FRAUD AND BANK PERFORMANCE NEXUS. EVIDENCE FROM NIGERIA USING VECTOR ERROR CORRECTION MODEL

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A B S T R A C T

This study, through the use of Vector Error Correction Model, dwell on the fraud triangle theory developed by Cressey, (1971) in examining the impact of fraud on bank performance in Nigerian banking industry using quarterly data spanning from 2000 to 2013.The study found out that the number of staff involved in fraud has a significantly positive impact on the return on asset while the fraud perpetrated and the amount involved in fraud perpetration both have negative impact on bank performance. The expected coefficient of the (VECM) result shows that there is a short run dynamic effect of the changes on the return on asset meaning that the variables adjusted to correct the imbalances in the fraudulent banking environment. Therefore, the study recommends that banks need to strengthen their internal control systems to be able to detect and prevent fraudulent activities and to protect its assets in the banking industry in Nigeria.

Keywords: Fraud, Bank Performance, Econometrics, NDIC, Nigeria.

INTRODUCTION

Fraud is a major challenge to the entire banking industry; no bank is immune to it and in all facets of life (Olorunsegun, 2010). The banking public expects accountability, fairness, transparency in their day operation for effective intermediation. Though there were known cases of fraud in the sector, some major problems remain unsolved which are what is the significant effects of fraud cases identified, problem of how to curb or minimize the number of staff involved in the fraud cases, and how to drastically reduce the amount involved in the fraud cases to the minimum. It is asserted by Adeyemo (2012) that fraud in the bank is possible with confirmation of an insider. The banks are expected to ensure that they carry out their responsibilities with sincerity of purpose which is devoid of fraudulent practices. There are three basic elements (perceived pressure, perceived opportunity and perceived rationalization) that constitute fraudulent practices in the banking industry. Therefore, the problem is how these trends of fraudulent practices can be minimized. Upon these backdrops, this study tends to resolve the problems to address the worrisome reduction in the profitability level of banks due to fraudulent activities. The general objective of this study is to empirically examine the impact of fraud and fraudulent practices on bank performance in Nigerian banking sector.

This study will be beneficial to the following groups; First, the authorities concern with banking operation, managements, staff customers and prospective investors in the industry to identify the various means (theft, embezzlement, forgeries etc.) employed in defrauding banks and to identify the cause of frauds in banks in Nigeria. Secondly the government who might find this work relevant to future policy and decision making with to restructuring its agencies for better performance in detaching frauds in Nigeria banks. Thirdly, the study will be useful to the public because the banking industry touches the life of everyone in an economy. Banks all over the world have contributed immensely to the economic growth and development of nations. As such, problems such as fraud which can hinder the smooth operation of the banking industry should be viewed with all seriousness in other not to intercept or destroy the

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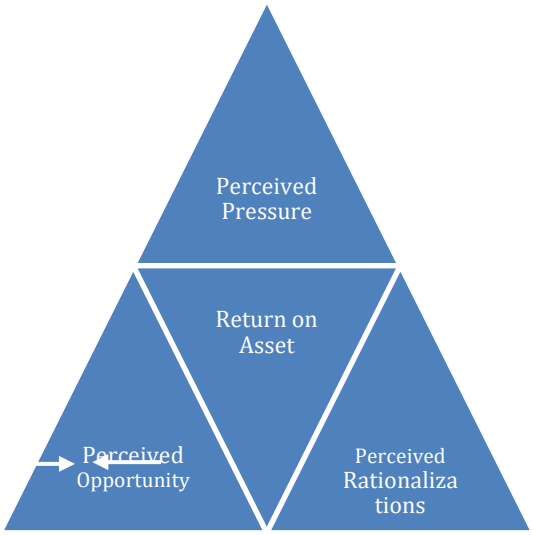
rate of development and lastly the study will also be beneficial to the academia who will carry out further research in this area.

