

**EFFECT OF BOARD CHARACTERISTICS ON EARNINGS MANAGEMENT OF  
LISTED OIL AND GAS FIRMS IN NIGERIA**

**BY**

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**A THESIS SUBMITTED TO THE SCHOOL OF POSTGRADUATE STUDIES,  
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## **DECLARATION**

I, IdrisGarbaMagaji, declare that the work in this dissertation titled “Effect of Board Characteristics on Earnings Management of Listed Oil and Gas Firms in Nigeria” has been performed by me in the Department of Accounting. The information derived from the literature has been duly acknowledged in the text and a list of references provided. No part of this dissertation was previously presented for another degree or diploma at this or any other Institution.

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## CERTIFICATION

This dissertation entitled **EFFECT OF BOARD CHARACTERISTICS ONEARNINGS MANAGEMENT OF LISTED OIL AND GAS FIRMS IN NIGERIA** by Idris Garba MAGAJI, meets the regulations governing the award of degree of Master of Science in Accounting and Finance of the Ahmadu Bello University, Zaria and is approved for its contribution to knowledge and literary presentation.

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## **ABSTRACT**

Financial scandals around the world are blamed on widespread alteration in accounting earnings by managers. Board characteristics are expected to curtail the opportunistic behaviors of management. Hence, the study investigates the effect of Board characteristics on earnings management of listed oil and gas firms in Nigeria. Board characteristics variables used were gender diversity, board nationality, board size, board composition and board meetings, while earnings management was measured using Yoon, Kim and Woodruff (2012) model. The population comprise of nine listed Oil and Gas firms, while eight were used as sample, due to non-availability of data for one of the firms. Secondary source of data was employed and data were extracted from the financial statements of the firms covering the period 2009-2016. Panel least square regression and Stata 13 were used as technique and statistical package, respectively for data analysis. The findings revealed that, gender diversity, Board nationality and Board size have negative and significant effect on earnings management of firms, while Board composition and board meetings also have negative but insignificant effect on earnings management. From the findings, the study recommended amongst others that, the percentage of non-executive director to total number of directors and the number of meetings held by directors in a year should be improved upon as this is expected to constrain managers from unethical behaviors.



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## **CHAPTER ONE INTRODUCTION**

### **1.1 Background to the study**

The integrity of financial reporting has been a source of concern among regulators and practitioners due to collapse of large corporations such as Enron Corporation, Tyco, HealthSouth, WorldCom, Xerox (all in USA), the Parmalat (Italy), and Cardbury in Nigeria among others. These financial scandals that have affected many corporations world over did not leave Nigeria corporations untouched, especially the likes of Oceanic bank, Intercontinental bank and African Petroleum PLC (CBN, 2009). However, the Oil and Gas sector in Nigeria cannot be exonerated.

Therefore, it is of interest to focus on oil and gas sector in Nigeria because of its services and significant contribution to economic growth of the country. Therefore, there is the need for adequate attention to be given to such sector. The study is motivated by the fact that corporate governance culture in Nigeria has consistently failed to be responsible and accountable to the stakeholders and has no deep-rooted mechanism to maintain a balance among the major players which have resulted in increase in manipulation of reported accounting numbers as posited by Bello (2005).

Also, the motivation to investigate the oil and gas sector is based on the financial scandals that rocked the African Petroleum Plc (now Forte oil) which include falsification of accounts. There was a petition by a director that, in 2009, A.P Plc made a loss of about N15 Billion, which was due to the fact that the Chairman's companies (Zenon Petroleum and Gas Company Limited, Platinum Fleet Limited and Fineshade Energy limited) sold products to AP Plc at higher prices than normal, at times higher than the retail pump price at gas station. However, in September 2009, the finance director claimed to have prepared a management account where the company made a loss of N9.7 billion and the loss was not acceptable to the

chairman who brought in others to produce an alternative account that showed a profit of N957 million (Clement, 2010). Also, there are still few studies of this nature in the oil and gas firms particularly in Nigeria that have address challenges of earnings management in Nigerian Corporate environment.

Corporate environment in Nigeria experienced reported cases of financial scandals which could be best described as earnings management and it has brought doubt in the credibility of financial reports. For example, there was a report of manipulative accounting in financial statement of African Petroleum Plc indicating that the statements do not fairly present the company's financial position (Oyejide & Soyibo, 2001). This has raised questions about the reliability and quality of financial reports presented by the oil and gas firms. Therefore, there is the need to examine the factors that could reduce the level of earnings manipulations by corporations particularly in the Oil and Gas sector which serve as one of the pivot of Nigerian economy. The sector is also characterised with huge investments and a lot of risks involved in the operations of Oil and Gas firms, which are prone to earnings management activities (Farouk & Shehu, 2014). Therefore, board characteristics have been identify as an important variable in this study to mitigate earnings management in the sector.

Board characteristics may include variation of the age, race, ethnicity, gender, and social/cultural identities among employees within a specific corporation (Marimuthu, 2008). The quality of financial reports could be dependent on the strength, qualities, diversity, independence and the characteristics of firm's board (Farouk & Shehu, 2014). Board characteristics in relation to gender diversity, board nationality, board size, board composition and board meetings believed to have significant effect on the level of earnings management of firms.

Women directors are found to be more punctual in meeting attendance and more adhere to ethical codes and standards than their male counterparts (Vafeas & Theodorou, 1998). Therefore, a board that is made up of female directors is believed to enhance performance and therefore ensure compliance to ethical codes. Previous research on ethics found that women are less likely to engage in unethical behaviour in the workplace to obtain financial rewards (Rose, 2007). In a similar vein, a board that is composed of foreign nationals or foreign institutional investors could be seen as diverse board, which may have significant incentives to monitor the managers in order to protect their wealth, because of the foreign national or institution's huge investment. This monitoring role played by foreign investors is expected to curtail the opportunistic tendencies by managers against discretionary choices (Isenmila & Elijah 2012).

While on board size, researchers have conflicting view about the influence and direction on earnings management. Xie, Davidson, and DaDalt (2003) and AbdulRahman and Ali (2006) argued that increased number of board members do not affect earnings management of firms which may be due to disagreement among members during meeting and thereby wasting time without taking any value maximizing decision. However, some researchers such as, Ebrahim (2007) and Yu (2013) posit that for board to perform effectively and efficiently, they need to be many in order to have better composition. Therefore, the size of the board is expected to have significant influence in determining the direction and the level of pervasiveness of earnings management.

In addition, it is expected that when board members are composed of more numbers of executive directors, they will serve as better monitors to checkmate the activities of the management and as such mitigate the opportunistic tendencies of managers to manipulate accounting earnings. It can also be argued that because the non-executive directors do not

participate in the day to day running of the organization, this gives them the inquisitive ability to know what is happening within the organization in order to protect the interest of investors.

In another dimension, the number of meetings held by the board members within a year could serve as an opportunity to curtail managers' excess. This is in order to forestall the occurrence before it becomes too late because the meetings provides members of the board with an avenue to raise issues as they affect the management. Therefore, the time spent to deliberate on issues affecting the organisation could go a long way in curtailing the manager's tendencies to manipulative the accounting earnings.

It is to this end that the study seeks to establish the effect of board characteristics on earnings management of oil and gas firms in Nigeria.

## **1.2 Statement of the Problem**

The financial scandal involving the African Petroleum Plc in 2009, is one not to be taken with levity as this may be happening among other firms within the sector. There were claims that a credit facility of 24 billion naira was not disclosed in the financial statements (Kantudu & Samaila, 2015). The implication of this is that, there will be a continuous rise of scepticisms in the mind of investors, shareholders and other stakeholders and loss of confidence on the credibility of financial reports of companies in Nigeria and particularly oil and gas firms due to the fact that financial reporting fraud could be more pervasive than imagined. This therefore forms the practical problem that formed the thrust for this research since the tendency for earnings management has been witnessed amongst companies in Nigeria and this suggest that earnings management is a key challenge for stakeholders in the Nigerian corporate setting.

In studies conducted in various developed and developing countries such as Guo, Huang, Zhang and Zhou (2014), Arun, Almahrog and Aribi (2015), Hussaini and Gugong

(2015), Ibrahim (2015) and Ishaq (2017) failed to consider the use of Yoon, Kim and Woodruff (2012) model for measuring earnings management level despite the criticisms levelled against the model by Dechow, Sloan and Sweeney(1995) that these studies adopted. The criticisms are; the improper separation of discretionary components of accruals that leads to improper inferences. They argued that, if non-discretionary components are treated as discretionary or vice versa, it will be hard to discern the degree of earnings management appropriately, while the second criticisms is that, studies on earnings management generally do not decompose accruals into current components and non-current components.

However, the results from the regression for the models by Yoon et al. (2012) suggests that the average and the adjusted  $R^2$  of the coefficients for the new models is high than that of modified Jones Model by Dechow et al. (1995) implying that the right hand components of the model is better in predicting the ratio of total accruals to lagged total assets compared with the modified Jones model. Hence, this study adopted the Yoon et al. (2012) model as it is considered more sophisticated in capturing the level of earnings management by firms rather than the previous model.

In Nigeria, researches on Board characteristics and earnings management such as Ishaq (2017), Obigbemi, Omolehinwa, Mukoro, Ben-Caleb and Olusanmi(2016) as well as Kantudu and Samaila (2015) failed to conduct robustness tests, multicollinearity test, heteroskedasticity tests, normality tests for residuals and langrange multiplier test before drawing inferences from their findings. The failure to conduct these tests may render their findings and recommendation unreliable. Therefore, this study takes into considerations all the robustness tests.

There is worldwide identification of value of boards for the achievement of organizational objectives and goals. Several countries have issued guidelines and recommendations for best governance practices and board composition (Cadbury, 1992; OECD Principles, 1999; Nigeria SEC code 2003 and revised version of 2011, CBN Corporate Governance code, 2006 and revised version of 2014 and NDIC code, 2009). Therefore these codes complied with the need to be examined against the level of earnings management in the firms, because the expectation is that compliance with those codes will bring out the best practices of firms.

Most of the studies in this area (Gulzar & Wang, 2011; Qi & Tian, 2012; Saleh & Haat, 2014; Baccouche, Hadriche & Omri, 2014) were conducted in developed countries, while other studies such as (Razek, 2012; Shehu & Ibrahim, 2014; Kantudu & Samaila, 2015; and Ishaq, 2017) were carried out in Nigeria. Because of the peculiarity of these countries data and business environment, there is therefore need to add to the existing literature in another dimension using a new measurement of earnings management.

Based on identified problem and gaps above, the study investigates the effect of board characteristics on earnings management of listed Oil and Gas firms in Nigeria. Therefore, the following research questions were raised.

### **1.3 Research Questions**

The following research questions are raised based on the identified problem and gaps in the literature in relations to the variables of the study.

- i. To what extent does gender diversity have significant effect on earnings management of listed Oil and Gas firms in Nigeria?
- ii. To what extent does board nationality have significant effect on earnings management of listed Oil and Gas firms in Nigeria?

- iii. How does board size have significant effect on earnings management of listed Oil and Gas firms in Nigeria?
- iv. How does board composition have effect on earnings management of listed Oil and Gas firms in Nigeria?
- iv. To what extent does board meetings have significant effect on earnings management of listed Oil and Gas firms in Nigeria?

#### **1.4 Objectives of the Study**

The major objective of the study is to examine the effect of Board characteristics on earnings management of listed Oil and Gas firms in Nigeria. Therefore, the specific objectives are to;

- i. examine the effect of gender diversity on earnings management of listed Oil and Gas firms in Nigeria;
- ii. determine the effect of board nationality on earnings management of listed Oil and Gas firms in Nigeria;
- iii. examine the effect of board size on earnings management of listed Oil and Gas firms in Nigeria;
- iv. determine the effect of board composition on earnings management of listed Oil and Gas firms in Nigeria;
- v. examine the effect of board meeting on earnings management of listed Oil and Gas firms in Nigeria.

#### **1.5 Hypotheses of the Study**

Based on the above highlighted objectives, the following hypotheses are formulated in null form.

- Ho<sub>1</sub>. Gender diversity has no significant effect on earnings management of listed Oil and Gas firms in Nigeria.



- Ho<sub>2</sub>. Board nationality has no significant effect on earnings management of listed Oil and Gas firms in Nigeria.
- Ho<sub>3</sub>. Board size has no significant effect on earnings management of listed Oil and Gas firms in Nigeria.
- Ho<sub>4</sub>. Board composition has no significant effect on earnings management of listed Oil and Gas firms in Nigeria.
- Ho<sub>5</sub>. Board Meeting has no significant effect on earnings management of listed Oil and Gas firms in Nigeria.

## **1.6 Scope of the Study**

The study examines the effect of Board characteristics on earnings management of Oil and Gas firms listed on the Nigerian stock exchange as at 31<sup>st</sup> December 2016. The study covers a period of 8 years starting from 2009 to 2016. The justification of choosing this period is based on the fact that the period comes after global financial crises that affected almost every sector in Nigeria that could have paved way for more earnings management to absorb the shock and report good accounting numbers. Five proxies of board characteristics (Gender diversity, board nationality, board size, board composition and board meetings) were used based on the availability of their information in the annual reports and accounts. Variables like board age, board qualification and board tenure is not fully available as there is no stringent requirement for its disclosure. Modified Dechow, Sloan and Sweeney (1995) model by Yoon, Kim and Woodruff (2012) was adopted based on the criticisms provided in respect of the earlier model and the strength in the new model.

## **1.7 Significance of the Study**

The results of this study can be used as a consideration for investors in deciding to invest since rational investors prefer organisations where their investment is safe and yield higher return. Also, for the creditor in making lending decisions especially in the aspect of knowing

fully well how and the extent to which these board characteristics help mitigate the managers' opportunistic tendencies. It further create confidence in the minds of the investors and potential investors on the reliability of their earnings, owing to the board characteristics which mitigates the opportunistic tendencies of the management and capitalizing on such characteristics to ensure transparent and financial reports free of misstatements.

