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The Effect of Board Characteristic on Corporate Fraud of Insured Deposit Money Banks in Nigeria

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Abstract
Corporate Fraud is one of the major issues challenging Insured Deposit Money Banks (DMBs) as a result; this study examines the effect of board characteristics on corporate fraud of insured deposit money banks in Nigeria. The population of the study comprises of all fifteen (15) Deposit Money Bank insured by Nigeria Deposit Insurance Commission. Five Deposits Money Banks were used for this study and their annual reports with that of Nigeria Deposit Insurance Commission for 12 years from 2009 to 2020 were utilised. The data were analysed using Cross Sectional Time Series Generalised Least Squares regression for analysis it reveals that board gender diversity and firm age has positive effect on corporate fraud while board size and board meeting do not have significant effect on corporate fraud. The number of women in a board of any bank should be reduced to one, corporate organisations should include fraud experts in their board and Fraud Act should be establish which will go a long away minimizing corporate fraud.

Introduction

It has been announced by Association of Certified Fraud Examiners (ACFE, 2018) that the overall total of loss as a result of fraud is approximately to $4 trillion in 2017. In addition the number of organisations reported losses of approximately losses greater than $1 Million as a result of fraud has raised from 2016 to 2017 by 13% and 22% respectively in Malaysia (Price waterhouse Coopers, 2018). Corporate fraud has received critical attention specifically Insured Deposit Money Banks (DMBs) known as one of the major back bone of any economy; they were established with the main goal of Shareholder wealth maximization. Fraud is one of the major issues challenging Insured Deposit Money Banks (DMBs). In this year 2021 Nigeria Deposit Insurance Commission reported that the corporate fraud in billions of Naira make the matter devastating especially in the following periods 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019 and 2020 which are ₦ 41.27Billions, ₦21.29Billions, ₦28.40 Billions, ₦18.05Billions, ₦8.68Billions, ₦12.01Billions, ₦38.93Billions, ₦204.65Billions and ₦120Billions respectively. Losses occurred as a result of fraud in the amount in involved above, for the following periods: 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019 and 2020 which are ₦7.55Billions, ₦11.68Billions, ₦4.07Billions, ₦4.16Billions, ₦5.76Billions, ₦6.19Billions, ₦3.17Billions, ₦2.4Billions, ₦2.4Billions, ₦15.15Billions, ₦5.46Billions and ₦5.334Billions respectively (NDIC, 2020), (NDIC, 2017).

According to Business Day (2021) there were more than six first-generation bank fraud cases in Nigeria between February and July 2021 that attracted the attention of various banks across the country. Among these was the failed attempt on an account of a Federal Government parastatal domiciled with one of the first-generation banks in which well over ₦1 billion was transferred to various accounts across different banks in the country." It Failed," some repentant bank hackers told Business Day. "The transfer is processed on the National Electronic Fund Transfer (NEFT) platform, which takes 24 hours to process, so it was discovered before the money was offset." Barewa, Ele and Ereke (not their real names) are repentant bank hackers.

The total number of fraud cases that occurred in Deposit Money Banks as reported by NDIC for the following years: 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019 and 2020 are 1,764, 1,532, 2,352, 3,380, 3,756, 10,652, 12,279, 16,751, 26,182, 37,817, 52,754, and 146,183 respectively.

Number of persons involved in fraud especially the employee of Deposit Money Banks becomes an issue of concern; Economic and Financial Crime Commission (EFCC, 2021) on Wednesday, 24th September, said most frauds in the banking sector were committed by insiders information and Information and Communications Technology employees. Abbah Sambo, Head of Cybercrime at EFCC, issued a statement at a national seminar on banking and related matters for judges in Abuja. He said that most banking sector fraud handled by the commission showed that bank employees aided the acts. He also regretted the increasing number of cybercrime, despite the Commission's efforts to combat cybercrime (EFCC, 2021). Business Day (2021) said targeting the business account of a large public sector organisation requires fraudsters to always recruit an insider from within the target organization. In the case of the Federal Government parastatal targeted in April 2021, such an insider was able to aid the hacking of the accounting platform of the parastatal by accessing the log-in details of as many as six approving officials (EFCC, 2021). The Nigerian Deposit Insurance Corporation (2018) investigated some banks in 2018 for inadequate returns to businesses in the event of employee dismissal or dismissal due to fraud, counterfeiting, and fraud. NDIC made the decision in the light of the bank's offsite supervision report. In this report, the number of fraud cases resulting from internal abuse by bank employees increased from 231 in 2016 to 320 in 2017. NDIC (2020) reported number of persons involved in fraud which became an issue of concern for the following periods: 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019 and 2020 are 357, 498, 531, 682, 465, 425, 231, 320, 899, 835 and 474 respectively.

