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EDITORIAL

Esteemed Readers,

The second issue of the Journal of Banking, Volume 10 of 2022 focuses on four broad areas of the economy- Cryptocurrencies and E-transactions; Analysis of weaknesses in the operations of banks and Risk management; Board Characteristics and Debt structure of firms. In the first paper titled **Examining the impact of cryptocurrencies on the microeconomic variables in Nigeria**, the author applies the vector autoregression model (VAR) and Quartile Regression Technique to explore the relationship between bitcoin price and key macroeconomic variables in Nigeria. The study concludes that cryptocurrencies have implications for such macroeconomic variables as exchange rate, money supply and interest rates.

The second paper analyses the weaknesses in the operation of banks in Nigeria. The author tries to identify the different types of weaknesses, the frequencies of occurrences and the most reported weaknesses for the period of 2009 to 2018. The findings indicate that out of the thirty weaknesses established, four were the most prevalent. The author used the NDIC Annual Report and Accounts as the source of data.

The third article examined Board Characteristics and Firm's Financial Performance in Nigeria. The study was aimed at examining the relationship between Board characteristics and performance and concludes that the size of the board plays a significant role in the performance of the company.

This edition also looks at the effect of E-transactions on the profitability of commercial banks in Nigeria. The study adopts Ex-post facto research method covering the period 2010 to 2020 in executing the analysis. The research concludes that bank profitability can be influenced by E-banking proxies used in the study.

The effect of Risk Management Techniques on the Performance of Non-Banking Financial Forms in Nigeria is also considered. Focusing on insurance companies in Nigeria, it was established that the adoption of loss prevention and control, risk avoidance and loss/risk financing as management techniques significantly enhanced positively, the performance of insurance companies in Nigeria.

Again, Debt Structure and Financial Performance; Evidence from Listed Construction firms in Nigeria is examined. Ex-post research design is deployed in the analysis of the secondary data used. It was concluded that an optical mix of debt-equity financing will be a preferable option for construction firms in Nigeria.

In general, most of the outcomes of the studies aligns with the findings of studies carried out in other jurisdiction. We encourage readers and researchers to go through the empirical analysis of the studies in this edition to further research work in the various areas.

I wish you an enlightening reading.

Akin Morakinyo, HCIB
Registrar/Chief Executive.

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EXAMINING THE *IMPACT OF CRYPTO CURRENCIES ON MACROECONOMIC VARIABLES IN NIGERIA.*

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Emomotimi John Agama[1]
Benedict N. Akanegbu[2]

Abstract

This study employs a Vector Autoregression Model (VAR) and a Quantile Regression Technique to analyze the relationship between bitcoin price and major macroeconomic variables in Nigeria. The results from the multivariate VAR and the generated impulse response and variance decomposition indicate no strong statistically significant response of interest rate, inflation, and exchange rate to changes in bitcoin price. However, the study finds a positive relationship between the *stock market index and money supply with bitcoin price. From the estimated Quantile regression technique, results indicate that the price of the prime cryptocurrency bitcoin has a positive relationship with money supply and exchange rate across all quantiles. Results also indicate the positive relationship between bitcoin and the rate of inflation at high quantiles. Furthermore, results indicate the importance of cryptocurrency in explaining interest rates in the country at only the low and high quantiles. The study concludes that crypto currencies have implications for macroeconomic variables such as exchange rate, money supply, interest rate and inflation in the country. As a result, the study recommends the need for regulatory clarity in the country to encapsulate envisaged impact on macroeconomic variables,*

[1] *Managing Director, Nigerian Capital Market Institute A Subsidiary of the Securities and Exchange Commission*
[2] *Nigerian Capital Market Institute A Subsidiary of the Securities and Exchange Commission*

so that Nigeria can reap the potential benefits from the novel asset class.

Keywords: *Cryptocurrencies; Money Supply; Interest rate; Exchange rate; Macroeconomic Variables.*

Introduction

According to Jonker (2018), decentralized cryptocurrencies such as bitcoin are capable of leading to a major alteration of the current retail payment system as well as the monetary system. According to Othman et al.(2020), cryptocurrencies are unsettling the standard channels of the traditional monetary system. Scheibe et al.(2015) notes that cryptocurrencies are distorting the concept of money in the modern world and the government's role in this field will eventually decline thereby inhibiting some effective tools of monetary policy. For them, virtual currencies constitute a serious risk to macroeconomic stability and their increased usage will lead to a fall in the use of "real" money, this will also lead to a decline in actual cash needed thus making monetary policy more difficult to conduct.

Nigeria ranks high among countries with high cryptocurrency adopters and usage. The high usage rate of cryptocurrencies in Nigeria is attributed to Nigerians' search for alternative investment opportunities. Sauer(2016) articulated this point clearly, noting that Virtual currencies are in trend owing to two factors. Firstly, as a way of protesting against traditional monetary authorities' policy decisions; secondly, as options to imbalances in several monetary systems caused by political uncertainty and other factors. Perhaps another perception currently making the waves is the classification of cryptocurrencies as "freedom money" that is without regulation.

Given the rapid, high, and increasing usage of cryptocurrencies in Nigeria. What then is the macroeconomic implications of cryptocurrency usage in Nigeria? Indeed there are concerns about

their disruptive potential for financial system stability (Assenmacher, 2020). The Central Bank of Nigeria's recent pronouncement and directives to the Banks strongly support the apprehension that cryptocurrency usage has caused. Given the high level of usage of virtual currencies in Nigeria, can cryptocurrencies threaten the primary function of the Nigerian Central Bank, which is the objective of influencing inflation, financial stability, full employment, and economic activity. The relationship between cryptocurrencies and macroeconomic variables in Nigeria is understudied and unclear at the moment.

Literature review

Narayan et al, (2019) investigated the role of cryptocurrency on economic variables using correlation matrix. The study found that Bitcoin Price growth, significantly influences, currency appreciation the reduction in money velocity as well as raising inflation in Indonesia. According to the scholars, this finding justifies the policy stance of the Bank Indonesia on the Bitcoin market. Their findings also have lessons for other nations that will experience the effects of the sudden growth and emergence of the cryptocurrency market.

Nguyen et al. (2019) writing on bitcoin and money supply, finds substantial responses of four major cryptocurrencies including Bitcoin to contracting monetary policies in China. This suggests that monetary policies significantly impact cryptocurrency returns; however, this relationship was not established for the U.S.

Amihud and Cukierman(2018) also identified four macroeconomic problems that having a virtual currency such as bitcoin as a world currency would bring. First, they noted that sovereigns such as central banks will lose their ability to stabilize the economy in the face of economic shocks. Secondly the same sovereign institutions may no

longer earn seigniorage income usually earned from its own issued currency and may need to resort to increasing taxes to augment the fall in revenue. Third, Amihud and Cukierman(2018) noted another macroeconomic effect of having a single privately issued world currency such as bitcoin to be that, single nations will lose the ability to adjust exchange rate in case of shocks and this may result in harsher economic shocks. Fourthly, the high cost of producing such a currency will incur a dead-weight cost on the world economy.

According to Fernández-Villaverde (2017), private moneys are vulnerable to episodes of self-inflation and private issuers and could provide price stability if total circulation limit can be enforced . For him, a structure replete with private monies cannot guarantee price constancy, when possible, it will provide suboptimal amount of money.

According to Noam, (2019), the inability to control money in circulation has important implications for inflationary conditions in an economy. Where there exist several digital currencies in circulation with zero unified approach to supply, it will lead to hyperinflation with the value of these currencies diminishing to zero in the long run. Noam argued that inflation in the crypto-currency sector does imply general rise in the authorized currency. Where cryptos constitute a small fraction of the economy, the consequence will be inconsequential. Thus, issuing of currency outside of the regulation of a central bank will increase the amount of currency circulating in relation to products without the necessary and traditional monetary authorities counter-policies and ultimately breed inflation.

On the impact on interest rate, Noam observed that the potential impact of cryptocurrencies will be indirectly through the discount rate because of its influence on the interest rates that banks charge customers and the economy's prevailing interest rates. Noam argued that the impact is surely indirect. He noted that whenever issuers of cryptocurrency

give credit–the rates are dependent on the prevailing and pre-existing interest rate. When the latter are low, borrowers of fund will demand payment at a lower rate extended in crypto credit market and vice versa such that whenever such currency usage become large scale it could impact the effectiveness of the central bank.

According to Sauer, (2016) achieving the central bank's policy objectives of controlling the amount of money in circulation as well as interest rates are today more complicated in view of cryptocurrency usage. Monetary policy decisions Transmission channels are likely to be weakened, suggesting a new role of bankers' bank and the need to adapt to virtual currencies. For him, central banks could lose their ability to control the money supply, thus inhibiting a major monetary policy tool for managing inflation or sustaining price stability. This according to Sauer, (2016), can build distrust in a nation's monetary systems with consequential effects on economic activity. For Sauer , (2016), new issuers of money (means of payment) aside from the bankers' bank could potentially impact the supply of money. It is projected that Central banks may need to respond more aggressively to achieve their policy objective as a result of entrants such as bitcoin. He however acknowledges we are not there yet.

However Assenmacher (2020), denies that cryptocurrencies entail significant risk for monetary policy now or in the future. For her, given their low usage as well as "lack of moneyness", they will not have a consequential effect. According to her, it is stable coins that will have prospects if they are to be promoted by large corporations with a potential large usage rate. She adds that only a central bank digital currency as an official currency that is available to all, can cause significant risks and consequences for monetary policy and financial stability. In the same vein, Vidal-Tomás and Ibañez's (2018) study report that the cryptocurrency Bitcoin did not respond to monetary policy events from the Federal Reserve System, European Central Bank, Bank of England and Bank of Japan.

In contrast, Benigno (2019) argues that without doubt, the coming of cryptocurrencies is a major challenge to central banks in achieving their policy objectives. Benigno explained that the reason why central banks are planning their versions of digital currencies is because of the ability such digital assets can have in risking as well as jeopardizing the efficiency of central banks' operational tools and policy objectives on inflation and ultimately economic activity.

Kumah and Odei-Mensah (2021) posit that from an economic development standpoint, the "depth" and "width" of global stock markets may be impacted due to their level of exposure to cryptocurrencies, translating to uncertain and more costly equity financing for the domestic firms. Several studies also report a relationship between monetary policy announcements and cryptocurrencies. For example, Mora et al (2019) note that the role cryptocurrencies are playing in modern society will check traditional monetary systems. For them, the supply of money might be affected by the level of virtual currency in circulation, and they posit that cryptocurrencies will give rise to unregulated monetary systems because digital currencies are not issued by any central bank, nor is it backed by any government.

For Noam (2019) “Cryptocurrencies provide an important dimension of innovation to the evolution of the exchange medium we call money. However, they will, collectively and in volume, create real problems for the monetary system of a country. Central banks, which are institutions tasked with providing monetary stability, are more essential than ever. Yet they will see their problems rise while the power of their traditional tools to control money supply and interest rates—such as reserve requirements and the discount rates—are declining. But the new digital technologies— such as distributed ledgers—and new approaches provide regulatory bodies also with new and potentially powerful tools”.

According to Noam (2019) cryptocurrencies emergence is believed to have implications for macroeconomic variables such as inflation. For example, in theory, private currencies are expected to promote competition. Therefore, in nations where there is a freefall in the official currency, residents are forced to search for alternative means of exchange.

Noam (2019) cited the case of Argentina, where inflation and an unstable national currency created a large black market for US dollars as people tried to save in dollars and took extreme adverse measures to secure the dollar. Crypto currency according to Noam provides a means of hedging against an inflationary official currency and such a shift towards cryptocurrency is justified, provided they are not inflationary. The study states that the usage of cryptocurrencies represents a shift from a monopoly system of government-issued national currency to one of several private issuers. A position that supports the age long economic theory of full competition. Though critics argue that the stability of prices in an economy will be affected by the absence of control over the amount of money supply. He said that a crypto currency enables users to circumvent the official inflationary currency, conduct transactions outside the banking system using the money, and helps them to safeguard their investments. However, such a transition to cryptocurrency stands to reason only when it does not promote inflation. There is no value in trading one sort of poor money for another that may be worse. As a result, it is vital to examine the inflationary tendencies of cryptocurrency. With a variety of digital currencies circulating and the absence of a centralized authority to regulate supply, the value of virtual currencies would ultimately depreciate to zero in the long term, resulting in high inflation, so it is believed. Even though the study acknowledges that in the case of paper money, hyperinflation did not occur when money was convertible into a commodity but occurred only when all constraints were removed. Moreover, Noam opines that the two monetary sectors are similar because the issuing of money outside of

traditional monetary authorities will raise money supply relative to products thereby triggering inflationary pressures.

Kumar Mallick and Arvind Mallik's (2021) paper highlights the connectedness between Cryptocurrencies (Bitcoin, Ethereum, Litecoin, Binance Coin) and Indian Currency foreign exchange (YEN, USD, EURO, GBP). The study utilizes daily data spanning the period December 17, 2019, to Jun 17, 2021. The result indicates that with the exception of Binance Coin with the US dollar, Ethereum with the YEN as well as Litecoin, no significant effect was observed between Indian rupee and Cryptocurrencies. The study also establishes a significant negative relationship between the USD and Litecoin suggesting the former may serve for diversification as well as hedging purposes. The study established that Indian foreign exchange markets do impact influence on cryptocurrency markets. This the authors linked to the absence of government legal association which influences public opinion, causing low adoption rate.

Methodology

Data

In the empirical analysis, the study made use of five macroeconomic variables: money supply (M2), the exchange rate(exr), inflation rate(inf), interest rate(int) and the stock market performance index (Alsi). The sample comprises monthly observations for the period July 2010 to May 2021. The duration of analysis and time is dictated by data availability. The variable definition and data constructed is as follows:

i. Money supply denoted (m2). It measures the supply of money which comprises current account deposits, near money as well as cash. M2 comprises only of cash and current account deposits. M2 is more commonly viewed to gauge money

supply as well as price levels, and as a basis of Central Bank monetary policy.

ii. INT stands for interest rate. This is the 3 months' treasury bills rate charged by the Central Bank.

iii. The exchange rate (Exr) is the data on exchange rate specifically, the study employs the BDC exchange rate.

iv. Inflation, or the rate at which prices go up, is (inf). It is calculated as the log first difference in the Consumer Price Index (CPI).

v. The Price of Bitcoin which is the proxy cryptocurrency (bitc).

Data on the prices of cryptocurrencies was obtained from yahoo finance, coinmarketcap.com, and CryproCompare.com. While data on the macroeconomic variables (Inflation rate, Money supply, Exchange rate and Interest rate) were obtained from the Central Bank of Nigeria statistical bulletin (2020) and CBN statistical online database.

Vector Autoregressive (VAR) Estimation Techniques

Establishing the time-series properties of the variables, and where we find no linear combination of the variables, that is stationary (i.e., no error correction representation). The study proposes to estimate a VAR model to explore the dynamic relationship between cryptocurrency and monetary aggregates. The VAR model was popularized by Sims (1980) and has several advantages. The VAR is a hybrid of the univariate and simultaneous equation models. The VAR approach generates a better forecast compared to traditional models. It is a flexible model as a variable can depend on its lag and lag of others. In addition, there is no need to distinguish endogenous from exogenous variables.

Consider a VAR of order P:

$$y_t = A_1\ y_{t-1} + ... + A_p\ y_{t-p} + Bx_t + \varepsilon_t$$

Where yt is a vector of K non-stationary I(1) variables, β constitute the vector of deterministic variables and Xt is the vector of innovations. The Vector Autoregression model (VAR) can be rewritten as,

$$y_t = A_0 + \sum_{k=1}^{p} A_k + y_{t-k} + e_t$$

To explore the dynamic interaction between bitcoin price and macroeconomic variables, the study exploits the vector autoregression (VAR) model of money supply, inflation, exchange rate, stock returns and interest rates. Consider a VAR of order P, where Y_t = [m2, alsi, int, inf, exr, bitc], where the variables are as previously defined. Y is a n x 1 vector of non-stationary I(1) variables, n refers to the number of variables in the system. A_0 represents a *n x 1* vector of constant terms, A_K represents a n x n matrix of coefficients, e_t is an n x 1 vector of independent and identically distributed error terms, and p is the order of autoregression and lags. The VAR is linearly specified to scrutinize the dynamic association between variables of interest in the VAR system. There are several lags when estimating a VAR, the optimal lag must be determined based on various information criteria such as the Akaike information criteria (AIC), Schwarz criteria (SIC), and Hannan- Quinn test.

The impulse response function curves are based on the generalized impulse method suggested by Pesaran and Shin, (1998). It presents the dynamic simulations indicating how an endogenous variable responds to shock to an exogenous variable over a period. The variance decompositions on the other hand present the extent of changes in the dependent variable that are attributed to the variable and others.

Impulse response functions and variance decompositions will then be estimated for the analysis and will be plotted. The impulse response function (IRF) traces out the reaction of the dependent variables in response to shocks to each of the identified variables. In this case, it traces out the responsiveness of the financial development measures in the VAR to shocks to the error term (Pesaran & Shin, 1998).

The Variance decompositions provide a slightly different method to the dynamics of the variables. They tell us the proportion of movements that are due to a variable versus those attributed to other variables in the system. "Information on the proportion of the movements in the dependent variables that are due to their "own" shocks, compared to shocks to the other variables".

Quantile regression

Koenker and Basset (1978) introduced Quantile regression method models as an alternative to the OLS method. A Quantile regression method is a popular method which models the quantiles of the dependent variable given a set of conditioning variables. The method estimates linear relationship between regressors and a specified quantile of the dependent variable. As opposed to the OLS regression model which analyzes the conditional mean of a dependent variable, Koenker and Basset quantile regression is concerned with other aspects of the conditional distribution. This permits a more complete description of the conditional distribution than an OLS conditional mean analysis. Quantile regression method describes how the 10^{th}, 20^{th}, 30^{th} up to 90th percentile of the response variable, are affected by regressor variables. One advantage of the quantile regression approach is that strong distributional assumptions are not required, and it provides a distribution ally robust method. Focusing on the impact of cryptocurrency usage on macroeconomic variables in Nigeria. The linkage between cryptocurrency and macroeconomic variables can be described in the following equations:

$$Log(M2)_t = c + \beta 1\ log(Bitcoin)_t + \varepsilon_t$$

$$Log(EXR)_t = c + \beta 2\ log(Bitcoin)_t + \varepsilon_t$$

$$INFC_t = c + \beta 3\ log(Bitcoin)_t + \varepsilon_t$$

$$INT_t = c + \beta 4\ log(Bitcoin)_t + \varepsilon_t$$

Where M2 is the Money supply, EXR denotes Exchange rate, INF is the inflation rate and INT is the interest rate, β_i(i=1,2,3,4) is the estimated coefficient and ε_t is the error term.

Adapting Lee and Zeng (2011), we employ nine quantiles (Θ = 01, 0.2…,0.9) breaking them into three parts: Low, Medium, and High. When two adjacent quantiles are statistically significant, then the portion is adjudged statistically significant.

Empirical analysis

Analysis of the Response of Monetary/Macroeconomic Variables to Shocks in Bitcoin Prices using the Vector Autoregression Model (VAR)

The study employs a Vector autoregression model (VAR) to analyze the interaction between bitcoin price and money supply, inflation, interest rate and exchange rate in Nigeria. By utilizing a VAR approach, we can discern the response of macroeconomic variables to changes in bitcoin prices. The VAR model multivariate framework offers a medium where changes in Nigeria's macroeconomic variables are assessed in relation to changes in bitcoin prices and changes in other variables.

The dynamic response of macroeconomic variables to changes in bitcoin prices can be traced using simulated responses of the estimated VAR system called Impulse Response Functions. Secondly, the importance of a variable in generating changes in its value and the variation of the value of other variables are assessed using a Forecast Error Variance Decomposition.

Impulse response functions

Figure 1 shows the response of interest rates, stock returns, inflation rates resulting from one standard deviation to innovation in bitcoin price for the period 2010:M7:01 to 2021. The impulse functions come with 95% confidence bounds to judge the statistical significance of the impulse response function. Looking at Figure 1, we can see that there is no statistically significant response of interest rate, inflation, exchange rate and stock market index, to shocks in the bitcoin price. However, for money supply, the impulse response results indicate that the macroeconomic series react to a shock in bitcoin price by appreciating.

The result demonstrates that bitcoin price significantly influenced money supply in Nigeria over the study period as money supply series reacts to a shock in bitcoin price by appreciating. This appreciation is statistically significant over the 30-month forecast period. Bitcoin price had a positive impact on the short-term interest rate, the effect was significant from the 1st to 10th month, after the 10th month it was however no longer statistically significant. For inflation rate and interest rate, however, bitcoin price results in a negative response although not statistically significant.

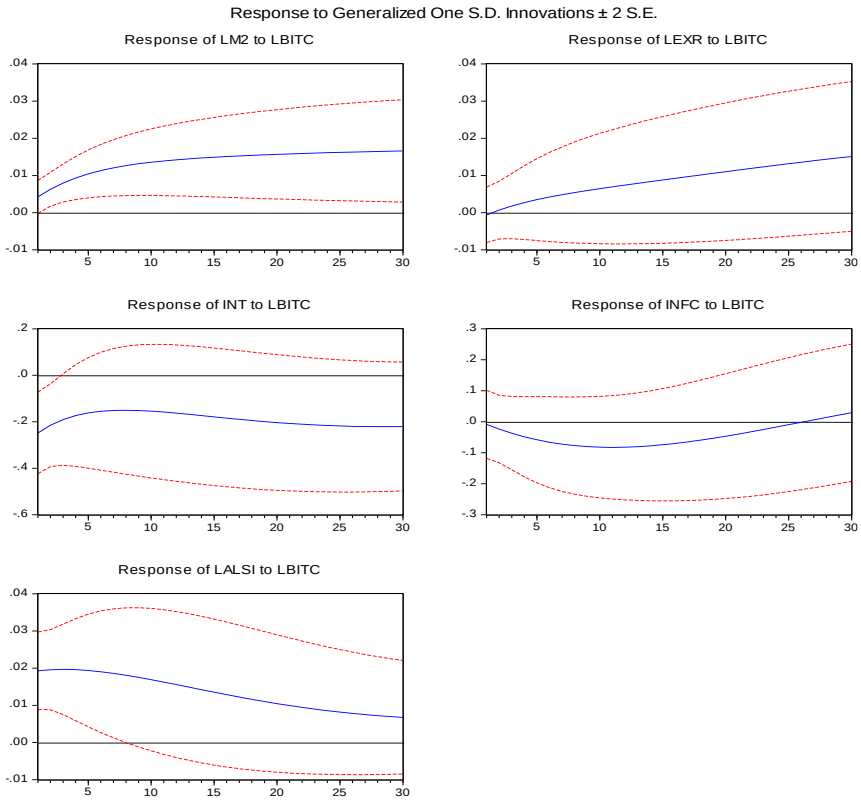

Figure 1: Results of the Impulse Response Function Showing the Responses of the Variables of Shocks in Bitcoin Prices

Further from the analysis of the impulse response function, the study estimated the forecast variance decomposition and the result is presented in Table 1

Table 1: Result of the Forecast Variance Decomposition

Variance Decomposition of LM2:

Period	S.E.	LM2	LEXR	INT	INFC	LALSI	LBITC
1	0.025489	100	0	0	0	0	0
5	0.054227	92.04236	0.092679	4.023689	0.015373	0.562693	3.263208
10	0.076726	77.73082	0.615898	11.92783	0.462983	1.051464	8.210996
15	0.095293	66.99846	1.218603	17.90928	1.522011	1.002969	11.34868
20	0.111192	60.04269	1.563202	21.58554	2.689373	0.789405	13.32979
25	0.124835	55.6625	1.64163	23.68326	3.593655	0.638566	14.78039
30	0.136602	52.88628	1.563254	24.8154	4.129515	0.63223	15.97332

Variance Decomposition of LEXR:

Period	S.E.	LM2	LEXR	INT	INFC	LALSI	LBITC
1	0.042616	1.863622	98.13638	0	0	0	0
5	0.091067	2.696178	94.83047	1.415159	0.039488	0.648229	0.370479
10	0.125803	3.897033	87.32712	5.094669	0.554185	2.029575	1.097422
15	0.152477	5.224028	78.96673	9.036381	1.823122	3.118316	1.831419
20	0.174469	6.633592	71.15198	12.40597	3.555581	3.652602	2.600274
25	0.192704	8.099076	64.36137	15.04112	5.324088	3.717868	3.456485
30	0.207756	9.599025	58.64612	17.01696	6.818208	3.502585	4.417104

Variance Decomposition of INT:

Period	S.E.	LM2	LEXR	INT	INFC	LALSI	LBITC
1	1.019097	4.88914	0.431779	94.67908	0	0	0
5	2.025613	8.947082	1.46246	88.30235	0.96991	0.273374	0.044821
10	2.586331	13.01417	3.45617	79.40661	3.294632	0.786878	0.041545
15	2.925858	15.64047	5.770122	71.93872	5.47743	0.96011	0.213147
20	3.153502	17.2363	8.118189	66.21275	6.888463	0.872437	0.671861
25	3.313686	18.1845	10.33825	61.82917	7.459039	0.860726	1.328322
30	3.432948	18.71681	12.29145	58.38088	7.428545	1.142339	2.039986

Variance Decomposition of INFC:

Period	S.E.	LM2	LEXR	INT	INFC	LALSI	LBITC
1	0.627741	0.525727	1.522283	4.018057	93.93393	0	0
5	1.202665	0.638796	8.186899	1.830032	87.39234	1.723584	0.228345
10	1.527479	0.858112	19.92666	2.7566	68.0963	7.657095	0.705231
15	1.805463	1.117908	28.47261	5.989086	49.48817	14.04352	0.888701
20	2.070487	1.40154	32.01129	9.152738	38.62222	18.02278	0.789439
25	2.299383	1.717023	32.47592	11.44079	34.10992	19.60909	0.647259
30	2.476626	2.075373	31.66421	12.94098	32.97758	19.72436	0.617493

Variance Decomposition of LALSI:

Period	S.E.	LM2	LEXR	INT	INFC	LALSI	LBITC
1	0.061213	1.519788	2.817176	0.340332	0.798709	94.524	0
5	0.127902	2.781697	7.625709	0.114014	5.688043	83.53447	0.256068
10	0.169058	4.01626	11.52252	0.151364	12.54462	71.09411	0.671123
15	0.192027	5.028812	13.07062	0.136414	17.67338	63.1505	0.94027
20	0.204208	5.977228	13.39294	0.15818	20.84611	58.52604	1.099498
25	0.210301	6.899585	13.23352	0.359152	22.40525	55.89484	1.207655
30	0.213504	7.769688	12.9589	0.802551	22.83841	54.33188	1.298573

Cholesky Ordering: LM2 LEXR INT INFC LALSI LBITC

Using a 30-month forecasting horizon, the results of the forecast variance decomposition reveals the proportion of the movement in the macroeconomic time series (money supply, inflation, interest rate, exchange rate, and stock market index) that are due to shocks in their series as opposed to shocks in bitcoin price. The estimated decompositions suggest that for money supply (M2), other than money supply itself, bitcoin price is the major source of shock. The contribution of bitcoin price to money supply lies between 0.00 to 15% over the 30-months forecast period. We can observe that by the first period, M2 accounted for 100% of the variation, while bitcoin prices and other macroeconomic variables do not explain (0%) variations in money supply and this increased to 11% in the 15th period and increased further to 15% in the 30th month period.