Second, results from this research provide an understanding and appreciation of the link between board characteristics and earnings management. Gaining such factenable regulators to ensure well organised and strategic board. The costs of meeting corporate governance requirements are more considerable because the outcome of this study has the potentials to benefit the Oil and Gas sector, policy makers, professional bodies, and the community at large.

This study also assists the regulators in areas where there is need for improvement on corporate governance mechanisms, in order to put the firms on the right direction. It further helps investors and potentials investors in choosing one or some of the corporate governance mechanisms as an indicator for earnings reliability.

For researchers, the study add to the existing literatures on the subject matter, owing to the five board characteristics proxies used i.e. gender diversity, board nationality, board size, board composition and board meeting.

Finally, the use and the findings from board gender and board nationality effect on earnings management is useful to management when they design their corporate boards.

## **CHAPTER TWO LITERATURE REVIEW**

## **2.1 Introduction**

This chapter discusses the related and relevant literature of the study. The items discussed are as follows: concepts which include the board characteristics variables such as gender diversity, board nationality, board size, board composition and board meetings. Also the concepts of earnings management are covered under this section. The section also captures the conceptual framework showing the link between the variables of the study. Empirical review on board characteristics and earnings management and end with discussion on the theoretical framework of the study

## **2.2 Concept of Earnings Management**

Earnings in Accounting can be referred to as the excess of revenue over expenses. This earning could also be referred to as income or profit in another dimension. Scholars have regarded Income as a pointer to management's effectiveness in employing the assets belonging to the investors. This provides the rudimentary standard by which accomplishment is measured. Therefore, income can also be used to evaluate the quality of management's policy, decision making and also their controlling activities. Management of earnings in organisations could be ascending or descending depending on what the management desires. However, whichever way the earnings are managed, in as much as it is within the generally acceptable accounting principles, it can be regarded as legal but unethical (Farouk, 2014).

Earnings management has been defined by various scholars. Copeland (1968) defines earnings management to involve repetitive selection of accounting measurement or reporting rules in a particular pattern, which is aimed at reporting a stream of income with a smaller variation from trend than would otherwise have appeared. The definition buttress the fact that available choices to managers in accounting created opportunities for managers when they prepare accounting reports. While Barnea, Ronen and Sandan (1976) regard earnings management as the deliberate dampening of fluctuations about "some level of earnings

considered being normal for the firm". This definition regards earnings as an intentional downward alteration, but failed to appreciate the fact that it could also be managed upward.

In a similar vein, Schipper (1989) defined earnings management as the process of taking deliberate steps within the constraints of Generally Accepted Accounting Principles (GAAP) to bring about a desired level of reported income. Also, Naser (1993) defines creative accounting as the transformation of financial accounting figures from what they actually are to what preparers' desire by taking advantage of the existing rules and or ignoring some or all of them. These definitions see earnings management as legal and reasonable decision taken by management since it does not alter any accounting principles.

According to Rahman, Mohammad and Jamil (2013), earnings management refers to reasonable and legal management decision making and reporting intended to achieve stable and predictable financial results. All the definitions given above have the same thing in common, which is the intentional misrepresentation of accounting figures.

However, the definition given by Schipper (1989) and Naser (1993) were able to identify the fact that these statements are prepared within the constraints of GAAP except the fact that Naser (1993) argued that some of the existing rules may be ignored. Hence, for the purpose of this study the definition given by (Schipper, 1989) is considered the best that suit this research work.

### **2.3 Concept of Board Characteristics**

Board of directors is a body of elected or appointed members who jointly oversee the activities of a company or organization. Other names include board of governors, board of managers, board of regents and board of trustees. It is often simply referred to as "the board". A board's activities are determined by the powers, duties, and responsibilities delegated to it or conferred on it by an authority outside itself. These matters are typically

detailed in the organization's guidelines. The guidelines specify the number of members of the board, how they are to be chosen, and when they are to meet (Farouk & Shehu, 2014). In an organization with voting members, the board acts on behalf of, and is subordinate to the organization's full group, which usually chooses the members of the board. In a corporation where stock are issued, the board is elected by the shareholders and is the highest authority in the corporation (Bathula, 2008).

Over the years, regulators have placed great emphasis on addressing different matters relating to the board of directors. Two prominent examples were: (i) stressing on the roles of non-executive directors as well as the importance of independence of the board, and (ii) emphasizing the significance of balancing skills and experience of the board members. Diversity or characteristics means having a range of many people that are different from each other. There is, however, no uniform definition of board diversity. Traditionally speaking, one can consider factors like age, race, gender, educational background and professional qualifications of the directors to make the board less homogenous. Some may interpret board diversity by taking into account such less tangible factors as life experience and personal attitudes. A simple and common measure to promote heterogeneity in the boardroom commonly known as gender diversity is to include female representation on the board (Farouk, 2018)

Board characteristics are defined as the variation of the age, race, ethnicity, gender, and social/cultural identities among employees within a specific corporation (Marimuthu, 2008). Van der Walt and Ingleby (2003) defined diversity in the composition of the board as the varied combination of attributes, characteristics and skills that their members have. This definition is also applied to the top management of an organization. Women and minorities have historically been under-represented on corporate boards of directors but this began to

change in the 1990s (Farrell & Hersch, 2005). Usually two categories of diversity are considered. The first one is demographic diversity. This type is observable, because it is based on easily detectable factors, such as sex, race or level of education. The second type cannot be observed, and needs cognitive considerations because it refers to non-visible attributes such as knowledge, skills, profiles and individual capabilities (Milliken & Martins, 1996).

Burton and Ryall (1995) describe board diversity as the composition of the board by combining attributes, characteristics and expertise of individual board members that contribute to board processes and decision making in a positive way. Mazur(2010) seediversity as a subjective phenomenon, created by group members themselves who on the basis of their different social identities categorize others as similar or dissimilar: “A group is diverse if it is composed of individuals who differ on acharacteristic on which they base their own social identity” (O’Reilly, Williams, & Barsade 1998, p. 186). Loden and Rosener (1991) defined diversity as that whichdifferentiates one group of people from another along primary and secondary dimensions.

### **2.3.1 Gender diversity**

Research on women as directors on boards has focused on women’s under-representation on board of director (Burke & Mattis, 2000), and this continues to be well documented by many researchers. There exist two statistics about women’s representation on board which are commonly reported: these are the percentage of board seats held by women, and the percentage of organizations that have one or more women on their board. Many researches shows a much lower percentage of board seats held by women than the percentage of companies with a woman on their board (Catalyst, 1998). Clearly, men occupy most board seats, leading researchers are to the suggestion that the few women appointed to boards are

“tokens” (Webber, 1996). Despite the identification of few women on board as at 20 years back now, much have not been done in terms of having more women representation on the board

Carter, Simkins, and Simpson (2003) explained the relationship between board gender diversity and firm performance based on the agency theory and they posit that board gender diversity enhances the board’s ability to monitor top management. In addition to this, they argue that increasing the number of female directors may increase board’s independence since women tend to ask questions that male directors may not ask.

### **2.3.2 Board Nationality**

Foreign directors also bring diverse opinions and perspectives. Language, religion, family upbringing and life and professional experiences differ from country to country. As such, foreign directors may represent different notions about the role of the board with respect to its control role especially if they come from countries with stronger shareholder rights. Foreign Independent Directors can enhance the advisory capability of boards to the extent that living or working in foreign countries gives them first-hand knowledge of foreign markets and enables them to develop and tap a network of foreign contacts (Hooghiemstra, Hermes, Oxelheim& Randoy, 2015). In Nigeria firms, you rarely find foreign directors on board except for foreign organisations who operate in Nigeria and are listed in the NigeriaStock Exchange. Foreign independent directors could weaken a board’s monitoring effectiveness due to several reasons. First, a director’s geographic distance from corporate headquarters generates substantial oversight costs, since making on-site visits and attending board meetings (usually held at corporate headquarters) become more difficult and time-consuming. This undermines a director’s ability and incentives to gather information and closely monitor management (Farouk, 2018).

### **2.3.3 Board Size**

An ideal board size is likely to be different for each firm, because one size does not fit all. Each board needs to define its optimal capacity at any given time. Organisations are expected to determine the best size for their firms by considering what *the* board needs to accomplish. Optimal board size may vary according to the moment in the board's life cycle, its mission, its fundraising necessities, and whether it is a national or a local board (Sarkar, Sarkar & Sen, 2008). Some boards function under a representational mandate; their composition needs to reflect the constituency, and this creates an upward pressure on the size. As productive communication is affected by the size of a gathering, group dynamics may become a criterion for structuring the board (Park & Shin, 2003).

### **2.3.4 Board Composition**

Executive directors have specialized skills, expertise and valuable knowledge of the firms' operating policies and day-to-day activities, but there is the need for outside directors to contribute fresh ideas, independence, objectivity and expertise gained from their own fields (Firth, Fung & Rui 2007). As such, agency theory advocates the participation of non-executive directors to promote the independence of the board from management. The reason for this suggestion is not far away from the fact that if the majority of the board members are executives of the firm, the board will be more prone to be manoeuvred by the managers and the decision made by the board may be biased which may favour the interests of the management, and not the shareholders (Lee, Walters & Kroll 2006). Therefore, the agency theory suggests a greater proportion of outside directors to monitor any self-interested actions by managers and to minimize agency costs (Florackis & Ozkan, 2004 and Williams, 2006).

To achieve corporate governance goals, the board of directors needs to closely monitor managers' behavior and be independent from them. However, board members often have



conflicts of interest and may not exercise independence in monitoring the top executives (Fama & Jensen, 1983; Hashim & Davi, 2008). This is particularly the case with executive directors who have active day-to-day management roles as well as monitoring roles. Hence, externals or outsiders are brought in to provide monitoring and to protect shareholders' interests. It could be argued that to have an effective role, the board should consist of a significant number of independent directors. According to Peasnell, Pope and Young (2002) and Vafeas (2005), outside directors play a more effective role in monitoring top managers' aggressive behaviours than insiders.

### **2.3.5 Board Meetings**

This is the number of times the board members meet in a particular year. By the provision of the codes of corporate governance as provided by Securities and Exchange Commission; which board members of any organisation is expected to meet for at least quarterly, before the end of the year where decisions regarding the organisations, employees, shareholders, stakeholders and potential investors are taken. It is expected that, the quality of time spent together by the board members will affect the earnings quality of the organisation positively. The meeting also create an opportunity for the executives to intimate the non-executives directors about the progress of the organisation and it also gives opportunity to the non-executive directors to ask questions, seek for clarifications, guide the managers and redirect them towards value maximising decision that will affect the generality of the organisation positively. If meetings are held frequently and quality decisions are taken, it is expected that it will drive earnings management potentials of the managers downward to avoid questioning and possible rejections from other board members.

### **2.4 Earnings Management Models Review**

There exist various models for earnings management which may be used to proxy the extent of earnings manipulations by management of corporations. Many of the measures used here

rely heavily on the existing literature on earnings management. Researchers use different methods to try to detect earnings management. Previous empirical studies used the models of accruals manipulation to measure earnings management which are showcased in the empirical review of this study.

Within the different accounting manipulation methods available, accruals seem to be the favourite instrument. Accruals management is less obvious and detectable than, for example, changing accounting methods that have to be explained in the financial statements of the company. The accruals that are thought to be manipulated are most often referred to as discretionary accruals (or also unexpected or abnormal accruals). Models of earnings management are based on earlier work by Healy (1985) and DeAngelo (1986) who used (the change in) total accruals from the estimation period to proxy for expected non-discretionary accruals in the event period.

$$TA_t = DA_t$$

Where  $TA_t$  = Total Accruals in year t.  $DA_t$  is Discretionary Accruals in year t. The model implicitly assumed that there are no non-discretionary accruals in the estimation period. This implies however that, if non-discretionary accruals change from period to period, their models will measure non-discretionary accruals with error. Jones (1991) has relaxed the assumption of constant non-discretionary accruals and has created a model that controls for the effect of the company's economic evolution on non-discretionary accruals.

DeAngelo (1986) improved further on Healy's model by using prior period accrual (t-k) as a measure of normal total accruals ( $NAt-1$ ) (scaled by lagged total assets) as proxy for non-discretionary accruals in year t. According to the researcher, abnormal total accrual ( $DA_t$ ) is the difference between current total accruals ( $AC_t$ ) and prior period normal total accruals

(NA<sub>t-1</sub>), but failed to empirically partition normal total accruals into discretionary and non-discretionary portions.

$$DA_t = AC_t - NA_t$$

AC<sub>t</sub> is current total accruals calculated as current net income minus operating cash flows. The model assumes that there are no non-discretionary accruals in year t and uses prior period non-discretionary accruals as proxy for current year non-discretionary accruals. McNichols and Wilson(1988) improved on DeAngelo's model by capturing the discretionary accruals as a measure of earnings management instead of the total accrual used by (Healy, 1985) and (DeAngelo, 1986), however they used specific component of discretionary accruals.

McNichols model brought to light the emergence of Jones model (1991). He used firm-specific expectation model and a minimum of fourteen year time series data as estimation period. The research measured 'normal' total accruals (non-discretionary accruals) in estimation period from financial statement data and used it to compute firm-specific parameters (coefficients) and the same model during event period (prediction period) to measure expected non-discretionary Accruals(NDA<sub>t</sub>) using coefficients obtained in the estimation period.

$$e_t = DA_t = \{TA_t / T_{t-1}\} - \{(\alpha_{0i} (1/T_{t-1}) + \alpha_{1i} (\Delta REV_t / T_{t-1}) + \alpha_{2i} (PPE_t / T_{t-1}))\}$$

Where TA<sub>t</sub> = Actual total accruals from financial statement data = {Δ Current assets – Δ cash – Δ current liabilities – Δ Current maturities of long term debt – Δ Income taxes payable - Depreciation and amortization expenses}.

