

Internal Determinants of Share Price Movements among Listed Companies in Nigeria: Does Gender Diversity in Boardroom Matter?

(Penentu Dalaman Pergerakan Harga Saham dalam Kalangan Syarikat Tersenarai di Nigeria: Adakah Kepelbagaian Jantina Dalam Bilik Mesyuarat Penting?)

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ABSTRACT

This study focused on ascertaining the value relevance of gender diversity in determining share price movements among listed firms by obtaining evidence from a notable Sub-Saharan African (SSA) country - Nigeria. Panel data were collated from companies' annual reports for 6 years covering 2012 – 2017. In estimating the models formulated to test the postulated hypotheses, the multiple regression technique was applied along with the fixed and random effect analyses. On a general note, findings indicate that the level of gender diversity in corporate boards are value relevant in determining movements in share prices since they have strong and positive effect on variations in share prices of listed firms. We therefore recommend amongst others, the passage and enforcement of legislations by the relevant and appropriate authorities and organs of regulatory controls in Nigeria, requiring all corporate boards to have a minimum proportion of female presence in their respective boardrooms. Overall, the outcome of this study contributes to existing body of empirical knowledge on the statistical link between movements in the prices of companies' stocks and boardroom gender diversity.

Keywords: Gender diversity; board structure; equity stock; earnings; financial reports; firm performance.

ABSTRAK

Kajian ini bertujuan untuk memastikan kerelevanan nilai kepelbagaian jantina dalam menentukan pergerakan harga saham dalam kalangan syarikat tersenarai dengan mendapatkan bukti dari negara Afrika Sub-Sahara (SSA) terkenal - Nigeria. Data panel disusun dari laporan tahunan syarikat selama 6 tahun merangkumi 2012 - 2017. Bagi menganggar model yang dirumuskan untuk menguji hipotesis yang diandaikan, teknik regresi berganda diterapkan bersama dengan analisis kesan tetap dan rawak. Secara umum, penemuan menunjukkan bahawa tahap kepelbagaian jantina dakan lembaga korporat adalah nilai yang relevan dalam menentukan pergerakan harga saham kerana ia mempunyai kesan yang kuat dan positif terhadap variasi harga saham syarikat tersenarai. Oleh itu, kami mengesyorkan antara lain, pelaksanaan dan penguatkuasaan undang-undang oleh pihak berkuasa yang relevan dan tepat serta organ kawalan peraturan di Nigeria, yang mewajibkan semua lembaga korporat mempunyai kadar minimum kehadiran wanita di dewan masing-masing. Secara keseluruhan, hasil kajian ini menyumbang kepada pengetahuan empirikal sedia ada mengenai hubungan statistik antara pergerakan harga saham syarikat dan kepelbagaian jantina di dalam dewan.

Kata kunci: Kepelbagaian gender; struktur lembaga; saham ekuiti; pendapatan; laporan kewangan; prestasi firma

INTRODUCTION

The growing interests on firms' performance, share price movements, and corporate governance have attracted heated debates by professionals, academics and stakeholders globally. Findings from prior studies like Al-Omar and Al-Mutairi (2008), Malhotra and Tandon (2013), Jeroh (2016) and Jeroh (2020), suggest that share prices are basically determined by accounting information like earnings and book value per share. Notably, while a statistical association was found between corporate governance variables (audit quality, audit committee structure, board size, independence, structure and concentration, etc) and firm performance, there are indications that a significant and positive relationship also exist

between movements in share price and firms' financial performance.

According to Jeroh and Okoro (2015), studies on the extent in which available information (non-accounting and accounting information) predicts stock prices of firms abound. In Nigeria for instance, studies on stock price determinants (Ejubekpokpo & Okoro 2014; Jeroh & Okoro 2015) focused on how variables like earnings, book values of shares, net asset, and dividend amongst others, predicts movements in stock prices. This is why experts have continuously maintained that researches on equity stock determinants in Sub-Saharan Africa (SSA) and Nigeria in particular are not extensive, as other variables like boardroom effectiveness and gender diversity which may also affect stock price movements, are almost neglected in considering equity stock price

determinants/movements in the region. Hinged on this argument, this study sought to examine the internal determinants of share price movements among listed firms with particular focus on the sensitivity of share prices to gender diversity in corporate boards. The research paper is sectionalised into five parts. Next to the introduction, we present the conceptual clarification and hypothesis development in Section 1. Relevant prior empirical studies were reviewed in Section 2, while Section 3 presents the data and methodology applied in the study. Section 4 presents the results and discussions which emanated from the analysis of the data obtained for this study. Finally, in Section 5, we present the conclusion and policy recommendations.

LITERATURE REVIEW

CONCEPTUAL CLARIFICATIONS AND HYPOTHESIS DEVELOPMENT

Board effectiveness remains an internal determinant, and of course, a major indicant of organisational successes. An effective board is presumed to correlate strongly with policies, strategies and milestones of organisations. According to Reguera-Alvarado, de-Fuentes and Laffarga (2017), concerns of board effectiveness got heightened following recorded global cases of financial scandals and the 2008 financial crisis that erupted most countries, their capital markets and participants; Nigeria inclusive. Empirical findings have suggested that the more the level of diversity in corporate boards, the higher the level of board effectiveness (Owen & Temesvary 2018; Tanaka, 2019; Ye et al. 2019).