Analysis of the Macroeconomic Effects of Cryptocurrency Usage using the Quantile Regression Technique

Here the quantile regression estimation technique is used to analyze the macroeconomic effect of cryptocurrency usage in Nigeria. The results are reported in Table 2. The empirical estimation is carried out over the period July 2010 to June 2021. An inspection of Table 2 indicates different results. It can be observed from the second row of Table 2, that over the period July 2010 to June 2021, bitcoin price exhibited significant influence on money supply in Nigeria over the low, medium, and high quantile This suggest significant evidence of the importance of bitcoin prices on money supply in Nigeria. As shown in the third row of Table 2 crypto currency exert a positive influence on Naira(Nigeria) exchange rate at all quantiles. However, quite differently, the quantile regression estimation indicates the positive effect of cryptocurrency on inflation at high quantile. While interest rate had a negative relationship with crypto currency at both the low and high quantiles. There are no noticeable significant influences of cryptocurrency on interest rate in the medium quantiles likewise inflation in both the low and medium quantiles.

Thus over the period 2010 to 2020, cryptocurrency exerted a positive and significant influence on exchange rate and money supply. While there is a positive influence on inflation rate at the upper quintiles. while it exerted a negative influence on interest rate at both the lower and higher quantiles

This reult is consistent with the findings of Noam (2019) who observed that private currencies were inflationary. Mallick and Mallick (2021) also reported the connectedness between Cryptocurrencies (Bitcoin, Ethereum, Litecoin, Binance Coin) and Indian Currency foreign exchange.

Table 2: Quantile Regression method (2010 to 2021)

Macroeconomic variables	Quantile								
	Low			Median			High		
	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
M2	0.09[a] (0.000)	0.09[a] (0.000)	0.08[a] (0.000)	0.09[a] (0.000)	0.09[a] (0.000)	0.09[a] (0.000)	0.10[a] (0.000)	0.10[a] (0.000)	0.09[a] (0.000)
EXR	0.03[b] (0.054)	0.12[a] (0.000)	0.12[a] (0.000)	0.12[a] (0.000)	0.11[a] (0.000)	0.11[a] (0.000)	0.10[a] (0.000)	0.09[a] (0.000)	0.09[a] (0.000)
INF	0.00 (1.000)	0.50[c] (0.056)	0.34 (0.103)	0.14 (0.231)	0.06 (0.473)	0.07 (0.363)	0.26[a] (0.006)	0.37[a] (0.000)	0.34[a] (0.000)
INT	-0.49[a] (0.000)	-0.54[a] (0.000)	0.01 (0.964)	0.01 (0.918)	-0.07 (0.736)	-0.16 (0.462)	-0.28 (0.110)	-0.29[b] (0.049)	-0,20 (0.141)

Note: Values in parentheses ( ) are the p-values. The superscript a, b &c denote significance at the 1%, 5% and 10% respectively.

Conclusion

It has become increasingly important to understand the effect of cryptocurrency usage on the macro economy. In line with the research

objective for the study vis-à-vis investigating cryptocurrency usage and its impact on macroeconomic variables in Nigeria. Empirical results from the multivariate VAR and generated impulse response and variance decomposition indicate no strong statistically significant response of interest rate, inflation, and exchange rate to shocks in cryptocurrency which was proxied with bitcoin price. However, for other macroeconomic variables, such as money supply and stock market index, the derived impulse response results suggest that the two macroeconomic series react to a shock in bitcoin price by appreciating. This appreciation is statistically significant. Findings also demonstrate that bitcoin price significantly influenced money supply in Nigeria over the study period as money supply series reacts to a shock in bitcoin price by appreciating.

However, from the estimated Quantile regression technique, results indicate that cryptocurrency proxied by the prime bitcoin price plays an important role in influencing money supply and exchange rate across all quantiles. Results also indicate the positive influence of cryptocurrency in influencing inflationary pressure at high quantiles. While results point to the importance of cryptocurrency in explaining interest rates in the country at only the low and high quantiles.

The need therefore for Government to devise tools to study and evaluate these impacts cannot be overemphasized. The health of the economy depends to a large extent on macroeconomic stability and indeed financial system stability. The earlier government recognizes the impact and the need to provide clarity and regulation, the better it will be for financial system stability. Perhaps it is now useful to introduce "*fintecnomics'* as a branch of economics that will study the disruptive effects of the Fintech revolution to economies.

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AN ANALYSIS OF WEAKNESSES IN THE OPERATIONS OF BANKS IN NIGERIA, 2009-2018.

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Uju M Ogubunka[1]

ABSTRACT

This study covers the decade, 2009-2018. Its principal intendments are to find out: the different types, number, occurrence frequency and the most prevalent reported Weakness(es) in the operations of Deposit Money Banks (DMBs) in Nigeria, the half-decade (2009-2013 or 2014-2018) that incidences of Weaknesses were better controlled, highlight the implications of the Weaknesses in the operation of the banks and make informed recommendations. For ease of appreciation, understanding and conviction, descriptive method of analysis was utilised in the study. The findings show that, DMBs in Nigeria had thirty (30) different types of reported Weaknesses. They include Non-Compliance with banking laws, rules and regulations, Extreme weak corporate governance practices, Loan and Deposit concentration, non-Performing insider credits, Poor risk management practices and Poor internal controls. Four Weaknesses were found to be prevalent but the most prevalent was "Non-compliance with banking laws, rules and regulations". The number and frequency occurrence of Weaknesses in the first half of the decade studied, were more than in the second half thus, suggesting that there was better control in the second than in the first half. While a major implication of the Weaknesses was that they posed serious threats to the soundness, health and survival of the banks, a principal recommendation is that banks should urgently find and deploy appropriate and enduring

[1] *Officer, Corporate Skills Bridge Limited & Fellow, Department Finance, University of Lagos*

solutions that will not only eliminate the 30 Weaknesses but also prevent any reoccurrence of Weaknesses in their operations going forward. Another is that an Annual Bank Weakness-Free Award, to be won by any bank or banks found to have operated free of Weaknesses, should be instituted by the CBN and NDIC, in collaboration with the Chartered Institute of Bankers of Nigeria (CIBN).

1.0 INTRODUCTION

The Nigeria Deposit Insurance Corporation (NDIC) is one of the regulatory and supervisory authorities in the Nigerian banking industry. It has the "sole responsibility of administering Deposit Insurance System (DIS) in Nigeria". It is also responsible for **Deposit Guarantee, Resolution of Bank Distress and Bank Liquidation in the Nigerian banking industry**.

The NDIC thus, conducts On-Site Examination and Off-Site Surveillance in banks. Under the On-site Examination, NDIC officials physically visit banks to assess their financial condition against some pre-determined parameters. Beyond financial condition, the Corporation tries to form an opinion about the overall health status of the banks by also assessing such things as the quality of: Board and Management oversight, Risk Management practices, Internal Control Systems, Level of Compliance with relevant laws, rules and regulations, Quality of Banks' Risk Assets, and Loan-loss provisions, among others.

In the case of Off-site Surveillance, NDIC makes requests on banks to avail it specified information. With the information provided, it performs a review and assessment of the banks' financial and other relevant conditions that also aid in understanding their health status.
At the end of each examination exercise, exception reports, especially in terms of observed "Weaknesses" that the examined bank needs to

redress, are made available to the Management of the bank. Annually, NDIC includes in its Annual Report and Statement of Accounts, highlights of the "Weaknesses" that were noted in examined banks, without mentioning the name(s) of the affected bank(s).

Whether or not the observed weaknesses in banks are eventually corrected remains a question that only the regulators and supervisors (Central Bank of Nigeria, CBN and NDIC) can answer.

Whatever "Weaknesses" NDIC discovers in examined banks have enormous implications for: **the continued existence of the banks as going concerns; quality of their assets and financial conditions; safety of depositors' funds; obligations of NDIC as the deposit insurer; and overall confidence of the public in the banking and financial system in Nigeria.**

The observed "Weaknesses" by NDIC in operations of banks are scattered in the Corporation's various Annual Report and Statement of Accounts. Despite the fact that such Weaknesses portend grave risks to banks, the banking system and the economy, there has not been any attempt to collate, analyse and closely study the development with a view to discovering, among other things, the types and extent of the Weaknesses as well as their implications.

It is such important issues as these, among others, yearning for determination that have provided the opportunity and given the impetus for this study which principal objectives are stated in the next section of this paper.

1.2 OBJECTIVES OF THE STUDY:

The Objectives of this study are to, for the ten-year period, 2009 - 2018, provide insights on:

i) the number of deposit money banks in operations and the number examined (where the Weaknesses were discovered) by NDIC.
ii) the different types and number of Weaknesses found by NDIC in the examined banks.
iii) the frequency of occurrence of all the types of Weaknesses discovered.
iv) the prevalent (most common) type(s) of Weakness(es);
v) the number of different types of Weaknesses found relative to or compared with the number of examined banks.
vi) the year(s) when no different type of Weakness was found as well as when the highest and lowest number of different type(s) of Weakness(es) was/were discovered by NDIC.

Further from the above, the study also seeks to:

a) group the types of Weaknesses along their operation areas with a view to finding out the number per group, the group with the highest and lowest number of types and frequencies of occurrence of Weaknesses; and
b) compare the incidences of different types of Weaknesses and frequencies of occurrences between the half decades (2009-2013 and 2014-2018) within the period of the study; and
c) highlight some implications of the Weaknesses found in operations of banks.

The ultimate objective or essence of this study is to, from the findings, make informed recommendations that may lead to decisions and actions towards significant reduction or putting to a complete stop the issue of Weaknesses in deposit money banks in Nigeria.

1.3 NATURE AND SOURCE OF DATA FOR THE STUDY:

Published (Secondary) data are sourced from NDIC's various Annual Report and Statement of Accounts (2009-2018) to facilitate the study.

1.4 METHODOLOGY AND LIMITATIONS OF THE STUDY

The data collected and collated are descriptively analysed in search of answers to the stated objectives of the study which is limited to Weaknesses uncovered in the operations of deposit money banks (DMBs) in Nigeria by NDIC during On-Site Examinations. In other words, Weaknesses that might have been discovered and highlighted by NDIC during Off-Site Surveillance of deposit money banks and both On-Site Examinations and Off-Site Surveillance of Primary Mortgage Banks (PMBs) and Micro-Finance Banks (MFBs), do not form part of this study. The focus on only DMBs is essentially because they constitute the largest component in Assets and Liabilities of the banking sector in the country and if anything, negative should happen to them, the impact will be horrendous not only for the banks and the banking system but also the entire economy. Besides, the study is intended to be compact.

2.0 NUMBER OF BANKS EXAMINED BY NDIC VIS-A-VIS THE NUMBER OF BANKS IN OPERATION.

The number of deposit money banks (DMBs) in operation and those that were examined by NDIC in each of the ten (10) years, 2009-2018, are as shown in **Table 1** below.

The total number of DMBs in operation in the ten years was 237. However, on per annum basis, the number ranged from the lowest, 20 in 2011 and 2012, to the highest, 27 in 2018. In each of the five (5) years 2009, 2010, 2013, 2014 and 2015, the number was 24 while the number was 25 in each of years 2016 and 2017. On average, for the ten years, the number of banks in operation per annum was about 24.

On the other hand, the total number of DMBs examined by NDIC from 2009-2018 was 197 with an annual average of about 20. On yearly basis however, it was 11 and 12 in 2009 and 2010, respectively. In 2011 and 2012, 16 were, respectively examined. While 20 banks were

examined in 2013, 24 were examined in each of years 2014 and 2015. The numbers examined in each of the remaining three years, 2016, 2017 and 2018 were 23, 25 and 26. Within the ten-year period reviewed, the lowest number of banks examined per annum by NDIC was 11 which was in 2009 while the highest number, 26 occurred in 2018.

Consequent upon the foregoing, out of an annual average of 24 banks in operation within the period, about 20 or 83.3% of them were examined.

As can still be noted from **Table 1,** the minimum rate of examination coverage took place in 2009 when only 11 or 45.8% of the 24 banks in operation were examined. In 2010, 50%, that is, 12 of the 24 banks in operation were examined. In 2011 and 2012, 80% or 16 of the 20 banks in operation in each of the years were examined. In the three years, 2013, 2016 and 2018, the examination coverage rates of banks in operation were 83.3%, 92% and 96.3%, respectively. While these records can be recognised as very good, the best can be observed in years 2014, 2015 and 2017, when a 100% of all the 24, 24 and 25 banks in operation in the respective years were examined. However, for the entire ten (10) years under review, the rate of examination coverage of banks in operation was about 83.1% (197 out of 237 banks). In other words, only 40 or 16.9% out of the 237 banks in operations within the period were not examined. This performance can be adjudged to be very good.

TABLE 1: NUMBER OF BANKS IN OPERATION, NUMBER EXAMINED, NUMBER OF TYPES OF WEAKNESSES AND FREQUENCY OCCURRENCE OF WEAKNESSES (2009-2018)

		2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	TOTAL
A	Number of DMBs in Operation	24	24	20	20	24	24	24	25	25	27	237
B	Number of DMBs Examined	11	12	16	16	20	24	24	23	25	26	197
C	Number of Types of Weaknesses	10	10	4	2	-	1	3	-	-	-	30
	B/A%	45.8	50	80	80	83.3	100	100	92	100	96.3	83.1
	C/B%	90.9	83.3	25	12.5	-	4.2	12.5	-	-	-	15.2

SOURCE: NDIC, ANNUAL REPORT AND STATEMENT OF ACCOUNTS, 2009-2018/EXTRACTIONS FROM THE APPENDIX.

3.0 DIFFERENT TYPES, NUMBERS AND FREQUENCIES, ETC OF WEAKNESSES DISCOVERED IN EXAMINED BANKS, 2009-2018

Thirty (30) different types of Weaknesses were discovered and reported by NDIC. They are shown in the **Appendix** where they have been classified into four different groups, namely: **Corporate Governance, Credits/Loans, Risk Management and Internal Control**. As earlier pointed out, the number of the different types of Weaknesses that occurred in each of the ten years reviewed has been summarised and shown in **Table 1**. However, in **Table 2** below, attempt has been made to indicate the number of Weaknesses and their occurrence frequencies in each of the groups.

3.1 Types of Weaknesses Found Per Group:

Under **Corporate Governance Group**, there are twelve (12) different types of Weaknesses found. They include: Non-Compliance with banking laws, rules and regulations; Poor/Extreme Weak Corporate Governance Practices; Failure to implement some recommendations in Examiners Reports; and Inadequate Capital in some banks. The others are shown in the **Appendix**.

Among the eleven (11) constituent different types of Weaknesses in the **Credits/Loans Group** are: Poor Loan Underwriting and Administration; Loan and Deposit Concentration; Non-Performing Insider-related Credits; and Declining Asset Quality.
The others are shown in the **Appendix**.

With regard to the five (5) different types of Weaknesses in the **Risk Management Group**, there are, for instance, Failure to Implement Effective Risk Management Framework; Poor Risk Management Practices (arising from inadequate manpower and training); and Absence of defined overall risk appetite by banks. The remaining two are shown in the **Appendix**.

In the fourth and last group - **Internal Control Group** - as shown in the **Appendix**, the two different types of Weaknesses found are: Poor Internal Control, and Inaccurate Financial Reporting.

3.2. Number of Weaknesses Found Per Group:

As evident in **Table 2,** of the 30 different types of Weaknesses, twelve (12) or 40% of them fall within the Corporate Governance group while eleven (11) or 36.7% are within Credit/Loans group. Five (5) and two (2) types of the Weaknesses, respectively are identified with Risk Management and Internal Control groups.

TABLE 2: WEAKNESS GROUP TYPES: NUMBERS AND FREQUENCIES, 2009 - 2018.

		2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Total Freq.
A	No. of Weakness Frequency	10	10	8	5	6	5	8	8	8	8	76
	A/76%	13.2	13.2	10.5	6.6	7.9	6.6	10.5	10.5	10.5	10.5	100
B	No. of Banks Examined	11	12	16	16	20	24	24	23	25	26	197
	A/B%	90.9	83.3	50.0	31.3	30.0	20.8	33.3	34.8	32.0	30.8	38.6

SOURCE: EXTRACTED FROM THE APPENDIX.

From the foregoing, it is clear that during the ten years covered by the study, the 30 types of Weaknesses discovered in banks were mostly accounted for by the failure in the handling of Corporate Governance and Credit/Loans-related issues. The two areas of banking accounted for 23 or about 76.7% of the 30 types of Weaknesses reported. This is against the 7 or 23.4% joint contribution by Risk Management and Internal Control-related groups. Consequently, banks need to pay more attention to Corporate Governance and Credit/Loans aspects of their functions.

3.3 Group Frequency Occurrence of the Weaknesses:

With regard to frequency of occurrence of the Weaknesses, it is shown in **Table 2** that the 30 Weaknesses generated seventy-six (76) frequencies, meaning that, on average, a Weakness happened about 3 times (i.e 2.53) in the ten-year period, 2009-2018. Weaknesses associated with Corporate Governance and Credit/Loans groups accounted for thirty-two (32) or 42.1% and twenty seven (27) or 35.5%, respectively of the 76 frequencies. Thus, together, Corporate Governance and Credit/Loans Weaknesses accounted for as high as 59 or 77.6% of all the 76 frequencies. Risk Management and Internal Control groups had 12 (15.5%) and 5 (6.6%), respectively, giving a total of 17 or 22.4% of the total 76. The signal still shows the need for banks to buckle-up in their Corporate Governance and Credit/Loans functions.

3.4 Control of Occurrence of Weaknesses:

Control of the occurrence of Corporate Governance-related Weaknesses was better in the second half (2014-2018) of the period with 14 or 43.8% than in the first half (2009-2013) with 18 or 56.3% of the total 32 frequencies (**please, see Table 3**).

In terms of Credit/Loans, a compartmentalisation of the ten years into two halves (that is, 2009-2013 and 2014-2018), shows clearly that 12

or 44.4% of the Weakness occurrences took place in the first half while 15 or 55.6% happened in the second half. This suggests that banks' control of Credit/Loans-related Weaknesses was better by as much as11.2%, in the first half (2009-2013) than in the second half of the period (2014-2018). Thus, there is the need for banks to intensify their efforts in the control of Credit/Loans-related Weaknesses.

With respect to Risk Management-related Weaknesses, of the twelve (12) occurrences, 8 or 66.7% took place in the period 2009-2013 (first half) while 4 or 33.3% occurred within 2014-2018 (second half). Consequently, banks' performance in controlling Risk Management-related Weaknesses was better in the second than in the first half of the period under review.

Banks' efforts at arresting Internal Control-related Weaknesses was worse in the second half (2014-2018) of the ten-year period studied when 4 or 80% of the 5 reported Weakness occurrences took place than in the first half (2009-2013) that only one (1) or 20% was reported. The evidence challenges banks to pay more attention to check-mating Internal Control-related Weaknesses in their operations. As may be observed from the immediate four (4) preceding paragraphs, banks' control of Corporate Governance and Risk Management-related Weaknesses in the ten years studied was better in the second half of the period than in the first half. On the other hand, banks' control of Credit/Loans and Internal Control-related Weaknesses was better in the first than in the second half of the period. These outcomes beckon on banks to improve their operations if Weaknesses will become a thing of the past in the Nigerian banking industry.

3.5 Annual Frequencies:

The annual frequencies of Weaknesses for the period, 2009-2018, are summarised in **Table 3.** As obvious from the Table, the years with the

highest frequencies are 2009 and 2010 that recorded ten (10) each and contributed 13.2% each of the 76 total frequencies. The second position is occupied by years 2011, 2015, 2016, 2017 and 2018 that recorded eight (8) or 10.5% each of the entire 76 frequencies in the period. Year 2013 recorded six (6) frequencies or 7.9%. The years, 2012 and 2014 had the lowest frequencies of five (5) each or 6.6% of the total frequencies in the ten years covered by the study.

TABLE 3: ANNUAL GROUP FREQUENCIES OF WEAKNESSES, 2009-2018.

	Weakness Group Types	**No. of Types in Group**	**% of Total**	**Frequency Per Group**	**% of Total**
1.	Corporate Governance	12	40	32	42.1
2.	Credits/Loans	11	36.7	27	35.5
3.	Risk Management	5	16.7	12	15.8
4.	Internal Control	2	6.7	5	6.6
	Total	30	100	76	100

SOURCE: EXTRACTED FROM THE APPENDIX.
NOTE: S/TL = Sub-Total; TL% = Per cent age of Total.

Given a compartmentalisation of the frequencies in the ten years into two halves, the performance of the banks shows that a total of 39 (51.3%) frequencies out of 76 occurred in the first half, that is, 2009-2013. The second half, 2014-2018 contributed 37 (48.7%) of the total (see also Section 5, paragraph 3). The difference of 2 frequencies or 2.6% in performance, in favour of the second half, is very marginal and may indeed, be considered to be negligible. Nevertheless, it is a pointer that banks need and should be made, to work harder towards ensuring they operate free from Weaknesses.

It is important to observe that, in the ten years studied, there was no year that banks were found to have operated without recording Weakness frequencies. This is certainly worrisome, and it should be a

source of serious concern to both the banks, their regulators and supervisors.

3.6 Number of Different Types of Weaknesses Discovered Vis - a - Vis the Number of Banks Examined:

As evident from both **Table 1** and the **Appendix**, 30 different types of Weaknesses, on the whole, were discovered from a total of 197 banks examined out of the 237 in operation in the ten (10) years studied. This gives an average of three (3) different types of Weaknesses found from an average of about 20 examined banks per annum. This translates, on average basis, to one different type of Weakness being discovered from about seven examined banks.

As further shown in **Table 1,** ten (10) different types of Weaknesses were discovered in both 2009 and 2010 from 11 and 12 examined banks, respectively. In years 2011 and 2012 only 4 and 2 were respectively found from the 16 examined banks apiece. When 24 banks were examined in each of years 2014 and 2015, one (1) and three (3) different types of Weaknesses were respectively discovered. In the remaining four years, 2013, 2016, 2017 and 2018, no different type of Weakness was found from any of the examined 20, 23, 25 and 26 banks.

Further review of **Table 1** indicates that, out of the thirty (30) different types of Weaknesses, 26 or 86.7% of them occurred in the first half (2009-2013) of the ten years under study while only four (4) or 13.3% took place in the second half (2014-2018). This seems to be a pointer to the possibility that banks improved in the control of occurrence of different types of Weaknesses in their operations in the second than the first half of the ten years reviewed.

3.7 Total Number of Banks Examined Vis - a - Vis Total Frequency Occurrence of all Weaknesses, 2009-2018.

In the ten (10) years, 2009-2018, the number of times the 30 different Weaknesses were reported to have occurred in the 197 examined banks was 76 times. The year-by-year frequency figures are also shown in **Table 1**.

A review of the data in **Table 1** indicates that, of the 11 and 12 banks examined in 2009 and 2010, respectively, 10 Weakness frequencies were found in each year. In 2011 and 2012 that 16 banks apiece were examined, the number of Weakness frequencies unearthed were 8 and 5, respectively. While the Weakness frequencies discovered in the 20 and 24 banks examined in 2013 and 2014 were 6 and 5, respectively, the number discovered in the 24, 23, 25 and 26 banks examined in four years, 2015-2018 was 8 per annum.

Relative to the number of examined banks, the year that recorded the highest reported rate of occurrence of weaknesses (90.9%) was 2009 when 10 Weaknesses were found from the 11 examined banks. It was followed by year 2011 with the rate of 83.3% when 10 Weaknesses were discovered from 12 examined banks. However, the lowest rate, 20.8% was in 2014 when only 5 Weakness occurrences were discovered from the 24 banks that were examined that year.

It is interesting to observe that, of the 76 total occurrences of the all the Weaknesses in the ten years reviewed, 39 (or 51.3%} were discovered in the first five years, 2009-2013 while 37 (or 48.7%) were discovered in the second five years, 2014-2018. These indicate that fewer Weaknesses occurred in the second half of the period under study and suggest that banks controlled the occurrence of Weaknesses better in the second than in the first half of the period. This may be ascribed to banks' improved handling of their responsibilities. It is especially welcome given that more banks (122) were examined in the

later years than in the earlier ones (75) and yet the number of Weaknesses declined, though, marginally by two (2) or 2.6%.

3.8 Most Prevalent Type(s) of Weakness(es) Discovered:

The frequency of occurrence of the thirty (30) different types of Weaknesses evidenced in the **Appendix** clearly indicates that, four (4) of them occurred in a majority of the ten years. The Weaknesses are: "Non-compliance with banking laws, rules and regulations" (which occurred in 8 out of the 10 years covered by this study); "Poor/Extreme Weak Corporate Governance Practices" (occurred in 7 out of 10 years); "Failure to implement/Non-implementation of some recommendations in Examiners' Reports" (occurred in 7 out of 10 years); and "Loan and Deposit Concentrations" (occurred in 7 out of 10 years).

A frequency occurrence of 4 was attained by each of the following five types of Weaknesses: Non-Performing Insider Loans, Failure to Implement Effective Risk Management, Poor Risk Management and Poor Internal Controls. While the Weakness "Declining Asset Quality" occurred in 3 of the 10 years, each of the following four Weaknesses- Inadequate Capital, Increase/Large Volume of Non-Performing Loans, Concentrated Lending and Absence of defined overall Risk appetite, occurred in 2 of the 10 years. It is noteworthy from the **Appendix** that as many as 16 or 53.3% of the 30 different types of Weaknesses occurred only once in the 10 years reviewed.

Consequent from the foregoing, it can be stated without contradiction that, of all the 30 different types of Weaknesses, the most prevalent was "Non-compliance with banking laws, rules and regulations". The more prevalent types were three, viz:
"Poor/Extreme Weak Corporate Governance Practices"; "Failure to implement/Non-implementation of some recommendations in Examiners' Reports" and "Loan and Deposit Concentrations".

As can be noticed, the most prevalent, "Non-compliance with banking laws, rules and regulations" and two of the three more prevalent Weaknesses "Poor/Extreme Weak Corporate Governance Practices"; and "Failure to implement/Non-implementation of some recommendations in Examiners' Reports", featured under Corporate Governance Group while one of the more prevalent ones, "Loan and Deposit Concentrations", is of Credits/Loans Group. The Weaknesses that were reported to be within Risk Management Group and Internal Control Group, respectively are not regarded to be more or most prevalent because their frequencies of occurrence were not above five times or 50% of the ten-year period covered by the study - a criterion set by this researcher.

It is important to also note from the Appendix, that the four (4) more and most prevalent Weaknesses recorded a collective frequency occurrence of 29 or 38.2% of the total 76 frequencies for all the 30 types of weaknesses. On the other hand, the remaining twenty six (26) others had a collective frequency of 47 or 61.8% of the total 76. While each of the four more and most prevalent weaknesses contributed 3.2 of the 29 associated frequencies, each of the 26 others contributed only 1.8 of the 47 associated frequencies. This shows that the four (4) frequently reported weaknesses must have made greater negative contributions in banks. The Regulatory and Supervisory Authorities need to urgently do something that will ensure that banks back-down from carrying on these Weaknesses.

