



## **Fraud Prevention and Internal Control in the Nigerian Banking System**

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### **ABSTRACT**

This paper examines the issues of internal control *viz.*, fraud prevention in the banking industry, adopting both primary and secondary data. Primary data was used to test internal control while secondary data were employed to test fraud prevention. The main primary variables were separation of duties, monitoring, and staff qualifications while the main secondary variables are bank profit, regulation, technology and *M2*. In both cases regression techniques were adopted. The results show that internal control on its own is effective against fraud, but not all staff are committed to it, while the secondary data is quite supportive of the primary data but more exemplifying in that *M2*, staff qualifications and technology were significant throughout the various dependent variables. It is also clear from the regressions that technological based fraud is significant. The paper recommends the continuation of the cashless policy of the Central Bank to reduce available cash and improvement in educated staff engagement to reduce fraud in the banking system.

**Keywords:** Deposit Money Banks, Internal Control, Fraud Prevention, Regulation, Cashless Policy

**JEL Classifications:** G21, G38

### **1. INTRODUCTION**

Fraud control is becoming an issue that the regulators and top banking executives who are in saddle when fraudulent activities takes place or more succinctly when someone commit an act of fraud in the financial institutions under their management. It is quite clear that the installation of internal controls cannot be sufficient to eliminate dishonest activities, constantly rejigging of the controls already put in place to ensure that they are effective in reducing fraudulent activities in financial institutions from becoming successful should become important. Fraudulent activities are rampant in every organization but more rampant in financial institutions and perhaps more common in Deposit Money Banks (DMBs) because of the instruments of their trade. Banks are most prone to financial fraud as a result of money and near money instruments used in the process of their operations.

The acts of financial fraud has persisted in DMBs in spite of strong internal controls put in place to forestall and control any planned intention to steal the bank's money. Strong controls that at times are antithetical to the efficient operations of the bank

having been put in place in certain cases but have not succeeded in reducing drastically the amount of funds lost. Thus all internal control measures have become preventive and protective of the banks financial resources sometimes to the detriment of the bank's primary operations. Most banks are litigation-shy as judicial officers often do not find it interesting that that the process (internal controls) put in place by the bank was compromised by the employee. In addition, where the bank is litigious, courts often sympathize with customers whose infractions led to large losses of funds irrespective of whether collusion with an employee had existed. The scenarios are not funny outside the banking halls when financial fraud happened and parties have to prove their innocence. Whatever the case is, the bank losses money and reputation, the staff members' lose jobs.

One of the reasons for the use and continuous revision of internal control systems in the bank is to ensure that losses occasioned by fraudulent activities are minimal if they occur, and attempts are discovered very early before losses can occur. The triumvirate of fraud prevention, fraud control and detection are coalesced into the effective internal control system that the bank employs.

Most studies done earlier dealing with the fraud had employed primary data and did not consider the use of secondary data, while employees were the main focus of those studies. A new approach is required to measure the determinants of possibility to commit fraud and what can be adopted as main levers in the control of fraud within the banking system. Black (2005) describes fraudulent employees as super financial predators which seek to ruin many of such establishments. Ozigbo and Orife (2011) conclude in their study that internal control is an effective deterrent to internal organizational fraud that may be planned in the organization.

The objective of this study is to test the determinants of fraud prevention and internal control system impact on banks performance and the determinants that can be effective in the management and control of financial fraud against DMBs. The objective to be achieved is thus broken into two specific objectives *viz.*: To determine the internal control measures that are effective and other determinants that are significant in the prevention and control of fraud in DMBs. The paper consequently proceeds as follows: Following after this introduction is the literature review. Section three is on methodology and the measurements adopting both primary and secondary data and techniques in ascertaining such determinants, the results are fully discussed in sections four while the last section recommends and concludes on the paper.