Noteworthy however, is the fact that extant discourse on board diversity among firms in developing economies have focused mostly on gender diversity which on its part, has remained one probable and most controversial issue of contention in this sphere of discourse in accounting, especially at the board level (Sudeck & Latridis 2014); yet, as a concept in corporate governance, it has caught several attentions from shareholders, policy makers, corporate boards and their directors, researchers, professionals, analysts and the likes (Johansen 2008; Owen & Temesvary 2018; Nadeem, Suleman & Ahmed 2019; Jebran, Chen & Zhang 2020). Arguably, the perceived rise in the numbers of women in corporate boards in recent times could be linked to the belief that a more diversified board perform better and are more proactive than undiversified homogeneous – male dominated boards (Tanaka 2019). This is why countries like Norway, Sweden among others have continuously promoted through legislations, gender equality especially in boardrooms.

Gender diversity is a concept that describes the conscious inclusion of females (women) as members of organisations' board of directors (Dutta & Bose 2007; Fernando, Jain & Tripathy 2020). This desire to include

females in corporate boards became popular after the unveiling of the Higgs Report on Corporate Governance in the United Kingdom (UK), far back in 2003 (Grosvold, Brammer & Rayton 2007).

Interestingly, the present day setting in most organisations exhibits dramatic upsurge in the percentage (%) of female employees' thus making arguments for gender diversity to become popular for most organisations; a concept that has become highly important for all levels of managerial hierarchy. According to Írge and Abubakar (2014), women, apart from occupying managerial positions, are increasingly becoming important and influential figures in boardrooms. This, according to prior studies, is in connection with reported cases of corporate collapse of giants like Enron, Adelphia, Lehman Brothers, Tyco, WorldCom and others; which led to continuous growth on concerns for good corporate governance and the need for the inclusion of a good number of female members in corporate boards of organisations (Plessis, Saenger & Foster 2012; Írge & Abubakar 2014).

Campbell and Mínguez-Vera (2008) argued that the need for gender diversity within boardrooms is rooted on ethical and economic arguments that have positive relationship with company value. No doubt, we understand that studies have examined the relationship between gender diversity in corporate boards and firm performance within and outside Nigeria and other countries in Sub-Saharan Africa. While most of the studies were conducted in the UK and USA and other European countries, only few of such studies were conducted with data from emerging economies like Nigeria or other countries in Sub-Saharan Africa.

Additionally, value relevance studies within and outside countries in Sub-Saharan Africa had almost totally ignored the statistical link that may exist between board gender diversity measures (like the Blau and Shannon index) and share price movements. This is because; most studies in this domain were founded on the Ohlson and Jones model and focused mainly on variables like earnings, dividends, firm size, returns, book values of shares and other variables reported only in statements of comprehensive income, financial position and cashflows respectively. On this premise, the concern of this study is to examine by appropriate statistical techniques, the link between share price movements and measures of diversity in boardrooms using the Shannon and Blau gender diversity index amongst others. The significance of this thrust is premised on the fact that prior studies on share price determinants in Nigeria and other countries in Sub-Saharan Africa did not consider these indexes as possible determinants of share price movements among listed firms. Thus our guiding postulations are:

H_1 The Blau gender diversity index is not value relevant in explaining variations in the share prices of listed firms.

H₂ The Shannon gender diversity index is not value relevant in explaining variations in the share prices of listed firms.

H₃ Stock prices are not significantly affected by the proportion of females in the boardroom of listed firms.

REVIEW OF PRIOR EMPIRICAL RESEARCHES

Just like capital markets to economies, the prices of shares are very important to investors, analysts, shareholders and concerned stakeholders. Investment decisions are mostly based on stock price behaviours, yet such prices are never static, but fluctuate on the hub/vigor of demand and supply, which again are premised on factors that are either internal or external to concerned organisations (Cheng, Shamsheer & Annuar 2008; Sharma 2011; Bhattarai 2014; Zhou et al. 2020; Mumtaz & Theodoridis 2020). On this note, researches have examined how these factors (internal and external) affect stock prices of companies in given capital markets. This is in attempt to provide clearer knowledge and/or understanding on these factors and the extent to which they affect the prices of equity stocks in identified capital markets. Additionally, knowledge on such factors would foster informed decisions on stock investments and better understanding of the overall value of firms.

Enow and Brijlal (2016) examined share price determinants in South Africa by obtaining yearly data from 14 listed firms during a 5-year period (2009-2013). The study, just like most prior studies, focused on profitability and performance ratios. The regression results (multiple regression) revealed that the trio of earnings (EPS), dividends (DPS) and P/E ratio accounted for about 57.8% changes in share prices of South African firms. Unlike dividend per share, EPS and P/E ratio were found to have significant and positive link with share price movement.

