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CORPORATE BOARD CHARACTERISTICS AND TAX AGGRESSIVENESS: A STUDY OF MANUFACTURING FIRMS IN NIGERIA

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ABSTRACT The concept of corporate tax aggressiveness has received immense empirical investigation in the developed countries of Europe and America. However, the association of the concept with corporate board characteristic has not been sufficiently explored in literature. This study therefore seeks to provide empirical evidence on whether corporate board characteristics such as board size, board gender diversity, and board independence are significantly associated with tax aggressiveness amongst manufacturing firms in Nigeria. Leaning on the agency theory and to achieve the above objective, a sample of forty-nine (49) manufacturing firms listed on the Nigeria stock exchange (NSE) as at December 2016 was examined. Data for the study were obtained solely from annual financial statements of the studied firms for the period 2011 to 2016. The econometric model adopted for the study was estimated using panel data regression approach with a preference for the fixed effect model based on the result of the Hausman test. Results of the study show that both board size and board independence exert negative and significant impacts on tax aggressiveness in manufacturing firms in Nigeria, while board gender exerts no significant effects. The insufficient women corporate board membership in the firms is assumed to be a plausible reason for this outcome. In light of the findings of the study, we therefore, recommend that listed manufacturing firms in Nigeria should ensure more women are included in their boards of directors.

KEYWORDS : Tax aggressiveness, board of directors, cash effective tax rate, corporate governance

1.INTRODUCTION

Tax is a compulsory levy which the government of a nation imposes on its citizens for the purpose generating revenue to finance its developmental activities, including the provision of infrastructure, security, and the enabling environment for the economic stability of the society (Adesola, 1986). Despite the advantages that are associated with tax revenue, individuals and firms still see tax as an undesired compulsory levy imposed on them by government. The major aim of a firm is wealth creation and business success, and one reliable way of achieving this aim, is to minimise business costs. Management considers corporate income tax as one of the major sources of business cash outflow as relatively significant part of the wealth of shareholders and other relevant stakeholders are appropriated by governments through taxation (Richardson, Taylor, & Lanis, 2013; Desai, Dyck, & Zingales, 2007). Given that the key objective of the firms is to minimise tax liabilities and maximise shareholders value, employing tax aggressive strategies becomes warranted (Ilaboya, Izevbekhai, & Ohiokha, 2016; Richardson, Taylor & Lanis, 2013). Most corporate firms develop their tax aggressive strategies considering the tradeoff between the marginal benefits and costs of managing taxes (Chen, Chen, Cheng, & Shevlin, 2010). However, the fact that firms use aggressive tax policies to minimise tax liabilities has made tax aggressive activities of firms to come under close examination by tax authorities. Tax authorities can successfully challenge tax aggressive activities of firms, and those found culpable may be heavily penalised (Lisowsky 2009). The news of government sanction of a firm over tax fraud may have a substantial adverse effect on the reputation and stock prices of the firm (Hanlon & Slemrod, 2009); and as a result, shareholders may not support managers on certain policies on tax matters, especially when perceived to be illegitimate and opportunistic in nature.

In tax literature, there are two theoretical perspectives to firm's tax aggressive behaviours, namely the traditional and the agency theory perspectives. The traditional perspective presents aggressive tax strategies as firm's value creating activity since it entails the transfer of wealth from government to shareholders (Khurana & Moser, 2013). The agency theory perspective presents tax aggressiveness as an activity designed to create scope for managerial opportunism in which managers seek to increase their personal utilities rather than creating wealth for shareholders owing to the separation of ownership from control (Khurana & Moser, 2009). The basic intuition on the interplay between corporate board

characteristics and tax aggressiveness can be explained by the agency problem that exists between managers and shareholders in firms. While managers use the complexity and opaqueness of tax avoidance activities as shield for managerial opportunistic actions (Desai & Dharmapala, 2008), shareholders' attitude towards tax aggressiveness depends on their evaluation of both costs and benefits of such an activity. Therefore, a tax aggressive strategy whose benefits are offset by the hidden agency costs arising from managerial actions, such as masking rent extraction activities, will not be supported by shareholders (Chen *et al*., 2010).

Although, tax literature suggest that sound corporate governance mechanisms will have an indirect association with aggressive tax reporting, the type of link between corporate board characteristics and tax aggressiveness remains unclear because tax aggressive policies can provide benefits or real cash flows to firms but can as well incur costs that may offset the benefits. Thus, the form of the relationship between board characteristics and tax aggressiveness may depend on the attitude of both shareholders and managers toward tax aggressive activities (Desai & Dharmapala 2009). Hence, the objective of the study is to evaluate the existence of relationships between corporate board characteristics and tax aggressiveness in Nigeria.