The Jones (1991) model and modified Jones model by Dechow, Sloan and Sweeney (1995), although not free of criticism, are by far the most popular models used. The original Jones model was modified by Dechow, et al. (1995). The reason for the modification was the fact that some discretionary accruals are measured as non-discretionary accruals when part of revenue is also managed (e.g. managers could accrue revenue that is in fact not yet earned

and not yet received in cash, which would lead to a change in revenue, but also to a change in receivables). The Jones model implicitly assumed that discretion is not exercised over revenue in either the estimation period or the event period. They however, removed change in receivables ( $\Delta REC$ ) from change in revenue ( $\Delta REV$ ) in the Jones (1991) model to correct the error in the model.

$$\epsilon_t = DA_t = \{TA_t\} - \{(\alpha_0 i (1/T_{t-1}) + \alpha_1 i (\Delta REV_t - \Delta REC_t) + \alpha_2 i (PPE_t))\}$$

Although the Jones and modified Jones model are popular models to detect earnings management, researchers are aware that these models may be biased or even misspecified. McNichols (2000) examined some research design issues related to the use of the aforementioned models and methods. One of the main arguments against using aggregate accruals models is that there is little knowledge of how accruals behave in the absence of earnings management. McNichols argues that the amount of researches in which there is evidence of earnings management may indicate aggressive earnings management or bias in the earnings management tests. The bias in the earnings management tests can be attributed to the fact that, these models often measure discretionary accruals by industry. The second reason could be, if companies manage their earnings simply because they expect their competitors to do so, the level of discretionary accruals will be understated because the average level of discretion exercised by the industry is included.

Also, McNichols (2002) argues that the model by Dechow and Dichev (2002) suffers from some limitations, for example, related to the model being mis-specified for growing firms as the cash flow in the future period may exceed the accrual in the current period due to the growth in sales. Thus, McNichols (2002) suggests that by including the changes in sales and PPE from the Jones (1991) model into the Dechow and Dichev (2002) model using cash flows, the ability to explain the change in accrual increases. The combination of the two is

shown to be more efficient than when they are separated. The first model is the Dechow and Dichev (2002), while the second is the McNichols (2002) model.

$$\Delta WC_t = b_0 + b_1 \Delta REV_t + b_2 PPE_t + e_t \dots \dots \dots (1)$$

$$\Delta WC_t = b_0 + b_1 CFO_{t-1} + b_2 CFO_t + b_3 CFO_{t+1} + b_4 \Delta REV_t + b_5 PPE_t + e_t \dots \dots \dots (2)$$

In the wake of these criticisms against earlier models, Kothari, Leone and Wasley (2005) examined the power of ‘traditional’ discretionary accruals tests and tests based on performance-matched discretionary accruals. Their results suggest that performance matching enhances the reliability of inferences from earnings management research when the hypothesis being tested does not imply that earnings management will vary with performance, or where the control firms are not expected to engage in earnings management. Based on this argument, Kothari et al (2005) added return on assets (ROA) to the modified Jones Model by Dechow, Sloan and Sweeney (1995).

$$\epsilon_t = DA_t = \{TA_t\} - \{(\alpha_0 i (1/T_{t-1}) + \alpha_1 i (\Delta REV_t - \Delta REC_t) + \alpha_2 i (PPE_t) + ROA_{t-1} + \epsilon_i)\}$$

However, as measurement models of discretionary accruals are becoming increasingly robust, the manipulation of discretionary accruals is increasingly easy to detect. Roychowdhury(2006) found that many companies have abandoned earnings management with discretionary accruals, and there is growing evidence that the manipulation of discretionary accruals is no longer the main method for earnings management. In a similar vein, Gunny (2010) found that real activity management (RM) involves changing the firm’s underlying operations in an effort to boost current-period earnings. Such activities includes overproduction to decrease cost of goods sold (COGS) expense, cutting desirable research and development (R&D) investments to boost current period earnings, postponing or eliminating expenses such as hiring, advertising, travel and maintenance, cutting back on capital expenditures to avoid depreciation expense. Roychowdhury came up with the following model for detecting earnings management.

$$\text{CFO}_t/\text{TA}_{t-1} = \alpha_0 + \alpha_1/\text{TA}_{t-1} + \alpha_2\text{SL}_t/\text{TA}_{t-1} + \Delta\text{SL}_t/\text{TA}_{t-1} + \mu_t$$

Where:

$\text{CFO}_t$  = cash flow from operation of present year

$\text{TA}_{t-1}$  = total assets at time of previous year

$\alpha_0$  = intercept

$\alpha_1, -\alpha_2$  = parameters for estimating normal cash-flow

$\text{SL}_t$  = sales at present year

$\Delta\text{SL}_t$  = change in sales of present year

$\mu_t$  = residuals

Most recently, Yoon, Kim and Woodruff (2012) came up with superior models after pointing out the weaknesses in modified Jones model by Dechow Sloan and Sweeney (1995). The first criticism was the improper separation of discretionary components of accruals will lead to improper inferences. If nondiscretionary components are treated as discretionary or vice versa, it will be hard to discern the degree of earnings management appropriately, while the second criticisms was that Studies on earnings management generally do not decompose accruals into current components and noncurrent components

The study shows that proxy measurements based on financial-structure are superior to those based on industry. It also decomposes accruals and determines if there are any rudimentary differences between them, and shows that accrual decomposition plays an important role in understanding and identifying their importance for various earnings management studies. The study however examined how current assets (like accounts receivable, inventory, and others), noncurrent assets (like plant assets and intangible assets), current liabilities, and noncurrent liabilities are related to earnings management based on the assumption that earnings management may be related to financial structures and based on the notion that current assets/liabilities will be more strongly related to current accruals than to noncurrent accruals.

Also, noncurrent assets/liabilities is expected to be more related to noncurrent accruals than to current accruals and that noncurrent assets is expected to be negatively related to noncurrent accruals primarily due to depreciation and amortization expenses. Yoon et al (2012) also argued that current accruals and noncurrent accruals may be related to each other in an offsetting way, thereby resulting in no noticeable impact on total accruals. On the other hand, stating that even if current accruals and noncurrent accruals are managed, total accruals may appear not being managed.

Based on the above criticisms of the modified Jones model (1991) by Dechow, Sloan and Sweeney (1995) and strength and superiority inherent in the proposed models, the following two models are proposed.

$$TA/At-1 = \beta_0 + \beta_1\Delta REV/At-1 + \beta_2\Delta NREC/At-1 + \beta_3PPEt-1/At-1 + \varepsilon \dots \dots \dots \text{Model I}$$

Where, TA, At-1, REV, NREC and PPE respectively represent total accruals, lagged total assets, revenue, net receivables, and property, plant and equipment.

$$TA/At-1 = \beta_0 + \beta_1\Delta REV/At-1 + \beta_2\Delta NREC/At-1 + \beta_3PPEt-1/At-1 + \beta_4INTGt-1/At-1 + \varepsilon \dots \dots \dots \text{Model II}$$

Under the second model, lagged intangible assets (INTG) was added as an additional proxy for noncurrent accruals.

The results from the regression for the models suggests that the average and the Adjusted R<sup>2</sup> of the coefficients for the new models is high than that of modified Jones Model by Dechow, Sloan and Sweeney (1995) implying that the right hand components of the model is better in predicting the ratio of total accruals to lagged total assets compared with the modified Jones model. However, based on the criticisms of the previous models, this study adopts the model II of Yoon, Kim and Woodruff (2012) to proxy earnings management.

## **2.5 Review of Empirical Studies**

This section reviews empirical literatures in relation to the variables of the study. The review contains the author(s) names, year of publication, title of research work, the country of study, population and sample size, techniques of data analysis, period covered by the research, the sectors, industry or domain investigated by the study, findings from the study. A humble attempt is made to critique the studies in order to establish gaps upon which this study is conducted.

### **2.5.1 Gender Diversity and Earnings Management**

Eze (2017) examined the effect of corporate governance mechanisms on earnings management in Nigerian food product companies. A sample of six (6) firms was selected out of eleven (11) firms in the Nigerian food product firms. The data were sourced from yearly report and account of selected firms for a period of twelve years from 2003 to 2014. A panel data regression technique was used. It was found that board gender has negative but insignificant relationship with earnings management. There was clear absence of tests relating to normality test, multicollinearity test and heteroskedasticity test. There was no justification provided for the technique of data analysis used.

Firoozi, Magnan and Fortin (2016) investigated the influence of board diversity on financial reporting quality using a population of Canadian firms in compustat from 2008 -2012 and a sample of 260 firms were arrived at after using filter. The findings reveal that board gender diversity is negatively, but do not significantly impact on financial reporting quality of firms.

Van der Zwet (2015) examined the influence of Board diversity on earnings management. The study examined three aspects of board diversity, namely gender diversity, age diversity and ethnic diversity. OLS and robust regression technique were used in analyzing the data of sample of U.S. firms in the period 2008 – 2013. It was found that gender diversity only significant results are found with the modified Jones model without year and industry



dummies. That is, as expected, a negative relationship between the percentage of women and earnings management.

Einer and Soderqvist (2016) examined earnings management and female representation on the board of directors in Norway. The sample was generated through the Orbis database where publicly listed companies on the Oslo Stock Exchange between 2006 to 2010. The sample consists of 82 firms. The study found a negative association between earnings management and female representation on board of director in Norway. The study does not justify the use of only female as the variable in the study.

Arun, Almahrog and Aribi (2015) examined the effect of female directors on earnings management: Evidence from UK companies. Their initial sample for the study is the UK FTSE 350 index during the period 2005–2011. But they removed the categories of regulated, mining and financial industries due to their unique characteristics and specific regulations. The final sample consists of 1217 firm-year observations, while Ordinary Least Square technique was used. The findings of pooled OLS regression reveal that the presence of a number of female directors on the board constrains the level of earnings management. They further made a distinction between complex (high debt) and simple (low debt) companies, and the outcomes reveal that female directors have a positive effect on the earnings management in sampled companies. The study did not provide any evidence of robustness tests conducted and as such put to question the reliability of the inferences drawn from the findings.

Shehu and Ibrahim (2014) investigated the effect of governance attributes on real activities manipulation practices of listed manufacturing firms in Nigeria. The study used women directors in addition to other variables for the purpose of explaining and predicting real activities manipulation practiced by managers in the listed Nigerian manufacturing firms.

Panel multiple regression was used as a technique of analysis. Fixed effect model was interpreted because the probability of hausman specification test was less than 5%. Secondary data was extracted from the audited annual reports of the sampled firms from 2007–2012. The results reveal that women directors have significant positive impact on real activity manipulation. The inferences made on women director was wrong because positive influence of women director on real activity manipulation cannot be interpreted as deterrence to earnings manipulation, rather increases the level of real activity manipulation.

Oba (2014) investigated the influence of gender diversity in Nigeria using a sample of 69 firms within the period of 2008-2012 using multiple regression technique. It was found that gender diversity has significant negative impact on earnings management. A similar study conducted in Nigeria by Omoye and Eriki (2014) assessed the impact of board gender on earnings management using a sample of 132 firms between 2005 and 2010 using probit, logit and extreme regression technique. They found that board gender has significant negative impact on earnings management and they concluded that when the number of female on board is increased, the earnings management of the firms will decrease. The study failed to give an adequate reason upon which the dependent variable was dichotomized despite the fact that the modified Jones model was used. Also the period of the research is not current as improvement in earnings management measures and changes in corporate governance codes must have overtaken their researches.

A study of Lakhali, Aguir, Lakhali, and Malek (2015) investigated the effect of Proportion of Women on Board Standing on earnings management in France between 2008 to 2011 using a sample of sample of 170 firms Using a multiple regression technique, they found a negative influence of Proportion of Women on Board Standing on earnings management of firms. The inability of the study to test for heteroskedasticity and multicollinearity especially on the use of different measurement of gender diversity may threaten the validity of the result. Similar

findings were recorded by Peni and Vahamaa (2010) for women executive in Finland using a sample of 500 firms between the periods 2003 to 2007.

Susanto (2016) examined the effect of audit committees and corporate governance on Earnings Management in Indonesia Manufacturing Industry. The research uses sample of 62 manufacturing firms which listed in Indonesia Stock Exchange during 2009 until 2012. The sample selection is based on purposive sampling method. The research uses multiple regression analysis to hypothesis testing. The result of the research shows that gender diversity has significant negative influence on earnings management. The use of purposive sampling as the sampling technique is not scientific and as such important study units may have been eliminated from the sample, thereby making generalization of the findings difficult.

The study of Gulzar and Wang (2011) investigated the impact of female director on earnings management in China using a sample of 1009 firms between the periods of 2002 to 2006. They found that female director has a significant positive influence on earnings management. However, the study of Hili and Affes (2012) found an insignificant but positive impact of female director on earnings management for companies in France using a sample of 70 firms between 2007 to 2010. Hussaini and Gugong (2015) conducted research on the influence of women director on earnings management in Nigerian firms using a sample of eight (8) between 2009 to 2014. They found that female director has a significant positive influence on earnings management. The study interpreted the wrong result as the langrange multiplier test suggests use of robust ordinary least square as against the random effect result interpreted. This led to misinterpretation of the findings, conclusion and hence wrong recommendations.

Ioualalen, Khemakhem and Fontaine (2015) investigated the influence of gender diversity and women director in Iran and Canada respectively using multiple regression techniques.

They found that gender diversity has no significant influence on earnings management of firms for both in Iran and Canada firms investigated. A similar research by Abdullahi and Ismail (2009) and Letting, Aosa and Machuki (2012) in Malaysia and Kenya, assessed the impact of women director on earnings management using a multiple regression techniques. They documented that women directors have insignificant but positive impact on earnings management. Hence, women do not appear to perform the accounting oversight role well.

Ibrahim (2015) examined the effect of board characteristics on earnings management of listed food and beverages firms in Nigeria. The study concentrated on three board characteristics' proxies, namely: board competency, frequency of board meetings and gender mix, covering the period from 2007 to 2013. The estimation of discretionary accruals was proxy by modified Jones (1991) model. The sample size of the population is nine (9) firms. Ex-post factors research design was adopted. Panel multiple regression technique was employed. The result reveal that gender mix have negative and significant effect on earnings management. The study concluded that increase in number of the proportion of women directors on the board, constrain the level of discretionary accruals.

