

**EFFECT OF BOARD CHARACTERISTICS ON FINANCIAL STATEMENTS FRAUD
LIKELIHOOD OF QUOTED FOOD & BEVERAGE FIRMS IN NIGERIA**

BY

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NSU/GDM/FAA/0026/16/17

M.Sc. FORENSIC ACCOUNTING AND AUDITING

JUNE, 2021

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**A DISSERTATION SUBMITTED TO THE SCHOOL OF POSTGRADUATE STUDIES,
NASARAWA STATE UNIVERSITY KEFFI, IN PARTIAL FULFILMENT OF THE
REQUIREMENTS FOR THE AWARD OF DEGREE OF MASTER OF SCIENCE (MSC.)
IN FORENSIC ACCOUNTING AND AUDITING**

INSTITUTE OF GOVERNANCE AND DEVELOPMENT STUDIES

NASARAWA STATE UNIVERSITY, KEFFI

NIGERIA

DECLARATION

I hereby declare that this dissertation has been written by me and that it is a report of my research work. It has not been presented in any previous application for a diploma or degree. All quotations are indicated, and sources of information specifically acknowledged by means of references.

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CERTIFICATION

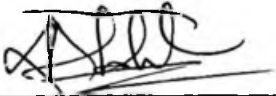
This dissertation titled **EFFECT OF BOARD CHARACTERISTICS ON FINANCIAL STATEMENTS FRAUD LIKELIHOOD OF QUOTED FOODS & BEVERAGES FIRMS IN NIGERIA** meets the requirements governing the award of Master of Science (M.Sc.) in Forensic Accounting and Audit, of the School of Postgraduate Studies of Nasarawa State University, Keffi for its contribution to knowledge and literary presentation.



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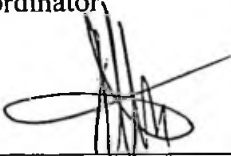
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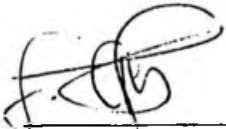
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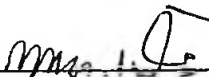
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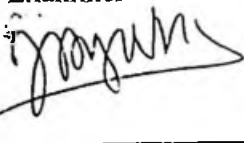
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DEDICATION

This dissertation is dedicated to my beloved family, whose unyielding love, support and motivation had inspired me to pursue and complete this program of study.

ACKNOWLEDGMENTS

I am grateful to God Almighty for granting me the knowledge and strength to carry out this study.

My unreserved appreciation goes to my wife, Amina for her understanding, support and prayers. I am thankful to my mother Mallama Baraka for her moral and spiritual provisions. I am grateful to my supervisor Dr. Adamu Abdul, together with my internal examiner in persons of Dr. Ahmed A. Ibrahim and my external examiner in person of Prof. U. M Ofili for their immense improvement on my work. My appreciation goes to my course lecturers who had imparted me with new knowledge in this field of study. I am thankful to my classmates for the mutual encouragement and social harmony throughout the course of this program.

My general appreciation goes to the staff and management of the Institute of Governance and Development Studies (IGDS). I am particularly thankful to the Dean, Postgraduate School, Prof. J. M. Ayuba the Director, IGDS, Prof. A. E. Zamani, the course coordinator, Dr. Abdul Adamu and the entire staff of the Institute.

ABSTRACT

The study examines the effect of board characteristics on the financial fraud likelihood of food and beverage companies in Nigeria. The scope of the study covers four board characteristics, namely: size remuneration, independence and gender diversity. The Beneish M-score is used as the measure of fraud likelihood. The sample of the study comprises 19 food and beverage companies, listed in the Nigerian Stock Exchange (NSE). The findings show that an increase in board size reduces the likelihood of financial statements fraud, though this is not significantly. An increase in board independence reduces the likelihood of financial statements fraud significantly. An increase in the number of females on the board increases the likelihood of financial fraud but this is not significant and finally, an increase in board remuneration increases the likelihood of financial statements fraud but this is also not significant. Board independence is the only component that has significant effect on the likelihood of financial statement fraud. The study recommends that corporate boards should include outside directors and represent a diversity of stakeholder interests. The gender mix should be appraised based on member's credential and not by mere female affirmation. Board remuneration should be determined within the context of sound corporate governance to prevent fraudulent practices.

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INTRODUCTION

1.1 Background to the Study

In the last twenty (20) years the world has seen great financial reporting frauds in the history of corporate reporting, resulting in the issuance of new rules and principles occurred by authorities and lawmakers across the globe. The consequences of the frauds led to corporate failures and loss of jobs and investments, which triggered studies into the causal factors of fraudulent financial reporting and ways to identify financial reports that are being manipulated. Hence, fraudulent financial reporting critically harms users of financial information, who depend on a company's code of ethics as it prepares its accounting reports. According to the ACFE, corporate fraud takes the forms of corruption, misappropriation of asset, and financial statement fraud. A survey by PricewaterhouseCoopers (PwC 2009) shows that, while asset misappropriation is the more prevalent, the losses are higher for frauds relating to financial statement manipulation. The report indicates that frauds relating to financial statements manipulation have a more serious implication as it impacts the entire economic value chain.

In the effort to identify ways to prevent corporate frauds, studies in recent times have been geared towards identifying and analyzing some factors that are relevant to corporate fraud and recommend preventive mechanisms to reduce incidence and attract public attention due to its significance in sustaining the business as a going concern. Hence, it has recently gained the attention of academics, regulators,

and market participants (Hemray, 2004; Bar-Gill & Bebchuck, 2003). The collapse of companies has created misgivings among stakeholders regarding the credibility and trustworthiness of accounting information presented in the financial reports. The board insitute corporate governance structure to deal with matters concerning board remuneration, composition, function, integrity, bias, effectiveness of committees, and more. Furthermore, Iskander and Chamlou (2000) identifies that the board plays a serious role to accomplish sustainable organisational growth.

The board size is a notable characteristic of the board. It denotes the sum of executive and independent directors. Another board characteristic is the independence of the board. There is also board gender diversity, which is the number females on the board. Lastly, this research takes interest in the board remuneration which describes the compensation scheme for board members. These characteristics will impact the general performance. Agency theory provides hypothetical premise for this study. The theory holds that an agency relationship arises in a business arrangement. Conflicts often arise where the agents' (managers) interests conflicts with principals'.

The study examines the effects of four (4) board characteristics on the likelihood of fraud in financial statement.

1.2 Statement of the Problem

ACFE (2012) report indicates that an organization records a loss of approximately 5% of its annual revenues to financial statement frauds. Asset misappropriation, financial statement fraud, and corruption represent 67%, 38%, and 27% respectively of corporate frauds. IP infringement and money laundering represent 15% and 12% respectively. Meanwhile, there is a significant empirical diversity about the relationship that exists between board characteristics and fraud likelihood. Studies on this subject matter are still far from a consensus outcome.

On the independence characteristics, Xie et al. (2003) specify that a higher ratio of independent directors yields slower earnings manipulation activities, implying an inverse correlation between the ratio of independent directors on the board and fraud likelihood. More so, the findings of Carcello and Nagy (2004) indicate that firms with a higher rate of independent directors are non-fraud compared to fraud companies. In the same light, Saksena (2003) finds that fraud likelihood is significantly reduced by the presence of more independent directors. On the contrary, Hasnan, Abdul Rahman, and Mahenthrian (2008), in a Malaysian study, find an insignificant relationship between independent directors and fraudulent reporting.

For Board Gender Diversity, the result of the finding of Ye, Zhang, and Rezaee (2010) for China indicates no link between gender diversity and risk of fraud,

which is similar to the findings by Owahso (2002) from the U.S. On the other hand, Cumming and Leung (2017) for China illustrates less likelihood.

For remuneration of the board, Persons (2012) indicates a varying relationship between the fraud likelihood and directors' remuneration. The study took from a collection of 111 fraud and non-fraud companies and logistic regression analysis. The findings reveal that the correlation between directors' compensation that is based on share-option and the fraud influence are positive and significant; whereas no such correlation is found with cash compensation.

The problem here is the lack of conclusiveness in previous researches, which makes the case for more studies in this field, and hence this study is conducted. Another justification for this study is that many of the related past studies were carried out in foreign environments, creating a jurisdictional gap for Nigeria. The existence of cultural, institutional, and regulatory differences across jurisdictions, means that simply applying the outcome of previous research works for the Nigerian environment will not be logical.

1.3 Research Questions

The research questions for the study are stated below:

- i. What effect does board size have on financial statements fraud likelihood in quoted food and beverage firms in Nigeria?

- ii. How is financial statement fraud likelihood affected by board gender diversity in quoted food and beverage firms in Nigeria?
- iii. What effect does board independence have on financial statements fraud likelihood in quoted food and beverage firms in Nigeria?
- iv. In what way does board remuneration affect financial statement fraud likelihood in quoted food and beverage firms in Nigeria?

1.4 Objectives of the Study

Broadly, the objective of this study is to examine the effects of board characteristics on the likelihood of financial statement fraud in food and beverage firms in Nigeria. The specific objectives are stated below:

- i. To examine the effect of board size on financial statements fraud likelihood of quoted food and beverage firms in Nigeria.
- ii. To investigate the effect of board remuneration on financial statements fraud likelihood of quoted food and beverage firms in Nigeria.
- iii. To determine the effect of board diversity on financial statement fraud likelihood of quoted food and beverage firms in Nigeria.
- iv. To investigate the effect of board remuneration on financial statements fraud likelihood of food and beverage firms in Nigeria.

1.5 Statement of the Hypotheses

In light of the research objectives, the under-listed hypotheses are stated:

- H₀₁: Board size has no significant effect on financial fraud likelihood in quoted food & beverage Firms in Nigeria.
- H₀₂: Board independence has no significant effect on financial fraud likelihood in quoted food & beverage firms in Nigeria.
- H₀₃: Board gender diversity has no significant effect on financial fraud likelihood in quoted food & beverage firms in Nigeria.
- H₀₄: Board remuneration has no significant effect on financial fraud likelihood in quoted food & beverage firms in Nigeria.

1.6 Significance of the Study

Globally, rise in financial reporting fraud has triggered concerns among regulators and legislators, leading to the formulation of policies to govern the operations of the market and corporate governance. Board characteristics influence corporate behaviours and steer the direction of focus for the management. It is an important part of the corporate culture that attracts regulatory attention, leading to issuance of frameworks that seek to guide the composition of the board, especially for quoted companies.

This research work is significant in evaluating the degree by which board characteristics could influence fraud behaviour. It will contribute to knowledge in this field and provide further dimensions to policymakers in developing a framework towards combating financial statements fraud.

The study will assist shareholders and other stakeholders in their evaluation of the financial performance of a company to protect their investment or interest. It will serve as a tool to auditors for evaluating the risks of financial statements fraud. Thus, the findings of this research will highlight the association between board characteristics and financial reporting fraud likelihood. It will also highlight whether the companies' published financial report is useful in the detection of fraud likelihood.

The study is also significant to the academics in the understanding of the theories and concepts that are relevant to this topic of the research, in relation to the broader areas of knowledge being considered.

1.7 Scope of the Study

The study covers nineteen (19) food and beverage quoted firms in Nigerian from 2008-2017, and the variables include board size, independence, remuneration and gender diversity. The Fraud likelihood is computed using the Beneish M-score model. The 10 years' timeframe is selected because it give the researcher a broader spectrum for data analysis. While there are other board characteristics including board ownership (domestic and foreign), board meetings, board composition, and CEO duality, this research examines four (4) characteristics, namely; board size, independence, gender diversity, and remuneration. This is because we find fewer studies on these characteristics when compared to the others.

More so, the majority of the previous studies focus on one or two board characteristics. The justification for selecting four characteristics for this research is to provide a wider scope in single research work to broaden knowledge in this field. Most previous studies are based on one or two board characteristics only.

CHAPTER TWO

LITERATURE REVIEW

2.1 Conceptual Framework

The conceptual framework explains what the various notions used in this research. It defines the relevant variables for the study and maps out how they relate with each other. This section focuses on the two key concepts of the study; financial statements fraud and board characteristics and attempts to examine both concepts definitively.

2.1.1 Financial Statements Fraud

Fraud defies a formal definition from the Generally Accepted Accounting Principle (GAAP). However, accounting literature and standard-setting faculties have proffered definitions from an accounting standpoint. Arens, Best, Shailer, Fiedler, Elder, and Beasley (2007) define fraud as a wrongful act performed intentionally with the motive of deceit or harming another. Kwok (2005) defines fraudulent reporting as the application of accounting practices that contravenes the provisions of GAAP. The Malaysian Institute of Accountants (2001), describes fraud as an intentional act of deception aimed at gaining illegal advantage often perpetrated at the managerial level of a company involving management staff, other employees, or outsiders. The definition is in line with the US American Institute of Certified Public Accountants (AICPA) Statements on Auditing Standards (SAS) No. 54, (1997).