4.0 FINDINGS FROM THE STUDY

From the foregoing analysis, clear-cut findings have been made from the study. They are presented as follows:

i) the total number of banks in operation within the period was 237. On per annum basis, the number ranged from the lowest of 20

in 2011 and 2012, to the highest of 27 in 2018. On average, about 24 banks, per annum, were in operation.

ii) The number of banks examined by NDIC was 197 or about 83.1% of the 237 banks in operation. The highest number of banks examined in a year was 26 which is about 96.3% of the 27 banks in operation in that year, 2018. On the reverse, the lowest number examined was only 11 or 45.8% of the 24 banks in operation in 2009. With an annual average of about 24 banks in operation, 20 or 83.3% on average were examined. It is noted that, in the three years 2014, 2015 and 2017, all the 24, 24, and 25 respective banks in operation were 100% examined. These performances can be adjudged to be very good.

iii) The different types of Weaknesses discovered include: Non-Compliance with banking laws, rules and regulations; Abuse and fraudulent use of subsidiaries; Inadequate Capital in some banks; Deliberate falsification of income; Credits in excess of Single Obligor Limits; Inadequate Collaterals; Ineffectiveness of Board's Risk Management control functions; and Inaccurate financial reporting, among others.(See the attached Appendix for all the different types of Weaknesses).

iv) The number of different types of Weaknesses noted in banks and reported by NDIC, for the ten years studied was thirty (30), spread into four groups of: Corporate Governance (12 or 40%), Credits/Loans (11 or 36.7%), Risk Management (5 or 16.7%) and Internal Control (2 or 6.7%). Thus, Corporate Governance Weaknesses led the pack, followed by Credits/Loans.

v) The frequency occurrence of the reported thirty (30) Weaknesses, within the study period, was seventy six (76) times. While the highest annual frequency of 10 or 13.2% took place

in each of the two years, 2009 and 2010, the lowest of five (5) or 6.6% was recorded in each of the two years, 2012 and 2014. Each of the five (5) years - 2011, 2015, 2016, 2017 and 2018 - recorded eight (8) weakness frequencies or 10.5% of the total while in 2013 six (6) frequencies or 7.9% of the total were recorded.

vi) The **prevalent types of the reported Weaknesses** were "Non-Compliance with banking laws, rules and regulations" that recorded a frequency of 8 times or 80% in the 10 years analysed; "Poor/Extreme Weak Corporate Governance Practices"; "Failure to implement/Non-implementation of some recommendations in Examiners' Reports"; and "Loans and Deposit Concentrations" each of which occurred 7 times or 70% in the ten years.

It is important to note that three of the four prevalent Weaknesses, i.e. Non-compliance with banking laws, rules, and regulations; Poor/Extreme weak Corporate Governance practices; and Failure to implement some recommendations in Examiners' Reports, belong to the Corporate Governance Group while one - Loan and Deposit concentrations- belongs to Credits/Loans Group.
It is also important to note that the **most prevalent** of all the Weaknesses found was "Non-compliance with banking laws, rules and regulations" while the **more prevalent ones** were the other three ("Poor/Extreme Weak Corporate Governance Practices"; "Failure to implement/Non-implementation of some recommendations in Examiners' Reports"; and "Loans and Deposit Concentrations").

vii) The number of different types of Weaknesses discovered relative to the number of banks examined showed inverse but healthy trends. While the number of banks examined progressively increased from 11 in 2009 to 26 in 2018, the

number of discovered different types of Weaknesses per annum dropped from the height of 10 in 2009 and 2010, to zero in 2013, 2016, 2017 and 2018. On average, three (3) different types of Weaknesses were discovered per annum from an average of about 20 banks examined per annum in the ten years, 2009-2018.

viii) The years with the highest number of different types of Weaknesses were 2009 and 2010 with each recording ten (10). However, the lowest number (1) type was recorded in 2014 although none (zero) was recorded in the four years, 2013, 2016, 2017 and 2018.

ix) The Groups of types of Weaknesses found were four (4), made up of: Corporate Governance Group, Credits/Loans Group, Risk Management Group, and Internal Control Group.

x) The number of Weaknesses recorded per Group are as follow: Corporate Governance Group (12); Credits/Loans Group (11); Risk Management Group recorded (5); and Internal Control Group (2). The Group with the highest number of types of Weaknesses is Corporate Governance (12) while the lowest number (2) is recorded by Internal Control.

As may be appreciated, Corporate Governance and Credit/Loans Groups jointly accounted for (23) or about 76.7% of the entire 30 types of Weaknesses in all the four Groups. On the other hand, Risk Management and Internal Control Groups accounted for (7) or 23.3% of the total (30).

xi) The Group with the **highest frequency of Weaknesses** was Corporate Governance Group that recorded thirty two (32) or 42.1% of the seventy six (76) frequencies. The **higher frequency Group** that recorded 27 or 35.5% of the total was

Credts/Loans. The Group that recorded the **lowest frequency** was, Internal Control with five (5) or 6.6% of the total (76).

xii) A comparison of the number of different types of Weaknesses that occurred in the two half decade periods, 2009 - 2013 and 2014 - 2018 indicates that while 26 or 86.7% of the total (30) was in the first period, 4 or 13.3% occurred in the second.

In terms of frequencies, 39 (51.3%) occurred in the first while 37 (48.7%) was recorded in the second period. Both trends show that performance in the control of Weaknesses (in number and frequency) was better in the second half than the first half of the period studied.

xiii) A comparison of banks' performance in controlling the occurrence of Weaknesses in each group shows that, banks' performance in controlling Corporate Governance Group of Weaknesses was better in the second half (14 or 43.8%) of the ten years studied than in the first (17 or 56.3%); in relation to Credits/Loans Group of Weaknesses, performance was worse in the second (15 or 55.6%) than in the first (12 or 44.4%) half of the periods; as for Risk Management Group of Weaknesses, control was better in the second half with 4 or 30.8% against 9 or 69.2% in the first half; as regards Internal Control-related Group of Weaknesses, control was better in the first half (1 or 20%) than in the second (4 or 80%).

xiv) In all the ten years studied, there was no year that banks were found to have operated free from Weaknesses. In other words, Weaknesses were discovered in banks in all the ten years (2009-2018). However, no different type of Weakness was found in years 2013, 2016, 2017 and 2018.

5.0 IMPLICATIONS OF THE FINDINGS FROM THE STUDY FOR BANKS AND THE BANKING SYSTEM/ECONOMY

Expectedly**,** findings from this study ought to or should throw up some implications. Quite rightly they have multiple and diverse implications for the banks, the banking industry, customers of banks/ the banking public and of course, banks' regulators and supervisors.

With respect to banks, most of the 30 different types of Weaknesses found in their operations that evidenced negativity in their corporate governance, risk asset quality, credit/loans and internal control indicate, to say the least, that they have not learnt lessons from what happened in the days of massive bank distresses and failures of the 1990s. Consequently, they were unable to guide against slipping neck deep into committing the same types of Weaknesses that were found to have been the critical sources and causes of bank distress in and failure of banks. Thus, the implications for banks lie in the threats the Weaknesses pose to their overall soundness and health as well as what they must do to avert crystallisation of the threats. In particular with the lowering of the quality of their assets, higher exposure to risks and weak corporate governance, the threats to survival are higher. It should, therefore, be of serious concern for the banks to find pragmatic, enduring and sustainable ways to overcome further or continued manifestation of the Weaknesses in their operations. In other words, there is the need for banks to find solutions to the various multiple Weaknesses in the operations.

With threats to the survival of the banks, the health and soundness of the banking system are also at stake. There is no way the system will remain healthy and sound if either some banks become distressed or fail. In the least case, the banking system will witness a reduction in the number of banking institutions, the volume and value of assets and the capacity to provide the needed and important services for the entire

economy. Once the sustenance is negatively affected, the impact will be seriously felt in the economy, especially as financial intermediation will be hampered with adverse consequences for socio-economic expansion, growth, and development. Needless to state that the integrity and image of the industry will also be jeopardised. It also has adverse implications for the stability of the banking sector as well as the entire financial system.

The next area that the findings have implications is not only the provision of services to the customers of banks but also the sustainability of consumer and public interests and confidence in the banks and by extension, the banking system. For example, whatever threatens banks' soundness and health has severe negative implications for the provision of quality and consistent services to bank customers and the banking public. Beyond direct negative implications for services to customers, there is also the impairment of the on - going much desired national financial inclusion in the country.

Perhaps, the implications are more obvious, and challenging among the regulatory and supervisory institutions (CBN /NDIC) in the banking industry. Although NDIC's level of On-Site Examination coverage of banks within the period studied showed a very good performance 83.1% but the number of different types of Weaknesses discovered in the examined banks is indicative of the fact that NDIC still has much to do in causing banks to eliminate all forms of Weaknesses in their operations. In recognition of the negative effects of the weaknesses in banks and the banking system, the regulators and supervisors should have the key responsibility of causing banks to operate free from Weaknesses. As a matter of fact, given the finding that some banks fail to implement some recommendations in Examiners Reports, the authorities are challenged to ensure that whatever recommendations they make to banks for implementation are carried out timely failing which appropriate sanctions become merited

and should be actualised. It is essential to point out that the outcome of the study has a unique implication for the NDIC as the deposit insurer in the banking system. That is, the Corporation will have the unenviable burden of fulfilling its responsibilities of not just liquidating any failed bank but also settling claims of depositors whose funds may be trapped in any failed bank (s). This is a very grave and expensive implication for NDIC and indeed, the banking system. To delimit the possibility of failure of banks, the regulators and supervisors of banks must up their games via aggressive human capital training and development, effective constant monitoring of activities and operations of banks and delivering of deterrent sanctions whenever the need arises.

6.0 RECOMMENDATIONS

Arising from the foregoing are the following recommended ways forward:

1. Managements of Deposit Money Banks (DMBs) in Nigeria should:

a) immediately embark on elimination of all the thirty (30) forms of Weaknesses in their banks. There is no reason why they cannot eliminate them except, of course, the banks are profiting, in one form or another, from harbouring the Weaknesses.

b) pay more attention to the handling of Corporate Governance and Credits/Loans operations to significantly address the issues of prevalence of Weaknesses in banks.

c) embark on aggressive human capacity building and development of their employees.

2 The Regulators and Supervisors of banks in Nigeria (CBN/NDIC) should:

a) stop the practice of just making “recommendations" to banks for the purpose of addressing observed Weaknesses during

On-Site Examinations since evidence has shown that banks' managements disregard or disobey the recommendations. NDIC and CBN should rather give firm directives to managements of banks for compliance within a specified time failing which they should face severe penalties.

b) immediately ensure that all the Weaknesses detected, especially the ones with the highest frequencies of occurrence in the period (that is, the most prevalent ones - Non-compliance with banking laws, rules and regulations; Poor/Extreme weak corporate governance practices; Failure to implement some recommendations in Examiners' reports; and Loan-deposit concentrations), are resolved by management of banks without further delay, in order to free the banks and the industry from negative impacts.

c) strive to find out the reasons behind banks perpetrating and sustaining Weaknesses in their operations and the banking industry (even after the Weaknesses had been pointed out and recommended by the Supervisors for resolution). The outcome of such inquiries will greatly assist in finding lasting solutions to the presence of Weaknesses in deposit money banks in Nigeria.

d) closely monitor and examine deposit money banks more frequently to ensure, not only that they do not take undue advantage of the banking system but also the focus on the protection of depositors' funds.

e) cause banks to address the obvious need for human capacity building in banks, especially in the areas of Corporate Governance; Credits/Loans; and Risk Management, if incidences of Weaknesses must be significantly reduced or indeed, eliminated.

3. The Bankers Committee in collaboration with the Chartered Institute of Bankers of Nigeria (CIBN) or just CBN/NDIC in

collaboration with CIBN should, in order to encourage and motivate banks to operate free of Weaknesses, institute a suitable **Annual Weakness-Free Performance Award**, to be won by any bank or banks that will be found to have conducted its/their operations Weakness-free in a year.

7.0 CONCLUDING REMARKS

This study has clearly shown that although, there were some instances of improvement in the reduction of annual number of Weaknesses reported against deposit money banks, the general situation points to the need for serious improvement in all the four groups of identified Weaknesses viz, Corporate Governance, Credits/Loans, Risk Management, and Internal Control.

The reason banks should voluntarily and steadfastly address Weaknesses arising from the way and manner they handle their operations, duties and responsibilities in these areas is not far-fetched - they are the foremost drivers of banks into distress and/or failure. As has been well documented in: A CBN/NDIC Collaborative Study of Distress in the Nigerian Financial Services Industry (1995, p.58), major sources/causes of bank distress and/or failure include bad loans and advances, fraudulent practices, under capitalisation, rapid changes in government policies, bad management, lack of adequate supervision, undue reliance on Forex. Furthermore, at a Public Hearing on the Developments in the Banking System, convened in 2001 by the House of Representatives Committee in Banking and Currency, Ogunleye (2001) identified abuse of ownership, insider abuse, weak corporate governance, weak risk asset management practices and inadequate capital as some of the main causes of persistent bank distress and failure in the Nigerian banking industry. Many more "underpinning causes" of bank distress and failure are exposed in, Case Study of Bank Failures in Nigeria, published by the Nigeria Deposit Insurance Corporation (NDIC).

Most of the Weaknesses that were discovered in this study are among the ones highlighted in the above stated reports, papers and book, as causes and/or sources of bank distress and failure in this country. It is therefore, emphasised that, given what has been revealed in this study, if nothing serious is expeditiously done to remedy the situation, it should not be any surprise if another round of bank distress and failure envelop the Nigerian banking industry in no distant time from now.

Consequently, the CBN/NDIC have the responsibility to cause banks to, at all times, comply with laws, rules and regulations as well as practices that guide proper governance and management of operations of banks. A situation where banks are found not complying with laws, rules and regulations should be unacceptable and ought to attract serious attention and if need be, maximum sanctions. Quite surprisingly and unbelievably, in the portion of NDIC's various Annual Report and Statement of Accounts where Weaknesses found in banks were reported, no mention was made of sanctioning defaulting banks.

We also wonder about the reasons behind Regulators and Supervisors of banks making “recommendations" to banks for implementation which the banks either disregarded or disobeyed. If there is anything that forbids or constrains CBN/NDIC from giving 'directives' to banks for compliance, the time to find statutory solution has come, in order to elicit compliance or imposition of punitive sanctions upon disobedience. It is when banks begin to fully comply with laws, rules, regulations and directives of their Supervisors and Regulators that the aims of Banking Supervision to ensure that depositors are adequately protected and that the banking system remains safe and sound, can be realised and guaranteed.

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BOARD CHARACTERISTICS AND FIRM'S FINANCIAL PERFORMANCE IN NIGERIA

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Babatunde Dele Akinwole[1]
Folorunsho M. Ajide[2]

Abstract
The fallout from the financial crisis has placed a heavier focus on best practices for corporate governance principles. Boards of directors feel more pressure than ever before to be transparent and accountable. The study examined the effect of board size and its independence on the performance of listed entities in Nigeria. It further determined the effect of board diligence and board diversity on the performance of quoted firms in Nigeria. These were with the view of examining the relationship that exists between board characteristics and performance of quoted firms in Nigeria. The study which covered a ten-year period (2009–2018) made use of secondary data sourced from published annual reports and accounts of 35 purposively selected listed companies on the Nigerian Stock Exchange (NSE). The Pooled Ordinary Least Square (OLS) and generalized least square method of regression techniques were employed in analyzing the data obtained. Findings from the study revealed that a significant negative relationship exists between earnings per share and board size with a coefficient of -0.33 and p-value of 0.0095 (>0.01) and between earnings per share and board diligence with coefficients of -0.43 and

[1] *Faculty of Business Administration,University of Lagos, Akoka,Lagos, Nigeria*
[2] *Faculty of Social Sciences,University of Ilorin, Nigeria*

-0.48 and p-value of 0.02 (>0.05) and 0.0095 (>0.01) respectively, but no significant relationship exists between earnings per share and board independence with coefficients of -2.67 and –1.64 and p-value of 0.0218 and 0.49 respectively and between earnings per share and board gender diversity with coefficients of 0.06 and 0.08 and p-value of 0.42 and 0.36 respectively. The study concluded that board size and board diligence have impact on the performance of quoted companies in Nigeria, while board independence and gender diversity do not have effect on the performance of quoted firms in Nigeria. It was recommended small board size of diverse educational background and wide experiences of members, and regular meetings to discuss matters that concern the performance of firms.

Keywords: *Corporate Governance, independent directors, board characteristics, Performance,*
JEL Classification: *L25, M21*

1. Introduction

Issues of governance and corporate performance have received serious empirical consideration in recent times. This unending enthusiasm on governance research may have been sustained by the high-profile corporate demise, financial scandals and the global financial meltdown resulting in general loss of public confidence and investor's apathy. Corporate governance transcends the daily management of business activities Bairathi (2009). The board of directors has a part to play in corporate governance as their main duty is that of supervising the management to ensure proper accountability to shareholders and other stakeholders. Since the board of directors is vested with the responsibility of monitoring the interest of shareholders, they ought to have greater interest in the appointment of directors to ensure that qualified, experienced, and educated directors are appointed. Individual firms apart from the Security and Exchange Commission

(SEC, 2011) requirements have specified the profile requirements expected of their directors. Corporate governance is dynamic and appears broader than the conventional management practices. It is concerned with transparency in business dealings, probity and accountability, ethical conduct, fairness and strict compliance with both regulatory and ethical standards. Against the backdrop of the robustness of governance issues, one fundamental question becomes pertinent: do board characteristics affect the performance of the firm?

Studies have shown that corporate governance can be measured through board size, board women, CEO duality, board education, working experience, outside directors, compensation and block holders (Vo & Phan, 2013). Several studies have examined the impact of CEO duality, board composition, board size, board independence on firm performance. In Nigeria, studies like Sanda, Mukailu, and Garba (2005), Ehikioya (2009), Babatunde and Olaniran (2009), Kajola (2010), and Akhalumeh, Ohiokho, Ohiokha (2011) have studied corporate governance and firm performance, but did not consider the elements of gender diversity, age, educational qualification, board diligence, board experience, and board independence. Therefore, this study aims to bridge the gap between the inconclusive results because of various reasons such as fast changing of the market, management methods and different approaches from earlier studies by using the main corporate board characteristics such as; Board size, Board Independence, Board Diligence, and Gender diversity to explain the relationship between board characteristics and performance of quoted entities in Nigeria. The main objective of this study is to investigate the effect of board characteristics on performance of quoted firms, using Nigerian corporate entities listed on the Nigerian Stock Exchange. The next section reviews the literature. In section 3, we discuss the methodology of the paper. Section 4 discusses the results while section 5 concludes the paper.

2. Literature review

2.1 Theoretical background

This study uses the agency theory as a theoretical background to form an empirical framework for assessing board composition and firm performance of selected listed companies in Nigeria. Agency theory was developed by Jensen and Meckling (1976). They suggested a theory of how the governance of a company is based on the conflicts of interest between the company's owners (shareholders), and its managers. Each of these groups has different interests and objectives.

The shareholders want to increase their income and wealth. Their interest is with the returns that the company will provide in the form of dividends, and also in the value of their shares. The value of their shares depends on the long-term financial prospects for the company. Shareholders are therefore concerned about dividends, but they are even more concerned about long-term profitability and financial prospects, because these affect the value of their shares. The managers are employed to run the company on behalf of the shareholders. However, if the managers do not own shares in the company, they have no direct interest in future returns for shareholders, or in the value of the shares. Managers have an employment contract and earn a salary. Unless they own shares, or unless their remuneration is linked to profits or share values, their main interests are likely to be the size of their remuneration package and their status as company managers.

Jensen and Meckling (1976) defined the agency relationship as a form of contract between a company's owners and its managers, where the owners (as principal) appoint an agent (the managers) to manage the company on their behalf. As a part of this arrangement, the owners must delegate decision-making authority to the management. The owners expect the agents to act in the best interests of the owners. Ideally, the 'contract' between the owners and the managers should ensure that the managers always act in the best interests of the owners.

However, it is impossible to arrange the 'perfect contract', because decisions by the managers (agents) affect their own personal welfare as well as the interests of the owners. This raises a fundamental question. How can managers, as agents of their company, be induced or persuaded to act in the best interests of the shareholders?

2.2 Board Size and Firm Performance

Board size affects the quality of deliberation among members and ability of board to arrive at optimal corporate decisions. However, determining an ideal size of the board has been an ongoing and controversial debate in corporate governance literature. Several arguments arise in the literature on whether the size of corporate boards determines corporate performance. This argument always prevails due to the strategic posture of board members in companies' policies and strategies. Among others, Said et al. (2009) evidenced a significant negative relationship between board size and corporate performance, advocating that large board size result to ineffectiveness in communication, coordination and decision-making. However, a study conducted on a sample of public listed Indonesian companies by Siregar and Bachtiar (2010) found a non-linear relationship between board size and improved corporate performance. The study noted that a large board would be able to exercise better monitoring, but too large board will render the monitoring process ineffective. Chang et al. (2012), Esa and Mohd-Ghazali (2012) provide evidence of a positive relationship between board size and corporate performance. Based on the positive findings, Esa and Mohd-Ghazali (2012) argued that larger boards offer more knowledge and experience and also put forward different ideas in board deliberations. Similarly, Haji and Mohd-Ghazali (2013) concluded that large board size is connected with increased monitoring capacity which could lead to sharing of a variety of experiences in boardrooms. Besides, a corporate governance-sustainability disclosure study conducted on a sample of 50 Pakistan companies by Lone, Ali, and Khan (2016) established that a large

number of directors on corporate boards bring the experiences of diverse backgrounds which affect the level of corporate performance. More recently, Sadou et al. (2017) highlighted that larger boards are more effective and have greater influence over companies' performances. On the other side, some literature provided evidence of a negative association between board size and sustainability disclosure. In Nigeria, the rule guiding the size of a corporate board is spelled out in the country's corporate governance code. Specifically, the revised code of corporate governance 2018 stipulates that corporate board size should be relative to the complexity and scale of companies' operations. The code further specifies that the number of directors in company's board should not fall below five (5). However, the governance code did not specify the maximum number of directors a company should appoint for any specified period. Therefore, considering the provision in Nigeria's revised corporate governance code, this study expects board size to have a positive effect on corporate performance.

Hypothesis 1: The size of the board will have significant impact on the performance of quoted firms.

2.3 Board Independence and Firm Performance

The presence of independent directors on a board can help to segregate the management and control tasks of a company and this is expected to offset inside members' opportunistic behaviours (Jensen and Meckling, 1976). In addition, independent directors generally have stronger and extended engagement with wider groups of stakeholders (Wang and Dewhirst, 1992), and they tend to have a broader perspective that is likely to result in a greater exposure to performance requirements (Rupley et al., 2012). However, despite several support for independent directors on corporate boards, debates were still ongoing whether independent directorship is a necessary mechanism for aligning managerial interests with those of shareholders and also

their value creation merits for corporate performance. Huang (2010) concluded that independent directors act as a monitoring mechanism that ensures companies are properly managed by corporate management and also work towards enhancing corporate image and performance. A study conducted on a sampled US firms by Zhang, Zhu, and Ding (2013) claims that independent directors have more diverse background and represents external stakeholders of companies. As such, they have a stronger orientation towards better operation strategies than their counterparts in the boardroom. Studies by Sharif and Rashid (2014), Kaur et al., (2016) indicated a positive link between board independence and improved corporate performance.

Conversely, Abdullah et al. (2011) affirmed that independent directors are not effective in discharging their duties, talk less of going against other members of the boards. Additionally, Al-Moataz and Hussainey (2012) reiterated that higher number of independent directors on companies' boards leads to less effective board monitoring and equally lower levels of corporate transparency. Michelon and Parbonetti (2012), Janggu et al. (2014) provided evidence of an insignificant relationship between independent directors and improved corporate performance. This suggests that board independence does not seem to play a vital role in improving or determining a firm's extent of performance. Based on the insignificant result observed, managers are perceived as moral agents other than opportunistic individuals. As such, their role is to achieve a balance between the interests of diverse stakeholders (Shankman, 1999). Therefore, it is presumed that a corporate board with a higher proportion of independent directors will ensure improved board monitoring quality and also work toward satisfying the needs of all stakeholders. Therefore, based on the positive result observed in the extant literature, this study anticipates a significant positive relationship between board independence and corporate performance. This implies that with a higher proportion of

independent directors on a corporate board, a company will exhibit more concern and give more attention to corporate performance.

Hypothesis 2: The independence of board members will improve the performance of quoted firms.

2.4 Board Diligence and Firm Performance

Board diligence here refers to the number or frequency of board meetings. Some studies advise against frequent board meetings, while others believe that frequent meetings will enhance the performance of the firm. Ghosh (2007) found a statistically significant impact of board diligence on firm performance, noting that 10% increase in diligence increases the performance of the organisation by 1%. Ntim and Osei (2011) found a positive relationship between board meeting frequency and firm performance in their study on South African listed firms for the period of 2002 to 2007. The board members' capacity for consultation, supervision and management increased because they interact regularly through meetings, and that resulted in good firm financial performance. Similarly, Irshad and Ali (2015) discovered that independent directors, board meeting frequency and board size exert a positive effect on firm performance measured through coefficients of Q and returns on asset (ROA). Akpan (2015) obtained similar results in his study on 79 listed companies in Nigeria from 2010 to 2012. Johl et al. (2015) categorized board diligence as part of the key corporate governance mechanism that helps in guiding and advising the management towards the pursuit of shareholder interests amidst other control functions. The aforementioned study also detailed the regulation placed on Malaysian companies by regulators. The Malaysian code encourages regular board meetings and regular disclosure of details of frequency as well as member attendance. This is said to increase board effectiveness and also bring the board members into one mind by serving as a medium for disseminating

salient information to all board members as regards the progress of the company

However, others believe that Board meeting frequency negatively affects firm performance in the current year because board meetings are costly in terms of time and costs incurred in relation to the meetings (Vafeas, 1999). A study conducted with a sample of 328 Malaysian listed companies from 2003 to 2007 reported that high board meeting frequency causes low firm performance (Amran, 2011). Francis et al. (2012) used a financial crisis as a sample period to examine the extent to which corporate boards affect firm performance. The results showed that board meeting frequency and directors' attendance behaviour and age affect firm performance during a crisis. Unlike previous studies, the study of Horváth and Spirollari (2012) used a sample of 136 firms traded on S&P 500 Index from 2005 to 2009 to examine the relationship between firm performance and several factors related to the characteristics of the board of directors, including board meeting frequency. They found no relationship between firm performance and board meeting frequency. The impact of board meetings on firm performance is an important issue in transition literature. A different view is that board meetings are not necessarily useful because the limited time external directors spend together is not used for the meaningful exchange of ideas among themselves or with the management (Jensen, 1993). Johl, Kaur and Cooper (2013) used financial and non-financial data from companies listed on the Malaysian Stock Exchange market in 2009 and the result of the study reported a negative relationship between board diligence and financial performance. The implication of the finding is that less frequent, but meaningful meetings should be encouraged. This negative relationship is also consistent with Lipton and Lorsch (1992).

Hypothesis 3: The diligence of board members will have significant impact on the performance of quoted firms.