The motivation behind this study is to examine the effect of board characteristics on the corporate fraud of insured deposit money banks: to do this , the specific objectives of the study is to determine the Board size, Board Gender Diversity, Board meeting and Firm age on corporate fraud of insured deposit money banks in Nigeria using secondary data which has now become an issue of concern for Nigeria Deposit Money Banks and Nigeria Deposit Insurance Commission, Central Bank of Nigeria, the Nigerian Electronic Fraud Forum (NEFF), Economic and Financial Crimes Commission, Federal Government of Nigeria and researchers

Literature Review

Introduction

Insured Deposit Money Banks is now full of bugs in the banking industry of Nigeria (Ikechi & Nwadiubu, 2020). The long arms of fraud issues are now quite alarming which serve as blow to the banking industry. The major challenge of our society today is the philosophy of "get rich quick" by all means whether good or bad people want to get money. It has become very necessary for us to protect the deposit money banks from fraudsters because of the roles that banks do play in the economic development and growth in any country (Ikechi & Nwadiubu, 2020). According to NDIC 2019 annual report the sum of ₦ 204,652,000,000 has been involved in fraud where ₦ 5,464,000,000 has been lost to fraudsters.

Corporate fraud

Corporate fraud can be define as an act which involve deception to other parties to make a personal gain for oneself, dishonesty conducted to gain benefit of others (Chartered Institute of Management Accountants, 2009).

For the purpose of this study, Corporate fraud denotes the amount of money involved in fraud that is amount of money that is fraudulently taken.

Board Characteristics

Board characteristics can be viewed as a general word; there is no general acceptable definition. In this study, there will be attention for the following board characteristics: The size of the board, Nationality of the board members, gender diversity and age diversity among board members. For the purpose of this research, Board characteristics refers to Board Size, Board Gender Diversity, Board Meeting and Firm age is what is referred to Board Characteristics.

Theoretical Framework

To know the effect of Board characteristic on corporate fraud we have to know why it occur although there is no specific answer on why fraud is been committed because every human being is unique and have different trait with different personal experience.

What matters is to know and understand the symptoms of reoccurring fraud which is something we should learn to identify so we can make preventions. Some of the relevant existing theories on fraud are, fraud triangle, theory of the fraud diamond, work place condition theory etc. Therefore, for the purpose of this study fraud triangle will be the appropriate theory to explain the relationship between board characteristics and corporate fraud.

Fraud Triangle (Donald R. Cressey: 1919- 1987)

The Fraud Triangle is the finest and most frequently acknowledged model for why people commit fraud. This is a model created by Dr. Donald Cressey, a criminologist who studied embezzlers, or "trust violators," in his studies. Cressey said: "A trustworthy person becomes a trust violator when he envisions non-shareable financial problem. This problem can be secretly resolved by violating the position of financial trust and affects behavior within it. Be aware that you may give. Compare your image as a trusted person with your image as a user of commissioned funds and goods. "For many years, this hypothesis has often been a fraud triangle. All the members of the board of any corporate organization were trusted and capable of contributing to such organization before been appointed to the Board for a person to perpetrate fraud, three factors must be present at the same moment, according to Cressey: pressure, Perceived and opportunity rationalization according to Wolfe & Hermanson (2004), many fraud wouldn't have happened without the right people with the right skills to commit the frauds. "Opportunities open the door to fraud, and incentives and rationalization can drive people to fraud. But people have the opportunity to go through the open door over and over again, not just once. You need to be aware of and have the ability to use it. Therefore, the important question is: "Who can turn the potential for fraud into reality?" (Wolfe & Hermanson, 2004).