Furthermore, PricewaterhouseCoopers (2005) categorized the types of fraud into three (3). Namely: (i) Fraud or Economic crime; (ii) Asset misappropriation; (iii) Financial misrepresentation. Economic crime is defined as a criminal act intending to result in a financial benefit to the perpetrator. Asset misappropriation is the theft of financial and non-financial assets of a company by its members of staff. Financial misrepresentation is the manipulation of an organisation's accounts and presented in a manner that falsifies the company's financial activities.

People are driven into fraud due to pressures from financial needs, family, frustration from work, and a desire to short-change the system. Fraud attempts will be successful in the presence of an opportunity coupled with a weak internal control mechanism. According to the PwC (2007) survey, the prompts for fraud are two; namely corporate and individual. Corporate prompts are an organizational culture that creates a breeding ground for fraud to take place, while individual prompts are reasons that are personal to the perpetrators. The survey enumerates some reasons why fraud is committed, including greed, temptation, ignorance, luxury lifestyle, and career failure. Moreover, the PwC (2009) global economic crime survey finds that the frequency at which fraud is being reported has significantly increased whereby financial statement fraud represents 38%.

The occurrence of financial statement fraud has a damaging implication that goes beyond financial losses to companies. The collateral damages inflicted by

financial reporting fraud on businesses will include staff demoralisation, falling stock price, loss of business relations, and reputational damage.

Zahra, Priem, and Rasheed (2007) view fraud as the deliberate deception and cheating of stakeholders and investors by the management of a company. Using similar elements, Arens (2007) describes financial statement fraud as the deliberate falsification of records with the treacherous goal of misleading users. Reports on the degree of losses and damages being suffered by firms due to deceitful financial reporting spur the conduct of this study. The aim is to leverage financial reports and highlight the likelihood of fraud occurring in a firm. According to Rezaee (2005), investors could make informed decisions based on transparency, uniformity, reliability, and preparing financial statements. The financial report serves as a key source of information for the management functions and decision making (Harvey, Atrill, McLaney & Jenner, 2003).

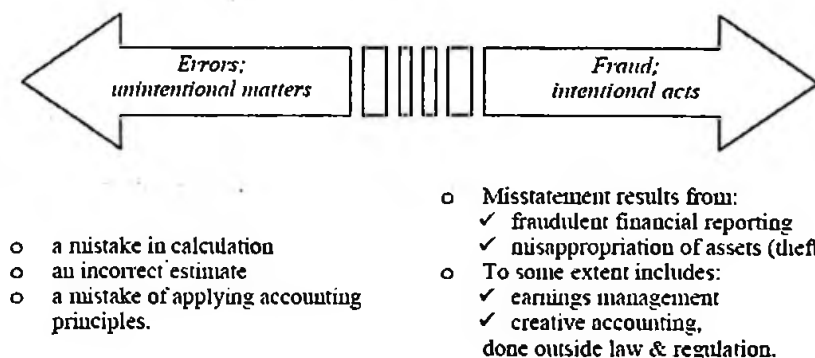
To the outside users, a company's annual report and accounts is the prominent source of information they could rely up on to plan and make enlightened investment decisions. Hence, it is critical that the contents of the annual reports and accounts represent the true and fair position of the affairs in the company. Unfortunately, it has become common to have companies that have posted good financial outlook filing for bankruptcy, due to engagement in fraudulent financial reporting practices over time.

Specifically, financial statement fraud comprises deceitful acts, including, falsification or manipulation of financial records and vouchers. This includes deliberately misapplying accounting policy and principles to produce an enhanced performance. Fraudulent financial reporting could be motivated by management's post a fantastic performance through tampering with the record of earnings to deceive users of the financial statement into believing that the results posted by the company are interesting. The act of accounts manipulation may take the forms of error, incorrect adjustment, improper estimate, bad judgments, and purposeful changing of accounting policy.

Various forms of pressures and incentives drive management into fraudulent financial reporting, such as a desire to maximize compensation-based performance, meet market expectations, as a way of saving their face. But it only postpones the firm's doomsday.

Financial statement fraud does more harm to corporate entities than the other types of fraud in terms of the value of total losses, which causes a greater impact on the affected entity, its employees, creditors, investors, shareholders, and the general public.

Figure 2.1: The Accounting Fraud Spectrum



Source: AICPA (2011)

Figure 2.1 above, presents a schematic for the accounting fraud spectrum. It shows that financial statements misrepresentation occurs along a spectrum that ranges from the state of errors (unintentional) to the state of fraud (intentional). This implies that financial reporting misstatement is part of a scale from low levels unintentional of violation of GAAP at one end to flagrant fraudulent financial misstatement at the other (Smaili and Labelle 2009). The left of the spectrum shows false records caused by accidental mistakes known as accounting errors. Errors may cause immaterial and material misrepresentation of accounting information. On the right side of the spectrum is false records caused by the intentional misrepresentation of the records known as fraud. Fraud may be perpetrated by management or employees of the company. The difference between an error and a fraud is the intent that underlies the misstatement. The GAAP has a laydown procedure for the correction of accounting errors.

2.1.2 Financial Statements Fraud Likelihood

Previous literature has not defined fraud likelihood as a concept. However, studies have been done towards determining the propensity of a corporate entity to commit fraud using fraud risk analysis and accounting procedures. Albrecht and Romney (1986) published the first empirical study, which shows the significance of using red flags to predict financial fraud. Subsequently, a lot of researches focus on evaluating the risk of a firm involving in financial fraud to determine the potentials for red flags. Most of the empirical studies are conducted through surveys that target internal or external auditors using questionnaires. Whereas the red flag studies grant some insight into the premise of fraud, the use of questionnaires is criticized for being voluminous, partial, non-predictive, and lack objectiveness (Cottrell and Albrecht (1994)).

However, the use of analytical procedures (financial ratios) in determining fraud likelihood has also been examined by other studies. Using the information in the public domain to formulate a fraud model, Calderon and Green (1994) put out an experimental study based on fraud risk. Persons (1995) employs accounting ratios that drive the prospects of fraudulent reporting and indicates that firm size, the composition of assets, capital turnover, and financial leverage are significant factors in fraud detection. Apostolou et al. (2001) use the SAS 82 risk factors of fraud to survey internal and external auditors. They find that board characteristics are crucial to predicting fraud.

In conceptualizing fraud, this study aligns with the AICPA (1997) definition, which views financial statements fraud as deceitful activities done to materially misrepresent accounting information. This research aligns with this view because it is underpinned by financial reporting.

2.1.3 Board Characteristics

These are board size, independence, gender diversity, and remuneration as key board characteristics.

2.1.3.1 Board Size

The number of members on the board of a company is identified as the board size. The Board comprises the Chairman, CEO, executive, and non-executive or independent directors for each financial year. Although there is no standard limit for board size, the board is mandated to constitute an appropriate mix of board members to prevent domination by a single member.

Hermalin and Weisbach (2003) argue that a small board size will be more effective than a large-sized one. They contend that too much membership on a board will breed fertile ground for agency problems to grow. More so, they could be waste and inefficiency, as some directors may be redundant. Jensen (1993) states that the changes brought about by technology have led to cost-cutting and pruning of physical manpower, thereby reducing the need for a large board size. The aforementioned views are further stressed by Chaganti, Mahajan, Sharma (2005)

in their study, in which they posit that it is easier to manage smaller boards than larger ones. They maintain that it is not realistic for a large board to effectively supervise the affairs of management. In a contrary view, Dalton and Dalton (2005), contend that a larger board has a higher potential for better board diversity, which will positively tap from skills, experience, gender-mix, and jurisdiction, while small boards are deprived of such crucial benefit of having a versatile board with diversified expertise steering the affairs of the company.

Lipton and Lorch (2002) suggests the restriction of board membership to seven or eight. They argue that numbers over seven or eight might be burdensome for the CEO to manage. Firm size is a function of other parameters, such as industry-standard, balance sheet size, customer and client base, shareholders fund, and staff strength.

Nonetheless, an effective corporate governance framework helps to stipulate how the board of a company or boards of companies in a designated industry should be constituted considering its size and other factors to achieve the highest level of effectiveness.

2.1.3.2 Board Independence

Board independence measures the objectiveness of a board. Studies have shown that a board that is properly constituted and has the appropriate combination with non-executive or independent directors is more able to defy control by

management and be independent than one that is dominated by executing directors (Ilaboya and Iyafekhe 2014). The necessity for independent directors to be present on the board has been recognised by stakeholders as a veritable tool for instituting sound management. To this end, regulators issue codes of corporate governance for adoption by industry operators. These corporate governance codes emphasise the need to make a minimum proportion of the board to be independent directors. For example, the Nigeria code of corporate governance 2018 does not stipulate the number of non-executive or independent directors to put a company's board, but it does recommend that they should constitute the majority.

2.1.3.3 Board Gender Diversity

Gender diversity is receiving higher significance among the other board characteristics in modern companies (Carter et al., 2003). Female directors are predisposed to onboarding varying viewpoints and capable of influencing important outcomes. Supporting the inclusion of female members on the board, Walt and Ingley (2003) are of the view that a balance needs to be struck between skills and character among directors for sound decision making, which is achievable through the appointment of more female members to the board. Fondas (2000) also argues in favour of female directors as likely to be more independent and objective. He opines that they are inclined to interrogate issues more impulsively (Bilimoria and Wheeler, 2000).

2.1.3.4 Board Remuneration

According to Cascio (2002), remuneration comprises cash payments, other employee benefits, and incentives that are given to the workforce to serve as motivation for improved productivity.

Managerial remuneration is the total emolument given to a management staff by its firm as compensation for services rendered. It comprises financial non-financial rewards. It is characteristically a combination of salaries, allowances, bonuses, company's share ownership, fringe benefits, and gratuities. The remuneration is usually structured to capture statutory deductions according to state regulations (e.g. taxes, pension contribution, contribution to housing funds and NHIS, etc.). The remuneration package of an organisations is important in directing the interest and commitment of management staff towards the goal of the organisation, which helps to align the interests of managers with owners of the organisation.

2.2 Empirical Review

The empirical literature review examines past empirical studies that are relevant to this research.

2.2.1 Board Size and Fraud Likelihood

To effectively perform its oversight responsibility on management, the board needs to be of appropriate size. Too many members would render the board obese

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2.2 Empirical Review

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2.2.1 Board Size and Fraud Likelihood

To effectively perform its oversight responsibility on management, the board needs to be of appropriate size. Too many members would render the board obese

and ineffective, while too few members will make the board fragile and inefficient. A weak, ineffective, and inefficient board will increase the prospect of committing fraud. In strengthening its oversight responsibility, an attempt is made to determine the number that is most appropriate for a board. Lipton & Lorch (2002) suggests that board membership should be limited to seven or eight, arguing that more numbers will be too much for a CEO to manage. Yermack (1996) opines that a board of fewer than 10 members is more effective at performing its function. Beasley (1996) also finds that higher fraud likelihood is associated with a larger board size because it undermines the effectiveness of the controls. Due to the varying nature of businesses, deciding a generic board size as optimal for any company will be loose. The most suitable board size for a firm depends upon factors such as firm size, industry practice, line of business, and regulatory requirement in determining the most suitable board size toward preventing financial reporting fraud.

In an Australian study, Sharma (2014) investigates the link between fraud and the size of the board. His findings reveal that adding a member to the board leads to a reduction in the likelihood of fraud. Conversely, Italian research by D'Onza and Lamboglia (2014) covering 2001-2011 examines a similar relationship and finds that raising the number of board directors leads to a rise in the likelihood of fraudulent reporting. Optimal board size cannot be fixed in anticipation of using that to strengthen the credibility of accounting reports. Increasing the number of members on the board is capable of creating redundancy and reduce the efficiency

of controls in some firms, whereas doing so in some other firms may create a complement and strengthen the board in avoiding financial fraud.

Yang and Buckland (2010) study quoted firms in China covering a period of 11 years (1996 – 2007) and develops a paper analysing the incidents and causes of fraudulent reporting, which highlights how corporate governance correlates with financial reporting fraud. It finds no significant difference between the board size of fraud-performing firms and non-fraud ones. This implies that it is immaterial whether the size is large or small when compared to the conscious attitude of the members towards preventing financial statement fraud.

Yuemei and Yanxi (2007) find that the earnings management activities decrease when the number of directors on the board is increased. This is in alignment with the findings of Wen Yao and Qin (2008). Klai and Omri (2011) equally find a relationship between the size of a board and quality of financial reporting. In contrast, Xia and Zhao (2009) did not find a significant link between the size of the board and financial misstatement. The finding is similar to those of Gulzar and Wang (2011) and Sarikhani and Ebrahimi (2011). It is imperative to realise that the size is less material in determining its capacity to prevent fraudulent accounting. A smaller board size may be more effective in constraining fraud financial reporting due to its ability to swiftly respond to signal. In the same way, a larger board size may achieve same due to shared board responsibilities among members. Conversely, a smaller board may be overwhelmed by volume

responsibility fail to exert adequate control to prevent fraud. Similarly, too many members on the board may cause redundancy and weaken controls meant to prevent fraud.