The study is motivated by two fundamental gaps in the literature. First, the relationship between corporate board characteristics and tax aggressiveness has been less investigated in the literature. With the exception of a handful of recent Nigerian studies (e.g. Ibobo, Egbule & Arukaroha, 2018; Uchendu, Ironkwe, & Nwaiwu, 2016; Onyali & Okafor, 2018), the few existing studies in the area are domiciled in the developed countries of Europe, America and Australia. This means that the issue of tax aggressiveness is partly understood and practised in Nigeria as it is still evolving. Secondly, most studies in the present area have restricted their measure of tax aggressiveness to the effective tax rate (ETR). The ETR measure does not account for tax aggressiveness associated with temporary book-to-tax difference because a shortfall in current tax expense is offset by corresponding increase in deferred tax expense. We, therefore, employ cash effective tax rate (CETR) as a measure of tax aggressiveness because it reduces volatility associated with the annual ETR measures (Hanlon & Heitzman, 2010; Salihu *et al*., 2013) and data truncation bias caused by loss years (Henry & Sansing, 2014).

The remainder of the paper is structured as follows: Sections 2 addresses the concept of tax aggressiveness and the connection between corporate board characteristics and tax aggressiveness. Following this section is section 3 which reviews theories considered relevant to the study. Section 4 focuses on the methodology, comprising the research framework, model specification and date estimation technique. Section 5 concludes the discussion with some recommendations.

2.Literature Review
2.1Tax Aggressiveness
Tax aggressiveness has been defined in several ways by different authors. Chen, Chen, Cheng, and Shevlin (2010) defined tax aggressiveness as the use of tax planning strategies to reduce taxable income and tax liabilities. Frank, Lynch and Rego (2009) referred to tax aggressiveness as the downward manipulation of taxable income through tax aggressive activities. Frischmann, Shevlin, and Wilson (2008) narrowly defined tax aggressiveness as the process of embarking on significant tax activities without strong facts. However, a more comprehensive definition was provided by Lisowsky et al. (2010), in which they presented tax aggressiveness as activities close to the end of a continuum of tax avoidance actions that range from legitimate tax planning to investments in abusive tax shelters.

Tax aggressive actions are viewed as a veritable investment for firms and shareholders as it can be used to reduce the tax liabilities, but authors including Ilaboya, Izevbekhai and Ohiokha (2016) and Chen et al. (2010) submit that shareholders may not support the activities of tax planning because of the likely future cost implication to the firm. Firms carry out tax aggressive activities in a number of ways, including failure to submit returns, wrong returns by manipulating taxable profits, reporting fictitious transactions, overstating expenses, violating the provisions of relevant Tax Acts (Kiabel & Nwankwo, 2009; Sharayri & Momani, 2009). The extent of tax aggressiveness in firms may be determined by the nature and extent of agency conflicts, and thus, analysis of an aggressive tax decision should be rooted in an agency framework. Different measures of corporate tax aggressiveness have been used in the previous literature (Lee, Dobiyanski & Minton, 2015; Salihu, Obid, & Annuar, 2014). These measures which are based on the estimates from the financial statements include constructs that measure the ratio of the amount of taxes to accounting income such as the accounting ETR; current ETR; cash ETR; long-run cash ETR; ETR differential; ratio of income tax expense to operating cash flow; (Lee, Dobiyanski, & Minton, 2015; Salihu, Obid, & Annuar, 2014); other measures include constructs that consider the size of the gap between book and taxable income such as the total book-tax differences. The final category of the measures include tax savings, unrecognised tax benefits and tax shelter estimates (Lee et al., 2015).

2.2Corporate board characteristics and Tax aggressiveness
The board characteristics adopted in this study are board size, board independence, and board gender. These characteristics are selected because they are commonly used in studies relating to corporate boards. The effectiveness of corporate boards in constraining tax aggressive actions of managers largely depends on their characteristics.