FRAUD AND FRAUDULENT ACT

This study is anchored on the fraud triangle theory developed by Cressey, (1971) in *'Other People's Money: This theory holds that there are three elements namely: (perceived pressure, perceived opportunity and perceived rationalization) that lead people in any organization to commit fraud.*



Fraud Triangle Model. Source: Cressey, (1971).

Perceived Pressure, Perceived Opportunity and Perceived Rationalization: The first element of the Fraud Triangle is pressure or incentive. This is what causes a person to commit fraud. Pressure can include almost anything including medical bills, expensive tastes, addiction problems, etc. Most of the time, pressure comes from a significant financial need/problem. Often this need/problem is non-sharable in the eyes of the fraudster. The second element means, a mechanism or position, by which the potential fraudster can utilise his or her position to resolve their non-shareable financial need. Because fraudsters don't wish to be caught, they must also believe that their activities will not be detected. Opportunity is created by weak internal controls, poor management oversight, and/or through use of one's position and authority. The perceived opportunity must be deemed a low personal risk, which means that they believe that the wrongdoing will remain secret. The final element is a crucial component in most frauds. Rationalization involves a person reconciling his/her behavior (stealing) with the commonly accepted notions of decency and trust. Some common rationalizations for committing fraud are: person believes that committing fraud is justified to save a family member or loved one; person believes that they will lose everything – family, home, car, etc. if they don't take the money; person believes that no help is available from outside; person labels the theft as "borrowing", and fully intends to pay the stolen money back at some point; person, because of job dissatisfaction (salaries, job environment, treatment by managers, etc.), believes that something is owed to him/her; and the person is unable to understand or does not care about the consequence of their actions or of accepted notions of decency and trust.

Empirical Review: There have been an extensive study (Adewunmi, 2007; conducted in many countries on fraud and its effect on bank performance. In a study conducted by Adewunmi (2007) on bank fraud, it identified socio-economic lapse in society such as misplacement of societal values, the unquestioning attitude of society towards the sources of wealth, the rising societal expectations from bank staff and the subsequent desire of the staff to live up to such explanations as contributory factors of fraud. In a different study, Idowu (2009) conducted a research on the means of minimizing the incidence of fraud in

Nigerian banking industry. Findings of the study revealed that, so many factors contributed to the incidence of frauds in banks amongst which are poor management of policies and procedures, inadequate working conditions, bank staff staying longer on a job and staff feeling frustrated because of poor remunerations. Akindele (2011) conducted a research on the "challenges of automated teller machine (ATM) usage and fraud occurrence in Nigeria banking industry". The study posits that lack of adequate training, communication gap, and poor leadership skills were the greatest causes of fraud in banks. He advised that adequate internal control mechanism be put in place and that workers satisfaction and comfort be taking care of.

Onuorah and Ebimobowei (2012) investigate fraudulent activities and forensic accounting in Nigeria. The study found that there is need for the banks in Nigeria to adopt more proactive measures such as the use of forensic accounting techniques in banks. Abdulrasheed, Babaitu and Yinusa (2012) also examined the impact of fraud on bank performance in Nigeria. Result of the study shows that, there is a significant relationship between banks profit and total amount of funds involved in fraud. Finally, Kanu and Okorafor (2013) did a work on the nature, extent and economic impact of fraud on bank deposit in Nigeria using descriptive and inference statistics. The study revealed that there is a positive significant relationship between bank deposit and fraud in Nigerian banking industry.

Nweze (2008) conducted a study on bank frauds. The methodology he adopted involved an interaction with bank staff of various cadres with structured questionnaire to identify the fraud forms and characteristics in the banking industry. Idowu (2009) did a research aimed at finding means of minimizing the incidence of fraud in Nigerian banks. Findings of this study revealed that, so many factors contributed to the incidence of frauds in banks amongst which are poor management of policies and procedures, inadequate working conditions, bank staff staying longer on a particular job and staff feeling frustrated as a result of poor remunerations. Chiezey and Onu (2013) in their study used multiple regression analysis to ascertain the impact of fraud and fraudulent practices on bank performance in Nigeria from 2001 to 2011. They found that the percentage of mobilized funds lost to fraud was highest between 2001 and 2005 but which was significant reduced between 2006 and 2011. The study concluded that fraud and fraudulent activities inflict severe financial difficulties on banks and their customers.