Okoro and Onyebueke (2021) evaluated the eradication of banking malpractices and frauds in Nigeria. They investigated the impact of the total number of fraud cases on the annual profits of Nigerian commercial banks and to determine the impact of the total number of fraud cases on the annual profits of Nigerian commercial banks. Ex post facto design was selected as the methodology of the study. The population surveyed consisted of all 19 Nigerian-listed commercial banks. The analytical method used in this study was a random effects panel regression model. Studies show that the total number of fraud cases has a significant impact on the annual profits of Nigerian commercial banks, and the total amount involved in fraud cases has a significant impact on the annual profits of Nigerian commercial banks.

Ololade, Salawu and Adekanmi (2020) in their study, they investigated why and how employees of Nigerian Money Deposit Banks committed fraud. Survey research design was adopted where primary data were obtained from 120 fraud investigators at the banks through the administration of structured questionnaires. The data were analyzed using simple percentages. The results show that employees who failed to meet their deposit goals and whose employment was threatened by fraudulently using knowledgeable or legitimate power to connive with other employees to commit e-fraud against the Banks.

Inaya and Obasuyi (2020) agreed that the wave of fraud in Nigerian banks continues to grow. In 2018, 20,768 cases of fraud and counterfeiting (trials and successes) worth 19.77 billion Naira were reported, while in 2017 16,762 cases worth 5.52 billion Naira and $120,000 were reported. In 2018, it totaled ₦12.06 billion, but in the first half of 2017 it was 780 million Naira, or $30,000. Therefore, Inaya and Obasuyi (2020) study investigated the impact of fraud on the financial performance of Nigerian banks.

(Xiang & Zhu, 2020) look into the effect of academic independent directors on the incidence of corporate fraud of Chinese listed companies from 2007 to 2017. They discovered that there is no significant relationship between academic directors and corporate fraud.

James, Ajayi, and Okoh (2019) in their study assessed Nigeria's Deposit Money Bank (DMB) fraud and profitability for ten years (2009-2018). For the specific purpose of assessing whether the frequency of fraud, the number of people involved in fraud, the target amount of fraud, and the losses incurred by the bank as a result of fraud have a significant impact on the profitability of the reporting period. The researchers used secondary data sources, where the study is based on estimates of fraud frequency, fraud participation, fraud losses, fraud amounts, and return on equity for all Deposit money banks in Nigeria. Using regression analysis of historical data from the Nigerian Deposit Insurance Corporation (NDIC) report, the researchers have found a strong positive correlation between DMB fraud and profitability of over 90%. Judging by the 5% significance data analysis, the frequency of fraud, the amount of fraud, and the funds that could not be recovered from fraud have a strong impact on the profitability of the Nigerian DMB, and fraud is insignificant.

Sadique, Ismail, Roudaki, Alias & Clark (2019) conducted study on corporate governance attributes and fraud deterrence, companies charged with auditing and accounting offences were their sampled from 2003 to 2007 in Malaysia. The researchers used secondary data for their analysis using Logistics regression and they found that the board and the percentage of institutional shareholdings had significant relationships with the likelihood of corporate fraud occurrences consistently across their two-year period studied.

Girau, Bujang, Jidwin & Paulus (2019) examined the relationships between corporate governance and corporate fraud in Malaysia from 2010 to 2017 using secondary data as their source they analysed the data with Logistic regression where it was found that size of the board and CEO may lead to corporate fraud.

Xu, Zhang & Chen (2018) investigated board age and corporate financial fraud by sampling Chinese listed firms from 2010 to 2013, they sourced data were secondary in nature and tested using Logistic Regression and it was found that firm size is positively associated with corporate financial fraud.

Corporate governance and financial statement fraud among listed firms in Nigeria from 2012 to 2016 was the investigation of Uwuigbe, Olorunshe, Uwuigbe, Ozordi, Asiriuwa, Asaolu & Erin (2018) in which they sourced secondary data and analysed it using panel regression. They found that there is an insignificant association between audit committee independence, the composition of the board and financial statement fraud.

According to Kolawole, Salman, Durodola, Babatunde and Igbekoyi (2018)Forensic accounting reports are considered evidence in administrative proceedings or in court. Despite these reports of fraud in Nigeria, many foreign investors have lost billions of dollars to fraudsters, resulting in

removal of some investments from Nigeria. Therefore, this study focused on forensic accounting and mitigation of fraud in Nigerian deposit money banks. This survey used primary data collected through the management of surveys of employees at selected banks in Lagos. Using ordered logit regression, the results of the study showed that forensic accounting reduced the misappropriation of assets at Nigerian deposit money banks.

