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Associate Professor Muhammad Bilyaminu Ado
Editor-in-Chief

BOARD GENDER DIVERSITY, HUMAN RESOURCES DEVELOPMENT AND FIRM PERFORMANCE OF DEPOSIT MONEY BANKS IN NIGERIA

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Abstract

This study examines the direct impact of women on the board on firm performance of Deposit Money Banks **(**DMBs**)** in Nigeria as well as the moderating role of human resources development on the relationship between gender diversity and firm performance. The study adopted a sample size of ten (10) banks from a total population of fifteen (15) listed DMBs on the Nigerian Exchange Group and relevant research information was extracted from the annual reports and accounts of the sampled banks for a period of ten years from 2013 to 2022. Generalized Least Square (GLS) regression and robust Ordinary Least Square (OLS) techniques were used to test the study's hypotheses. The results showed that board gender diversity has significant impact on Tobins Q but not on ROA of listed DMBs. It was also found that board independence has a positive and significant impact on performance. The finding of the study also revealed that human capital development used as moderating variable improved the positive impact of gender diversity on firm performance. The study recommends that the management of listed DBMs in Nigeria should increase the number of women on their board in order to influence their performance. Also, the study recommends that the management of the DMBs should increase the level of their spending employees' training and development in order to improve/increase their performance.

***Keywords*:** Deposit Money Banks, Firm Performance, Human resources development, Gender diversity, Size

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1. Introduction

Performance measurement is an important aspect of every business endeavour. The objective of measuring performance does not only cover how a business is performing but also gives an insight on how business can perform better. Financial performance is the measure of how a firm uses its assets for the generation of revenue (Mbuga, 2015). The performance of a firm describes how a firm has achieved its target financial objectives. Firm performance is also seen as a measure of how well an organization makes use of its assets to generate income. Firm performance can also be seen as the ability of a firm to obtain additional resources, from its activities during a given year.

Gender composition of the board of directors of firms is one of the important governance issues that recent modern corporation managers, shareholders and directors are facing which has drawn attention from the press, major institutional investors and proposals from advocacy groups because of their effect on the performance of organization (Carter *et al.*, 2003). Gender directorship represents the numbers of women on the board of a company. There is strong contention that company performance will improve because women are better than men at multi-tasking, risk

management and communication (Schubert, 2006); and because they have a more participative and process-oriented communication style (Lucas-Pérez *et al.,* 2015). Gender-diverse boards bring more creativity (Hillman *et al.,* 2007) and multi-perspectives for board's decision making (Gul *et al.,* 2011) and make problem solving more effective (Cohen *et al.,* 2007), which is beneficial for firm's financial performance.

In stiff competitive environments, organizations need to shift towards knowledge economy, creates value and gains sustained competitive advantage to remain afloat. To do this, firms need to commit adequate resources on their human resources. Firms that make necessary investment in developing human capital witness significant financial performance. Investment in the human resources development (HRD) is a must for improving the efficiency of human capital and thereby enhancing the productivity and performance of an organization (Gidado *et al.,* 2014). Since human resources are the potential sources of sustainable competitive advantage, managing them well, in turn, drive competitiveness (Cappelli & Anne, 1996; Ivancevich, 2003). This, in principle, facilitates the organizations to desirable financial performance (Guest, 1997,2011). It is now recognized that all resources minus human resources equal to zero (Bhuiyan *et al.,* 2017). Therefore, long-term growth in an economy with efficiency and effectiveness depends on productive investment in HRD (Olayemi, 2012). From the above, one will conclude that investment in human resources development will have significant influence on the performance of DMBs and moderate the relationship between gender diversity and firm performance.

Most of the researches in the area of firm performance, board diversity and HRD have their origin from empirical analyses from advanced economies (For instance, Carter *et al.,* 2003; Adams & Ferreira, 2009; Dobbin & Jung, 2010). Whereas only few studies examined the impact gender diversity and HRD have on the performance of firms in developing economy (for example Tessema, 2015; Eletu *et al.,* 2017). In addition, none of these studies examine the moderating effect of HRD on the relationship between gender diversity and performance of DMBs in Nigeria.