Alaryan (2012) examines the roles of board size, composition, and leadership structure in deterring financial manipulation. The author uses data from the 5 years (2010-2014) financial reports of non-financial companies. The findings indicate that the correlation between size and manipulation of accounting records is not significant. The findings cannot be generalized as there are nuances that could not be overlooked in other circumstances.

In a Malaysian study conducted by Mohd, Salleh and Othman (2016) on corporate fraud; the findings show that board size and duality are insignificant in deterring fraud. The findings are similar to Samili and Labelle (2009); Chen et al. (2006); Bradbury, Mak and Tan (2006) and Faber (2005). These show that the size of a board is not as crucial as its corporate governance mechanism in determining its tendency to engage in financial fraud. There are mixed results for testing the relationship between fraud likelihood and board size are mixed. There is no standard size or number that best constitute a board.

2.2.2 Board Independence and Fraud Likelihood

The success of independent directors in deterring accounts manipulation practices is significant according to some studies, while some studies find it as not

significant. Borokhovich, Parrino and Trapani (2002) and Mulgrew and Forker (2006) find that a greater number of independent directors disincentivise earnings management. This indicates a negative correlation between board independence and fraud. The finding is consistent with that of Saksena (2003). A higher percentage of independent directors provide better oversight of management accounting functions, which could minimise the tendency for fraudulent accounting practices.

In a related study by Carcello and Nagy (2004), based on fraud and non-fraud companies, the result is that firms that present with a higher rate of independent directors turned out as non-fraudulent while those with a lower percentage turned out as fraud companies. Similar findings were made by Peasnell et al. (2005) presenting that companies whose percentage of independent directors on the board are higher have less likelihood of manipulating financial statements. However, the vulnerability to commit accounting fraud, that may be created by having a lower rate of independent directors does not connote that it will be exploited by every company.

However, in a Malaysian study by Abdullah, Yusof and Mohamd-Nor (2010), they examine the effects of board independence and institutional shareholding on fraud likelihood, and find no significant effect, whereas institutional shareholding does have. Similarly, Hasnan et al. (2008) also find for Malaysia that the effect of a higher rate of independent directors on deterring financial reporting fraud is not

significant. Bradbury, Mar and Tan (2006) also has similar findings. These findings raise some doubt upon claims that greater number of independent directors makes the board more effective in its oversight function over the management. Meanwhile, majority of findings contradict this result.

Using data from the Wall Street Journal, Uzun et al. (2004) study fraud firms in the United States for a period covering 1978 to 2001. The study investigates the relationships between selected variables and corporate fraud. They find that fraud likelihood was low when the percentage of independent directors is higher on the board. The finding is akin to those of a Canadian study by Park and Shin (2004). A lack of members with accounting knowledge makes the presence of independent directors less effective. Therefore, a mere higher increase in the independent directors does not improve board effectiveness in overseeing and controlling management financial activities, except it has one or more experts among the independent directors.

2.2.3 Board Gender Diversity and Fraud Likelihood

In a study by Terjesen, Sealy and Singh (2009) covering 43 countries, they find that the percentage of women on the board varies from under 1% to a little above 20% with Japan having the least at less than 1% and Slovenia having the highest at 22%. Others are 15% for the US, Australia and China (10%), Portugal, France, Denmark, and Germany (5%) while the rest have less than 5%. The situation is common among many countries around the world including Nigeria. Countries

around the world are introducing policies and legislation that seek to give a minimum percentage of female affirmation in positions of service. For instance, the Norwegian government mandated that quoted firms have a minimum of 40% female board membership on their board by 2008. Minimum quotas for female board membership in some European countries are captured by Cabo, Gimeno, and Nieto (2011) in a report: in Spain, large quoted firms 40% by 2015, in France, quoted firms 40% by 2017, in Italy, quoted and government enterprises 30% by 2015, and in Germany, quoted firms 30% by January 2016.

In the U.S Farrell and Hersch (2005); Rosener (2003) find that the number of women taking up executive responsibilities, including board membership in firms, has been growing the last two decades. The growing interest in female affirmative action on board membership attracts studies on the effects that the having of women on board of a firm brings. There is no resolution as to whether the presence of women on the board in a given ratio will increase or decrease financial statement fraud likelihood. The divergence of the result of the findings implies that continuous research in this area is imperative.

Ye, Zhang, and Rezaee (2010) studied 5,216 firms in China covering a period of six (6) years (2001–2006). The study finds no impact from female executives with respect to exhibiting accounting manipulations. The study of Cumming and Leung (2017) adds to previous studies that investigate the correlation between securities fraud and female membership on the board. Using records of 1,422 fraud cases

from the China Securities Regulatory Commission (CSRC) database, covering the year 2001 to 2010 on the inclusion of a woman, the study finds an increase in the marginal effect of raising the percentage of women (up to 50%) on the board at a diminishing rate. The likelihood of fraud was decreased by 14.6% after an increase in the proportion of women.

Capezio and Mavisakaly (2016) conduct a study of quoted firms in Australia. They study the correlation between board gender diversity and organisational fraud. The finding shows that an increased number of women on the board is linked to a decreased likelihood of fraud. Although, there is a divergence of result in the findings, an increase is more associated with a decrease in the probability of fraud occurrence.

Abbott, Parker, and Presley (2012) explore the relationship between gender diversity with accounting fraud, based on a U.S. General Accounting Office (2002) data. The study constructs a sample of 278 annual financial reporting restatement in control firms. It finds that there is negative correlation between female board membership and financial fraud likelihood. After controlling for some fraud-related factors, the findings indicate further that correlation is a significant.

In Nigeria, Yau, Victor, Emmanuel & Jide (2014) empirically study the effect of having a female director on the quality of financial reporting, using a set of 20 listed companies in Nigeria. The results reveal that the presence of one female

director does not particularly enhance the financial reporting quality. Nevertheless, financial reporting credibility is enhanced, as the ratio of female directors on the board grows. The chances of managerial manipulation of accounting records are minimised, when the quality of reporting is high.

2.2.4 Board Remuneration and Fraud Likelihood

In a China study by Conyon and Leong (2013). They explore the relationship between compensation and fraud among corporate entities based on panel data from quoted firms covering 2005 to 2010. The study uses propensity score methods and fixed effects, and the findings show that the relationship between remuneration and organisational fraud is significantly negative. This indicates that corporate entities with lower compensation schemes are more involved in fraud. Perceived low executive compensation may create disgruntledness in the mind of members and cause them to rationalise fraudulent behaviours. Hence increase in their remuneration may create satisfaction and keep their mind away from fraud pressure.

In a study by Ling (2016) to examine if executive compensation is associated with financial fraud likelihood, data on compensation was collected from 20 firms that comprise 10 fraud and 10 non-fraud firms. Both sets of firms are aligned according to industry and number of employees. The findings suggest that highly compensated executives have a high tendency to engage in financial fraud practices. This implies that executive compensations that are based on

financial performance put pressure on members to enhance results to earn their compensation. This will cause the members to accept a window-dressed financial report.

In a study by Merle, Hanlon and Edward (2016), they compare share-based reward systems for executives in fraud-performing firms with two other sets of firms not accused of same, based on a U.S. Securities and Exchange Commission (SEC) data, covering 2006–2013. The study explores the relationship between share-based incentives for execute and fraudulent accounting. They find no positive correlation linking executive equity incentives to fraudulent reporting. This is at variance with related studies that find incentives from equity-based compensation and the shareholding to be linked with fraud increase.

Using regression analysis, Hab, Tarsalawska and Zhan (2016) examine the effect of share-based compensation on organizational fraud likelihood. Ownership and corporate governance attributes were held as the controlled variables. The study selected quoted firms from the Shanghai and Shenzhen Stock markets. The findings support that the fraudulent reporting tendency is increased by share-based incentives for executives.

Erickson, Hanlon and Maydew (2004) also based their study on investigating the link between share-based remuneration and fraudulent accounting. The study covers selected firms accused of fraudulent reporting against those not accused of

same based on data from the SEC covering 1996-2003. The study finds that financial statement fraud likelihood increases according to rate of share-based executive compensation, holding financial performance, governance characteristics, firm size, financial distress and probability of external financing as the control variables. They find that fraudulent reporting is less likely. However, an increase in the rate of share-based remuneration by one standard, makes fraud more likely by nearly 68%. This implies that tying a component of the executive compensation to profit puts pressure on managers to manipulate and report higher earnings.

Lew (2014) explores the association between accounting misstatement bonus-based employee compensation scheme in Taiwan. The study reveals that account manipulation is motivated by a bonus-based employee reward package. The study uses the regression analysis and finds that rewarding performance using a bonus-based scheme engenders earnings management practice. The granting of performance-based incentives bonuses habitually stimulates executives to commit financial misstatements to ensure that they earn associated bonuses. Bonus-based compensation schemes have constructive effects in motivating staff to meet performance targets. However, the scheme needs to put in place, a mechanism that checks the tendency for financial manipulation induced by management's desire to receive performance bonuses.

Chuang, Chang, Song and Tsai (2013) studied the effects of equity incentives on earnings manipulation and insider trading, using quoted firms and compensation data from the Taiwan Stock Market and Taiwan Economic Journal database respectively. The sample consists of 4,570 firms, and the results show that firms having high equity incentive-based reward scheme for managers show more earnings manipulation activity among managers. They also find that the reward scheme is linked to insider trading. The result is consistent with most findings that indicate a positive correlation between the remuneration of board and the likelihood of fraudulent reporting

Chan, Tsai and Li (2015) conduct an empirical study to examine the correlation between executive perquisites and accounting fraud likelihood. Their results indicate that effective oversight of executive officers' powers along with giving financial packages to top management decreases the likelihood of financial fraud committed by top executives. This a form of control established to check fraud pressure on management staff.

2.3 Theoretical Framework

The theoretical framework introduces and describes the theory that underlies the research problem. It states and discusses the theories that relevant to the problem.

2.3.1 Agency Theory

Agency theory has been examined extensively in various publications and received positive observations. Generally, the agency theory demonstrates the conflict of interest that arises between business owner (client) and its appointed manager (agent). It emphasizes the subsistence of a contract between managers

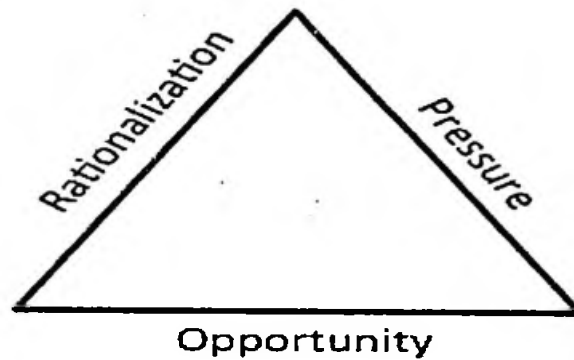
and owners as key hypotheses of the theory. Managers of the company have a lot of latitude and could leverage that to pursue self-interest.

The relationship between board characteristics and fraudulent reporting can be analyzed within the theoretical framework of the agency theory (Demsky, 2003). Dey (2008) views the theory within the context of conflicts of interests, which tend to arise between shareholders and management staff due to separation of the manager from the owner. The information asymmetry inherent in the arrangement can favour the managers to pursue personal interests, which will create agency problems for the company. A usual causality in a company that is suffering from agency problems under a weak corporate governance structure, is the financial reports. Hence, agency problems breed financial reporting malpractice among managers of a company.

2.3.2 Fraud Triangle Theory

In research to discover what drives people to breach trust and commit fraud, Cressey (1953) develops the Fraud Triangle Theory (FTT). The theory is significant to the study as the agency theory is a fiduciary relationship built on trust. In his studies, Donald Cressey argues that there is always a reason for what people do. He set up two (2) yardsticks and on those bases interviews, 250 criminals in 5 months: that (i) people embrace duties of trust faithfully; and (ii) conditions cause them to breach the trust. He submits that pressure, opportunity, and rationalization are three (3) elements that must be present.

Figure 2.2: Fraud Triangle



Source: Cressey (1953)

Figure 2.2 presents the three (3) elements of Cressey FTT.

(i) Pressure (Incentive/Motivation)

Lister (2007) identifies pressure as a significant driver to commit fraud. According to Albrecht et al., (2006), financial pressure accounts for the causes of about 95% of fraud. Vona (2008) further examines the motivations for fraud and indicates that organisational and personal forces are proxies for the pressure to commit fraud. Pressure may be perceived from debt, greed, gambling, extravagant lifestyle, poverty, family health, and financial problems.

(ii) Opportunity

Rae and Subramanian (2008) describe the opportunity as the power and ability of an employee to identify a weakness of their organization's system and exploit it to commit fraud. Opportunities are usually created where the accounting, control, and governance systems of an organisation are weak. Cressey (1953) postulates that the fraud occurrence is highly probable, where the chances of being caught are low. Fazli, Mohd and Muhammad (2014) analysed opportunity using three (3) proxies. These are CEO duality, related party transactions, cash flow rights, and the

difference between related party transactions and control. Related party transactions are ranked second and third amongst the highest occurring opportunity by Moyès et al. (2005), and Wilks and Zimbelman (2004) respectively.

