corporate sustainability disclosure initiatives solely depend upon the firm's sound financial performance. The article is divided into five sections: the first section covers the introduction, followed by a literature review in the second section, which covers the theoretical framework and hypothesis development. Third, it contains a detailed discussion of data, methodology and regression models. The results and findings are discussed in the fourth section. Finally, a general conclusion and recommendations are provided.

## LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

### Effects of Financial Performance on CSDC

As part of their oversight function, the board of directors is mandated to ensure adherence to relevant corporate laws, standards and regulations (Peters and Romi, 2013). Prior studies have established the link between board attributes and the financial performance of an entity. The studies use various dimensions to measure financial performance (such as ROA, ROE, & Tobin's Q) against a number of board characteristics. The justification for the appropriateness of the need to test for the moderating effect of financial performance in the current study is that researchers have extensively studied the association between financial performance and CSR disclosure in the past. For instance, Kansal et al. (2014) investigate the link between Corporate Social Responsibility (CSR) and disclosure level with some selected financial and non-financial determinants, namely firm size, total asset, industry type and profit after tax. The dataset used for the study covers a period of 2009 and 2010, obtained from a total sample of 100 Bombay Stock Exchange (BSE) listed companies in India. The study strongly correlates industry type and firm size with CSR disclosure. The researchers used a rating scale of 0 to 5 to measure CSR disclosure. Subsequently, a panel regression analysis was conducted, which revealed a significant positive relationship between total assets and CSR disclosure.

Other studies have extensively examined the association between financial performance and environmental disclosure. Recently, Yoo and Managi (2021) documented that Environmental Social and Governance (ESG) disclosure is more important than action taken by firms to improve financial performance. Furthermore, Tahtamouni et al. (2020) investigated the impact of board diversity on the corporate performance of 49 Jordanian firms. Results from the multiple regression analysis revealed a significant link between board independence and the age of corporate financial performance. The multiple regression results. In their part, Deswanto and Siregar (2018) used a data set of three years (2012 to 2014) extracted from a

sample of 211 Indonesian firms and reported a negative relationship between returns on sale (ROS) and environmental disclosure. The result was analysed using Structural Equation Modelling.

Furthermore, Ezeagba et al. (2017) investigated the association between CSR disclosure and the financial performance of Nigeria's food and beverage corporations. The study examined the association between CSR disclosure, return on equity and return on capital employed by the food and beverages corporations. Based on a secondary source of data and using multiple regression and Pearson's correlation techniques, the findings revealed a positive relationship between CSR disclosure and return on equity of selected corporations and showed a negative association between CSR disclosure and capital employed net profit margin.

Clarkson et al. (2011) investigate the factors influencing the environmental disclosure index, the study focuses on 51 listed firms in Australia for the period 2002 to 2006, and the results from the panel regression show a significant positive relationship of three financial performance indicators namely; ROA, ROE, and Tobin's Q. Iatridis (2013) equally found a significant and positive association between the ROA and Tobin's Q on the environmental disclosure score of 529 listed firms in Malaysia. Likewise, in a later study, Nor et al. (2016) investigate financial performance indicators influencing voluntary disclosures, and the results from the sample of 100 Malaysian firms for the 2011 financial year shows three variable have a positive influence on voluntary disclosure, namely; ROA, ROE and ROS accordingly. Similarly, Thi et al. (2021) explore the relationship between CSR disclosure and the financial performance of Vietnamese listed firms. The results of OLS and GMM reveal positive effects of disclosure and financial performance. A most recent study (Ismail et al., 2022) reveals a significant relationship between ESG and share value, as such, the relationship leads to good financial returns.

A study by Modugu (2017) concluded that the OLS regression shows no relationship between profitability and the three categories of disclosure, namely; mandatory, voluntary and total disclosure made by 128 listed firms for years between 2012 to 2014. However, this main study focuses on the disclosure post-IFRS adoption period. Similarly, Allam (2018) explores the impact of corporate governance mechanisms on a firm's performance measures the panel regression covering the period of 2005-2011 shows that not all corporate governance mechanisms lead to higher firm performance. Furthermore, Mangesti (2019) test the mediating effect of firm financial performance on the relationship between capital growth and asset utilisation on market growth based on the leverage irrelevance theory. The sample of 146 firms was used to cover a period between 2011 and 2016, and thus conclude that the mediation effect of financial performance is confirmed.

Based on the reviews above. There are empirical and theoretical links between financial performance and corporate disclosure. However, this current study shows that this prior evidence on the relationships mentioned above can further present an avenue to test the moderating effects of financial performance using ROA and ROE as variables on the relationship between the board of directors attributes and the CSDC in Nigeria.

### **Theoretical Framework**

Suchman (1995) proposed the Legitimacy Theory, which is considered a socioeconomic theory that mainly focuses on building and maintaining relationships with both internal and external environments. Corporate trust is created and maintained when firms meet and exceed public expectations in discharging responsibilities (Stuebs and Sun, 2014). Kaplan and Ruland (1991) view legitimacy as a process by which organizations seek societal approval through avoidance of sanctions by engaging in an acceptable social value and ethical behavior in a social system. This act led to a strong form of legitimacy, and contrary to this leads to a weak form of legitimacy. Elfeky, (2017) asserts that the legitimacy theory presents debates that are connected to the external environment through the societal contract and thus provides a certain level of disclosure in order to ensure compliance with laid-down regulations and societal ethics. Hence, companies must operate within the acceptable norm and the values of the larger society to earn strong legitimacy through continuous improvement on the level of compliance with corporate sustainability disclosure requirements.

