Board Attributes and Financial Performance of Quoted Manufacturing Firms in Nigeria

Davies, Stanley Diepiriye (FCA)
Department of Accountancy,
Kenule Beeson Saro-Wiwa Polytechnic, Bori, Nigeria
lucky.anyike@yahoo.com

DOI: 10.56201/wjfir.v7.no3.2023.pg56.79

ABSTRACT
This study examined the effect of board attributes and the financial performance of quoted manufacturing firms in Nigeria. Panel data were sourced from financial statement of the quoted firms from 2011 to 2020. Market value and equity value were modeled as a function of board size, board composition, board independence and board gender diversity. Panel data Ordinary least square method was used as data analysis technique. The study found that 50.1 percent variation in return on equity and 61 percent variation in profit after tax of the quoted manufacturing firms can be traced to variation in board attributes. findings have proved that board size have positive effect on the return on equity and profit after tax, board independence has negative effect on financial performance, board gender diversity has negative effect on financial performance, while board composition has positive effect on financial performance. The study concludes that there is no significant relationship between board composition and return on equity of quoted manufacturing firms in Nigeria, no significant relationship between board composition and profit after tax, no significant relationship between board independence and return on equity, significant relationship between board independence and profit after tax, there is significant relationship between board size and return on equity there is no significant relationship between board size and profit after tax and there is no significant relationship between board gender diversity and profit after tax of quoted manufacturing firms in Nigeria. the study recommend that size of the board appointed as non-executive directors who are independent of management and the activities of the firm, and who at the same time will bring in experience and expertise that can positively improve its relationship on financial performance.

INTRODUCTION

Every corporate organization especially the public limited companies allow for the separation of ownership and management. This means that owners do not need to be managers and managers do not need to be owners. While the owners invest and provide strategic advice, direction and clear guidelines for implementing plans with the objective of maximizing Return on Investment, the management has the function of planning, directing, controlling and organizing the corporate resources to achieve the shareholders and stakeholders expectations. The role of management as agent to the shareholders gives it obligation to be accountable to the owners. Management is responsible for the preparation of financial statement based on the accounting records of the organization which reflects the nature and operations of the entity and expected to be in conformity

with Generally Accepted Accounting Principle (GAAP). The function of the board has great extent to which it affects financial performance.

The direct relationship between dimensions of boards attribute and firm performance might be influence indirectly by other factors like social, economic and political aspects that might be the strength, weakness, opportunities, and threats posed by the market within which the business operates. The relationship can also be influence by the different roles played by boards to arrive at strategic outcomes which later influence performance (Zahra & Pearce II, 1989). This is an avenue for future researchers to use mediations or moderations in examining relationship between board attributes and firm performance.

Firm performance as described by Dess *et al.* (2006) and Wachira, (2014) is the effectiveness of the firm as the myriad of inner performance outcomes normally as a result of more efficient processes and other outside actions that connect to deliberations that are extensive than those naturally allied to economic assessment either by directors, shareholders, or clients such as corporate social responsibility. According to Wachira (2014) firms can track and measure performance in several extents such as monetary performance, client service, firm social duty and even worker stewardship. Several other studies describe performance in many different aspects. Johnson et al. (2009) described performance as the procedure of quantification of the competence and efficacy of previous actions including evaluation of how well organizations are managed and the value they deliver to customers and other stakeholders. Lewis (2004) categorizes main performance indicators in the financial sector into; quantitative such as number of outlets, branches and qualitative indicators predicts the future outcome of a process and finally financial indicators. A firm's financial performance is measured by monetary changes. Company's monetary growth is reflected in its Return on equity, return on assets, net profit margin, return on investment (Oguda, 2015).

Corporate board of directors play numerous and integral roles in organizations. They are mainly saddle with the responsibility of providing of oversight, advice, and counsel to Chief Executive Officers and monitoring and if necessary disciplining chief executive officers (Finkelstein & Mooney, 2003). Based on agency theory, executives (agents) possess significant freedoms and powers to manage shareholders (principals) resources. It believes that the executives have some objectives that may be conflicting with those of the owners (principals), hence, ignoring shareholders' wealth maximization objective (Masson,1971). It is expected that board of directors are to perform painstaking function of monitoring and rewarding top executives to ensure the attainment of shareholders' wealth maximization (Zahra & Pearce II, 1989). Consequently, for board of directors to perform their functions effectively, some attributes must be in place.
Conceptually Board attributes denotes the distinguishing features of persons serving on a board. These features are directors' background (age, level of education and expertise) and personality (Hambrick, 1987, Mueller, 1981). Board structure as asserted by Zahra and Pearce II (1989) refers to the dimensions or specifications of the board's organization that include the number and type of committees, committee membership, leadership and flow of information among the committees. Whereas Board process involve the series of approaches taken by the board in making decisions. It includes dimensions like; frequency and number of meetings, formality of board proceedings,

self-evaluation of board, CEO-board relation and level of agreement among directors on prevailing issues (Mueller, 1979).

Performance aspects of board characteristics have gained major consideration globally, especially after waves of company outrages and the disappointments of some major companies globally. The collapse of these enterprises has highlighted the limited role acted by the respective boards through a let-down of corporate governance processes (Ghabayen, 2012). Each wave of corporate scandals over the years has reignited the recent debate on corporate governance. For example, in 1990, the financial crisis in Asia exposed weak checks and balances and governance practices, the collapse of Oceanic bank, Intercontinental bank, Afribank and others. This led to focus on insider trading (Radelet & Sachs, 1998). The second wave of outrages exhibited by boards was at the onset of the new millennium involving companies like Worldcom (USA), Enron (USA), Parmalat (Italy) and Air New Zealand (Australia). According to France & Carney (2002) and Lockhart, (2004), the collapse of these firms brought to the fore the failure of the governance process, and this contributed to the emphasis on board composition.