The decision to focus on the DMBs in Nigeria emanates from the fact that banks are one of the important sectors that contribute to the growth of the economy. There is the need therefore to study such sector. Moreover, the justification for choosing DMBs is based on the fact that, it is still an area with few studies on the topic. This study therefore examines the moderating role of HRD on the relationship between gender diversity and financial performance of DMBs in Nigeria from 2013 to 2022. Section two outlines the literature review and development of hypotheses while section three details the methodology adopted for the study. Section four discusses the data analysis while section five provides conclusion and policy recommendations.

2. Literature review

2.1 Conceptual Review/Theoretical Review

2.1.1 Concept of performance

Profitability is a major objective of every business undertaking. In fact, it is the essential persuading power for most financial exercises. Zeitun and Tian (2007) argued that the word performance is a controversial issue in the financial strategy of most corporate organizations due to its multidimensional meanings. Operational performance measures such as growth in sales and growth in market share provide a broad definition of performance as they focus on the factors that ultimately lead to financial performance (Hoffer & Sandberg, 1987 as cited in Zeitun *et al*, 2007). Barbosa and Louri (2005) opined that financial performance measurement is one of the tools which indicate the financial strengths, weaknesses, opportunities and threats in the organization. Financial performance can be measure in different ways and choosing specific performance measure is based on the objective of the study.

2.1.2 Concept of Gender Diversity

Carter *et al.* (2010) explain the relationship between board gender diversity and firm performance based on the agency theory. The authors posit that board gender diversity enhances the board's ability to monitor top management. In addition, they argue that increasing the number

of female directors may increase the board's independence since women tend to ask questions that male directors may not ask. For instance, Mallin and Michelon (2011) suggest that a high proportion of women in the boardroom lead to higher overall social performance, better community performance, better employee relations and improved human rights (Hafsi & Turgut, 2013).

2.1.3 Concept of Human Resources Development

Human resources development (HRD) is the process of building an appropriate, balanced and critical mass of human resource base and providing an enabling environment for all individuals to be fully engaged and contribute to national development effort. The sole aim of managing human capital (HC) centres on the need to have capable manpower available to oversee the affairs of the entity in order to achieve its set objectives. HRD improves employees' performance; as a result, adequate training is needed for optimal performance. Hsu and Wang (2012) argued that a firm can improve its performance so long as its employees continue to improve their knowledge and skills because HC focuses on the value addition to the business in terms of profitability. HRD becomes a part of an overall effort to achieve cost-effective and firm performance (Marimuth *et al*, 2009). The authors further stated that firms need to understand HC that would enhance employee satisfaction and improve performance.

2.2 Theoretical framework

2.2.1 Resource dependency theory

The proponents of this theory, Pfeffer and Salancik (2003), argued that every firm depends on several stakeholders such as other firms that hold strategic resources necessary for the operations of the firm. They argued that every firm cannot hold all strategic resources so they have to build long term relationships with those stakeholders who can assist the firm in terms of necessary resources. This necessity actually motivates the firms to engage with the external environment, which forms the basis of social and relational capital for the firms. In trying to link RD theory with the human resources of firms, Abeysekera (2010) argues that firms' effective engagement with the external environment is possible only when a firm holds efficient internal resources such as human capital and learning environment. This argument is also consistent with Williams (2000) who argues that firms should utilize their available human resources effectively to increase the value creation capabilities of the firm. The resource dependency theory gives credence to the importance of efficient human resources, which will ultimately lead to stakeholders having assurance in the firm activities.

2.2.2 Upper echelons theory

The upper echelons theory was propounded by Hambrick and Mason (1984). According to the theory, organizational outcomes both strategies and effectiveness are viewed as reflections of the values and cognitive bases of powerful actors in the organization. Upper Echelons theory states that Top Management Team (TMT) members' characteristics, including past experiences, values, and personalities, affect how they make strategic and organizational decisions. The theory states that these characteristics can have influence on how TMT members make decision that affect the organization. The theory suggests that TMT member's gender characteristics can affect decision making in the organization.