Interestingly, Guthrie and Parker (1989) were the first to attempt to empirically test legitimacy by exploring the link between the extent of public concern and CSR disclosures. However, their findings failed to provide empirical evidence, as such, they concluded that corporate disclosure is not influenced by legitimacy

theory. On the contrary, Heard and Bolce (1981) maintained that high social expectations of society motivate successful corporations to react to human, social, environmental and other consequences in their daily operations. However, they concluded that companies who fail to comply with the terms of the social contract may face sanctions from the society.

The legitimacy theory could provide a strong basis for providing the rationale behind this current study, as it aimed to explore the determinants of corporate sustainability disclosure in compliance with Nigeria's corporate governance code. The current study further extends the legitimacy theory by testing the moderating effect of financial performance on the relationship between board attributes and CSDC.

### **Hypothesis Development**

The firm's financial performance is considered a moderating variable in this current study. This study aimed to explore the extent to which the financial performance of firm moderates the relationship between board attributes with the CSDC. It is important to note that full disclosure is rarely obtained, even in a situation of strict regulation (Shehata, 2014). Based on the legitimacy theory perspective, the need for corporate disclosure is still paramount for companies to legitimise their societal positions. Where such legitimacy is achieved, it limits government interference in corporate activities (Kansal et al., 2014).

Empirical studies show the influence of financial performance and corporate disclosure. Specifically, on the influence of financial performance on environmental disclosures, there are associations with regard to the relationship between a firm's financial performance and the CSR disclosure (Farag et al., 2014; Kansal et al., 2014), on the influence of financial performance and voluntary disclosure (Md Nor et al., 2016; Modugu, 2017), and also on the link between corporate governance and firm value (Nurdin et al., 2018). In addition, Mangesti (2019) provides evidence on the mediating effect of financial performance on the relationship between capital growth on market growth and asset utilisation. Thus, the theoretical and empirical implication that can be inferred is that, financial performance has an influence on corporate disclosures and, by extension, it would moderate the link between the board attributes and the CSDC as postulated in the following sets of hypotheses:

*Hypothesis 1: The effect of board attributes on CSDC is strengthened with improved return on assets.*

*Hypothesis 2: The effect of board attributes on CSDC is strengthened with improved return on equity.*

## **RESEARCH METHODOLOGY**

### **Study Sample**

The study is based on a sample size of 118 Nigerian listed firms was determined using 's (1970) table, covering a period from 2011 to 2017 that consists of 826 firm-year observations. The sample was selected using stratified random sampling. With the sampling distribution cutting across all industries in the country, namely; Agriculture (3), Conglomerate (4), Construction/Real estate (6), Consumer goods (15), Financial services (40), Health services (7), ICT (5), Industrial goods (10), Natural resources (3), Oil and gas (8) and Services (17).

### **Model Specification and Variables Definition**

The regression models are designed to analyse the moderating effects of financial performance on the relationship between some selected board attributes and CSDC. The study used the STATA 14 software for regression analysis. The GMM is considered in the current study to test the regression models formulated. Since prior evidence shows that the traditional individual-specific effect estimators are badly biased (Law, 2019), furthermore, to solve the issue of possible endogeneity problems, the dynamic panel regression shall be conducted. The models contain lagged dependent variables among the regressor. Dynamic panel regression is based on two step-system GMM estimator (Blundell and Bond, 1998).

Moreover, the error term  $\varepsilon_{it}$  in the dynamic panel model is further decomposed into three components as thus;  $\mu_{it} = \lambda_i + \eta_t + \varepsilon_{it}$ , where  $\lambda_i + \eta_t$  is the two-way unobserved individual-specific effect,  $\lambda_i$  for the firm and  $\eta_t$  for time effects. While  $\varepsilon_{it}$  is the remaining (regular) error term. The basic research models are classified into two main groups. Models 1 to 5 test the moderating effects of ROA and models 6 to 10 are used to test the effects of ROE. The variables contained in the model are explained in Table 1.

Moderating effect of return on asset:

$$lcsdc_{it} = \alpha_0 + \beta_1 lcsdc_{it-1} + \beta_2 lbsize_{it} + \beta_3 lbindp_{it} + \beta_4 lgdiv_{it} + \beta_5 lacomm_{it} + \beta_6 lfsz_{it} + \beta_7 lfage_{it} + \beta_8 lroa_{it} + \lambda_i + \eta_t + \varepsilon_{it} \quad (1)$$

$$lcsdc_{it} = \alpha_0 + \beta_1 lcsdc_{it-1} + \beta_2 lbsize_{it} + \beta_3 lbindp_{it} + \beta_4 lgdiv_{it} + \beta_5 lacomm_{it} + \beta_6 lfsz_{it} + \beta_7 lfage_{it} + \beta_8 lroa_{it} + \beta_9 (lbsize_{it} \times lroa_{it}) + \lambda_i + \eta_t + \varepsilon_{it} \quad (2)$$