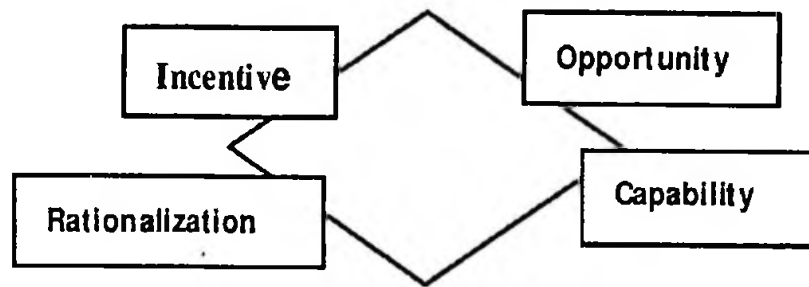
(iii) Rationalisation

The rationalisation is a defense mechanism used by people to justify scandalous behaviours or feelings and explained them in a manner that attempts to make the act seem reasonable or logical. Rationalisation is the act of justifying that a scandalous conduct is not a criminal behaviour. According to Rae and Subramanian (2008), Rationalisation is used by employees to justify fraudulent acts due to dishonesty or other unethical conduct. Cressey (1953) states that rationalization is not a post fraud afterthought but rather a necessary element of it before it takes place, as part of the motivation. The rationalisation of financial fraud could be "the company is owing me, therefore, am taking from my money", "I am only borrowing some money", "I need to save my family", "everyone else has done it".

2.3.3 Fraud Diamond Theory

A fourth element to the FTT was introduced by Wolfe and Hermonson (2004) in their 2004 research, published in the CPA Journal. The element is Capacity/Capability. The new element expanded the FTT. They opine that even though pressure opportunity and rationalization may exist, it takes capacity/capability for fraud to succeed. Hence, without it, fraud is unlikely to happen.

Figure 2.3: Fraud Diamond



Source: Wolfe and Hermonson (2004)

Figure 2.3 presents the four (4) elements of Fraud Diamond.

(iv) Capability

Capability is the condition of possessing the skills, traits, or competence necessary for a fraudster to successfully execute fraud. Some of the traits that support capability element intelligence, ego, position, coercion, and deceit are Wolfe and Hermanson (2004).

2.3.4 Fraud Pentagon Theory

Crowe (2011) in his work pushes the frontier further and added a new angle to the fraud diagram. The new element is Arrogance. This addition brings the fraud theory to comprise five (5) elements. Namely, pressure, opportunity, rationalization, capability, and arrogance. The research finds that 70% of organizational frauds are committed by members with a profile that features a mix of greed, pressure, and arrogance. Such profiles are common to top executives.

Figure 2.4: Fraud Pentagon



Source: Crowe Horwarth (2011)

Figure 2.4 presents the five (5) elements of the Fraud pentagon.

(v) **Arrogance**

Crowe (2011) opines that arrogance is an attribute that exhibits a superiority complex and ignorance resulting from greed, and the thought by a member of a company that they are above the internal controls established by the organisation. Yusof & Simon (2015) discourses that a politician who doubles as the CEO of an enterprise is a signal for a higher financial fraud likelihood.

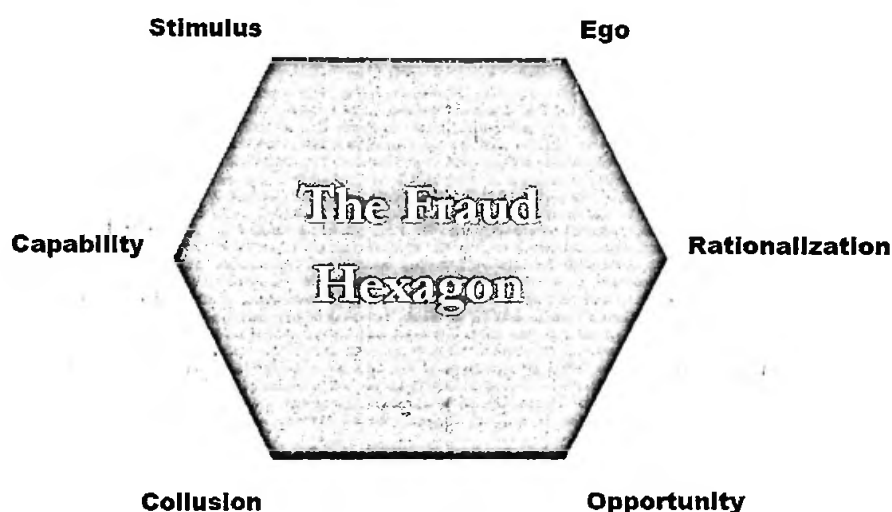
2.3.5 Fraud Hexagon Theory

Vousinas (2019) in his paper aims to advance on the theory of fraud by extending the fraud pentagon theory. He argues that preceding models need to be updated to adjust to contemporary developments in the fields and the ever transforming fraud landscape. He builds on the theoretical background to create a new model so as to

enhance the understanding of the major factors that drive fraud. The author renamed 'Pressure' as 'Stimulus' and 'Arrogance' as 'Ego' to formulate the S.C.O.R.E model, which is graphically depicted in the Fraud Pentagon. He goes further by adding a sixth element named 'Collusion' as needed to better apply

fraud theory to the cases of white-collar crimes, and produced a S.C.C.O.R.E model. So the S.C.O.R.E model becomes the S.C.C.O.R.E model, with the addition of the sixth element of collusion, resulting in the Fraud Hexagon, as shown below.

Figure 2.5: Fraud Hexagon



Source: Voutsinas, G. L. (2019)

Figure 2.4 presents the six (6) elements of the Fraud Hexagon.

(vi) Collusion

He postulates that once there is collusion between employees, or between employees and external parties, fraud is much harder to stop. The significance of collusion as a main factor in committing fraud is also indicated in the ACFE Report (2016) on Occupational Fraud and Abuse, which illustrates that almost half of the examined cases involved multiple perpetrators colluding to commit fraud, and the greater the number of perpetrators involved, the higher the amount of losses.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Research Design

The ex-post facto is utilized for this study. The justification for using the research design is that it is the most appropriate for the study because the independent variable (board characteristics) is studied in retrospect for possible effects on the dependent variable (financial statements fraud). Therefore, the research predicts the likely causes of an event that had already taken place, such as using attributes that are present with the board members of a company to predict the likelihood of manipulating accounting records.

3.2 Population, Sample and Sampling Techniques

The population comprises nineteen (19) quoted food and beverage companies in the Nigerian from 2008 -2017 (10 years). The selection of the sector for the research is justified by the absence of previous similar work in that area.

3.3 Methods of Data Collection

Secondary data is collected from the annual financial reports of the quoted firms for a period of ten (10) years in this research. Financial statements of the quoted firms were used because of their availability and accessibility, which offer a more dependable platform for comparability of outcomes. The 10 year period gives enough room for proper analysis to be carried out.

3.4 Techniques for Data Analysis

The study offers a situation whereby the fraud likelihood outcome as observed (dependent variable) has two possibilities only, which are normally coded in binary logistic regression as "0" and "1". The logistic panel regression technique is adopted for data analysis, to model the binary outcome variables, which is represented as a probability function. However, descriptive statistics and correlation analysis are conducted before the binary estimation is derived.

The model is based on logistic panel regression and is presented below. It has previously been applied by Abdullah, Yusof and Mohamd-Nor (2010).

$$P_{jt}(FFL=1) = 1 / (1 + e^{-Z})$$

$$= 1 / \{1 + \exp [-\beta_0 + \beta_1 X_{1jt} + \mu_{jt}]\}$$

$$P_{jt}(FFL=1) = 1 / \{1 + \exp [-\beta_0 + \beta_1 BSIZE + \beta_2 BDIND + \beta_3 BDDIV + \beta_4 BDREM + \mu_{it}]\} \text{-----(1)}$$

The Control Variables are: Leverage (LEV) and Firm Size (FS).

Thus, the model is denoted as follows:

$$P_{jt}(FFL=1) = 1 / \{1 + \exp [-\beta_0 + \beta_1 BSIZE + \beta_2 BDIND + \beta_3 BDDIV + \beta_4 BDREM + \beta_5 FS + \beta_6 LEV + \mu_{it}]\} \text{-----}$$

$$\text{-----(2)}$$

Where: FFL= Financial Fraud Likelihood, exp = exponential function; $\beta_1, \dots, \beta_n$ = slope coefficients; $X_1, X_2, \dots, X_n$ = explanatory variables *BDREM*=Board remuneration; *BDIND*=Board independence, *BDSIZE*= Board size, *BDDIV*= Board gender diversity, $i = i^{th}$ firm, t = time period, μ_{it} = Model disturbance term

3.5 Justification of Methods

The selection of the logistic binary regression is justified by the landscape of the study, whereby the dependent variable (i.e. fraud likelihood) is dichotomous. That means when fraud is likely, it assumes the value of "1" and "0" when unlikely. This will fit perfectly into the Beneish M-score model that is used to measure fraud likelihood; whereby if M-score is less than -2.22, fraud is unlikely and hence coded "1" and if M-Score is higher than -2.22, fraud is likely and then coded "0".

3.6 Measuring of Financial Statements Fraud

(i) Beneish M-Score

Beneish (1999) creates mathematical model that utilises the accounting records of a firm to compute financial ratios that are used to determine the likelihood (high probability) that the earnings being reported by a firm to have been compromised.

Eight (8) accounting ratios are used to compute the Beneish M-Score.

- i. Sales Growth Index (SGI)

$$SGI = \text{Sales}_t / \text{Sales}_{t-1}$$

- ii. Sales General and Administrative Expenses Index (SGAI)

$$SGAI = (\text{SG\&A Expense}_t / \text{Sales}_t) / (\text{SG\&A Expense}_{t-1} / \text{Sales}_{t-1})$$

- iii. Days Sales in Receivables Index

$$(\text{DSRI}) \text{ DSRI} = (\text{Net Receivables}_t / \text{Sales}_t) / (\text{Net Receivables}_{t-1} / \text{Sales}_{t-1})$$

- iv. Gross Margin Index (GMI)

$$GMI = [(\text{Sales}_{t-1} - \text{COGS}_{t-1}) / \text{Sales}_{t-1}] / [(\text{Sales}_t - \text{COGS}_t) / \text{Sales}_t]$$

- v. Depreciation Index (DEPI)

$$DEPI = (\text{Depreciation}_{t-1} / (\text{PP\&E}_{t-1} + \text{Depreciation}_{t-1})) / (\text{Depreciation}_t / (\text{PP\&E}_t + \text{Depreciation}_t))$$

vi. Asset Quality Index (AQI)

$$AQI = [1 - (\text{Current Assets}_t + \text{PP\&E}_t + \text{Securities}_t) / \text{Total Assets}_t] / [1 - ((\text{Current Assets}_{t-1} + \text{PP\&E}_{t-1} + \text{Securities}_{t-1}) / \text{Total Assets}_{t-1})]$$

vii. Total Accruals to Total Assets (TATA)

$$TATA = (\text{Income from Continuing Operations}_t - \text{Cash Flows from Operations}_t) / \text{Total Assets}_t$$

viii. Leverage Index (LVGI)

$$LVGI = [(\text{Current Liabilities}_t + \text{Total Long Term Debt}_t) / \text{Total Assets}_t] / [(\text{Current Liabilities}_{t-1} + \text{Total Long Term Debt}_{t-1}) / \text{Total Assets}_{t-1}]$$

M-Score is computed as follows;

$$\text{M-Score} = (-4.84 + 0.92) \times (\text{DSRI} + 0.528) \times (\text{GMI} + 0.404) \times (\text{AQI} + 0.892) \times (\text{SGI} + 0.115) \times (\text{DEPI} - 0.172) \times (\text{SGAI} + 4.679) \times (\text{TATA} - 0.327) \times \text{LVGI}$$

Where M-Score is lower than -2.22, account manipulation is unlikely

Where M-Score is greater than -2.22, account manipulation is likely

(ii) The Jones Model

Jones (1991) introduced this model, which diminishes DeAngelo (1986) and Healy (1985) assumptions on non-discretionary accruals. The model assumes that changes in economic situation of a company affect accruals and then targets to manage the effects of such changes on non-discretionary accruals. In her work, she notes that the model is exposed to a significant limitation. It extracts

the accruals discretionary component and assumes that revenues are not discretionary (Dechow et al., 1995).

(iii) The Modified Jones Model

After comparing several models used to detect earnings manipulation in financial statements, Dechow et al. (1995) conclude that modifying the Jones model produces by adding a change in receivables produces a stronger model because it assumes that all credit sales changes in the period derive from earnings management. The modified Jones model removes the tendency for conjecture inherent in the previous Jones Model (Dechow et al., 1995).

The model proposes that total change in revenues should be presented less change in receivables when using the Jones model to measure the non-discretionary accruals.