On the other hand, studies on gender diversity focused more on the perceived relation between diversified boards and the financial performance of firms. For instance, Mínguez-Vera and López-Martínez (2010) examined whether the presence of female directors influences the performance of SMEs in Spain. An unbalanced panel data from 10786 firms with about 43,213 observations were sourced from the SABI database which housed data of about 900,000 firms in Spain. Binary measures were used to capture women presence in corporate boards while the proportion of women to total board members was computed to measure “women ratio” in corporate boards. Also, the blau and shannon index were computed as additional measures of gender diversity in corporate boards. ROA was employed as the measure of firm performance in this study and was controlled for by operational risk and the level of debt by each company. Analysis was conducted by means of panel data methodology through

the application of the Generalised Method of Moment (GMM) technique among others. The results however reveal that boardroom gender diversity positively affects firms’ performances.

Reguera-Alvarado, de-Fuentes and Laffarga (2017) examined how gender diversity in boardroom influence the financial performance of listed firms in Spain by obtaining 5-year data from 125 listed firms in the Madrid Stock Exchange (MADSE). The panel data approach was employed, and the fixed effect term was the basis of analysis as it controls for unobservable constant heterogeneity common in data drawn from a panel of heterogeneous firms within and across sectors. Tobins’ Q was employed as the proxy for financial performance and was found to be positively influenced by a high proportion of women presence in corporate boards.

Furthermore, the study of Yap, Chan and Zainudin (2017) which also focused on an examination of the relationship between gender diversity and firms’ financial performance drew data for 336 observations from 76 listed firms on the floor of the Bursa Malaysia for a period covering 2009 - 2013. The study relied on unbalanced panel data and tested by means of empirical tools, the extent to which gender diversity may influence firms’ performance. Performance in this study was also measured by Tobins’ Q, while several proxies (dummy variable to represent women, percentage of women to total board size, Blau index, and Shannon index) were employed to gauge gender diversity in corporate boards. Findings indicate that higher degree of female representations on corporate boards have positive influence on firms’ financial performance.

Chen, Gramlich and Houser (2017) assessed the effect which gender diversity within corporate boards may have on the risk strategies of firms. For this purpose, firm level data on boardroom gender diversity, financial and reputation risks among others were obtained from a combination of different sources (*RiskMetrics*, Compustat Annual data, KLD Data, Thomson Reuters (13F) database and Federal Reserve Bank) where applicable, for listed firms in S & P for 17 years spanning from 1997 – 2013. The regression technique was employed in the process of data analysis. Findings indicate that gender diversity in corporate boards has negative association with reputational risk (proxied by tax avoidance). Impliedly, firms with diversified boards along gender lines tend to be more cautious about reputation risks that are mostly associated with aggressive tax strategies. Additionally, the study noticed that gender diversity among corporate boards has significant and positive association with the level of financial risks among firms.

Owen and Temesvary (2018) assessed how gender diversity could possibly affect the performance of banks in the US. Secondary data for 90 bank holding firms were obtained from 1999-2015 and analysed through the application of instrumental variable technique. The study observed a U-shaped non-linear link between indices of bank performance and more diversified

boards. Additionally, for more capitalized banks, female participation was found to exert positive influence once certain threshold level of diversity was attained.

Ye et al. (2019) examined whether gender diversity has the capacity of increasing dividend payouts and evidence was obtained from a global perspective. Data were obtained from 8876 companies across 22 different countries over 14 years (2000 -2013). Series of the multiple regression technique was conducted and evidence proved that the facilitation of enhanced corporate governance is engendered by gender diversity whose relationship with dividend payout was found to be significant and positive.

Fernando, Jain and Tripathy (2020) explored how managerial ability could mediate on the relationship between gender diversity and the performance of US companies. Data on 2,635 companies covering the period 1992 – 2015 were analysed. Models were developed to form the basis of hypothesis testing which was done using the multivariate regression technique. Results show that performance is enhanced within firms following evidence of increased female representation in corporate boards.

Evidence from the above studies show that concerns on whether share prices are influenced by gender diversity remains scarce. In the Nigerian context, and across major economies in the SSA region, prior studies on share price determinants have ignored the possible effect which gender diversity or boardroom effectiveness may have on the share prices of firms generally. This therefore forms the thrust of the current study which seeks to examine whether measures of boardroom gender diversity are relevant in determining movements in share prices of firms. Three (3) proxies of boardroom gender diversity (blau index, Shannon index and female to board ratio) are used as internal determinants of share price movements. Efforts are therefore directed at ascertaining whether movements in share prices among firms are sensitive to the proxies of boardroom gender diversity.

CONCEPTUAL FRAMEWORK

This current study is anchored on the conceptual framework depicted in Figure 1. In line with the hypotheses of this study, the figure diagrammatically presents the presumed link between the study's variables – dependent variable (share price), independent variables (blau index, Shannon index and the proportion of females to total board members) and the control variables (firm size and tobin's q).

METHODOLOGY

DATA AND METHODS

Firm-year panel data for 6 years (2012-2017) were sourced from the financial records of Nigerian companies. Taking cognizance of the associated problems of missing company-dataset predominant in countries like Nigeria, only companies with complete and consistent data for all variables during the study period were purposively sampled. Resulting from this, data were gotten from 70 listed Nigerian firms from 11 different sectors and were analysed with the panel regression technique. The study period covers the post adoption era of the international global standards for financial reporting in the country. The fixed and random effect analyses were respectively employed and the choice of the model upon which conclusions were made is based on the result of the Hausman test. The choice of this approach is in cognizance of the possible heterogeneous dimensions associated with panel data as evidenced in prior empirical studies. To ascertain the nature and veracity of the data stream in this study, some preliminary tests were conducted and the results presented and analysed.