Abdulrasheed, Babaitu & Yinusa (2012) examined the impact of fraud on bank performance in Nigeria. The study revealed that Nigerian banks recorded the highest cases of fraud in 2008. Result of the study shows that, there is a significant relationship between banks profit and total amount of funds involved in fraud. Lastly, Adeyemo (2012) examined the nature, causes, effects and remedy for bank fraud in Nigeria. The study opined that the battle for reclusion, uncovering and retribution of fraud, offenders must be fought on two extensive fronts. First is to reduce the temptation to commit fraud and second is to increase the chances of detection. The above studies seem to have dwelt largely on perpetrators of frauds and their modus operandi. While it is generally believed that fraud depletes the quantum of cash deposits at the disposal of deposit money banks, there has not been any empirical evidence to that effect. That re-enforces the need for this current effort.

THEORETICAL FRAMEWORK

The research premised on the Fraud Triangle Theory developed by Cressey, (1971) as its framework because it explains the factors that cause individuals to commit fraud and best describes fraud in the context of the banking industry. The model as shown above identified three elements in fraud activities. These are: Perceived pressure measured by the number of staff involved in fraud cases; perceived opportunity measured by the number of fraud cases that were perpetrated and perceived rationalization measured by the total amount involved in fraud cases. Perceived pressure or incentive is what causes a person to commit fraud.

Model Specification: Going by the literatures, the studies on impact of fraud on bank performance all used mixture of both primary and secondary data (Adewumi (2007), Akindele (2011), Onuorah and Ebimobowei (2012) Chiezey and Onu (2013) and Kanu and Okorafor (2013) However, going by the research conducted by Chiezey and Onu, (2013) which used variables like number of staff involved in fraud cases (NSTF), number of fraud cases perpetrated (NFCA) and total amount involved in fraud cases (TAFC) as proxies for perceived pressure, perceived opportunity and perceived rationalizations respectively. That informs the model specification. Hence, this model is specified as:

BPERF= f (FRAUD) ---------- (1)
BPERF= f (ROA) ---------- (2)
FRAUD = f (NSTF,NFCA,TAFC) ---------- (3)
ROA = f (NSTF,NFCA,TAFC) ---------- (4)
Where:
ROA = Return on Assets (Proxy for Bank Performance)
NSTF = Number of Staff (Proxy for Perceived Pressure)
NFCA = Number of Fraud Cases (Proxy for Perceived Opportunity).
TAFC = Total Amount involved (Proxy for Perceived Rationalization).

Expressing equation (3.1) in linear form:
$ROA01_t = \alpha_0 + \beta_1 NSTF01_t + \beta_2 NFCA01_t + \beta_3 TAFC01_t + \mu$ --
----------(5)
Where α_0 = Autonomous incomes
β_1, β_2, and β_3, are parameters, μ = Error Term, t = time trend and L is logarithm.

TREND ANALYSIS

Trend Analysis of Fraud Cases in Nigeria: This section captures the trend analysis of fraud cases in Nigerian banking sector between 2000 and 2013. This trend is analyzed analytically with the use of graph.