Furthermore, heightened dissatisfactions by shareholders due to poor financial performance, falling share value have led to questions being raised on the notch of competency of the management (Sherman & Chaganti, 1998). The phenomenal growth exhibited by corporate investors of corporate organizations has also increased focus on corporate boards. These established investors have the expertise to perform fiduciary responsibility of monitoring board so as to ensure good returns (Bolton & Roell, 2005). The increase recognition whereby a considerate executive team is a basis of asset in different forms including; promoting venture, improve share development as well as provision of healthier long-run stakeholder return (Lee, 2001; Carlsoon 2001). According to Healy (2003), it is now recognized that good corporate practices are a source of economic growth. At the midst of each of these corporate scandals, there is an attribute of the ineffectiveness of boards of directors.

Securities and Exchange Commission Guidelines recommend that the board define the company's strategy, oversee management and performance, identify principal risks and opportunities, develop remuneration and staff policy, and review internal controls and compliance. Agency theory about the financial performance of an organization according to Habbash (2010) has received greater attention from academic, and practitioners contend that as companies expand in magnitude, the principals lose operative control thereby allotting experts to manage the corporate affairs. Mizruchi, (1983) claimed that managers steadily gain operational control over the firm. On the other hand, the stakeholder theory suggested by Jensen (2001) has not been exposed to significant empirical exploration.

REVIEW OF RELATED LITERATURE

Board Attribute

Board attribute refer to features of corporate boards that are tasked with overall management of the firms. Some other studies (Bolton & Roell, 2005; Ghabayen, 2012) refer or attribute these characteristics to the concept of corporate governance. The success or collapse of firms is thus associated with the role acted by the management and firm governance as a process. While studies (Hermalin & Weisbach, 2003; Keil & Nicholson, 2003; Fan, Lau & Young, 2007) consider a broad variety of matters in corporate management, some process such as exposes, rights of voting, rules among others, this study gives attention to the several features of the executives including ownership, board expertise, board diligence, size of board and gender about financial performance of firms under study.

In Nigeria securities and exchange commission provides revised code of firm governance (2011) to streamline characteristics of boards for companies listed on the NSE. The new regulations emphasized good governance and function of the boards however, the revision of the codes were done again in 2014, so as to be realigned with the world-wide best corporate practices. The proposed guidelines give organizations the option of using them as specified or seek for exemption in line with industry demands (Business Daily, 2014). Among the expected changes include constituting the boards and how they are structured. This is in an effort to make them more effective, despite existence of internal challenges on process of their operation. Suggestions including to lower board size, emphasize independence as well as raise meetings by the board of directors and even what to do in emergencies are yet to be found.

Boards of management in firms are considered as major players in the control of their day to day governance and thus need for clear understanding of their influence on development of the respective companies. Studies have been conducted in this field(s) (Adams & Ferreira, 2007; Hermanlin & Weisbach., 2007; Gillete et al., 2007; and Harris & Raviv., 2008) however most of them have focused towards industrialised markets. Little has been explored in relation to board characteristics concerning commercial and service sectors in the emerging markets like Nigeria.

Corporate boards are the internal governing mechanism that shape firm governance given their direct access to the other two in the corporate governance triangle which are managers and shareholders. Ownership structure refers to the different types of ownership interest that holders of stocks have in a firm (Adams & Mehran, 2002).Previous studies (LaPorta, Lopez-de-Silances & Vishny, 2000; Salterio, Conrod & Schmidt, 2013) have indicated that the degree of control and deviation can be used to measure the quality of corporate governance mechanisms. Hence, the larger the deviation the more controlling shareholders will be motivated to erode the assets of the firm as well as the interests of external investors. According to Habbash (2010) and Aggarwal, Erel, Ferreira and Matos (2011), corporate boards use the audit committee as an important part of the decision control system for internal monitoring. Thus, the existence of an audit committee improves the monitoring of firm's internal controls and also helps to promote good corporate governance which in turn improves firm value thereby reducing agency cost (Al-Sa'eed & Al-Mahamid, 2011).

Chaghadari (2011) defined boards as the internal governing mechanism that shapes firm governance, given their direct access to the two other aspects of the corporate governance triangle which are managers and shareholders. Fama (1980) argued that the composition of board structure is an important component due to the presence of non-executive directors which represents a method of monitoring the actions of the executive directors and ensuring that the executive directors pursue the firm's policies that are consistent with shareholders' interests. In effect, the board of directors is now seen as a target of blame for corporate misdeeds and also as a source capable of improving corporate governance. Much of the capacity in solving the excess power within firms has been assigned to the board of directors with a specific need for non-executive directors to help increase executive accountability.

Hillman and Dalziel (2003) in their study described the two main functions of the board of directors as monitoring and providing resources. The board's monitoring function which is underpinned by the agency theory which describes the potential for conflicts of interest that may arise from the separation of ownership and control in firms (Fama & Jensen, 1983: Iturralde, Maseda & Arosa, 2011). As a primary function, agency theorists see boards as monitoring the actions of managers (agents) in order to protect the interests of owners (principals) (Eisenhardt, 1989; Ghabayen, 2012). Hence, Fama(1980) and Alhassan, Bajaher and Alshehri (2015) concluded that monitoring by the board is important to eliminate the potential costs incurred when management pursues its own interests at the expense of shareholders‟ interests. Thus, monitoring by boards of directors can reduce agency costs which are inherent in the separation of ownership and control and in this way, improve firm value.