Board Size and Tax Aggressiveness
Board size simply means the number of people that make up a corporate board. Board size somewhat varies from country to country. In Nigeria, the minimum board membership for all listed firms as stipulated by the Securities and Exchange Commission (SEC) code of corporate governance (2009) is five (5). The debate remains to the present day as to whether large or small boards are more effective in performing their oversight functions. Theoretically, some authors advocate for smaller boards, asserting that smaller boards provide better financial reporting monitoring function; and that expressing opinions and communicating within a smaller group are usually easier and quicker (Minnick & Noga 2010; Hermalin & Weisbach, 2003; Yermack, 1996). In contrast, others

argue that larger boards are able to draw from a wealth of combined experiences of members, making it easier for the board to handle issues, monitor managerial performance, and advice management accordingly (Dalton, Daily, Ellstrand, & Johnson, 2009; Dalton & Dalton, 2005; Xie, Davidson & DaDait, 2003). Agency theory proposes smaller boards because when board size increases, agency problems in the boardroom increase also, thus leading to internal conflicts among board members (Uwuigbe, Egbide, & Ayokunle, 2011; Ning, Davidson, & Wang, 2010). Larger boards are considered less effective in information flow and cause coalition costs to rise among directors (Firth, Fung, & Rui, 2007).

Results so far on the link between corporate board characteristics and tax aggressiveness are mixed. For instance, in a study on the associate of board composition with corporate tax aggressiveness, Lanis and Richardson (2011) reported significant connection between board size and tax aggressiveness. On the other hand, Aliani and Zarai (2012) discovered a non-significant relationship between board size and tax aggressiveness, stating that the number of corporate directors does not affect strategies designed to reduce tax liabilities within the American context. Some few other researchers, including Khaoula and Ali (2012) and Khaoula (2013), although not specifically studying the correlation between corporate board characteristics and tax aggressiveness, incorporated some corporate governance variables in their data estimation. In examining effect of board-related governance attributes on corporate tax planning (proxied by GAAP ETR) for a sample of Tunisian firms, Khaoula and Ali (2012) established the effect of board size not to be statistically significant. Using GAAP ETR as a proxy for aggressive tax avoidance, Khaoula (2013) found a statistically insignificant connection between board size and GAAP ETR based on a sample of American firms. Minnick and Noga (2010) demonstrated that small board sizes support good tax management compared to large boards which can make decision-making regarding tax aggressive policies slow and difficult. Hence, the following hypothesis is proposed:

H_1: Board size has no significant influence on tax aggressiveness

Board Independence and Tax Aggressiveness
Board independence means the number of independent non-executive directors on a corporate board in relation to the total number of board directors, and it represents the willingness of the boards to check management. Board independence is generally surrogated by looking at the right blend of executive and non-executive directors in a given board (Adams et al 2010; Dalton, Daily, Johnson & Ellstrand, 2009). The essence of having a board with more non- executive (outside) directors stems from the theoretical assumption that a board dominated by outside directors is likely to be more independent and will make better decisions than boards dominated by insiders (Fama & Jensen, 1983). Agency theory is consistent with this assumption. The SEC code of corporate governance (2009) for listed firms in Nigeria stresses need for corporate boards to have a mix of executive and non-executive directors with majority of members being non-executive directors.

A number of studies have reported that high proportion of non-executive directors may introduce excessive monitoring into the firm that is harmful and stifles strategic actions, and that outside director may even lack the business knowledge to be truly effective (Goodstein, Gautum, & Boeker, 1994; Demb & Neubauer, 1992; Patton & Baker, 1987; Baysinger & Butler, 1985). Further, other studies suggest that wholly independent boards may not be effective in reducing aggressive tax actions. For example, Owens (2008) found a direct relationship between the independent board and aggressive tax planning, leading them to conclude that boards comprising too many outsiders lose the expertise associated with officers serving on the board. Sharayri and Momani (2009) found no relationship between outsider directors and tax aggressiveness. On the contrary, Richardson et al. (2012), Armstrong et al. (2012) and Lanis and Richardson (2011) provided evidence concerning board independence and risky tax planning (e.g. tax aggressiveness) and

found that the presence of a high percentage of independent directors on the board helps to reduce risky tax planning. Specifically, Lanis and Richardson (2011) provide evidence that higher proportion of independent non-executive directors is negatively associated with the likelihood of tax aggressiveness. For Sarkar, Sarkar, and Sen (2008), it is board quality rather than board independence that is associated with lower opportunistic tax management. Khaoula and Ali (2012) did not find statistical significant relationship between board independence and tax aggressiveness. Therefore, the following hypothesis is proposed:

H₂: Board independence has no significant influence on tax aggressiveness

Board Gender Diversity and Tax Aggressiveness
There is a growing stream of research which shows considerable benefits that can be obtained from having gender diversity on corporate boards (Renee & Daniel, 2008). In other words, the need to include more women in corporate boards has been emphasised as they have found to bring a new perspective to board deliberations (Duc & Thuy, 2013; Smith, Smith, & Verner, 2006). The board consisting of female members is more likely to promote honesty, high ethical values, and independent reasoning that enhance the level of transparency at the board level and credibility within the board (Lanis *et al*., 2015). Agency theory supports board female gender because having more women on corporate boards increase the chance of improving profitability and the image of the organisation as well as adding to shareholders' value through effective, objective and quality deliberations (Lakhal, Aguir, Lakhal, & Malek, 2015).