## 2. CONCEPTUAL FRAMEWORK AND LITERATURE REVIEW

Economic theory on fraud dates back to when white collar frauds by Chief Executive Officers (CEOs) against the organization were becoming rampant. This theory started with Akerlof (1970)'s study with the belief that this is an inefficient contract that is manifested in the market for lemons. One of the notorious white collar crimes is the employee fraud in the organization with intent to enrich and at most and exits the organization as quickly as possible when the fraud has been successfully executed. Committee of Sponsoring Organization of the Treadway Commission (2010) reports large sums of money being lost regularly by public firms and more commonly among the medium or lower size firms, where more than 26% of assets were lost. The make-up of the management seems not significantly different from non-fraud prone firms. Black (2005) had earlier termed the phenomenon as control fraud. There are different variants of control frauds: Accounting fraud, looting and crass kleptomani. This theory, traced from the efficient market hypothesis proves that the awareness by the executives of deposit insurance and other palliatives that provide succor to creditors incentivise the looting spree by the CEOs. The special case of the Savings and Loans in the United States of the 1990s is likened to two other scenarios during which noticeable losses to the financial system of Chile and United States occurred which were subsequently transferred to the deposit insurers. Wood (2003) held to the belief that the deposit insurance provided impetus for looting in over 3000 savings and loans firms in those years.

Chakrabarty (2013) defines fraud as any behavior by which one person intends to obtain a dishonest advantage over another where the person makes an illicit gain while the other party incurs a

loss. The Institute of Professional Practises Framework (Sommer, 2014) defines fraud as 'any illegal act characterized by deceit or concealment or violation of trust which do not directly depend on the use of violence, perpetrated in firms to obtain money, property, or services; to avoid payment or loss of services; or to secure personal or business advantage. While Chakrabarty categorizes the frauds into three different types as technology related, know your customer (KYC) related and advances related. ACL groups fraud in banking into eleven sections with four being quite significant among which are corruption, cash in hand, billing and cheque tampering, non-cash skimming and larceny among several others. In these days of technology enabled payment platforms, it is reported that the greatest value of frauds occur from this channel. KYC is related to customers planned fraud in any form either through duplication of data or through falsification or obtainment of data to commit fraud, while the third is related to advances portfolio which may cut across several banks.

Khanna and Arora (2009) from the Indian environment believes the reason for the rise in fraud profile in the banking industry is because the procedures jointly instituted by the banks and the Reserve Bank were not fully implemented. The paper cites overburdened staff, lack of training and competition as other causes of the fraud. The accounting firms of Ernst and Young (2010) and Deloitte (2015) have attempted to help stem fraud in several ways. Fraud detection or prevention is a function that should be system-wide, but mostly in the realm of internal audit group. Fraud should not go through and be undetected in any accounting year where an effective internal control and audit process are in place.

Internal control is a gamut of measures that seeks to detect errors, frauds and irregularities, to ensure that all transactions are correctly processed and ensure that all assets are safeguarded through restriction of access to authorized persons only. It also enables work to be performed by a person and any omission or error can be traced to that person and to make the work of the auditors easier (Aguotu, 2002). One of the ways to detect fraud, though, ex-post is through internal audit. Internal audit is the process engaged to check if due process and procedures have been followed in the carrying out the operations of an organization which is carried out regularly and as when needed. According to Gayasi (2000) internal audit functions to provide independent view of financial, accounting and other processes to the management as a basis for protective and constructive service. It performs well if it has sufficient standing and authority within the bank and at the same time operates according sound principles (Bank for International Settlement, 2012). It acts a check on the way in which the operations of the firm or the organization are done.

For a country known negatively with corruption perception index, the Nigerian financial environment presents a fraud level in significant figures and increasing in sophistication. The fraudulent practices in the Nigerian banking industry show consistently that outright theft is the commonest with the highest percentage in terms of value and volume (Owolabi, 2010). The paper analyzed in details employee involvement scenarios. The typology of fraud in Nigeria is variously described and detailed out. Owho (2005) and Nwanze (2006) gave different typologies as many as nine

in each case, but clearly marked out by the various patterns as mentioned above.