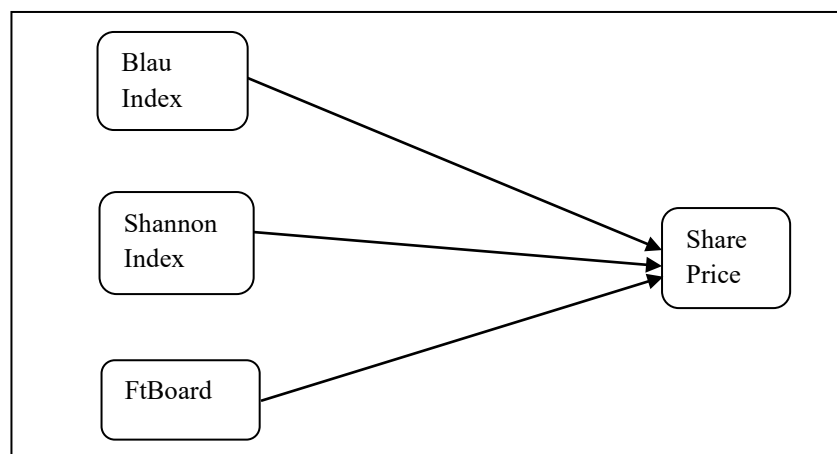


FIGURE 1. The research model

MODEL SPECIFICATION

In specifying the model for this study, we adopted the conventional model for panel data, taking into consideration, the individual-specific company characteristics and time invariant effects which may either be fixed or may assume a random movement over time. Thus, given the above, every typical panel data takes the form:

$$y_{i\varphi} = \alpha + \beta_1 X_{i\varphi} + U_{i\varphi}$$

$$U_{i\varphi} = \mu_{i\varphi} + v_{i\varphi}$$

Where:

$\mu_{i\varphi}$ = individual specific and time invariant effects, and
 $v_{i\varphi}$ = the time varying random component.

Based on the above, the models for this study are specified in line with composite model and the formulated hypotheses thus:

COMPOSITE MODEL

The models developed to test each hypothesis in this study are derived from the composite model which is specified in Eq.1:

$$sharep_{i\varphi} = \alpha_0 + \alpha_1 \text{gender diversity in boardroom}_{i\varphi} + \varepsilon_i \quad (1)$$

Where:

$$\text{gender diversity in boardroom} = f(\text{blaux}, \text{shannonx}, \text{ftboard}) \quad (2)$$

Given the above composite model, each hypothesis was however tested on the basis of the dimensions of gender diversity in boardroom as shown in the following models.

Model 1

$$sharep_{i\varphi} = \alpha_0 + \alpha_1 \text{blaux}_{i\varphi} + \alpha_2 \text{fsize} + \alpha_3 \text{tobins}'q_{i\varphi} + \varepsilon_{i\varphi}$$

Model 2

$$sharep_{i\varphi} = \alpha_0 + \alpha_1 \text{shannonx}_{i\varphi} + \alpha_2 \text{fsize} + \alpha_3 \text{tobins}'q_{i\varphi} + \varepsilon_{i\varphi}$$

Model 3

$$sharep_{i\varphi} = \alpha_0 + \alpha_1 \text{ftboard}_{i\varphi} + \alpha_2 \text{fsize}_{i\varphi} + \alpha_3 \text{tobins}'q_{i\varphi} + \varepsilon_{i\varphi}$$

Where:

$sharep_{i\varphi}$	= share price of company i in year φ
$blaux_{i\varphi}$	= blau board gender diversity index of company i in year φ
$shannonx_{i\varphi}$	= shannon board gender diversity index of company i in year φ
$ftboard_{i\varphi}$	= proportion of females to total members in the boardroom of company i in year φ
$fsize_{i\varphi}$	= the size of company i in year φ
$tobins'q_{i\varphi}$	= the tobins'Q of company i in year φ
a_0, a_1, a_2, a_3	= regression coefficients
$\varepsilon_{i\varphi}$	= error term

A priori expectation is that a_0, a_1, a_2 and $a_3 > 0$

Noteworthy, testing this study's postulated hypotheses requires the adoption of the widely used techniques for panel data; the fixed (FE) and random effect (RE) analysis. Usually, in estimating with FE, the basic assumption is that no correlation exists among the explanatory variables of concern and the error term whereas, RE assumes that all explanatory variables are correlated with the error term. Furthermore, in selecting from the results of the FE and RE estimations, the study conducted the Hausman specification test. Results of the analyses are presented in the following section.

RESULTS AND DISCUSSION

PRELIMINARY ANALYSIS

To assess the nature of the collated data for the entire variables, an analysis of the descriptive statistics was done and the outcome is presented in this section. Additionally, the results of the diagnostic tests for the regression analysis are presented to establish the nature and validity of the data stream/regression outcomes presented in this study. To this end, analysis/tests conducted include correlation analysis, normality, multicollinearity, panel unit root and test for heteroscedasticity.