Kolapo and Olaniyan (2018) conducted a study whereby they investigated the impact of fraud on the performance of Nigerian deposit money banks for the periods 1994 -2015. In this study, bank deposits were reported as the dependent variable, while the value of bank deposits was delayed by one period. Fraud Engagement: The number of fraud cases and the number of employees involved in the fraud cases were used as independent variables. The data was analyzed using the generalized method of moments (GMM) estimator. The study shows that the amount of fraud, the amount lost by fraud, and the number of employees involved in the fraud have a negative impact on and have a significant impact on Nigerian bank deposits. On the other hand, the value of past bank deposits has a positive and important relationship with deposits in Nigerian banks.

Samuel, Udoh, Prince, Nneka and John (2018) investigated the impact of insider abuse in the Nigerian banking sector and its root causes. The Classic Linear Regression Model (CLRM) was adopted along with the secondary data from the Nigerian Deposit Insurance Company (NDIC) 2000-2016 Annual Report. The total number of fraud cases and their associated amounts were found to be positively associated with the total expected losses, while the total staff involvement and expected losses showed a negative and insignificant association.

Kawugana & Faruna (2018) research assessed the root causes of financial fraud in the Nigerian banking industry. Specifically, it targets First Bank, Keystone Bank, and Zenith Bank. The data used in this study are from secondary sources. Data was analyzed using analysis of variance (ANOVA). The findings show that the annual average of financial fraud cases reported during a particular period was due to workers failing to follow the procedures established by banks. Economic and social conditions also lead to bank financial fraud.

Furthermore, a study was conducted by Said , Alam, Ramli and Rafidi (2017) using primary data on "Integrating ethical values into fraud triangle theory in assessing employee fraud: Evidence from the Malaysian banking industry." The survey was conducted on employees of three major Malaysian banks. The data has been analysed using descriptive statistics, factor analysis and section regression. The findings shows that ethical value of credibility was negatively linked to employee fraud, and the two elements of fraud's triangle theory, opportunity and rationalization, were positively linked to employee fraud.

By interviewing 180 bank representatives (bankers) Patiala and Mohari district of Punjab, Neha and Dhiraj (2017) find out various reasons for fraud in the Indian banking sector. A closed-ended questionnaire was used to get an idea of the mood of the bank representative. The study shows that various internal controls of Indian banks are inadequate and do not meet the requirements of Indian reserved banks. The survey also points out the benefits of employee training to prevent bank fraud.

However the above studies did not look into the effect of board characteristics on corporate fraud using secondary data from 2009 to 2020 in the area of insured deposit money banks in Nigeria

Methodology

Ex-post facto research design was adopted in this study. The choice of the ex-post facto design was because the research relied on already recorded events, and researchers do not have control over the relevant dependent and independent variables they are studying with a view to manipulating them (Okoro & Onyebueke, 2021). The population of the study comprises of all fifteen (15) Deposit Money Banks insured by Nigeria Deposit Insurance Commission (NDIC). This is justified by the fact that Deposits Money Banks has the highest risk of fraud and based on availability of data, five Deposits Money Banks were used for this study and their annual reports with that of Nigeria Deposit Insurance Commission for 12 years from 2009 to 2020 were used. The Secondary data was used and was decrement from the annual reports of NDIC and that of the banks. The data were analysed using Cross Sectional Time Series Generalised Least Squares (GLS) regression. The selection of the technique was based on regression and correlation used in testing effect Board Attributes on Corporate fraud.

Model Specification*:* This study uses the Cross Sectional Time Series Generalised Least Squares (GLS) regression model to examine the study hypotheses:

Corporate Fraud Model

$CF_{it} = \beta 0 + \beta 1 BSIZE_{it} + \beta 2 BGD_{it} + \beta 3 BM_{it} + \beta 4 FA_{it} + E_{it}$

Where;
CF = Corporate Fraud
BSIZE = Board Size
BGD = Board Gender Diversity
BM = Board Meeting
FA = Firm Age
ß0 = Intercept;
ß1 to ß4 = Coefficient of the independent variables;
E = Error term;
it = Panel Data indicator