Moradi, Salehi, Bighi and Najari (2012) examined the Relationship between Board Characteristics and Earning Management in listed companies on Tehran Stock Exchange during 2006-2009. 159 companies were selected as final sample among 430 listed companies. The findings reveal that women members have negative effect but do not significantly affect earnings management of firms in Iran. The study however, did not conduct any normality test, heteroskedasticity and multicollinearity test.

Another study by Obigbemi, Omolehinwa, Mukoro, Ben-Caleb and Olusanmi (2016) investigated Earnings Management and Board Structure in Nigeria. The study sampled the data of 137 quoted companies in Nigeria for a period of 8 years (2003-2010). Earnings

management was measured using the magnitude of the discretionary accruals as estimated by the performance matched modified Jones model by Kothari, et al (2005). The ordinary least squares (OLS) regression technique was used. The study found that there is a negative significant relationship between board gender and earnings management. The weakness of this research is that it has failed to show how appropriate was the OLS technique as there was no evidence to show the choice of the technique.

Buniamin, Johari, Abd Rahman and Abdul Rauf (2012) examined Board diversity and discretionary accruals of the top 100 Malaysia corporate governance (MCG) index Company. Data was obtained from annual report for the year 2008. The link was tested between five board diversity (that is, size, independence, competency, remuneration and gender) and discretionary accruals practices. The study revealed that women on board are found to have a positive significant relationship with discretionary accruals which indicate that higher number of women board may increase the discretionary accruals activity.

Yang, Chun and Ramadili (2009) investigated the impact of gender diversity in Chinese firms using a multiple regression technique. They found that gender diversity has a significant positive impact on earnings management. Similar research by Zhang and Uchida (2011) in China, assessing gender diversity influence on earnings management using 18,491 firms as sample size between 2000-2009 They found that gender diversity has positive, strong and significant impact on earnings management of Chinese firms.

Garba and Abubakar (2014) investigated the influence of gender diversity, women director on earnings management in Japan and Nigeria respectively using multiple regression techniques. They found that gender diversity, women director has significant negative impact on earnings management of firms implying that the higher the number of women on board, the lesser the earnings management of firms. The choice of the use of these two countries is not justified as

the countries data, laws, board characteristics and pervasiveness of earnings management may differ significantly. Therefore putting them together, the study may suffer from heterogeneity problem among the units.

### **2.5.2 Board Nationality and Earnings Management**

Parveen, Malik, Mahmood and Ali Jan (2016) examined the Impact of Ownership Structure on Earnings Management of Pakistani Banking Sector using Data of year 2005-2012 from Annual reports of 20 banks. The study used Pooled Estimated Generalized Least Square (EGLS) in carrying out the analysis. Foreign ownership was found to be positively and significantly influenced the tendencies of manipulative activities of the managers which imply that increased foreign investors ownership is associated with increasing earnings management in Pakistan Banking Sector.

Van der Zwet (2015) examined the influence of Board diversity on earnings management. The study examined three aspects of board diversity, namely gender diversity, age diversity and ethnic diversity. OLS and robust regression technique was used in analyzing the data of sample of U.S. firms in the period 2008 – 2013. The third proxy (board ethnicity) was found to have significant but positive effect on earnings management in the results of OLS and robust regressions without year and industry dummies.

Van den Berg (2015) investigated whether firms with more nationality diverse boards of directors have lower levels of earnings management. Modified Jones Model by Kothari et al. (2005) was used to measure the level of earnings management. To determine the nationality diversity of boards of directors, the first measure used was the proportion of the amount of different nationalities in the board of directors divided by the number of directors in the board of directors. The second measure was the real amount of different nationalities in the board of directors. Data from the period 2007-2014 and data from the

United Kingdom were utilized. The results did not support the hypothesis that firms with more nationality diverse boards of directors have lower levels of earnings management. This implicates that more nationality diverse boards of directors are not appropriate to lower levels of earnings management.

Nguyen (2016) examined the impact of board of directors and ownership characteristics on earnings management of publicly listed firms in Vietnam. Based on sample of 570 non-financial listed firms from 2010 to 2014 The study found that firms with higher proportion of foreign ownership are more likely to constrain the manipulative practices exercised by managers.

Abdul Rauf, Johari, Buniamin, and Abd Rahman (2012) examined the impact of company and board characteristics on earnings management practices among Malaysian public listed companies. In particular, board size and board race represent the board characteristics. Data were obtained using content analysis on the annual report of 214 companies for the year 2008. The earnings management practice is measured by discretionary current accruals based on modified Jones (1991) model. The study reveals that board race is positively, but do not significantly influence the practice of earnings management. The study used modified Jones model that have been heavily criticized and better models have been suggested. Therefore the inferences from the result may not be reliable due to the proxy of earnings management used. A study from Netherland by Hooghiemstra, Hermes, Oxelheim and Randoy (2015) investigated the influence of foreign director on earnings management for 586 firms between 2001-2008 using multiple regression techniques They found that foreign director is positively, strongly and significantly influencing earnings management of firms.

On the other hand, Zhang and Uchida (2011) and Lei (2003) investigated the influence of foreign board member, independent foreign institutional investors and foreign director on

earnings management in Japan, Virginia and Casablanca between 2000-2009 and 1999 – 2012 using a large observation size of 18,491 and 32,066. They found that foreign board member, independent foreign institutional investors and foreign director have significant and positive impact on earnings management of firms.

Khanna and Palepu (2000) found that interest held by foreign investors in an organization is positively correlated with firm value, which therefore connotes that the foreign investors have incentives to monitor a firm's activities and also have an advanced firm monitoring mechanism. Choi, Jean and Park (2004) also found a significant positive association between foreign ownership and the earnings response coefficient, suggesting that foreign shareholders consider earnings quality (measured as discretionary accruals) in their investment decisions. The role of foreign investors as external monitors of corporate activities may even be bigger because foreign investors are less likely to be related to controlling shareholders. In order to protect their wealth and to reduce monitoring costs, foreign shareholders have stronger incentives and expertise to independently monitor firms. Thus, higher proportions of foreign ownership induce firms to improve transparency and to decrease opportunistic managerial accounting choices and decisions.

Guo,Huang,Zhang and Zhou (2014) wrote on foreign ownership and real earnings management: evidence from Japan spanning the period of 2004-2008 using a sample size of 15,212 firm year observations. They found that firms with greater foreign ownership engage in less real earnings management which is in line with the knowledge spillover hypothesis which predict that the superior knowledge of foreign investors can curtail real earnings management. Aksu Moradoglu and Cetin (2012) investigated the influence of ownership concentration, IFRS adoption and earnings quality: evidence from an emerging market. They found that foreign ownership enhances earnings quality.



Foreign investment is considered to be associated with better monitoring and hence expected to reduce the private benefits of control. Most researchers found that foreign institutional ownership is associated with lower earnings management. Omar and Hind (2012) found that firms with foreign or local institutions as the largest shareholders engage in significantly lower earnings management than other firms. Frydman, Gray, Hessel and Hapaczynski (1999) posited that foreign owners have the financial resources, managerial know-how, and corporate governance expertise that give them an advantage over other owners in monitoring insiders and report a positive association between foreign ownership and post-privatization corporate performance. Also, D'Souza and Megginson (2005) found evidence suggesting that greater foreign ownership, results in greater efficiency gains in privatized firms. Therefore, foreign ownership is associated with a better monitoring, reduces the ability of insiders to manipulate earnings for private purposes.

### **2.5.3 Board Size and Earnings Management**

Daghsnii, Zouhayer and Mbarek (2016) examined the relationship between Earnings Management and Board Characteristics of French Listed Firms. Sample of 70 listed companies was used covering the period of four (4) years from 2008 to 2012. Modified Jones model by Dechow, Sloan and Sweeney (1995) was used to proxy earnings management. The study found that the earnings management is negatively associated with size of the board which suggests that large boards are more effective in monitoring a Chief Executive Officer's action. In another study by Jamaludina, Sanusib and Kamaluddina (2015), they reported a negative but insignificant effect of board size on earnings management for 26 Malaysian listed GLCs (Group Listed Companies) from various industries. The findings from the study must have been overtaken by event as the period covered is not current.

Iraya, Mwangi and Muchoki (2015) established the effect of corporate governance practices on earnings management of companies listed at the Nairobi Security Exchange (NSE). The population consisted of the 49 companies that had been continuously and actively trading at the NSE between January 2010 and December 2012. Secondary data was used covering the period 2010 to 2012 and analyzed using linear regression to test the effect of the independent variables on the dependent variable. The study found that earnings management is negatively related to board size.

A study by Dimitropoulos (2011) analyzed the impact of board size on the earnings management behaviour of European Union's football clubs over the period 2006–2009. Empirical results documented that corporate governance quality mitigates aggressive earnings manipulation (income smoothing, accrual manipulation and reporting small positive income) by football managers and specifically clubs with small board size are associated with high quality financial reporting through the deterioration of earnings management behaviour. In another study by Zhang and Li (2007) found that board size is not significantly related to the earnings management. The findings provide empirical evidence for corporate governance reform and benefit improvement of financial reporting quality. Also in a study by Abdul Rauf, Johari, Buniamin, and Abd Rahman (2012) examined the impact of company and board characteristics on earnings management practices among Malaysian public listed companies. The results, however, indicate that board size do not significantly influence the practice of earnings management.

Mustafa, Mehmet, and Suleyman, (2014) investigated the impact of corporate ownership structure and board size on earnings management for a sample of Turkish firms listed on the Istanbul Stock Exchange (ISE) between the period of 2009 to 2012. The board size was measured as the number of members in the board. This study also used three controlled variables: return on assets, size of the firm and financial leverage. The modified Jones Model

(1991) by Dechow, Sloan and Sweeney(1995) was used to proxy earnings management, while the multivariate regression technique was utilized. The results show that board size has negative and significant effect on the earnings management. In a related study by Oba (2014),using a panel data obtained from annual reports of 69 listed Nigerian firms from 2008 to 2012, documented negative but insignificant effect of board size on earnings management of firms in Nigeria.

Fodio, Ibikunle and Oba (2013) investigated the effect of corporate governance mechanisms on reported earnings quality of listed Insurance companies in Nigeria. The study used twenty five (25) quoted insurance firms during the period 2007-2010. Multiple regressions were employed. The study found that board size is negatively and significantly associated with earnings management. The major flaw of this study was that the proxy for earnings management which was modified Jones model was not suitable for financial sector because of the components of the model, hence making their findings unjustifiable. Also the  $R^2$  of 0.910 from their study was too high suggesting model misspecification, because the investigated independent variables cannot account for insurance firms' earnings quality alone.

Younis, Hashmi, Khalid and Nazir (2016) examined the impact of corporate governance on earnings quality of the manufacturing firms listed on Karachi Stock Exchange. The sample was taken from Karachi Stock Exchange 100 index including 70 non-financial listed firms, while financial companies and those firms for which were not available were excluded. Data were obtained from annual financial reports. The four characteristics were used to capture the effect of corporate governance like audit quality, CEO duality, board size and gender diversity and two control variables: firm size and leverage. Findings of the study disclose significant negative impact of board size on earnings management. Hsu and Wen (2015) investigate the influence of ownership structure and board characteristics on discretionary

accruals and real earnings management using the data of A-shares in Chinese Shanghai and Shenzhen Stock Exchange Securities Market from 2002 to 2012. The empirical results show that the larger the board size, the more ability for the board to monitor whether the managers conduct earnings management behaviour or not.

Holtzand Neto (2013) examined the Effects of Board of Directors' Characteristics on the Quality of Accounting Information in Brazil. The sample included non-financial companies listed on the BM and FBovespa with annual stock market liquidity higher than 0.001, covering the period from 2008-2011. Data were collected from the Economíadatabase and directly from companies' annual reports and reference forms available on the Securities Commission. Data analysis was undertaken using the multiple regression technique for calculating the models of accounting information relevance and earnings informativeness. The results reveal that earnings informativeness is negatively affected by larger board size (more than nine members).

Salihi and Jibril (2015) examined the relationship between board size, audit committee size and earnings management in Nigerian consumer industries companies. A total of 29 companies in the consumer sector of the Nigerian stock exchange were analyzed using multiple linear regressions. Data were obtained from secondary sources alone using annual report and account of the companies for the periods of 2010 to 2013. The result suggests that larger board doesnot minimize the tendency of managing earnings. Also, a study conducted by Patrick, Paulinus and Nympha (2015) explored the influence of corporate governance and earningsmanagement practices in Nigerian quoted companies. Primary and secondary data were used on a sampled of quoted Nigerian companies' selected through purposive sampling technique between a period of 2011-2014. Data collected were analyzed using tables, simple regression technique. The research findings show that corporate governance practices such as

the board size has significant negative influence on earnings management practices among Nigerian quoted companies.

Baimukhamedova and Baimukhamedova (2015) investigated the effect of Corporate Governance on Companies' Earnings management from Kazakhstan Companies in Natural Resources Sector. The data were obtained from the annual financial reports of 24 (twenty four) companies listed on Kazakhstan Stock Exchange (KASE). The data gathered and analyzed was from the past five years covering between 2009-2013. Secondary source of data collection was employed and the Statements of Financial Position, Profit & Loss Statements, disclosure notes and Manager's report serve as the method through which the data were collected. Panel least square regression analysis was adopted for the analysis. The findings revealed that board size has significant negative effect on earnings management. In a similar vein, Obigbemi, Omolehinwa, Mukoro, Ben-Caleb and Olusanmi (2016) found that there is a negative significant relationship between board size and earnings management.

Kingsley, Osaro, Precious and Collins (2016) studied the determinants of earnings management in Nigerian Quoted companies. The study adopts a cross-sectional research design with an extensive reliance on secondary data from the financial statement of quoted company's annual report. The simple random sampling technique was employed in selecting the 30 companies for 2007-2014 financial years. Secondary data sourced from financial statements of quoted companies retrieved from the Nigeria Stock Exchange and websites of the sampled companies were utilized for the study. The study used ordinary least squares (OLS) regression analysis as the data analysis method. The study finding indicates the existence of negative significant relationship between board size and earnings management.