Non-discretionary accruals are estimated below:

$$NDA(i,t) = \{a_1 [1/A(i,t-1)]\} + \{a_2 [\Delta REV(i,t)] - [\Delta REC / (i,t-1)]\} + \{a_3 [PPE(i,t)]/[A(i,t-1)]\}$$

Where ΔREC stands for change in net receivables in year t , less net receivables in year $t-1$ scaled by total assets $t-1$.

3.6.1 Justification for adopting the Beneish M-Score Model

The Beneish M-Score Model is adopted to fill a research methodology gap observed for the few related works previously done in Nigeria. The model provides unique contextual findings for Nigerian. The related studies conducted

in Nigeria did not use the Beneish M-Score model to measure fraud likely wood. Meanwhile, the Beneish M-score is receiving a growing justification for its appropriateness in detecting fraud likelihood over the Jones Model, which also justifies the model adoption.

CHAPTER FOUR

PRESENTATION AND ANALYSIS OF RESULT

4.1 Data Presentation

Results of the descriptive statistics, multicollinearity, and mixed-effect logistic regression are presented and analyzed.

Table 4.1: Descriptive statistics

	BDSIZE	BDIND	BDDIV	BREM	Beneish M-score
Mean	10	0.63	2.165739	.0070822	35164.66
Maximum	20	0.82	5	.5767	4618444
Minimum	4	0.17	0	.0001	-997.37
Std. Dev.	3.0	2.7667	1.1632	.042673	350294.2

Source: Researcher's compilation (2019)

Where:

BDSIZE=Board size

BDIND= Board independence

BDDIV= Board gender diversity

BDREM= Board remuneration

The average BDSIZE is about ten (10) with maximum and minimum values of 20 and 4, respectively, with a standard deviation of 2.766. The average value of BDIND is 0.63, indicating that approximately 0.63% of the board are independent directors, having a maximum value of 0.82 and a minimum value of 0.17. The value of BDDIV is 2.165, suggesting on average that there are two female members on the board with a maximum value of 5 and minimum values of

0., BDREM is 19.728m averagely and has maximum values of 87.029m and a minimum value of 12.728m.

Table 4.2 Variance Inflation Factor (VIF) Test

Variable	VIF
BDSIZE	1.9151
BDIND	4.910936
BDDIV	4.615146
BDREM	2.82011

Source: Researcher's compilation (2019)

The VIF determines how much the dependent variable (fraud likelihood) varies as a result of the effects of the independent variables (board characteristics). Essentially, a VIF greater than 10 is viewed as a call for concern. However, as seen in table 4.2, no VIF values are greater than 10. Hence, none presents an indication of multicollinearity.

Table 4.3 Hausman Test

	(b)	(B)	(b-B)	sqrt (diag (V_b-V_B))
fe	re	Difference	S.E.	
BDSIZE	-.1643561	-.1521772	.012179	.1200116
BDDIV	.3161444	.2204542	.0956902	.1156896
BDIND	-2.974603	-3.448517	.4739146	.7018418
BREM	17.20557	20.80401	-3.598445	13.13887

Note: b = consistent under H_0 and H_a ; obtained from fixed effect logit, B = inconsistent under H_a , efficient under H_0 ; obtained from mixed fixed logit

Test: H_0 : difference in coefficients not systematic

$$\chi^2(4) = (b-B)'[(V_b-V_B)^{-1}](b-B) = 1.27$$

$$\text{Prob} > \chi^2 = 0.8657$$

Hausman's test is used to evaluate the appropriateness of either the fixed or the random effect approach of the panel data analysis. The test result shows the chi-

square value of (1.27) and a probability value of (0.866), thereby exceeding the p-value of (0.05). This upholds the superiority of the fixed effect model.

Table 4.4: Model Efficiency

	Model	Obsll (null)	ll (model)	df	AIC
BIC					
fe	185	-84.26727	-81.27799	4	170.556
re	185		-119.3281	6	250.6563
					269.9784

Note: fe=fixed effect model; re=Random effect model

According to the model efficiency table, the fixed effect model has 170.57 as Akaike Information Criterion (AIC) and the random effect model has 250.66 AIC. Therefore, the fixed effect model is more efficient than the random effect model because of the minimum AIC value. Thus, every other analysis and interpretation is based on the fixed effect model.

Table 4.5: Logistic Regression for Fixed Effect and Random Effect Models

	Aprori sign	Fixed effect model Coefficient Standard error () p-value { }	Random effect model Coefficient Standard error () p-value { }
BDIND	+	-2.975* (1.51) {0.04}	-3.45 (1.34) {0.01}
BDSIZE	+	-0.164 (0.144) {0.256}	-0.152 (0.081) {0.059}
BDDIV	+	0.316 (0.222) {0.154}	0.22 (0.189) {0.245}
BDREM	+	17.21 (29.4) {0.556}	20.8 (26.13) {0.392}

Source: Researcher's compilation from Stata 14

Table 4.6: Model Diagnostics

Likelihood ratio		36.40
------------------	--	-------

p-value		0.004
Hosmer-Lemeshow		5.98
Prob.		0.2008

Source: Researcher's compilation from Stata 14

The Hosmer–Lemeshow test has a probability of 0.2008 and that is an indication of a good fit to the data, confirming that the overall model fits well. P-value <0.05 is an indication that the ratio of likelihood is significant and goes to assert that the specified logistic model and independent variables are more effective than the null model. As seen in Table 4.5, the coefficient of BFSIZE is -0.164 which implies that an increase in board membership decreases the likelihood of fraud. The coefficient of BDIND is -2.98 and indicates that an increase in independent directors decreases the fraud likelihood. The coefficient of BDDIV is 0.316 and implies that when the number of female directors is increased, the likelihood of fraud increases. The coefficient of BDREM is 17.21, which infers that when the remuneration of the board increases, the likelihood of fraud increases.

Table 4.7: Conditional Marginal Effects (dy/dx)

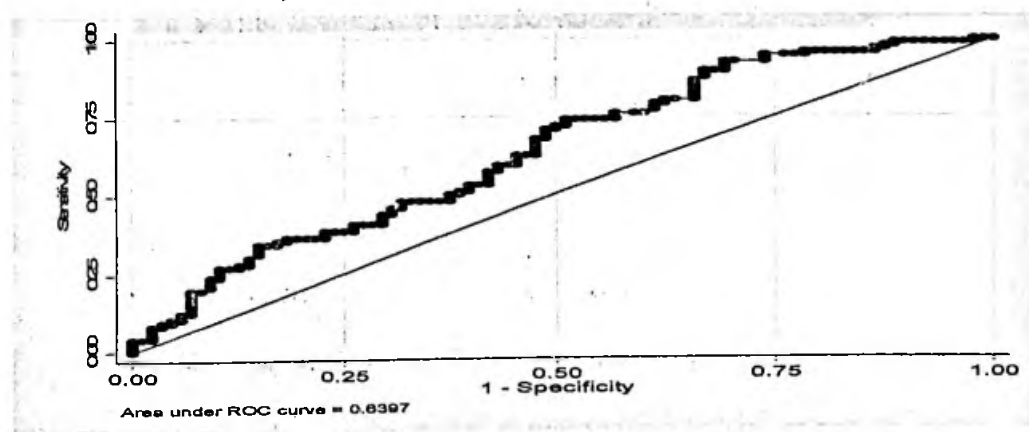
	A priori sign	dy/dx Standard error () Z-value { }
BFSIZE	+	-0.034 (0.041) {0.408}
BDIND	+	-0.62* (0.278) {0.026}
BDDIV	+	0.66 (0.223) {0.054}
BDREM	+	3.58 (5.932) {0.546}

Source: Researcher's compilation from Stata 14

Marginal effects illustrate the change in probability when there is one unit increase in the predictor (independent variable). These are useful in interpreting the outcome of a model. When BFSIZE increases by one unit (holding other variables constant), the probability of fraud occurrence decreases by 0.034 units, but not significant at 5% and hence caution is observed in making inferences. When BFINDC increases by one unit, the fraud likelihood reduces by 0.62 and this is significant at 5%. When BDDIV is increased by one unit, the prospect of fraud to occur increases by 0.066 units, but not significant at 5%. With an additional unit increase in BDRM, the probability of fraud occurrence increases by 3.58 and this is also not significant at 5%. The analysis reveals that BFINDC is the only component that has a statistically significant influence on fraud likelihood.

4.1.1 Evaluating Predictive Ability of the Model

Figure 4.1 shows that the ROC curve for the model is 0.64, which is different from 0.5 on a 5% significance level. This implies that the fixed effect logistic regression model performs well in predicting the financial fraud likelihood of non-financial companies. Figure 4.1: ROC Curve



Source: Stata 14 Output

4.2 Data Analysis and Results

4.2.1 Board Size and Fraud Likelihood

According to the analysis and results, the coefficient of BDSIZE is -0.164 which indicates that when the board increases in size fraud likelihood decrease, though not significant at 5%. Hence, this study accepts the null hypothesis that board size does not have a significant effect on financial statements fraud likelihood.

4.2.2 Board Independence and Fraud Likelihood

According to the analysis and results, the coefficient of BDIND is -2.97 which infers that when board independence is increased, the likelihood of financial fraud decreases, and this is significant at 5%. Additionally, marginal effects estimates confirm fraud likelihood will be affected by any slight changes in BDIND. Thus, this study rejects the null hypothesis that board independence has no significant effect on financial statements fraud likelihood.

4.2.3 Board Gender Diversity and Fraud Likelihood

From the results, the coefficient of BDDIV is 0.316 which indicates that increase in gender diversity increases the financial fraud likelihood, though not significant at 5%. According to the marginal estimates, with any addition of female directors, there is a 0.066 probability of an increase in fraud occurrence. Thus, the study accepts the null hypothesis that board gender diversity has no significant effect on financial statements fraud likelihood.

4.2.4 Board Remuneration and Fraud Likelihood

From the results, the coefficient of BDREM is 17.20 and suggests that any increase in remuneration increases the likelihood of financial statement fraud, but not significant at 5%. Hence, the study accepts the null hypothesis that board remuneration has no significant effect on financial statements fraud likelihood.

4.3 Discussion of Findings

4.3.1 Board Size and Fraud Likelihood

The result from the analysis reveals that there is no significant effect on the fraud likelihood for Board size. This finding is in tandem with Mohd Salleh and Othman (2016), which finds that the number of directors that make a board is not significant in deterring fraud. It also aligns with Samili and Labelle (2009), Bradbury et al. (2006), Chen et al. (2006), Faber (2005), and Uzun, Szewczyk and Varma (2004).

Yang and Buckland (2010) examine the board size for Chinese quoted fraud and non-fraud and finds their board sizes are not statistically different. Also supporting this research is the work of Xia and Zhao (2009), which find that the correlation between the size of the board and earnings management is not significant. Also, Gulzar and Wang (2011) finds the similar outcome.

In contrary findings, Beasley (1996) finds that controls effectiveness and increase financial fraud likelihood is diminished by a greater board size. However, Xie et al. (2003) find a larger board to be linked with fewer earnings manipulation practices. In Sharma (2014) Australian study of the relationship between board size and fraud, he finds a negative correlation between the two variables, whereas, D'onza and Lamboglia (2014) finds a significant positive relationship for Italy.

4.3.2 Board Independence and Fraud Likelihood

The results show that the effect of Board independence on fraud likelihood is significant. A large number of independent directors impedes the motivation to engage in fraud. The findings of this study attune with those of Chen and Lin (2007) based on a set of 176 listed firms in China. They find that the percentage of independent directors is lower for fraud firms than for non-fraud. Likewise, Carcello and Nagy (2004), which finds that for non-fraud firms, the percentage of independent directors is larger than fraud firms. This study is also aligning with Uzun et al. (2004) which examines U.S. firms and finds that a greater percentage of outside directors reduces the likelihood of fraud.

However, Hasnan et al. (2008) find contrarily that the number of independent directors on the board does not have a significant effect on fraud likelihood for Malaysia.

4.3.3 Board Gender Diversity and Fraud Likelihood

The study accepts the null hypothesis that Board gender diversity does not have a significant effect on financial statements fraud likelihood. This is consistent with

Owhoso (2002) from the U.S. who conducts an assessment of accounting fraud risk and finds no evidence from gender. Ye, Zhang, and Rezaee (2010) from China have similar findings.

Also, in Capezio and Mavisakaly (2016) examination of the correlation between gender diversity and fraud, they find that an increase in the number of female representations is negatively correlated with fraud likelihood.

4.3.4 Board Remuneration and Fraud Likelihood

This study shows a positive but insignificant effect of Board remuneration on fraud likelihood. This is the same as the findings of Merle, Hanlon and Edward (2016) in the U. S which notes that share-based reward increases the likelihood of accounting fraud. Similarly, Ling (2016) for the U.S. companies finds that executives, who receive higher compensation are more likely to engage in account manipulation. Managers tend to raise the variable portion of their compensation package by engaging in a financial misstatement, as illustrated in the findings of Lakhal, Lakhal and Cheurfi (2014).