Board size

The size of the board of directors is a vital corporate governance structure, which is crucial to the management of any organization and essential in monitoring corporate governance effectiveness (Ntim & Soobaroyen, 2013). Board size is the overall number of directors, non-executive and executive, in the firm. Since the directors of companies are alleged to affect organizational performance, it is very essential to ascertain the appropriate board size of a company. Although there is no standard board size, the Central Bank code prescribes a minimum of five and a maximum of twenty directors. Some businesses choose a small board size with the expectation that control will be effective and decision-making will be quicker, while some prefer the larger board size with the belief that it will lead to an expansion of expertise because more knowledge as well as skills are available (Hussainey & Wang, 2010). Agency theory suggests that better organizational performance might be correlated with smaller board sizes because they are not likely to have as much problems in organizing and communication, and are likely to be more successful in controlling the activities of management (Isik & Ince, 2016). While the resource dependency approach favors larger boards, it states that they could be helpful in limiting reliance on external resources and may give better opportunities for greater connections than smaller boards. According to Pathan and Faff (2013) whether small or large, the size of the board can affect firm's performance.

Board Independence

The management of any firm requires a board with strategic vision, in addition to efficient monitoring. Several studies on the role and effectiveness of boards of directors has emphasized

the potential importance of board independence (Raheja, 2005; Adams & Ferreira, 2007; Boone, Field, Karpoff & Raheja, 2007; Coles, Daniel & Naveen, 2008; Tariq & Abbas, 2013). One stream of research had focused on independent director representation on the board and concluded that the nature of a firm's investment opportunities affects its demand for outside directors with particular attributes to enhance a board's advisory and monitoring roles. Another stream of research emphasizes private benefits of control and CEO influence over board nominations to explain the degree of board independence.

Existing evidence finds an insignificant impact of distance in a variety of situations where monitoring has substantial value. Manas and Saravanan (2006) argued that proximity affects its willingness to invest in a firm or join a firm's board since it is generally less costly to oversee local firms than more distant ones. Peasnell, Pope and Young (2006) found that foreign independent directors, who are far removed from a firm, are less likely to attend board meetings and boards that include them are more likely to offer excessive CEO compensation and restate earnings as a result of financial misreporting and exhibit significantly poorer firm value. Forbes and Daniel (1999) presented evidence of local investment bias among mutual fund managers and evidence that they earn higher abnormal returns on nearby investments, while Bae, Jon and Jin (2002) illustrated the information advantage of local stock analysts in forecasting earnings. Yasser, Entebang and Mansor (2011) showed that local investment bias is present among individual investors, while earlier works by Carter, Simkins and Simpson (2003) and Cheng and Ritenga (2009), suggested that information costs being a positive function of distance to an investment can partially explain these investor preferences.

While the proportion of independent directors is an indicator of the degree of board oversight, it is not a sufficient measure of the quality of such oversight or of a board's ability to provide expert advice to management. Outside directors with executive experience are crucial to shareholder wealth creation (Fich & Lawrence, 2005; Balasubramanian, Black & Khanna, 2010), and executives of other local firms comprise a significant proportion of independent directors and of the local pool of prospective directors. Corporate boards require more than general managerial experience from their independent directors; they also require individuals with specialized knowledge and skills to advise the board and CEO (Linck, Netter & Yang, 2008; Luo & Salterio, 2014). A number of prior studies reported evidence that greater representation of outside directors on boards lead to gains in shareholder wealth (Brickley, Coles & Terry, 1994; Beasley, 1996; Yermack, 1996; Rosenstein & Wyatt, 1997; Dedman, 2000; Gompers, Ishii & Metrick, 2003; Gul & Leung, 2004; Gupta, Otley & Young, 2008; Arosa, Iturralde & Maseda, 2010). However, many well-known researchers have raised concerns about endogeneity of board composition and the challenges in attributing causation to the observed board independence-firm value relation (Boone, Field, Karpoff & Raheja, 2007; Duchin, Matsusaka & Ozbas, 2010).
There are strong perceptions therefore that the existence of independent directors lead to increased good corporate governance (Pombo & Gutierrez, 2011). The high expectations of the role of the non-executive board members are interesting since the existing empirical studies have shown mixed results regarding the relationship between firm value and board independence (Peng, 2004; Easterwood, Ince & Raheja, 2012). Furthermore, Al-Matari, Al-Swidi, Fadzil and Al-Matari, 2012 had argued that a super-majority of independent directors will lead to worse performance.

Hillman, Cannella and Paetzold (2000) in their research while highlighting the difference between skills as distinct from monitoring, stress on the important to also have board members with varied skills such business experts, support specialists, and members of a community organization as being insiders in the firm. However, Boyd (1990) from the resource dependence perspective presents an alternative to the agency perspective, arguing that good corporate governance is achieved when board members are appointed for their expertise to help firms successfully cope with environmental uncertainty. Much of the policy prescriptions enshrined in codes of good corporate governance rely on universal notions of best practice, which often need to be adapted to the local contexts of firms or translated across diverse national institutional settings (Kim & Lim, 2010; Shan & Mclver, 2011).

Board Gender Diversity

Diversity on the board is clearly well encouraged in corporate governance literature. Such diversity as is often advocated includes; combination of executives, independent and non-executive directors, diversity of experience, expertise and skill (Campbell & Minguez-Vera, 2010; Rhode& Peckel, 2010). Other areas of diversity often ignored include; social diversity, racial diversity and gender diversity. Board gender diversity is becoming a strategic issue as some institutional investors are beginning to see gender diversity as a crucial criterion of the investment policy (Carter, Simkins & Simpson, 2003; Carter, D'Souza, Simkins & Simpson, 2010). Some research studies have shown that board gender diversity falls within the scope of the business case of diversity which was introduced by Cos and Blake (1991) and Dang, Nguyen and Vo (2012).