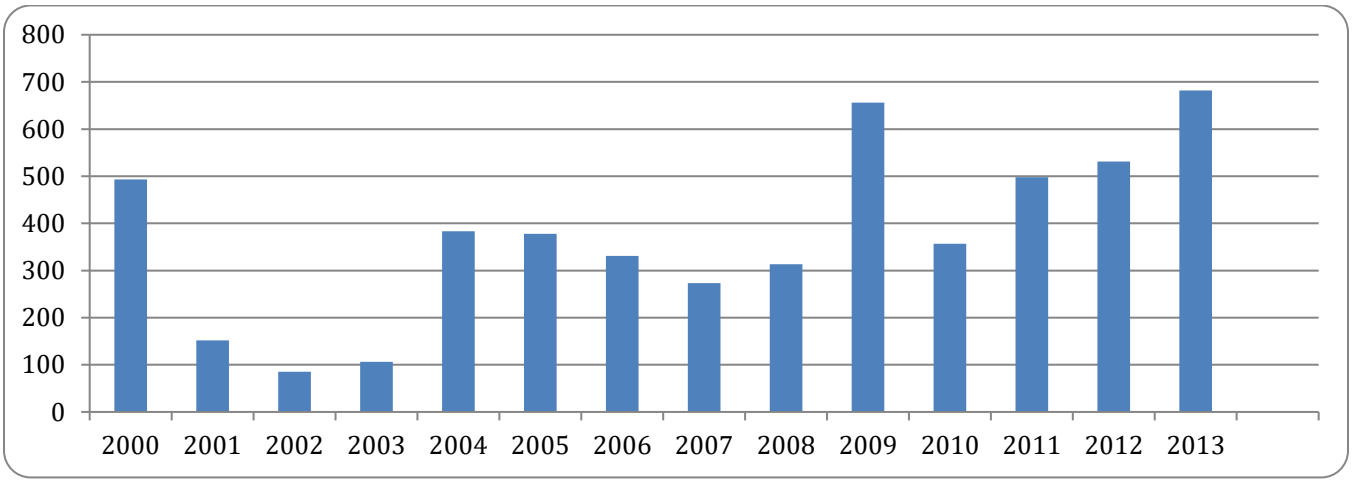


Figure 1. Numbers of Staff Involved in Fraud Cases in Nigeria (2000 - 2013).

From trend analysis above, it can be observed that a total of 5,238 bank staff was involved in fraud and forgery during the study period.The number involved in fraud and fraudulent activities was highest in the year 2009 and 2013 amounting to 25.5% whereas the lowest number of staff involved in fraud cases occurred in 2002 giving a considerable 1.6%. This was due to the fact that attraction to perpetrate in fraudulent act as at that time was minimal.