However, some shortcomings of diverse gender boards suggest that arriving at common decisions may take longer time and disagreement may arise more frequently (Oyenike, Olayinka & Emeni, 2016). Besides, gender-based behavioural conflicts between women and men board members are observed from the decisions made by directors which tend to influence main strategic and financial decisions taken (Palvia, Vahamaa, & Vahamaa, 2015). A study carried out by Francis, Hasan, Wu, and Yan (2014) revealed that female CFOs are related to lower tax aggressiveness than their male counterparts. Similarly, Boussaidi and Hamed (2015) found a negative link between board gender diversity and aggressive tax actions. On the other hand, other studies propose that having more female on corporate boards may not necessary be effective in constraining aggressive tax actions. This position was demonstrated in a study carried by Aliani and Zarai (2012) which revealed a positive and significant relationship between the percentage of women on the board and tax planning (tax aggressiveness). Hence, the following hypothesis is proposed:

H₃: Board gender diversity has no significant influence on tax aggressiveness

Firm Size and Tax Aggressiveness
It is plausible that other factors may jointly influence corporate board characteristics or tax aggressiveness and therefore cause spurious correlation (Richardson, Taylor & Lanis, 2013). For this reason, firm size was included in this study as a control variable. This is essential because firm size accounts for the scale and scope of a firm's operations and, as a result, may confound the relationship between both corporate board characteristics and tax aggressiveness. Besides, firm size account for variations in tax aggressiveness which are not explained by the explanatory variables (in this case, corporate board characteristics).

There are a number of measures of firm size and these include the number of employees (Ilaboya et al., 2016), log of revenue (Fagiolo & Luzzi, 2006), log of total assets (Fagiolo & Luzzi, 2006 Minnick & Noga, 2010) and value added (Ilaboya *et al*., 2016; Fagiolo & Luzzi, 2006). Prior studies on the link between firm size and tax aggressiveness are mixed. For instance, Hoi, Wu, and Zhang (2013), Ftouhi, Ayed, and Zemzem (2015) and Rego (2003) all reported that

the advantage of the economic and political power of larger firms compared to small ones makes them more likely to be involved in tax aggressiveness.

Also, studies by Richardson et al. (2013), Nwaobia (2014), Desai and Dharmapala (2006) and Chen *et al*. (2010) showed the existence of a positive association between firm size and the effective tax rate. In contrast, Richardson and Lanis (2011) and Avi-Yonah (2008) found an inverse relationship between firm size and tax aggressiveness. They argue that corporations, especially those with large stakeholders and reputation to maintain, will consider any deliberate actions directed towards engaging in strategic tax behaviour designed solely to minimise its corporate taxes as illegitimate, despite having the right to minimise tax liabilities within the confine of the law. Therefore, studies on the connection between firm size and tax aggressiveness are mixed.

3. Underpinning Theories
Although, different theories have underpinned the nexus between corporate board characteristics and tax aggressiveness, ranging from the agency theory (Jensen & Meckling, 1976), stakeholder theory (Jenson, 2001) and resource dependence theory (Pfeffer & Salancik, 1978), however, past studies on the relationship between corporate board characteristics and tax aggressiveness have been anchored on the agency theory.

Agency Theory
An agency relationship arises wherever one or more individuals, called principals, hire one or more other individuals called agents, to perform some service and then delegate decision- making authority to agents (Oso & Semiu, 2012; Bamberg & Klaus 1987; Jensen & Meckling, 1976). The primary agency relationships in business are those between shareholders and managers. However, agency problems do not just occur between shareholders and management; such relationships also exist between different classes of shareholders. Oso & Semiu, (2012) note that minority ownership in firms can lead to new type of agency problems in the shape of conflicts between majority shareholders and minority shareholders. In fact, agency theory is concerned with the conflicts of interest between the principal and the agent and how the conflicts can be resolved (Oso & Semiu, 2012).