DESCRIPTIVE STATISTICS

Table 2 summarizes the results of the descriptive statistics of the entire variable set. The total number of observations (Obs.) is 350 and was obtained from 70 firms over a 6 year study period. The dependent variable (sharep) had a mean score of approximately 19.81 with a corresponding standard deviation (Std.Dev.) of 43.45 approximately. The standard deviation of about 43.45 suggests that a good number of firms had share prices that relatively disperse from the average share price of N19.81k. This again is evident in the minimum share price of 0.5 and a maximum share price of ₦299. The maximum value of share price (N299) was recorded by Total Nigeria Ltd in 2016 financial year. The blau gender diversity index recorded a mean value of approximately

TABLE 1. Variables' definition/measurement

Variables	Notation	Description and Measurement	Effect
<i>Dependent</i>			
Share Price	<i>Sharep</i>	share price of the sampled companies (measured by the share price of each firm at the balance sheet date)	
<i>Independent</i>			
Blau index	<i>Blaux</i>	Blau gender diversity index	+/-
Shannon index	<i>Shannonx</i>	Shannon gender diversity index	+/-
Proportion of female to board	<i>Ftboard</i>	Proportion of females in boardroom (measured by the ratio of female members to total board members)	+/-
Firm Size	<i>Fsize</i>	size of the sampled firms (measured by the Logarithm of each firm's total assets)	+/-
Tobins'Q	<i>Tobins'Q</i>	a measure of firm performance (measured as the ratio of market value to the book value of each firm)	+/-

TABLE 2. Result for the descriptive statistics

Variables	No. of Obs.	Mean	Std.Dev.	Min.	Max.
Sharep	350	19.8123100	43.4492900	0.50	299
Blaux	350	0.1868571	0.1591358	0.00	0.49
Shannonx	350	0.5757714	0.0406939	0.53	0.67
Ftboard	350	0.1208571	0.1138534	0.00	0.44
Fsize	350	7.5243710	0.9713583	5.63	9.68
tobins'q	350	1.3561430	1.1963300	0.39	10.83

0.187 with a corresponding standard deviation of 0.159. The low standard deviation clearly suggests that the data for the blau index across all sampled firms revolved around the average value of 0.187, with very slight level of dispersion. Minimum and maximum values for blau index stood at 0 and 0.49 respectively with Law Union and Rock Plc. (insurance company) recording the maximum value in 2012 and 2013 financial years respectively. Since no firm recorded exactly 0.50 for blau index, it means that no firm had equal proportion of both male and female board members.

Additionally, the results for shannon index revealed a mean score of 0.57577 with 0.04069 as its standard deviation. Again, the low standard deviation suggests that the data for shannon index revolved around the average value of 0.57577 with very slight variations. With shannonx below the maximum obtainable value of 0.69, it means that no firm had equal proportion of male and female board members. Similarly, the ratio of female members to total board members recorded a mean score of 0.12 and a standard deviation of 0.11. Just like blaux and shannonx, the low standard deviation of 0.11 suggests that the ratio of female members to total board members for individual firms obtained values that revolved around the average value of 0.12. However, as indicated by the minimum value of 0, there are firms whose board members are entirely males. Also, with an average value of 0.12, it means that the corporate boards

of most firms are still dominated by the male counterpart with most firms having boards with more than 88% male dominated.

The control variables, fsize and tobins'q recorded means of 7.524 and 1.356 respectively with corresponding standard deviation of 0.971 and 1.356 respectively. This shows that data for both variables had low dispersion with values revolving closely around the mean. The minimum value of 5.63 recorded by fsize was found in the books of Interlinked Technologies Plc in 2015 whereas, the maximum value of 9.68 was simultaneously recorded by First Bank Holding and Zenith bank Plc. in 2016.

CORRELATION ANALYSES

The correlation analysis of the entire variable set was conducted and the results are presented in Table 3.

Table 3 uncovers the correlation result for the specified models in this study. Accordingly, we observe that measures of gender diversity (blaux, shannonx and ftboard) recorded negative correlation which implies the exhibition of an inverse relationship with share price (sharep) in all cases. For model 1, correlation coefficient ranged from -0.00886 (between blaux and share price) to 0.3746 (between tobins'q and share price). Similarly, model 2 produced correlation coefficients values ranging from about -0.0921 (between shannonx and share price) to 0.3746 (between tobins'q and share price).

TABLE 3. Result for the correlation analyses

		Sharep	Blaux	Fsize	tobins'q
MODEL 1	Sharep	1.0000			
	Blaux	-0.0886	1.0000		
	Fsize	0.2497	0.0476	1.0000	
	tobins'q	0.3746	0.0286	-0.0716	1.0000
MODEL 2	Sharep	1.0000			
	Shannonx	-0.0921	1.0000		
	Fsize	0.2497	0.0227	1.0000	
	tobins'q	0.3746	0.0415	-0.0716	1.0000
MODEL 3	Sharep	1.0000			
	Ftboard	-0.1022	1.0000		
	Fsize	0.2497	0.0073	1.0000	
	tobins'q	0.3746	0.0438	-0.0716	1.0000

The same was the situation in model 3 which had correlation coefficients ranging from -0.1022 (between ftboard and share price) to 0.3746 (between tobins'q and share price). Interestingly, correlation coefficients between pairs of explanatory variables did not exceed the maximum threshold of 0.8. This suggests the absence of possible signs of multicollinearity among the independent variables. To confirm this, the data were further subjected to some diagnostics test and the results are shown in the following section.