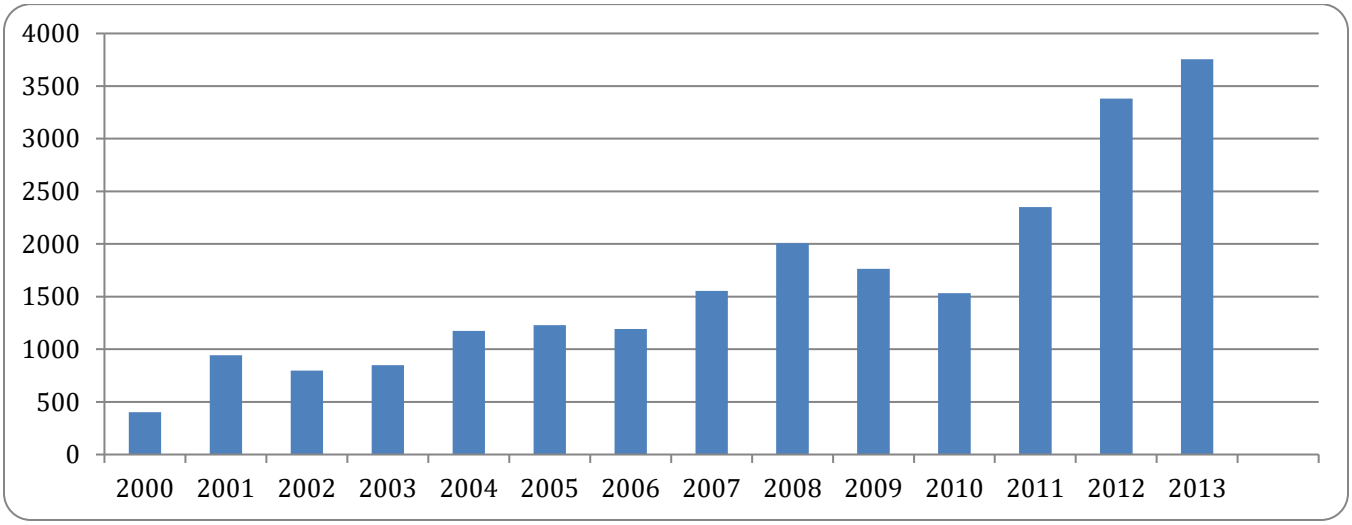
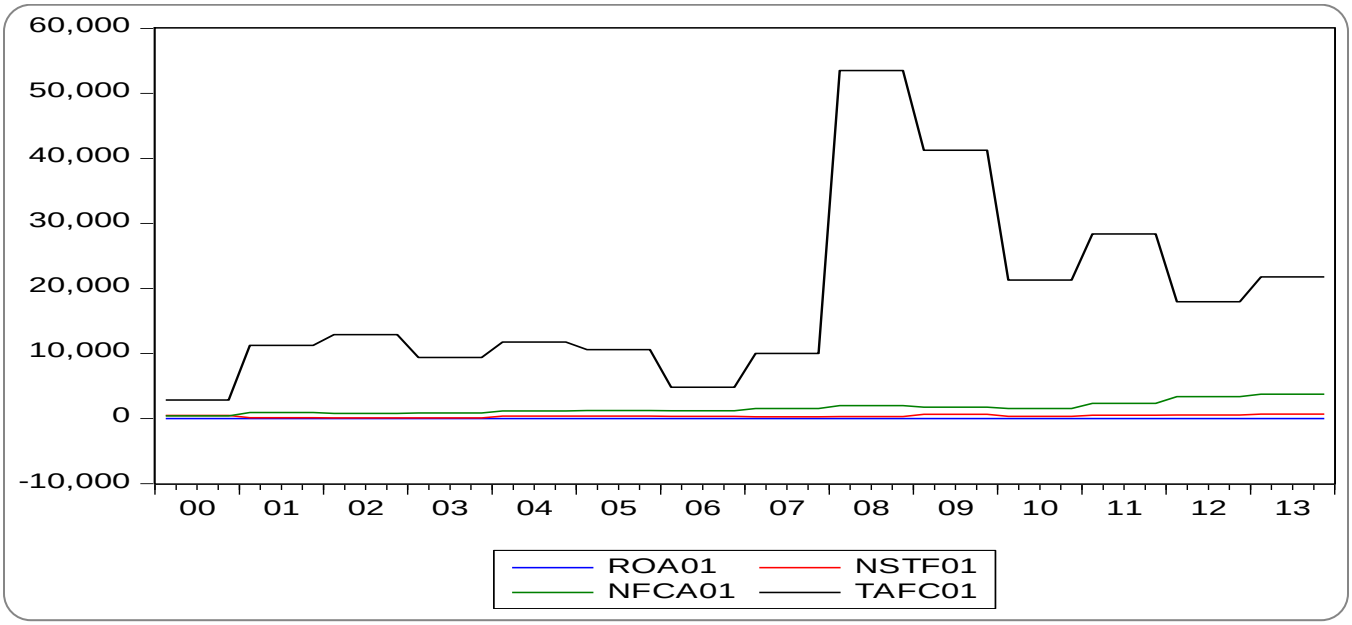


Figure 2. Numbers of Fraud Cases in Nigeiran Banking Sector (2000 - 2013).

In 2000, the reported cases were 403, while in 2001; they rose to 943 which was an increment of 57.3%. In 2002, the cases recorded dropped to 796 indicating a decrease of 18.8%. This implies that fraud and fraudulent activities were reduced due to the fact that the number of staff involved in fraudulent activities was as well low. However, from 2011 to the present year, the fraudulent activities were of the increase in the banking sector in Nigeria during the period of study.



The trend in figure 2 and 3 above show that despite the fact that year 2002 recorded the lowest number of fraud (796) as well as the lowest number of staff (85) involved in fraudulent act, it recorded a high amount of money recorded due to fraudulent activities. However, there was a sharp increase from year 2006 when it was 4,832.17 to 53,522.86 in 2008 which is an increase of 90.9%. Since then, the amount committed to fraud cases in the banking industry has been drastically reducing due to various consolidation and regulatory measures put in place by the financial authority.