2.5 Board Gender Diversity and Firm Performance

The number of studies on board gender diversity and firm performance from different countries has increased in recent years because of the unique knowledge, information and variety of experiences, skills, and networks of gender-diverse boards (Hillman et al., 2007; Miller & del Carmen Triana, 2009). A board with female members is more able to integrate the interest of multiple stakeholders, including employees, customers, suppliers, and the communities with the performance-based interests of shareholders (Harrison and Coombs, 2012). This argument is supported by (Vo and Phan, 2013), who considered three different reasons to recognize the importance of female on a board. First, female board members usually have a better understanding of a market in comparison with male members. As such, this understanding will enhance the decisions made by the board. Second, female board members will bring better images in the perception of the community for a firm, and this will contribute positively to firm's performance. Third, other board members will have enhanced understanding of the business environment when female board members are appointed. Hence, as a result of women on board, a firm's performance is improved directly and indirectly. Low, Roberts and Whiting (2015) investigated Asian firms in Hong Kong, South Korea, Malaysia, and Singapore and found that the appointment of female directors can positively affect the firm's performance. Rao and Tilt (2016) conducted a comprehensive review of prior board diversity and overall corporate performance. Based on the review, Rao and Tilt concluded that the impact of having females on corporate board is likely to be minimal except when there is a critical mass. A growing body of contemporary research on boards and board roles suggested that women directors on board have the potential to increase board effectiveness and firm performance (Carter et al., 2003; cited in Bello and Kamarul, 2017). Women on board facilitate in-depth discussions and alternative perspectives and are more likely to be helpful in the course of uncertainties and complex decisions.

Conversely, Adams and Ferreira (2009) and Pletzer, Nikolova, Kedzior, and Voelpel (2015) highlighted a negative relationship between female directors and firm performance due to these directors' lack of skills and experiences in monitoring the performance of their firms. Strydom, Au Yong, and Rankin (2016) found that board gender diversity may not affect firm performance in terms of earnings quality. They also found that a higher proportion of female directors on the board of Australian firms corresponds to a lower stock price volatility. They added that female directors might not be employed based on their level of expertise and experiences but rather based on their family relationships (Bianco, Ciavarella, & Signoretti, 2015; Saeed, Yousaf & Alharbi, 2017).

In the context of Nigeria, culture plays a pivotal role in restricting women's participation in corporate boards. However, this perception is gradually fading out. As such the significance of gender diversity is nowadays becoming obvious and visible (Şener and Karaye, 2014). An example is the recent measure put in place by the Central Bank of Nigeria (CBN) to boost female representation in board formation in the country. The CBN through its bankers' committee imposes mandatory quota target on deposit money banks. The aim is to increase women's representation on companies' boards to 30 percent (Şener and Karaye, 2014). Therefore, considering the recent changes in Nigerian gender diversity policies and also the view of stakeholder theory which supports a positive association between board diversity and firm performance, this study expects women on board to have a positive and significant effect on firm performance.

Hypothesis 4: Board gender diversity will affect the performance of quoted firms.

3. Methodology

The researchers employ purposive sampling technique to select the 35 listed entities from the Nigerian Stock Exchange as at 31st December, 2008 across nine sectors out the entire (eleven) sectors in Nigeria as the sample for the study. Purposive sampling technique is adopted to ensure that companies with adequate data within the selected years are selected in order to have a balanced panel. Sample will be drawn from nine sectors namely: Conglomerates, Consumer Goods, Financial Services, Healthcare, ICT, Industrial Goods, Industrial Services, Oil & Gas and Services. The other two sectors, Agriculture and Real estate, were exempted from selection because sufficient data were not available for the studied years (2009-2018) to enable the researched to arrive at reasonable conclusion. The reason for using those sectors is to ensure that all industries with adequate data for the years under consideration are included. This paper employs secondary data sourced from the audited reports and accounts of the selected firms available on the ***Nigerian Stock Exchange Fact Books for 2009 to 2018***. The choice of the study is guided by the availability of relevant data.

In order to examine the effect of board characteristics (independent variables) proxied by board size, board experience, board independence and gender diversity on firm performance (dependent variable) measured by Earning Per Share (EPS), we specify the following equation can be computed as:

$Y = \beta_0 + \beta_{x1} + \beta_{cv} + \mu_{it}$ ..... *(1)*

Where:

Y = Quoted Firm Performance (Dependent variable)

X = Board Characteristics (Independent variable)

CV = Control Variables such as firm size, liquidity, and leverages

ß= Coefficient

µit = Error term

Equation 1 can be more clearly defined as:

Quoted Firm Performance = *f* (Board Characteristics) c

..... *(2)*

Equation 2 is further expanded by introducing the constructs of Quoted Firm Performance and Board Characteristics, including a control variable, hence formulating equation 3.

Earnings Per Share = *f (*board size, board diligence, board independence, gender diversity, firm size, liquidity and leverages*)* + c..... *(3)*

The model specification based on regression is:

$EPS_{it}\ BS_{it} + BD_{it} + BI_{it}t + GD_{it} + FZ_{it} + LQ_{it} + LEV_{it} + C_{it}$..... *(4)*

Where-

EPS= Earnings Per Share is the proxy for measuring quoted firm performance.

BS= Board Size, which is the number of board of directors running the affairs of the company.

BD= Board Diligence; It is the number or frequency of board meetings.

BI= Board Independence, which is the number of independent directors among the board members.

GD= Gender Diversity, which is the ratio of male to female among the board of directors.

BS= Size of the firm measured by logarithm of firms' total asset

LQ= Total debt divided by shareholders' equity

LV= Current asset divided by current liabilities

ß = Coefficient of parameters

µ= Error term, which captures other explanatory variables not explicitly included in the model.

it = time coefficient, i.e., for firm i in year t

The equation (4) was estimated using pooled OLS and Generalized least square.

4. Research findings

Table 1 showed the mean, the median, the maximum, minimum, the standard deviation, the skewness, the Kurtosis, Jarque-Bera, the probability, the sum, the sum square deviation and the observations of all the variables used in the research project. The data were obtained from the annual reports of 35 companies listed across nine (9) sectors on the Nigeria Stock Exchange (NSE) from 2009 to 2018 with a total number of 338 observations.

Table 1 - Descriptive Statistics

	EPS	BI	BS	BD	FZ	GD	LQ	LV
Mean	2.078698	0.695769	10.35503	5.192308	24.55045	6.469438	3.394083	1.835799
Median	0.410000	0.670000	10.00000	5.000000	24.56676	7.000000	1.140000	1.240000
Maximum	54.26000	1.000000	20.00000	12.00000	29.23151	15.00000	191.2100	61.18000
Minimum	0.000000	0.380000	5.000000	2.000000	0.000000	0.830000	0.000000	0.090000
Std. Dev.	5.310360	0.123464	2.755839	1.498268	2.433624	3.271866	11.03594	3.736432
Skewness	5.944205	0.220001	0.961954	1.138185	-2.862481	0.230129	14.78534	12.51201
Kurtosis	46.09717	2.110555	4.073840	4.822774	32.06876	2.266772	249.9437	191.3787
Jarque-Bera	28148.37	13.86806	68.36831	119.7698	12361.90	10.55489	871133.1	508587.6
Probability	0.000000	0.000974	0.000000	0.000000	0.000000	0.005105	0.000000	0.000000
Sum.	702.6000	235.1700	3500.000	1755.000	8298.052	2186.670	1147.200	620.5000
Sum Sq. Dev.	9503.372	5.137050	2559.396	756.5000	1995.891	3607.621	41043.86	4704.830

The results from the analysis of the Earnings Per Share (EPS) shows the highest Earnings Per Share of 54.26 and the lowest of 0.00 with a standard deviation of 5.31%. The statistics on board independence (BI) indicates a significant portion (69.57%) of total board members with maximum of 100% and 38%. The mean board size (BZ) is about eight (10) suggesting that firms listed on the Nigerian Stock Exchange (NSE) have relatively moderate board sizes. There is a maximum board size of twenty (20), minimum board size of five (5) and standard deviation of 2.75, implying that quoted firms in Nigeria have relatively similar board sizes. The board diligence (BD) in terms of board meetings indicates that the number of board meetings ranged from a

minimum of 2 to a maximum of 12 with an approximation of 5.19. The mean gender diversity (GD) is about six (6), maximum gender diversity is about fifteen (15), minimum gender diversity is about one (1) and standard deviation of 3.27. The mean value of the firm size (FS) is 24.55, the maximum is 29.23 while the minimum value is 0.00 and the deviation is 1.49. The firms listed on the stock exchange are highly liquid as the mean shows 3.39 with maximum value of 191.21 and minimum of 0.00. The firms generally depend more on debt equity financing as indicated by the highly leverage figure of 1.83.

Table 2: Correlation Matrix

	EPS	BS	BD	BI	GD	FZ	LQ	LV
EPS	1.000000							
BS	-0.014095	1.000000						
BD	-0.103803	0.144396	1.000000					
BI	-0.083818	-0.277702	-0.005374	1.000000				
GD	0.044881	0.018326	-0.055280	0.007997	1.000000			
FZ	0.180776	0.546574	0.148831	-0.217661	0.038255	1.000000		
LQ	-0.004071	0.163213	0.005053	-0.051512	0.121984	0.154168	1.000000	
LV	-0.069023	-0.094792	-0.063441	0.127000	0.089387	-0.026833	-0.070065	1.000000

**p<0.01; *p<0.05 at tailed level

The researcher carried out a correlation analysis of dependent variable with independent variables and control variables in order to answer the hypotheses laid down for this study. The correlations are given in Table 3. It is evident from the table that the dependent variable (Earnings Per Share) performance is having negative relationship with board size (r= -0.01), board diligence (r= -0.10), board independence (r= -0.08), liquidity (r= -0.00), leverage and (r= -0.06). This pattern of correlation suggests that low level of associations subsists between these variables and earnings per share. However, the performance, earnings per share, is positive with gender diversity (r= 0.04) and firm size (r= 0.18). This suggests that high level of associations exists

between the variables and earnings per share. Board size in relations to other variables shows positive relationship to board diligence (r= 0.14), gender diversity (r= 0.02), firm size (r= 0.55), liquidity (r= 0.16), but negative to board independence (r= -0.28) and leverage (r= -0.9). In the case of board diligence, it is positive to firm size (r= 0.15) and liquidity (r= 0.01), but negative to board independence (r= -0.01), gender diversity (r= -0.06) and leverage (r= -0.06). Board independence in comparison with other variables has positive relationship to gender diversity (r= 0.01) and leverage (r= 0.13) but otherwise to firm size (r= -0.22) and liquidity (r= -0.05). Gender diversity has positive relationship with firm size (r= 0.04), liquidity (r= 0.12) and leverage (r= 0.09). Liquidity is negative to leverage (r= -0.07).

TABLE 3: Regression Results (USING POOLED OLS)
Dependent Variable: EPS

Independent Variables	**(1)**	**(2)**	**(3)**	**(4)**
BS	-0.326783* (0.0095)			
BD	-0.439725** (0.0218)	-0.482640* (0.0095)		
BI	-2.672182 (0.2645)			-1.641281 (0.4899)
GD	0.068899 (0.4288)		0.080425 (0.3627)	
FZ	0.610209* (0.0000)	0.450714* (0.0002)	0.400756* (0.0008)	0.381274* (0.0017)
LQ	-0.015937 (0.5419)	-0.019312 (0.4566)	-0.020905 (0.4291)	-0.017885 (0.4944)
LV	-0.118943 (0.1210)	-0.106402 (0.1611)	-0.101715 (0.1867)	-0.087722 (0.2549)
C	-5.549228 (0.1357)	-6.225130** (0.0335)	-8.022658* (0.0070)	-5.930100 (0.1091)
R-squared	0.078846	0.056917	0.040542	0.039126
Adjusted R-squared	0.059306	0.045656	0.029017	0.027653
F-statistic	4.035168*	5.054489*	3.517697*	3.410221*
Prob(F-statistic)	0.000294	0.000575	0.007883	0.009436

*, **, means Significant at 1%, 5%, Figures in ( ) are P-value

TABLE 4: Regression Results (USING GENERALISED LEAST SQUARE)

Dependent Variable: EPS

Independent Variables	**(1)**	**(2)**	**(3)**	**(4)**
BS	-0.326783* (0.0090)	-0.324858* (0.0082)		
BD	-0.439725** (0.0212)			
BI	-2.672182 (0.2637)		-1.641281 (0.4894)	
GD	0.068899 (0.4283)			0.080425 (0.3620)
FZ	0.610209* (0.0000)	0.596973* (0.0000)	0.381274* (0.0016)	0.400756* (0.0007)
LQ	-0.015937 (0.5415)	-0.011599 (0.6555)	-0.017885 (0.4940)	-0.020905 (0.4285)
LV	-0.118943 (0.1201)	-0.112393 (0.1387)	-0.087722 (0.2541)	-0.101715 0.1857)
C	-5.549228 (0.1347)	-8.977206* (0.0022)	-5.930100 (0.1081)	-8.022658* (0.0067)
LR statistic	28.24617	20.40034	13.64088	14.07079
Pearson SSR	8754.072	8962.946	9136.720	9118.091
Prob(LR statistic)	0.000198	0.000416	0.008534	0.007073

*, **, mean Significant at 1%, 5%

Table 4 shows the results between the independent variables (BS, BD, BI, GD) and dependent variable (EPS) using control variables (FZ, LQ and LV). Table 5 results is just a robustness check over the table 4 results. As a result, the two tables gave the same results. Attention will be paid to table 4 to explain each finding in order to support or reject the hypotheses of the research.

4.1 Discussion of findings

4.1.1 The effect of board size on the performance of quoted firms.

Model 1 of Table 4 described that the coefficient of the variable BS was -0.33 with a p-value of 0.0095 (>0.01). It can be deduced that board size has a negative and significant impact on the performance of quoted firms which does not provide support for the hypothesis. Theoretically, findings are not consistent with agency theory that

proposes that larger corporate boards improve monitoring function of the board and accordingly improve firm performance. The implication of the results is that large number of directors in the board has negative impact on the performance of the firm. It is therefore advised that board size appropriate for firm size for positive impact should be advocated. The way forward here is to decrease the board size by 33% in order to increase the earnings per share of an entity by 1%. This result was in line with the work of Said et al. (2009) that evidenced a significant negative relationship between board size and corporate performance. This work advocates that large board size results to ineffectiveness in communication, coordination and decision making. Firms must maintain moderate size of the board members for smooth flow of communication and timely decision making. Other results of negative relationship between the board size and firm performance were documented by a number of researchers (Eisenberg, Sundgren, & Wells, 1998; Garg, 2007; Ghosh, 2006; Kota & Tomar, 2010; Guo & Kga, 2012).

However, more recently, Sadou et al. (2017) highlighted that larger boards are more effective and have greater influence over companies' performances. Also, the work of Siregar and Bachtiar (2010) found a non-linear relationship between board size and improved corporate performance. The study noted that a large board would be able to exercise better monitoring, but too large board will render the monitoring process ineffective. As result of the relationship that exists between board size and quoted firm's performance as indicated above, the Null hypothesis is rejected. The Alternative hypothesis which states that board size will have significant impact on the performance of quoted firms is hereby accepted.

4.1.2 **The effect of board independence on the performance of quoted firms.**

Model 1 of Table 4 describes that the coefficient of the variable BI was -2.67 with a p-value of 0.26. Model 4 of table 4 shows that the coefficient of the variable BI was -1.64 with a p-value of 0.49. In the two scenarios, the results revealed a negative and insignificant relationship betweew board independence and quoted firms' performance. Agency theory suggests that if companies have a proportion of board members who are independent, this may contribute to better decision-making, help companies to connect with their external environment and enhance their vital resources (Nguyen et al., 2014). The possible reason for negative relationship between the board independence and quoted firm performance could be that not all independent directors are truly independent. A further reason could be that both the role of independent directors in Nigeria and the appointment process differ from what was stipulated from the corporate governance code of conduct. Another reason may be that insiders are the most effective directors because they have more information about the firm than outsiders and thus outside directors must rely on them to make decisions. This result of negative relationship between board independence and quoted firm performance, supported by the work of Abdullah et al. (2011) affirmed that independent directors are not effective in discharging their duties, let alone of going against other members of the boards. Al-Moataz and Hussainey (2012) reiterated that higher number of independent directors on companies' boards leads to less effective board monitoring and equally lowers levels of corporate transparency. Conversely, Huang (2010) concluded that independent directors act as a monitoring mechanism that ensures companies are properly managed by corporate management and also work towards enhancing corporate image and performance. Studies by Sharif and Rashid (2014), Kaur et al., (2016) indicate a positive link between board independence and improved corporate performance. In view of the above, we can

conclude that the Alternative hypothesis is rejected to give way to the Null hypothesis which states that independence of board members will not have significant effect on the performance of quoted firms.

4.1.3 The effect of board diligence on the performance of quoted firms.

Focusing on the relationship between board diligence and quoted firm performance, it can be seen from the table above that there exists a negative but significant relationship. Model 1 of table 4 shows that the coefficient of the variable BD is -0.43 with a p-value of 0.02 (>0.05), while model 2 of table 4 shows that the coefficient of the variable BD is -0.48 with a p-value of 0.0095 (>0.01). At 5% level of significance, it implies that 43% reduction in corporate board meetings will improve earnings per share by 5%. While at 1% level of significance, it implies that 48% reduction in corporate board meetings will improve earnings per share by 1%. This research contributes to discovering the critical role of the Board of director Meetings (BM) on quoted firm performance. Meetings take a large amount of time to prepare for, attend and follow-up on. The board must ensure that their meetings add value to the organization. Then this finding supports the believe that Board meeting frequency negatively affects firm performance in the current year because board meetings are costly in terms of time and costs incurred in relation to the meetings (Vafeas, 1999). A study conducted with a sample of 328 Malaysian listed companies from 2003 to 2007 reported that high board meeting frequency causes low firm performance (Amran, 2011). However, study conducted by Ghosh (2007) found a statistically significant positive impact of board diligence on firm performance, noting that 10% increase in diligence increases the performance of the organization by 1%. Akpan (2015) obtained similar results in his study on 79 listed companies in Nigeria from 2010 to 2012. Based on the above findings, it can be said that the Null hypothesis is rejected in order to accept the Alternative

hypothesis which states that the diligence of board members will have significant impact on the performance of quoted firms.

4.1.4 The effect of gender diversity on the performance of quoted firms.

Model 1 of table 4 shows that the coefficient of the variable GD is 0.06 with a p-value of 0.42, while model 3 of table 4 shows that the coefficient of the variable GD is 0.08 with a p-value of 0.36. The results show positive but insignificant relationship between gender diversity and quoted firm performance as measured by earnings per share. This may be as a result of small number of female directors in the boardroom. It can be explained by a previous study done by Wang and Clift (2009) where there is no strong relationship between gender diversity on the board and financial performance, and it is assumed that this is due to very few female directors in the sample. Besides, Kramer, et. al. (2008) argued on the effectiveness of having more than one woman in a board to fulfil the interest of the stakeholders and lead to better decision making. Since most of the companies which have women directors in the sample of this study have one woman only, the benefits of gender diversity might not be fully utilized and thus the result cannot be generalized. This reason is supported by the study by Huse and Solberg (2006) in which the reason for failure to find a significant relationship between women directorship and firm performance is due to the benefits of increased gender diversity does not materialize as expected. Therefore, it can be said that a larger number of women in boards could significantly have an effect the company performance. Smith et al. (2006) cited in Vo and Phan, (2013), who considered three different reasons to recognize the importance of female on a board. First, female board members usually have a better understanding of a market in comparison with male members. As such, this understanding will enhance the decisions made by the board. Second, female board members will bring better images in the perception of the community for a firm, and this will contribute

positively to firm's performance. Third, other board members will have enhanced understanding of the business environment when female board members are appointed. Hence, as a result of women on board, quoted firms performance is improved directly and indirectly. Low, Roberts and Whiting (2015) investigated Asian firms in Hong Kong, South Korea, Malaysia, and Singapore and found that the appointment of female directors can positively affect the firm's performance. Conversely, Adams and Ferreira (2009) and Pletzer, Nikolova, Kedzior, and Voelpel (2015) highlighted a negative relationship between female directors and firm performance due to these directors' lack of skills and experiences in monitoring the performance of their firms. Strydom, Au Yong, and Rankin (2016) found that board gender diversity may not affect firm performance in terms of earnings quality. They also found that a higher proportion of female directors on the board of Australian firms corresponds to a lower stock price volatility. As a result of the finding above, the Null hypothesis is accepted because board gender diversity has no effect on the performance of quoted firms contrary to what is supported by the Alternative hypothesis.

5. Conclusion and policy implications

The fallout from the financial crisis has placed a heavier focus on best practices for corporate governance principles. Boards of directors feel more pressure than ever before to be transparent and accountable. The study examined the effect of board size and its independence on the performance of listed entities in Nigeria. It further determined the effect of board diligence and board diversity on firm performance. These were with the view of examining the relationship that exists between board characteristics and firm performance of quoted entities in Nigeria. The research project which covered a ten-year period (2009–2018) made use of secondary data sourced from published annual reports and accounts of 35 purposively selected listed companies on the Nigerian Stock Exchange (NSE). The Pooled

Ordinary Least Square (OLS) regression model was employed in analyzing the data obtained.

Findings from the study revealed that a significant negative relationship exists between earnings per share and board size with a co-efficient of -0.33 and a p-value of 0.0095 (>0.01) and between earnings per share and board diligence with co-efficient of -0.43 and -0.48 and p-values of 0.02 (>0.05) and 0.0095 (>0.01) respectively, but no significant relationship exists between earnings per share and board independence with co-efficient of -2.67 and -1.64 with p-values of 0.0218 and 0.49 respectively and between earnings per share and board gender diversity with co-efficient of 0.06 and 0.08 and p-values of 0.42 and 0.36 respectively. This paper draws the following conclusions from its findings:

A significant negative relationship was found to be existing between the board size and quoted firms' performance. The result showed -0.33 with a p-value of 0.0095 (>0.01) which indicated a negative, yet significant relationship between board size and quoted firm performance. This implies that board size has an impact on quoted firm performance. It was concluded that a smaller board size is more effective than large board size because good smaller board size with upright personal traits, relevant core competences, wealth of experiences, different educational background, and entrepreneurial spirit knowledgeable in board matters will enhance earnings per share of listed companies in Nigeria. Therefore, larger board size should be discouraged. This work is in line with that of (Lipton and Lorch, 1992) who argued that a large board could also result in less meaningful discussion, since expressing opinions within a large group is generally time consuming, difficult, and frequently results lack of cohesiveness on the board. Also, Said et al. (2009) evidenced a significant negative relationship between board size and corporate performance. This work advocates that large board size results to ineffectiveness in

communication, coordination and decision making. Firms must maintain moderate size of board members for smooth flow of communication and timely decision making.

Concerning board diligence, the result also shows a significant negative association between board diligence and quoted firm performance. The study concludes that at 5% level of significance, 43% reduction in corporate board meeting will improve earnings per share by 5%. While at 1% level of significance, 48% reduction in corporate board meetings will improve earnings per share by 1%. The board members need to reduce the number of meetings and pay serious attention to issues that has impact on the business of the company. Then this finding supports the belief that frequent Board meetings negatively affect firm performance in the current year because board meetings are costly in terms of time and costs incurred in relation to the meetings (Vafeas, 1999).

Regarding the investigation of board independence on quoted firm performance, the OLS result shows a negative and insignificant relationship between board independence and quoted firm performance. The reason for this result may be as a result of the fact that not all independent directors are truly independent. A further reason could be that both the role of independent directors in Nigeria and the appointment process differ from what was stipulated by the corporate governance code of conduct This result of negative relationship between board independence and quoted firm performance is supported by the work of Abdullah et al. (2011) which affirmed that independent directors are not effective in discharging their duties, let alone going against other members of the boards.

The study also examined the relationship between gender diversity and earnings per share. The results reveal that the ratio of female directors to other directors in the boardroom has no significant impact on quoted

firm performance as measured by earning per share. It is therefore suggested that more female directors should be allowed in the board position. Therefore, it can be said that larger number of women in boards could significantly have an effect on the company performance. Smith et al. (2006) cited in Vo and Phan, (2013), considered three different reasons to recognize the importance of female on a board. First, female board members usually have a better understanding of a market in comparison with male members. As such, this understanding will enhance the decisions made by the board. Second, female board members will bring better image in the perception of the community for a firm, and this will contribute positively to firm's performance. Third, other board members will have enhanced understanding of the business environment when female board members are appointed.

Among the control variables included in the equations, only the firm size (FZ) yielded significant positive relationships at a 1% confidence, while other control variables such as liquidity (LQ) and leverage (LV) were insignificant at a greater than 5% confident level. The control factors contributed to the explanatory power of the models.

This study has relevant implications for management and shareholders. The paper has shed some new light on the factors of board characteristics that affect performance of quoted firms in Nigeria. Hence, it will enable the firms' management and policymakers to make a better decision on issues regarding board characteristics. By improving on the characteristics of board members in the running of company's businesses, the performance of quoted firm will also increase. The findings of this study imply that both existing and potential shareholders can assess the board characteristics to make a better decision on their investment. Also, result of this study provides evidence to corporate governance theories, thereby, indicating the needs for corporate governance regulators to gain more insight into board's practices.

Based on the findings of this study, the following recommendations are made for efficient performance of listed companies on the Nigeria Stock Exchange:

a. Reduction of board sizes will be critical to the success and survival of corporate listed firms in Nigerian while firms should also increase their scales of operations through increase in liquidity and put these to efficient use in order to enjoy economies of scale. The size of the board must not be unwieldy so that company's businesses can be managed effectively and efficiently by the board members.
b. Firms should make appointments of independent directors to dominate the appointment of inside executive directors so as to enable the firms to maximally reap the benefits of board independence. Also, independent directors are expected to carry out their duties in line with the specifications and directions of extant Nigerian laws and codes governing their operations.
c. Attendance of board members at various meetings should be scrutinized to determine the level of commitment of the board. Strategic and informed decisions that will improve the performance of quoted firms are expected to be made in board meetings. Board meetings should be scheduled in such a way that it will be convenient enough for all the board members to be in attendance.
d. Female participation in the boardroom should be encouraged. The Nigerian government should encourage and promote the idea of gender diversity by implementing policies that will set a minimum number of female directors' firms should have. The women appointed to corporate boards can use their values, experiences, and knowledge to add value to the organization. The inclusion of female directors in the boardroom will challenge the male counterparts to be more proactive for performance improvement.

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EFFECTS OF E-TRANSACTIONS ON THE PROFITABILITY OF COMMERCIAL BANKS IN NIGERIA

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Nwankwo, Odi[1]
Idachaba Odekina Innocent[2]
Eze, R. O,[3]

Abstract

This study examined the Effects of e-Transactions on the Profitability of Commercial Banks in Nigeria. E-cheque, ATM, POS, Mobile Money Transfer (MMT) and Online Money Payment (WEB) are proxies for E-banking payments while Return on Equity (RoE) is used as proxy for commercial banks profitability. Ex-post-Facto research design is adopted, covering the period 2010-2020. Diagnostic tests are conducted, and analysis of an Auto Regressive Distributed Lag (ARDL) estimated, using Error Correction Model (ECM) approach. The result of analysis indicates that current values of E-CHEQUE, ATM, MMT, POS and WEB are statistically significant at less than 0.05. While E-cheque is insignificant to the profitability of banks in Nigeria. This study thus, rejects the null hypotheses and concludes that with the coefficient of determination (R^2) and adjusted R-Square of the model, about 83% influence on bank profitability in Nigeria can be influenced by these variables of study. It is also meaning that the

[1] *Department of Banking and Finance, Kogi State University*
[2] *Department of Banking and Finance, ABU Business School, Ahmadu Bello University*
[3] *Department of Banking and Finance, Ebonyi State University*

combined effect of the e-banking proxies in this study is statistically significant in explaining the profitability of banks in Nigeria. The recommendations are that Banks should invest in all the channels of electronic payment to ensure that the economy, just like a developed economy fully and seamlessly operates a cashless economy. It is obvious that the fundamental of every developing economy is to make the banking sector stable and sustainable enough to drive its economy.