DIAGNOSTIC TESTS

This section presents the results for robustness tests aimed at confirming validity and fitness of this study's formulated models. For this purpose, data for all the variables were gathered and subjected to several diagnostic test which includes multicollinearity, normality, heteroskedasticity and panel unit root tests respectively and the results are presented hereunder.

NORMALITY TEST

In determining the nature, distribution and fitness of the data stream and models for a study like this, prior researches have recommended the normality and multicollinearity tests respectively. Normality tests will enable the researcher to ascertain if the data set was correctly modeled by a normal distribution in addition to determining how likely underlying random variables may have been normally distributed. The skewness and kurtosis test was therefore employed to test for the normality of the data.

Indication from the result of the normality test in Table 4a is that the hypothesis that the study's data are not normally distributed is rejected. Impliedly, since

the joint p-values obtained for all variables is less than 0.1 (p-values $\leq 10\%$), we argue that the data for this study are normally distributed. We therefore proceed to test whether or not; the data set exhibits multicollinearity problems.

MULTICOLLINEARITY TEST

To be sure that no pair of predictor variables are correlated, the multicollinearity test was conducted via the variance inflation factor (VIF) test. The results are presented in Table 4b.

Also, the result of the multicollinearity test produced VIFs that ranged from 1.00 to 1.01. By this result, no variable had a VIF between 5 and 10, thus confirming the absence multicollinearity among this study's explanatory variables. These conditions are necessary for further estimations using the regression technique.

PANEL UNIT ROOT TEST

One important step towards ascertaining the order of integration among variables in panel data studies is through panel unit root tests (Ehigiamusoe and Lean 2017). In this vein, further tests were thus conducted to establish whether the panel data for the variables were stationary at level. For this purpose, the Hari-LM and Harris-Tzavalis tests for stationarity were employed and the results from the respective tests are presented in Table 5.

Table 5 presents the results for the Hadri-LM and Harris-Tzavalis tests respectively. These tests are mostly applied for datasets with relatively short T (time dimension). The results however indicate that the data for the variables (sharep, blaux, shannonx, ftboard, fsize and tobins'q) were stationary at level which suggests that the variables are integrated at level. This

TABLE 4a. Results for normality tests

Variables	No. of Obs.	Normality Tests			
		Pr (Skewness)	Pr (Kurtosis)	Joint	
				adj chi2(2)	Prob> chi2
Sharep	350	0.0000	0.0000	.	0.0000
Blaux	350	0.2974	0.0000	.	0.0000
Shannonx	350	0.0083	0.0000	51.09	0.0000
Ftboard	350	0.0000	0.0274	20.86	0.0000
Fsize	350	0.0004	0.0023	18.37	0.0001
tobins'q	350	0.0000	0.0000	.	0.0000

TABLE 4b. Results for multicollinearity tests

	Blaux	Shannonx	Ftboard	Fsize	tobins'Q
VIF	1.00	1.00	1.00	1.01	1.01
1/VIF	0.996	0.997	0.998	0.994	0.993

TABLE 5. Summary of panel unit-root tests' results

Variables	Hadri-LM-Test		Harris-Tzavalis Test	
	Statistics	p-value	Statistics	p-value
Sharep	5.8689**	0.0000	0.3232**	0.0012
Blaux	6.5924**	0.0000	0.3729*	0.0145
Shannonx	6.1890**	0.0000	0.3224**	0.0011
Ftboard	6.3701**	0.0000	0.3534**	0.0059
Fsize	10.2109**	0.0000	-0.1982*	0.0271
tobins'q	2.0163*	0.0219	0.0103**	0.0000

Note: ** and * significant at < 1% and < 5% levels respectively

is a pre-condition for the estimation of cointegrating relationships in regression models. Given the above, the data were further subjected to heteroskedasticity test and the results for the three models are summarised in Table 6.

Evidence from Table 6 reveal that for model 1, the $\chi^2(1)$ of the fitted values of the dependent variable (sharep) is 156.94 with 0.0000 as its p-value. Similarly, the fitted values of sharep obtained for model 2 revealed a $\chi^2(1)$ value of 154.53 (p-value = 0.0000). In the same vein, model 3 had a $\chi^2(1)$ value of 157.32 with a p-value of 0.0000. These results confirm the presence of heteroskedasticity problems believed to be common among panel data. To cater for this problem, since the results from other diagnostics tests confirm the fitness of the estimated models in this study, we proceeded to analyse our data by means of the regression technique, but by employing the fixed effect and random effect analysis which usually controls for unobservable constant heterogeneity common in data drawn from a panel of heterogeneous firms within and across sectors. The conclusion reached is therefore based on the result of the Hausman test.

REGRESSION RESULTS, ANALYSIS AND DISCUSSION

With the outcome of the heteroskedasticity test in the previous section, this section presents the multiple regression result alongside the outcomes of the Fixed Effect Model (FEM) and Random Effect Model (REM) for each of the specified models and in line with the study's hypotheses.