In most public firms, shareholders (principal) want to maximise their share value, while management (agent) wants to maximise their utility. Extant literature has shown that board of directors (agents) sees tax aggressiveness as a veritable investment for firms and shareholders, and as a result may have the incentive to engage in it (Wahab & Holland, 2012; Lisowsky, Robinson & Schmidt, 2013). On the other hand, shareholders (principal) may not support the activities due to the likely future costs to the firm (Ilaboya, *et al*., 2016; Chen, *et al*., 2010). The agency theory viewpoint of tax aggressiveness holds that tax aggressiveness can lead to managerial opportunism (Minnick & Noga, 2010; Desai & Dharmapala. 2009), therefore suggests that higher levels of effective corporate governance are related to lower aggressive tax actions by management (Jiang, Lee, & Anandarajan, 2008).

4. METHODOLOGY
4.1 Analytical Framework
Agency problem arises because in an agency agreement the intention of the principal is at variance with that of the agent, and it is difficult and even costly for the principal to monitor the activities of the agent. Managers (in this case, the agents) pursue selfish strategies and would not act in the interest of shareholders unless an appropriate governance structure is put in place to protect the interests of the shareholders (Jensen & Meckling, 1976). The agency theory, therefore, seeks to resolve this agency conflict between managers and their principals (shareholders). Sound corporate governance structure supports the concept of board independence and a balance of power in the boardroom, appropriate board size, board gender as well as board independence that will protect shareholders' rights and recognise the importance of transparency

and disclosure. The agency theory posits that these corporate board characteristics are vital to better financial reporting, and therefore, suggests that higher levels of effective corporate governance are associated with lower tax aggressiveness by management (Wahab & Holland, 2012; Minnick & Noga, 2010; and Jiang, Lee, & Anandarajan, 2008).

Flowing from the extant literature and theoretical review above, we expect a functional relationship between corporate board characteristics and tax aggressiveness represented in the following schema:
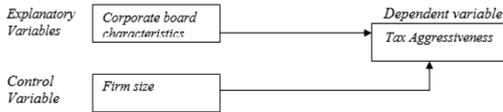

Figure 1: Analytical framework for the study

Decomposing the schema above into its relevant components will produce the following:

Dependent variable

Table 1 – Operationalsation of Variables

S/N	Definition	Variables	Type	Measurement	Source
1	Tax aggressiveness	TAG	Dependent	Firm's total cash tax paid scaled by pre-tax accounting income	Salihu, Obid, and Annuar (2014)
2	Board size	BSIZE	Independent	Number of directors on the board	Boussaidi and Hamed (2015)
3	Board independence	BIND	Independent	proportion of non-executive independent directors on boards	McKnight and Weir (2009)
4	Board gender	BGEND	Independence	Measured using Blau diversity index	Blau (1977); Ugedo and Vera (2014)
5	Firm size	FSIZE	Control	Log of carrying value total assets	Fagiolo and Luzzi (2006) ; Minnick and Noga (2010)
6	e			An error term	

Authors' compilation, 2018

4.3 Research Design, Sample, and Data Estimation Technique

This study employed ex-post facto research design. This research design was adopted because it seeks to analyze secondary data which can hardly be manipulated by the researchers. The population of the study consists of the entire 56 manufacturing firms quoted on the Nigerian Stock Exchange (NSE) as at 31st December, 2016. As it was practically difficult to collect data for all 56 manufacturing firms, a sample size of 49 firms derived using the Yamani's (1967) scientific approach to sample determination was used for this study. To ensure that the 49 sample firms are given equal opportunity of being selected, the probabilistic sampling approach was adopted with emphasis on a simple random sampling technique. Data was extracted from the published financial statements of the firms, covering a period of 6 years from 2011 to 2016. This was supported, where required, with the financial information of the firms as contained in the Nigeria Stock Exchange (NSE) fact book.

Both descriptive statistics (such as mean, median, standard deviation, minimum, maximum, skewness, kurtosis) and inferential statistics (such as the fixed effect panel regression model) were used to analyse our study data. The choice of the fixed effect regression model was based on the outcome of the Hausman test. Moreover, to establish the accuracy of the research model, we performed the classical regression assumption tests of normality, heteroskedasticity, serial correlation, Ramsey reset, and model misspecification. The panel regression technique was employed to enable us investigate the connection between tax aggressiveness (dependent variable) and corporate board characteristics (explanatory variables) over time (time series) with a cross-section of sample listed firms (cross-section).