Keywords: *Commercial banks, E-banking, Innovation, Performance, Point of sales,*

1.1 Introduction

Banking is an intermediating activity that play a pivotal role in the growth and development of a nation, be it developing, emerging and/or developed economy. Before the advent of e-banking and allied transactions electronically, recording of data and its retrieval mechanism were manually done. Today in Nigeria, electronic transaction has not just come to stay but has been widely accepted (Nwankwo & Eze, 2018). Nigeria banks in this 21st century has queued behind the western world economy in technology development by focusing attention on electronic transactions as a veritable option for efficient payment service towards the promotion of rapid financial inclusion, bank development and increased economic activities (Sanusi, 2015).

Accordingly, Ugwueze & Nwezeaku, (2016) asserts that, Information and Communication Technology (ICT) has changed the dimensions of competition in the retail banking sector. In the same vein, Mustapha (2018) and Nwankwo (2018) stressed that electronic banking operations, however, concentrates on the payment aspect of banking activities, and therefore, most technology innovations are to support payment activities. However, in recent times, electronic payment innovations have brought about several electronic payment channels

and subsequent establishments of financial technology companies. The widely used e-payment technologies in the country are; Electronic Cheques (E-cheques), Automatic Teller Machine (ATM), Point of Sale (POS), Mobile Money Transfer (MMT) and Online Money Payment (WEB) Technologies. Shares of these electronic payment technologies have increased continuously since inception (Nigerian Inter-Bank Settlement System report, 2018).

Banks are profit oriented businesses as such, their growth is dependent on profitability and through different other measures. This study thus evaluates the implications of electronic banking transactions in the profitability and sustainability of banking businesses in the 21st century and beyond.

Modernity comes with its implications, and such is the case of technological innovations in banking with its concomitant diverse implication on customers, operations, and profitability (Nwankwo, 2018). Ugwueze & Nwezeaku, (2016) asserts that innovations in information and communication technology (ICT) have made banking environment so dynamic for rapid changes. Thus, banking industry of the 21st century operates in a complex and competitive environment characterized by these changing conditions and highly unpredictable economic climate. With the advent of technology, its lofty acceptance and assumed high advantage, it is observed that there are still periodic systemic distresses owing to their allergic vulnerability to dynamic changes in the economy (Abu, Halilu & Olukoga, 2019). For instance, within a short space of time (2018-2019), banks like Sky and Diamond have been acquired by other banks. On the part of the society, the high rate of adoption of the innovations for settlement of payments over time, have exposed customers to more risks such as internet fraudsters and incomplete transactions, among others. These, no doubt, have led to micro and macro-economic volatility, which in turn may have adversely affected the efficiency of banks to some extent.

The banking industry generally intermediates between the economic sectors and because of their critical role of financial intermediation within the economy, they are highly regulated. The banking sector thus, faces a myriad of issues ranging from high regulations, customer satisfaction, insider abuses, to adverse implications of e-transaction that have culminated in impediment to efficiency and by implication in profitability (Abu, Halilu & Olukoga, 2019).

The role of the E-cheque payment, Automated Teller Machine (ATM) payment, Point of Sales (POS) payment, Mobile Money Transfer (MMT) payment and Online Money Payment (WEB) Technologies on bank profitability has been neglected in the course of implementation of e-transaction policies. That is the reason why the sector has not been able to perform up to expectation. Had these E-cheque payment, Automated Teller Machine (ATM) payment, Point of Sales (POS) payment, Mobile Money Transfer (MMT) payment and Online Money Payment (WEB) Technologies payment achieved their aims and objectives in Nigeria banking industry, the country could have not only succeeded in its cashless economy programme but could have been a major partaker in e-transaction through cashless banking. This calls for empirical investigation of how possible e-transaction policies will such as E-cheque payment, Automated Teller Machine (ATM) payment, Point of Sales (POS) payment, Mobile Money Transfer (MMT) payment and Online Money Payment (WEB) Technologies payment will promote economic growth through bank profitability in Nigeria looking at the current situation of Nigerian economy and the quest to enhance cashless economy by increasing the level of e-transactions.

Consequently, this study seeks to analyze the effects of e-Transactions on the Profitability of Commercial Banks in Nigeria. The specific objectives are to:

(i) To investigate the effect of E-cheque payment on profitability of Commercial Banks in Nigeria.

(ii) To determine the effect of Automated Teller Machine (ATM) payment on profitability of Commercial Banks in Nigeria.
(iii) To assess the effect of Point of Sales (POS) payment on profitability of Commercial Banks in Nigeria.
(iv) To ascertain the effect of Mobile Money Transfer (MMT) payment on profitability of Commercial Banks in Nigeria.
(v) To examine the effect of Online Money Payment (WEB) Technologies payment on profitability of Commercial Banks in Nigeria.

To achieve these study objectives, the following hypotheses were raised in their null form as follow;

Ho1: E-Cheque payment has no Significant Effect on profitability of Commercial Banks in Nigeria.
Ho2: ATM payment has no Significant Effect on profitability of Commercial Banks in Nigeria.
Ho3: POS Payment has no Significant Effect on profitability of Commercial Banks in Nigeria.
Ho4: MMT payment has no Significant Effect on profitability of Commercial Banks in Nigeria.
Ho5: WEB payment has no Significant Effect on profitability of Commercial Banks in Nigeria.

2.1 Review of Literatures

This section reviews the theory that underpins this study, alongside some conceptual issues; majorly on electronic transaction (payment) and bank profitability. Also, reviewed are few selected relevant empirical studies in the relevant areas.

2.1.1 Conceptual Review

E-Transaction: According to EMA (2016) E-transaction, e-commerce, e-wallets – all those financial terms could be grouped under one category called electronic. Letter "e" is just the shortening of "electronic", in effect basically everything which is done

electronically or online. E-transaction hence means a business process where money is transferred electronically from one place into another. It could be through internet banking, ATM, from stock exchange trades or just an invoice completion for some service/goods. Nowadays almost all transactions are classified as electronic transactions. INETCO (2020) said, the term **"**transaction**"** is used by most people to describe everything from a stock trade to the transfer of money or goods involving people, businesses, accounts, or applications such as ATMs and POS terminals.

Profitability: Profitability is the ability of a business to earn a profit. A profit is what is left of the revenue a business generates after it pays all expenses directly related to the generation of the revenue, such as producing a product, and other expenses related to the conduct of the business activities (Study.com, 2019). Investopedia (2019) in a different view says Profitability is closely related to profit – but with one key difference. While profit is an absolute amount, profitability is a relative one.

2.2 Empirical Review

The current pace of the Nigerian banking industry profitability and the attendant e-transaction calls for a review of extant literature to identify gaps and possibly fill spaces. Literature on e-transaction in the Nigerian banking industry is reviewed here. Nwankwo and Agbo (2021) investigated a study on the effect of electronic banking on the performance of Nigerian commercial banks. The study adopts ex-post facto research design and covers the period 2013 to 2017. The results of the study reveal that automated teller machine transactions have positive and significant effect on the performance of commercial banks in Nigeria while both point-of-sale terminal transaction and mobile banking transactions have negative and weak effects on the performance of commercial banks in Nigeria. The study recommends that the management of banks should adopt such innovations in their operations as would shore up their profitability. **This study failed to**

state the econometric tools used for the analysis and the scope of 5years used was too small to give a good result hence it created a research gap. The study also used only ATM, POS, and Mobile banking transaction without stating what was used as proxy for performance.

Chondough (2021) examined a study on the implication of the CBN cashless economy policy channels on the performance of Nigerian banks with specific attention on the effect of automated teller machine, point of sales and web- based transaction on earnings per share. Vector error correction model was used to estimate quarterly data collected on the variables from 2010 to 2018. Findings reveal that automated teller machine, point if sales and web-based transaction had a long-run effect on earnings per share. **The study failed to show the short run effect of result which vector error correction model (VECM) is supposed to measure. The long-run effect the study presented was supposed to come from cointegration test not VECM. The result also did not show the direction/sign of the result whether positive or negative which is a research gap.**

Also, Muotolu & Nwadialor (2019) completed a 6-12 year investigation on how the overall financial performance of deposit money banks was hampered by CBN's cashless coverage in Nigeria. The study applied the panel data techniques. Financial performance was measured using the return on asset of selected banks. There was evidence that led to the conclusion that only ATM was statistically significant for measuring financial performance in Nigeria. **Although this study considered ATM as tool for CBN's cashless policy, but the framework for the study was built on performance. It is not shown whether the sufficient condition for e-transaction hold or not.**

Abu, Halilu and Olukoga, (2019) examined E-banking payments system and commercial banks performance in Nigeria. E-cheque,

ATM and POS were proxies for E-banking payments while measure of profitability such as Return on Equity (RoE) is used as proxy for commercial banks performance. Ex-post-Facto research design was adopted, and analysis of an Auto Regressive Distributed Lag (ARDL) estimated, using Ordinary Least Square (OLS) approach. The result of analysis indicates that current values of ATM, E-cheque and POS are statistically significant at less than 0.05. The beta coefficient values of E-cheque and POS are positive but that of ATM shows a negative value. This study, however, rejects the null hypotheses, and concludes that about 67% influence on bank performance in Nigeria can be influenced by the variables of study. The study recommend that commercial banks should collaborate to enhance their overall performance, while individual banks should see the need to constantly develop an innovative mindset, creating an enriching environment, and engagement in reflective innovative practices to enhance their profitability. **The web transaction which shows the level of mobile banking transaction from the perspective of e-banking service is ignored, which makes it impossible to validate the study results.**

Nwankwo and Eze (2018) in their study, Problem and Prospect of Electronic Payments in a Cashless Economy applied a descriptive research design. The study indicates that the electronic system of payment has a great implication in cashless economy of Nigeria. It was concluded that e-payment system should be pursued vigorously to get people so used to it, in order to enhance cashless economy policy. This is because; bulk of the Nigerian economy is driven by SME and petty traders. To retain this policy of cashless economy in Nigeria, the authors recommended that the migration of our payments system towards a cashless society would require some reforms and a lot of effort and sensitization especially for low-income group, who are currently deeply rooted in using cash as a convenient and easy way of receiving and making payments. The sensitization exercise would require the combined effort of various stakeholders, including government, financial institutions, clergy, and non-bank providers of

payment services. **This study relied on hearsay to make its conclusion while we utilized econometric tools in our analysis.**

Obiekwe and Anyanwaokoro (2017) investigated the Effect of Electronic payment Methods (EPM) on the profitability of commercial banks in Nigeria. To achieve the study objective, Automated Teller Machine (ATM), WEB Payments (WEB) and Mobile Payment (MPAY) were considered as independent variables against profitability of commercial banks in Nigeria. A total sample of five (5) banks was considered for the period 2009 to 2015 and the study adopted Panel Least Squares (PLS) estimation technique as analytical tool. Findings were that Automated Teller Machine (ATM) and Mobile Phone payment have significant effect on the profitability of commercial banks in Nigeria. However, Internet (WEB) has an insignificant effect on commercial banks' profitability in Nigeria. The study recommended, among others, that commercial banks in Nigeria should sponsor media campaigns in order to boost the awareness of Automated Teller Machine (ATM) payment and Mobile Phone payment methods so as to further increase their profitability. **This study adopted panel data regression which is not suitable for the study and ignored ordinary least square and error correction model which is the major estimation tools for such study.**

Taiwo and Agwu (2017) investigate the roles e-banking adoption has played in the performance of organizations. The study objective was to determine the role of e-banking on the operational efficiency of commercial banks in Nigeria. Primary data were obtained by administering questionnaires to staff of four purposively selected banks (Ecobank, UBA, GTB and First bank). The study used Pearson correlation method of analysis through Statistical Package for Social Sciences (SPSS) and it was observed that banks' operational efficiency in Nigeria since the adoption of electronic banking has improved compared to the era of traditional banking. This improvement was noticed in the strength of banks, revenue, and capital bases, as well as

in customers' loyalty. It is concluded that with the introduction of new channels into their e-banking operations, there was a drastic increase in bank performances. And that, the more active customers are with electronic transactions, the more profitable it is for the banks. **The study used selected banks and primary data but ignored the use of panel data. Also, none of the e-banking indicators was used which invalidates the result and cannot be relied on.**

Babatunde and Salaudeen (2017) examine the impact of electronic banking on banking and non-banking financial institutions. The paper uses both the primary and secondary data to elicit information from forty (40) respondents. It employs both descriptive and inferential statistics alongside simple frequency counts, percentages, and the Chi-square for data analysis. Findings show that 22 credit officers or 62.9% of respondents agree with the opinion that electronic banking system has made banking transactions easier, 11 credit officers representing 31.45% strongly agree, while 2 of them representing 5.7% are undecided and none of the respondents either disagree or strongly disagree. The paper concludes that the adoption of electronic banking has enhanced the bank's efficiency, making it more productive and effective. The paper therefore recommends that the Nigerian banking sector must be focused on terms of their needs and use the right technology to achieve their goals, rather than acquiring technology of internet banking because other banks have it. **This study ignores necessary conditions for electronic banking investigation and adopts hearsay as means of data collection.**

Gap in studies

This particular study is a unification of two separate studies; both having profitability of the banks as a dependent variable and while one used; POS, ATM and MMT, the other used; E-Cheque, ATM and POS. Thus, the literature gaps that were found in the two studies were fuse in this study. More so, the two studies in their methodologies adopted time series data, but this study adopted a panel data analysis to bridge

the methodological gap. More so, a theoretical gap was identified, prompting this study to part way in a choice of innovation theory of profit. This is simply to say that there were three identified gaps – the literature, methodological and theoretical gaps. This is done to enable a robust results and findings for this study.

2.3 Theoretical Framework

The theoretical framework adopted in this study is the Diffusion of Innovations (DOI) theory developed by Rogers in 1995. The three assumptions of the theory are that it should be diffused and adopted by all members of a social system, it should be diffused more rapidly, and it should be neither reinvented nor rejected. It is essentially an idea, practice or object that is perceived to be new by a person or adopting entity. Innovation is transmitted through diffusion and adoption. Diffusion entails communicating or spreading of the news of the innovation to the group for which it is intended. Adoption, however, is the commitment to and continued use of the innovation (Oluwafemi, 2011).

Rogers' diffusion of innovation theory postulates that diffusion of innovation occurs as potential users become aware of the innovation, judge its relative value, and decide based on their judgment, implement, or reject the innovation and seek confirmation of the adoption or rejection decision. The theory consists of three components: 'the innovation decision process, characteristics of an innovation and adopter characteristics (Bates, Manuel, and Oppenheim, 2007). The 'innovation decision process' categorizes the steps an individual takes from awareness of an innovation, through the formulation of an attitude to the innovation, on to the decision as to whether to implement, into five: knowledge, persuasion, decision, implementation, and confirmation. The characteristics of an innovation have an impact on the likelihood of acceptance and adoption, and also on the rate at which this process develops. These innovation characteristics can also be classified into five criteria:

compatibility, complexity, observability, relative advantage and trialability.

The relevance of this theory to the study is that the earlier people accept e-transactions in commercial bank, the earlier it improves business activities and in turn encourage economic growth in Nigeria through bank profitability. This theory is also suitable for this work in the sense that e-transaction in this era of global transformation is viewed as an innovation for organizations to achieve their stated objectives or for nations to achieve economic transformation especially in area of bank profitability.

3.0 Methodology of Study/Model Specification

This study adopts a time- series data regression model. Secondary data on aggregate performance of banks in Nigeria using values of Return on Equity (RoE) as proxy and E-transaction on the other hand, using Automated teller Machine (ATM) Electronic Cheques (E-Cheques) Point of Sales (POS), Mobile Money Transfer (MMT) and WEB Payments E-cheque as proxies were sourced. These data were collected from Federal Reserve Economic Data (FRED, 2017) and the Central Bank of Nigeria (CBN) Statistical Bulletin of 2021 respectively. The data were between 2010 and 2020, giving 11-year period of observations. Auto Regressive Distributed Lag (ARDL) using Ordinary Least Square (OLS) approach was estimated.

Multiple regression which is an extension of simple linear regression was adopted in this study with the help of ARDL ECM model. It is used when we want to predict the value of a variable based on the value of two or more other variables. The variable we predicted is called the dependent variable (or sometimes, the outcome, target, or criterion variable).

An Autoregressive Distributed Lag Model is considered as:

(ARDL (1,1) model: $yt = 1yt\text{-}1 + oxt + 1xt\text{-}1 + ut$

Where yt and xt are stationary variables, and ut is a white noise.

ARDL Model equation is the same as the conventional ARDl model, including a specific restriction. The restriction is that the coefficient on the x(t-1) variable is equal to 0. Where the ARDL model is:

$\mathbf{Y_t = \beta_0 + \beta_1 X_{t-1} + \beta_2 X_t + \beta_3 X_{t-1} + \mu_t \ldots (1)}$

Using the ARDL model:

$$\Delta y_t = \alpha_{1,0} + \sum_{i=1}^{p} \alpha_{1,i} \Delta y_{t-i} + \sum_{j=0}^{q} \beta_{1,j} \Delta x_{t-j}$$

$$+ \sum_{k=0}^{r} \gamma_{1,k} \Delta er_{t-k} + \eta_{1,t}$$

where Δ represents the first difference of the variables, p and n are the lag lengths and the et is a scalar mean error term.

The ECM form model is often reparametrized into another form, an autoregressive-distributed lag (ARDL) model in the levels of the variables. Note that reparameterization merely alters the form in which an equation is written, but without imposing any further restrictions on it. The ARDL model corresponding to is

$Y_t = \gamma_1 X_{1,t} + \gamma_2 X_{2,t} + \gamma_3 X_{1,t-1} + \gamma_4 X_{2,t-1} + \gamma_5 Y_{t-1} + \varepsilon_t$ **……..... (2)**

Equation (2) is an ARDL (1,1) model (sometimes written as ADL(1,1)) as it includes a first order (AR=1) autoregressive process in the dependent variable Y, and a first order distributed lag (DL=1) in the two regressor variables, X_1 and X_2 . However, the dynamics of the adjustment process might require higher order AR or DL lag lengths. Usually, an economic researcher has no prior information about the required lag lengths, and this decision must be data-based, using a 'general-to-specific' modelling strategy.

To achieve the specific objectives of our study, we modified the equation as follow:

ROE=F (E-CHEQUE, ATM, POS, MMT, WEB) … (3)

Where;

ROE is the Return on Equity at current period in Nigeria.

E-CHEQUE is the sum of E-cheque transactions done in the banking sector in Nigeria

ATM is the volume of automated teller machine use in Nigeria at current period;

POS is the Point-of-Sale payment.

MMT is the Mobile Money Transfer payment

WEB is the Online Money Payment Technologies

The model can also be transformed as follows:

$ROE = \beta_0 + \beta_1 E\text{-}CHEQUE + \beta_2 ATM + \beta_3 POS + \beta_4 MMT + \beta_5 WEB + \mu$ **… (4)**

Where; β_0 to $\beta 5$ are the parameter of the coefficient and μ the error term.

A Priori Expectation according to the Diffusion of Innovations (DOI) theory states that the earlier people accept e-transactions in commercial bank the earlier it improves business activities and in turn encourage economic growth in Nigeria through bank profitability. In essence, e-transaction represented by e-cheque, ATM, POS, MMT and WEB transaction are expected to have a positive relationship with bank profitability in Nigeria.

4.0 RESULTS AND ANALYSIS

Diagnostic Tests

In order to ensure the validity and reliability of data used, it was subjected to tests such as; Stationarity, linearity, Homoskedasticity and so on to ensure the data set agrees with the assumptions of linear regression.

Table 1: Pre and Post Analysis Tests

Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-3.38137	**0.0004**	6	57
ADF - Fisher Chi-square	37.6714	**0.0002**	6	57
PP - Fisher Chi-square	44.3908	**0.0000**	6	60

Breusch-Godfrey Serial Correlation LM Test:			
F-statisti	0.894247	Prob. F(1,6)	**0.3808**
Obs*R-squared	1.556510	Prob. Chi-Square (1)	**0.2122**
Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	0.831800	Prob. F(5,6)	**0.5708**
Obs*R-squared	4.912690	Prob. Chi-Square(5)	**0.4266**
Scaled explained SS	1.794398	Prob. Chi-Square(5)	**0.8768**

Ramsey RESET Test	Value	Df	Probability
t-statistic	5.106886	6	**0.0022**
F-statistic	26.08028	(1, 6)	**0.0022**
Likelihood ratio	20.11779	1	**0.0000**

The unit root test with the probability values less than 5% (0.0004, 0.0002 and 0.0000**)** is an indication that there is no unit root in the data set at first difference. The LM Test also indicates that there is no serial correlation among the residuals of the data set with the probabilities for F-statistic and X^2 greater than 5% (0.3808, 0.2122). With the Breuch Pagan test showing probabilities for F-statistics and X^2 greater than 5%, is an indication that the data set is homoskedastic. A specification test known as Ramsey Regression specification error test (Ramsey RESET) was also conducted as a post regression test. The test probabilities for T-statistic, F-statistic and Likelihood ratio are all less than 5% level of significance, hence showing that the data set for analysis possess no non-linear combination or that the model does not suffer from omitted variables.

ARDL ECM RESULT

The Error Correction Model (ECM) result shows how the system adjusts to the long-run equilibrium implied by the co-integration equation 2. A crucial question concerning the ECM is about the optimal lag for the right-hand-side variables. Hendry's (1987) methodology of "general-to-specific was employed via stepwise regression procedure (through the elimination of those variables and

their lags that are highly not significant), before finally arriving at an interpretable model. The elimination process is carried out until the coefficient of the error correction term ECT(-1) has the expected negative sign, less than unity and it is highly significant at the 1.0 percent level of significance. Accordingly, this led to an initial estimation of an ECM with three lagged differences of the explanatory variables, a constant term and error correction term lagged one (ECMst-1). The dimensions of the parameter space are then reduced to a parsimonious ECT specification by using omitted and redundant variable test to exclude the statistically insignificant lags.

The main purpose of error correction model is to indicate the speed of adjustment from the short run to long run equilibrium state. Co-integration relationship has been established among the variables, and then Error Correction Mechanism is used for this exercise to determine the behaviour of E-transaction on bank profitability in Nigeria. This is because the greater the coefficient of the parameter, the higher the speed of adjustment of the model from the short run to long run equilibrium. As noted, the ECM is meant to tie the short-run dynamics of the co-integrating equations to their long-run static dispositions.

Table 2: ARDL ECM Result

ARDL Error Correction Regression
Dependent Variable: D(ROE)
Selected Model: ARDL(4, 4, 4, 3, 4)
Case 1: No Constant and No Trend
Sample: 2010 2020

Included observations: 11

ECM Regression
Case 1: No Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(ROE(-1))	-0.395531	0.228526	-1.730793	0.1217
D(ROE(-2))	-0.387880	0.133406	-2.907521	0.0197
D(ROE(-3))	-0.536512	0.179379	-2.990946	0.0173
D(E-CHEQUE)	0.538541	0.153904	2.984526	0.0006
D(E-CHEQUE(-1))	0.210432	0.077990	2.698203	0.0271
D(E-CHEQUE(-2))	-0.302700	0.087660	-3.453124	0.0087
D(ATM)	0.035499	0.060232	0.589365	0.5719
D(ATM (-1))	-0.379399	0.076059	-4.988226	0.0011
D(ATM (-2))	-0.473085	0.092312	-5.124876	0.0009
D(POS)	0.285643	0.136298	-4.987367	0.0023
D(POS(-1))	0.463285	0.092617	-3.674932	0.0004
D(POS(-2))	0.347639	0.184903	-2.783562	0.0017
D(MMT)	0.095630	0.139082	0.687579	0.5112
D(MMT(-1))	0.832749	0.205026	4.061672	0.0036
D(MMT(-2))	0.489667	0.206253	2.374110	0.0450
D(WEB)	0.120569	0.147756	0.816003	0.4381
D(WEB (-1))	0.703613	0.193392	3.638267	0.0066
D(WEB (-2))	0.226122	0.190831	1.184932	0.2700
CointEq(-1)*	-0.284409	0.058774	-4.839063	0.0013

R-squared	0.932464	Mean dependent var	0.308824
Adjusted R-squared	0.814275	S.D. dependent var	3.066866
S.E. of regression	1.321690	Akaike info criterion	3.648364
Sum squared resid	20.96238	Schwarz criterion	4.636009
Log likelihood	-40.02218	Hannan-Quinn criter.	3.985179
Durbin-Watson stat	2.506320		

* p-value incompatible with t-Bounds distribution.
Levels Equation
Case 1: No Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
E-CHEQUE	1.423187	0.563984	2.982374	0.0003
ATM	1.314723	0.664469	2.978607	0.0032
POS	1.653527	0.673954	2.983657	0.0045
MMT	-1.192529	0.763633	-3.561652	0.0370
WEB	-0.822669	0.645304	-2.274856	0.0436

EC = ROE - (1.423*E-CHEQUE 1.3147*ATM 1.653*POS -1.1925*MMT -0.8227*WEB)

Source: **Extracted from EViews 10 Output** 2022

As expected, the EC term, here represented as **Coint Eq (-1)**, is negative with an associated coefficient estimate of −0.284409. This implies that about 28.44% of any movements into disequilibrium are corrected for within one period. Moreover, given the very large t-statistic, namely −4.839063, we can also conclude that the coefficient is highly significant. The short-run coefficients estimate show the dynamic adjustment of all variables. The short run coefficients for E-CHEQUE, ATM, POS and MMT has significant effect on ROE in lags 1 and 2; WEB also has significant effect on ROE in lag 1. In summary, the short run coefficients for E-CHEQUE, ATM, POS, MMT and WEB are statistically significant at the 5% level. The coefficient of error correction term ECM (-1) estimated at -0.284409 is highly significant indicating that the bank profitability, e-cheque transaction, automated teller machine, internet banking and computerized system control are cointegrated. The estimated value of the coefficient indicates that about 28.44 percent of the disequilibrium in bank fraud detection is offset by the short run adjustment in the same quarter.

Moreso, the parsimonious model is free of serial correlation going by the value of the Durbin-Watson statistics of 2.51. The coefficient of determination (R-square) which was used to measure the goodness of

fit of the estimated model, indicates that the model is reasonably fit in prediction, that is, 93.25percent change in ROE was due to E-CHEQUE, ATM, POS, MMT and WEB collectively, while 6.75percent unaccounted variations was captured by the white noise error term. It showed that E-CHEQUE, ATM, POS, MMT and WEB had strong and significant effect on the BFD in Nigeria.