Previous researches by Carter, Simkins and Simpson (2003) and Catalyst (2014) found that good corporate governance is positively associated with board diversity. As such, Rhode and Packel (2010) opined that a well-managed diversity on board of directors enhances firm value in terms of the decision-making process and corporate image with equality. Milliken and Martins (1996) summarized the types of diversity into observable attributes, which are readily detectable and refers to gender, age, race and ethnic background, while the non-observable attributes, which are less visible are defined as personal value, personality characteristic and education. It is therefore argued that board gender diversity will benefit the firm in financial terms which should be regarded in the context of shareholder value (Dang, Nguyen & Vo, 2012).

Women normally are more careful and this may be brought to bear on risk taking and this is likely to lead to better protection of the firm's investments and assets. They are also sometimes more painstaking and this may lead to better investment decisions. As noted by Robinson and Dechant (1997), at the bottom of the argument is the belief that increased demographic diversity among corporate boards will help to improve decision making and hence positively affect firm value. Apart from the increased number of women who are getting educated and the social awareness being created about gender equality, the increase in the number of women on the board is explained by the robustness of the evidence of performance effect of board gender diversity (Smith, Smith & Verner, 2006; Campbell & Minguez-Vera, 2008; Yi & Bob, 2009; David, Carter, Frank, Betty & Simpson, 2010; Dezso & Ross, 2012).

Theoretical Review

This study is anchored on stakeholders' theory. This theory states that managers react to pressures put forth by owner-stakeholders because of legitimacy, power, and urgency considerations. Freeman (1984) suggests that the firm stakeholders influence the top managers who are in charge of strategy development and implementation through resource usage and withholding mechanisms. Murtha and Lenway(1994) suggested that states are able to influence management because they control authority, markets, and property rights which are the main strategic resources by their involvement in the appointment of a firm's top management as well as board members and providing direct or indirect government subsidies and incentives. States involvement in the markets can negatively affect the degrees of openness (free market) or control (closed market). This influence can also manifest itself through property rights in countries where the government has undue powers in regard to property ownership. The implication of this theory is that most of the policies and market approaches implemented by commercial banks owned by the government are highly subjective to government strategies being rolled out in that period. The assumption is that the state as the major stakeholder supplies resources to these banks but with a lot of 'strings attached. Therefore, state owned banks will perform well if and only if the ruling government influences competitive strategies.

Empirical Studies

Hassan (2010) studied the corporate governance and performance structures of nine licensed deposit money banks in Nigeria for the period of 2013 to 2017. The paper utilized multiple regression techniques and found no correlation between board size, board composition, directors' shareholding, dividend policy, audit quality and financial performance (return on assets, net interest margin, Tobin's Q and earnings ratio). The research concluded that regulators should leave specific concerns of board size and board composition to the preference of banks.

Maxwell and Kehinde (2012) considered a relationship between corporate governance and bank performance by utilizing two governance metrics, board composition and ownership structure, and using market value to measure bank performance. The study utilized cross-sectional survey research design in analyzing data from a sample of 14 Nigerian banks quoted on the NSE. The authors found no association between indices of governance used in the analysis and performance. The results propose that board size should be limited to boost performance by reducing costs, since the board composition is not significantly associated with performance.

Al-Saidi and Al-Shammari (2013) obtained perspectives on the interaction between board composition and bank performance by sampling nine listed banks in Kuwait. To check this relationship, the analysis used ordinary least squares (OLS) and 2SLS. According to the findings of the OLS, only board size and the proportion of non-executive directors adversely influence the performance of the banks. The 2SLS findings showed that role duality has a positive effect on the performance of a bank, while board size has a negative influence on the performance of a bank. The study indicated their main drawbacks were smaller sample size and length of time.

Bebeji *et al.* (2015) assessed the extent to which board size and composition influence the performance of listed banks in Nigeria. The researchers adopted a multivariate regression analysis technique on five banks for a span of nine years. The research recorded the effect of board size on

ROA and ROE to be negative, and the influence on bank performance by board composition to be significantly positive. The work suggested that firms possess sufficient board members and complexity and should be structured to ensure diverse levels of experience without losing independence.

Jadah and Adzis (2016) evaluated the link between board characteristics and bank performance for 20 Iraqi banks over a 10-year period from 2005– 2014. The results showed that board characteristics significantly and positively impacted bank performance (proxied by return on equity). Shukla et al. (2018) researched the effects of board characteristics on the market performance of 29 Indian banks listed on the National Stock Exchange from 2009 to 2016. Ten board features reflected the independent variables, and the dependent variable was proxied by Tobin Q. The results showed that only three of the features (CEO duality, average number of boards served and number of meetings) were positively linked with market performance.

Osemene and Fakile (2019) analyzed the efficacy of an audit committee and the financial performance of Nigerian deposit money banks. Return on equity (ROE) was used as a measure of performance and independence, financial expertise and frequency of meetings were used as factors affecting financial performance. The study resolved that the financial experience and meetings of the audit committee had substantial control over financial performance.

METHODOLOGY

This study adopted the ex-facto research design which involves the examination of causal relationship between the dependent and independent variables. According to Asika (1991) the population is a census of all the elements or subject of interest and may be finite or infinite. The full set of cases from which the sample is taken is called the population. However, the population of this study covers the twenty-three (23) existing food and manufacturing firms in Nigeria. The sample population of this study covers only twenty (20) existing food and manufacturing firms in Nigeria, because as at the time of this research there were only twenty (20) firms within this category that are quoted on the Nigerian Stock Exchange. The major types of data collection methods are questionnaire, interview, participant observation these are called primary data source and the source from published material such as Central Bank of Nigeria Statistical Bulletin and annual report which is known as secondary data. The data in this study comprises a cross sectional data which will be sourced from the financial statement of the 20 quoted food and beverage manufacturing firms.