Relationship between Blau Gender Diversity Index and Share Price

This current study analysed the relevance of blau gender diversity index in explaining variations in share prices of listed firms as depicted in model 1. The result is presented in Table 7

Table 7 displays results for the estimation of model 1 of this study. The value of $\chi^2(3)$ from the result of the Hausman test is 8.95 and is significant at 0.05 level of significance (p-value = 0.0300). On this note, the result of the FEM is deemed more appropriate in explaining the statistical relationship between Blaux and share price.

TABLE 6. Summary of result for Breusch-Pagan/Cook-Weisberg Test

Model 1		Model 2		Model 3	
chi 2(1)	Prob > chi2	chi 2(1)	Prob > chi2	chi 2(1)	Prob > chi2
156.94**	0.0000	154.53**	0.0000	157.32**	0.0000

Note: ** and * significant at < 1% and < 5% levels respectively

TABLE 7. Results for model 1: Blau Index (Blaux) and Share Price (Sharep)

Estimator	Dependent Variable: Share Price (Sharep)					
	Multiple Regression (Obs.=350)		FEM (Obs.=350; Groups = 70)		REM (Obs. =350; Groups = 70)	
Variable	Coef.	Std.Err	Coef.	Std.Err	Coef.	Std.Err
_cons (<i>p-value</i>)	-89.48** (0.000)	16.453	-253.92** (0.001)	76.619	-112.0025** (0.000)	31.942
Blaux (<i>p-value</i>)	-30.9819* (0.017)	12.901	0.0185 (0.999)	12.774	-5.8259 (0.622)	11.824
Fsize (<i>p-value</i>)	12.6882** (0.000)	2.1182	34.800** (0.001)	10.072	15.9761** (0.000)	4.146
Tobins'Q (<i>p-value</i>)	14.4604** (0.000)	1.7186	8.7599** (0.000)	2.0126	9.3597** (0.000)	1.771
R-Squared	0.2300					
Adj. R-Squared	0.2234					
Prob. F.	0.0000					
F(3, 346)	34.46					
R-Squared (between)			0.1356		0.2105	
R-Squared (within)			0.0837		0.0696	
R-Squared (overall)			0.1273		0.1953	
F (3, 277) (<i>p-value</i>)			8.43** (0.0000)			
Wald Ch2 (3)					39.10**	
Prob. > Ch2					0.0000	
Hausman Test			Chi2(3) = 8.95*		Prob>Chi2= 0.0300	

Note: ** and * significant at < 1% and < 5% levels respectively

Given the above and judging from the result of the FEM, it is observed that from the result of the r-squared, by holding other variables constant, about 12.73% of the overall variations in share prices was accounted for by changes in blaux. Noteworthy, at F(3, 277), the value of F_{crit} is 2.60, whereas, from Table 7, the reported value of F_{cal} is 8.43; with a p-value of approximately 0.0000. This result invalidates the postulated null hypothesis that Blau gender diversity index is not value relevant in explaining variations in the share prices of firms. Thus we conclude that Blau gender diversity index (blaux) is value relevant in explaining variations in the share prices of listed firms.

Relationship between Shannon Gender Diversity Index and Share Price

This current study further analysed the relevance of shannon gender diversity index in explaining variations

in share prices of listed firms as depicted in model 2. The result is presented in Table 8

In Table 8, the results obtained from estimating model 2 are displayed. As revealed from the table, the value of chi2(3) from the result of the Hausman test is 9.19 and is significant at 5% level of significance given that its p-value of 0.0268 is below 0.05. Again, the result of the FEM is deemed more appropriate in explaining the statistical relationship between shannonx and share price. Thus, in judging from the result of the FEM, the result of the r-squared shows that by holding other variables constant, about 12.66% of the overall variations in share prices was accounted for by changes in shannonx. Noteworthy, at F(3, 277), the value for F_{crit} is 2.60, whereas, from Table 8, the computed value for $F(F_{cal})$ is approximately 8.43 with a p-value of 0.0000.

This result however invalidates the postulated null hypothesis that Shannon gender diversity index is not value relevant in explaining variations in the share prices

TABLE 8. Results For Model 2: Shannon Index (Shannonx) and Share Price (Sharep)

Estimator	Dependent Variable: Share Price (Sharep)					
	Multiple Regression (Obs.=350)		FEM (Obs.=350; Groups = 70)		REM (Obs. =350; Groups = 70)	
Variable	Coef.	Std.Err	Coef.	Std.Err	Coef.	Std.Err
_cons (p-value)	34.0416 (0.534)	54.719	-262.40** (0.006)	94.2805	-95.1002 (0.100)	57.817
Shannonx (p-value)	-122.849* (0.015)	50.416	7.6049 (0.878)	49.4579	-17.0630 (0.710)	45.875
Fsize (p-value)	12.5680** (0.000)	2.1157	34.8678** (0.001)	10.0741	15.9523** (0.000)	4.145
Tobins'Q (p-value)	14.5087** (0.000)	1.7189	8.7774** (0.000)	2.0097	9.3836** (0.000)	1.769
R-Squared	0.2304					
Adj. R-Squared	0.2237					
Prob. F.	0.0000					
F(3, 346)	34.53					
R-Squared (between)			0.1349		0.2096	
R-Squared (within)			0.0838		0.0695	
R-Squared (overall)			0.1266		0.1945	
F (3, 277) (p-value)			8.44** (0.0000)			
Wald Ch2 (3)					38.99**	
Prob. > Ch2					0.0000	
Hausman Test			Chi2(3) = 9.19*		Prob>Chi2= 0.0268	

Note: ** and * significant at < 1% and < 5% levels respectively

of firms. This finding therefore leads us to conclude that Shannon gender diversity index (shannonx) is value relevant in explaining variations in the share prices of listed firms.