Akaike Information Criteria Test

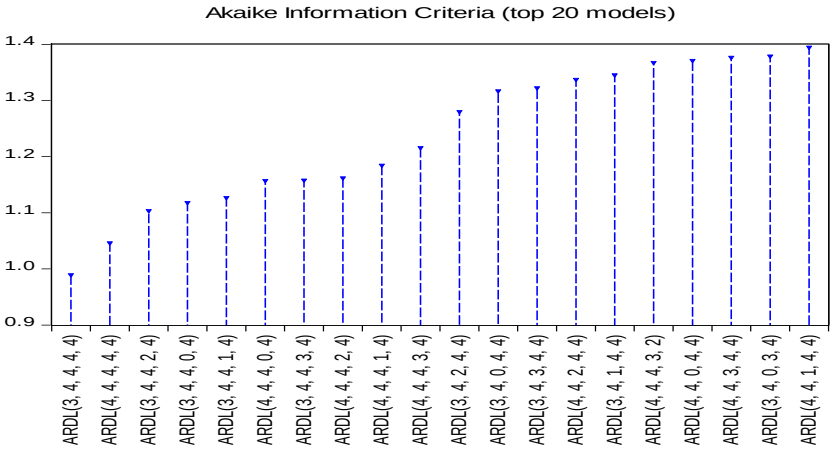

Figure 1: Akaike Information Criterion (AIC)

The Akaike Information Criterion (AIC) graph above shows the model selection value for the twenty best estimated models with the lowest criterion value. To achieve parsimony, the model with the least AIC, that is ARDL (3, 4, 4, 4, 4) is selected to determine the error correction and long run models.

To verify whether the residuals from the model are serially uncorrelated, in the estimation view, we proceed to Residual Diagnostics/Serial Correlation LM Test and select the number of lags. In our case, we chose 4. Here's the output

Table 3: F-Bounds of ARDL Co-integration Test for BFD

t-Bounds Test Null Hypothesis: No levels relationship

Test Statistic	Value	Signif.	I(0)	I(1)
t-statistic	-6.534622	10%	-1.62	-3.26
		5%	-1.95	-3.6
		2.5%	-2.24	-3.89
		1%	-2.58	-4.23

Source: **Extracted from EViews 10 Output**.

The T-statistic value 6.534622 is evidently below the I(0) critical value bound. Our analysis of this series indicates that we fail to reject the null hypothesis that there is no equilibrating relationship. Since the null hypothesis is that the residuals are serially uncorrelated, the T-statistic p-value of 6.534622 indicates that we will not fail to reject this null. We therefore conclude that the residuals are serially correlated.

4.1 Hypotheses Testing

Hypothesis testing is the use of statistics to determine the probability that a given hypothesis is true or not. Thus, in testing the hypothesis, P-values of the t-statistics in ECM are employed. The results from ARDL ECM in tables 2 above were extracted in testing the five hypotheses set in this study. The statistics adopted in doing this include the Error Correction Model coefficient of determination paired with the arising t-statistics, Durbin-Watson Statistic, F-Statistic, R-Squared, Adjusted R-squared and the respective probability value of t-statistics. This is because t-test assesses whether individual contributions of the explanatory variables are significant and can as well be used as a basis for testing the hypothesis on the effect of independent variables on dependent variable.

Decision Rules: Accept the alternate hypothesis and reject the null hypothesis if the P-value is less than the chosen level of significance (0.05). It implies that the estimated variable has significant impact on the dependent variable.

Hypothesis 1: The table 2 above indicates the short run equilibrium of E-cheque on Bank Profitability in Nigeria. The short run dynamics of E-cheque on Bank Profitability in Nigeria showed that e-cheque has a significant and positive effect on bank profitability in Nigeria (ROE) [sig. = 0.0003] and a one percentage increase in e-cheque leads to 1.42 increases in bank profitability. This means that e-cheque has positive and significant effect on bank profitability in Nigeria in the short run. In this case, the null hypothesis was rejected while the alternate hypothesis was accepted with the conclusion that there is significant and positive effect of e-cheque on the level of bank profitability in Nigeria.

Hypothesis 2: The table 2 above indicates the short run equilibrium of automated teller machine (ATM) on Bank Profitability in Nigeria. The short run dynamics of automated teller machine on Bank Profitability in Nigeria showed that automated teller machine (ATM) has a significant and positive effect on bank profitability in Nigeria (ROE) [sig. = 0.0032] and coefficient of 1.314723. In effects, a one percentage increase in automated teller machine leads to 1.31 increases in bank profitability. This means that automated teller machine (ATM) has positive and significant effect on bank profitability in Nigeria in the short run. In this case, the null hypothesis was rejected while the alternate hypothesis was accepted with the conclusion that there is significant and positive effect of automated teller machine (ATM) on the level of bank profitability in Nigeria.

Hypothesis 3: Table 2 above also indicates the direction of effect between point of sale (POS) and Bank Profitability in Nigeria. The

short run dynamics of POS on Bank Profitability in Nigeria shows that point of sale (POS) has a significant and positive effect on bank profitability in Nigeria (ROE) [sig. = 0.0045] with coefficient of 1.653527. This means that point of sale (POS) has positive and significant effect on bank profitability in Nigeria in the short run. In this case, the null hypothesis was rejected while the alternate hypothesis was accepted with the conclusion that there is significant and positive effect of point of sale (POS) on the level of bank profitability in Nigeria.

Hypothesis 4: That Mobile Money Transfer (MMT) payment channel has significant and negative effect on banks profitability in Nigeria as shown in table 2 above. The short run dynamics of Mobile Money Transfer (MMT) on Bank Profitability in Nigeria shows that Mobile Money Transfer (MMT) has a significant and negative effect on bank profitability in Nigeria (ROE) [sig. = 0.0045] with coefficient of -1.192529. This means that Mobile Money Transfer (MMT) has negative and significant effect on bank profitability in Nigeria in the short run. In this case, the null hypothesis was rejected while the alternate hypothesis was accepted with the conclusion that there is significant and negative effect of Mobile Money Transfer (MMT) on the level of bank profitability in Nigeria.

Hypothesis 5: WEB payment has no Significant Effect on banks performance in Nigeria. The result in table 2 as shown above has indicated that MMT has a probability value of 0.0436 and coefficient of -0.822669 which is less than the 5% level of significance, signifying that; WEB payment channel is significant to affect profitability of banks in Nigeria. Hence, this study rejects the null hypothesis but rather accepts the alternate hypothesis which states that there is significant and negative effect of WEB payment on the level of bank profitability in Nigeria

5.0 CONCLUSION AND RECOMMENDATION

CONCLUSION

This study is about E-transaction in the 21st century banking and beyond. Data were sourced through the central bank of Nigeria and were diagnosed accordingly. The first treatment was the pretests as shown in table 1, which all shows that the data are free of any form of ambiguities. The subsequent ARDL regression result as shown in table 2 indicates that the model of this study is fit. The coefficient of determination (R^2) is 0.932464 or (93.25%) while its corresponding adjusted R^2 is 0.814275 or (81.43%), indicating that 81% of the response variable can be influenced by the explanatory variables. The Durbin Watson of 2.5 is a confirmation of absence of serial autocorrelation among the residuals of the explanatory variables. It is however interesting to also note that, the testing of hypotheses has indicated that of all the five hypotheses, only two variables appear to have negative significance. This also is an indication of the model of fitness. Careful observation of the results in table 2 above also indicates that all the explanatory variables, E-CHEQUE, ATM, POS, MMT and WEB have significant effect on the profitability of the banks in Nigeria within this study time. These may be adduced to some levels of frauds perpetrated in the use of the channels. However, the ATM and the Mobile (MMT) channels have shown a positive effect on their profitability.

The usage of e-transaction can lead to lower costs, but the effect on profitability in banking industry remains inconclusive, owing to the possibility of e-transaction effects that arise as a result of consistent high demand of skilled work force, issues of increasing demand to meet customers' expectations for customer service delivery, trustworthiness of the information system and competition in financial services. However, from the discussion whilst reviewing literature, many researchers found e-transaction challenging for the delivery of

customer service profitability among banks in Nigeria. We, therefore, conclude that there is significant effect of e-transaction variables such as E-CHEQUE, ATM, POS, MMT and WEB on bank profitability among Nigerian banks.

RECOMMENDATIONS

Based on our findings and conclusions from our study, the following recommendations were made, and they include:

1. Since ATM usage has a positive and significant effect on bank profitability in Nigeria, there is the need for government to encourage the level of ATM usage as it is one of the easy ways to increase the level of profitability in Nigerian banking industry.

2. Banks should invest in all the channels of electronic payment to ensure that the economy, just like the developed economies fully and seamlessly operates a cashless economy. It is obvious that the fundamental of every development economy is to make the banking sector stable and sustainable enough to drive its economy.

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EFFECT OF RISK MANAGEMENT TECHNIQUES ON PERFORMANCE OF NON-BANKING FINANCIAL FIRMS IN NIGERIA

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Kehinde Isiaq Olaiya[1]
Emmanuel Olufemi Adebayo[2]
Mayowa Ebenezer Ariyibi[3]
Olusola Enitan Olowofela[4]

Abstract

This study examined the effect of risk management techniques on the performance of insurance companies in Nigeria, as empirical studies in this area are seemingly insufficient for objective assessment and justification for continuous involvement in this core aspect of insurance strategy. The Structural Equation Model (SEM) of the primary data obtained from 41 randomly sampled insurance companies in Nigeria (Lagos State in focus) enabled the researchers to establish that the adoption of loss prevention and control; risk avoidance; and loss/risk financing as risk management techniques significantly enhanced positively the performance (proxy by underwriting profitability) of insurance companies in Nigeria. It should be noted, however, that the loss prevention and control

1 *Department of Banking and Finance, Faculty of Administration and Management Sciences, Olabisi Onabanjo University, Ago-Iwoye, Ogun state*
2 *Department of Banking and Finance, Faculty of Administration and Management Sciences, Olabisi Onabanjo University, Ago-Iwoye, Ogun state, Nigeria*
3 *Department of Banking and Finance, Faculty of Administration and Management Sciences, Olabisi Onabanjo University, Ago-Iwoye, Ogun state, Nigeria*
4 *Department of Banking and Finance, Faculty of Administration and Management Sciences, Olabisi Onabanjo University, Ago-Iwoye*

technique of risk management commanded a higher positive correlation when measured against underwriting profitability than the other two techniques of loss/risk financing and risk avoidance. The study concluded that risk management techniques have positively and significantly influenced the underwriting profitability of insurance companies in Nigeria. It is recommended, therefore, that insurance companies in Nigeria should implement more preventive and control measures that will help to reduce the frequency of certain specific losses that could arise in the course of business.

Keywords: *Underwriting profitability, risk management techniques, Insurance company performance.*
JEL: G23, G32, G52

1.0 Introduction

In recent years, business organizations have experienced numerous obstacles in their operations and investment strategies, significantly impacting their profit margins (Sufian & Habibullah, 2009). When considering the risks that they cover, which are on the high side, insurance companies are not immune to the fall in profit margin. This tendency necessitates the creation of a new strategy or plans to address the current economic crisis confronting the business world. Environmental instability, strong competition, and the challenges of market liberalization, along with the occurrence of repeated financial crises, have prompted businesses to rethink their strategy in order to maximize profit and outperform other industry competitors (Njuguna, kwasira & Orwa, 2018). As a result, current tactics including the careful selection of securities to be included in an investment portfolio in order to successfully minimize risk exposure and maximize the portfolio's expected return are required (Kanini, Patrick & Muhanji, 2019). The current economic crisis, banditry, kidnapping, high rate of unemployment, cyber-crime, and the recent COVID-19 pandemic all

pose hurdles to the implementation of a modern plan. As a result of these issues, risk management has become a necessity for insurance firms, whose major mission is to limit risk faced by individuals and businesses.

Risk management requires developing an atmosphere that safeguards financial institutions against poor outcomes or risk exposure. It aims at assess the risks that individuals, corporations, financial institutions (both banking and non-banking), and public entities face in order to make recommendations on how to mitigate those risks (including risk transfer). This can be accomplished by categorizing events into one or more broad categories, such as market risks, credit risks, and operational risks; assessing risks using data and risk models; monitoring and reporting risk assessments on a timely basis; and employing risk management techniques to mitigate the risks' impact (Ebenezer & Omar, 2016). Documents and guidelines recommend that established risk management approaches should be employed on a continuous basis to increase performance and business profits because risk management is a never-ending process that comprises several steps (Kokobe & Gemechu, 2016).

Insurance firms are a bit of a riddle in that they handle both internal and external risks for individuals and businesses, and also have their own risks to manage (Olaiya, Arikewuyo, Sogunro, & Yunusa 2021). As a result, risk management and risk management approaches are critical to a company's ability to make sound decisions and perform successfully. Most risk management solutions deal with several types of hazards based on their severity which necessitates risk ranking and prioritization. Risks that may cause minor inconveniences are rated low, but risks that can cause catastrophic losses are rated high. As a result, it is critical to rank risks in order for the company to make informed decisions.

The profit that insurer derived from providing insurance or reinsurance coverage, exclusive of the income it derives from investment (Underwriting profitability), is a critical component that keeps a company running and gives it a competitive advantage over its competitors, since it is crucial to all stakeholders, investors, shareholders, and the economy as a whole. So far, investors are only concerned with the returns on their investments. Profitable businesses are economically and socially responsible because they create value, employ people, innovative, and also pay taxes (Odusanya, Yinusa & Ilo, 2018 as cited by Olaiya et al, 2021). An insurer faces numerous sorts of risk when carrying out their operations, which must be controlled by incorporating a robust risk management strategy into their system so that they can perform better.

Therefore, the goal of this study is to determine the effect of risk management techniques using loss prevention and control, loss financing, risk financing and individual risk avoidance on performance of insurance companies in Nigeria using underwriting profitability as measures of performance. The presentation of this research work is in five sections. The first Section introduces the subject matter of the study; the second section presents a review of literatures. The third section describes the research methodology employed for the study, while the fourth section focuses on research findings and the last section presents the conclusion and recommendations for the study.

2.0 Literature

Globally, insurance companies have experienced moderate returns and a sense of security. It has long been a favourite of investors seeking a piece of the financial sector without the dangers associated with investment firms or banks. The sector's diversification and subsidiary partnerships are also appealing to them. However, since the last quarter of the twentieth century, the insurance industry has changed, and it now offers an alternative to other high-growth financial stocks. Large

annuity contracts are now available, and insurance companies are opting for more sophisticated portfolios as their underlying capital basis. It is still unclear whether this is a successful transfer (Schich, 2010). But individuals and business organizations tend to reduce their loss by applying different risk management techniques which are mutually exclusive. They include loss prevention and control, loss financing and individual risk avoidance. The loss reduction aims at reducing the expected total loss by applying loss prevention as a method of reducing the severity of a particular loss and lowering the expected number of occurrences and loss reduction to reduce the severity of each loss that can be realize by reducing the level of risky activities through shifting to less risky product (Kiochos, 1997). This method remains a viable strategy for only small risks. Business organizations employ this technique if they discover that the cost of shifting risk to insurance companies is higher than the cost of absorbing the risk. They obtain financial resources to cover possible losses anyhow avoidable by retaining or self-insurance either through internal resources that consist of current cash flows produced by shareholders' capital and external financing (Olivieri & Pitacco, 2011). Risk that generates potential losses with a low frequency but a high severity or impact on the firm should be transferred to an insurance company and losses with high severity can be eliminated at any cost and refusing to undertake any task that could bring risk to the insurance company (Olivieri & Pitacco, 2011). An individual may decide to diversify his investment strategies that are related to risk by investing his small amount of wealth in a number of different stocks, rather than putting all of the wealth into one stock. Developing new products through diversification requires the financial institutions to adopt more technically advanced risk management techniques in order to sustain their competitiveness in the market (Ariffin & Kassim, 2009).

Risk managers must follow a specific process that includes identifying, analysing, evaluating, monitoring, communicating, treating, and

mitigating risks in order for risk management techniques to be more effective, resulting in increased underwriting profitability and improved performance of Nigerian insurance companies. (Saleem & Abideen, 2011). Identification of risk is the first and perhaps the most important step in the risk management process. Failure to identify the risk that an organization faces makes it difficult to apply other steps in the risk management process and manage potential risk(s) in the organization adequately. It is considered to be the most important step in the risk management process because it provides the foundation for the right future activities of the organization concerning the development and implementation of new programs for risk control (Tchankova, 2002). Identification is seen as a team effort which looks at project events with respect to various risk categories and extracts those which could have a negative impact on the project. Due to vast changes in the business environment, the risk identification process must be continuous (Russell, 2018). After the identification of risks, there is a need to assess the risks, which aims at expressing in quantitative terms the impact of the risk on significant target results in monetary terms or profits, and analysis is done to determine their characteristics and whether they are worth further analysis. (Ahmed, Kayis, & Amornsawadwatana, 2007; Olivieri & Pitacco, 2011). At this stage, each risk identified is ranked and prioritized. By doing so, it will help in better understanding of the possible impact of a risk or the likelihood of its occurrence (Yilmaz, 2019).

The evaluation stage usually depends on the number of risks. However, when there are only few risks then the evaluation stage might be lightweight, but, when there are much menace and the situation is complex, the evaluation becomes difficult. Moreover, in the evaluation stage, risk should be examined individually, as well as their combined impact on the project (Saleem & Abideen, 2011). Risk evaluation entails assessment of the level of damage so as to make decisions about further risk treatment. This involves comparing the

level of hazard, determined during the risk analysis and risk evaluation, with the defined risk criteria to prioritize the implementation of adequate measures for treatment and mitigating the risk (ISO, 2009).

The important result of the risk management process is the risk treatment. Risks that are worth of further investigation due to either of their relative importance or because of their high chance of occurring again are determined and treated by implementing a risk mitigation plan. Risks can be treated either through proactive approach or through reactive approach. Reactive approach refers to the actions initiated after the evaluation of the risks events while proactive approach refers to actions initiated based on chance of the occurrence of certain risks (Ariff et al, 2014). This is necessary to ensure that changing circumstances do not alter priorities, and to facilitate easy identification and treatment of new risks as they arise. It is, therefore, paramount to maintain adequate process records for monitoring and review purposes (Tularam & Attili, 2012).

Monitoring is an essential step in risk management process where risks are properly monitored, and the effectiveness of risk treatment plan is reviewed. Risks are needed to be monitored to ensure that changing circumstances do not alter the risk priorities. Some risks are likely to remain static, which require the risk management process to be performed on regularly bases, so as to capture new risks and effectively managed them (Moller, 2007). There is the need to communicate risk which is seen as an integral part of all risk management activities that take place at all stages of the risk management process. This entails engaging internal and external stakeholders through the risk management process. The framework promotes ‘consultative team approach’ in order to facilitate good communication with key stakeholders, from the outset (ISO31000:2009). In future, the face of risk communication will be

two folds: First, organizations have to expand their internal communication, secondly, the demands of external stakeholders will likely increase (Saleem & Abideen, 2011). Organizations must establish a proper communication strategy to support effective communication and consultation. Moreover, focus should be on consultations which make it important that shareholders must be communicated to throughout the risk management process and after that, their perceptions must be recorded which would be helpful in decision-making. It is necessary to ensure that changing circumstances do not alter priorities, and to facilitate easy identification and treatment of new risks as they arise. It is, therefore, paramount to maintain adequate process records for monitoring and review purposes (Tularam & Attili, 2012). This is an important step in the risk management process, during which hazards are appropriately monitored and the success of the risk treatment strategy is evaluated. Risks must be monitored to ensure that risk priorities do not shift as a result of changing circumstances. Some risks are likely to remain static, necessitating the risk management process to be repeated on a regular basis in order to catch new threats and manage them efficiently. (Chapman, 2001).

According to Olaiya, Arikewuyo, Sogunro, and Yunusa (2021), risk management plays a significant part in every organization's profit maximization through risk cost minimization for wise protection. Their findings, which were based on a well-structured 5-point Likert-scale questionnaire, Stata-SE 14 statistical software, and 120 questionnaires retrieved from respondents, revealed that risk reduction and risk monitoring have a significant impact on the profitability of insurance companies in Nigeria. They concluded that risk reduction and monitoring are critical in determining industry profitability, and that insurance regulators should work to ensure effective risk identification and evaluation in order to avoid financial crises and improve insurance performance.

Using data obtained from 51 insurance firms licensed to operate in Kenya as of 31 December 2020, Kiptoo, Kariuki, and Ocharo (2021) investigated the relationship between risk management and financial performance of insurance firms in Kenya for the period 2013–2020. Risk management has a considerable impact on the financial success of insurance companies, according to the results of regression analysis. Credit risk has a negative and considerable impact on financial performance, according to the researchers' conclusions. Firms having a higher percentage of non-performing receivables than total receivables are said to perform poorly. They went on to say that insurance companies should implement credit management systems to ensure receivables are collected on time, avoiding non-performing receivables, and so improving performance.

With a sample size of 19 enterprises, Fali, Nyor, and Mustapha (2020) analysed the impact of several forms of insurance-specific risks on profitability in Nigeria over a 10-year period (2009–2018). For independent variables, three variables were utilized as a measure of insurance-specific risk, such as re-insurance, technical provisions, and underwriting risks, while the dependent variable net profit margin, was employed as a measure of profitability. The results of the fixed effect regression model, which were based on secondary data gathered from companies' annual reports, revealed that technical provision and underwriting risks had a negative and significant impact on profitability, while re-insurance risk had a negative and insignificant impact. The authors concluded that increasing technical provision and risk underwriting will result in poor profitability for insurance companies listed in Nigeria, and that insurance companies in Nigeria should make adequate provision for outstanding claims by conducting an adequate assessment of their liabilities and also taking into account past experience to develop a comprehensive procedure for effectively monitoring and controlling their outstanding claims.

Kokobe and Gemechu, (2016) in their study showed that risk management practice and financial performance are not correlated. This opens a door for other problems on the application of the management techniques. Insurance companies should adopt enterprise risk management that is currently the best practice standard, and they should also apply risk management techniques effectively so as to improve on their return on equity and reduce loss ratios. Dabari and Saidin (2014) in their study mentioned that based on the extant literature, the implementation of risk management will improve performance and enhance shareholders value by identifying, evaluating, monitoring, and controlling all risks that can hinder the organization from achieving its set objectives.

3.0 Methodology

This study investigates relationship between risk management techniques and financial performance of non-banking institutions in Nigeria within agency theory and stakeholder theory frameworks. The study uses survey research design to achieve its objectives by focusing on insurance sector in Nigeria. Survey research is adopted due to its ability to provide certain information about population of the study through representation of lesser number of population members (Creswell & Eklund, 2006). According to Creswell, survey design procedure allows a researcher to collect data through an instrument (such as questionnaire) which can be analysed, and inferences drawn to provide answers to research questions and/or test theoretical postulations between two or more economic variables.

In the main, the population of this study comprised all non-banking financial institutions in Nigeria. However, the study specifically focuses on all insurance companies currently operating in Nigeria. The rationale behind the focus on insurance sector is premised on the role of the sector in ensuring protection and assurance for business and

investments continuity with resultant effect on economic growth of a country. In this regard, Nigeria insurance industry plays a significant role on economic growth and development of the country (Oke, 2012; Richard, & Victor, 2013; Ukpong & Acha, 2017; Nwafor, 2018; Iyodo, Samuel, Adewole & Ola, 2020). Consequently, the population of the study consists of all fifty-eight (58) insurance companies in Nigeria. National Insurance Commission (NAICOM) 2022 report states that 58 companies currently operate as insurance firms in Nigeria (GetInsurance, 2022). Out of these 58 fims, 46 of the insurance companies operate in Lagos State (Lawuyi, 2022)

Meanwhile, given the research strategy employed, this study uses all 46 insurance companies in Lagos State for effective responses to all the sensitive questions contained in the questionnaire. More importantly, Lagos State is selected due to the concentration of large number of big companies with most of their headquarters located in the state. With this 46 insurance companies, the study employed sample size determination formula developed by Krejcie & Morgan (1970) which was employed in Saka & Fatogun (2021). The outcome yielded forty-one (41) as efficient sample size.

The formula is provided as:

$$\boldsymbol{S} = \frac{\boldsymbol{X^2\ \ NP(1-P)}}{\boldsymbol{d^2\ (N-1)+X^2\ \ P(1-P)}} \ldots\ldots\ldots \text{(Krejcie \& } Morgan, 1970)$$

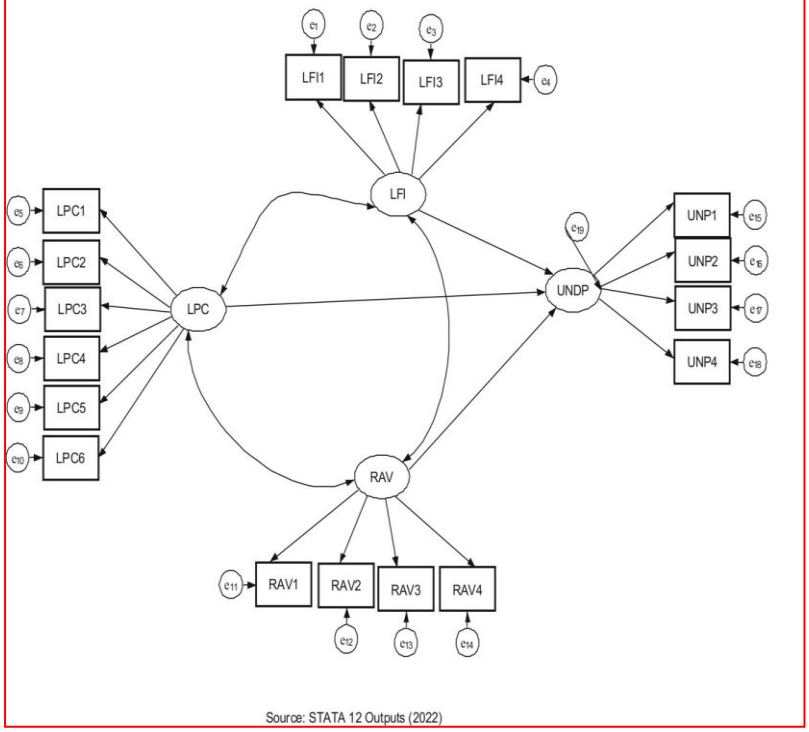
Where s = sample size (41); X^2 = table value of chi-square at 1 degree of freedom for desired confidence level (0.95); N = population size (46); and P = population proportion (0.5).

Simple random sampling technique was utilized to select 41 companies out of the final population (46) using Lottery design method. The sampling technique gives every insurance company in Lagos State equal chance of being selected for inclusion in the survey. The sampling frame from which the samples were selected consists of

risk officers from list of three (3) stratified groups including Chief Risk Officers, Strategic Risk Committee and Risk Managers of randomly sampled 41 insurance companies in Lagos State. One member from each stratum in each of the sampled companies was randomly picked. However, in a company with only one Chief Risk Officer, such officer is automatically selected for data collection. Consequently, a total number of one hundred and twenty-three (123) risk officers were obtained for opinion survey analysis. The selected risk officials from the sampled insurance companies form the units of analysis in this study.