Model Specification

From theories, principles and empirical findings, the models below are specified in this study.

ROE= f (BS, BC, BI, BGD) (1)

PAT = f (BS, BC,BI, BGD) (2)

It is empirically stated as

$$ROE = \beta_0 + \beta_1 BS + \beta_2 BC + \beta_2 BI + \beta_3 BGD + \mu \quad (3)$$

$$PAT = \beta_0 + \beta_1 BS + \beta_2 BC + \beta_2 BI + \beta_3 BGD + \mu \quad (4)$$

Where:

ROE = Return on Equity

PAT = Log of Profit after tax

BS = Board size

BC = Board composition

BI = Board independence

BGD = Board gender diversity

β_0 = Intercept Term

β_1 - β_5 = Coefficients

μ = Error term

Pooled Effect

The study adopts the panel data method of data analyses which involve the pooled effect, fixed effect, and the random effect and the Hausman Test.

Pooled Effect Model

$$ROE = \beta_0 + \beta_1 BS + \beta_2 BC + \beta_2 BI + \beta_3 BGD + \mu \quad (5)$$

$$PAT = \beta_0 + \beta_1 BS + \beta_2 BC + \beta_2 BI + \beta_3 BGD + \mu \quad (6)$$

Fixed Effects

The fixed effects focus on the allowance between ownership structure and profitability of quoted food and beverage manufacturing firms' differences by using a fixed intercept for each of the different cross-sectional structures. If we assume that the dummy variable for a bank is 1 or 0, then D_i, which is the dummy variable for bank i, can be expressed as:

$$D_i = \begin{cases} 1, & j-1 \\ 0, & otherwise \end{cases} \quad D_2 = \begin{cases} 1, & j-2 \\ 0, & otherwise \end{cases} \quad \ldots D_N = \begin{cases} 1, & j-1 \\ 0, & otherwise \end{cases} \ldots \quad (7)$$

The regression of total samples can be expressed as

$$Y_{it} = \sum_{t=1}^{N} \beta_{ot} D_t + \beta_i D_s + \beta_2 D_{ma} + \beta_3 s_1 + \beta_{it} D_4 s_2 + \varepsilon_{it} \; . \quad (8)$$

The dummy variables are expressed as follows: if $j = i$, then $Dj = 1$; otherwise $Dj = 0$.[2]

To further investigate the fraud effect, Adebayo (2012) analyzed whether ownership structure affects profitability of quoted food and beverage manufacturing firms. The regression of the effect ownership structure affects profitability of quoted food and beverage manufacturing firms is specified.

$$ROE_{it} = \sum_{t=1}^{N} \beta_0 + \beta_1 BS + \beta_2 BC + \beta_2 BI + \beta_3 BGD + \mu \quad (9)$$

$$PAT_{it} = \sum_{t=1}^{N} \beta_0 + \beta_1 BS + \beta_2 BC + \beta_2 BI + \beta_3 BGD + \mu \quad (10)$$

Because the fixed effects account for both cross-sectional and time-series data, the increased covariance caused by individual-firms' differences is eliminated, thereby increasing estimation result efficiency.

Random Effects

Random effects focus on the relationship with the study sample as a whole; thus, the samples are randomly selected, as opposed to using the entire population. The total sample regression (a function of the random effect) can be expressed as:

Hausman Test

The Hausman test (YairMundlak 1978) is the most commonly used method for evaluating fixed and random effects. If variables are statistically correlated, then the fixed-effects estimation is consistent and efficient, whereas the random- effects estimation is inconsistent, and the fixed-effects model should be adopted. Conversely, if the variables are statistically uncorrelated, then the random-effects estimation is consistent and efficient, whereas the fixed-effects estimation is consistent but inefficient, and the random-effects model should be adopted.

A-priori Expectation of the Result

The elasticity parameter also known as the a-priori expectation of the variables proposes that an increase in the independent variable's board attribute increase financial performance. Therefore, it can be mathematical stated as follows: - $\alpha_1, \alpha_2 > \alpha_3, \alpha_4 > 0$

Data Analysis Method

The study adopts the panel data method of data analyses which involve the fixed effect, the random effect and the Hausman Test. The technique used in this study is the Ordinary Least Square (OLS) estimation technique. The test instruments in the OLS are the T-statistics and F-test which were used to test the significance of variables and the overall significance of the regression respectively. Other test instruments also employed were the Durbin Watson test which was used to test the presence or absence of auto correlation between and among the explanatory variables and the adjusted R square used to test the percentage variation of the dependent and the independent variables.

ANALYSIS AND INTERPRETATIONS OF RESULTS

The regression results for the panel data observations for the period 2011 to 2020 are displayed and discussed so that meaningful conclusions are drawn. The analyses are used to test the earlier formulated hypotheses to establish the relationship which exists among the variables expressed.