Presentation and Analysis of Results
Table 2. Descriptive Statistics

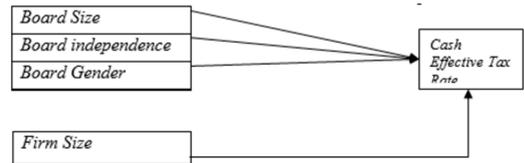|	TAG	BSIZE	BIND	BGEND	FSIZE
Mean	0.2150	12.000	0.4238	0.1100	5.2528

Figure 2: Analytical framework for the study (Decomposed)

4.2 Model Specification and Operationalisation of Variables
Against the backdrop above, the relationship between corporate board characteristics and tax aggressiveness may be captured in the functional form as:

Tax aggressiveness = f (BSIZE, BIND, BGEND, FSIZE)……… …….. (1)

In econometrics form, equation one expressed as follows:

$$CETR_{it} = \beta_0 + \beta_1 BSIZE_{it} + \beta_2 BIND_{it} + \beta_3 BGEND_{it} + \beta_4 FSIZE_{it} + \mathcal{C}_{it} \ldots\ldots (2)$$

Where: CETR = cash effective tax rate; BSIZE = board size; BIND = board independence; BGEND = board gender; FSIZE = firm size, i = firms; t= time period and $\mathcal{C}_i$ = error term. It is expected that β_1, β_2, β_3, β_4 > 0 based on extant studies and existing theories.

Median	0.1987	12.000	0.4143	0.1200	5.1230
Maximum	15.939	19.000	0.7404	0.2100	6.9316
Minimum	1.0002	5.0000	0.2695	0.0000	3.9063
Std. Dev	8.6527	0.1963	0.1710	0.1024	0.1633
Skewness	16.581	0.5923	0.6762	0.3720	0.3826
Kurtosis	399.07	2.3431	3.9142	1.8160	1.8808
Jarque-bera	559713	29.528	372.41	10.213	23.368
Probability	0.0000	0.0000	0.0000	0.0000	0.0000
Observations	294	294	294	294	294

Source: Researchers' computation, 2018

The descriptive statistics presented in table 2 above shows a mean (CETR) of about 22%. This figure is below the statutory tax rate of 30% as stipulated by the Nigerian government. The result indicates that the sampled firms were tax aggressive in the periods under review. The standard deviation of 8.6527 for CETR represents the risk implication of engaging in tax aggressive practice which includes reputation cost to the firm, penalties imposed by tax authorities following a tax audit, and the likely fall in stock prices in reaction to news of tax offenses. The large Jarque-Bera values and the associated probabilities show that the regression variables are normally distributed. Apart from the CETR which has a relatively high standard deviation value, all other variables reported rather small values, thus demonstrating small dispersion of the variables from their respective averages. The small size of the spread somewhat indicates good quality of our sample data.

As observed, board size has a mean value of 12, median value of 12 as well as maximum and minimum values of 19 and 5 respectively. Board size range of 5 to 19 directors is within the acceptable range as specified by the SEC code of corporate governance (2009). The average board size of 12 directors signifies that on average corporate boards in Nigerian manufacturing firms are neither too

large nor too small based on the submission of Sanda*et al* (2010) on an appropriate board size. The standard deviation of 0.1063 suggests that board size exhibits considerable clustering around the average. Board size skewness value of 0.5923 and kurtosis of 2.3431 suggest no considerable departure from symmetry.

Board independence was observed to have a mean value of 42% with maximum and minimum values of 74% and 27% respectively. The closeness of both the mean (42%) and median (41%) values as well as the standard deviation of 0.1710 implies board independence exhibits significant clustering around the average for the sample. The Jacque-Bera statistic of 372.41 alongside its p-value (p=0.00<0.05) means that the data satisfied normality and the presence of outliers in the series unlikely. Based on these statistics, we report that boards of manufacturing firms in Nigeria seem reasonably independent. Board gender diversity for the period ranged from 0.00 to 0.41, suggesting broad variations between our sample firms regarding the extent to which women are included in their boards. The maximum value of 0.21 demonstrates that some of the studied firms have women as board members; while the minimum value of 0.00 shows that some firms have no female members in their boards.

Firm size as measured by the natural logarithm of total assets has a mean of the mean value of firm size is 5.2528 billion. This figure points to the fact that the firms which constitute the size of the study sample invested heavily in assets, perhaps with the intention of taking advantage of the benefit of tax depreciation, economy of large scale, and thus reduce tax liabilities. Firm size which was measured as the natural logarithm of total assets has a mean value of 5.2528 with a standard deviation of 0.1633. The skewness value of 0.3826 specifies no departure from symmetry while the kurtosis value of 1.8808 shows that the sampling distribution for total assets of the firms is rather mesokurtic. These figures point to the fact that the firms which constitute the size of the study sample invested heavily in assets, perhaps with the intention of taking advantage of the benefit of tax depreciation, economy of large scale, and thus reduce tax liabilities.