#### **2.5.4 Board composition and Earnings Management**

Chouaibi, Harres and Brahim (2016) examined the effect of Board Director's Characteristics on Real Earnings Management: Tunisian-Listed Firms using 29 sampled firms from 2009 to 2013. They found that board independence has negative and significant effect on the sales manipulation of firms. The study concludes that, board independence was driving earnings management of firms downward. Despite the fact that the study was published in year 2016, the period of study is not current as a lot of research capturing up to the current period may make the findings irrelevant since it may not captures current happenings and reality.

Schauppa (2016) examined whether firms that act socially responsible and have favourable board characteristics engage in a more transparent financial reporting. The study attempted to answer the question that deals with the level of support of favourable Corporate Governance (CG), leading to a superior transparent financial reporting. The study therefore examine whether firms with high independence in board engage in even lower earnings management. The results show that firms exhibit lower earnings management, when overall board have higher degrees of independent members. Prominent among the result is that there was a level of interaction effect between the favourable board independence characteristics and corporate social responsibility, leading to a superior transparency in financial reporting. However, high-incentive situations are detected in which the magnitude of earnings management is high for all firms.

Roodposhti and Chashmi (2010) examined the association between corporate governance internal mechanisms ownership concentration, board independence, the existence of CEO-Chairman duality and earnings management. Firm size and leverage were used as control variables. The population used in the study comprises firms listed on the Tehran Stock Exchange (TSE) from 2004 to 2008 and the sample comprises 196 firms. Panel Data method is employed as technique to estimate the model. The study found that there is negative significant association between board independence and earnings management. Nguyen

(2016) investigated the extent whether board of directors and ownership characteristics are related to earnings management in Vietnamese context. Based on sample of 570 non-financial listed firms from 2010 to 2014 using multiple regression technique on the data collected from secondary sources through the financial statement of the firms, it was found that board with higher percentage of non-executive directors might not have any effect on earnings management. It was also found that the revision of corporate governance code in 2012 improves board monitoring function.

Khalil and Ozkan (2016) investigated board independence, audit quality and earnings management using data from Egypt. They tested whether firm-level corporate governance provisions matter in an emerging market setting, characterised by weak legal enforcement and inadequate external discipline by the market for corporate control. Their results cast doubt on the notion that a higher ratio of non-executive members is associated with lower earnings management. But they however, found that the effect of board independence on earnings management practices is contingent on the levels of ownership held by executive directors and large shareholders, as well as the composition of audit committee.

Liu and Tsai (2015) tested the impacts of board member characteristics and ownership structure on real earnings management for firms listed in Taiwan. The study established board member quality index based on seven different factors of the board member characteristics (independence, ownership, professionalism, education, busyness, meeting attendance and pledges) rather than examining board member characteristics individually. Observations used in the process of estimating variables, a total of 5,788 firm-year observations that span 19 different industries were included in their study. Multiple regression technique was used in estimating the coefficients. The results revealed that better board member quality (independence) results in greater suppression of real earnings management. Similar findings were documented by Baimukhamedova and Baimukhamedova

(2015) as their result showed that board independence has negative and significant impact on earnings management of firms within the study period, but however, the study failed to conduct robustness test to guarantee the validity and the inferences to be made.

Kankanamage (2015) investigated the impact of board characteristics on earnings management in Sri Lanka during the period from 2012-2015. The study used ordinary least squares regression (OLS) to examine the effect of board on earnings management for a sample of 160 listed firms in Sri Lanka from 2012-2015. Kothari, Lenon and Wesley (2005) performance adjusted discretionary accrual model used to measure the earnings management by using the discretionary accruals. Findings revealed that there is a significant negative impact of board composition on earnings management of the firms.

Nahandi, Baghbani and Bolouri (2011) examined the influence of the board of directors' combination on earnings management for a panel of 480 observations from 2001 to 2008 in Iranian company. Multiple regression technique was adopted and secondary source of data collection was used through the annual reports and accounts of the selected firms. Board combination has been measured by board size, board independence, and CEO-duality. The Modified Jones Model (1995) was used to determine the earnings management. Common effect model failed to indicate any statistically significant relationship between board independence and earnings management.

Talbi and Omri (2015) provide an empirical evidence of the efficacy of board characteristics in constraining management opportunism, measured by real earnings management. The study uses regression analysis to document empirical evidence regarding the impact of the independence of boards of directors and the independence of committees on real earnings management in 7,481 US firms over the period 2000 to 2009. The study contributes to empirical studies on the role of corporate governance in financial reporting quality by



demonstrating the role of the independence of boards of directors in constraining real earnings management. Contrary to this finding, Holtz and Neto (2015) documented that, for companies that trade stocks on the BM&FBovespa in the Brazilian market, the characteristics of board independence positively influence the quality of reported accounting information, specifically regarding the relevance of equity.

Nugroho and Eko (2011) reviewed the effect of board characteristics (measured based on the independent board of directors, dual leadership/CEO duality, board size, managerial ownership, board composition / multiple directorships, board tenure, audit committee, and board interlock) on earnings management in companies listed in the Indonesian Stock Exchange during the 2004-2008 period. Modified Jones model (1991) by Dechow, Sloan and Sweeney (1995) was used to separate non-discretionary accrual (NDAC) components from discretionary accrual components (DAC) in the total accrual. The result showed that the independent board of directors do not affect earning management practices in the above companies.

Oba (2014) investigated the ability of certain board dynamics to influence management attitude in relation to reporting quality in Nigerian listed firms. Accruals, a proxy for financial reporting quality was estimated using the Dechow and Dichev model. The study used a panel data obtained from annual reports of 69 listed Nigerian firms from 2008 to 2012, the study documents that board independence is significant predictors of financial reporting credibility in Nigeria.

Stockmans, Lybaert and Voordeckers (2013) investigated the conditional nature of board characteristics in constraining earnings management in private family firms. The study concentrated on the usefulness of proportion of outside director and CEO duality on earnings

management. The findings revealed that a higher proportion of outside directors may have a constraining effect on earnings management.

Sarah (2015) used a unique, hand-collected dataset of board and audit committee characteristics from the post-SOX period to examine the effects of corporate governance structures on real earnings management (REM). Results from logistic regression analysis of 148 REM and 148 non-REM firms indicate there is some support for the expectation that board characteristics are associated with the probability of REM activity. Specifically, they found that the number of outside directorships held by independent board members demonstrate a positive association with REM.

Kao and Chen (2004) examined the relationship between board characteristics and earnings management. They found that, when there are more outside directors in the board, the extent of earnings management is lower. It was concluded that board characteristics on earnings management are significant only for group affiliation firms or non-electronic firms. There is huge literature on the role of the boards as well as outside directors on the board. Outsider-dominated boards are arguably better in monitor and control management (Dechow et al., 1996; Weisbach, 1988). Hence, extant papers provide evidence suggesting that board independence is associated with effective governance and good firm performance (Brickley et al., 1994) when others document a negative relation between outside directors and the incidence of earnings management (Dechow et al., 1996; Beasley, 1996).

Klein (2002) showed that not only board independence is inversely related to discretionary accruals, but also reductions in board independence are accompanied by large increase in discretionary accruals. Peasnell et al. (2002) likewise found that the proportion of outsiders on the board is negatively associated with the level of income-increasing discretionary accruals to avoid reporting loss or earnings reductions.

On the other hand, Park and Shin (2004) they found that independent outside directors per se did not decrease earnings management (EM), while outside directors from financial intermediaries and active institutional shareholders did decrease EM. This highlights the importance of appointing outside directors with financial expertise. Niu (2006) further supported all these findings by saying that the level of independence of board composition is negatively related to the level of abnormal accruals. Benkel, et al. (2006) and Osam and Noguier (2007) also observed these phenomena whereby they found that boards and audit committees with higher independence are associated with reduced EM levels.

Jaggi, Leung & Gul; (2009) examined whether independent boards provide effective EM monitoring in firms operating in the family ownership environment in Hong Kong. The results indicated that independent boards provide effective monitoring of EM. Nevertheless, they found that the monitoring effectiveness of independent boards was moderated in family-controlled firms, which suggests that increasing the proportion of independent directors to strengthen board monitoring is unlikely to be effective in family-controlled firms. Lo et al. (2010) investigated whether good governance structures help constrain management's opportunistic behaviours measured through transfer pricing manipulations. They documented that firms with independent boards' are less likely to engage in transfer pricing manipulations. Siregar and Utama (2008) also did not found evidence that firms with independent boards engage in informative EM. These findings are contrary to other studies. Therefore, if the independent directors perform effectively in Oil and Gas listed firms, then we can expect that earnings management decreases in response to more board independence.

### **2.5.5 Board Meeting and Earnings Management**

Directors on boards that meet regularly are more likely to discharge their duties in accordance with interests of shareholders, since more time can be devoted to monitoring issues such as

EM, conflicts of interest and monitoring management. On the other hand, boards that hardly ever meet may have no time to find out about such complex issues and may perhaps have time only to rubber stamp management plans.

Daghsni, Zouhayer and Mbarek (2016) tested the effect of the board characteristics including; its size, independence, the CEO duality and its activity on the earnings management in companies listed on the SBF 250. The study used discretionary accruals (DA) as a proxy for the earnings management. In order to estimate DA, they used two models which are the modified Jones model and performance-matched discretionary accruals estimated from the modified Jones model. Based on a sample of 70 French listed companies over the period of 5 years from 2008 to 2012, the study found no effect of the board independence on the earnings management.

Chouaibi, Harres and Brahim (2016) as reviewed above found that board meeting has negative impact on the sales manipulation of firms. The study however, concludes that board meetings help decrease the level of earnings management of firms. Also, studies conducted by Kankanamage (2015) revealed that there is a significant negative relationship between board meeting and earnings management of the firms. In a similar vein, Liu and Tsai (2015) in their study revealed that better board member quality (meeting attendance) results in greater suppression of real earnings management.

The degree of board interaction and activities has influence on earnings management. Boards that meet frequently are more likely to solve the problems of the company effectively (Lipton & Lorsch, 1992). According to Vafeas (1999), the greater the meeting frequency, as proxy by the number of board meetings, the more effective will be the board's monitoring function. They evidence that if companies have fewer board meetings than necessary, the firm's value will decrease.

Boards that meet frequently are more likely to solve the problems of the company effectively (Moradi & Salehi, 2012). In terms of earnings management, Xie, Davidson and DaDalt, (2003) argued that when board meetings are rare, issues such as earnings management may not be on the priority list, due to paucity of time. In such cases, the function of the board is reduced to a mere rubber stamp to sign off management plans. In other words, they find that earnings management was significantly negatively related to the number of board meetings. This shows that board meetings affect performance, and it is an important factor in constraining earnings management.

Additionally, Chen, Firth, Gao and Rui, (2006) suggested that the higher frequency of board meetings, reduce the possibility of fraud since regular meetings allow the directors to identify and resolve potential problems. Conger, Finegold and Lawler(1998) suggested that more frequent board meetings improve the effectiveness of the board. The meetings are a key dimension of board operations and an indicator of the effort put in by the directors (Ronen and Yaari, 2008).

Active boards that meet more frequently are more likely to perform their duties in accordance with the interests of the shareholders and put more effort in monitoring the financial reporting integrity. Sarkar, Sarkar and Sen, (2008) in a study of 500 manufacturing firms in India found that board diligence i.e. number of meetings attended by the independent directors, has a significant negative association with earnings management. An opposing view is that board meetings are not necessarily useful because routine tasks absorb much of the limited time that directors and CEO's spend together to set the agenda for board meetings (Lorca, Sanchez-Ballesta, and Garcia-Meca, 2011).

Gulzar and Wang, (2011) found a significantly positive association between earning management and board meetings. In Egypt, Metawee, (2013) found that there is a positive

relationship between board meetings and earnings management. It is worth pointing out that the studies conducted to investigate board meetings and earnings management have been low-key, thus their claims cannot to be generalized. Therefore, further investigation is needed in order to determine whether this element is effective or not. Bearing in mind the above conflicting views, this study still believes that there is a potential relationship between board meetings and earnings management.

## **2.6 Theoretical Framework**

There many theories that have been used to underpin studies on board characteristics and earnings management. However, this research limits itself to only three of the theories which are agency theory, resource dependency theory and upper echelon theory.

### **2.6.1. Agency Theory**

The agency theory views directors as agent of the shareholders (owners) and the directors are expected to act in the best interest of the shareholders. But sometimes, the agent may not act in the best interest of the shareholders and this may result in an agency cost. The agency theory stressed the separation of ownership (principal) and managers (agent) in an organization; it is believed that this separation allow managers to sometimes pursue opportunistic behaviour which may conflict with the goal of the owners (principals) and therefore destroy the wealth of the shareholders. Advocates of the agency approach view the manager (directors) as an economic institution that will mitigate the problems and serves as the guardian to shareholders (Hermalin & Weisbach 2003). Also, when the board is well represented by a number of interested parties on the board, equitably composed, structured and diversified, their monitoring role as explain by agency theory are expected to prevent the

managers from embarking on earnings manipulation. Based on this position, this study adopts agency theory due to its relevance in resolving conflict that may arise between managers(agent) and shareholders(principal) of the firms.

### **2.6.2. Resource Dependency Theory**

This theory introduces accessibility to resources, in addition to the separation of ownership and control, as a critical dimension to the debate on corporate governance. Again, the theory posits that organization usually tend to reduce the uncertainty of external influences by ensuring that resources are available for their survival and development. By implication, this theory seems to suggest that the issue of dichotomy between executive and non-executive directors is actually irrelevant. How then does a firm operate efficiently? To resolve this problem, the theory indicates that what is relevant is the firm's presence on the boards of directors of other organizations to establish relationships in order to have access to resources in the form of information which could then be utilized to the firm's advantage. Hence, this theory shows that the strength of a corporate organization lies in the amount of relevant information it has at its disposal.