$$lcsdc_{it} = \alpha_0 + \beta_1 lcsdc_{it-1} + \beta_2 lbsize_{it} + \beta_3 lbindp_{it} + \beta_4 lgdiv_{it} + \beta_5 lacomm_{it} + \beta_6 lfsz_{it} + \beta_7 lfage_{it} + \beta_8 lroa_{it} + \beta_9 (lindp_{it} \times lroa_{it}) + \lambda_i + \eta_t + \varepsilon_{it} \quad (3)$$

$$lcsdc_{it} = \alpha_0 + \beta_1 lcsdc_{it-1} + \beta_2 lbsize_{it} + \beta_3 lbindp_{it} + \beta_4 lgdiv_{it} + \beta_5 lacomm_{it} + \beta_6 lfsz_{it} + \beta_7 lfage_{it} + \beta_8 lroa_{it} + \beta_9 (lgdiv_{it} \times lroa_{it}) + \lambda_i + \eta_t + \varepsilon_{it} \quad (4)$$

$$lcsdc_{it} = \alpha_0 + \beta_1 lcsdc_{it-1} + \beta_2 lbsize_{it} + \beta_3 lbindp_{it} + \beta_4 lgdiv_{it} + \beta_5 lacomm_{it} + \beta_6 lfsz_{it} + \beta_7 lfage_{it} + \beta_8 lroa_{it} + \beta_9 (lacomm_{it} \times lroa_{it}) + \lambda_i + \eta_t + \varepsilon_{it} \quad (5)$$

Moderating effect of return on equity:

$$lcsdc_{it} = \alpha_0 + \beta_1 lcsdc_{it-1} + \beta_2 lbsize_{it} + \beta_3 lbindp_{it} + \beta_4 lgdiv_{it} + \beta_5 lacomm_{it} + \beta_6 lfsz_{it} + \beta_7 lfage_{it} + \beta_8 lroe_{it} + \lambda_i + \eta_t + \varepsilon_{it} \quad (6)$$

$$lcsdc_{it} = \alpha_0 + \beta_1 lcsdc_{it-1} + \beta_2 lbsize_{it} + \beta_3 lbindp_{it} + \beta_4 lgdiv_{it} + \beta_5 lacomm_{it} + \beta_6 lfsz_{it} + \beta_7 lfage_{it} + \beta_8 lroe_{it} + \beta_9 (lbsize_{it} \times lroe_{it}) + \lambda_i + \eta_t + \varepsilon_{it} \quad (7)$$

$$lcsdc_{it} = \alpha_0 + \beta_1 lcsdc_{it-1} + \beta_2 lbsize_{it} + \beta_3 lbindp_{it} + \beta_4 lgdiv_{it} + \beta_5 lacomm_{it} + \beta_6 lfsz_{it} + \beta_7 lfage_{it} + \beta_8 lroe_{it} + \beta_9 (lindp_{it} \times lroe_{it}) + \lambda_i + \eta_t + \varepsilon_{it} \quad (8)$$

$$lcsdc_{it} = \alpha_0 + \beta_1 lcsdc_{it-1} + \beta_2 lbsize_{it} + \beta_3 lbindp_{it} + \beta_4 lgdiv_{it} + \beta_5 lacomm_{it} + \beta_6 lfsz_{it} + \beta_7 lfage_{it} + \beta_8 lroe_{it} + \beta_9 (lgdiv_{it} \times lroe_{it}) + \lambda_i + \eta_t + \varepsilon_{it} \quad (9)$$

$$lcsdc_{it} = \alpha_0 + \beta_1 lcsdc_{it-1} + \beta_2 lbsize_{it} + \beta_3 lbindp_{it} + \beta_4 lgdiv_{it} + \beta_5 lacomm_{it} + \beta_6 lfsz_{it} + \beta_7 lfage_{it} + \beta_8 lroe_{it} + \beta_9 (lacomm_{it} \times lroe_{it}) + \lambda_i + \eta_t + \varepsilon_{it} \quad (10)$$

We conducted a diagnostic check on the models prior to regression analysis. The VIF and correlation matrix are calculated to test for the multicollinearity among selected variables. Furthermore, Wald Statistics test is applied to check for heteroscedasticity. While the outliers are identified and excluded from the dataset using Cook's distance test. Moreover, the CSDC index was measured using the Cooke (1989) unweighted disclosure index, as shown below. The selection of the unweighted disclosure index is due to the fact that no priority is given to any of the nine sustainability disclosure items as contained in the Nigerian corporate governance code. The computation is conducted to test the extent of corporate sustainability disclosure compliance with the nine codes of sustainability disclosure requirement as outlined in the Nigerian code of corporate governance (SEC, 2011). The index is generated using the binary score methods, where value 1 is allocated to a company that disclose a sustainability code in a particular year. Moreover, 0 if no disclosure is made.

$$CSDCscore_x = \frac{\sum_{i=1}^n di}{\sum_{j=1}^n dj} \quad (11)$$

where  $CSDCscore_x$  = Unweighted Index score of  $CSDC_{it}$ , in respect to company x,  $di$  = Attribute analysis of a continuous variable, which takes value (1) if  $d^{th}$  item is disclosed by company i, in a particular year, and zero (0) if not found and  $dj$  = Maximum number of items a company can disclose, maximum of Nine (9).