On the determinants of fraud in the Nigeria banking system, Ojo (2008) summarizes the causes of fraud in Nigeria banking system to two: Generic, institutional or endogenous factors and exogenous, environmental or social factors. Ajayi (undated) found total amount and number of staff involved as highly significant. This study did not suggest a solution to that problem of staff. A revisit of the study by Ajayi (2003) shows that there is significance in the number of branches of the bank apart from the cadre of workers in the bank, both at 0.01 level. Idolor (2010), in a study adopting primary data makes several conclusions about the state of banking frauds in Nigeria. Chief among the conclusion is that computer fraud now account for significant amount at  $t = 70.23$  of banking frauds followed closely by stealing and theft at  $t = 27.16$  of a total useable sample of 100 respondents. Abdul Rasheed et al. (2012) uses Pearson product moment correlation and evaluates the reported cases of frauds in Nigerian banks and concludes that it has insignificant negative impact on banks profitability, and that the highest level of fraud happened in 2009. The data employed in this study is however of longer series.

### 3. METHODOLOGY AND MEASUREMENTS

Just as most internal control and fraud related studies, the paper adopts primary data at the first instance and followed up with secondary data using some of the primary data variables for further investigation. The primary data adopted the use of structured questionnaire and which were served on a select group of banks that cut across the various genres of Nigerian DMBs. From the old generations First Bank was selected and among the young banks, Ecobank Bank was picked. The most technological driven, Zenith Bank, the most unstable Enterprise Bank. Thus 120 questionnaires were distributed on equal basis of 30. The distribution and retrieval is shown in Table 1. The return rate of the questionnaires shows that First Bank and Zenith Bank both have 20% of total while Ecobank and Enterprise have 18.3% and 15.8 of total questionnaire returned. All the banks are located in Lagos, the financial nerve center of Nigeria. This stratification enables the understanding of the type of responses obtained from the various banks. Thus total response rate of the banks to the questionnaire was 74.1%.

The secondary data approach was adopted to clarify the following unresolved issues in primary data and test some others: (a) The issues of technology being an enabler of fraud, (b) if increase in remuneration would reduce fraud, and (c) if more educated persons would be reduce fraud, and (d) if the regulatory oversight by the monetary authorities were sufficient to reduce fraudulent

**Table 1: Distribution and retrieval of questionnaires**

Bank	No served	No returned	% Returned
Zenith Bank	30	24	20
Ecobank	30	22	18.3
First Bank	30	24	20
Enterprise Bank	30	19	15.8
Total	120	89	74.1

Source: Authors' Field study (2015)

practices in the banking system. Thus the secondary data based tests have these issues and others with it. The variables of interest were selected based on the above disparities in the primary data. The variables are thus: Remuneration proxied with the per capita gross national income, technology with internet penetration (e-transactions), regulatory institutions performance, cash and negotiable instruments ( $M2$ ), and qualification (level of education). The study uses the aforementioned variables as independent variables; while three measures of loss were adopted as dependent variables. The paper elects to adopt the regression technique to estimate the impact of the each of the variables on the dependent variables: (a) Actual loss, (b) weighted loss and (c) percentage increase in losses.

Data for the variables are extracted from various sources as follows:  $M2$  is from CBN Statistical Bulletin (available online), level of education and internet penetration from World Bank Development Indicators; Income per capita available from WEO from the IMF. All the series were from obtained from Nigeria Deposit Insurance Corporation.  $M2$  is obtained from CBN statistical bulletin. Regulation is obtained from the World Development Governance Index.  $Bprofit$  is a total annual profit for the sample of banks used in the primary data, while lastly the  $etrans$  was obtained the internet penetration for the country from WDGI. The dependent variables were picked from the NDIC reports for 2014 and weighted loss is obtained as actual loss/number of persons, and increase in loss as  $\% \Delta X = (X_2 - X_1) / X_1$ . Actual loss is used as presented. Attempting to know the impact, the paper formulates the ordinary least square regression as follows:

$$\gamma = \alpha + \beta x + \varepsilon$$

Single equations of multivariate regression of the following form were tested with the various dependent variables as explained below:

$$Wloss = Bprofit + Qualification + etrans + Remuneration + M2 + Regulation + \varepsilon_i \quad (1)$$

With each of the models having an alternative autoregressive first order function as:

$$AR(t) = b * AR(t-1) + e(t) \quad (1a)$$

$$Actloss = Bprofit + Qualification + etrans + Remuneration + M2 + Regulation + \varepsilon_i \quad (2)$$

$$Incrloss = Bprofit + Qualification + etrans + Remuneration + M2 + Regulation + \varepsilon \quad (3)$$

The variables were derived from Nigeria Deposit Insurance Corporation (NDIC) Annual Reports.  $WLoss$  is the weighted loss derived from Loss/No of staff involved.  $Incrloss$  is the percentage increase in  $Actloss$ . Figure 1 below represents the relationships between the loss (dependent) variables.