In the light of the foregoing analysis, it is clear that governance mechanism seeks to protect the interest of all stakeholders of a firm. In recent times, the structure of laws and accountability issues regarding corporate governance is changing worldwide and directors are being held responsible every day for the success and failures of the companies they govern. Corporate boards are responsible for major decisions like changing corporation bylaws, issuing of shares, declaring of dividends, etcetera. This explains to some extent, the reason why discussions of corporate governance usually focus on boards. The board of directors is the "apex" of the controlling system in an organization and is there to monitor the activities of top management to ensure that the interests of shareholders are protected (Short and Keasey, 1998). It acts as the fulcrum between the owners and controllers of the corporation

(Monks & Minow, 2001) and regarded as the single most important corporate governance mechanism (Ramsey & Blair, 1993). From the resource dependency perspective, qualified and skilful board members can be considered as a strategic resource to provide a strategic linkage to different external resources (Ingley & van der Walt, 2001).

### **2.6.3. Upper Echelon Theory**

Corporate monitoring by diverse board in terms of gender diversity and board nationality are expected to constrain managers' behaviour because corporate monitoring by diverse board may force managers to focus more on corporate performance and less on opportunistic or self-serving behaviour. If corporate board diversity enhances monitoring, it might be associated with lower use of discretionary accruals in firms.

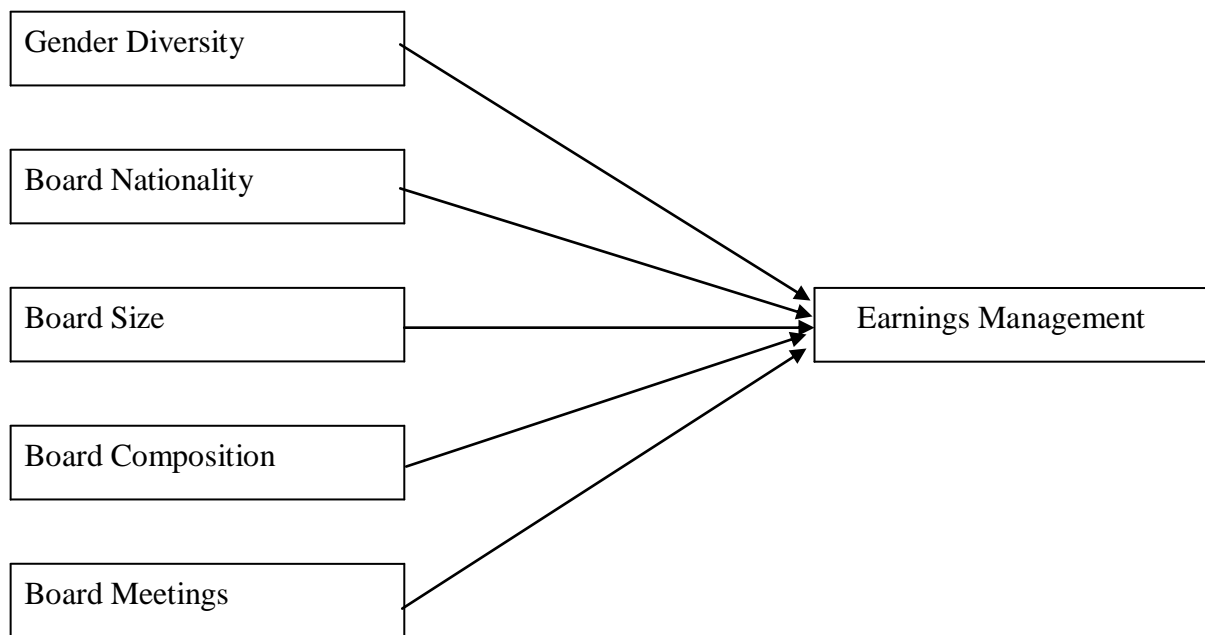
These board diversity variables (gender diversity and board nationality) were anchored by the upper echelon theory because organizations wishing to attract, retain, and benefit from diverse talents are often advised to begin by increasing the diversity of their senior management (Gelfand, Nishii, Raver, & Schneider, 2004). Doing so has been proposed to help not only because of the signal that it sends to diverse employees about their advancement potential, but because a diverse senior management team is more likely to be sensitive to the issues that may affect the owners of the business which require to be given adequate attention for the retention and advancement of investors. Thus, organizations with more diverse senior managers are expected to reduce the level of earnings management. The notion that the characteristics of senior management, or the upper echelon of an organization, can influence the decisions made and practices adopted by an organization dates back to early upper echelon theory as developed by Hambrick and Mason (1984). In this vein, this study



adopts upper echelon theory to underpin the relationship between gender diversity, board nationality and earnings management.

The relationships are diagrammatically represented below:-

**Figure 1: Schematic Diagram**



**Independent Variables**

**Dependent Variable**

**Source : Configured & Designed by the Author (2016).**

## **CHAPTER THREE RESEARCH METHODOLOGY**

### **3.1 Introduction**

This chapter presents details on methodology adopted in this study. Population of the study was also captured in this chapter. Furthermore, source and methods through which the data were collected are discussed. The technique employed in the analysis with the justification for the method and technique is explained. Finally, the variable measurement, and model specification were explained in detail.

### **3.2 Research Design**

In choosing a particular design for a research work, it is usually based on the nature and the problem of the research and how best the research objectives can be achieved. The study adopts the ex-post facto research design which is based on a scientific examination of dependent and independent variables. The design for the study is considered appropriate, in that, it is better in determining the significant effect of board characteristics on earnings management in our study which may permit prediction. The study adopted quantitative and deductive approach as the data for the variables are in figures. The study also aligns itself with the positivist paradigm because it depends on quantifiable observations that lead to statistical analysis through quantitative data collection and interpretation to establish what is without any form of human interaction within the study.

### **3.3 Population and Sample Size of the study**

The study population is nine (9) Oil and Gas firms listed on the Nigerian Stock exchange as at 31<sup>st</sup> December, 2016. The number of listed Oil and Gas firms as at 2016 in Nigeria as shown in Nigerian Stock Exchange (NSE) Factbook are nine (9). The justification for choosing Oil and Gas firms is premised on the fact that, it is still an area with paucity of studies in Nigeria. Only eight (8) of the firms were used, as there is no complete data relating to Bechem Petroleum Nigeria Plc. All the firms selected are the major players within the Nigerian Oil and Gas sector (see Appendix I)

### **3.4 Source and Method of Data Collection**

The study used secondary sources of data. The use of secondary data source has been adjudged a better source as it makes available all needed data for the empirical investigation in this type of research. Data were extracted from the published audited annual reports and accounts of the selected Oil and Gas companies. The gender diversity, board nationality, board size, board composition and board meetings were obtained from the directors' report, while the data of Yoon, Kim and Woodruff (2012) model were extracted from the statement of comprehensive income and statement of financial position.

### **3.5 Data Analysis Technique and Justification**

Panel Least Square regression technique is used to test the model of the study. Longitudinal panel data was used to account for individual heterogeneity of the sample firms. Stata 13 was used as statistical package for the data analysis. The choice of this technique is based on the fact that, it is more informative (i.e. more variability, less collinearity, more degrees of freedom), as estimates may be more efficient under it. Also they allow the study of individual dynamics (e.g. separating cohort effects).

The Descriptive statistics is used which capture the minimum, maximum, mean, standard deviation, skewness and kurtosis. This features describes the type, nature and forms of the data used. The correlation matrix is also used to test for the magnitude of association, its direction and the level of significance of association between the dependent and the independent variables of the study.

The regression analysis carried out include the coefficient, t-value and the probability value is used to ascertain the level of impact, its direction and the magnitude of effect of the independent variable on the dependent variable. However, the cumulative results are interpreted from the  $R^2$  which is the coefficient of determination to capture the extent to which all the independent variables explain the dependent variable of the study. Also the Fisher exact test (F-statistics) value is used to test the fitness of the study model and to prove that the relationship between the independent variables and the dependent variables is not due to a mere chance.

### **3.6 Variable Measurement and Model Specification**

This section presents and discusses the earnings management model used in the study as developed by Kim Yoon and Woodruff (2012) haven modified the model by Dechow, Sloan and Sweeney (1995).

#### **3.6.1 Earnings Management measurement**

The study used accounting accrualsto measure earnings management. In order to get the estimate for discretionary accruals, the modified Dechow et al. (1995) model by Yoon, Kim and Woodruff (2012) was adopted. This is specified as follows:

$$TA/A_{t-1} = \beta_0 + \beta_1 \Delta REV/A_{t-1} + \beta_2 \Delta NREC/A_{t-1} + \beta_3 PPE_{t-1}/A_{t-1} + \beta_4 INTG_{t-1}/A_{t-1} + \varepsilon$$

Where, TA,  $A_{t-1}$ , REV, NREC, PPE and INTG respectively represent total accruals, lagged total assets, revenue, net receivables, property, plant and equipment, lagged intangible assets.

The study makes use of the absolute measure as a proxy for the extent of opportunistic earnings management.

### 3.6.2 Variable Measurement

**Table 3.1 Variables and its Measurement**

<b>Variable</b>	<b>Nature of Variable</b>	<b>Proxy (ies)</b>	<b>Measurement</b>
<b>Earnings Management</b>	Dependent Variable	Discretionary Accruals	Modified Dechow, Sloan and Sweeney (1995) by Yoon, Kim and Woodruff (2012)
<b>Board Characteristics</b>	Independent Variables	Gender Diversity	Percentage of female board members to total number of board of directors
		Board Nationality	Percentage of foreign board members to total number of board of directors
			Numbers of Directors on the Board in a particular year
		Board Size	Percentage of Outside Directors sitting on the Board to total number of board members
		Board Composition	Number of times meetings are held by directors in a year
		Board Meeting	

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**Source: Computed by the Author (2016).**

### 3.6.3 Model Specification

The equation is represented as follows:

$$EM_{it} = \beta_0 + \beta_1 GDIV_{it} + \beta_2 BNAT_{it} + \beta_3 BSIZ_{it} + \beta_4 BCOM_{it} + \beta_5 BMEET_{it} + \mu_{it}$$

Where:

EM = Earnings Management

GDIV = Gender Diversity

BNAT = Board nationality

BSIZ = Board size

BCOM = Board composition

BMEET = Board meeting

$\beta_1, \beta_2, \beta_3, \beta_4, \beta_5$  = Coefficient of explanatory variables

$\beta_0$  = Constant

$\mu_{it}$  = Error Term

### **3.7 Robustness Tests**

Post estimation tests were conducted, ranging from multicollinearity test, normality test for residuals, heteroscedasticity test, hausman specification test, contemporaneous correlation test for establishing panel effect. This is in order to make better the validity of all statistical inferences to be drawn for the study. Normality test was conducted using the skewness and kurtosis statistics. Multicollinearity test was conducted to check whether there was any excessive correlation between the independent variables themselves, which may mislead the result of the study using uncentered variance inflation factor (VIF).

Breusch-Pagan / Cook-Weisberg was used to test the null hypothesis that the error variances are all equal versus the alternative that the error variances are a multiplicative function of one or more variables. The alternative hypothesis states that the error variances increase (or decrease) as the predicted values of Y increase, that is, the bigger the predicted value of Y, the bigger the error variance is. A large chi-square and smaller p-value would indicate that heteroscedasticity was present.

In order to decide the more effective model between the fixed effect and Random effect researchers often rely on the Hausman (1978) specification test. The contemporaneous correlation test was used to check whether the individual firms' specific characteristics in the panel are dependent on each other or not and also whether the residuals are correlated across firms in the panel. Cross-sectional dependence can lead to biasness in the overall results of the study if not taken care of.

## **CHAPTER FOUR DATA PRESENTATION, ANALYSIS AND DISCUSSION**

### **4.1 Introduction**

This chapter first deals with the preliminary analysis of data using descriptive statistics and correlation analysis. The various robustness test conducted were also discussed and analyzed. This was followed by the presentation, analysis and discussion of regression results in respect of the variables.

### **4.2 Descriptive Statistics**

The descriptive statistics is presented in Table 4.1 showing the minimum, maximum, mean, standard deviation, skewness and kurtosis of the data in respect of the variables used in the study.

**Table 4.1: Descriptive Statistics**

Variables	Min	Max	Mean	Std. Dev.	Skewness	Kurtosis	N
EM	0.00002	0.006	0.001	0.002	1.936	5.426	64
GDIV	0	0.25	0.092	0.073	0.064	2.030	64
BNAT	0	0.78	0.218	0.215	1.093	3.503	64
BSIZ	4	16	9.297	3.105	0.319	2.498	64
BCOM	0.25	0.90	0.568	0.165	0.023	2.130	64
BMEET	2	7	4.422	0.851	0.947	4.206	64

Table 4.1 Earnings management showed a minimum value of 0.00002 implying that the quality of earnings was high within the firms and when compared with the highest level of discretionary accrual from the residual (0.006) of the model. It depicts that earnings management was low due to the values recorded for maximum. The mean value further substantiates that earnings management was low within the study period. The skewness and kurtosis values for earnings management, shows that the data is not normally distributed because is far and above the range of zero and three.

The minimum value for gender diversity is 0, while the maximum value is 0.25, which means that within the oil and gas sector and the study period, there was a company that do not have any woman director on their board, while the highest value implies that there was a firm that had 25% of women representation on the board, while men occupy 75%. The mean value of 0.092 implies that on average the companies have 9% of women directors represented on board for all the firms. The differences between the standard deviation (0.073) and its respective mean (0.092) is not significant implying that there is a huge deviation from the actual average of the variable. The skewness and kurtosis values are falling around zero and three implying that the data is normally distributed.

The minimum value for board nationality is 0 and the maximum value is 0.78 which implies that lowest percentage of representation occupies by the foreign director on board, is zero, while the highest percentage of representation by foreign directors on board is 78%. On overall, board nationality recorded a mean value of 0.218 which indicate that on average; most of the firms have foreign directors occupying about 21% of the seat of board of directors. The insignificant difference between the standard deviation (0.215) and mean value (0.218) implies that there is huge deviation from the true average for the firms in respect of



the variable. The kurtosis value was within the acceptable range of three, except for skewness value which is far from zero implying abnormality of the distribution.