However, in a China study by Conyon and Leong (2013) based on data from quoted firms from 2005 to 2010, they find there is a significant negative relationship between remuneration and corporate fraud.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATION

5.1 Summary

In ensuring that the interest of stakeholders such as investors, creditors, shareholders, and other users of accounting information are protected, regulatory authorities need to institutionalise means of checks and balances. In continuing the effort at finding ways to tackle financial reporting fraud, researchers are now investigating the factors that are linked to them as a step towards instituting preventive measures and detecting system to circumvent or minimise the likelihood of incidence. There is a growing interest in international literature testing the relationships between the characteristics of the boards and fraudulent reporting in organisations.

This study examines the effect of board characteristics on financial statements fraud likelihood in listed food and beverage firms in Nigeria. The scope of the study is the board characteristics namely board size, independence, gender diversity, and remuneration, based on secondary data (i.e., ten (10) years financial statements) collected from 19 food and beverages firms in Nigeria from 2008 – 2017.

5.2 Conclusion

Financial statement fraud is a grave threat to the sustainability of any organization. The role of corporate businesses in the global economic system cannot be

overemphasised. The threat posed by fraudulent financial reporting erodes stakeholders' confidence and leads to the collapse of companies, creating job losses, investment losses, and other systemic failures. Currently, the prevention of accounting fraud is imperative to restoring the stakeholders' confidence and also to help the country's overall economic growth and stability. The likelihood of engaging in fraudulent financial reporting is increased when a firm has a weak control structure and ineffective corporate governance arrangement. Board characteristics like size, independence, remuneration, ownership, gender diversity, professional diversity, frequency of meetings, and CEO duality have been found to affect the quality of control and corporate governance in firms. This has had implications on firms' ability to prevent financial reporting fraud. In order to give credence to this assertion, the board size, remuneration, independence, and gender diversity were selected and tested hypothetically to find out their effect on the likelihood of financial reporting fraud in quoted food and beverage firms in Nigeria.

The effect of size is negative, implying that when board size increases the likelihood of fraud decreases, although not significantly. For board independence, the effect on fraud likelihood is negative, implying that when board independence increases, the likelihood of financial statements fraud decreases significantly. Additionally, marginal effects estimates confirm that when board independence is changed slightly, the fraud likelihood will be affected. For board gender diversity, the effect of fraud likelihood is positive,

which implies that when gender diversity increases, the likelihood of fraud increases but insignificantly. Marginal estimates reveal that having additional females on the board increases the probability of fraud occurrence although not significantly. For board remuneration, the effect on is positive, which implies that when remuneration is increased, the likelihood of fraud increases but not significantly.

Detection of financial statement fraud requires the usage of tools that are different from traditional audit procedures and techniques. The Beneish M-score model is receiving increasing validation for its robustness in detecting fraud likelihood. The model is a statistical technique used to improve the probability of identifying the likelihood of manipulation in a financial statement. The model focuses on using ratio analysis to detect financial statement anomalies by comparing, at least two years of financial data. The Beneish M-Score model is used to measure fraud likelihood.

5.3 Recommendations

Firstly, the effect of board size on the likelihood of fraud was negative, though this is not significant at 5%. As it is well known, at the moment, there is neither agreement on what makes up an ideal board size. However, the research work recommends that the board must represent all dimensions of stakeholder interest.

Secondly, the effect of independence attribute is negative and significant. Consequently, the study recommends that independent directors should be more on the board. This is because a higher percentage of them will approve their oversight and monitoring functions over management which can lessen the likelihood of accounting fraud.

Thirdly, the effect of diversity of gender is positive, but not significant, indicating that when the number of female directors is increased, the likelihood of fraudulent reporting is also increased.. Nevertheless, corporate boards should always look into the gender mix more critically.

Finally, it revealed that the effect of remuneration of the directors on fraud likelihood is positive, which indicates that any increase in board remuneration increases the likelihood of fraud, but then again not significantly. Consequently, board remuneration should always be appraised broadly, considering corporate governance factors to restrain fraud.

However, the nature of the remuneration especially in the light of using it as a broad incentive or in modeling as a performance-based outcome has its implications and this is because, in an attempt to meet earnings targets, managers have often used fraudulent approaches.

5.4 Limitations of the Study

1. Results are based on the 19 quoted food and beverage firms in the NSE, whose audited annual financial reports were available to the public. There is a

possibility that if the sample size increases and other non-quoted companies are included, the results may vary. Therefore, the outcomes of this research may not be generalized.

2. Results may also vary if there are more than 19 quoted food and beverage firms in the NSE at the time of the research, or if the sample is increased to include quoted companies from other sectors such as banking and telecommunication. Hence, the findings of this work may not have a generalized application.

3. Beneish M-Score model uses financial ratios computed from accounting records of companies to determine the likelihood that the financial reports of a firm may have been misstated. The size and age of companies taken into study vary. This may have differential effects on the reporting practices of a company.

4. The study is based on ten (10) years of audited annual financial reports of quoted food and beverage companies. However, Honeywell Flour Mill got listed in 2009, as a result, it only had nine (9) years of audited annual financial reports, as a quoted company. Similarly, Champion Breweries and McNichols Consolidated got listed in 2010, as a result, both had eight (8) years of audited annual financial reports, as quoted companies.

5.5 Contribution of the Study to Knowledge

1. Aiming to find some ways to prevent financial statement fraud using effective corporate governance as a yardstick, the effect of board characteristics on fraudulent financial reporting becomes an interesting area of study. This study

contributes to broadening the frontier of knowledge by studying four (4) board characteristics in a single work. Most previous studies limit the variables to one or two characteristics.

2. Observing that majority of the research works on characteristics of the board and the likelihood of fraudulent reporting were carried out in other climes, thereby creating a jurisdictional gap for Nigeria, this study focuses on the Nigerian jurisdiction. The results of findings contribute to providing useful background knowledge and literature references from Nigeria.

3. This study contributes to the pool of knowledge that is useful for developing frameworks towards combating financial statement fraud.

4. The research applied the Beneish M-score model to proxy fraud likelihood of Nigerian companies using their 10 years financial statement.

5.6 Suggestions for Further Study

Limitations of this study leave areas for future studies. Some of these areas are as follows:

1. There are a few board characteristics out of which this research focuses on four (4) only, namely: independence, the board size, remuneration, and gender diversity. The researcher suggests that other board characteristics should also be studied to investigate their effect on committing financial statement fraud in Nigeria.

2. This research covers one sector of the economy (food and beverage firms). The researcher suggests further studies in this area to cover other industry sectors

of the Nigerian economy such as agriculture, oil & gas, ICT, financial services, health care, construction, etc.

3. The Beneish M-score model is based on accounting ratios, which uses accounting data, whereas accounting data are known to be affected by a firm's management practices and accounting policy. This could cause similar firms, operating in the same industry under similar conditions, to produce varying financial results. The researcher suggests that a focused study should be further conducted using identical firms to find out how differences in their accounting practices might have influenced the result of findings on the effect of their board characteristics on fraudulent reporting.

4. It is also of interest to the researcher to suggest a further study using quoted firms of an industry sector on one hand and unquoted firms of the same sector on the other, to compare results and find out whether listing or non-listing of a firm on the NSE plays a role on the effectiveness of board attributes in preventing fraudulent reporting.

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Appendix 1
STATA OUTPUT

xtlogit ffl bsize febsize blndep BoardRemunerationtoSales, fe
note: multiple positive outcomes within groups encountered.

Iteration 0: log likelihood = -81.534518
Iteration 1: log likelihood = -81.278052
Iteration 2: log likelihood = -81.277995
Iteration 3: log likelihood = -81.277995

Conditional fixed-effects logistic regression Number of obs = 184
Group variable: panel Number of groups = 19

Obs per group:
min = 7
avg = 9.7
max = 10

LR chi2(4) = 5.98
Log likelihood = -81.277995 Prob > chi2 = 0.2008

ffl	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
bsize	-.1643561	.1446462	-1.14	0.256	-.4478575	.1191453
febsize	.3161444	.2219958	1.42	0.154	-.1189594	.7512481
blndep	-2.97460	1.508899	-1.97	0.04	-5.212142	-.0171991
BoardRemun~s	17.20557	29.24787	0.59	0.556	-40.11921	74.53034

margins, dydx(*)

Average marginal effects Number of obs = 184
Model VCE : OIM

Expression : Pr(ffl|fixed effect is 0), predict(pu0)

dy/dx w.r.t. : bsize febsize blndep BoardRemunerationtoSales

Delta-method						
	dy/dx	Std. Err.	z	P> z	[95% Conf. Interval]	
bsize	-.0342074	.0413813	-0.83	0.408	-.1153132	.0468985
febsize	.065799	.0540096	1.22	0.223	-.0400579	.1716558
blndep	-.619102	.278427	-2.22	0.026	-1.03394	-.074811
BoardRemun~s	3.580987	5.932544	0.60	0.546	-8.046587	15.20856

Mixed-effects logistic regression Number of obs = 184

Group variable: panel Number of groups = 19

Obs per group:

min = 7

avg = 9.7

max = 10

Integration method: mvaghermite Integration pts. = 7

Wald chi2(4) = 9.24

Log likelihood = -119.32814 Prob > chi2 = 0.0554

ffl	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
bsize	-.1521772	.080745	-1.88	0.059	-.3104344	.0060801
febsize	.2204542	.1894678	1.16	0.245	-.1508958	.5918042
blndep	-3.448517	1.335738	-2.58	0.010	-6.8305	-.866515
BoardRemun~s	20.80401	26.13059	0.80	0.426	-30.41101	72.01903
_cons	-1.003385	1.171266	-0.86	0.392	-3.299023	1.292254

panel

var(_cons) | .2939344 .2688804 .048933 1.765625

LR test vs. logistic model: chibar2(01) = 2.40 Prob >= chibar2 = 0.0607

.esidual intraclass correlation

Level	ICC	Std. Err.	[95% Conf. Interval]
panel	.0820175	.0688731	.0146559 .3492488

.kaike's information criterion and Bayesian information criterion

Model	Obs	ll(null)	ll(model)	df	AIC	BIC
1	184		-119.3281	6	250.6563	269.9459

Note: N=Obs used in calculating BIC; see [R] BIC note.

---- Coefficients ----

	(b)	(B)	(b-B)	sqrt(diag(V_b-V_B))
	fe	re	Difference	S.E.
bsize	-.1643561	-.1521772	-.012179	.1200116
febsize	.3161444	.2204542	.0956902	.1156896
blndep	- 2.974603	-3.448517	.4739146	.7018418
BoardRemun~s	17.20557	20.80401	-3.598445	13.13887

b = consistent under Ho and Ha; obtained from xtlogit

B = inconsistent under Ha, efficient under Ho; obtained from me!ogit

Test: Ho: difference in coefficients not systematic

chi2(4) = (b-B)'[(V_b-V_B)^(-1)](b-B)
 = 1.27
 Prob>chi2 = 0.8657

	ffl	OR	Std. Err.	z	P> z	[95% Conf. Interval]
bsize	.8484398	.1227236	-1.14	0.256	.6389957	1.126534
febsize	1.371828	.3045401	1.42	0.154	.8878439	2.119644
blndep	19.58184	29.54703	1.97	0.049	1.017363	376.9042
BoardRemunerationtoSales	2.97e+07	8.68e+08	0.59	0.556	3.77e-18	2.33e+32

Integration method: mvaghermite Integration pts. = 7

Wald chi2(4) = 11.86

Log pseudolikelihood = -119.32814 Prob > chi2 = 0.0184

(Std. Err. adjusted for 19 clusters in panel)

	ffl	Odds Ratio	Std. Err.	z	P> z	[95% Conf. Interval]
bsize	.8588361	.0623639	-2.10	0.036	.7449048	.990193
febsize	1.246643	.2655478	1.03	0.301	.8211592	1.892591
blndep	31.45372	39.64816	2.74	0.006	2.658963	372.0761
BoardRemunerationtoSales	1.08e+09	2.24e+10	1.01	0.314	2.71e-09	4.34e+26
_cons	.3666364	.3869928	-0.95	0.342	.0463206	2.902
var(_cons)	.2939344	.2326504			.0623046	1.386693

```

-----
Integration method: mvaghermite           Integration pts. =           7

                                           Wald chi2(4)      =       11.86
Log pseudolikelihood = -119.32814         Prob > chi2       =       0.0184
                                           (Std. Err. adjusted for 19 clusters in
panel)
-----

```

			Robust			
Interval]	ffl	Coef.	Std. Err.	z	P> z	{95% Conf.
-----+-----						
.0098554	bsize	-.1521772	.0726145	-2.10	0.036	-.2944989 -
.6379467	febsize	.2204542	.2130103	1.03	0.301	-.1970383
5.919098	blndep	3.448517	1.260524	2.74	0.006	.9779362
BoardRemunerationtoSales		20.80401	20.67986	1.01	0.314	-19.72776
61.33579						
	_cons	-1.003385	1.055522	-0.95	0.342	-3.072169
1.0654						
-----+-----						
panel						
	var(_cons)	.2939344	.2326504			.0623046
1.386693						

```

-----
Integration method: mvaghermite           Integration pts. =           7

                                           Wald chi2(4)      =       9.24
Log likelihood = -119.32814               Prob > chi2       =       0.0554
-----