Thus, this study is underpinned primarily by resource dependency theory and upper echelons theory which provide relevant framework for understanding gender diversity, HRD and firm performance. Many researchers concluded that organization can only have effective engagement with outside parties only when such organisation holds efficient internal resources such as human capital and learning environment. Also, the TMT theory points to the role of diversity (heterogeneity) of the TMT as a potential benefit in terms of a range of outcomes, from firm financial performance to strategic agility

2.3 Empirical Review

In a study, Khan *et al.,* (2017) examine the relationship between gender diversity among corporate board and firm financial performance using 100 non-financial companies in Malaysia for the period of 2009-2013 and found that gender diversity had a positive impact on performance (ROE). In a study by Moreno-Gómez *et al.* (2018), the authors investigated how gender diversity in top management affects business performance among Colombian public companies for the period 2008-2015 and concluded that gender diversity is positively associated with business performance. Similarly, in a study of A-share-listed non-financial firms in China during the period 2007-2012, Li and Chen (2018) found that gender diversity on the board had a positive impact on firm performance if and only if the value of firm size is less than some critical value. In addition, the study revealed that firm size may undermine the positive impact of board gender diversity on firm performance. Also, in a study of fifty selected firms over a period of five years on the Nigerian Stock Exchange, Temile *et al.* (2018) found that proportion of females on the board and female chief financial officer had positive impact on the firms' corporate performance in Nigeria.

Owolabi *et al.* (2021) found that board gender diversity had a positive impact on the after-tax profits of ten selected listed companies in Nigeria during the period 2010 to 2019. Similarly, Yahaya (2022) concluded that gender diversity had significant impact on profitability of seventy-five non-financial services firms in Nigeria during the period 2012 to 2021.

However, Mandala *et al.,* (2017) examine whether gender diversity of boards and board composition, affects performance for a ten-year period from 2006 to 2015 from 98 sampled financial institutions in Kenya and concluded that gender diversity of board had no significant influence on performance of financial institutions in Kenya. In a study, Nwankwo and Nguru (2022) concluded that board gender had no significant impact on profitability of twenty firms during the period 2011 to 2020.

Tessema (2015) examined the impact of human capital on the performance of a sample of 143 small scale Footwear sector in Addis Ababa, Ethiopia and found that HC investment in company lead to the improved company performance. In a study by Bhuiyan *et al.,* (2017), the authors examined the impact of investment in HRD on the financial performance of the banking sector of Bangladesh during the period 2007-2011 and concluded that there is a significant positive relationship between HRD investment and financial performance of the sample banks.

Eletu *et al.* (2017) investigated the effect of human capital development on corporate performance in food and beverages firms in Port Harcourt, Nigeria and concluded that there was strong correlation between the dimensions of human capital development and the measures of corporate performance. Al-Sharafat (2017) examined the effect of human capital development on the financial performance of agricultural enterprises of 119 broiler farms in Jordan and concluded that training, education, exposure to agricultural extension activities, experience, education area and entrepreneurial skills of farm operators have significant positive impact on the financial performance of the studied broiler farms. Similarly, in a study of fifty manufacturing firms in Pakistan, Irfan *et al.* (2023) found that human resources management had significant impact on the organizational performance. Based on the above, the following hypotheses are formulated:

***H*$_{01}$**: Gender Diversity does not have a significant impact on the performance of deposit money banks using ROA.

***H*$_{02}$**: Gender Diversity does not have a significant impact on the performance of deposit money banks using Tobin's Q.

***H*$_{03}$**: HRD does not moderate the relationship between gender diversity and performance of deposit money banks.

3. Methodology

This study adopted descriptive and correlation research designs. The population of the study is the entire deposit money banks quoted on the Nigeria Exchange Group (NGX) as at 31st December 2022. This study covered the period of 2013 to 2022. There are fifteen (15) DMBs in Nigeria as at 31st December, 2022. However, for firms to be part of the sample, there are some criteria which

have to be met as follows: i banks must have been quoted on the Nigeria Exchange Group as at 1st January 2013 ii banks must not have any omission in its data during the period of the study. iii banks must not change its name, merge or being taken over during the period of the study. After the above filters, ten (10) DMBs made the population and were selected as samples of this study which is shown in appendix.