Table 1 Variables of the Current Study

| Variables  | Operational definition   |
|--|--|
| <b>Dependent Variables:</b>                                    |  |
| Corporate Sustainability Disclosure Compliance ( <b>csdc</b> ) | Total unweighted disclosure Compliance index                             |
| <b>Independent Variables:</b>                                  |  |
| <b>Board attributes</b>  |  |
| Board size ( <b>lsize</b> )                                    | Total number of executive and non-executive members                      |
| Board Independence ( <b>lsize</b> )                            | The proportion of non-executive directors to total board size            |
| Gender Diversity ( <b>lgdiv</b> )                              | Percentage of women on the board of directors                            |
| Audit committee ( <b>lcomm</b> )                               | Number of board members in the audit committee                           |
| <b>Moderating Variables:</b>                                   |  |
| ROA ( <b>lroa</b> )  | Return on asset, computed as profit after tax divided by total assets    |
| ROE ( <b>lroe</b> )  | Return on equity, computed as net profit after tax divided by equity     |
| <b>Control Variables:</b>                                      |  |
| Firm size ( <b>size</b> )                                      | Total asset expressed in million   |
| Firm age ( <b>lface</b> )                                      | Natural log of the total number of years since a company was established |

### Descriptive Statistics

Table 2 contains details of descriptive statistics for the CSDC (dependent variable), board attributes (independent variables), financial performance (moderating variables) and control variables. The CSDC expressed in percentage indicates a mean (standard deviation) of 66.49 (19.03). The board attributes mean shows approximately 10 members in a Board room, 0.78 mean for independence, an average of 12 female board members and mean of 6 audit committee members. Furthermore, financial performance indicators show a mean (maximum value) of 6.93% (1217.44) and 37.83% (10459) for ROA and ROE, respectively. The descriptive statistics for the control variables show a mean firm size of 275012.5 (million) and a minimum of 98 (million). While the age of the sampled companies ranges from 1 to 94 years.

Table 2 Descriptive Statistics

| Variable     | Obs. | Mean     | Std. Dev. | Min      | Max     |
|--------------|------|----------|-----------|----------|---------|
| <b>csdc</b>  | 826  | 66.49    | 19.03     | 0        | 100     |
| <b>bsize</b> | 826  | 9.67     | 3.17      | 4        | 21      |
| <b>bindp</b> | 826  | 0.78     | 14.62     | 6.67     | 171.43  |
| <b>gdiv</b>  | 826  | 12.34    | 12.55     | 0        | 60      |
| <b>acomm</b> | 826  | 5.55     | 0.95      | 2        | 8       |
| <b>roa</b>   | 826  | 6.93     | 61.95     | -280.81  | 1217.44 |
| <b>roe</b>   | 826  | 37.83    | 490.60    | -3251.75 | 10459   |
| <b>fsize</b> | 826  | 275012.5 | 810666.5  | 98       | 6800000 |
| <b>fage</b>  | 826  | 34.38    | 19.33     | 1        | 94      |

## RESULTS AND ANALYSIS

### Diagnostic Checks

#### Test for Multicollinearity

The regression results for the moderating effects of return on assets under the GMM estimator is contained in models 1 to 10 of Table 5. Models 1 and 4 show no evidence for the presence of a multicollinearity problem. However, based on the initial vif result of model 2, which shows a mean of 13.74 (refer to Table 5) the variable lroa was excluded from the model, a vif result of 1.29 was obtained. Similarly, the elimination of return on assets in model 3 led to a vif of 1.29. Thus, a new estimate of model 5 after excluding the aforementioned variable (lroa) reveals a favourable vif of 1.29 as presented in Table 5 below.

Furthermore, Table 6 presents the GMM model estimations for the moderating effect of return on equity as outlined in models 6 to 10. Based on the result, there is no evidence of the multicollinearity problem in models 6 and 9, as none of the coefficients of the correlation matrix (see Table 4) exceeds 90%, and the vif test result shows an acceptable mean of 1.29 and 2.00, respectively. Conversely, return on equity was excluded from model 7 to arrive a mean vif of 1.27. Similarly, a multicollinearity problem in model 8 led to lroe being removed from the model estimations leading to a vif of 1.27. Similarly, the correlation coefficients for model 10, thus, a new estimate after excluding the lroe reveal a favourable vif mean of 1.27.

**Test for Outlier**

Based on the cook’s distance test results for outliers, a set of outliers was automatically detected and eliminated from the list of observations. Regarding the test for the moderating effect of return on assets, a total of 676 observations were considered for model 1 and 3 estimations, 675 observations for models 2, 678 observations for models 4 and 677 observations were used for model estimations 6. Moreover, 677 observations were considered in model 6 and 8 estimations. While 676, 680 and 678 observations were used in model estimation for model 7, 9 and 10, respectively.