```

Interval]	ffl	Odds Ratio	Std. Err.	z	P> z	[95% Conf.
-----------	-----	------------	-----------	---	------	------------

--	--	--	--	--	--	--

1.006099	bsize	.8588361	.0693467	-1.88	0.059	.7331284
----------	-------	----------	----------	-------	-------	----------

1.807246	febsize	1.246643	.2361986	1.16	0.245	.8599373
----------	---------	----------	----------	------	-------	----------

431.1755	blndep	31.45372	42.01392	2.58	0.010	2.29451
----------	--------	----------	----------	------	-------	---------

BoardRemunerationontoSales 1.89e+31		1.08e+09	2.83e+10	0.80	0.426	6.20e-14
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3.640984	_cons	.3666364	.4294286	-0.86	0.392	.0369192
----------	-------	----------	----------	-------	-------	----------

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panel						
1.765625	var(_cons)	.2939344	.2688804			.048933

--	--	--	--	--	--	--

LR test vs. logistic model: chibar2(01) = 2.40 Prob >= chibar2 = 0.0607

Model	Obs	ll(null)	ll(model)	df	AIC	BIC
fe	185	-84.26727	-81.27799	4	170.556	183.4374
re	185		-119.3281	6	250.6563	269.9784

Note: N=185 used in calculating BIC.

ffl	Freq.	Percent	Cum.
NO	88	47.57	47.57
yes	97	52.43	100.00
Total	185	100.00	



Here are the latest versions of these records from the "MachamerRATIOS" table:

Name	Fiscal Year	Companies	Major Business	Board Size	Female Board Size	Board Meetings	Board Ownership	Board Independence	Board Remuneration to Sales	Total Debt to Asset	Asset Firm Size	Beneish M-score
11	2008	7Up Nigeria	Breweries	10	0	4	0.68%	0.60	0.02%	0.70	7.38	-3.01
10	2009	7Up Nigeria	Breweries	10	0	4	0.66%	0.60	0.02%	0.75	7.50	-2.91
9	2010	7Up Nigeria	Breweries	10	0	4	0.66%	0.60	0.07%	0.73	7.52	-3.13
8	2011	7Up Nigeria	Breweries	10	0	19	0.74%	0.60	0.06%	0.79	7.60	-3.12
7	2012	7Up Nigeria	Breweries	10	0	4	0.65%	0.60	0.05%	0.77	7.65	85868.14
6	2013	7Up Nigeria	Breweries	10	0	4	0.60%	0.60	0.06%	0.76	7.71	-3.51
5	2014	7Up Nigeria	Breweries	10	0	4	0.60%	0.60	0.06%	0.69	7.75	-3.63
4	2015	7Up Nigeria	Breweries	11	0	4	0.55%	0.82	0.06%	0.65	7.83	-3.09
3	2016	7Up Nigeria	Breweries	11	0	4	0.47%	0.82	0.02%	0.63	7.83	-3.28
2	2017	7Up Nigeria	Breweries	11	1	5	0.45%	0.91	0.01%	0.85	7.94	-1.47
238	2008	Cadbury Nig	Food Process	8	1	6	0.01%	0.63	0.04%	1.13	7.38	-2.61
235	2009	Cadbury Nig	Food Process	8	1	6	1.62%	0.63	0.23%	0.50	7.40	-3.87
234	2010	Cadbury Nig	Food Process	8	1	5	0.52%	0.63	0.26%	0.54	7.45	-2.66
233	2011	Cadbury Nig	Food Process	8	1	5	0.54%	0.75	0.17%	0.51	7.53	-2.63
232	2012	Cadbury Nig	Food Process	7	2	6	2.98%	0.57	0.47%	0.50	7.60	-3.17
231	2013	Cadbury Nig	Food Process	7	2	6	2.98%	0.57	0.46%	0.44	7.64	-2.77
230	2014	Cadbury Nig	Food Process	7	2	6	0.48%	0.57	0.55%	0.60	7.46	14.92

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229	2015	Cadbury Nig	Food Process	7	2	5	0.51%	0.57	0.59%	0.57	7.45	-3.05
228	2016	Cadbury Nig	Food Process	9	2	9	0.51%	0.56	0.73%	0.61	7.45	-2.28
227	2017	Cadbury Nig	Food Process	9	2	5	0.03%	0.67	0.63%	0.59	7.45	-2.19
279	2010	Champion Breweries	Breweries	10	0	4	0.29%	0.80	0.14%	2.24	6.45	NaN
278	2011	Champion Breweries	Breweries	10	0	4	0.29%	0.70	0.20%	1.30	6.84	697244.74
277	2012	Champion Breweries	Breweries	10	0	4	0.29%	0.80	0.18%	1.50	6.83	-2.64
276	2013	Champion Breweries	Breweries	10	0	4	0.29%	0.80	0.43%	1.50	6.96	-4.06
275	2014	Champion Breweries	Breweries	11	0	5	0.03%	0.82	0.33%	0.39	6.98	9.69
274	2015	Champion Breweries	Breweries	9	1	5	0.01%	0.78	0.40%	0.31	7.01	-2.67
273	2016	Champion Breweries	Breweries	11	1	5	0.01%	0.82	1.21%	0.23	7.00	-2.40
272	2017	Champion Breweries	Breweries	11	1	4	0.01%	0.91	1.32%	0.19	7.00	-1.07
432	2008	Dangote Sugar	Sugar Process	9	1	5	3.72%	0.56	0.08%	0.44	7.76	304326.25
431	2009	Dangote Sugar	Sugar Process	9	1	5	3.79%	0.56	0.07%	0.46	7.89	-2.56
430	2010	Dangote Sugar	Sugar Process	9	1	2	3.80%	0.56	0.03%	0.34	7.79	-1.21
429	2011	Dangote Sugar	Sugar Process	9	1	5	3.82%	0.56	0.04%	0.46	7.86	-1.83
428	2012	Dangote Sugar	Sugar Process	10	2	4	5.54%	0.70	0.04%	0.44	7.92	-3.24
427	2013	Dangote Sugar	Sugar Process	11	2	4	5.51%	0.73	0.15%	0.44	7.92	-1.22
426	2014	Dangote Sugar	Sugar Process	9	1	4	5.53%	0.78	0.35%	0.45	7.97	-2.12
425	2015	Dangote Sugar	Sugar Process	9	2	4	5.53%	0.78	0.20%	0.43	8.01	-2.43
424	2016	Dangote Sugar	Sugar Process	9	2	8	5.55%	0.78	0.12%	0.63	8.25	-3.09
423	2017	Dangote Sugar	Sugar Process	9	2	6	5.55%	0.89	0.13%	0.52	8.29	-1.50
603	2008	Flour Mills Of Nigeria	Flour Process	12	0	5	0.51%	0.83	0.02%	0.68	8.04	-2.24
602	2009	Flour Mills Of Nigeria	Flour Process	13	0	4	0.56%	0.85	0.02%	0.73	8.14	-2.12
601	2010	Flour Mills Of Nigeria	Flour Process	15	0	4	0.33%	0.87	0.02%	0.63	8.16	-2.67

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600	2011	Flour Mills Of Nigeria	Flour Process	15	0	5	0.00%	0.87	0.02%	0.69	8.21	-2.95
599	2012	Flour Mills Of Nigeria	Flour Process	13	0	4	0.93%	0.77	0.02%	0.65	8.37	-1.71
598	2013	Flour Mills Of Nigeria	Flour Process	13	0	4	0.40%	0.77	0.02%	0.70	8.45	-3.00
597	2014	Flour Mills Of Nigeria	Flour Process	14	0	4	0.42%	0.71	0.02%	0.72	8.47	-2.84
596	2015	Flour Mills Of Nigeria	Flour Process	15	0	4	0.51%	0.73	0.03%	0.75	8.54	-3.16
595	2016	Flour Mills Of Nigeria	Flour Process	14	0	5	0.48%	0.71	0.01%	0.72	8.54	-2.81
594	2017	Flour Mills Of Nigeria	Flour Process	15	1	1	0.49%	0.93	0.02%	0.79	8.68	-1.58
633	2008	Ftn Cocoa Processors	Cocoa	6	1	4	47.30%	0.67	2.36%	0.22	6.50	NaN
632	2009	Ftn Cocoa Processors	Cocoa	7	1	2	44.00%	0.86	1.31%	0.31	6.54	-1.71
631	2010	Ftn Cocoa Processors	Cocoa	7	1	4	46.82%	0.86	1.55%	0.48	6.64	481.58
630	2011	Ftn Cocoa Processors	Cocoa	7	1	3	41.32%	0.86	0.23%	0.48	6.66	72.37
629	2012	Ftn Cocoa Processors	Cocoa	7	0	1	41.32%	0.57	0.70%	0.55	6.64	-32.28
628	2013	Ftn Cocoa Processors	Cocoa	7	0	2	36.96%	0.57	0.40%	0.63	6.66	-2.39
627	2014	Ftn Cocoa Processors	Cocoa	7	0	4	33.85%	0.43	0.79%	0.73	6.65	-2.16
626	2015	Ftn Cocoa Processors	Cocoa	7	0	4	32.41%	0.43	3.62%	0.78	6.68	1.37
625	2016	Ftn Cocoa Processors	Cocoa	6	0	2	34.20%	0.50	5.89%	0.77	6.72	-3.77
624	2017	Ftn Cocoa Processors	Cocoa	6	0	1	34.20%	0.67	57.67%	0.92	6.68	-0.46
710	2008	Guinness Nig	Breweries	12	0	4	0.11%	0.92	0.10%	0.50	7.86	-0.23
709	2009	Guinness Nig	Breweries	13	0	4	0.09%	0.92	0.10%	0.57	7.87	-1.82
708	2010	Guinness Nig	Breweries	15	1	4	0.09%	0.93	0.09%	0.56	7.89	-3.41
707	2011	Guinness Nig	Breweries	15	0	4	0.08%	0.93	0.07%	0.56	7.96	-1.75
706	2012	Guinness Nig	Breweries	12	3	4	0.08%	0.67	0.24%	0.64	8.03	-3.63
705	2013	Guinness Nig	Breweries	12	3	4	0.07%	0.67	0.15%	0.62	8.08	-2.67
704	2014	Guinness Nig	Breweries	14	2	4	0.07%	0.79	0.20%	0.66	8.12	-2.63

Appendix 2

703	2015	Guinness Nig	Breweries	15	2	5	0.07%	0.80	0.21%	0.60	8.09	-3.37
702	2016	Guinness Nig	Breweries	14	3	6	0.07%	0.64	0.27%	0.70	8.14	-1.65
701	2017	Guinness Nig	Breweries	14	2	5	0.09%	0.64	0.36%	0.71	8.16	-3.09
721	2009	Honywell Flour Mill	Flour Process	10	1	4	0.04%	0.70	0.07%	0.77	7.37	NaN
720	2010	Honywell Flour Mill	Flour Process	9	1	4	0.03%	0.67	0.08%	0.55	7.48	-0.85
719	2011	Honywell Flour Mill	Flour Process	9	1	4	22.91%	0.67	0.10%	0.48	7.46	-2.84
718	2012	Honywell Flour Mill	Flour Process	11	1	5	22.91%	0.45	0.10%	0.63	7.65	-2.10
717	2013	Honywell Flour Mill	Flour Process	10	0	7	22.93%	0.50	0.10%	0.67	7.74	-2.36
716	2014	Honywell Flour Mill	Flour Process	12	0	5	22.93%	0.50	0.09%	0.68	7.81	-2.75
715	2015	Honywell Flour Mill	Flour Process	15	1	4	22.96%	0.67	0.09%	0.70	7.83	-2.93
714	2016	Honywell Flour Mill	Flour Process	15	2	4	22.96%	0.60	0.11%	0.78	7.88	-4.19
713	2017	Honywell Flour Mill	Flour Process	15	2	4	254.96%	0.73	0.10%	0.54	8.05	-1.39
771	2008	International Breweries	Breweries	10	1	4	4.89%	0.60	2.53%	1.00	6.22	3.16
770	2009	International Breweries	Breweries	10	1	4	5.14%	0.60	0.77%	1.06	6.71	-9.24
769	2010	International Breweries	Breweries	10	1	4	0.47%	0.60	1.45%	1.01	7.00	-1.30
768	2011	International Breweries	Breweries	10	1	4	5.50%	0.60	0.33%	0.91	7.16	870.83
767	2012	International Breweries	Breweries	10	1	4	5.50%	0.60	0.33%	0.91	7.16	-3.11
766	2013	International Breweries	Breweries	10	1	4	3.89%	0.60	0.21%	0.59	7.36	1.40
765	2014	International Breweries	Breweries	14	3	4	3.89%	0.71	0.14%	0.54	7.39	-3.64
764	2015	International Breweries	Breweries	14	3	4	3.54%	0.71	0.20%	0.60	7.48	-2.47
763	2016	International Breweries	Breweries	14	3	5	3.54%	0.79	0.17%	0.58	7.52	-3.10
762	2017	International Breweries	Breweries	13	3	5	3.32%	0.85	0.11%	0.69	7.65	-0.96
903	2008	Livestock Feeds	Livestock Feed	7	1	4	0.21%	0.71	0.44%	0.84	6.00	2.05
902	2009	Livestock Feeds	Livestock Feed	6	1	9	0.37%	0.83	0.26%	0.55	5.94	-3.62