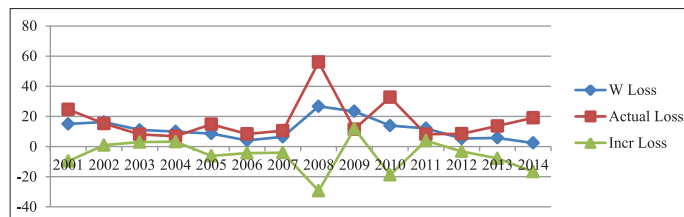
The demographics and information on the respondents reveal the following: Majority are male at 62% while majority of

respondents (71%) are the in the 30-40 years bracket while 15% are in 40-50 years age bracket. 77.5% are bachelor degrees holders. Only 14.6% are HND holders showing the degree of discrimination against the holders of the diploma. There are more chartered accountants (67%) among the respondents than bankers (6%). A sizeable number (27%) of them do not have any professional

qualification and majority at 80% have working with experience of between 5 and 15 years. The complete status of the respondents is reported in Table 2.

Reliability of an instrument shows how stable and consistent the instrument is within the given context. It is the degree which an assessment tool produces a stable and consistent result. The reliability of a research instrument can be assessed for consistency using the Cronbach's alpha test. In this test, the coefficient ranges from 0 to 1.00. In determining the reliability of the research instrument, the Cronbach's alpha test was administered to measure the reliability of the underlying dimensions of the research instrument.

Figure 1: The relationship between the loss variables



Source: Loss variables adopted from Various NDIC Reports (2015)

Table 2: Demographic and status information of respondents

Status	Measuring group	Frequency (%)
Gender	Male	55 (62)
	Female	34 (38)
Age bracket (years)	<30	10 (11)
	30<40	63 (71)
	40<50	13 (15)
	>50	3 (3)
Academic qualification	OND	3 (3.4)
	HND	13 (14.6)
	B.Sc.	69 (77.5)
	Post-graduate	4 (4.5)
Professional qualifications	ACA	41 (46)
	ACCA	19 (21)
	ACIB	5 (5.6)
	None	24 (27)
Experience (years)	1<5	9 (10.1)
	5<15	71 (80)
	15<25	8 (9)
	>25	1 (1.1)

Source: Field study on Fraud (2015)

Table 3: Statistical analysis of divergence in respondents views

Headword	Statistic	Bias	Standard error	Lower	Upper	T	Significant (two-tailed)
Weakness	18.4526	-2.29	3.9091	6.38748	21.637	2.424	0.072
Effectiveness	25.3179	-3.78	7.1555	0.89442	30.318	1.766	0.152
Efficiency	23.0542	-3.59	6.9500	2.88097	28.987	1.94	0.124
Duties	27.4317	-4.38	8.5370	1.64316	34.14	1.63	0.178
Fraud	25.1694	-3.44	6.6800	2.04939	29.953	1.777	0.15
Responsibility	28.4605	-5.21	10.488	2.44949	36.523	1.571	0.191
Review	34.0661	-6.93	14.013	0.44721	43.270	1.313	0.26
Awareness	21.1660	-2.80	4.9399	2.94957	22.456	2.113	0.102
Remuneration	12.8646	-1.88	3.8016	1.78885	18.005	3.476	<b>0.025</b>
Objectives	24.7285	-3.31	5.9665	2.07364	25.928	1.808	0.145
Fraud	29.3683	-4.66	9.0508	0	35.601	1.523	0.202
Capital	24.99	-3.56	6.5533	2.05240	29.580	1.79	0.148
Monitoring	25.3179	-3.43	6.4020	0.89442	27.933	1.766	0.152
Audit	22.4165	-3.34	6.9179	3.93700	28.621	1.995	0.117
Regulatory	20.8446	-2.71	4.8568	2.86787	23.543	2.145	<b>0.098</b>
Profitability	29.6900	-5.05	10.035	0.4472	37.064	1.506	0.206
Adequacy	24.6779	-3.36	6.1377	1.34164	25.195	1.812	0.144
Qualification	16.0156	-2.55	5.3761	1.2247	22.113	2.792	<b>0.049</b>
Technology	16.2941	-2.19	4.1899	5.47722	20.731	2.745	<b>0.052</b>
Performance	25.5734	-3.51	6.5138	0.44721	26.290	1.749	0.155

