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Empirical Assessment of Frauds on Banks' Liquidity: Evidence from Nigeria

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Abstract

The study examined the effects of frauds on the liquidity position of banks in the Nigerian banking sector using time series data for the period 1994 to 2015. The study used unit root test to determine the stationary state of the variables. It also employed the Johansson co-integration and error correction model (ECM) statistical techniques to establish both short-run and long-run dynamic relationships between the endogenous and exogenous variables. The findings revealed that total number of fraud cases, actual amount involved in the fraud and the loss associated with it negatively affect banks liquidity position in the long- run, though the effect is not as strong as in the short run. The paper concluded that fraud is a key variable that depletes the banks' ability to meet

up with short term obligation as well as impinge on the ability to effectively maximize the wealth of the shareholders. The study therefore suggested that the services of the forensic accountants should be given utmost priority by banks and all concerned stakeholders so as to constantly and effectively monitor the internal control system, report levels of frauds, as well as come up with a model to fight the effect of frauds on banks' operation. The CBN and other law enforcement agencies should come up with stiffer penalties for any perpetrator of frauds of any nature and categories in the banking sector. This will help to create sanity and serve as deterrent to the other would be perpetrators of frauds. Another peculiar aspect that should be empirically examined is banks' staff involvement in frauds and forgeries and how they impact on the banking sector operations and liquidity position.

Key Words: Liquidity, number of fraud cases, actual loss, amount involved in fraud cases

Introduction

More often, the implication of frauds on banks' liquidity is hardly observed in empirical literatures, particularly in developing countries like Nigeria. While on the queue in the banking hall, some customers are worried over a delay in not being able to receive quick attention by way of cash disbursement. Prior day deposits may not be sufficient to meet customers' demand withdrawal. Some cashiers have often been accused of under-reporting cash collection from bank customers. After balancing the day's record, if the cash missing is unduly large, the bank has to find ways of cushioning the effect or difference pending when investigations and findings are made. The import of the foregoing is that frauds in terms of nature and categories have ways of contributing to illiquidity in the bank; and this may engender bank runs.

Bassey and Moses (2015) suggested that profitability and liquidity are the most effective financial performance indicators of banks, considering the fact that the major stakeholders such as shareholders and depositors in the industry rely on the two indicators to measure how well or otherwise a bank is performing. The shareholders are interested in the profitability of banks because it determines their returns on investment, while depositors are concerned with the liquidity position of their banks because it determines the ability to respond to their withdrawal needs which are normally on demand or on a short notice as the case may be.

Chiezy and Onu (2013), Kanu and Okorafor (2013) and Ikpefan (2007) asserted that fraud erodes the liquid assets of banks and may be responsible for the liquidity challenges that some banks may have experienced. In addition, fraudulent activities inflict severe difficulties on banks and their customers, deplete their equity capital, impair their financial health and constrain their ability to extend loans and advances to their customers for profitable operations. While the effect of fraud on bank deposits may be better appreciated from the standpoint of cash depletion, if remained

unexplained, the effect that it has on the aggregated liquidity position of banks considering the fact that fraud, especially the ones perpetrated within the country, may only result in a rearrangement of the mobilized funds within the banking system. For example, a fraud perpetrated against bank A, may only result in cash depletion to bank A while such funds may be moved to another bank B, which increases the total deposit liabilities of bank B. Consequently, the actual amount lost to fraud by individual bank may not leave the entire banking system, hence may be capable of creating a liquidity trap in the entire banking system. It can also be argued that although fraud adversely affects the liquidity position of banks individually, such effect may not be significant when the aggregated liquidity position of banks is being considered.

The adverse effects of frauds on bank liquidity may not be severe in the short run, but certainly could cause a lot of damages to banks operation in the long-run. There is paucity of empirical literatures on the nexus between frauds and liquidity of banks in developing countries, specifically, how frauds impact on banks' liquidity in Nigeria has not gained ascendancy on the empirical fronts, hence this paper.