3.1 Variable Description

3.1.1 Dependent variables

The dependent variables of the study are ROA and Tobin's Q. ROA is the ratio of pre-tax profit divided by total assets. ROA is a comparison of net income over total assets. This accounting measure of performance is generally accepted as a valid measure of overall company performance (Core, *et al.,* 1999). The ROA provides information about the value added to the company that lead to better performance of that company. ROA is measure as the ratio of profit before tax divided by total assets. Tobin's Q is a forward-looking measure that captures the value of a firm as a whole rather than a sum of its parts. In other words, it is forward-looking because it includes the expected future cash flow of a firm (i.e. the combined market value of firm's debt and equity). Tobin's Q is a ratio of the firm's market value to its book value (i.e. market value of equity divided by book value of asset). Many researchers' used Tobin's Q as a proxy for a firm's financial performance (for example, Adams & Ferreira, 2009; Bohren & Strom, 2010).

3.1.2 Independent variables

3.1.2.1 Gender Diversity

This represents the percentage of board seats held by women. The presence of more women on the board may increase the board's independence since women tend to ask questions that male directors may not ask. Board gender diversity is measure as the proportion of women on board of directors over the total number of board members (Saruchi *et al.,* 2019, Rahman, *et al.,* 2019).

3.1.3 Human resources development (moderating variable)

There is possibility that a firm will improve on its performance when employees continue to increase their knowledge and skills since HC focuses on the value addition to the business in terms of profitability. Human resources development is measured as the ratio of training and development expenditure to total revenue (Bontis & Fitz-enz, 2002). This is used as moderating variable between gender diversity and firm performance.

3.1.4 Control variables

Board Independence, board size and firm size are used as control variables in this study. Board independence is defined as the proportion of outside directors (non-executive) to the total number of directors (Haniffa & Hudaib, 2006). The composition of the board to include more outside directors may influence the entity perception towards firm performance, hence the introduction of the variable in this study. Board independence is measured as the proportion of board of directors who are non-executives to total board members (Nyarko *et al*, 2018; Isa *et al.,* 2022). Board Size refers to the total number of directors (executive and non-executive) sitting on the board. The resource dependency theory posits that larger boards are more likely to include a large pool of experts with diverse industrial and educational backgrounds, and skills that enhance boards' information processing capabilities. This can mitigate individual directors' deficiencies in business skills through collective decision makings, which in turn improves the quality of strategic decisions and actions made by a firm (Abeysekera, 2010). Board size is measure as the number of directors on the board as used in studies such as (Hatane, *et al*, 2017; Isa *et al.*, 2022)). Finally, past studies have suggested that size of the company is an important factor which has a positive impact on the performance.

3.2 Model Specification

In line with the previous study, the following model was adapted. The study, therefore, established a simple model to direct our analysis. This model is as follows:

$ROA_{it} = \beta_0 + \beta_1 GEN_{it} + \beta_2 BIND_{it} + \beta_3 BSIZE_{it} + \beta_4 Size_{it} + \varepsilon_{it}$ (1)
$TOBIN'S\ Q_{it} = \beta_0 + \beta_1 GEN_{it} + \beta_2 BIND_{it} + \beta_3 BSIZE_{it} + \beta_4 Size_{it} + \varepsilon_{it}$ (2)

This study introduced human resources development as a moderating variable. The following regression models are used to examine the moderating role of human capital development on the relationship between female director and firm performance.

$ROA_{it} = \beta_0 + \beta_1 GEN_{it} + \beta_2 HRD_{it} + \beta_3 BIND_{it} + \beta_4 BSIZE_{it} + \beta_5 Size_{it} + \varepsilon_{it}$ (3)
$Tobin's\ Q_{it} = \beta_0 + \beta_1 GEN_{it} + \beta_2 HRD_{it} + \beta_3 BIND_{it} + \beta_4 BSIZE_{it} + \beta_5 Size_{it} + \varepsilon_{it}$ (4)
$ROA_{it} = \beta_0 + \beta_1 GEN_{it} + \beta_2 GEN_{it} * HRD + \beta_3 HRD_{it}\ \beta_4 BIND_{it} + \beta_5 BSIZE_{it} + \beta_6 Size_{it} + \varepsilon_{it}$ (5)
$Tobin's\ Q_{it} = \beta_0 + \beta_1 GEN_{it} + \beta_2 GEN_{it} * HRD + \beta_3 HRD_{it} + \beta_4 BIND_{it} + \beta_5 BSIZE_{it} + \beta_6 Size_{it} + \varepsilon_{it}$ (6)

where:
ROA_{it} = Return on Asset
$Tobin's\ Q_{it}$ = Tobin's Q
GEN_{it} = Gender Diversity
HRD_{it} = Human Resources Development
$BIND_{it}$ = Board Independence
$Bsize_{it}$ = Board size
$FSize_{it}$ = Firm Size
ε_{it} = error term

4. Results and Discussion

This section presents and discusses the results of the tests conducted on the data collected for the study. The results were presented using Tables. It follows with descriptive statistics, correlation matrix and regression analysis.