**Test for serial Correlation**

The result of the serial correlation test in the first difference denoted by AR1 and AR2, the results of the AR1 show a significant p-value for models 1 to 10, which are designed to test for the moderating effects of financial performance. Thus, the null hypothesis of no first-order serial correlation is rejected. Conversely, the AR2 results show an insignificant p-value for all models stated above, which signifies that the null hypothesis is not rejected in the second-order serial correlation.

**Test for Overidentifying Restrictions**

The test for possible correlation between the error term and instruments is conducted using the Sargan or Hensen test. The models designed to test the moderating effects of institutional quality show a p-value greater than 0.05 in either Sargan or Hensen test (see Table 5 and Table 6). Therefore, based on the GMM conditions, it can be concluded that the instruments are valid and unbiased.

Table 3 GMM: Moderating Effect of Return on Asset

|          | lcsdc  | lsize   | lbindp  | lgdiv  | lacomm | lfsize  | lfage   | lroa   | bsize  | bindproa | gdivroa | acomproa |
|----------|--------|---------|---------|--------|--------|---------|---------|--------|--------|----------|---------|----------|
| lsize    | 0.1745 | 1.0000  |         |        |        |         |         |        |        |          |         |          |
| lbindp   | 0.0980 | -0.1029 | 1.0000  |        |        |         |         |        |        |          |         |          |
| lgdiv    | 0.0566 | 0.2676  | -0.1487 | 1.0000 |        |         |         |        |        |          |         |          |
| lacomm   | 0.0601 | 0.3761  | -0.0336 | 0.1330 | 1.0000 |         |         |        |        |          |         |          |
| lfsize   | 0.2509 | 0.6014  | -0.0729 | 0.2321 | 0.2948 | 1.0000  |         |        |        |          |         |          |
| lfage    | 0.1004 | 0.0378  | 0.0246  | 0.0218 | 0.1041 | -0.1526 | 1.0000  |        |        |          |         |          |
| lroa     | 0.0888 | -0.1067 | 0.0498  | 0.0389 | 0.0321 | -0.1782 | -0.0381 | 1.0000 |        |          |         |          |
| bsize    | 0.1093 | -0.0187 | 0.0557  | 0.0490 | 0.0687 | -0.1326 | -0.0270 | 0.9870 | 1.0000 |          |         |          |
| bindproa | 0.0929 | -0.1044 | 0.0823  | 0.0351 | 0.0342 | -0.1807 | -0.0397 | 0.9975 | 0.9834 | 1.0000   |         |          |
| gdivroa  | 0.1050 | -0.0311 | -0.0027 | 0.3913 | 0.0545 | -0.0964 | -0.0209 | 0.8024 | 0.8049 | 0.7938   | 1.0000  |          |
| acomproa | 0.0958 | -0.0756 | 0.0530  | 0.0454 | 0.1047 | -0.1541 | -0.0230 | 0.9894 | 0.9843 | 0.9859   | 0.8003  | 1.0000   |

Table 4 Moderating Effect of Return on Equity

|          | lcsdc  | lsize   | lbindp  | lgdiv  | lacomm  | lfsize  | lfage   | lroe   | bsize  | bindproe | gdivroe | acomproe |
|----------|--------|---------|---------|--------|---------|---------|---------|--------|--------|----------|---------|----------|
| lcsdc    | 1.0000 |         |         |        |         |         |         |        |        |          |         |          |
| lsize    | 0.1745 | 1.0000  |         |        |         |         |         |        |        |          |         |          |
| lbindp   | 0.0980 | -0.1029 | 1.0000  |        |         |         |         |        |        |          |         |          |
| lgdiv    | 0.0566 | 0.2676  | -0.1487 | 1.0000 |         |         |         |        |        |          |         |          |
| lacomm   | 0.0601 | 0.3761  | -0.0336 | 0.1330 | 1.0000  |         |         |        |        |          |         |          |
| lfsize   | 0.2509 | 0.6014  | -0.0729 | 0.2321 | 0.2948  | 1.0000  |         |        |        |          |         |          |
| lfage    | 0.1004 | 0.0378  | 0.0246  | 0.0218 | 0.1041  | -0.1526 | 1.0000  |        |        |          |         |          |
| lroe     | 0.1594 | 0.0003  | 0.0101  | 0.0471 | -0.0030 | 0.1019  | -0.0032 | 1.0000 |        |          |         |          |
| bsize    | 0.1934 | 0.1641  | -0.0049 | 0.0835 | 0.0710  | 0.2092  | -0.0040 | 0.9776 | 1.0000 |          |         |          |
| bindproe | 0.1592 | -0.0055 | 0.0765  | 0.0402 | -0.0035 | 0.0941  | -0.0076 | 0.9960 | 0.9712 | 1.0000   |         |          |
| Gdivroe  | 0.1784 | 0.1304  | -0.0534 | 0.5862 | 0.0563  | 0.2066  | -0.0038 | 0.6837 | 0.7040 | 0.6737   | 1.0000  |          |
| Acomproe | 0.1707 | 0.0591  | 0.0090  | 0.0598 | 0.1310  | 0.1524  | 0.0104  | 0.9844 | 0.9785 | 0.9799   | 0.6887  | 1.0000   |

**Dynamic GMM Regression Results for the Moderating Effect of Return on Assets**

The results from the dynamic GMM estimators for the test of the moderating effect of return on assets are represented in models 1 to 5. Model 1 in Table 5 is developed to test the direct relationship of all the explanatory, control and moderating variables on CSDC. Subsequently, four (4) interaction variables (lsize\*lroa, lbindp\*lroa, lgdiv\* lroa and lacomm\*lroa) were tested using the stepwise regression approach in models 2 to 5. The empirical findings from the test for direct effect of explanatory, control and moderation variables are presented in model 1 in Table 5. The result reveals a significant positive relationship between the moderator (return on assets) and the dependent variable (lcsdc).