Source: Variables from the responses of respondents (significant issues in bold)

## 4. RESULTS AND DISCUSSIONS

### 4.1. Primary Data Results

The data output indicate that data was well spread with Cronbach's alpha of 0.778 when the minimum expected is 0.75. This shows that the output is unique in results to be expected. The items in the questionnaire are 21 with summary of output as shown in Table 3.

The use of primary data based fully on responses from bank staffs show that most were in favor of internal control being very effective for fraud control. The responses are further analyzed to understand the distribution around each question. From Table 3 it can be observed that there are five significant responses. These five observations are significant at various levels from the respondents' standpoint and at various levels. The most significant of them all is remuneration. Next to this is qualification of bank staff, both beyond 0.05 level of significance. The rest are significant equally beyond 0.1 levels.

The primary data tested the effectiveness internal controls in the banking system to the effect that it is effective and has been and can result in better performance of banks. A number of variables were used in the test from the 21 items in the questionnaire. An observation about the possible skewness of the responses



prompted a test to show the significant divergence of responses as represented by bias of higher than  $-2.26$  and with  $t = 2.145$  of and  $\rho$  of  $0.098$  (about  $0.1$ ). The study analyzed the variables further and employed secondary data to prove the validity or otherwise of the observation of the respondents. Five items were observed to have this type of result: Weakness, remuneration, regulatory, technology and qualification. Table 4 shows the complete comparative respondents' result. The analysis was to help to discover the divergent views of the respondents. The highly divergent views are those with high significant values.

The regression of primary data indicates that internal control can effectively reduce fraud in the banking system. Constant changes in the process and staff can effectively reduce fraud as the t-statistics shows, separation of duties seem to be most important positive factors that reduce fraud effectively. Monitoring and process control are other highly significant variables in the primary regression equations. Regression summary of respondents' are displayed in Table 4.

These show clearly that the observed variables should be important for attention before the bank management and the monetary authorities as the variables to be manipulated in order to obtain the best scenario of the management of fraud in banking organizations. However, an interesting result of the regression is that most staff members do not believe it is a joint responsibility to monitor and

reduce fraud in the banking system. This is not surprising as the same staff have often compromised the internal process to commit fraud while some are actually employed in the bank with the intent to commit fraud against the system.

Table 4 show how much of the variance of the dependent variable can be explained by the model. The adjusted  $R^2$  is  $0.698$  when expressed in percentage; the model explains that  $69.8\%$  variance of fraud in DMBs is in respect to the effect that internal control system has on fraud prevention. The other  $31.2\%$  unexplained variable is due to the variations in other variables outside this model. There is a strong inverse relationship between internal control and fraud.

Table 5 shows the extent to which internal control system has a significant effect on fraud prevention in DMBs. Beta values are used for the comparison. In Table 5, the largest beta co-efficient is  $0.421$ , which shows that separation of duties is an effective measure of controlling fraud. It makes the strongest contribution to explaining the dependent variable; which means that for every  $16.8\%$  case of fraud, weakness in the internal control is responsible.

## 4.2. Secondary Data Results

The study was able to accumulate data for only 14 years on the all the variables that were adopted for the regression equation set out in section 3. The descriptive of the data are as analyzed below. From the data in Table 6 the standard deviation of the *Actloss* is highest among the dependent variables while the independent variables show *Bprofit* as highest. The skewness of *Actloss* and *Regul* were highest and lowest respectively.