4.1 Descriptive statistics

Table 1 presents descriptive statistics of the variables for the study. The mean, standard deviation, minimum and maximum were used to describe the data.

Table 1: Descriptive Statistics

Variables	Obs.	Mean	Std. Deviation	Minimum	Maximum
ROA	100	0.02754	0.4778	-0.1360	0.3012
TOBINSQ	100	1.7193	2.7422	-1.6558	16.1061
BGD	100	0.2019	0.0617	0.0769	0.3333
HRD	100	0.0525	0.0288	0.0077	0.1282
BSIZE	100	14.65	2.7094	8	19
BIND	100	0.6007	0.0829	0.4615	0.875
FSIZE	100	6.0424	0.3872	5.1945	6.6903

Source: Extracted from Stata Output, 2023

Table 1 provides descriptive statistics of the variables considered in the study for sampled banks. It indicates that sampled banks have an average return on assets of 0.0275 (3%). This shows a high variation in return on assets of the sampled of banks as portrayed by the standard deviation of 0.4777 (4%). The minimum and maximum values were -0.1360 and 1.3012 respectively. The negative minimum value indicates that, some sampled of banks incurred loss at a particular period. Similarly, Table 1 also indicates an average value of Tobins Q is 1.7193 (117%). The standard

deviation showed a value of 2. 7422.. The negative minimum value indicates that, some sampled of banks incurred loss at a particular period.

Furthermore, an average value of board gender diversity is 0.2019 (20%). This shows a low variation in board gender diversity of sampled of banks as portrayed by the standard deviation of 0.0617 (6%) which is lower than the mean value. The minimum and maximum values were 0.0769 (8%) and 0.3333 (33%) respectively. Similarly, HRD has an average of 0.05249 (5%). This shows a low variation in HRD of the sampled of banks as portrayed by the standard deviation of 0.0288 (3%) which is lower than the mean value. Also, board independence has a mean of 0.6007(60%). The minimum and maximum values are 0.4615(46%) and 0.875(875). Board size has an average of 14 with standard deviation of 2.709. The minimum board members are 8 while the maximum are 19. Firm size was measured as logarithm of total assets, has a mean of ₦6, 042, 364.00 with a minimum of ₦5, 194, 531.00 and maximum of ₦7, 165, 507.00.

4.2 Correlation Matrix

The correlation matrix as presented in Table 2 shows the association between dependent variables and explanatory variables.

Table 2: correlation Matrix

VARIABLES	ROA	TOBINSQ	BGD	BSIZ	BIND	FSIZE	HRD	VIF
ROA	1.0000							
TOBIN'S Q	0.5570	1.0000						
BGD	0.1880	0.0991	1.0000					1.54
BSIZ	-0.2837	-0.2998	-0.2943	1.0000				1.50
BIND	0.3456	0.4132	0.0757	-0.5014	1.0000			1.45
FSIZE	-0.0530	0.1504	-0.2203	0.2542	-0.2540	1.0000		1.40
HRD	-0.2184	-0.1808	0.1733	-0.0815	0.1692	-0.5432	1.0000	1.15

Source: Extracted from STATA Output, 2023

From Table 2, Board gender diversity has a positive correlation with financial performance at 0.1880 and 0.0991. HRD has negative coefficient value of -0.2184 and -0.1808 with financial performance. Firm size and board size also reported a negative relationship with financial performance with a correlation coefficient of -0.0530 and -0.2837. However, board independence has a positive correlation with firm performance. The study conducted multicollinearity test using variance inflation factor (VIF) in order to assess the presence of multicollinearity or otherwise. The results indicate absence of multicollinearity. This is confirmed from the statistical result that shows all the VIF are not closer to 10. The mean value of VIF was 1.41.