Correlation Analysis
The outcome of the correlation coefficient, as shown in table 3 above, reveals a predominant negative correlation between tax aggressiveness and the explanatory variables of board size and board gender.

Table 3: Correlation Matrix for Selected Listed Manufacturing firms

Variables	TAG	BSIZE	BIND	BGEND	FSIZE
TAG	1.00	1.00	1.00	1.00	1.00
BSIZE	-0.15	-0.26	-0.16	0. 08	
BIND	-0.08	0.22	0.19		
BGEND	-0.02	0.04			
FSIZE	0.07				

Authors' compilation, 2018

The correlation between firm size and tax aggressiveness is negative, with a coefficient of - 0.15. Though weak, the association suggests that that board size can lead to a reduction in tax aggressiveness among manufacturing firms in Nigeria. A negative correlation was also observed between board gender and tax aggressiveness (r = - 0.02). Though weak, the connection shows that board gender may be associated with a decline in tax aggressiveness. Generally, the correlation coefficients among all the variables are weak with the highest correlation of 0.26 between board size and board independence. The weak correlation coefficients indicate the absence of the multicollinearity among the variables under investigation. This position is further reinforced by the results of the variance inflation factors of the regression variables as reported in table 4 below.

Table 4: Variance Inflation Factor (VIF)

variable	Coefficient variance	Uncentered VIF	Centered VIF
C	0.001994	67.51594	NA
BSIZE	0.00538	8.55894	1.32347
BIND	0.00345	2.24630	1.13540
BGEND	0.00144	1.45471	1.05428
FSIZE	2.94E-05	53.95239	1.04542

Authors' compilation, 2018

The result of the centered VIF of the explanatory variables above shows absence of the problem of multicollinearity as the reported values of the variables are relatively small and well below the benchmark of 10.00. Only centered VIF over and above 10 is indicative of the problem of multicollinearity.

Table 5: Results of the Regression Diagnostics

Diagnostic Test	F-statistic	Probability	Remark
Serial correlation	1.41944	0.2196	Not correlated
Heteroskedasticity	1.21647	0.1350	Homoskedastic
Ramsey reset	0.24865	0.4056	Not mis-specified

Authors' compilation, 2018

The classical regression assumption tests were carried to establish the accuracy of our regression model. The Breusch-Godfrey serial correlation test shows the absence of serial correlation in the regression variables with a probability value of 0.2196. The result of the Ramsey RESET test with probability value of 0.4056 shows that the regression model was well specified. In addition to the outcome of the variance inflation factor (VIF) as shown in table 4, the result of the test of heteroskedasticity with a probability value of 0.1350 reveals homoscedastic residuals, which implies that error variances are a multiplicative function of one or more variables.

Table 6: Results of the Regression Analysis

	Fixed effects	Random effects
CONSTANT	0.03175 (0.14362)	0.11201 (1.29965)
BSIZE	- 0.01368 (- 0.32566)	- 0.11587 (- 0.44924)
BIND	- 0.61517 (- 0.27952)	- 0.52218 (- 0.13302)
BGEND	-0.0098 (-0.64921)	-0.00437 (-0.58954)
FSIZE	0.00368 (0.12563)	0.00479 (0.44258)
R-SQUARED	0.71814	0.70915
ADJUSTED R-SQUARED	0.64051	0.63906
F-STATISTIC	393.154	6111.28
PROBABILITY	0.00000	0.00000
DURBIN WATSON STATISTIC	2.03406	1.94085
HAUSMAN TEST STATISTIC	0.0079	
TOTAL OBSERVATION	294	294

Authors' compilation, 2018

In consonance with Brooks (2008), the result of the Hausman test reveals preference for the fixed effect model, over the random effect model, with a probability value of 0.0079. The outcome of the regression analysis shows that the model is well fitted (F-statistic = 393.154, p-value = 0.0000), and thus depicts the existence of a linear relationship between the explanatory and the dependent variables. The Durbin-Watson statistic of 2.034 portrays the absence of autocorrelation in the regression variables as it is considerably close to the benchmark of 2.00. The R-square (coefficient of determination) of 0.71814 explains that about 72% of the systematic changes in the tax aggressive actions of the studied firms are explained by the regressors of board size, board independence and board gender. However, this was moderated by the adjusted R-

squared to 64%, thus signifying that other variables outside our explanatory variables influence tax aggressiveness in the manufacturing firms.