Table 1. Summary Statistics of the Variables Used in the Regression Analysis.

Variables	ROA01	NSTF01	NFCA01	TAFC01
Mean	2.329286	374.1429	1638.071	18417.30
Maximum	5.920000	682.0000	3756.000	53522.86
Minimum	-9.280000	85.00000	403.0000	2857.110
Std. Dev.	3.641162	180.7781	938.8045	13856.67
Skewness	-2.228074	0.040303	1.032183	1.305592
Kurtosis	7.824694	2.152833	3.161908	3.846557
Probability	0.000000	0.429605	0.006721	0.000152
Observations	56	56	56	56

Source: Author's Computation, 2015.

The summary of the statistics used in this empirical study is presented in the table 3 above. As observed from the table, ROA01 has the lowest mean value of 2.329286 and TAFC01 has the highest mean value of 18417.30where as the mean value of NSTF01 and NFCA01 are 374.1429 and 1638.071 respectively. The analysis was also fortified by the values of the skewness and kurtosis of all the variables involved in the models. The skewness is a measure of the symmetry of the histogram while the kurtosis is a measure of the tail shape of the histogram. Hence, all the variables are positively skewed except from ROA01 which are negatively skewed. The bench mark for the symmetrical distribution i.e for the skewness is how close the variable is to zero while the case of the kurtosis is

three (mesokurtic) but values lower than that is called platykurtic and above is referred to leptokurtic. Hence, from the table, it be observed that all the variables used present positive kurtosis value which means that the distribution is leptokurtic (too tall).

Unit Root Test: The study also uses both the Augmented Dickey-Fuller (ADF) and the Phillip- perron (PP) unit root test in order to access the possibility of co-integration in the data to ensure consistency in subsequent stationarity modeling. The results are shown below.

Table 2. Augmented Dickey Fuller (ADF) Test Result.

	ADF Value	Mackinnon Critical Values	ADF Value	Mackinnon Critical Values	
Variables	LEVEL		FIRST DIFF		Order of integration
ROA01	-3.131130	-4.133838***	-6.326074	-4.148465***	I(1)
NSTF01	-3.156304	-4.133838***	-7.326632	-4.137279***	I(1)
NFCA01	-1.607819	-4.133838***	-7.894772	-4.137279***	I(1)
TAFC01	-2.222933	-4.133838***	-7.183022	-4.137279***	I(1)

Source: Author's Computation, 2015.

Note: One, two and three asterisk denotes rejection of the null hypothesis at 10%, 5% and 1% respectively based on Mackinnon critical values.

The above result i.e. ADF test shows that all the variables are stationary at first difference.

Table 3. Phillips-Perron (PP) Test Result.

	PP Value	Mackinnon Critical Values	PP Value	Mackinnon Critical Values	
Variables	LEVEL		FIRST DIFF		Order of integration
ROA01	-3.378329	-4.133838***	-7.147143	-4.137279***	I(1)
NSTF01	-3.191286	-4.133838***	-7.326616	-4.137279***	I(1)
NFCA01	-1.541401	-4.133838***	-7.929399	-4.137279***	I(1)
TAFC01	-2.365909	-4.133838***	-7.183022	-4.137279***	I(1)

Source: Author's Computation, 2015.

Note: Note: One, two and three asterisk denotes rejection of the null hypothesis at 10%, 5% and 1% respectively based on Mackinnon critical values.

The above result i.e. Phillips-Perron test shows that all the variables are stationary at first difference.The two test produce supporting results. The results show that almost all the variables are found to be stationary at 99 percent significance level in their first difference from with the assumption constant, trend and none of the two cases. Therefore, all variables are non stationery and integrated of order 1, 1(1). Therefore, we can safely conclude that first differencing is sufficient for modeling the time series adopted in this research work. It is appropriate to estimate models that include variables in their first differenced form through the VECM procedure.