Table 1: Panel Unit Root at Level

Method: Series: D(ROE,2)	Statistic	Prob.**	Cross-sections	Obs
Levin, Lin & Chu t*	-10.7235	0.0000	20	120
Im, Pesaran and Shin W-stat	-5.01347	0.0000	20	120
ADF - Fisher Chi-square	104.091	0.0000	20	120
PP - Fisher Chi-square	278.991	0.0000	20	140
Series: D(PAT,2)				
Levin, Lin & Chu t*	-11.6800	0.0000	20	120
Im, Pesaran and Shin W-stat	-6.45535	0.0000	20	120
ADF - Fisher Chi-square	120.841	0.0000	20	120
PP - Fisher Chi-square	302.721	0.0000	20	140
Series: D(BS,2)				
Levin, Lin & Chu t*	-12.8770	0.0000	20	120
Im, Pesaran and Shin W-stat	-5.76905	0.0000	20	120
ADF - Fisher Chi-square	113.544	0.0000	20	120
PP - Fisher Chi-square	271.048	0.0000	20	140
Series: D(BI,2)				
Levin, Lin & Chu t*	7.81897	0.0000	20	120
Im, Pesaran and Shin W-stat	-4.13193	0.0000	20	120
ADF - Fisher Chi-square	97.6596	0.0000	20	120
PP - Fisher Chi-square	362.083	0.0000	20	140
Series: D(BGD,2)				
Levin, Lin & Chu t*	-17.7681	0.0000	20	120
Im, Pesaran and Shin W-stat	-9.54382	0.0000	20	120
ADF - Fisher Chi-square	161.680	0.0000	20	120
PP - Fisher Chi-square	381.806	0.0000	20	140
Series: D(BC,2)				
Levin, Lin & Chu t*	-18.7424	0.0000	20	120
Im, Pesaran and Shin W-stat	-6.71595	0.0000	20	120
ADF - Fisher Chi-square	116.592	0.0000	20	120
PP - Fisher Chi-square	333.228	0.0000	20	140

To avoid change of the estimates over time due to non-stationarity, unit root tests were applied to investigate or detect non stationarity in all the study variables which in turn leads to spurious estimates. In this case, all board specific characteristics under study were subjected to Levin-Lin-Chu unit-root test. In this test if variables are found to be non- stationary, first differencing or successful lagging is applied until the bias is eliminated. Presence of unit root leads to spurious regressions. The null hypothesis in this case was that the variable under consideration was non-stationary or has unit root and in this study, it was stated as; null and alternative hypothesis state that Panels contain unit roots and Panels are stationary respectively. Table 4.1, the Levin-Lin-Chu unit-root test revealed that all variables had p values less than significance level of 0.05 which led to rejection of the null hypothesis (that the variables had unit root).

Table 2 Pairwise Granger Causality Tests

Null Hypothesis:	Obs	F-Statistic	Prob.
The Effect of Board Characteristics on Return on Equity			
BS does not Granger Cause ROE	160	0.24030	0.7867
ROE does not Granger Cause BS		0.03911	0.9617
BI does not Granger Cause ROE	160	0.54497	0.5810
ROE does not Granger Cause BI		0.99861	0.3707
BGD does not Granger Cause ROE	160	0.46430	0.6294
ROE does not Granger Cause BGD		2.88712	0.0587
BC does not Granger Cause ROE	160	1.55326	0.2148
ROE does not Granger Cause BC		0.19265	0.8250
The Effect of Board Characteristics on Profit after Tax			
BS does not Granger Cause PAT	160	0.75710	0.4708
PAT does not Granger Cause BS		0.62899	0.5345
BI does not Granger Cause PAT	160	0.24127	0.7859
PAT does not Granger Cause BI		1.32471	0.2689
BGD does not Granger Cause PAT	160	0.09862	0.9061
PAT does not Granger Cause BGD		1.33579	0.2660
BC does not Granger Cause PAT	160	2.52990	0.0830
PAT does not Granger Cause BC		2.03942	0.1336

The results of the granger causality test found no causal relationship among the variables, therefore, the study accepts the null hypothesis of no causality and this is contrary to the expectations of the results and can be blamed on factors internal and external within the business environment.

Table 3 Pedroni Residual Cointegration Test

	Statistic	Prob.	Weighted Statistic	Prob.
The Effect of Board Characteristics on Return on Equity				
Panel v-Statistic	-2.131226	0.9835	-3.140832	0.9992
Panel rho-Statistic	2.965708	0.9985	3.372989	0.9996
Panel PP-Statistic	-2.601015	0.0046	-5.987278	0.0000
Panel ADF-Statistic	3.412630	0.9997	-1.459744	0.0722
	Statistic	Prob.		
Group rho-Statistic	5.435943	0.0000		
Group PP-Statistic	-7.122085	0.0000		
Group ADF-Statistic	-0.952978	0.1703		
The Effect of Board Characteristics on Profit after Tax				
Series: PAT BS BI BGD BC				
	Statistic	Prob.	Weighted Statistic	Prob.
Panel v-Statistic	-1.556953	0.9403	-2.876137	0.9980
Panel rho-Statistic	3.592261	0.9998	3.926812	0.0000
Panel PP-Statistic	-2.630410	0.0043	-1.036838	0.1499
Panel ADF-Statistic	1.346787	0.9110	3.698689	0.9999
	Statistic	Prob.		

Group rho-Statistic	5.436552	1.0000
Group PP-Statistic	-4.268530	0.0000
Group ADF-Statistic	4.003591	1.0000

The hypothesis of cointegration between all variables is tested using pedroni (2004) cointegration tests. As seen in table 3 all the three assumptions (no trend, trend and intercept and no trend or intercept) indicate the presence of cointegration among the variables. Thus majority of between and within dimension statistics indicate that the null hypothesis of no co-integration is rejected at 1% and 5% significance levels. This empirical finding further proves the presence of long run equilibrium relationship between economic growth and expenditure variables.