Relationship between the Proportion of Females in Corporate Boardroom and Share Price

This current study also analysed the relevance of the proportion of females in Boardroom in explaining variations in share prices of listed firms as depicted in model 3. The result is presented in Table 9.

Table 9 displays the results of the multiple regression, FEM, REM and the Hausman test with respect to the estimation of model 3 of this study. Indications from the table shows that the value of chi2(3) from the result of the Hausman test is 9.09 and is significant at 5% level of significance given that its p-value of 0.0281 is below 0.05. In view of this, the result of the FEM is deemed more appropriate in explaining the statistical relationship between ftboard and share price. In judging from the result of the FEM therefore, it is observed that with the result of the r-squared, by holding other variables constant, about 12.78% of the overall variations in share prices are accounted for by changes in ftboard. Importantly,

at F(3, 277), $F_{crit} = 2.60$, whereas, from Table 8, F_{cal} is approximately 8.44 with a p-value of 0.0000.

This result however invalidates the postulated null hypothesis that stock prices are not significantly affected by the proportion of females in the boardroom of listed firms. This study therefore concludes that the proportion of females in the boardroom of listed firms has significant effect on movements in share prices.

CONCLUSION

This research sets to examine by means of appropriate statistical tools, the internal determinants of movements in share prices, by considering gender diversity in boardroom as a possible determinant of share price movements among listed Nigerian companies. In this regards, the extent to which corporate boards are diversified along the lines of gender differentials was considered using three (3) proxies. While we posit that the subject of board gender diversity is largely treated in prior accounting and scientific literature, the fact that most prior studies focused largely on how gender diversity affects firms' financial performance cannot be overemphasized. Additionally, prior studies on gender

TABLE 9. Results for model 3: Ratio of Females in Corporate Boards to Total Board Size (ftboard) and Share Price (Sharep)

Estimator	Dependent Variable: Share Price (Sharep)					
	Multiple Regression (Obs.=350)		FEM (Obs.=350; Groups = 70)		REM (Obs. =350; Groups = 70)	
Variable	Coef.	Std.Err	Coef.	Std.Err	Coef.	Std.Err
_cons (p-value)	-88.267** (0.000)	16.470	-253.515** (0.001)	76.482	-111.775** (0.000)	31.898
Ftboard (p-value)	-46.453* (0.010)	17.998	-2.3137 (0.897)	17.783	-9.8427 (0.550)	16.486
Fsize (p-value)	12.4922** (0.000)	2.1129	34.786* (0.001)	10.065	15.9554** (0.000)	4.142
Tobins'Q (p-value)	14.5248** (0.000)	1.7172	8.7487* (0.000)	2.0082	9.3816** (0.000)	1.769
R-Squared	0.2320					
Adj. R-Squared	0.2255					
Prob. F.	0.0000					
F(3, 346)	34.84					
R-Squared (between)			0.1362		0.2119	
R-Squared (within)			0.0837		0.0696	
R-Squared (overall)			0.1278		0.1966	
F (3, 277) (p-value)			8.44** (0.0000)			
Wald Ch2 (3)					39.26**	
Prob. > Ch2					0.0000	
Hausman Test			Chi2(3) = 9.09*		Prob>Chi2= 0.0281	

Note: ** and * significant at < 1% and < 5% levels respectively

diversity have been vast in developed economies, leaving very few empirical attempts in developing or emerging economies. The thrust of this study therefore is hinged on contributing to specialized economic and accounting literature by examining the value relevance of gender diversity of corporate boards in the determination of share prices by obtaining evidence from listed firms in Nigeria, one of the most populated and well known economy in Sub-Saharan Africa.

The blau and shannon indexes which were employed as measures of gender diversity in boardroom were found to have significant relationship with variations and movements in stock prices of listed firms. Impliedly, these measures are value relevant in determining the prices of equity stocks of the listed sampled firms. We also established that the proportion of females in corporate boards (also a measure of gender diversity) was significantly related with share price movements, thus indicating that the presence of women in boardroom is value relevant in explaining share price movements among listed firms in Nigeria and possibly, the region of SSA.

POLICY IMPLICATIONS & RECOMMENDATIONS

This study provides empirical crutch for governance systems within firms with much emphasis on the need for

more diversified boards along gender attributes. Since the presence of women in corporate boards proved to be value relevant in the pricing of equity stocks, this study recommends the passage and enforcement of legislation by the relevant and appropriate authorities and organs of regulatory controls in Nigeria, requiring all corporate boards to have a minimum proportion of female presence in their respective boardrooms. The current trend where the boards of directors of some firms are entirely males should be abolished and appropriate sanctions be meted on offenders.

The paper further offers a starting point for future researches particularly with regards to sectorial analysis of similar trends and the results of the current study.

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