Variable Measurement

The table 1 below presents the variables, their types and measurement used in the research

Table 1: Variable Measurement

Variables		Types	Measurements	Sources
Corporate Fraud	CF	Dependent variable	Corporate Fraud is the Number of staff involved in fraud for each year divided by the total number of staff in each year all multiplied by Amount of money involved from fraud for each year	Author's computation
Board Size	BZ	Independent variable	The total number of board members who made up the board in an accounting period refers to board size.	(Nurulyasmin, Afzalur & Jeff, 2017)
Board Gender Diversity	BGD	Independent variable	Number of Board women members divided by the total number of directors on the board per year	(Amin, Rizwan, Rehman, Muhammed & Ahmad, 2021)
Board Meeting	BM	Independent variable	Total number of Board Meetings held by the board each year	(Nurulyasmin et al., 2017b)
Firm Age	FA	Independent variable	Logarithm of the age of the existing company from incorporation	(Nurulyasmin et al., 2017b)

Result and Discussion

Descriptive Statistics

Commencing the analysis from Descriptive Statistics of dependent and independent variables which present the following: mean standard deviation, meaning and maximum.

Table 2*: Summary of Descriptive Statistic*

Variables	Obs	Mean	Std dev.	Min	Max
CF	60	9.31	0.43	8.64	10.45
BZ	60	15	3	10	21

BGD	60	0.20	0.10	0.00	0.41
BM	60	6	2	2	12
FA	60	1.57	0.27	1.3	2.13

Source: Descriptive Statistic from STATA 15, (2025)

The table 2 above shows the average independent directors in the board composition of Deposit Money Banks is approximately 15, Board Gender Diversity for is proportionately 20% of the board members females on the average, The average number of meetings per annum is 6 and the logged average age of Deposit Money Banks in Nigeria is 1.57. The Standard deviations of most of the variables is not far from the average value of each other. The meaning minimum and maximum number of Members 10 and 21, 0.00 to 0.41 of the proportion of the board members are females, 2 to 12 number of meetings usually held in a year and 1.3 to 2.13 are the logged age of the Deposits Money Banks in Nigeria.

Correlation Matrix

To show the direction of variables correlation matrix was conducted and the outcome was shown in table 3 below.

Table 3: Correlation Matrix

Variables	CF	BZ	BGD	BM	FA
CF	1.0000				
BZ	-0.1131	1.000			
BGD	0.2317	0.0636	1.000		
BM	0.0126	0.2194	-0.1785	1.000	
FA	0.4500	-0.1229	-0.0028	0.3452	1.000

Source: Author's Computation using Stata15 Output, (2025)

From the correlation matrix table 3, it can be observed that the corporate fraud has a weak negative relationship with board size while it has positive weak relationship with board gender diversity, board meeting and firm age. This implies that the above variables move in the same direction with corporate fraud. However, corporate fraud has a negative weak relationship with board size. The implication of this is that board size move in the opposite direction with corporate fraud. Table 3 also depicts the association of independent variables themselves. According to (Gujarati, 2004) a correlation coefficient between two independent variables above 0.80 is considered excessive. From the table above, it can be observed that all correlation coefficients among the independent variables are all below 0.80 which shows there may be absence of multicollinearity.

Results of Diagnostic Test

In this section, the results of multicollinearity test, heteroskedasticity test and Hausman specification test, were presented and discussed below.

Multicollinearity Test

You may recall that in table 3 above, the researcher presented correlation matrix result, where it is clearly stated that there may be absence of multicollinearity. Hence multicollinearity test was conducted and presented below.

Table 4 *Multicollinearity test*

Variable	VIF	1/VIF
BM	1.29	0.773
FA	1.20	0.832
BZ	1.12	0.949
BGD	1.05	
MEAN VIF	1.17	

Source: VIF result using Stata 15 (2025)

The study tested for multicollinearity among the board of directors attributes and amount involve in fraud. The results from Table 4 showed that there is no multicollinearity among the independent Variables on the average of Variance Inflation Factor of 1.17.

Hausman Test

Table 5: Hausman Specification Test Effects

Test	Chi2	P-Value
Hausman Specification Test	2.58	0.6299

Source: Outcome from Stata 15 (2025)

Hausman Specification Test: Hausman specification test was conducted after running fixed and random effect model to decide if the effect is random or fixed. The result shows that at 5% level of significance, the chi2 is 2.58 and the probability of 0.6299 which is above 5% level significance. This insignificant p-value shows that Hausman test favors Random effect model.