**Table 4: Regression summary outputs**

Model	R	R <sup>2</sup>	Adjusted R <sup>2</sup>	SE estimate	F stat	Sig.
1	0.836 <sup>a</sup>	0.698	0.680	0.22100	38.449	0.000 <sup>a</sup>

Model 1 predictors: (Constant), Constant changes effective internal control separation of duties monitoring staff qualification. <sup>a</sup>P=0.05. SE: Standard error

**Table 5: Coefficient results**

Model	Unstandardized coefficients		Standardized coefficients	t	Significant
	B	SE			
1					
(Constant)	0.468	0.313		1.494	0.139
Constant changes	0.421	0.078	0.384	5.400	0.000***
Effective internal control	0.092	0.039	0.154	2.344	0.021**
Separation of duties	0.168	0.037	0.297	4.567	0.000***
Monitoring	0.140	0.042	0.238	3.331	0.001***
Staff qualification	0.066	0.027	0.176	2.419	0.018**

Source: Regression outputs of respondents responses, \*\*\*\*P=0.05

**Table 6: Descriptives of the variables**

Variables	<i>Actloss</i>	<i>Bprofit</i>	<i>Qualification</i>	<i>etrans</i>	<i>Renumetn</i>	<i>M2</i>	<i>Regulatory</i>	<i>Wloss</i>
Mean	17.0125	24194.54	0.6765	16.4285	1270.714	23.8287	-1.631977	11.4949
Median	12.5585	17278.25	0.6788	11.5000	1065.000	18.0807	-1.408451	10.521
Maxim	56.0479	62087.50	0.7180	48.0000	2970.000	56.1844	39.83740	26.667
Minim	6.8146	-2510.000	0.6430	0.0000	10.0000	9.1030	-71.42857	2.4133
Standard deviated	13.3982	21457.20	0.0214	15.673	886.9955	14.014	24.04698	7.1138
Skewss	1.9775	0.7717	0.1100	0.6322	0.7684	0.9707	-1.477130	0.7979
Kurtosis	6.2288	2.2647	2.3603	2.1422	2.2903	3.0603	6.668244	2.8097
J Bera	15.2064	1.7050	0.2669	1.3620	1.6717	2.2007	12.94047	1.5069
P	0.0004	0.4263	0.8750	0.5061	0.4334	0.3327	0.001549	0.4707
Sum	238.175	338,723.5	9.4711	230.00	17,790.00	333.6027	-22.84768	160.929
SS deviation	2333.654	5.99E+09	0.0059	3193.429	10,2278	2553.100	7517.341	657.8937
Observation	14	14	14	14	14	14	14	14

Source: Outputs of the variables, SS: Sum of squares

### 4.3. Correlation Results

The correlation results of the variables show some interesting relationships that are indirectly tested in the study. For example remuneration and qualification is displayed in the correlation with high t-statistics of significant beyond 0.01 at 8.8 with r of 0.93. Also positively significant is remuneration and *etrans* and this r at 0.97 at 0.01 with it t-statistics 16.87. *M2* and *Actloss* is also significant at r of 0.55 and beyond. 0.05 level of significance. From the previous literature it is has been agreed that the commonest fraud in the system is theft of cash and negotiable instruments. Qualification and *Bprofit* are negatively significant. The reasons for this situation are well known in today's Nigerian banking system. This is also significant at 0.01. Somehow *etrans* and *Bprofit* also have significant inverse relationship. All the other variables are generally insignificant though the directions of relationships are quite evident. Notable ones are *Etrans* and *Actloss* that has have positive relationships and *etrans* and *M2* with negative relationship which is nearly significant. The complete table of the variables is shown Table 7.