Review of Literature

According to Echekoba, Egbunike and Ezu (2014), bank liquidity simply refers to the ease with which assets of banks can be converted to cash or their fair value in times of need. It is the ability of a bank to fund increases in assets and to meet obligations as they become due, without incurring unacceptable losses. It refers to the ability of the bank to ensure the availability of funds to meet financial commitments or maturing obligations at a reasonable price at all times. Olagunju, Adeyanju and Olabode, (2011) described the concept of bank liquidity as a measure of the relative amount of asset in cash or assets which can be quickly converted into cash without any loss or negligible loss in value available to meet short term financial obligations. Hence, they considered a bank liquid when it has sufficient cash and other liquid assets together with the ability to raise funds quickly from other sources to enable it meet its payments, obligations and financial commitments in a timely manner. Considering the fact that the survival of commercial banks depends greatly on how liquid they are since bank illiquidity signifies imminent distress that can easily erode the confidence of the public in the banking sector. According to Nikolaou (2009), financial liquidity is an elusive notion, yet it is considered a sine qua non for the effective operation and performance of a banking system. It refers to the unhindered flows among the agents of the financial system, with particular focus on the flows among the central bank, commercial banks and the markets. The amount and level of bank liquidity is a function of the liquidity ratio that is stipulated by the regulating authority, and the management of banks usually ensures that they maintain a liquidity level that is over and above that level which is stipulated by the regulators (Agbada & Osuji, 2013, Olongo, 2013, & Nikolaou, 2009).

The liquidity ratio of banks in Nigeria is regulated by the CBN, which prescribes the required minimum below which banks are not supposed to allow their liquidity ratio to fall, failing which they may find it challenging to meet their financial obligation to their customers and other stakeholders, consequently, they may be considered illiquid. By regulating the liquidity ratio of banks the CBN ensures that banks have adequate amount of unencumbered high quality liquid assets to meet its liquidity needs Olagunju, et al (2011). The CBN prudential guidelines issued in 2010 stipulated that the CBN shall prescribe the minimum liquidity ratio for banks in Nigeria from time to time in line with its monetary policy decisions. It is stated as the ratio of bank's total liquid asset to its total current liabilities. From the foregoing, it could be inferred that liquidity is a crucial variable that reflects bank's ability to meet its financial obligations. An adequate liquidity position either means a situation, where organization can obtain sufficient liquid funds, by increasing liabilities or by converting their assets quickly into cash, hence it involves the bank ensuring that it has a wide range of funds that can protect it against liquidity shortfalls.

The empirical study carried out by Chiezey and Onu (2013) revealed that commercial banks in Nigeria lost more than their mobilized funds between 2001 and 2004. In 2005, banks lost more than fifty percent of their mobilized funds to fraud, while in subsequent years, banks lost less than one percent of deposits mobilized to fraud. The high or geometric reduction was because their deposits increased significantly and tighter measures were put in place by regulatory bodies to combat fraud. Kanu and Okorafor (2013), from their analysis of NDIC report of 1993 to 2010, observed that the total deposit liabilities of the commercial banks in Nigeria for that period was N49,130,165,660,000, out of which N211,585,790,000 representing 0.43% of the total deposits was exposed to fraud, while N60,218.053,000 representing 0.12% of the total deposits was the actual loss sustained by the banks as a result of fraud. The empirical analysis of Ikpefan (2006) revealed that a unit decrease in actual loss due to fraud will stimulate deposits by 15 million units, and concluded that an inverse relationship exists between fraud and the deposits mobilized by commercial banks, in that the higher the fraud cases, the lower the amount of deposits in banks.

As can be observed from the above analysis of Chiezy and Onu (2013), Kanu and Okorafor (2013) and Ikpefan (2007), fraud erodes the liquid assets of banks and may be responsible for the liquidity challenges that some banks may have experienced. In addition, fraudulent activities inflict severe difficulties on banks and their customers, deplete their equity capital, impair their financial health and constrain their ability to extend loans and advances to their customers for profitable operations. While the effect of fraud on bank deposits may be better appreciated from the standpoint of cash depletion, it remained unexplainable the effect that it has on the aggregated liquidity position of banks, considering the fact that fraud, especially the ones perpetrated within the country may only result in a rearrangement of the mobilized funds within the

banking system. For example, a fraud perpetrated against bank A, may only result in cash depletion to bank A while such funds may be moved to another bank B, which increases the total deposit liabilities of bank B. Consequently, the actual amount lost to fraud by individual bank may not leave the entire banking system, hence may not be capable of creating a liquidity trap in the entire banking system. It can also be argued that although fraud adversely affects the liquidity position of banks individually, such effect may not be significant when the aggregated liquidity position of banks is being considered.