Moreover, variables *lfsize* and *lfage* indicate a significant positive relationship with *lcsdc*. The first interaction between board size and return on assets (*lsize\*lroa*) in model 4 reveals a significant positive relationship at 1% level of significance. This result indicates that the interaction effect of both board size and return to assets of a firm can strengthen the link between board attributes and CSDC in Nigeria. Furthermore, the result of model 3 in Table 5 indicates that, the interaction between board independence and return on assets shows a positive and insignificant relationship with the dependent variable (*lcsdc*). The result implies that there is no sufficient evidence that an increase in the number of non-executive directors in Nigerian firms and focus on improving the return on assets will have a statistically insignificantly influence on the level of CSDC in Nigeria. The obvious reason is due to the fact that firm performance in within the context of Nigeria is majorly influenced by the executive directors (Aliyu, 2018).

Regarding the third interaction variable in model 4, depicting a link between gender diversity and return on assets (*lgdiv\*lroa*), based on the result presented, the interaction variable is statistically significant at 5% level. This implies that return on assets will invariably strengthen the relationship between the board attributes influencing CSDC in Nigeria. Specifically, board size (*lsize*) appears to be statistically significant in the current model 4 compared to model 1. Furthermore, *lfsize* shows a slight increase in the coefficients. The last interaction (*lacomm\*lroa*) is shown in model 5 in Table 5. It is important to note that the result indicates a significant positive relationship between the interaction between the audit committee and return at a 1% significance level. The result further provides evidence that the interaction variable is capable of significantly improving the level of corporate compliance with sustainability disclosure requirements.

Table 5 GMM Result for the moderating effect of Return on Assets

| DV: <i>lcsdc</i>      | Model 1<br>(GMM)    | Model 2<br>(GMM)            | Model 3<br>(GMM)    | Model 4<br>(GMM)           | Model 5<br>(GMM)           |
|-----------------------|---------------------|-----------------------------|---------------------|----------------------------|----------------------------|
| Constant              | 1.209***<br>(0.000) | 0.884***<br>(0.000)         | 1.150***<br>(0.000) | 0.849*<br>(0.070)          | 1.433***<br>(0.000)        |
| <i>L.lcsdc</i>        | 0.183**<br>(0.039)  | 0.495***<br>(0.000)         | 0.144*<br>(0.088)   | 0.322***<br>(0.001)        | 0.335**<br>(0.022)         |
| <i>lsize</i>          | -0.121<br>(0.272)   | -0.217*<br>(0.086)          | -0.047<br>(0.514)   | -0.322**<br>(0.012)        | -0.454***<br>(0.003)       |
| <i>lbindp</i>         | 0.086<br>(0.258)    | 0.042<br>(0.499)            | 0.101<br>(0.176)    | 0.231<br>(0.281)           | 0.010<br>(0.937)           |
| <i>lgdiv</i>          | 0.014<br>(0.313)    | 0.008<br>(0.436)            | 0.011<br>(0.440)    | -0.046<br>(0.148)          | -0.028<br>(0.165)          |
| <i>lacomm</i>         | 0.113<br>(0.643)    | -0.000<br>(0.997)           | 0.166<br>(0.407)    | 0.029<br>(0.899)           | -0.474**<br>(0.013)        |
| <i>lfsize</i>         | 0.0429**<br>(0.018) | 0.045***<br>(0.000)         | 0.037**<br>(0.005)  | 0.101***<br>(0.000)        | 0.166***<br>(0.000)        |
| <i>lfage</i>          | 0.062**<br>(0.033)  | 0.056<br>(0.155)            | 0.063<br>(0.114)    | 0.104**<br>(0.049)         | 0.221***<br>(0.002)        |
| <i>lroa</i>           | 0.025**<br>(0.057)  | 0<br>(.)                    | 0<br>(.)            | -0.062<br>(0.169)          | 0<br>(.)                   |
| <i>lsize*lroa</i>     |                     | <b>0.069***<br/>(0.008)</b> |                     |                            |                            |
| <i>lbindp*lroa</i>    |                     |                             | 0.018<br>(0.153)    |                            |                            |
| <i>lgdiv*lroa</i>     |                     |                             |                     | <b>0.114**<br/>(0.014)</b> | <b>0.121**<br/>(0.008)</b> |
| <i>lacomm*lroa</i>    |                     |                             |                     |                            |                            |
| No. of obs.           | 676                 | 675                         | 676                 | 678                        | 677                        |
| Instruments           | 54                  | 55                          | 54                  | 60                         | 55                         |
| vif 1 (mean)          | 1.29                | 13.74                       | 58.26               | 2.01                       | 15.15                      |
| vif 2 (mean)          | -                   | 1.29                        | 1.29                | -                          | 1.29                       |
| Wald Chi <sup>2</sup> | 78.03***            | 129.24***                   | 70.68***            | 64.64***                   | 62.84***                   |
| AR(1)                 | 0.000               | 0.000                       | 0.000               | 0.000                      | 0.000                      |
| AR(2)                 | 0.899               | 0.704                       | 0.841               | 0.598                      | 0.845                      |
| Sargan                | 0.535               | 0.000                       | 0.439               | 0.381                      | 0.591                      |
| Hansen                | 0.336               | 0.537                       | 0.262               | 0.418                      | 0.511                      |