Due, insignificant outcome of the Hausman test, this study takes care by using Breusch and Pagan Lagrangian multiplier tests for random effects. The outcome is insignificant at 5%. The result has been attached in the appendices.

Heteroscedasticity Test: Heteroscedasticity test was conducted using Breusch- Pagan or cook – Weisberg to test and Cameron & Trivedi's decomposition of IM-test for Heteroscedasticity to look out for this assumption. The tests were set at 5% level of significance with a null hypothesis of constant variance (i.e, it is Homoskedastic) the result shows a P-value of 0.0242 5% level of significance. This points out that there is existence of heteroskedasticity. For more details you will see in the appendices.

Feasible Generalised Least Squares Regression Result: After the diagnostic test, Cross Sectional Time Series FGLS regression was prescribed and used, below is the outcome of prescription.

Table 6 Feasible Generalised Least Squares Regression Model

CF	Coef.	St.Err.	z-value	p-value
BZ	-0.006	0.017	-0.38	0.702
BGD	0.893	0.465	1.92	0.055
BM	-0.020	0.024	-0.84	0.402
FA	0.763	0.192	3.98	0.000
Constant	-8.145	0.395	20.61	0.000

Number of obs	60.000
Number of groups	5.000
Wald chi	22.27
Prob > chi	0.000

Source: Feasible Generalised Least Squares Regression Model Using Stata15 (2025)

Interpretation

The table 6 above shows that outcome of FGLS regression Model. The Feasible Generalised Least Squares regression was selected for the study based on the Hausman specification test.The F-statistics chi square reveals a value of 22.27 and a p-value of 0.000 which is significance at less than 1% level significance. This reveals that the model is fit and adequate.

Board Size and Corporate Fraud.

H_{01}: Board size has no effect on corporate fraud of insured deposit money banks in Nigeria.
The study could not establish that Board Size has effect on amount involved in fraud, as a result is insignificant, since the probability value is even greater that 10%, therefore this study conclude that there is no effect of board size on corporate fraud as stated by the null hypothesis. The study is not in agreement with the works of Girau et al., (2019).

Board Gender Diversity and Corporate Fraud.

H_{02}: Board Gender Diversity has no effect on corporate fraud of insured deposit money banks in Nigeria.

You may recall that the study argued that board gender diversity has effect on corporate fraud even though the null hypothesis suggest otherwise. In a quest to test the hypothesis this study ran Feasible Generalised Least Squares regression, result as presented in table 6 above. There is a clear indication that there is an existence of a positive relationship between board gender diversity and corporate fraud since the result is significant 10%, hence the null hypothesis has been rejected, this is because the probability value is less than 10%, it implies that as number of females increases in board by any value, the corporate fraud will increase by the parameter as seen in table 6 above, thus an increase of female in Board will lead to an increase in corporate fraud at by 0.893, all things been equal. The result is do not agree with the study of (Tahani & Mohd 2019) but it is in line with fraud triangle theory opined that opportunities, rationalization and pressure makes people to commit corporate fraud.

Board Meeting and Corporate Fraud

H_{03}: Board meeting has no effect on corporate fraud of insured deposit money banks in Nigeria.

The study argued that Board size has effect on corporate fraud; however the finding is in favour of null hypothesis which stated that Board meeting has no effect on corporate fraud, that is, the result is insignificant. Thus, the study failed to reject the hypothesis which stated that board meeting has no effect on corporate fraud.

Firm Age and Amount Involved in Fraud Corporate fraud

H_{04}: Firm age has no effect on corporate fraud of insured deposit money banks in Nigeria.

The null hypothesis stated that firm age has no effect on corporate fraud, with the aid Feasible Generalised Least Squares Regression the result proved that firm age has effect on the corporate fraud, hence the null hypothesis has been rejected based on the fact that the probability value is less than 1% significant value. The increase in firm age will lead to increase in corporate fraud at the stated parameter in table 6 above, all things been equal.