Also, well-structured closed-ended questionnaire was physically administered for two days among the selected 123 risk officials who were previously sampled via simple random sampling in 41 sampled insurance companies. The purpose here is to collect and analyse cross-sectional data upon which inference would be drawn. The study develops Structural Equation Model (SEM, henceforth) on relationship between risk management techniques and financial performance of insurance companies in Nigeria. SEM model is required due to the large number of multiple variables involving latent and observed variables used to seek information on key dimensions of risk management techniques (that is, loss prevention and control, risk financing and risk avoidance) and underwriting profitability. The model is presented in figure 1:

Figure 1: Underwriting Profitability Measurement and Structural Models



Source: STATA 12 Outputs (2022)

From Figure 1, the following structural equation is formulated:

$$\boldsymbol{UNDP_i = \alpha + LPC_i + LFI_i + RAV_i + \varepsilon_i\ (Structural\ Model)} \ldots . (\mathbf{1})$$

Where:

UNDP = Underwriting Profitability;

LPC = Loss Prevention and Control;

LFI = Loss Financing (Risk Financing);

RAV = Risk Avoidance;

α = model constant;

ε = random error;

i = individual insurance company
(represented by sampled risk officers)

In addition to Structural Model in equation 1 which is helpful in testing hypothesised relationships, SEM also tests the reliability of observed variables in measuring the latent variables vis-a-vis measurement model (Corral de Zubielqui et al, 2019). However, it is constructive to note that only structural modelling of Figure 1 as illustrated in equation 1 was analysed since the focus is on estimation of relationships among constructs of the study which are loss prevention and control, risk financing, risk avoidance and underwriting profitability. Specifically, the study structural model was analysed through the use of maximum likelihood method depending on the outcome of multivariate normality informed by Mardia's multivariate Kurtosis (normal distribution) with all analyses performed at 5% level of significance.

4.0 Presentation, Interpretation and Discussion of Results

4.1 Presentation of Results

This sub-section presents the outcome of the data analysis for the study. The estimation results are presented in Table 1 below.

Table1: Underwriting Profitability SEM Results (Measurement and Structural)

Structural Equation Model — Number of obs. = 103
Estimation method = Maximum Likelihood
Log likelihood = -3143.4955

	Coef.	OIM Std. Err.	z	P>|z|	[95% Conf.	Interval]
Structural						
UNDP <-						
LPC	.7689147	.2602871	2.95	0.003	.2587613	1.279068
LFI	.0148532	.3366895	0.04	0.965	-.6450461	.6747524
RAV	.0736925	.1822811	0.40	0.686	-.2835719	.4309568
Measurement						
LPC1 <-						
LPC	.7215806	.1582596	4.56	0.000	.4113974	1.031764
_cons	2.912621	.1215067	23.97	0.000	2.674473	3.15077
LPC2 <-						
LPC	.8446617	.1318232	6.41	0.000	.5862929	1.10303
_cons	2.990291	.1289786	23.18	0.000	2.737498	3.243085
LPC3 <-						
LPC	.7081963	.1361851	5.20	0.000	.4412783	.9751142
_cons	3.07767	.1207397	25.49	0.000	2.841024	3.314315
LFI1 <-						
LFI	.7565021	.1389051	5.45	0.000	.4842531	1.028751
_cons	2.796117	.1235516	22.63	0.000	2.55396	3.038273
LFI2 <-						
LFI	.569514	.161646	3.52	0.000	.2526936	.8863344
_cons	3.067961	.1133919	27.06	0.000	2.845717	3.290205
RAV1 <-						
RAV	1.154333	.1585947	7.28	0.000	.8434933	1.465173
_cons	3.456311	.1504842	22.97	0.000	3.161367	3.751254
RAV2 <-						
RAV	.4443556	.1253895	3.54	0.000	.1985966	.6901145
_cons	3.864078	.1078228	35.84	0.000	3.652749	4.075406
UNP2 <-						
UNDP	.8600555	.2222411	3.87	0.000	.424471	1.29564
_cons	3.067961	.1389744	22.08	0.000	2.795576	3.340346
UNP4 <-						
UNDP	1.017253	.3355866	3.03	0.002	.359515	1.67499
_cons	2.854369	.134972	21.15	0.000	2.589829	3.118909

chi2_bs(153): 831.034 baseline vs. saturated (p > chi2: 0.0696)
RMSEA (0.04); CFI (0.951); SRMR (O.061)

Source: Author's Computation from STATA 12 Outputs (2022)

4.2 Interpretation and Discussion of Results

The information in table 1 reveals important statistics performed in this study. By description, the Table shows that data analysed are responses to 103 questionnaires administered. In the methodology section, it was stated that a total 123 questionnaires were administered among 41 randomly sampled insurance companies in Lagos State, Nigeria with 3 risk officials selected in each of the companies. The figure revealed in Table 1 indicates that the study analysed approximately 84% of the total information required. This rate is quite efficient and acceptable given the recommendation by Fincham (2008) that a response rate of $\geq$ 80% is expected and accepted for responses from a large population of individuals. According to Screiber *et al* (2006) and other scholars in SEM analysis, the conduct of SEM analysis is very sensitive to sample size adequacy and 10 observations per parameter has been recommended. Thus, the total number of 103 observations as analysed responses indicate that the study sample size is adequate.

Table 1 illuminates the results from measurement and structural models' estimation obtained via maximum likelihood method. From the Table, the researcher provides those observed indicators that show high factor loadings on their respective latent (or unobserved) constructs while those with low factor loadings are neglected. However, low factor loadings from measurement model are shown in the Appendix section (Table 2) along high loading factors. The factor loadings show how reliably and importantly an observed variable explains variation in the latent variable. In term of measurement model estimation, it is discovered through high factor loadings that large number of observed variables such as *LPC1* (0.72), *LPC2* (0.85), *LPC3* (0.71), *LFI*1 (0.76), *LFI2* (0.57), *RAV1* (1.15), *RAV2* (0.44), *UNP2* (0.86) and *UNP4* (1.02) as indicated in Table 1 (and Table 2, Appendix) significantly accounted for high proportion of variance in the study endogenous variables. This result shows that these observed variables effectively captured the variation in the constructs of the

study. It is important to state that the codes for both observed variables and constructs (latent factors) are provided in the Appendix section (Table 4).

Furthermore, structural model result indicates that all the risk management techniques adopted in this study have positive impacts on the underwriting profitability of insurance industry in Nigeria. That is, with 1 unit increase in the adoption of loss prevention and control, loss financing and risk avoidance as risk management techniques, the underwriting profitability of Nigerian insurance industry increases by 0.77; 0.01; and 0.07 respectively. However, the structural model estimation result further shows that loss prevention and control is the sole significant risk management techniques that affect financial performance of non-banking firms (specifically, insurance sector) in Nigeria. Again, the vast majority of good-of-fit indexes of the analysed SEM estimations such as Chi-square ($p>.05$: 0.0696); RMSEA (0.042) and CFI (0.95) as displayed in Table 1 and Appendix (Table 3) indicate that the study model fit the observed data. This is quite impressive and satisfactory; thus, provides easy possibility to make an informed inferential assertion.

In addition, the model standardized residual as captured by Standard Root Mean Square Residual (SRMR) with value of 0.061 indicates that the study model is well specified. The positive relationship found between loss prevention and control and financial performance of insurance companies in this study is consistent with findings by Kokobe & Gemechu (2016) and Fleming (2002). However, this current study obtained a higher positive correlation than Kokobe & Gemechu (2016) study that was conducted among Ethiopian insurance companies. Consequently, this study affirms that there is significant evidence of improved financial performance of non-bank financial firms (that is, insurance companies) with the adoption of loss prevention and control as risk management technique.

5.0 Conclusion

This study investigates relationship between risk management techniques and financial performance of non-banking financial firms with specific focus on insurance companies in Nigeria. The SEM analysis of primary data obtained from 41 randomly sampled insurance companies in Nigeria (Lagos State, in focus) enables the researcher to establish that adoption of loss prevention and control as risk management technique significantly contributes to enhanced performance of insurance companies in Nigeria. Such technique is strong and superior to any other risk management techniques (for instance, loss financing and risk avoidance) adopted among insurance companies in Nigeria.

RECOMMENDATION

The researcher recommends that insurance companies in Nigeria should implement more preventive measures that reduce the frequency of certain specific losses that could arise in the course of business.

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APPENDIX

Table 2: Measurement and Structural Models Estimation Results

Structural Equation Model Number of obs = 103
Estimation Method = ml
Log Likelihood = -3143.4955

	OIM				
	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval]
Structural					
UNDP <-					
LPC	.7689147	.2602871	2.95	0.003	.2587613 1.279068
LFI	.0148532	.3366895	0.04	0.965	-.6450461 .6747524
RAV	.0736925	.1822811	0.40	0.686	-.2835719 .4309568
Measurement					
LPC1 <-					
LPC	.7215806	.1582596	4.56	0.000	.4113974 1.031764
_cons	2.912621	.1215067	23.97	0.000	2.674473 3.15077
LPC2 <-					
LPC	.8446617	.1318232	6.41	0.000	.5862929 1.10303
_cons	2.990291	.1289786	23.18	0.000	2.737498 3.243085
LPC3 <-					
LPC	.7081963	.1361851	5.20	0.000	.4412783 .9751142
_cons	3.07767	.1207397	25.49	0.000	2.841024 3.314315
LPC4 <-					
LPC	.0686389	.1192797	0.58	0.565	-.1651451 .3024228
_cons	2.84466	.0987648	28.80	0.000	2.651085 3.038236
LPC5 <-					
LPC	.077029	.1619735	0.48	0.634	-.2404333 .3944913
_cons	2.883495	.1269602	22.71	0.000	2.634658 3.132333
LPC6 <-					
LPC	.1328092	.1437898	0.92	0.356	-.1490137 .414632
_cons	3.067961	.0993981	30.87	0.000	2.873144 3.262778
LFI1 <-					

LFI	.7565021	.1389051	5.45	0.000	.4842531	1.028751
_cons	2.796117	.1235516	22.63	0.000	2.55396	3.038273
LFI2 <-						
LFI	.569514	.161646	3.52	0.000	.2526936	.8863344
_cons	3.067961	.1133919	27.06	0.000	2.845717	3.290205
LFI3 <-						
LFI	.4493013	.2300052	1.95	0.051	-.0015007	.9001032
_cons	2.757282	.1080216	25.53	0.000	2.545563	2.969
LFI4 <-						
LFI	.2890821	.2246486	1.29	0.198	-.1512211	.7293854
_cons	2.825243	.1025675	27.55	0.000	2.624214	3.026271
RAV1 <-						
RAV	1.154333	.1585947	7.28	0.000	.8434933	1.465173
_cons	3.456311	.1504842	22.97	0.000	3.161367	3.751254
RAV2 <-						
RAV	.4443556	.1253895	3.54	0.000	.1985966	.6901145
_cons	3.864078	.1078228	35.84	0.000	3.652749	4.075406
RAV3 <-						
RAV	.2540205	.173431	1.46	0.143	-.0858981	.5939391
_cons	3.135922	.1016622	30.85	0.000	2.936668	3.335177
RAV4 <-						
RAV	.0525416	.2400766	0.22	0.827	-.4179999	.523083
_cons	3.184466	.0986688	32.27	0.000	2.991079	3.377853
UNP1 <-						
UNDP	1	(constrained)				
_cons	2.961165	.136327	21.72	0.000	2.693969	3.228361
UNP2 <-						
UNDP	.8600555	.2222411	3.87	0.000	.424471	1.29564
_cons	3.067961	.1389744	22.08	0.000	2.795576	3.340346
UNP3 <-						
UNDP	.8513599	.	.	.	.	.
_cons	2.893204	.1450109	19.95	0.000	2.608988	3.17742
UNP4 <-						
UNDP	1.017253	.3355866	3.03	0.002	.359515	1.67499
_cons	2.854369	.134972	21.15	0.000	2.589829	3.118909

```
-------------+----------------------------------------------------------------
Variance     |
          e.LPC1 |             1  (constrained)
          e.LPC2 |             1  (constrained)
          e.LPC3 |             1  (constrained)
          e.LPC4 |             1  (constrained)
          e.LPC5 |          1.654313   .2309932    1.258241    2.175063
          e.LPC6 |             1  (constrained)
          e.LFI1 |             1  (constrained)
          e.LFI2 |             1  (constrained)
          e.LFI3 |             1  (constrained)
          e.LFI4 |             1  (constrained)
          e.RAV1 |             1  (constrained)
          e.RAV2 |             1  (constrained)
          e.RAV3 |             1  (constrained)
          e.RAV4 |             1  (constrained)
          e.UNP1 |          1.292627   .2171334    .9300148    1.796622
          e.UNP2 |          1.529512   .2501164    1.110091    2.107402
          e.UNP3 |          1.715332          .           .           .
          e.UNP4 |          1.233131          .           .           .
          e.UNDP |          2.31e-17   .3449272           .           .
             LPC |             1  (constrained)
             LFI |             1  (constrained)
             RAV |             1  (constrained)
-------------+----------------------------------------------------------------
```

Covariance |
LPC |
LFI | .7023595 .2037498 3.45 0.001 .3030172 1.101702
RAV | .0840394 .1821145 0.46 0.644 -.2728984 .4409771
-----------+--
LFI |
RAV | -.3727135 .192515 -1.94 0.053 -.7500359 .0046089

LR test of model vs. saturated: chi2(145) = 788.32, Prob > chi2 = 0.0729

Source: STATA 12 Outputs (2022)

Table 3: Goodness-of-fit Indexes

Fit statistic	Value	Description
Likelihood ratio		
chi2_ms (145)	788.318	model vs. saturated
p > chi2	0.000	
chi2_bs (153)	831.034	baseline vs. saturated
p > chi2	0.069	
Population error		
RMSEA	0.042	Root mean squared error of approximation
90% CI, lower bound	0.193	
upper bound	0.222	
pclose	-0.000	Probability RMSEA <= 0.05
Information criteria		
AIC	6374.991	Akaike's information criterion
BIC	6490.919	Bayesian information criterion
Baseline comparison		
CFI	0.951	Comparative fit index

	TLI	-0.001	Tucker-Lewis index
Size of residuals			
	SRMR	0.061	Standardized root mean squared residual
	CD	1.000	Coefficient of determination

Source: STATA 12 Outputs (2022)

Table 4: Codes for Observed Variables and Constructs

(a) Loss Prevention and Control (LPC)

S/N	Statements	CODE
1	Loss prevention and control as risk management techniques have a favourable effect on the underwriting profitability of insurance companies.	LPC1
2	Appropriate loss prevention method and control is a major factor that can affect the underwriting profitability of insurance companies.	LPC2
3	Loss prevention and control is one of the methods of reducing financial burden and increase underwriting profitability of insurance companies.	LPC3
4	Loss prevention and control enhance the underwriting profitability of insurance companies.	LPC4
5	The issue of loss prevention and control is taken with great consideration in our company to enhance underwriting profitability.	LPC5
6	There is the need for insurance companies to monitor and put proper risk control measures in place to enhance their underwriting profitability.	LPC6

(b) Loss Financing or Risk Financing (LFI)

S/N	Statements	CODE
1	The robust process for financing risk and monitoring each of the critical risks is essential to successful risk management and underwriting profitability of insurance companies.	LFI1
2	Risk management capabilities and financing must be improved continuously as the speed and complexity of business change so as to enhance underwriting profitability.	LFI2
3	Cultural issues and dysfunctional behaviour can undermine the effectiveness of financing risk management and lead to inappropriate risk taking or the undermining of established policies and processes.	LFI3
4	Lack of transparency, conflicts of interest, a shoot-the-messenger environment will encourage undesirable behaviour and compromise the effectiveness of financing risk management.	LF14

(c) Risk Avoidance (RAV)

S/N	Statements	CODE
1	There is a formal system of risk avoidance measure put in place in my organization.	RAV1
2	My organization follows a strict risk management process in order to be able avoid and immunized the adverse consequences of risk.	RAV2
3	My company has a dedicated chief risk officer, or its equivalent, in charge of risk management.	RAV3
4	Risk avoidance is considered as a value Centre in my organization	RAV4

(d) Underwriting Profitability (UNP)

S/N	Statements	CODE
1	There has been improved efficiency in our company's operations	UNP1
2	Financial statement analysis enhances risk management techniques.	UNP2
3	Proper monitoring and reporting of risk enhance financial performance of insurance firms in Nigeria.	UNP3
4	There is an improved level of innovations in my organization as a result of our risk management techniques.	UNP4

Source: Author's Compilation (2022)

DEBT STRUCTURE AND FINANCIAL PERFORMANCE: EVIDENCE FROM LISTED CONSTRUCTION FIRMS IN NIGERIA

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Meshack Aggreh[1]
Gilbert Ogechukwu Nworie[2]
Mary-Fidelis Chidoziem Abiahu[3]

Abstract
The study examined how debt structure is shaping the financial performance of listed construction firms in Nigeria. Debt structure was measured with total debt to asset ratio, total debt to equity ratio and noncurrent debt to asset ratio while the proxy for financial performance was Return on Assets. Ex-Post Facto research design was deployed on a population of eight (8) construction companies listed on the Nigerian Exchange Group (NGX) at the end of December 2021. Purposive sampling technique was deployed to select six (6) companies with complete financial reports over the review period as the sample size of the study. Secondary data were obtained from annual reports of the sampled firms from 2012 to 2021. In addition to the descriptive analysis, the Fixed Effect approach of Panel Least Square was used to carry out the regression analysis in the study. The findings include: total debt-to-asset ratio has a significant negative

[1] *Department of Accountancy, Nnamdi Azikiwe University, Awka*
[2] *Department of Accountancy, Nnamdi Azikiwe University, Awka*
[3] *CIBN Centre for Financial Studies, Lagos*

effect on the return on assets of quoted construction firms in Nigeria (β_1 = -1.205775, p-value = 0.0000); the total debt-to-equity ratio has no significant negative effect on the return on assets of quoted construction firms in Nigeria (β_2 = -0.001072, p-value = 0.0542); noncurrent debt to asset ratio has no significant negative effect on the return on assets of quoted construction firms in Nigeria (β_3 = -0.078793, p-value = 0.4439). The study recommends that management should ensure that proper debt level is maintained to improve profitability and to ensure there are sufficient funds for business expansion.

Keywords: *Debt structure, financial performance, total debt to asset ratio, total debt to equity ratio and noncurrent debt to asset ratio, return on assets.*

1. Introduction

1.1 Background to the Study

In financial literature over time, the nature and extent of the relationship between corporate debt structure and the financial performance of firms have continued to attract enormous research interest. This relationship is predicated upon the fact that one of the most important goals of financial managers is to maximize shareholders' wealth through the determination of the best combination of financial resources for the firm, including corporate debts (Oladunjoye, Ogbebor & Alalade, 2021; Nazir, Azam & Khalid, 2021). The above link has for ages been the subject matter of the Modigliani and Miller (1963) theory, Trade-Off Theory, Pecking Order Theory, Traditional Theory, etc. (Hasan et al., 2021; Saka & Fatogun, 2021; Asen, Nwude, Idamoyibo, Ufodiama & Udo, 2021; Udisifan, Akeem, Bako & Olalere, 2021; Okeke, Okere, Dafyak & Abiahu, 2022). Maximization of the company's value can be done by

determining from where to source funds or finances for investment. Historically, studies on the effect of debt structure on firm performance have varied perspectives on the direction of influence that corporate debt has on corporate financial outcomes (Udisifan, Akeem, Bako & Olalere, 2021). Thus, the use of debt in a firm's capital structure has been in different times and ages considered to have both positive and negative effects on corporate financial performance.

Debt structure involves the decision about the combination of the various sources of funds a firm uses to finance its operations and capital investments (Akaji, Nwadialor & Agubata, 2021). These sources include the use of long-term debt finance called debt financing, as well as preferred stock and common stock also called equity financing. The term debt structure represents the major claims to a corporation's asset which includes the different types of equities and debts. The debate centres on its determination, evaluation, and accounting as well as its relationship with the outcome of a firm's operations particularly as it relates to financial performance (Omaliko & Okpala, 2020).

Furthermore, debt structure is usually expressed in form of a ratio of assets (total assets in most cases) and equity (or shareholders' equity) (Saka & Fatogun, 2021). However, recently, Lyndon and Sawyer (2019) posited that another way of expressing debt structure is the debt-to-capital employed ratio. The total debts to total assets measure the amount of the total funds provided by outsiders or creditors as a ratio of the total assets of the firm. A low debt ratio is ordinarily preferred by creditors for all debts because it provides a cushion against creditors' losses in the event of firm liquidation as a high ratio indicates greater financial risk. Additionally, debt ratios help investors in analyzing the overall debt burden on the company as well as a firm's ability to pay off its debt and returns on investment in the future, especially during uncertain economic times (Asen, Nwude, Idamoyibo, Ufodiama & Udo, 2021). Corporate financial performance

measures how well an enterprise uses its assets and other resources from its business to generate revenues (Udisifan, Akeem, Bako & Olalere, 2021). The firm's debt structure is commonly financed with the combination of debt and equity, identified as the most important financing decision because it seems to drive the financial profitability of firms (Mamro & Legotlo, 2020). Debt financing is the main external financing used by companies (Baltaci & Ayaydian, 2014). The major increase in external financing over a longer period of years shows the economic expansion of firms. However, the use of debt financing has both advantages and disadvantages for the growth of the firms/companies and strategy. The mix of debt and equity of a firm and how it affects its financial performance has long been a subject of debate in finance literature. Modigliani and Miller (1963) suggested that firms should incorporate more debt in their capital structure to maximize its value which is manifested through high profits, increased share prices and management efficiency. However, firms with different cases of sub-optimal use of debt in their capital structure usually suffer from a variety of financial ailments, which are led by payment of high taxes, high proportions of accounts payable, large deficits in the firm cash flow and in some cases, corporate dissolution (Orichom and Omeke, 2021).

Most firms that went into insolvency failed to trade off the benefits of debts against their costs which resulted in an increased financial risk in a way that thwarted the firm’s corporate performance (Abdulkarim, Ahmadu & Sulaiman, 2019). That was because the sub-optimal capital structure level mixes the permanent sources of funds used by the firm in a manner that fails to maximize the value of the firm. This defeats the major objective of the firm which is to maximize its value. Improper planning of the composition of debt and equity has jeopardized sound financial management among firms because the debt-equity mix has implications on shareholders' earnings and risk, which in turn will affect the cost of capital and the market value of the

firm. A high ratio of debt content in the capital structure increases the financial risk of the firm which can lead to financial insolvency in bad times (Anyike & Agilebu, 2019; Adeoye, & Olojede, 2019). However, raising funds by debt is inexpensive as compared to raising funds by shares. This is because interest on debt is permitted as a cost for tax purposes. Dividend is considered to be an appropriation of profit; hence, payment of a dividend does not result in any tax benefit to the firm (Oladunjoye, Ogbebor & Alalade, 2021). Construction firms in Nigeria have a diverse level of leverage at their disposal which determines the best mix to enhance performance by managers and that remains a puzzle to be solved in corporate finance theory and finance literature. From the above mentioned, it is therefore imperative to understand how a firm's choice of debt is associated with its corporate financial performance using listed construction firms in Nigeria as a unit of analysis.

1.2 Statement of Problem

The debt structure of a firm is an important aspect of management decisions that are concerned with debt and equity mix which are optimally combined to meet the firm's objectives (Hasan et al., 2021). It is capable of influencing both the financial and operating performance of the organization as a result of its interest and dividends elements (Lyndon & Sawyer, 2019). The profitability of firms is ideally meant to meet the interest of various stakeholders through effective and efficient operating activities such as increased turnover and efficient asset utilization. The debt mix of a construction firm can take many forms but the most realistic is that which combines a proportion of debt and a proportion of equity in the capital structure to exploit the advantages of leverage. The main benefit of debt financing is the tax-deductibility of interest charges which results in a lower cost of capital. However, firms with different cases of sub-optimal use of debt in their capital structure usually suffer from a variety of financial

ailments (Saka & Fatogun, 2021), which is led by payment of high taxes, high proportions of accounts payable, large deficits in the firm cash flow and in some cases corporate dissolution. Thus, a large number of business failures in the past were attributed to the inability of financial managers to properly plan and control their corporate debt. Inefficient management of corporate debt structure in the face of economic and political crises in Nigerian businesses today has led to a loss of profit owing to high bad debts, over/under stocking; liquidity problems; inability to expand; financial losses; vulnerability to liquidation and insolvency (Olaoye, Akintola, Soetan & Olusola, 2020).

In the past, similar studies on debt structure have been carried out. Oladunjoye, Ogbebor and Alalade (2021), Saka and Fatogun (2021), Asen, Nwude, Idamoyibo, Ufodiama and Udo (2021), Olaoye, Akintola, Soetan and Olusola (2020) focused on the Nigerian manufacturing firms; Nazir, Azam and Khalid (2021) and Abbas and Aziz (2019) focused on Pakistan firms; Hasan et al. (2021) focused on Malaysian firms; Udisifan, Akeem Bako and Olalere (2021) concentrated on non-financial companies in Nigeria; Akaji, Nwadialor and Agubata (2021); Abosede (2020) focused on Oil and Gas Sector, Health Care Sector and ICT Sector of NSE; Udobi, Gbajumo, Umoru, Babatunde and Ilimezekhe (2020) and Lyndon and Sawyer (2019) covered consumer goods firms; Mamro and Legotlo (2020) focused on retail firms in Johannesburg; Adegbola, Nwanji, Eluyela and Fagboro (2020) focused on Nigerian banks; Patjoshi and Nandini (2020) covered software firms in India, etc. However, to the best of the researchers' knowledge, existing studies failed to specifically derive their evidence from listed construction firms in Nigeria. It is a gap in knowledge that the influence of debt structure on the corporate financial performance of listed construction firms in Nigeria is yet to be ascertained, hence the motivation for this study.

1.3 Objective of the Study

The broad objective of the study is to examine the effect of debt structure on the corporate financial performance of listed construction firms in Nigeria. The specific objectives of the study are to:

i. Determine the extent to which total debt-to-asset ratio affects the return on assets of quoted construction firms in Nigeria.
ii. Examine the extent to which total debt-to-equity ratio affects the return on assets of quoted construction firms in Nigeria.
iii. Determine the extent to which noncurrent debt-to-asset ratio affects the return on assets of quoted construction firms in Nigeria.

1.5 Research Hypotheses

The following null and alternate hypotheses were formulated to guide the direction of the study:

1. H_{o1}: Total debt to asset ratio has no significant effect on the return on assets of quoted construction firms in Nigeria.
2. H_{o2}: Total debt to equity ratio has no significant effect on the return on assets of quoted construction firms in Nigeria.
3. H_{o3}: Noncurrent debt to asset ratio has no significant effect on the return on assets of quoted construction firms in Nigeria.