4.3 Regression Results

Table 3 shows the regression result to examine the impact of gender diversity on the financial performance of Deposit Money Banks in Nigeria.

Table 3: Regression Results (Impact of Gender Diversity on the Financial Performance)

	Fixed Effects				OLS			
Variables	ROA				TOBINS Q			
	Coefficient	Std. Err.	T	P>/T/	Coefficient	Std. Err.	T	P>/T/
BGD	0.1559	0.1093	1.43	0.157	1.2237	4.6901	0.26	0.004
BIND	0.1914	0.0883	2.17	0.033	14.021	3.3934	3.56	0.000
BSIZE	0.0024	0.0029	0.81	0.421	0.0689	0,1270	0.54	0.007
FSIZE	-0.0749	0.0204	-3.66	0.000	-0.4256	0.8434	-0.50	0.614

Cons.	0.3106	0.1435	2.17	0.033	-2.6521	6.4680	-0.41	0.682
Prob > F	0.0000					0.0000		
R-Square								
Within		0.2889				0.2721		
Between		0.0469				0.1140		
Overall		0.0609				0.2068		

Source: Extracted from STATA Output, 2023

From Table 3, the model summary for the analyses become:

$$ROA_{it} = 0.3106 + 0.1559(BGD)_{it} + 0.1914(BIND)_{it} + 0.0024(BSIZ)_{it} - 0.0749(SIZE)_{it} + \varepsilon it \quad (1)$$

$$TOBINS\ Q_{it} = -2.6521 + 1.2237(BGD)_{it} + 14.021(BIND)_{it} - 0.0689(BSIZ)_{it} - 0.4256(SIZE)_{it} + \varepsilon it \quad (2)$$

Findings from the panel data regression analysis of model one and model two in Table 3 indicated that, R^2 (coefficient of determination, which refers to a goodness of fit measure for linear regression models and indicates the percentage of the variance in the dependent variable that the explanatory variables explain collectively) of the variables was 0.0609 and 0.2068 in model one and two respectively. As a measure of the overall fitness of the models, the R^2 indicated that, the model was capable of explaining about 7% and 21% of the systematic variation in the value of dependent variable which could be traced to the explanatory variables.

The result from Table 3 showed that board gender diversity has significant impact on firm performance using Tobins Q. Whereas, the finding showed that BGD has no significant impact on ROA. Also, the finding from the study revealed that board independence and board size have significant impact on firm performance. However, the finding showed that firm size has a negative and significant impact on performance. The result also showed that board size does not have a significant impact on DMBs performance using ROA. Thus, this provides enough evidence failing to reject the null hypotheses one and two of the study which states that: gender diversity does not have a significant impact on financial performance of listed DMBs in Nigeria. The finding is in line with those of Mreno-Gonez *et al.*, (2018), Temile *et al*., (2018), Owolabi *et al*., (2021) and Yahaya (2022). The findings of Mandala *et al*., (2017), Nwakwo *et al*., (2022) are contrary to ours.

Table 4: Regression Result of pre-moderation Models

	Fixed Effects				*OLS*			
Variables	ROA				TOBINS Q			
	Coefficient	Std. Err.	T	P>/T/	Coefficient	Std. Err.	T	P>/T/
BGD	0.1559	0.1093	1.43	0.157	1.2237	4.6901	0.26	0.794
HRD	0.2252	0.2449	0.92	0.031	-13.6729	10.70642	1.28	0.012
BIND	0.1914	0.0883	2.17	0.033	14.021	3.3934	3.56	0.000
BSIZE	0.0024	0.0029	0.81	0.421	-0.0689	0,1270	0.54	0.587
FSIZE	-0.0749	0.0204	-3.66	0.000	-0.4256	0.8434	0.50	0.614
Cons.	0.3106	0.1435	2.17	0.033	-2.6521	6.4680	0.41	0.682
Prob > F	0.0000					0.0000		
R-Square								
Within		0.2769				0.2930		
Between		0.0769				0.1060		
Overall		0.1029				0.2123		

Source: Extracted from STATA Output Version 14.0

The result from Table 4 revealed that HRD has significant impact on firm performance. Similarly, it showed that HRD can moderate the relationship between BGD and performance. of Deposit Money Banks.