### 4.4. Secondary Data Regression Results

The various equations subjecting the different dependent variables to several tests are quite revealing. The independent variables performed expectedly in the various directions and signs anticipated, thus validating the earlier assumptions of the paper. The *Actloss* variable performed generally better than any of the other two: *Incrloss* and *Wloss*. *Bprofit* variable is insignificant through the regressions. Where it was most significant, it recoded a t of -1.22 and with *Wloss* at -0.657 and it is rightly signed indicating that losses neither have nor began to impact significantly against *Bprofit* though it is negatively impactful. *Actloss* is the variables that indicate directly how much the banks have lost to fraud in the system. The *Qualification* variable also performed well with *Actloss* and with significant t at 1.856 beyond 0.1. It is however insignificant with the unvaried version of the regressions. It is highly significant again beyond 0.01 with the autoregressive order function introduced in both *Wloss* and *Actloss*. It is also negative in that the more qualified/educated bank staff working in the system is the less the fraud that would be recorded.

*Etrans* is highly significant in both *Wloss* and *Actloss* with the two variants of the regressions. In both regressions it is highly

significant beyond 0.01 except for the invariant *Actloss*. This shows that the internet and other Information and Communication Technology improvement in banking services delivery have led to increase in fraud situation in banking. The variable performed well under test as *Wloss*, the prime regression record a highly significant t that is positive. *Remuneration* is negatively significant as expected. This comes with the understanding that higher incomes for bank staff would reduce fraud and higher qualifications for bank staff would discourage and reduce fraud and of course higher qualifications would come with higher remunerations. *M2* is positively significant across the first two regressions except for a near significance with *Wloss* but negatively significant with *Incrloss*. It is highly significant in the varied *Wloss* and nearly significant at  $t = 1.79$  in the unvaried version. The impact is negative on the variables but for the *Incrloss*. This shows that technology based fraud is increasing. The regulatory variable indicates that it is significant only the varied *Wloss* and carrying the a priori sign all through the regressions. The indication is that beter regulatory environments would prevent or reduce fraud in banks. The complete result is shown as Table 8.

The fit for each of the regressions shows that *Actloss* has the highest  $R^2$  with 0.72 with adjusted  $R^2$  at 0.48 followed by the *Wloss* with  $R^2$  0.70 and adjusted  $R^2$  at 0.44. The performance of the fit in *Incrloss* indicates that it has a poor  $R^2$  with a much poorer of 0.25 for a data of 14 years. With the significant F-statistics at 3.4105 for 0.05 and 2.56027 for 0.10 ( $F_{6,14}$ ) only *Wloss* and *Actloss* are significant beyond 0.10% level and at 95% level of confidence for the unvaried version. These show that the variables represent a significant impact of fraud and can be adopted to manipulate the management of fraud with the intention to reducing it and possibly on macroeconomic basis. DW in each case represents the serial correlation of the set data. The perfect set of data is displayed by the *Wloss* while *Actloss* has a serially negatively correlated set of data. Of the six variables used in the data four are significantly negative.

## 5. CONCLUSION AND RECOMMENDATIONS

The paper has adopted three variants for loss as proxies for executed fraud. The most significant of the three measures is the

**Table 7: Correlation results**

	<i>Actloss</i>	<i>Bprofit</i>	<i>Qualification</i>	<i>etrans</i>	<i>Remuneration</i>	<i>M2</i>	<i>Regulatory</i>
<i>Actloss</i>	1.000000						
<i>Bprofit</i>	-0.05736 -0.19906	1.000000					
<i>Qualification</i>	0.02986 0.103491	-0.71188 -3.51138	1.000000				
<i>etrans</i>	0.064715 0.22465	-0.54702 -2.26367	0.924039 8.372960	1.000000			
<i>Remuneration</i>	-0.00327 -0.01135	-0.54299 -2.23995	0.930814 8.822150	0.979578 16.87713	1.000000		
<i>M2</i>	0.555182 2.312302	0.300661 1.092047	-0.30723 -1.11839	-0.43034 -1.65151	-0.40683 -1.54276	1.000000	
<i>Regulatory</i>	-0.10142 -0.35316	0.424728 1.625171	-0.14948 -0.52370	0.101800 0.354489	0.089842 0.312484	-0.07538 -0.26189	1.00000 -