Board size has minimum value of four (4) and a maximum value of sixteen (16) implying that the lowest number of board members within the study period was four (4), while highest number of board members is sixteen (16). The mean value of about 9.297 implies that on average, all the firms within the oil and gas sector were having nine members of the board. The standard deviation (3.105) for this variable, implies that there was a deviation of about three times from the actual mean (9.297) which means that the recorded value, well represent the true average. The data for board size was normally distributed based on the result from the skewness and kurtosis test.

The minimum value recorded for board composition is 0.25 and the maximum value is 0.90, which implies that the lowest percentage occupied by the non-executive directors in the firms within the period is 25%, while the maximum proportion occupied by the non-executive director is 90%. On average, the percentage of non-executive directors on board is 0.568, implying that, most of the firms' non-executive directors occupies about 57% of the entire board members, leaving on only 43% for the executive directors. The standard deviation (0.165) recorded implies that the mean value (0.568) for board composition was the true mean for the firms. The skewness and kurtosis values showed that the data is normally distributed as the skewness and kurtosis values fall within zero and three respectively.

Board meetings showed minimum and maximum values of two (2) and seven (7) respectively, which implies that the minimum number of times the board members met within the year is two times for all the firms, while the maximum number of times the directors met within the year was seven times. The average number of times the directors met within the year is 4.422 implying that most of the firms' board members met four times in a year. The standard

deviation (0.851) show that the average value (4.422) recorded represent the true mean, while the skewness and kurtosis values implies that the data was normally distributed, because the values were around zero and three respectively.

### 4.3 Correlation Analysis

Table 4.2 shows the Pearson correlation values between dependent and the independent variables and also the relationship amongst the independent variables. It shows the correlation matrix with the values displaying the Pearson correlation coefficient between all pairs of variables and the asterisk beside the coefficients, showing the level of significance of the coefficients.

**Table 4.2: Correlation Matrix**

	EM	GDIV	BNAT	BSIZ	BCOM	BMEET	VIF
EM	1						
GDIV	-0.5042*	1					1.54
BNAT	-0.4003*	0.2860*	1				1.17
BSIZ	-0.1002	-0.2638*	-0.0690	1			1.41
BCOM	-0.1661	-0.2560*	-0.0495	-0.3122*	1		1.37
BMEET	-0.1344	0.1720	-0.1144	0.1561	0.0256	1	1.17

Source: Stata 13

\*. Correlation is significant at 0.01 or 0.05 level (2-tailed)

From Table 4 Earnings management is 50% negatively correlated with gender diversity which was significant at 1%. This implies that earnings management and gender diversity have an inverse relationship. Board nationality has significant and negative relationship with earnings management to the magnitude of 40%. The relationship between board nationality and earnings management Earnings management was found to have insignificant, but negative relationship with board size at the magnitude of 10%. This indicates that earnings management and board size moves in opposite direction and at different magnitude which also applies to the relationship between board composition and earnings management. Board composition has negative, but insignificant correlation with earnings management at the

magnitude of 17%. Earnings management was found to have insignificant and negative correlation with board meetings of the firms at about 13%.

The relationship between board nationality and gender diversity is positive and significant at the level of 5% suggesting presence of colinearity. Gender diversity has significant negative correlation with board size and board composition. In addition, board size and board composition was also found to be negative and significantly correlated to the level of 31%.

Generally, the relationship among other independent variables themselves was found to be insignificant, except few.

#### **4.4. Robustness Test Results**

This section presents the result from post estimation tests. The post estimation tests comprise of multicollinearity test, heteroscedasticity test, hausman specification test, langrange multiplier test and normality test of the residuals.

**i. Multicollinearity Test:** To establish on the overall, that there is presence of multicollinearity amongst the independent variables of the study and that it constitute a problem, the Variance Inflation Factor (VIF) and tolerance values are used and were found to be consistently smaller than ten and one (see appendix II) respectively, indicating absence of harmful multicollinearity (Cassidy & Anderson, 1999).

**ii. Heteroskedasticity Test:** The heteroskedasticity tests conducted shows a chi-square value of 32.07 which is significant at 1% (see appendix II). This result indicates that heteroskedasticity is present and as such confirm the violation of one of the assumption of ordinary least square (OLS).

**iii. The Hausman Test:** The result obtained from the hausman specification tests for the regression recorded small chi square values 1.78 and large p-values 0.8789 (see appendix II) indicating that the random effect regressions was appropriate for interpretation and analysis.

**iv. Langrange Multiplier Test:** The result of the langrange multiplier test which show a chi-square value of 2.44 and a probability value of 0.0593(see appendix II) revealing therefore that there is no panel effect within the study unit. This led to failure to reject the null hypothesis which states that there is no panel effect within the study units. This hence necessitated the estimation and the use of robust ordinary least square.

**v. Normality Test of the Residuals:** The result of the normality test of the residual which was estimated through the kernel density estimate (see appendix II) shows that the data is tolerably mild as the shape is close to normal which can be referred to as mesokurtic as it is neither skewed to the right nor skewed to the left. The level of peakiness further substantiates the fact that the residuals are normally distributed.

#### 4.5 Presentation and Interpretation of Regression Results

This section presents the regression result of the parsimonious model of the study. This was followed with its interpretation, analysis and discussion of the results. Hypotheses formulated earlier in chapter one was tested based on the analysis.

This section explain the relationship between the board characteristics variables and earnings management of oil and gas firms, using coefficient value, t-statistics value and the probability value to demonstrate the direction and the strength of relationship between the variables.

**Table 4.3: Summary of Robust Ordinary Least Square**

Variables	Coeffi	T-Stat	Prob
Constant	0.0042	3.32	0.002
Gdiv	-0.0108	-3.71	0.000
Bnat	-0.0021	-3.44	0.001
Bsiz	-0.0001	-2.04	0.046
Bcom	-0.0002	-0.19	0.851
Bmeet	-0.0001	-0.35	0.727
R <sup>2</sup>			0.3855
F-Statistics			5.17
Probability			0.0005
Heteroskedasticity Test (Probability)			0.0000
Hausman Test (Probability)			0.8789

The  $R^2$  of 0.3855 gives the proportion of the total variation in the dependent variable as explained by the independent variables. Therefore, all the independent variables used explain the dependent variable by 38.55%. That is, the total variation in earnings management of listed oil and gas firms in Nigeria is accounted for by the proportion of women director, foreign directors, size of board of directors, its composition in terms of ratio of non-executive director and the number of times meetings is held in a year.

The F-statistics value of 5.17 which is significant at one percent (1%), indicates that board characteristics and earnings management model is well fitted. It implies that, when there are any changes in board characteristics of listed oil and gas firms in Nigeria; their earnings management is affected directly. The P-value of F-statistics which is significant at a level of 1% implies that there is 99.9 percent probability that the relationship among the variables were not due to mere chance and as such the results from the regression can be relied upon. In addition, it implies that the independent variables reliably predict the dependent variable of the study.

#### **4.6 Test of Hypotheses**

This section presents the regression result, analyses, interpret and discuss the findings from the results. Based on the level of significance of the variables, the hypotheses were tested.

##### **4.6.1 Gender Diversity and Earnings Management**

From the Table 4.3, it was observed that the t-value for gender diversity (gdiv) was -3.71, while the coefficient value is -0.0108 which is significant at 1%. This shows that gender diversity has significant negative effect on earnings management of listed oil and gas firms in Nigeria. This signifies that for every increase in the percentage of women on the board of directors, the earnings management of the companies will decrease by the coefficient

value. This may be as a result of the fact that board gender diversity is expected to enhance the board's ability to monitor top management and because women tend to ask questions that male directors may not ask. Based on the result and the findings in respect of gender diversity, the null hypothesis one of the study is rejected.

This finding is in line with those of Eze (2017), Firoozi, Magnan and Fortin (2016), Einer and Soderqvist (2016), Arun, Almahrog and Aribi (2015), but contrary to those of Hussaini and Gugong (2015), Ioualalen, Khemakhem and Fontaine (2015) and Shehu and Ibrahim (2014).

#### **4.6.2 Board Nationality and Earnings Management**

The regression results revealed that board nationality as shown in Table 4.3 has a t-value of -3.44 and a coefficient value of -0.0021 which is significant at 1% level. This indicates that board nationality has significant negative effect on earnings management of listed oil and gas firms in Nigeria. This however implies that, for every increase in the percentage of foreigners as directors on board, the earnings management of the firm, decreases by the coefficient value of 0.002. This may be as a result of the argument put forward by the advocate of strategic alliance hypothesis that foreign directors are sophisticated investors with huge amount of investment and technical know-how. Therefore, the foreign directors will be motivated to protect their huge investment by serving as monitors over the management of the firms, which may lead to decrease in earnings management. From the foregoing discussion from the findings, the null hypothesis two formulated earlier in chapter one, is hereby rejected.

The finding is contrary to those of Van den Berg (2015), Hooghiemstra, Hermes, Oxelheim and Randoy (2015), Abdul Rauf, Johari, Buniamin, and Abd Rahman (2012), Van der Zwet (2015) but found to be in tune with those of Choi, Jean and Park (2004), Aksu Moradoglu

and Cetin (2012), Omar and Hind (2012), Guo,Huang,Zhang and Zhou (2014), Nguyen (2016).

#### **4.6.3 Board Size and Earnings Management**

The result in respect of board size as shown on Table 4.3 has a t-value of -2.04 and a coefficient value of -0.0001 which is significant at 5% level. This indicates that board size has negative and significant effect on earnings management of listed oil and gas firms in Nigeria. This implies that for every increase in the number of board members, there is significant decrease in the level of earnings management by firms. This may be as a result of the argument put forward by previous researchers that larger board members may be more effective because of the coordination and its composition, which in turn adds to strong monitoring. From the discussion above, the findings provide evidence of rejecting null hypothesis three of the study.

This finding is in line with the study of Jamaludina, Sanusib and Kamaluddina (2015), Iraya, Mwangi and Muchoki (2015), Salihi and Jibril (2015), Fodio, Ibikunle and Oba (2013), Mustafa, Mehmet, and Suleyman, (2014), while other research such as Daghsnii, Zouhayer and Mbarek (2016) and Iraya, Mwangi and Muchoki (2015) are in contrast with our findings.

#### **4.6.4 Board Composition and Earnings Management**

From the Table above, it was observed that the t-value for board composition was -0.19, while the coefficient value in respect of board composition was -0.0002 which is neither significant at 1%, 5% nor 10% level. This signifies that board composition has negative but insignificant effect on earnings management of listed oil and gas firms in Nigeria. This implies that for every increase in the number of non-executive directors on board, the earnings management of firms will decrease insignificantly. This finding confirms the

assertion in the literature that boards dominated by outsiders or non-executive directors may help to mitigate the agency problem by monitoring and controlling the opportunistic behaviour of management. The null hypothesis four of the study is accepted based on the result and the findings in respect of the variable.

This finding is in line with those of Baimukhamedova and Baimukhamedova (2015), Roodposhti, Haybati, Talebnia, and Chasmi, (2012), Dimitropoulos (2011), but contrary to those of Daghsnii, Zouhayer and Mbarek (2016), Arabborzoo, Rashidpuran, Arabi (2015).

#### **4.6.5 Board Meetings and Earnings Management**

Board meetings variable has a t-value of -0.35 and a coefficient value of -0.0001 which is neither significant at 1%, 5% nor 10% level. This shows that board meetings has insignificant but negative effect on earnings management of listed oil and gas firms in Nigeria. This connotes that an increase in number of times directors on board held meetings in a year, the level of earnings management decreases insignificantly. This may be as a result of the fact that frequent meetings may allow the directors to ask questions, seek for clarity and even scrutinize the activities of the management which eventually reduces the opportunistic tendencies of the management. Null hypothesis in respect of board meetings is accepted based on the analysis and findings reported above.

This finding is in line with the studies of Chen, Firth, Gao & Rui, (2006), Sarkar, Sarkar and Sen, (2008), Chouaibi, Harres and Brahim (2016), Kankanamage (2015), however in contrast to those of Gulzar and Wang, (2011) and Metawee, (2013).

#### **4.7 Policy Implication of Findings**

Findings from this research have theoretical, practical and regulatory implications. The implications show the contributions to knowledge which are believed to assist the regulators (SEC), management (Oil and Gas firms) and researchers.



The findings from the study have important theoretical implications because, the findings in respect of the variable does not negate the agency theory. This implies that the agent (board of directors) act in the best interest of the owners (principal) as the result confirms that their characteristics mitigates management practice within the organisation.

Among the important policy implications is that the variables used suggest that there is continuous need by SEC to encourage the full application of corporate governance codes by oil and gas firms in Nigeria. This however provides effective and efficient monitoring of financial reports most importantly earnings of the firms, especially those firms with high percentage of non-executive directors and number of times the directors held meetings.

In addition, most listed public firms' board are characterized with local directors (indigenes), thereby not paving way for diverse board. This may not give the board the needed diversity which is expected to shape the behaviour of the board members through sharing of experience. Based on this, policy makers such as SEC should encourage the appointment of foreign directors and also extend the findings of this study to other sectors since this board nationality is found to enhance the reliability of reported earnings.

Furthermore, the negative effect of women director on earnings management of firms as shown by the empirical evidence may have an acceptable explanation. These has significant policy implications for the inclusion of women director. First, the entire idea of advocating for more women on board is for their infinitesimal probability to engage in earnings management according to socio-psychological literature which posit that women embrace greater ethical values than their male counterpart in decision making and in the exercise of power. These place women as better monitor than men. Therefore, this necessitates inclusion of more women on the board of firms in Nigeria.

Another guide to policy makers in respect of decisions regarding the size of the board members is that, emphasis should be on the quality, effectiveness and efficiency of the members not on the number of the board members. Also, the Security and Exchange Commission (SEC) should consider the need of all sectors in respect of the size of the board rather than assume that one size fits all.