Table 5: Regression Results of interaction variable

	Fixed Effects				*OLS*			
Variables	ROA				TOBINS Q			
	Coefficient	Std. Err.	T	P>/T/	Coefficient	Std. Err.	T	P>/T/
BGD	0.2579	0.2468	1.04	0.299	14.4812	10.5921	1.37	0.172
HRD	0.1267	0.8016	0.16	0.875	34.7283	35.8225	0.97	0.332
BGD*HRD	1.6784	3.6394	1.60	0.022	235.6215	168.9795	-1.39	0.033
BIND	0.1665	0.1038	2.17	0.033	10.8111	4.5641	2.37	0.018
BSIZE	0.0021	0.0030	0.69	0.492	-0.1199	0.1341	-0.89	0.371
FSIZE	-0.0755	0.0206	-3.67	0.000	-0.5205	0.8477	-0.61	0.539
Cons.	0.3125	0.1442	2.17	0.033	-2.0519	6.4640	-0.32	0.751
Prob > F	0.0000					0.2558		
R-Square								
Within		0.2907				0.3003		
Between		0.0600				0.0467		
Overall		0.0540				0.1912		

Source: Extracted from STATA Output Version 14.0

From Table 5, the model summary for the analysis becomes:

$$ROA_{it} = 0.3125 + 0.2579(BGD)_{it}\ 1.6784(BGD*HRD)_{it} + 0.1267(HRD)_{it} + 0.1665(BIND)_{it} + 0.0021(BSIZ)_{it} - 0.0755(SIZE)_{it} + \varepsilon it \quad (5)$$

$$TOBINS\ Q_{it} = -2.0519 + 14.4812(BGD)_{it} + 235.6215(BGD*HRD)_{it} + 34.7283(HRD)_{it} + 10.8111(BIND)_{it} - 0.1199(BSIZ)_{it} - 0.5202(SIZE)_{it} + \varepsilon it \quad (6)$$

The result from Table 5 showed that when HRD was introduced as a moderating variable between gender diversity and firm performance, the result showed that HRD improve the relationship between gender diversity and firm performance in both model five and six. Thus, this provides enough evidence to reject the null hypothesis three of the study which states that HRD does not moderate the relationship between gender diversity and performance of listed DMBs in Nigeria. The finding is in line with those of Tesema (2015), Bhuniyan et al., (2017), Eletu et al., (2017) and Irfan (2023).

4.4 Robustness Tests

Hausman specification test shows the extent to which statistical models correspond to the data under study. This regression analysis tests for endogeneity, is helpful in determining whether a model will ultimately be effective in calculating probability values which basically, is the bottom line for statistical significance or non-significance. In panel data analysis (the analysis of data over time), the Hausman specification test help to choose between random fixed model or a fixed effects model. The Hausman specification test was carried out and the result revealed that, fixed effects model was appropriate in model one as result is less than 5% (0.0007) level of significant and random effect model was more appropriate in model two as result is greater than 5% (0.3433) level of significant. Furthermore, Breusch and Pagan Lagrangian multiplier test for random effects was conducted in model two to choose between ordinary least square robust and random effect model. The result showed that ordinary least square robust supersedes the random effect model (1.0000). Thus, the result meant that, fixed effect model and ordinary least square robust were appropriate and it was adopted for the analysis of the study data.

5. Conclusion and Recommendations

5.1 Conclusion

This study is longitudinal which helps to offer a deeper understanding of the relationship between gender diversity, HRD and performance over time. This study adopted descriptive and correlation research designs. The sample size of the study is ten DMBs quoted on the Nigeria Exchange Group (NGX) as at 31st December 2022.This study therefore concludes that:

1. Board gender diversity has significant impact on Tobins Q but not on ROA.
2. The study also concludes that human capital resources development influenced the relationship between board gender diversity and firm performance positively.

5.2 Policy Recommendations

Based on the findings and conclusion, this study recommends that the management of listed DBMs in Nigeria should increase the number of women on their board in order to influence their performance. Also, the study recommends that the management of the DMBs should increase the level of their spending employees' training and development in order to more positive impact on their performance.

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