Methodology

This study employed the longitudinal research design. The population of this study is principally related to all the banks in the Nigerian banking sector. The sample period of this study is 1994 to 2015. Data for this study was generated from secondary sources which principally encompass the Nigerian Deposit Insurance Corporation (NDIC) official annual reports. The study employed both descriptive and inferential statistics for the purpose of data analysis. The descriptive statistics encompasses mean and correlation statistics. While the inferential statistics however include the Johanson Co-integration technique and Error correction mechanism (ECM) which basically measures both the long run and short run dynamic relationship between exogenous and endogenous variables in a construct.

Model Specification

The study employed the model below to examine the subject matter under investigation. The mathematical form of the model is:

Perf = F(FRAUD, LOSS, TAI and SIZE) ……(1)

The above mathematical model is further stated in a stochastic form as:

$$\Delta LIQ_{it} = \beta_0 + \beta_{1\Delta NFC_{it-i}} + \beta_{2\Delta TAI_{it-i}} + \beta_{3\Delta LOSS_{it-i}} + \beta_{4\Delta SIZE_{it-i}} + \lambda ECM_{t-1} + \varepsilon_t \quad \ldots\ldots(2)$$

Where

ΔLIQ represents change in liquidity ratio of the banks

β_1 to β_4 represents coefficient of the parameters of estimation

i represents cross- section, i.e aggregate of the banks in the Nigerian banking sector and t is the period in question.

ΔNFC represents number of fraud cases

ΔTAI represents total amount involved in the cases of fraud reported

ΔLOSS represents total actual/ expected loss involved in the cases of fraud reported

ΔSIZE represents the number of banks

ECM is used to represent the error correction model

Empirical Analysis

Table 1: Summary of the unit root test at 5% of all variables in all the models

Variables	ADF statistics	T-critical values	Remark
LIQR	-3.576981	-3.012363	Stationary at first difference
NFC	-3.322572	-3.020686	Stationary at first difference
TAI	-5.207457	-3.004861	Stationary at first difference
EARNINGS	-3.916657	-2.998064	Stationery at first difference
LOSS	-8.018872	-3.004861	Stationery at first difference
SIZE	-7.636914	-3.00861	Stationery at first difference

Source: Authors computation 2017 from E-views 8.0 version

Table 1 shows the summary results of the unit root test at 5%. The ADF results which compare the Augmented Dickey Fuller statistic against the Mckinnon critical values at 5% shows that at first difference all the variables, liquidity ratio was all stationary; albeit, this was observed after the stationarity test at levels. This portends that there is absence of unit root effects in the variables, thus making it devoid of spuriousness. Given that all the time series used in this study are stationary, it then allows us to conduct the preliminary analyses, diagnostics tests and apply the appropriate econometric estimation.

Diagnostic Tests Results

Table 2: Diagnostic tests Result

Variance inflation factors (VIFs)		
	Uncentered VIF	Centered VIF
C	5.345	NA
NFC	2.020	1.384
TAI	12.901	6.982
LOSS	11.090	6.821
SIZE	3.318	1.295
Breusch – Godfrey – serial correlation LM test		
F-statistic = 113.304	Prob.F(2, 336)	0.0000
Obs * R-squared = 138.557	Pro. Chi-square (2)	0.0000
Heteroskedasticity test		
F-statistic 1.427	Prob. F(5,338)	0.213
Obs * R-squared 7.112	Prob. Chi-square (5)	0.2124
Ramsey Reset Test		

t-statistic = 1.184	Df = 337	0.2369
F-statistic = 1.430343	Prob.F(1, 337)	0.2369

Source: Researchers' compilation from Eview 8.0 (2016)

The diagnostic table 2 shows that the variance inflation factor statistic is less than 10 (centered vif < 10) for each of the variables. This indicates absence of multicollinearity among the explanatory variables. The ARCH: Heteroskedasticity test shows the presence of homoscedasticity (0.213 > 0.05), thus confirming the constant variance assumption of the ordinary least square estimator. The Breusch-Godfrey serial correlation LM test result of 0.0000 > 0.05) points out the absence of higher order correlation. The Ramsey Reset Test result of (0.02369 > 0.05) substantiate validity of the regression model.