## **CHAPTER FIVE SUMMARY, CONCLUSION AND RECOMMENDATIONS**

### **5.1 Summary**

The study starts by explaining earnings management and board characteristics as used in the study. It went further to establish a link between the dependent and independent variables of the study. The motivation which serves as a guide for the study was highlighted and discussed. The chapter also showcased the importance and need for the research in oil and gas firm in Nigeria.

The basis of investigation into this research is as a result of many factors amongst which are the uniqueness of oil and gas firms and dearth of studies of this nature in the sector. The Use of Yoon, Kim and Woodruff (2012) model which have been proved to explain level of earnings management better than the modified model by Dechow, Sloan and Sweeney (1995)

The study reviewed concepts such as earnings management of which definition given by Schipper (1989) was adopted, while Marimuthu (2008) definition of board diversity is also adopted as the working definition. The chapter also show a diagram linking board characteristics with earnings management. Various models of earnings management were reviewed starting from Healy (1985) down to Yoon, Kim and Woodruff (2012), which was adopted. The third section of the literature review was concluded with discussion on the agency theory that underpins the study.

The study is purely quantitative and adopted ex-post facto research design. The study covers the period of 2009 to 2016. The population of the study is the nine listed oil and gas firms in Nigeria as at 31st December, 2016. Eight out of nine were selected due to non-availability of complete information regarding Beco Petroleum PLC. Secondary source of data was used and they were extracted from the audited annual reports and accounts of the selected firms. Panel least square regression technique was used, while Stata 13 was employed as the statistical package. Robustness test such as heteroscedasticity, hausman specification and lanagrange multiplier tests were conducted to validate the results.

The study revealed that all the explanatory variables (gender diversity, board nationality, board size) except board composition and board meetings were significant in explaining earnings management level of listed oil and gas firms in Nigeria. All the five explanatory variables have negative effect on earnings management of firms.

## **5.2 Conclusions**

As a result of the findings from the study, the researcher concludes as follows:

From the findings in respect of gender and earnings management, it can be concluded that having high percentage of women directors as board members is significantly associated with less discretionary accruals.

The conclusion on board nationality and earnings management is that high percentage of foreign directors on board mitigates management opportunistic behaviour in respect of earnings management.

Based on the findings for board size and earnings management prove further that size of the board members is associated with less earnings management in firms.

For board composition and earnings management, the study reached a conclusion that high percentage of non-executive director is not significantly responsible for an effective monitoring of the managers in respect of curtailing earnings management.

Based on the findings on board meetings and earnings management, the study conclude that board meetings is not significantly associated with level of earnings management of firms in oil and gas sector in Nigeria.

### **5.3 Recommendations**

From the findings and conclusions in this study, the following recommendations are made:

- i. The management should consider the inclusion of more women on the board of directors such that at least 10% of women occupy seats on the board.
- ii. Foreign directors membership on the board should be increased to an average of twenty two percentages (22%) since their presence on board can help mitigate the managers' tendencies for earnings management.
- iii. The number of board members should be maintained at an average of nine (9) for all the firms, if the quality of earnings must be enhanced and earnings management mitigated.
- iv. The percentage of non-executive director should be increased to an average of fifty seven percent (57%) by management in order to serve as better monitors against the executive members and hence discourage them from possible earnings manipulation.
- v. The management of the firms should increase the number of times meetings is held by directors in a year to at least four (4) times, to improve the quality of earnings of the firms.

### **5.4 Limitations of the Study**

Like any other research, the study is subjected to some limitations due to the following factors.

The study is only limited to a particular sector, that is, the listed oil and gas firms in Nigeria. Therefore, the findings and recommendation is only applicable to this sector, as the board characteristics variables may differ in other sectors.

The study limits itself to only one model for measuring earnings management, which is Yoon, Kim and Woodruff (2012) model.

### **5.5 Suggestions for Further Studies**

Based on the limitations identified with the study, It is suggested among others that:

- i. Interested researchers in this area should include firms from other sectors to make the findings more generalized.
  
- ii. Other researchers should consider the use of other model,especially the first model developed by Yoon, Kim and Woodroff (2012) in addition to their second model used by this study in order to make comparisons.

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## Appendix I

### Population of the Study

S/No.	Company's Name	Year of Listing	Eliminated	Reason for Elimination
1	Oando Plc	27 <sup>th</sup> February 1992	No	-
2	Japaul Oil and Maritime Service Plc		No	-



3	Beco Petroleum Product. Plc	2011	Yes	Incomplete Information
4	Conoil Plc	1989	No	-
5	Eterna Oil Plc	3 <sup>rd</sup> August 1992	No	-
6	Forte Oil Plc	1978	No	-
7	Mobil Oil Nigeria Plc	4 <sup>th</sup> April 1979	No	-
8	MRS Oil Nigeria Plc	8 <sup>th</sup> December 1978	No	-
9	Total Nigeria Plc	20 <sup>th</sup> April 1979	No	-

### Sample Size of the Study

S/No.	Company's Name
1	Japaul Oil and Maritime Services
2	Oando Plc
3	Conoil Plc
4	Eterna Oil Plc
5	Forte Oil Plc
6	Mobil Oil Nigeria Plc
7	MRS Oil Nigeria Plc
8	Total Nigeria Plc

## Appendix II

```
. xtset id year, yearly
      panel variable:  id (strongly balanced)
      time variable:  year, 2009 to 2016
      delta: 1 year
. su em gdiv bnat bsiz bcom bmeet, detail
```

EM				
Percentiles	Smallest			
1%	.00002	.00002		
5%	.00003	.00003		
10%	.0001	.00003	Obs	64
25%	.000155	.00003	Sum of Wgt.	64
50%	.0003		Mean	.0010397
		Largest	Std. Dev.	.0016105
75%	.000825	.00497		
90%	.00432	.00538	Variance	2.59e-06
95%	.00497	.00588	Skewness	1.935817
99%	.00608	.00608	Kurtosis	5.425509
GDIV				
Percentiles	Smallest			
1%	0	0		
5%	0	0		
10%	0	0	Obs	64
25%	0	0	Sum of Wgt.	64
50%	.1		Mean	.091875
		Largest	Std. Dev.	.0725909
75%	.135	.2		
90%	.18	.2	Variance	.0052694
95%	.2	.25	Skewness	.0644191
99%	.25	.25	Kurtosis	2.030269
BNAT				
Percentiles	Smallest			
1%	0	0		
5%	0	0		
10%	0	0	Obs	64
25%	0	0	Sum of Wgt.	64
50%	.185		Mean	.2176562
		Largest	Std. Dev.	.2146591
75%	.33	.7		
90%	.64	.7	Variance	.0460785
95%	.7	.78	Skewness	1.092978
99%	.78	.78	Kurtosis	3.50329

## BSIZ

	Percentiles	Smallest		
1%	4	4		
5%	5	5		
10%	5	5	Obs	64
25%	6.5	5	Sum of Wgt.	64
50%	10		Mean	9.296875
		Largest	Std. Dev.	3.104936
75%	11	16		
90%	13	16	Variance	9.640625
95%	16	16	Skewness	.3198233
99%	16	16	Kurtosis	2.498464
		BCOM		

	Percentiles	Smallest		
1%	.25	.25		
5%	.31	.29		
10%	.33	.31	Obs	64
25%	.4	.31	Sum of Wgt.	64
50%	.575		Mean	.5682813
		Largest	Std. Dev.	.1651796
75%	.685	.8		
90%	.8	.8	Variance	.0272843
95%	.8	.9	Skewness	.0231182
99%	.9	.9	Kurtosis	2.130397
		BMEET		

	Percentiles	Smallest		
1%	2	2		
5%	4	4		
10%	4	4	Obs	64
25%	4	4	Sum of Wgt.	64
50%	4		Mean	4.421875
		Largest	Std. Dev.	.8508574
75%	5	6		
90%	6	6	Variance	.7239583
95%	6	6	Skewness	.9472119
99%	7	7	Kurtosis	4.206466

. pwcorr em gdiv bnat bsiz bcom bmeet, star (0.05) sig

	em	gdiv	bnat	bsiz	bcom	bmeet
em	1.0000					
gdiv	-0.5042*	1.0000				
	0.0000					
bnat	-0.4003*	0.2860*	1.0000			
	0.0010	0.0220				
bsiz	-0.1002	-0.2638*	-0.0690	1.0000		
	0.4307	0.0352	0.5882			
bcom	0.1661	-0.2560*	0.0495	-0.3122*	1.0000	
	0.1895	0.0412	0.6975	0.0120		
bmeet	-0.1344	0.1720	-0.1144	0.1561	0.0256	1.0000
	0.2897	0.1741	0.3679	0.2180	0.8410	

. reg em gdiv bnat bsiz bcom bmeet

Source	SS	df	MS	Number of obs =	64
Model	.000063	5	.0000126	F( 5, 58) =	7.28
Residual	.000100404	58	1.7311e-06	Prob > F =	0.0000
				R-squared =	0.3855
				Adj R-squared =	0.3326
Total	.000163404	63	2.5937e-06	Root MSE =	.00132

em	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
gdiv	-.0107938	.0028342	-3.81	0.000	-.016467 - .0051205
bnat	-.0021174	.0008337	-2.54	0.014	-.0037863 - .0004486
bsiz	-.0001284	.0000633	-2.03	0.047	-.0002552 -1.65e-06
bcom	-.000201	.0011758	-0.17	0.865	-.0025546 .0021527
bmeet	-.0000829	.0002104	-0.39	0.695	-.0005041 .0003383
_cons	.0041671	.0012871	3.24	0.002	.0015907 .0067435

. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity

Ho: Constant variance  
Variables: fitted values of em

chi2(1) = 32.07  
Prob > chi2 = 0.0000

. vif

Variable	VIF	1/VIF
gdiv	1.54	0.649168
bsiz	1.41	0.710493
bcom	1.37	0.728452
bmeet	1.17	0.857211
bnat	1.17	0.857960
Mean VIF	1.33	

```
. xtreg em gdiv bnat bsiz bcom bmeet, fe
```

```
Fixed-effects (within) regression      Number of obs   =      64
Group variable: id                    Number of groups =      8

R-sq:  within = 0.2508                 Obs per group: min =      8
      between = 0.0522                 avg =          8.0
      overall  = 0.0045                 max =          8

corr(u_i, Xb) = -0.4549                F(5,51)        =      3.41
                                           Prob > F       =      0.0098
```

em	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
gdiv	-.0094137	.0024377	-3.86	0.000	-.0143076	-.0045199
bnat	.0030402	.0035708	0.85	0.399	-.0041286	.0102089
bsiz	.0000283	.0001	0.28	0.779	-.0001725	.000229
bcom	-.0005803	.0011438	-0.51	0.614	-.0028766	.001716
bmeet	.0000456	.0001786	0.26	0.800	-.000313	.0004042
_cons	.0011083	.0019441	0.57	0.571	-.0027947	.0050114
sigma_u	.0016006					
sigma_e	.00097903					
rho	.7277325	(fraction of variance due to u_i)				

```
F test that all u_i=0:      F(7, 51) =      7.68      Prob > F = 0.0000
```

```
. est store fixed
. xtreg em gdiv bnat bsiz bcom bmeet, re
```

```
Random-effects GLS regression      Number of obs   =      64
Group variable: id                    Number of groups =      8

R-sq:  within = 0.2362                 Obs per group: min =      8
      between = 0.4451                 avg =          8.0
      overall  = 0.3138                 max =          8

corr(u_i, X) = 0 (assumed)           Wald chi2(5)    =      18.47
                                           Prob > chi2    =      0.0024
```

em	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
gdiv	-.0090429	.0023324	-3.88	0.000	-.0136142	-.0044715
bnat	-.0004243	.0021402	-0.20	0.843	-.004619	.0037704
bsiz	-.0000346	.0000842	-0.41	0.681	-.0001995	.0001304
bcom	-.0006031	.0010924	-0.55	0.581	-.0027442	.001538
bmeet	-5.72e-06	.0001692	-0.03	0.973	-.0003373	.0003258
_cons	.0026524	.0016039	1.65	0.098	-.0004912	.0057959
sigma_u	.00159071					
sigma_e	.00097903					
rho	.7252698	(fraction of variance due to u_i)				

```
. est store random
```

. hausman fixed random

	Coefficients		(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
	(b) fixed	(B) random		
gdiv	-.0094137	-.0090429	-.0003709	.0007088
bnat	.0030402	-.0004243	.0034645	.0028584
bsiz	.0000283	-.0000346	.0000628	.000054
bcom	-.0005803	-.0006031	.0000228	.000339
bmeet	.0000456	-5.72e-06	.0000513	.0000573

b = consistent under Ho and Ha; obtained from xtreg  
 B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

chi2(5) = (b-B)'[(V\_b-V\_B)^(-1)](b-B)  
 = 1.78  
 Prob>chi2 = 0.8789

. xttest0

Breusch and Pagan Lagrangian multiplier test for random effects

em[id,t] = Xb + u[id] + e[id,t]

Estimated results:

	Var	sd = sqrt(Var)
em	.0003942	.0198543
e	.000022	.0046852
u	.0006867	.0262042

Test: Var(u) = 0

chibar2(01) = 2.44  
 Prob > chibar2 = 0.0593

. reg em gdiv bnat bsiz bcom bmeet, robust

Linear regression

Number of obs = 64  
 F( 5, 58) = 5.17  
 Prob > F = 0.0005  
 R-squared = 0.3855  
 Root MSE = .00132

em	Coef.	Robust Std. Err.	t	P> t	[95% Conf. Interval]
gdiv	-.0107938	.0029118	-3.71	0.000	-.0166224 - .0049652
bnat	-.0021174	.0006152	-3.44	0.001	-.003349 - .0008859
bsiz	-.0001284	.0000629	-2.04	0.046	-.0002542 -2.63e-06
bcom	-.000201	.0010657	-0.19	0.851	-.0023342 .0019323
bmeet	-.0000829	.0002365	-0.35	0.727	-.0005564 .0003906
_cons	.0041671	.0012562	3.32	0.002	.0016526 .0066817

. predict e  
 (option xb assumed; fitted values)

. kdensity e