Table 4: Augmented Dickey-Fuller results (parametric)

Cross ID	AR(1)	Variance	Lag	Max lag	Obs
Cadbury	-0.434	0.002675	1	--	8
Guinness	-0.004	0.112271	1	--	8
PZ Cussons	-1.058	0.000117	1	--	8
Nestle	-0.010	0.002244	1	--	8
Uniliver	-1.097	0.006580	1	--	8
UAC	-0.802	0.001764	1	--	8
National Salt	-0.694	0.000698	1	--	8
Northern Nigeria Floor Mills	0.130	0.000397	1	--	8
Seven Up	-0.489	0.001289	1	--	8
Flour Mills of Nigeria	-0.509	0.000854	1	--	8
Honey Well	-0.349	0.001022	1	--	8
Live Stock Feeds	-0.372	0.001472	1	--	8
Nigeria Breweries	-1.587	0.000640	1	--	8
Champion	-1.272	0.001242	1	--	8
Premier Breweries	-0.221	0.000569	1	--	8
FTN Coco Processing	-0.468	0.000921	1	--	8
Union Dicon Salt	-0.922	0.000538	1	--	8
Okomu Oil	-0.807	0.001110	1	--	8
Presco	-0.047	0.000297	1	--	8
Dufil Prima Food	-0.697	0.000636	1	--	8

We first identify whether the given series are cross-sectional dependent. To this end, the empirical analysis employs Pesaran's (2004) CD test. To select the correct type of unit root test, we must first test for cross-sectional dependence for the variables and the co-integrating equation. Thus, we employ the Lagrange Multiplier (LM) and bias-adjusted LaGrange Multiplier tests developed by Breusch and Pagan (1980) and Pesaran, Ullah, and Yamagata (2008), respectively. It is well known that when T is larger than N (T > N, as is the case in this paper), LM and LMadj tests are favourable to the tests suggested by Frees (1995) and Pesaran(2004). The LM test has a $\chi 2$ distribution with a cross-sectional independence null hypothesis.It is based on the sum of squared coefficients of correlation among cross-sectional residuals obtained through ordinary least squares (OLS). However, the LM test is biased when the group mean is equal to zero and the individual mean is different from zero. Therefore, Pesaran et al.(2008) corrected for bias by including variance and mean in the test statistic. In this way, they obtained the bias-adjusted LM test, which has standard normal distribution.

Table 5: Fixed Effect Regression Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
The Effect of Board Characteristics on Return on Equity				
C	0.001992	0.010785	0.184664	0.8537
D(BS)	-0.018832	0.195762	-0.096198	0.9235
D(BI)	-0.007400	0.017188	-0.430511	0.6674
D(BGD)	-0.294983	0.242444	-1.216707	0.2256
D(BC)	-0.007429	0.130725	-0.056828	0.9548
Effects Specification				
Cross-section fixed (dummy variables)				
R-squared	0.557839	Mean dependent var		0.002056
Adjusted R-squared	0.481070	S.D. dependent var		0.139026
S.E. of regression	0.144551	Akaike info criterion		-0.906799
Sum squared resid	3.259632	Schwarz criterion		-0.481071
Log likelihood	105.6119	Hannan-Quinn criter.		-0.734184
F-statistic	0.416380	Durbin-Watson stat		2.739615
Prob(F-statistic)	0.991826			
The Effect of Board Characteristics on Profit after Tax				
BS	-0.223850	0.886175	-0.252603	0.8009
BI	-0.029107	0.097935	-0.297203	0.7667
BGD	-0.275097	1.357949	-0.202583	0.8397
BC	-0.859587	0.755996	-1.137025	0.2571
C	8.432644	2.198264	3.836047	0.0002
Effects Specification				
Cross-section fixed (dummy variables)				
R-squared	0.420948	Mean dependent var		6.530200
Adjusted R-squared	0.345276	S.D. dependent var		0.730157
S.E. of regression	0.590806	Akaike info criterion		1.897509
Sum squared resid	61.43314	Schwarz criterion		2.293307
Log likelihood	-165.7509	Hannan-Quinn criter.		2.057682
F-statistic	5.562827	Durbin-Watson stat		1.407966
Prob(F-statistic)	0.000000			

From the fixed effect results the study found that 48.1 percent variation in return on equity and 43.5 percent variation in profit after tax is traced to variation in the independent variable. The probability coefficient indicates that the models are statistically significant while the Durbin Watson Statistics proved that absence of serial autocorrelation. It is evidence from the table that the independent variables have negative effect on the two dependent variables. This enables us to examine the effect of the board attributes on the financial performance of the firms using the random effect model

Table 6: Random Effect Regression Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
The Effect of Board Characteristics on Return on Equity				
C	0.001997	0.010784	0.185213	0.8533
D(BS)	0.030630	0.193548	2.158253	0.0044
D(BI)	-0.009916	0.017033	-0.582162	0.5612
D(BGD)	-0.276090	0.240008	-2.150336	0.0416
D(BC)	0.004905	0.130093	0.037706	0.9700
Effects Specification				
			S.D.	Rho
Cross-section random			0.000000	0.0000
Idiosyncratic random			0.144551	1.0000
Weighted Statistics				
R-squared	0.620969	Mean dependent var		0.002056
Adjusted R-squared	0.501409	S.D. dependent var		0.139026
S.E. of regression	0.139124	Sum squared resid		3.387194
F-statistic	0.937023	Durbin-Watson stat		2.635479
Prob(F-statistic)	0.443834			
Unweighted Statistics				
R-squared	0.420969	Mean dependent var		0.002056
Sum squared resid	3.387194	Durbin-Watson stat		2.635479
Correlated Random Effects - Hausman Test				
Equation: Untitled				
Test cross-section random effects				
Test Summary		Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random		1.323332	4	0.8574
The Effect of Board Characteristics on Profit after Tax				
BS	0.034125	0.822547	0.041487	0.9670
BI	-0.026756	0.097669	-2.273944	0.0044
BGD	-0.241174	1.352649	-0.178297	0.8587
BC	0.866709	0.754119	1.149300	0.2518
C	8.147858	2.165606	3.762392	0.0002
Effects Specification				
			S.D.	Rho
Cross-section random			0.495200	0.4126
Idiosyncratic random			0.590806	0.5874
Weighted Statistics				
R-squared	0.709594	Mean dependent var		2.305116
Adjusted R-squared	0.610722	S.D. dependent var		0.582847
S.E. of regression	0.585963	Sum squared resid		66.95382
F-statistic	0.472246	Durbin-Watson stat		1.243045
Prob(F-statistic)	0.756073			
Unweighted Statistics				
R-squared	0.505320	Mean dependent var		6.530200
Sum squared resid	105.5281	Durbin-Watson stat		0.788133