Pearson Correlation Statistics

Table 3: Correlation matrix

Variables	LIQR	NFC	TAI	LOSS	SIZE
LIQR	1	0.33	0.40	0.37	-0.18
NFC	0.33	1	0.48	0.42	-0.34
TAI	0.40	0.48	1	0.91	-0.38
LOSS	0.37	0.42	0.91	1	-0.43
SIZE	-0.18	-0.34	-0.38	-0.43	1

Source: E-View 7.0

The table above depicts the matrix of the Pearson Products Moment correlation coefficient for all variables. The correlation results show that all the explanatory variables, total number of fraud cases (NFC), total amount involved in the fraud cases (TAI), actual/expected loss (LOSS) move in the same direction towards affecting the liquidity position of banks in the banking sector except size (total assets) in the period evaluated with the values of 0.33, 0.40, 0.37, and -0.18 respectively. Similarly, all the independent variables have both strong positive and negative relationship with each other. For example, NFC and TAI are positively correlated (P=0.33 and 0.48). NFC and LOSS are positively related (P=0.33 and 0.42), NFC and LOSS are weakly negatively correlated (P=0.33 and -0.34). TAI and LOSS are also strong and positively associated (P=0.40 and 0.91) in the period considered. TAI and SIZE are negatively correlated with values of (p= 0.40 and -0.38). The correlations coefficients do not in any way shows signs of multi-collinearity considerably. In the nutshell, it can be said that all the variables re-enforce in a mutual perspective

Ordinary Least Squares Regression Results Showing the Long- Run Impact of Fraud on Banks' Financial Performance

Table 4: Ordinary Least Square

Dependent variable: Liquidity Ratio

Variables	Coefficient	Prob.value
C	41.918*****	
	(34.295)	
	[1.222]	0.237
NFC	-0.001*****	
	(0.0.003)	
	[0.472]	0.642
TAI	-0.574*****	
	(1.015)	
	[-0.565]	0.578
LOSS	-0.756*****	
	(2.459)	
	[0.307]	0.761
SIZE	0.108*****	
	(0.107)	
	[1.013)	0.324

R-square =0.681
Adjusted R-square = 0.593
F-statistic = 7.714
Prob.(F-statistic) = 0.000
Durbin-Watson stat = 1.195

**********Coefficient values

( ) *standard error in bracket

[ ] * T- statistic value in parenthesis

E-views 8.0 Output

From the table above, we observed that the model predicted about 68% systematic variation in the dependent variable, LIQR using the adjusted coefficient of determination, leaving about 32% unaccounted for to stochastic error term. It suggests that fraud affects the liquidity ratio of banks in the long-run with about 68% in the Nigerian banking sector. The F– Statistic value of 7.714 reveals that all the explanatory variables put together are statistically significant at 99% level. It indicates the goodness of fit of the model. The individual coefficient indicate that a unit change in total number fraud cases (NFC), actual/ expected loss (LOSS) and size of the banks in Nigeria do reduce the liquidity ratio of banks by 0.001 units, 0.756units and 0108 units

respectively; though they were not statistically significant at both 99% and 95% significant levels. The total amount involved in the fraud occurrence was observed to drastically reduce the liquidity ratio of the banks in the Nigerian banking sector; though it was not statistically significant at 95% level. Also, the Durbin–Watson statistic value of 1.195 shows the presence of serial Autocorrelation in the time series data; and of course this makes the result not too fit for policy perspective in the long-run.

Co-integration Analysis – unrestricted co-integration rank Test (Trace)

Table 5: Co-integration result

Hypothesis	Trace statistic	Critical value at 5%	Maximum Eigenvalue	Critical values at 5%
R = 0	109.692	69.818	45.633	33.876
R ≤ 1	64.059	47.856	31.695	27.584
R ≤ 2	32.364	29.797	18.860	21.131
R ≤ 3	13.503	15.494	11.744	14.264
R ≤ 4	1.758	3.841	1.758	3.841

Source: computed from E-views 8.0, (2017)

A careful examination of the results from the above table indicates that the trace statistic has at least three (3) Co-integrating equations and Maximum Eigen value statistics has at least two co-integrating equations in the relationship between liquidity ratio and the independent variables. This, therefore, suggests that there is a long–run relationship between frauds and liquidity ratio in the banking industry in Nigerian economy.