Note: p-values in parentheses: \* p<0.10, \*\* p<0.05, \*\*\* p<0.01.

### Dynamic GMM Regression Results for the Moderating Effect of Return on Equity

The panel regression results for models designed to test the moderating effect of financial performance is presented in Table 6. The return on equity is considered the second proxy to represent the firm's financial performance level in the current research. Models 6 to 10 are designed to determine the moderating effect of

return on equity in strengthening the relationship of board attributes on the level of corporate sustainability disclosure compliance (CSDC) in Nigeria. Model 6 of Table 6 tests the direct relationship of all the explanatory, control and moderating variables on the dependent variable (lcsdc). Subsequently, four (4) interaction variables (lsize\*lroe, lbindp\*lroe, lgdiv\*lroe and lacomm\*lroe) were tested using the stepwise regression approach in models 7 to 10. The interaction variables reflected in the dynamic GMM panel regression were designed to capture the moderating effect in the models. Based on the Wald Chi square distribution results in Table 6, the explanatory variables in models 6 to 10 are statistically significant and adequate to explain the level of CSDC. The empirical findings from the test for the direct effect of explanatory, control and moderation variables are presented in model 6 in Table 6. The result reveals a significant positive relationship between return on equity (lroe) and the dependent variable (lcsdc).

The interaction between board size and return on equity (lsize\*lroe) presented in model 7 below is significant at 10% level. This implies that an increase in board size and return to equity holders can strengthen the influence of board attributes on CSDC in Nigeria. Further evidence for the moderation can be observed to increase the coefficient of lgdiv and lsize due to the interaction. Similarly, at 10% level of significance, the result in model 8, shows a significant and positive interaction between the board independence of a firm and return on equity (lbindp\*lroe). The result indicates that, the interaction has significantly impacted the level of corporate sustainability disclosure in Nigeria. This leads to a stronger relationship of board attributes on CSDC. As a result of the current interaction (lbindp\*lroe) variables, lsize (firm size) and lfage (firm age) reveal stronger statistical evidence through a positive increase in respective p-values. However, the results related to the interaction effect presented in model 7 and 8 are both significant at 10%, as such, caution must be applied when relying on results.

Furthermore, the interaction variable (model 10) between the audit committee and return on equity (lacomm\*lroe) reveals a positive and significant relationship. The result is significant at 10% level; thus, caution must be applied upon reliance on the result. This result indicates evidence for the direct influence of the moderator in strengthening the link of board attributes on CSDC in Nigeria. However, it can be observed that with the introduction of the interaction variable into the model, board independent (lbindp), gender diversity (lgdiv) and firm age (lfage) provide stronger statistical evidence in the current model. The result implies that the increase in audit committee size and return on equity will significantly influence the level of CSDC in Nigeria through the influence of the selected board attributes. The result of the interaction between gender diversity and return on equity (model 9) shows a positive relationship with the dependent variable (CSDC). However, the result is not statistically significant. Thus, there is insufficient evidence to conclude that the interaction variable lgdiv\*lroe can strengthen the influence of board attributes on CSDC in Nigeria.

The assertion of the role of the financial performance of firms with corporate disclosure is presented by prior studies (Deswanto and Siregar, 2018; Farag et al., 2014; Md Nor et al., 2016; Modugu, 2017). Mangesti (2019) provides further evidence for the interaction effect of financial performance on asset growth. The finding on the moderating effects of financial performance using the ROA and ROE as proxies is further supported by the assertion by Suchman (1995), that legitimacy theory is socially constructed based on the society's perception towards goal congruence between organisational behaviour and societal beliefs and values. Hence, firms continuously strive to improve financial performance within the limits of rules and regulations set by the society. The findings further support the assertion under the legitimacy theory that companies gain legitimacy through an increase in corporate disclosure for the benefit of a range of users. Furthermore, based on the findings above, it is clear that the financial performance of corporate entities in Nigeria plays a vital role in establishing factors that led to compliance with sustainability disclosure requirements. Thus, to ensure sustainable growth and development of the private sector in Nigeria through corporate disclosures, there is a critical need to improve revenue generated by listed companies.