Cross-section random	0.816221	4	0.9363

In order to determine the best fitting model of firm performance, this study adopted Hausman specification test where the fixed effects model specification was compared to the random effects model. According to Woodridge (2004) under fixed effects, there is an assumption that all the dispersion in observed effect is due to sampling error whereas under random effects, there is allowance that some of the dispersion observed may illustrate real differences. The null hypothesis was that the differences in estimates are not systematic. Consequently, on conducting the test, it was shown that P-value of 0.8574 and 0.9363, at 0.05 level of significance, implied that the individual level effects are best modelled using the random effects method. The results indicates that 50.1 percent variation in return on equity and 61 percent variation in profit after tax of the quoted manufacturing firms can be traced to variation in board attributes, the model is statistically significant based on the probability of f-statistic while the Durbin Watson shows the there is no serial autocorrelations among the variables. The results further indicates that board size have positive effect on the return on equity and profit after tax, board independence has negative effect on financial performance, board gender diversity has negative effect on financial performance, while board composition has positive effect on financial performance.

Discussion of Findings

The result infers that board size have positive and significant effect on return on equity but positive and not significant effect on profit after tax of the manufacturing firms. This specifies that increased board size might not actually translate to better financial performance, and large boards are equivalent to more opinions, which might cause conflicts, limit faster decision makings and reduce performance. This replicates the positive results of Maxwell and Kehinde (2012), Shaba et al. (2016) and Adegboye et al. (2019). However, this negates the positive verdict of Ahmad and Sallau (2018). Similarly, the study discloses a positive but insignificant influence of board size onfinancial performance. This specifies that a rise in the proportion of shares held by directors might result in greater market performance.

The result infers that board composition have positive and no significant effect on financial performance of the manufacturing firms. This specifies that increased board composition might not actually translate to better financial performance, and large boards are equivalent to more opinions, which might cause conflicts, limit faster decision makings and reduce performance. This replicates the positive results of Maxwell and Kehinde (2012), Shaba et al. (2016) and Adegboye et al. (2019b). However, this negates the positive verdict of Ahmad and Sallau (2018). Similarly, the study discloses a positive but insignificant influence of board size on financial performance. This specifies that a rise in the proportion of shares held by directors might result in greater market performance.

The result infers that board independence and board gender diversity havenegative and no significant effect on financial performance of the manufacturing. This specifies that increased board independence might not actually translate to better financial performance, and large boards are equivalent to more opinions, which might cause conflicts, limit faster decision makings and reduce performance. This replicates the positive results of Jadah and Adzis (2016) that board characteristics significantly and positively impacted bank performance (proxied by return on

equity). Shukla et al. (2018) that only three of the features (CEO duality, average number of boards served and number of meetings) were positively linked with market performance and Osemene and Fakile (2019) that the financial experience and meetings of the audit committee had substantial control over financial performance.

CONCLUSION AND RECOMMENDATIONS

Conclusion

The study concludes that there is no significant relationship between board composition and return on equity of quoted manufacturing firms in Nigeria. The study concludes that there is no significant relationship between board composition and profit after tax of quoted manufacturing firms in Nigeria. The study concludes that there is no significant relationship between board independence and return on equity of quoted manufacturing firms in Nigeria. The study concludes that there is significant relationship between board independence and profit after tax of quoted manufacturing firms in Nigeria. The study concludes that there is significant relationship between board size and return on equity of quoted manufacturing firms in Nigeria. The study concludes that there is no significant relationship between board size and profit after tax of quoted manufacturing firms. The study concludes that there is no significant relationship between board gender diversity and profit after tax of quoted manufacturing firms in Nigeria.

Recommendations

i. The study recommends a considerable size of the board appointed with increased non-executive directors who are independent of management and the activities of the firm, and who at the same time will bring in experience and expertise that can positively improve its relationship on financial performance.
ii. The manufacturing firms should optimize its board size, but at the same time avoid a board size beyond which an additional member will create additional cost greater than the benefit of the added board member, because too large boards will create higher costs in communication, co-ordination and remuneration for directors, which will thereby decrease firm value.
iii. In view of the high costs associated with a large board size, the study recommends an optimal board size of directors.
iv. The negative and significant impact of board gender diversity on financial performance clearly shows that the increase of one female on the board of listed manufacturing firms operating in Nigeria has the capacity to increase reduce financial performance.
v. This recommends better gender diversity on the boards of listed manufacturing firms in Nigeria to improve firm financial performance.
vi. There is need for managers to ensure that the size of the board is also congruent to organizational needs, such that the board size, competencies, skills and ability advance organizational quest.
vii. Board attribute should be integrated as the operational objectives of firms in Nigeria and transmitted from management to lower employees in the organization to achieve set corporate goals.
viii. The study recommends the need for continuously review and update their board attributes in line with the changing dynamics within the firms and the need to ensure that code of

corporate governance is not limited the board and senior managers, but also middle lever managers and employees as well.

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