Parsimonious ECM

The parsimonious ECM allows restricted number of parameter estimates into our model. The ECM has been lauded for combining short-run dynamics with long–run equilibrium in a broad macro econometrics framework (Iyoha, 2006). In this study, the ECM was estimated using the first difference of the variables. The results are contained on the equation below:

Table 6: Parsimonious ECM equation showing short run relationship between frauds and liquidity ratio in the Nigerian banking sector

Variables	
Dependent variable: Liquidity Ratio	
C	1.264******
	(4.755)
	[0.265] p-value = 0.793
DNFC (-3)	-0.004******
	(0.015)
	[-0.317] p- value = 0.754

DTAI (-1)	0.585******
	(0.795)
	[0.735] p-value = 0.473
DLOSS (-1)	-0.766******
	(1.893)
	[-0.405] p-value = 0.691
DSIZE	-0.206******
	(0.117)
	[-1.758] p-value = 0.099
ECM(-1)	0.333*****
	(0.132)
	[2.511] p-value = 0.023
R-squared	0.468
Adjusted R-squared	0.290
F-statistic	2.640
Prob (F-statistic)	0.066
Durbin-Watson stat.	1.597

**********Coefficient values

( ) *standard error in bracket

[ ] * T- statistic value in parenthesis

Source: E-view 8.0

The table above presents the Parsimonious ECM result. The R-Squared value of 0.46 shows that about 46% of the variation in the dependent variable, the included regressors collectively explain LIQR. The adjusted coefficient of determination puts the systematic variation at 29%, leaving the remaining percentage unexplained as a result of the stochastic error term. Judging by R^2 and its adjusted counterpart, the estimated model is weak. The F-statistics at 2.640074with P = 0.066327, shows that at 5% significant level, we cannot accept the alternative hypothesis which specifies a systematic relationship between the dependent variable and all the included regressors and the overall goodness of fit of the model.

To examine the impact of each of the independent variables on the dependent variable, we examined the estimated coefficients. As observed, DNFC has positive coefficient (0.179918units) and is statistically significant at 5% level (P = 0.0132). DLOSS has positive coefficient (135.7607units) and is statistically significant at 5% level (P = 0.0027). Total amount involved in fraud in the banking sector has negative coefficient, implying that it decreases liquidity ratio (-4.374587) though is statistically not significant at 5% level (P = 0.8161). Similarly, size was observed to negatively affect

the liquidity ratio of banks in the banking sector by 1.011582 units. The ECM Coefficient is negative (-0.791796) and is statistically significant at 5% (P = 0.0239). The ECM coefficient can thus serve as error equilibrium. The ECM value of 0.791796 showed that any temporary deviation from the long-run equilibrium between LIQR and the regressors could be restored at the rate of 79.17%. Finally, the Durbin – Watson statistic put at 1.47 that can be approximated to 1.50 shows the absence of first–order serial dependence, thus making the result useful for policy perspective.

Conclusion and Recommendations

Flowing from the findings of this study, it is trite to conclude that fraud has both long and short-run negative impact on the liquidity ratio of banks in Nigeria. Specifically, the greatest effect is that in the long run fraud erodes the liquidity of banks. With such effects, it can be concluded that fraud is seen as a key variable that depletes the banks' ability to meet up with short term obligation as well as impinge on the ability to effectively maximize the wealth of the shareholders. If not effectively tackled, frauds can threaten the smooth operations and ability of banks in Nigeria to play their pivotal role of providing an effective and efficient payment system, and the mobilization of funds from surplus to deficit units' in Nigeria's economy. The study therefore suggested that the services of the forensic accountants should be given utmost priority by banks and all concerned stakeholders so as to constantly and effectively monitors the internal control system, report levels of frauds as well as come up with a model to fight the effect of frauds on banks' operation. The CBN and other law enforcement agencies should come up with stiffer penalties for any perpetrator of frauds of any nature and categories in the banking sector. This will help to create sanity and serve as deterrent to the other would be perpetrators of frauds. Another peculiar aspect that should be empirically examined is banks' staff involvement in frauds and forgeries and how they impact on the banking sector operations and performances. For example, future researchers should focus on the implications of categories of bank staff involvement in fraud and forgeries like supervisors and managers involvement in fraud, officers, accountants and executive assistants involvement in fraud, clerks and cashiers involvement in fraud, typists, technician and stenographers involvement in fraud, messengers, drivers, cleaners, security guards and stewards as well as temporary staff involvement in fraud and how they impact on bank returns empirically, using the appropriate method of analyses. If this is taken into consideration, it will enhance the level of researches on this aspect of the subject matter.

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