Appendix 2

901	2010	Livestock Feeds	Livestock Feed	6	1	4	0.20%	0.83	0.32%	0.61	6.03	1.18
900	2011	Livestock Feeds	Livestock Feed	6	1	4	21.01%	0.50	0.01%	0.68	6.19	-1.53
899	2012	Livestock Feeds	Livestock Feed	10	2	9	0.12%	0.50	0.07%	0.69	6.32	-1.65
898	2013	Livestock Feeds	Livestock Feed	10	2	8	0.12%	0.50	0.09%	0.53	6.56	1.09
897	2014	Livestock Feeds	Livestock Feed	8	2	6	13.25%	0.63	0.08%	0.66	6.76	-1.54
896	2015	Livestock Feeds	Livestock Feed	8	2	6	63.56%	0.63	0.55%	0.57	6.66	-3.33
895	2016	Livestock Feeds	Livestock Feed	8	2	4	63.56%	0.63	0.47%	0.72	6.87	-1.91
894	2017	Livestock Feeds	Livestock Feed	7	1	6	73.30%	0.71	0.01%	0.60	6.72	-2.85
925	2010	McNichols Consolidated	Food			4	39.99%	NaN	1.46%	0.26	5.25	NaN
924	2011	McNichols Consolidated	Food	6	1	4	39.99%	0.67	1.03%	0.39	5.35	-2.94
923	2012	McNichols Consolidated	Food	6	1	4	40.19%	0.67	0.31%	0.34	5.42	2585.30
922	2013	McNichols Consolidated	Food	6	1	4	29.47%	0.67	0.28%	0.41	5.51	-4.20
921	2014	McNichols Consolidated	Food	6	1	4	25.65%	0.67	0.29%	0.41	5.58	-2.46
920	2015	McNichols Consolidated	Food	6	1	4	25.65%	0.67	0.20%	0.38	5.62	1179.86
919	2016	McNichols Consolidated	Food	6	1	4	25.65%	0.67	0.19%	0.37	5.68	-1.65
918	2017	McNichols Consolidated	Food	4	1		0.00%	0.75	0.21%	0.40	5.73	-2.58
1003	2008	Nascon Allied	Salt Process	9	0	4	3.15%	0.78	0.21%	0.49	6.87	-2.76
1002	2009	Nascon Allied	Salt Process	9	0	4	3.46%	0.78	0.26%	0.43	6.91	-412.38
1001	2010	Nascon Allied	Salt Process	9	0	4	3.44%	0.78	0.28%	0.34	6.88	-2.76
1000	2011	Nascon Allied	Salt Process	9	0	4	3.44%	0.78	0.30%	0.44	7.00	-11.72
999	2012	Nascon Allied	Salt Process	9	0	6	3.42%	0.78	0.32%	0.38	7.03	-2.74
998	2013	Nascon Allied	Salt Process	9	0	6	4.83%	0.78	0.55%	0.40	7.06	-2.70
997	2014	Nascon Allied	Salt Process	9	0	5	4.83%	0.78	0.72%	0.50	7.10	91778.86
996	2015	Nascon Allied	Salt Process	10	4	7	0.34%	0.80	0.65%	0.57	7.21	0.24

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995	2016	Nascon Allied	Salt Process	10	4	9	0.35%	0.70	0.79%	0.67	7.39	-1.67
994	2017	Nascon Allied	Salt Process	10	3	7	0.30%	0.80	0.63%	0.62	7.48	-4.19
1063	2008	Nestle Nig	Household Food	13	0	4	0.06%	0.92	0.13%	0.69	7.46	-1.15
1062	2009	Nestle Nig	Household Food	10	0	4	0.06%	0.90	0.12%	0.76	7.65	-2.93
1061	2010	Nestle Nig	Household Food	9	0	4	0.06%	0.89	0.11%	0.75	7.78	-1.82
1060	2011	Nestle Nig	Household Food	10	0	4	0.05%	0.90	0.10%	0.70	7.89	156815.15
1059	2012	Nestle Nig	Household Food	8	2	4	0.05%	0.25	0.10%	0.62	7.95	-2.75
1058	2013	Nestle Nig	Household Food	8	2	4	0.02%	0.25	0.09%	0.62	8.03	-2.85
1057	2014	Nestle Nig	Household Food	9	2	4	0.01%	0.44	0.08%	0.66	8.03	-1.85
1056	2015	Nestle Nig	Household Food	8	2	4	0.01%	0.50	0.08%	0.68	8.08	-3.06
1055	2016	Nestle Nig	Household Food	9	1	4	0.01%	0.56	0.11%	0.82	8.23	-4.61
1054	2017	Nestle Nig	Household Food	8	1	4	0.01%	0.63	0.11%	0.69	8.17	-1.42
1087	2008	Nigeria Breweries	Breweries	13	2	5	0.00%	0.54	0.11%	0.69	8.02	-2.54
1086	2009	Nigeria Breweries	Breweries	12	0	5	0.00%	0.50	0.12%	0.56	8.03	-2.68
1085	2010	Nigeria Breweries	Breweries	14	0	5	0.21%	0.43	0.14%	0.56	8.06	-2.64
1084	2011	Nigeria Breweries	Breweries	14	0	3	0.21%	0.43	0.15%	0.67	8.37	-2.61
1083	2012	Nigeria Breweries	Breweries	13	1	5	0.19%	0.38	0.14%	0.63	8.40	-2.49
1082	2013	Nigeria Breweries	Breweries	13	1	5	0.17%	0.46	0.16%	0.56	8.40	-3.36
1081	2014	Nigeria Breweries	Breweries	17	2	5	0.01%	0.53	0.24%	0.51	8.54	-2.74
1080	2015	Nigeria Breweries	Breweries	17	2	5	0.02%	0.53	0.34%	0.52	8.55	-2.79
1079	2016	Nigeria Breweries	Breweries	15	2	5	0.01%	0.53	0.35%	0.55	8.56	-2.91
1078	2017	Nigeria Breweries	Breweries	14	2	6	0.02%	0.64	0.40%	0.53	8.58	-3.20
1114	2008	Nigerian Northern Flour Mill	Flour Process	11	0	4	11.70%	0.91	0.11%	0.72	6.37	-2.48
1113	2009	Nigerian Northern Flour Mill	Flour Process	11	0	4	11.70%	0.91	0.11%	0.72	6.37	-3.29

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1112	2010	Nigerian Northern Flour Mill	Flour Process	12	0	4	11.62%	0.83	0.09%	0.53	6.41	0.92
1111	2011	Nigerian Northern Flour Mill	Flour Process	12	0	4	12.45%	0.83	0.12%	0.62	6.62	-2.81
1110	2012	Nigerian Northern Flour Mill	Flour Process	11	0	4	8.37%	0.73	0.13%	0.59	6.53	-1.39
1109	2013	Nigerian Northern Flour Mill	Flour Process	11	0	5	8.87%	0.73	0.50%	0.56	6.56	-3.76
1108	2014	Nigerian Northern Flour Mill	Flour Process	12	0	4	7.89%	0.67	0.53%	0.46	6.51	-2.52
1107	2015	Nigerian Northern Flour Mill	Flour Process	12	0	4	6.90%	0.67	0.34%	1.00	6.61	45.39
1106	2016	Nigerian Northern Flour Mill	Flour Process	12	0	4	6.90%	0.50	4.13%	0.12	6.59	3.57
1105	2017	Nigerian Northern Flour Mill	Flour Process	12	0	4	6.71%	0.83	2.76%	0.71	6.64	-3.34
1157	2008	Okomu Oil Palm	Oil Palm	10	0	4	0.96%	0.90	0.12%	0.45	6.89	-1.15
1156	2009	Okomu Oil Palm	Oil Palm	10	0	4	0.96%	0.90	0.20%	0.45	6.90	9.15
1155	2010	Okomu Oil Palm	Oil Palm	10	0	4	0.96%	0.90	0.17%	0.32	6.94	-1.93
1154	2011	Okomu Oil Palm	Oil Palm	10	0	4	2.64%	0.90	0.25%	0.19	7.37	0.03
1153	2012	Okomu Oil Palm	Oil Palm	11	0	4	26.40%	0.73	0.14%	0.18	7.49	-2.44
1152	2013	Okomu Oil Palm	Oil Palm	11	0	4	5.28%	0.73	0.23%	0.25	7.48	-4.26
1151	2014	Okomu Oil Palm	Oil Palm	11	0	4	5.29%	0.73	0.37%	0.25	7.49	Infinity
1150	2015	Okomu Oil Palm	Oil Palm	11	0	4	5.40%	0.73	0.35%	0.40	7.30	4618443.31
1149	2016	Okomu Oil Palm	Oil Palm	10	0	4	5.40%	0.70	0.25%	0.31	7.39	-1.17
1148	2017	Okomu Oil Palm	Oil Palm	11	0	4	0.00%	0.82	0.27%	0.22	7.50	-2.30
1224	2008	Presco	Oil Palm	12	1	4	0.31%	0.50	0.17%	0.55	6.75	0.87
1223	2009	Presco	Oil Palm	12	1	4	1.66%	0.50	0.16%	0.65	6.88	-3.24
1222	2010	Presco	Oil Palm	11	1	4	1.95%	0.55	0.15%	0.52	6.87	-2.97
1221	2011	Presco	Oil Palm	11	1	4	1.95%	0.55	0.07%	0.81	7.40	-629.77
1220	2012	Presco	Oil Palm	10	1	4	2.64%	0.80	0.12%	0.39	7.45	-2.48
1219	2013	Presco	Oil Palm	11	1	4	2.57%	0.64	0.12%	0.47	7.51	-1.82

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1218	2014	Presco	Oil Palm	10	1	4	2.58%	0.60	0.08%	0.43	7.54	-2.13
1217	2015	Presco	Oil Palm	9	1	4	0.39%	0.67	0.25%	0.45	7.74	-1.73
1216	2016	Presco	Oil Palm	9	1	4	0.39%	0.67	0.21%	0.37	7.92	-2.44
1215	2017	Presco	Oil Palm	9	1		0.09%	0.78	0.19%	0.92	7.99	-0.18
1475	2008	Tiger Branded	Flour Process	10	0	4	0.67%	0.70	0.13%	0.64	7.84	NaN
1474	2009	Tiger Branded	Flour Process	10	0	4	0.00%	0.70	0.11%	0.55	7.80	-3.03
1473	2010	Tiger Branded	Flour Process	10	0	5	0.00%	0.70	0.16%	0.61	7.85	-3.37
1472	2011	Tiger Branded	Flour Process	10	1	5	0.00%	0.70	0.10%	0.65	7.94	337389.28
1471	2012	Tiger Branded	Flour Process	10	1	6	0.00%	0.70	0.13%	0.67	7.89	-2.21
1470	2013	Tiger Branded	Flour Process	10	1	6	0.00%	0.70	0.47%	0.73	7.82	-1.02
1469	2014	Tiger Branded	Flour Process	12	1	5	0.00%	0.67	0.53%	0.82	7.74	-1.40
1468	2015	Tiger Branded	Flour Process	9	1	5	0.00%	0.78	0.47%	1.06	7.69	-2.22
1467	2016	Tiger Branded	Flour Process	12	3	5	0.00%	0.67	0.42%	0.69	7.90	1.58
1466	2017	Tiger Branded	Flour Process	8	2	5	0.00%	0.63	0.14%	0.71	8.11	-2.48
1576	2008	Unilever Nig	Household Food	10	1	4	26.99%	0.60	0.62%	0.72	7.37	-2.60
1575	2009	Unilever Nig	Household Food	10	1	4	2.35%	0.60	0.62%	0.65	7.37	-997.37
1574	2010	Unilever Nig	Household Food	9	1	6	16.41%	0.67	0.58%	0.68	7.41	-3.57
1573	2011	Unilever Nig	Household Food	8	1	4	12.39%	0.67	0.39%	0.70	7.51	-222.40
1572	2012	Unilever Nig	Household Food	9	1	4	21.10%	0.67	0.53%	0.72	7.56	-2.55
1571	2013	Unilever Nig	Household Food	8	0	4	0.19%	0.50	0.74%	0.78	7.64	-3.12
1570	2014	Unilever Nig	Household Food	7	0	4	0.19%	0.43	1.27%	0.84	7.66	-2.04
1569	2015	Unilever Nig	Household Food	10	2	4	0.19%	0.50	1.32%	0.84	7.70	-3.92
1568	2016	Unilever Nig	Household Food	8	2	4	0.03%	0.67	1.39%	0.84	7.86	-2.16
1567	2017	Unilever Nig	Household Food	10	2	5	0.06%	0.70	0.48%	0.37	8.08	-1.73