The Cointegration Analysis Result and Interpretation: In determining the number of co integration vectors, trace test and maximum Eigen value test using the more recent critical values of Mackinon-Haug-Michelis (1999) was applied. The assumption of no deterministic trend and restricted constant was for all the variables. The choice was tested using (AIC) and Schwartz information Criterion (SIC). The result for both trace test and maximum Eigen value for unrestricted co integration rank test are presented in table 4 below.

Table 4. Long-Run Impact Analyses of Fraud and Bank Performance in Nigeria.

Hypothesized No. of CE(s)	Trace Statistic	0.05 Critical Value	Hypothesized No. of CE(s)	Max-Eigen Statistic	0.05 Critical Value
None *	47.85613*	42.55838	None *	21.03887*	27.58434
At most 1 *	29.79707*	21.51952	At most 1	21.13162	14.53031
At most 2	6.989201	15.49471	At most 2	14.26460	6.310095
At most 3	0.679106	3.841466	At most 3	3.841466	0.679106

SOURCE: Computed by the Researcher, 2015.

Max-eigenvalue test indicates no cointegration at the 5%; Trace test indicates no cointegration at the 5%

*Note: *denote rejection of the hypothesis at the 5% level.*

The result in table 4 shows that the trace test value statistics reject the null hypothesis at 5% level of significance suggesting evidence of the presence of 2 co-integrating vector. Johansen co-integration test shows this by comparing the trace statistics values with critical values, a result is chosen at the value where the trace statistic is less than the corresponding critical value. Here it is clear that there is at most 2cointegrating equation in the model with a trace statistics value of 6.989201 and critical values of 15.49471 at 5% level of significance. With this result, we reject the null hypothesis of no co integration. This implies that there exists a long run relationship among the variables which are ROA01, NSTF01, NFCA01 and TAFC01. This means that this study can go ahead to run the VECM because all the variables cointegrated.

The impact of Fraud on Bank Performance in Nigeria: This captures the second and third objectives, the result of co-integration test reveals that there is a long run relationship among the variables from the trace test result. This is due to the fact that the residuals of both equations are stationary at levels. This means that we can estimate the VECM. VECM is designed for use with non-stationary series that are known to be co-integrated. The VECM has co-integration relations built into the specification so that it restricts the long-run behavior of the endogenous variables to converge to their co-integrating relationships while allowing for short-run adjustment dynamics. The use of the methodology of co-integration and VECM add more quality, flexibility and versatility to the econometric modeling of dynamic systems and the integration of short-run dynamics with the long-run equilibrium. The results are of the co-integrating relationship amongst the variables within the VECM framework are presented in table 5 below.

Table 5. Co-integrating Equations for (VECM) result.

Variables	Coefficients	Standard Error	T-statistics
C	-1.322351		
NSTF01(-1)	0.028182***	0.00392	7.18700
NFCA01(-1)	-0.004815	0.01385	-0.34774
TAFC01(-1)	-15.06314***	0.77149	-19.5247

Source: Author's Computation, 2015.

Note: *= 10% it denotes rejection of null hypothesis at this level

***= 5% it denotes rejection of null hypothesis at this level*

****= 1% it denotes rejection of null hypothesis at this level respectively.*

The table 5 above shows that inflation rate (NSTFO1) has a positive and significant impact on return on asset in Nigerian banking industry at $p < 0.01$ i.e. a unit increase in number of staff involved in fraud would induce a 2.8% increase in return on asset. This implies that increase in number of staff involved in fraud will lead to increase in return on asset in Nigerian banking industry. This result is not in line with the apriori expectation [Abiola, (2009) and Dickson, (2009)] which predicts a negative relationship. The reason that can adduce to this is that increase in number of staff that perpetrated in fraudulent act would lead to an increase in the amount committed to fraud cases but in turn lead to a reduction in return on asset of banks.