The result of the study shows that board size exerts a negative and significant effect on tax aggressiveness (CETR) of the firms at the 5% level (β= - 0.01368, t= - 0.32566). The result conforms to the findings of Uwuigbe, Egbide, and Ayokunle (2011) and Ning, Davidson, and Wang (2010) who argued that agency problems in the boardroom increase as board size increases, leading to internal conflicts among board members. The result of the descriptive statistics revealed an average board size of 12 directors for the manufacturing firms in Nigeria, which is close to the board size of 10 members recommended by Sanda *et al* (2010) for a corporate board to perform optimally. Therefore, it is not surprising that the result of this study shows that small board size is able to constrain tax aggressiveness in the firms, thereby rejecting hypothesis one who states that board size has no significant influence on tax aggressiveness. Reasonable board size, according to Nik (2011) and Salawu *et al*. (2017), benefits from the skills, expertise and experience of its members which can help reduce tax aggressive behavior in firms

The result of the study also documents that board independence has a negative and significant effect on tax aggressiveness of the firms under review at 10% level (β= - 0.61517, t= - 0.27952). This means that by increasing prior year's board independence by 1 unit, a 0.61517 reduction in the current year CETR is anticipated. In other words, greater board independence can help constrain tax aggressive actions in manufacturing firms in Nigeria. This finding is in tandem with earlier studies (Armstrong *et al*., 2012; Lanis & Richardson, 2011; Richardson *et al*., 2012), and therefore provides the impetus for the rejection of our hypothesis two. However, against our apriori expectation, the relationship between board gender and tax aggressiveness (cash effective tax rate) is a negative and insignificant at the 10% level (β = - 0.0098, t= - 0.64921), suggestive of the failure of board gender as corporate governance mechanism in exerting any significant effect on tax aggressiveness in manufacturing firms in Nigeria. The insufficient women board membership in the manufacturing firms, as revealed by the outcome of the descriptive statistics above, may be responsible for this unexpected result. Consequently, hypothesis 3 is accepted. The negative and insignificant relationship between board gender and tax aggressiveness is line with the finding of Aliani and Zarai (2012) who reported that having more female on corporate boards may not necessary be effective in constraining aggressive tax actions.

Finally, the relationship between firm size and tax aggressiveness (cash effective tax rate) is positive and significant at 10% level (β= 0.00368, t = 0.12563). This result, which is in consonance with the position of Richardson *et al*. (2013), Nwaobia (2014), Desai and Dharmapala (2006) and Chen *et al*. (2010), implies that large firms tend to have the incentive to develop strategies designed to aggressively reduce tax liabilities. It is however at variance with the findings of Richardson and Lanis (2011) and Avi-Yonah (2008) who reported that large corporations may not engage in tax aggressive actions to protect the interest of their large stakeholders and firms reputation.

5. CONCLUSION AND RECOMMENDATIONS
The primary objective of this study was to investigate the influence of corporate board characteristics on tax aggressiveness. To achieve this objective, we used 294 firm-year observations in a panel data form for 49 manufacturing firms listed on the Nigerian Stock Exchange from 2011 to 2016. We proxy tax aggressiveness using cash effective tax rate (CETR), which was calculated as ratio of income tax paid to profit before tax. Corporate board characteristics adopted as explanatory variables for the present study are board size, board independence and board gender. These board characteristics were selected because they are amongst the commonly used governance mechanisms in accounting literature. Our study contributes considerably to the growing body of

knowledge on the dynamics of tax planning/tax aggressiveness as it is one of the few studies to be based on empirical evidence from a developing country like Nigeria. Besides its modest contribution to knowledge, the coverage of 49 firms with 294 observations, given the number of manufacturing firms listed on the Nigeria Stock Exchange as at 31st December, 2016 is considered extensive enough and hence constitutes one of the major strengths of the study.

Results of the study show that both board size and board independence exert negative and significant impacts on tax aggressiveness in manufacturing firms in Nigeria, while board gender exerts no significant effect. The insufficient women corporate board membership in the studied firms is assumed to be a plausible reason for this outcome. Based on the findings of the study, we therefore recommend that listed manufacturing firms in Nigeria should ensure more women are included in their boards of directors. This is very vital as extant literature has demonstrated the key role female directors can play toward board effectiveness and corporate success.

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