Source: Output of data from variables: Coefficients and t-statistics

**Table 8: Regression equations outputs**

Variables	Wloss	Wloss	Actloss	Actloss	Incrloss	Incrloss
Constant	298.1691 (1.4341)	747.2342 (4.0048)	707.7916 (1.8724)	896.1152 (2.2446)	-409.6225 (-1.1299)	-150.8712 (-0.3356)
Bprofit	-7.92E-05 (-0.6575)	2.54E-05 (0.1745)	-0.0002 (-1.2181)	7.71E-05 (0.1940)	0.0001 (0.8930)	9.85E-06 (0.0276)
Qualification	-428.28 (-1.3457)	-1136.044 (-3.940)***	-1073.922 (-1.8559)*	-1385.185 (4.8816)***	645.6405 (1.1634)	248.8651 (0.3596)
etrans	1.7191 (3.4068)***	2.3887 (8.3659)***	2.4701 (2.6923)**	3.0291 (4.881)***	-0.7510 (-0.853)	-0.5983 (-0.868)
Remuneration	-0.0227 (-2.4684)**	-0.0153 (-2.5892)**	-0.0159 (-0.950)	-0.0141 (-1.1189)	-0.0068 (-0.4242)	-0.0011 (-0.0792)
M2	0.2322 (1.7874)	0.5232 (5.1903)***	0.9058 (3.833)***	0.9998 (4.7399)***	-0.6735 (-2.97)***	-0.4800 (-2.023)**
Regulatory	-0.0704 (-0.8263)	-0.3554 (-2.3492)**	-0.1696 (-1.0951)	-0.5218 (-1.3719)	0.0992 (0.6680)	0.1055 (0.3227)
Ar (1)	-	-0.7351 (-4.216)***	-	-0.7998 (-2.4193)**	-	-0.6820 (-1.6076)
R <sup>2</sup>	0.7002	0.8885	0.7206	0.8555	0.5958	0.7404
Adjusted R <sup>2</sup>	0.4433	0.7324	0.4811	0.6534	0.2493	0.3770
F-statistics	2.7253	5.6939	3.0095	4.2320	1.7198	2.0373
DW	2.0197	2.2768	2.0719	2.3502	2.1859	2.2467
Observation	14	14	14	14	14	14

Source: Output of data from variables: Coefficients and t-statistics. \*\*\*\*Represent significance at 0.01, 0.05 and 0.1 respectively

*Actloss* while the increase in loss is least significant. Of all the variables the most significant is cash and the most insignificant is regulation. The independent variables behaved as a priori but displayed unanticipated magnitude in their impacts on the dependent variables. Clearly autoregressive first order is very impactful on the results of the *Actloss* and weighted loss of fund to the banking system.

The most positively significant and impactful variable is cash as used in the banking system, while the most negatively significantly is technology use in the system. Since the two are two are negatively correlated almost, the engagement of one must be used to deal with the other. It is safer to encourage the use of technology to reduce cash in the system while efforts are made to increase the quality of staff with good pay. These two efforts would reduce fraud in the very long term in the banking system in the country.

While internal control is a bank specific challenge, the variable adopted here can both be managed at the bank-firm level and at the macroeconomic level. Banks can adopt a self-regulation mode that makes them a model, though the monetary authorities and regulator of the banking system should do more work to improve the services and reduce fraud. From the regression outputs higher level of income would reduce fraud so banks should rather pay attention to remunerations for employees, a worrisome par to labor managements in banks is the continuous and increasing adoption of the casualization and employment of contract staff which costs about a quarter of regular staff. This is not only degrading the profession but leading to a higher level of fraud. Coupled with this is the level of education of the workers. Bank should rather employ qualified staff and pay good income for using their services. A safe conclusion would be then the hiring of educated and more qualified people in the system would definitely reduce fraud.

The use of technology to commit fraud can be controlled by the regulators with the biometric registration that is commonplace in the country. Since technological fraud is increasing, the use of cash in rendering service needs to be reduced by the Central Bank of Nigeria by intensifying the cashless policy begun some years back. This policy as matter of fact should be taken to a higher level with the financial system. The anti-cybercrime functions of the regulators and law enforcement agencies need be amplified. The assurance that internet fraud would reduce would ensure that more customers would move to the platform to enjoy services. Unlike at present where many are sceptical about using the e-platforms to obtain services form the banks.

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