Number of fraud committed (NFCA01) has a negative and significant impact on return on asset in Nigerian banking industry at $p<0.01\%$ i.e. a unit increase in Number of fraud committed would induce a 1506% decrease in return on asset. This implies that increase in Number of fraud committed will lead to reduction of return on asset which will lead to decrease in shareholders' fund. This result confirms the literatures [Ndi-Okereke, (2004) and Abiola, (2009)].

Total amount of fraud committed (TAFC01) has a negative and significant impact on return on asset at $p<0.01\%$ i.e. a unit increase in Total amount of fraud committed would induce a 163% decrease in return on asset in Nigerian banking industry. This implies that if number of fraud increases the rate at which total amount committed to fraud cases increase and would eventually lead to a reduction in return on asset in Nigerian banking sector. This result is in accordance with the result obtained by [Eseoghene, (2000), Ndi-Okereke, (2004), Dickson, (2009), and Abiola, (2009)].

Table 6. Short-Run Dynamics of Return on Asset and Fraud in Nigerian Banking Sector.

S/N	VARIABLES	Coefficients	T-STATISTIC	Standard Error
1	ECM_{t-1}	-0.301950	-2.20174	0.13714
2	INTERCEPT	0.015184	1.56020	0.00973
3	$D(NSTF01)_{t-1}$	-0.032997***	-3.08006	0.01071
4	$D(NFCA01)_{t-1}$	0.094196***	2.54664	0.03699
5	$D(TAFC01)_{t-1}$	-0.050170***	2.76690	0.01813
	R-Squared	0.731706		
	Adjusted R-squared	0.373981		
	F-statistics	2.045444		

Source: Compiled by the Author, 2015.

, **, * denotes significance at 10%, 5% and 1% respectively.*

The table 6 presents the results of the VECM coefficients. The estimated coefficients for the error correction term reveal which of the variables adjust to correct imbalance in the fraudulent banking environment whilst the variables coefficients shows the short run dynamic effects of the changes in the explanatory variables on the dependent variable.

Number of Staff involved in fraud cases (NSTF01) in the previous year has a negative and significant impact on return on asset in the current year at $p<0.01$ i.e. a percentage increase in number of staff involved in fraud cases in the previous year would induce a 3.3% decrease in return on asset in the banking sector in the current year.

Number of fraud committed (NFCA01) in the previous year has a positive and significant impact on return on asset in Nigerian banking sector in the current year at $p<0.01$% i.e. a percentage increase in number of fraud committed in the previous year would lead to 9.4% increase in return on asset in Nigerian banking sector in the current year.

Total amount of fraud committed (TAFC01) in the previous year has a negative and significant impact on return on asset in Nigerian banking sector in the current year at $p<0.01$ i.e. a percentage increase in total amount of fraud committed in the previous year would induce a 5% decrease in return on asset in Nigerian banking sector in the current year.

The result of the descriptive statistics showed that return on asset has the lowest mean value of 2.329286 and total amount of fraud committed has the highest mean value of 18417.30where as the mean value of number of staff involved in fraud cases and number of fraud cases are 374.1429 and 1638.071 respectively. Also, all the variables are positively skewed except from ROA01 which are negatively skewed. From the unit root test all variables are stationary at first difference under the ADF and PP test. From the co-integration test result a long run relationship exists among the variables.

CONCLUSION

This study thus concludes that fraud elements like number of fraud cases perpetrated (NFCA) and total amount of money perpetrated through fraud both have negative effect on return on asset while number of staff involved in fraud cases has a positive impact on return on asset. Result of the findings leads us to the conclusion that an inverse relationship exist between number of fraud cases and bank performance meaning that when fraud increases, bank performance proxied by return on asset will decreases.

POLICY RECOMMENDATION

Based on the findings, Banks in Nigeria industry need to strengthen their internal control systems in order to prevent fraud and fraudulent activities and to protect its assets. Also, the regulatory and supervisory bodies of banks need to improve their supervision using all tools at their disposal to appropriately check and curtain the incidence of fraud and fraudulent practices in the banking industry in Nigeria.

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