Conclusion and Recommendations

This study examines the effect of board characteristics on corporate fraud of insured deposit money banks in Nigeria from 2009 to 2020. The results from Feasible Generalised Least Squares reveal that board gender diversity and firm age has positive effect on corporate fraud while board size and board meeting do not have significant effect on corporate fraud. The research generally emphasize that the number of women in a board of any bank should be reduced to one, corporate organisations should include fraud expect in their board for he will play a crucial role in terms of combating corporate fraud and the federal government of Nigeria, Central Bank of Nigeria and Nigeria Deposit Insurance commission should jointly consider establishing Corporate Fraud Act which will go a long away minimizing corporate fraud.

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Appendices

STATA 15 File uploaded

Declared Data as Panel

```
. xtset ID YEARS, yearly
       panel variable:  ID (strongly balanced)
        time variable:  YEARS, 2009 to 2020
                delta:  1 year
```

.

Fixed Effect Tested

```
. xtreg CF BZ BGD BM FA,fe

Fixed-effects (within) regression               Number of obs      =        60
Group variable: ID                              Number of groups   =         5

R-sq:                                           Obs per group:
     within  = 0.1597                                         min =        12
     between = 0.9700                                         avg =      12.0
     overall = 0.2444                                         max =        12

                                                F(4,51)            =      2.42
corr(u_i, Xb)  = -0.9633                        Prob > F           =    0.0600

------------------------------------------------------------------------------
          CF |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
          BZ |   .0115575   .0218214     0.53   0.599    -.0322509    .0553658
         BGD |   1.307972   .7784866     1.68   0.099    -.2549054    2.870849
          BM |  -.0176391    .028492    -0.62   0.539    -.0748392    .0395609
          FA |   2.225981   1.394769     1.60   0.117    -.5741338    5.026096
       _cons |   5.491439    2.26791     2.42   0.019     .9384195    10.04446
-------------+----------------------------------------------------------------
     sigma_u |  .45106028
     sigma_e |  .38428035
         rho |  .57943568   (fraction of variance due to u_i)
------------------------------------------------------------------------------
F test that all u_i=0: F(4, 51) = 0.70                     Prob > F = 0.5924
```

Estimate store fixed
Random Effect tested

```
. estimate store fixed

. xtreg CF BZ BGD BM FA,re

Random-effects GLS regression                   Number of obs      =        60
Group variable: ID                              Number of groups   =         5

R-sq:                                           Obs per group:
     within  = 0.1350                                         min =        12
     between = 0.9417                                         avg =      12.0
     overall = 0.2707                                         max =        12

                                                Wald chi2(4)       =     20.41
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =    0.0004

------------------------------------------------------------------------------
          CF |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
          BZ |  -.0064463    .017583    -0.37   0.714    -.0409085    .0280158
         BGD |   .8931022    .486128     1.84   0.066    -.0596913    1.845896
          BM |  -.0200862   .0250339    -0.80   0.422    -.0691517    .0289794
          FA |   .7633226   .2001049     3.81   0.000     .3711241    1.155521
       _cons |   8.145112   .4127047    19.74   0.000     7.336226    8.953999
-------------+----------------------------------------------------------------
     sigma_u |          0
     sigma_e |  .38428035
         rho |          0   (fraction of variance due to u_i)
------------------------------------------------------------------------------
```

Estimate store random
Hausman test

```
. hausman fixed random

                 ---- Coefficients ----
             |      (b)          (B)            (b-B)     sqrt(diag(V_b-V_B))
             |    fixed       random       Difference          S.E.
-------------+----------------------------------------------------------------
          BZ |   .0115575    -.0064463       .0180038        .0129233
         BGD |   1.307972     .8931022       .4148696        .6080469
          BM |  -.0176391    -.0200862        .002447        .0136051
          FA |   2.225981     .7633226       1.462658         1.38034
------------------------------------------------------------------------------
                           b = consistent under Ho and Ha; obtained from xtreg
            B = inconsistent under Ha, efficient under Ho; obtained from xtreg

    Test:  Ho:  difference in coefficients not systematic

                  chi2(4) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                          =          2.58
                Prob>chi2 =        0.6299
```