Table 6 GMM Result for the moderating effect of Return on Equity

| DV: lcsdc              | Model 6             | Model 7                          | Model 8                          | Model 9              | Model 10                         |
|------------------------|---------------------|----------------------------------|----------------------------------|----------------------|----------------------------------|
| Independent Variables: | (GMM)               | (GMM)                            | (GMM)                            | (GMM)                | (GMM)                            |
| Constant               | 1.029***<br>(0.000) | 1.075***<br>(0.000)              | 1.085***<br>(0.000)              | 1.414***<br>(0.000)  | 1.127***<br>(0.000)              |
| L.lcsdc                | 0.104**<br>(0.043)  | 0.119*<br>(0.075)                | 0.104**<br>(0.047)               | 0.124*<br>(0.057)    | 0.116*<br>(0.067)                |
| lbsize                 | -0.0799<br>(0.337)  | -0.121<br>(0.142)                | -0.0891<br>(0.300)               | -0.110<br>(0.417)    | 0.0150<br>(0.898)                |
| lbindp                 | 0.147**<br>(0.034)  | 0.141*<br>(0.050)                | 0.130*<br>(0.059)                | 0.0590<br>(0.460)    | 0.156**<br>(0.031)               |
| lgdiv                  | 0.0481*<br>(0.066)  | 0.0504*<br>(0.054)               | 0.0465*<br>(0.079)               | 0.00740<br>(0.739)   | 0.0591**<br>(0.023)              |
| lacomm                 | 0.327<br>(0.120)    | 0.333<br>(0.109)                 | 0.329<br>(0.139)                 | 0.0542<br>(0.517)    | 0.0174<br>(0.870)                |
| lfsize                 | 0.0235**<br>(0.021) | 0.0221**<br>(0.028)              | 0.0236**<br>(0.025)              | 0.0422***<br>(0.001) | 0.0132<br>(0.573)                |
| lfage                  | 0.0556<br>(0.154)   | 0.0409<br>(0.120)                | 0.0449*<br>(0.089)               | 0.0581**<br>(0.046)  | 0.0625*<br>(0.087)               |
| lroe                   | 0.0368**<br>(0.043) | 0<br>(.)                         | 0<br>(.)                         | 0.00232<br>(0.918)   | 0<br>(.)                         |
| lbsize*lroe            |                     | <b>0.0313*</b><br><b>(0.079)</b> |                                  |                      |                                  |
| lbindp*lroe            |                     |                                  | <b>0.0202*</b><br><b>(0.053)</b> |                      |                                  |
| lgdiv*lroe             |                     |                                  |                                  | 0.0048<br>(0.815)    |                                  |
| lacomm*lroe            |                     |                                  |                                  |                      | <b>0.0464*</b><br><b>(0.070)</b> |
| No. of obs.            | 677                 | 676                              | 677                              | 680                  | 678                              |
| Instruments            | 53                  | 53                               | 54                               | 61                   | 53                               |
| vif 1 (mean)           | 1.29                | 14.01                            | 64.37                            | 2.00                 | 18.26                            |
| vif 2 (mean)           | -                   | 1.27                             | 1.27                             | -                    | 1.27                             |
| Wald Chi <sup>2</sup>  | 64.67***            | 79.68***                         | 71.02***                         | 59.02***             | 47.12***                         |
| AR(1)                  | 0.000               | 0.000                            | 0.000                            | 0.000                | 0.000                            |
| AR(2)                  | 0.571               | 0.536                            | 0.541                            | 0.893                | 0.548                            |
| Sargan                 | 0.913               | 0.855                            | 0.920                            | 0.449                | 0.908                            |
| Hansen                 | 0.628               | 0.603                            | 0.608                            | 0.412                | 0.506                            |

Note: p-values in parentheses: \* p<0.10, \*\* p<0.05, \*\*\* p<0.01.

## CONCLUSION

The study analyses the moderating effect of a firm's financial performance in strengthening the level of CSDC in Nigeria. The result of GMM estimations reveals strong evidence for the moderating effect of return on assets and equity on the board attributes influencing CSDC in the Nigerian Context. Findings from the moderating effects of return on assets show significant interaction of board size, gender diversity and audit committee, and return on asset appears to be statistically significant. Moreover, the finding justifies the legitimacy theory's assertion that companies shall continue to strive to improve their financial performance within the boundaries of stipulated laws and regulations. Similarly, findings from the moderating effects of return on equity show significant interaction between board size, board independence and audit committee and return on equity. The study presents that the determinants of sustainability across the globe have provided divergent findings, however, with the focus on the impact of moderating effect of financial performance. This will, in essence, provide comfort to various stakeholders. Furthermore, the study's findings shall benefit the private sector in Nigeria as the empirical result further stresses the need for firms to focus on activities that enhance financial performance through an increase in return. Thus, the study concludes that firms would gain financial strength to engage in more sustainable activities, leading to an increase in the level of corporate sustainability disclosure compliance. The results of this research could also serve as empirical evidence to be used by policymakers, such as the Nigerian SEC, CBN, and FRCN, in designing a mechanism to boost the financial performance and revenue generation of listed companies in Nigeria. A study focusing on a qualitative approach using interviews could be conducted to explore further factors that influence CSDC using a data source directly obtained from players in the Nigerian private sector.

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