Breusch and Pagan Lagrangian Multiplier test for Random Effect

```
. xttest0

Breusch and Pagan Lagrangian multiplier test for random effec

        CF[ID,t] = Xb + u[ID] + e[ID,t]

        Estimated results:
                         |       Var     sd = sqrt(Var)
                ---------+-----------------------------
                      CF |    .1846955        .4297622
                       e |    .1476714        .3842803
                       u |          0                0

        Test:   Var(u) = 0
                                 chibar2(01) =      0.00
                              Prob > chibar2 =    1.0000
```

Breusch and Pagan Lagrangian Multiplier test is significant

Regression Test

```
. reg CF BZ BGD BM FA
```

Source	SS	df	MS	Number of obs	=	60
				F(4, 55)	=	5.10
Model	2.94953267	4	.737383167	Prob > F	=	0.0014
Residual	7.94750317	55	.144500058	R-squared	=	0.2707
				Adj R-squared	=	0.2176
Total	10.8970358	59	.184695523	Root MSE	=	.38013

CF	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
BZ	-.0064463	.017583	-0.37	0.715	-.0416836	.0287909
BGD	.8931022	.486128	1.84	0.072	-.0811202	1.867325
BM	-.0200862	.0250339	-0.80	0.426	-.0702552	.0300829
FA	.7633226	.2001049	3.81	0.000	.3623034	1.164342
_cons	8.145112	.4127047	19.74	0.000	7.318033	8.972191

Heteroskedasticity test

```
. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of CF

         chi2(1)      =     5.08
         Prob > chi2  =   0.0242
```

Hettest result shows significant, FGLS is the recommended test
Feasible Generalised Least Square Result

```
. xtgls CF BZ BGD BM FA, panels(iid) corr(independent)

Cross-sectional time-series FGLS regression

Coefficients:  generalized least squares
Panels:        homoskedastic
Correlation:   no autocorrelation

Estimated covariances      =         1          Number of obs      =        60
Estimated autocorrelations =         0          Number of groups   =         5
Estimated coefficients     =         5          Time periods       =        12
                                                Wald chi2(4)       =     22.27
Log likelihood             = -24.49171          Prob > chi2        =    0.0002
```

CF	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
BZ	-.0064463	.0168345	-0.38	0.702	-.0394413	.0265487
BGD	.8931022	.4654322	1.92	0.055	-.0191281	1.805332
BM	-.0200862	.0239681	-0.84	0.402	-.0670629	.0268905
FA	.7633226	.1915859	3.98	0.000	.3878212	1.138824
_cons	8.145112	.3951347	20.61	0.000	7.370662	8.919562

Summary of Descriptive Statistics

```
. summarize CF BZ BGD BM FA
```

Variable	Obs	Mean	Std. Dev.	Min	Max
CF	60	9.306905	.4297622	8.64162	10.45031
BZ	60	14.66667	2.978264	10	21
BGD	60	.1994529	.1044827	0	.4117647
BM	60	5.883333	2.2481	2	12
FA	60	1.567333	.2710361	1.3	2.13

Correlation Matrix

```
. corr CF BZ BGD BM FA
(obs=60)
```

	CF	BZ	BGD	BM	FA
CF	1.0000				
BZ	-0.1131	1.0000			
BGD	0.2317	0.0636	1.0000		
BM	0.0126	0.2194	-0.1785	1.0000	
FA	0.4500	-0.1229	-0.0028	0.3452	1.0000

Regression Result

```
. reg CF BZ BGD BM FA
```

Source	SS	df	MS	Number of obs	=	60
				F(4, 55)	=	5.10
Model	2.94953267	4	.737383167	Prob > F	=	0.0014
Residual	7.94750317	55	.144500058	R-squared	=	0.2707
				Adj R-squared	=	0.2176
Total	10.8970358	59	.184695523	Root MSE	=	.38013

CF	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
BZ	-.0064463	.017583	-0.37	0.715	-.0416836	.0287909
BGD	.8931022	.486128	1.84	0.072	-.0811202	1.867325
BM	-.0200862	.0250339	-0.80	0.426	-.0702552	.0300829
FA	.7633226	.2001049	3.81	0.000	.3623034	1.164342
_cons	8.145112	.4127047	19.74	0.000	7.318033	8.972191

Multicollinearity Test

```
. vif
```

Variable	VIF	1/VIF
BM	1.29	0.773264
FA	1.20	0.832619
BZ	1.12	0.893102
BGD	1.05	0.949348
Mean VIF	1.17	