2.0 Review of Related Literature

2.1 Conceptual Review

2.1.1 Debt Structure

Debt structure involves the combination of the various sources of funds a firm uses to finance its operations and capital investments (Akaji, Nwadialor & Agubata, 2021). Debt structure is usually expressed in form of the ratio of assets (total assets in most cases) and equity (or shareholders' equity) (Saka & Fatogun, 2021). Pandey (2004) opines that debt structure is the proportionate relationship

between debt and equity financing of firms. In the views of Ayange, Nwude, Idamoyibo, Ufodiama and Udo (2021), debt structure deals with the question of what happens to the total valuation of the firm and its cost of capital when the ratio of debt to equity or degree of leverage is varied. In other words, debt structure is a mix of equity and debt. Equity is taken to mean ordinary shares plus retained earnings while debt is taken to mean all fixed interest-bearing stock (Nenu, Vintila, & Stefan, 2018). Corporate debt structure is the mixture of both debt and equity used by any organisation to finance its business to generate profit or render service to consumers without expecting anything in return. In addition, short-term debt is as well part of the corporate debt structure (Udisifan, Akeem, Bako & Olalere, 2021). Debt is one of the sources from which companies can raise capital in the capital market. Firms sometimes preferred debt to equity to take advantage of tax. If a firm finances its business with debt, the interest on debt is exempted from tax while debt holders pay taxes on their interest income. Debt is the most available to be accessed and with low-interest rates while equity is quite more expensive than debt. Debt structure entails the approach a firm uses in financing its assets through a mixture of debt, equity, or hybrid securities (Uremadu & Onuegbu, 2018). Hybrid securities in this context mean a group of securities that combine the elements of both debt and equity, which have fixed or floating rates of return, and the holder has the option of converting it into the underlying company's share.

In a layman's understanding, the debt structure of a firm is simply how the firm finances its operations and assets purchases through the combination of both debt and equity. According to Binh and Tram (2020), debt structure of a firm refers to the mixture of short-term and long-term debt components that the firm utilises in the financing activities of the firm such as funding for productive assets, future growth, and operations. Abiahu, Egbunike, Udeh, Egbunike and Amahalu (2019) posited that firms in the growth stage of their cycle

typically finance that growth through debt, borrowing money to grow faster. Similarly, Pais (2017) noted that corporate debt structure refers to the combination of the debt capital that a firm utilises for its financing purposes. Thus, Ullah, Pinglu, Ullah, Zaman and Hashmi (2020) simply define a firm's debt structure as an amalgam of the various sources by which the firm is financed. Tactically put, Akindele, Asri and Adedeji (2020) viewed the debt structure of a firm as the sum of the owners' rights and interests of creditors' proportional relationship. Categorically, Nguyen, Dao, Bui and Dang (2020) submitted that corporate debt structure entails two kinds of capital that contain debt capital and equity capital. The authors maintain that each of the capital components has not only advantages but also disadvantages for the firm's operational efficiency. Researchers believe that there is a point where the combination of both equity capital and debt capital will yield the highest profit at the barest cost of capital (Olarewaju, 2019). Rahman, Umme, Parvin and Ayrin (2019) view corporate debt structure as the monetary framework that is made up of equity, debt and retained earnings. It is the amount of debt-equity that a firm employs to finance its growth and operations.

2.1.2 Dimensions of Debt Structure

Debt structure is a mixture of a company's debts (long-term and short-term), common equity and preferred equity. Debt structure is traditionally measured by several proxies such as debt-equity ratio, debt-asset ratio, interest coverage ratio, noncurrent debt-to-asset ratio, noncurrent debt-to-equity ratio, etc. However, recently, Lyndon and Sawyer (2019) posited that another way of expressing corporate debt structure is debt to capital employed ratio. On that side, measures of debt structure in the study include total debt to asset ratio, total debt to equity ratio and noncurrent debt to asset ratio.

2.1.2.1 Total Debt to Asset Ratio

The total debts to total assets measure the amount of the total funds provided by outsiders or creditors as a ratio of the total assets of the firm (Nazir, Azam & Khalid, 2021). Debt to equity ratio is the amount of debt a firm uses to finance its assets. Debt to asset ratio calculates the amount of asset financing that comes from debt (Olaoye, Akintola, Soetan & Olusola, 2020). Debt to asset ratio serves as a financial ratio that is used to determine the association between the external financing of a firm and its assets (Abbas & Aziz, 2019). The average expectation is that increasing debt to asset ratio of the firm will improve the market price of the firm's shares as well as the worth of the firm (Saka & Fatogun, 2021). In this study, debt to asset ratio is measured as the ratio of total liabilities to total assets of the firm in an accounting period. The formula is expressed thus:

$$\frac{Total\ Liabilities}{Total\ Assets}$$

2.1.2.2 Total Debt to Equity Ratio

The debt-to-equity ratio of a firm refers to the ratio between a company's debt and equity. It denotes the presence of debt in a company's capital composition. Debt to equity ratio is the ratio of the total value of a company's debt capital to the total market value of its equity (Saka & Fatogun, 2021). A levered or geared firm essentially has some elements of debt in its capital structure, but unlevered firms are considered thus because they are all-equity firms. In this study, debt to equity ratio is measured as the ratio of total liabilities to total equity of the firm in an accounting period. The formula is expressed thus:

$$\frac{Total\ Liabilities}{Total\ Equity}$$

2.1.2.3 Noncurrent Debt to Asset Ratio

Long-term debt-to-asset ratio indicates the number of noncurrent liabilities that are used to acquire more assets (Adenugba, Ige & Kesinro, 2016). Also, long-term debt to asset ratio indicates the proportion of long-term debt per N1 of a firm's assets. This metric shows the number of assets that are financed using noncurrent liabilities. This can be a good financial leverage tool that is deployed to increase the firm's return on equity. Nevertheless, when the ratio of long-term debt to assets is excessively high, the risk of business failure in the firm increases. The formula for the long-term debt-to-asset ratio used in the study is given below:

$$\frac{Noncurrent\ Liabilities}{Total\ Assets}$$

2.1.3 Financial Performance

Financial performance measures how well an enterprise used its assets and other resources from its business to generate revenues (Udisifan, Akeem, Bako & Olalere, 2021). Corporate financial performance refers to the extent to which a firm achieves its financial objectives. It has over the years remained perceived only through the prism of profits. This has however changed in the current age. Corporate financial performance at this age has different meanings depending on the users' view of financial information (Sabri, Mohamed & Sahari, 2020). Managers are interested in profits because their targets are mostly tied to profits achieved. Shareholders are interested in wealth maximization through increased market capitalization and dividend payments. Commercial stakeholders are more interested in the solvency of the firm while creditors are interested in the capacity of the institutions to repay the loans on time. The firm employees desire a stable job accompanied by a high level of material benefits, while the government is interested in an efficient company that pays its taxes and other statutory fees.

Financial indicators are used by companies' management to measure, report and improve their financial performance. Financial and non-financial ratios are used to get a multi-dimensional perspective on companies' corporate performance (Oladunjoye, Ogbebor & Alalade, 2021). This analysis is vital for all participants, particularly the stockholders. Abu, Okpeh and Okpe (2016) contend that the market value of a corporation which is also shareholders' wealth is based on several factors among which are the risks a company faces, the economic growth potential for future earnings, and its profitability. While these are the main issues swaying the market price of a corporation (Waqas, Khan & Ullah, 2020), the market position of a firm greatly tells on its corporate financial results.

The submission of Erikie and Osagie (2017) shows that corporate financial performance is the measure of the results of a firm's policies and operations in monetary terms. These results are reflected in the firm's return on investment, return on assets, and value-added. The term corporate financial performance refers to the benefits emanating from shares and those from the functioning and operational activities of a firm (Akaji, Nwadialor & Agubata, 2021). Corporate financial performance is also defined as firm effectiveness in some quarters which can be disintegrated into net turnover and the net profit margin.

2.1.4 Effect of Debt Structure on the Corporate Financial Performance of Firms

Corporate debt financing is one of the financing alternatives mostly used in a manufacturing company (Hasan et al., 2021). The terms of the debt include that the borrower needs to pay back the money along with agreed services charges and interest. If they do not pay the debt as promised, the lender can start and do collection proceedings such as claim the debt from the borrower (Olaoye, Akintola, Soetan & Olusola, 2020). Most entrepreneurs want to avoid this process since they can lose their business and non-business assets. The payback

period for a long-term loan is usually more than 1 year. It depends on the deal negotiated by the borrowers and the lenders. These loans normally are secured and had a guarantee by the entrepreneur. Andow and Wetsi (2018) affirmed that corporate debt structure decisions are basic for the growth of any firm as it showed that management gives autonomy in choosing the mechanisms of their debt structure as long as they improve the firms' performance indices and at the same time attaining some of the core objectives and goals of firms. An increase in such a performance index is somewhat associated with risk and growth (Fruhan, 2015). This is because the market value is conditioned on the firm's financial results which are sensitive to the level of risk exposure (Olaoye, Akintola, Soetan & Olusola, 2020). Increasing debt components is a way of increasing the level of risk to which a firm is exposed, the risk of liquidation. However, firms leverage on debts regardless of the risk involved more because of the financial gains which an effective utilization of debts can bring.

The financial performance of firms is ideally meant to meet the interests of various stakeholders through effective and efficient operating activities such as increased turnover and efficient asset utilization. However, there are certain costs associated with debt financing. So, between the two extremes of whole equity financing and whole debt financing, a particular debt-equity mix is to be decided (Abbas & Aziz, 2019). Any attempt by a firm to design its debt-capital mix, therefore, is undertaken in the light of two prepositions, to yield optimal returns. First, poor debt structure decisions lead to a possible reduction in the value derived from strategic assets. Debt mix can be designed in such a way as to lead to the objective of maximizing shareholders' interest. Second, though the exact optimal debt structure may be impossible, efforts must be made to achieve the best approximation to the optimal debt structure to attain the long-term solvency and stability of the firm.

2.2 Theoretical Framework

2.2.1 Pecking Order Theory

The pecking order theory of debt structure as propounded by Donaldson (1961) is among the most influential theories of corporate leverage. It goes contrary to the idea of firms having a unique combination of debt and equity finance, which minimizes their cost of capital (Ayange, Nwude, Idamoyibo, Ufodiama and Udo, 2021). The theory suggests that when a firm is looking for ways to finance its long-term investments, it has a well-defined order of preference for the sources of finance it uses. It states that a firm's first preference should be the utilization of internal funds (i.e. retain earnings), followed by debt and then external equity. The theory postulates that the more profitable the firms become, the less they borrow because they would have sufficient internal finance to undertake their investment projects. It is further argued that it is when internal finance is inadequate that a firm should source external finance and most preferably bank borrowings or corporate bonds. Thus, after exhausting both internal and bank borrowing and corporate bonds, the final and least preferred source of finance is to issue new equity capital (Adeoye, & Olojede, 2019).

Pecking Order theory tries to capture the costs of asymmetric information which states that companies prioritize their sources of financing (from internal financing to equity) according to the principle of least effort, or of least resistance, preferring to raise equity as a financing means of last resort. Hence, internal funds are used first, and when that is exhausted, debt is issued, and when it is not sensible to issue any more debt, equity is issued. On the other hand, Pecking Order Theory according to Nenu, Vintila and Stefan (2018) captures the effect of asymmetric information upon the mispricing of new securities, which says that there is no well-defined target debt ratio. The theory believes that investors generally perceive that managers are better informed of the price-sensitive information of the firms. The

theory postulates that the optimum capital structure of debt and equity maximizes the financial performance of firms only when firms have a targeted debt structure that is between the financial risk and the returns of the firm. Therefore, striking a balance between the risks and returns in a firm's operation is the purpose of debt structure (Ayange, Nwude, Idamoyibo, Ufodiama and Udo, 2021). This study concentrates on the pecking order theory to ascertain if debt structure affects the financial performance of firms. The relevance of pecking order theory to this study is predicated on the postulations of the theory which posits that debt structure imposes costs and obligations to the firm which in return influences the financial performance of the firm.

2.2.1 Agency Cost Theory

Agency theory was first propounded by Berle and Means in 1932 but was greatly improved upon by Jensen and Meckling, 1976. Jensen and Meckling (1976) posited that the conflict of interests between owners and managers of a firm will often lead to an increase in agency costs. This is consequent upon the need that there should be a separation of ownership from control or management. According to this theory, agency cost is the sum of monitoring expenditure by the principal with the bonding costs by agents and a residual loss. It is this agency cost that the theory suggests will be reduced using secured debt. Since payment of debt interest reduces available surplus cash, debt level places a sort of constraint on managers to take decisions that are more in line with the shareholders' interest (Akindele, Asri & Adedeji, 2020). Most notably, Agency Cost Theory hypothesized that an optimal debt level could be determined when the cost arising from the conflict of interest between managers and owners is minimized.

Furthermore, it was postulated in the theory that the main factor that spurs conflict of interest between managers (agents) and equity holders (principals) is debt. /When cash flow is available, managers who are after their interests can identify with numerous investments such that

they may over-invest in projects that have negative Net Present values (NPV) which automatically impair the operational efficiency of the firm (Dahiru, 2016). In the same vein, the use of debt financing and the payment of the accrued interest on debt tend to reduce the agency conflict between management and shareholders. Outsiders from whom the firm borrows can seek legal redress in a case where management defaults in meeting up with payment of due interest. Agency cost theory postulates that managers would conduct their behaviour in such a way as to efficiently utilise the available resources to settle the interest payments when they are due. This invariably enforces management to have interests that align with those of the owners (Abu, Akinbola & Ojo, 2018; Akingunola, Olawale & Olaniyan, 2017). The relevance of this theory to the present study is that managers with greater debt finance in their debt structure are prompted more to reduce agency cost by the threat of liquidation which could result in some losses to the management as regards their reputation, salaries, etc. From the agency perspective, the effect of corporate debt structure on the corporate financial performance of construction companies is that managers would spend the amount of debt or corporate financial resources sensibly in a way as to generate enough revenues that would not only settle the debt but also meet up with the interest on debt as they mature (Vijayakumaran, 2017). Therefore, the present study is anchored on Agency Cost Theory considering the postulation it gave in terms of the link between debt structure and corporate financial performance.

2.3 Empirical Review

Oladunjoye, Ogbebor and Alalade (2021) examined the impact of the debt-equity ratio on the share price performance of manufacturing firms listed in Nigeria between 2010 and 2019. The study adopted an ex-post facto research design. A sample size of fifteen (15) listed manufacturing firms was used while panel regression models were estimated using the fixed effect model and random effect model, while

the result of the Hausman test was utilized to select the appropriate model between the fixed effect model and random effect model. The findings of the study revealed that the total debt to equity ratio is a negative and significant influence on the performance of share price {Coef. = -0.009; P-value > 0.05}. Return on Assets is also seen to be positive and significantly influences the performance of the share price of listed manufacturing firms in Nigeria {Coef = 2.428; P-value = 0.000}. However, the size of firm {Coef. = -0.019; P-value = 0.344} is seen to have a negative but insignificant effect on the performance of the share price. The study, therefore, recommended that firm managers should be cautious while using debt finance. Firm managers were advised to consider the consequences of debt finance before making capital structure decisions.

Nazir, Azam and Khalid (2021) investigated the relationship between the listed firms' debt level and performance on the Pakistan Stock Exchange (PSX) over five years. This study used pooled ordinary least squares regression and fixed- and random-effects models to analyze a cross-sectional sample of 30 Pakistani companies operating in the automobile, cement, and sugar sectors during 2013–2017 (N 5 150). The results indicate that both short- and long-term debt have negative and significant impacts on firm performance in profitability. This suggests that agency issues may lead to a high-debt policy, resulting in lower performance. Hasan et al. (2021) examined the effect of debt financing on the firm profitability of manufacturing companies listed in Bursa Malaysia. The study applied the trade-off theory and pecking order theory. The research collected debt financing data of listed manufacturing companies in Malaysia and analyzed the relationship by descriptive analysis and regression analysis. This study used 23 companies to determine the debt financing towards firms' profitability of the listed manufacturing companies in Malaysia. The data was taken for the period of 8 years from 2010 to 2018. The independent variables were debt ratio, long-term debt, and short-term debt while the

dependent variable was the return on equity and used to measure the firm's performance. The panel data regression analysis showed that the debt-to-asset ratio significantly and negatively affects the performance of firms.

Saka and Fatogun (2021) examined the effect of capital structure on the value of Nigerian manufacturing companies. Ex-post Facto design was employed for the random selection of 10 manufacturing firms across 6 real sectors of the Nigerian manufacturing industry. The study estimated balanced panel data with Panel (OLS) Regression techniques using 180 observations from 2015 - 2019. From findings, the results of preferred Random Effect estimation at 5% level of significance show that measures of capital structure such as debt-to-equity and debt-to-total assets have insignificant effects on the value of firms when proxied by Tobin's Q. Thus, the study re-affirms the claim of M-M Approach that capital structure does not matter when it comes to firm's performance in term of stock market efficiency. In practice, therefore, management should consider the use of debt as the last option for financing profitable projects. Asen, Nwude, Idamoyibo, Ufodiama and Udo (2021) examined the effect of debt structure measures on manufacturing firms' performance in Nigeria using annualized panel data for a sample of 15 quoted firms from diverse sectorial classifications from 1999-2018. Regression analysis was used in carrying out the study. The regression results indicate that performance proxied by ROE, and Tobin's Q, are significantly influenced by SDTA, SIZE, LDTA, and TDTA while ROA is negatively influenced by LDTA, D_E, and TDTA. Findings revealed a robust relationship between Tobin's Q and financial performance compared to other book values. The study reveals that Nigerian firms are keenly financed by short-term debt supporting the Pecking Order Theory.

Udisifan, Akeem, Bako and Olalere (2021) examined the moderating effect of board financial literacy on the relationship between capital structure and firm financial performance of listed non-financial companies in Nigeria. Capital structure was measured by long-term debts to total assets, short-term debts to total assets, equity to total debt ratios and board financial literacy was measured by the ratio of board members that have professional and academic qualifications in accounting, finance, and economics. Meanwhile, financial performance was measured by return on assets. Secondary data was extracted from the 30 sampled firms' annual reports and accounts from 2009 to 2018 and analyzed using Panel Least Square. This study revealed a positive and significant relationship between long-term debt and ROA. It also shows that board financial literacy moderate capital structure significantly and increase firm performance. The study recommended that the management of Nigerian-listed non-financial firms should optimize the capital structure to increase financial performance. Akaji, Nwadialor and Agubata (2021) examined the effect of debt financing on the performance of Firms in Nigeria. The study measured debt financing using the variables of long-term debt financing (LTDF), short-term debt financing (STDF) and preferred stock financing (PSF) while Firm's Performance on the other hand was measured using Return on equity (ROE). The study focused on the Oil and Gas Sector, Health Care Sector, and ICT Sector of NSE. The statistical test of parameter estimates was conducted using OLS Regression Model. The research design used was Ex Post Facto design and data for the study were obtained from the 26 firms which formed the sample size with data spanning from 2013-2020. The findings of the study showed that Debt Financing has a significant and positive effect on Firms' Performance in Nigeria at 5% significant level. The study concluded that debt financing has improved firms' performance over the years. Based on this, it was recommended that firms should try to finance their investment activities with debt and consider either

debt or equity as a last option. Firms should also be debt intensive in their financing decisions as it influences performance.

Abosede (2020) examined the impact of indebtedness on the performance of quoted Nigerian downstream oil and gas companies. The main objective of the study was to find out whether indebtedness has an impact on the financial performance of the quoted Nigerian downstream oil and gas companies, using Return on asset (ROA) and return on capital employed (ROCE) as proxies to financial performance. Secondary data from 11 listed oil and gas companies on the Nigeria Stock Exchange from 2007-2019 were used in the study. The data generated were analyzed using multiple regressions to examine the relationship between the variables. Indebtedness is proxied by long-term debt, short-term debt and total debt, using the pooled ordinary least square, fixed effect and random effect models. After the estimation, the study found that long-term debt negatively and significantly impacts the financial performance of quoted Nigerian downstream oil and gas companies. The study recommended that listed downstream oil and gas firms in Nigeria should make effective use of long-term debts to enhance their capital employed to generate more return on investment to cover the cost of capital and increase their retained earnings.

Udobi, Gbajumo, Umoru, Babatunde and Ilimezekhe (2020) investigated the impact of debt structure on the profitability of consumer goods firms in Nigeria for a period of eight years (2011-2018). Data from ten (10) randomly selected listed firms of the Nigeria Stock Exchange were derived from the firms' published financial reports for the period covered. The panel regression results revealed that Debt to Asset Ratio (DAR) is positively significant on Return On Asset (ROA) (Proxy for profitability), while other proxies of the capital structure show that Debt to Equity(DER), Liquidity Ratio(LIQ), are not statistically significant, Short Term Debt to Total

Asset Ratio (SDTA) shows a negative connection, Firm Size (FS) has a weak correlation with profit and, Long Term Debt to Total Asset Ratio (LDTA) do not influence firms' profitability of the consumer goods sector of Nigeria economy. Mamro and Legotlo (2020) investigated the impact of debt financing on the financial performance of retail firms listed on the Johannesburg Stock Exchange. The study sampled seventeen (17) retail firms for the period 2010–2019. The fixed effects were applied using the financial performance ratios, return on equity is used as the profitability measure and is the dependent variable, whereas the lagged return on equity, long-term debt to total asset, and total debt to the total asset are used as independent variables, while size, sales growth is used as control variables. The lagged return on equity, total debt to total asset and growth in sales strongly influence the financial performance of return on equity with a high statistical significance of 1% level, whereas long-term debt to total asset and firm size negatively influences financial performance with a statistical significance of 1% and 5%, respectively.

Adegbola, Nwanji, Eluyela and Fagboro (2020) examined the extent to which capital structure impacted the profitability of Nigerian Deposit Money Banks considering the profitability of eight Nigerian Deposit Money Banks from 2003 to 2018 (16 years). A descriptive research design was adopted for this study, and data were analyzed using regression. The study used secondary data obtained from published annual reports of selected Nigerian Deposit Money Banks on the Nigerian Stock Exchange (NSE) for the years (2003–2018). The study concluded that the indicators used to measure capital structure (debt-equity ratio and leverage ratio) and profitability (returns on equity) had a negative relationship. This means that the use of debts mixed with equity (debt-equity ratio and leverage ratio) in improper proportion as financing methods can negatively affect profitability. Patjoshi and Nandini (2020) examined the impact of capital structure on the corporate performance of six software companies in India for

the five years from 2016 to 2020. The study considered four corporate performance measures as dependent variables. The two main capital structure ratios are independent variables. The data were sourced from secondary sources and analyzed using different tools like descriptive statistics, correlation, and regression analysis for examining the impact of capital structure on the corporate performance of six software companies in India for the five years from 2015/16 to 2019/20. The findings revealed that capital structure significantly affects firm performance.

Olaoye, Akintola, Soetan and Olusola (2020) evaluated the effect of capital structure on the financial performance of listed manufacturing companies in Nigeria. The study employed ex-post facto research design. The population of the study consisted of the quoted manufacturing companies in Nigeria made up of 71 companies at of 31st December 2017 according to the Nigeria Stock Exchange (NSE). The study employed convenience sampling in the selection of the 20 manufacturing companies as sampled companies from 2009-2018. Data from the research was obtained from the annual reports of the sampled companies. The study adopted descriptive and panel data regression analysis. The finding of the study indicated that capital structure influences the performance of the quoted manufacturing companies in Nigeria. The study concluded that capital structure has a significant relationship with the financial performance of listed manufacturing companies in Nigeria. The study recommended that management should ensure that proper capital structure is maintained to improve financial performance and to allow for an increase in dividend payment and retained earnings for expansion. Abbas and Aziz (2019) examined the effect of different debt financing on firms' performance in 14 sectors of Pakistan economy. Secondary data was collected from the sample of 360 companies listed on the Pakistan Stock Exchange, for the period of 9 years (2006 to 2014). The results of the panel least square regression showed that debt financing has a

negative but also a significant impact on firm performance in Pakistan. The study recommended that companies should rely more on their internal source of finance because it is the cheap and reliable source of finance in the Pakistani context.

Lyndon and Sawyer (2019) investigated the effect of capital structure on firm performance using a sample of seven companies listed under the consumer goods sector of the Nigerian Stock Exchange. The study adopted return on assets as a proxy for performance (the response variable), while capital structure components such as debt to equity, debt to capital employed and equity to capital employed were used as the explanatory variables. Secondary data were collected from the published annual financial reports of the sampled consumer goods sector companies for the period 2009 to 2018. The study employed descriptive statistics and multiple regression techniques based on the E-view 9.0 software as the method of data analysis. The results revealed that debt to equity has an insignificant positive impact on return on assets, debt to capital employed and equity to capital employed had a negative but insignificant effect on return on assets. Overall, capital structure has no significant effect (at 5% level) on firm performance in the consumer goods sector. Based on the findings, the study recommended among others that the management of consumer goods sector companies should exercise caution in considering the use of debt finance (following the Pecking order theory) in their capital mix up to the optimal limits, as debt to equity ratio provided insignificant positive effect on performance; and that further studies be conducted on other sectors of the economy to provide more robust generalized inferences. Wambua (2019) examined the effect of debt financing on the financial performance of listed firms at the Nairobi Securities Exchange. A descriptive design was used in the study and the sample size entailed the 40 non-financial firms listed in the Nairobi Securities Exchange that had complete data for the period covering 2014 to 2018. To carry out the study secondary data was used which

was extracted from the targeted firm's financial statements and reports. Analysis of data was carried out through descriptive statistical techniques, correlation analysis and multiple linear regression. The findings revealed that debt financing had a weak negative correlation that was significant (r= - 0.208, p=0.006). Firm liquidity had a significant positive and weak correlation (r= 0.205, p= 007). Firm size had a weak negative but insignificant correlation (r= -0.030, p= 0.692) while asset tangibility had a strong negative but insignificant correlation (r=-0.092, p=0.227). The study concluded that the financial performances of non-financial firms that are listed on the Nairobi Stock Exchange are affected negatively and significantly by debt financing.

Aniefor and Onatuyeh (2019) examined the effect of debt financing on the corporate performance of listed consumer goods firms in Nigeria. Based on data gleaned from the audited annual reports of fifteen (15) consumer goods firms listed in the Nigerian Stock Exchange (NSE) for the period 2006 to 2017, results of the panel regression technique revealed that total debt, long-term debt, and short-term debt to asset ratios positively influence the performance of consumer goods firms in Nigeria. Based on the findings of the study, it was recommended, among others, that there is a need for Nigerian firms to rely less on short-term debts, which form a major part of their leverage and focus more on developing internal strategies that can help improve their performance. Yinusa, Adelopo, Yulia and Samuel (2019) examined the impact of debt structure on firm performance in Nigeria as well as tested the possibility of a non-monotonic relationship between capital structure and firm performance based on the prediction of the agency cost theory of capital structure when firms use debt financing excessively. The study used a dynamic panel model on panel data of 115 listed non-financial firms in Nigeria from 1998-2015. Specifically, the paper employed the two-step generalized method of moments (GMM) estimation method that recognizes the persistence of the

dependent variable by including its lag value as an explanatory variable in the regression model. The major findings indicates a statistically significant relationship exists between capital structure and firm performance particularly when debt financing is moderately employed. However, the paper found evidence of a non-monotonic relationship between capital structure and firm performance when firms in Nigeria employed excessive debt financing which impinged on the performance of firms.

Aigbedo and Osazee (2019) examined the impact of capital structure on the performance of listed multinational firms in Nigeria. Panel data from 2008 to 2017 were sourced from twelve (12) listed multinational companies. Data were analyzed, using descriptive statistics, ADF statistics, Levin, Lin and Chut statistics, correlation analysis and panel regression techniques. The findings revealed that capital structure is significant and negatively affects multinational firms' performance in Nigeria thereby confirming that the pecking order theory is valid in Nigerian multinational firms. Other firm-specific factors of board size, firm age, firm size, and board independence considered were positively related to the performance of multinational firms in Nigeria though not significant (except for firm size). It is, therefore, recommended that managers of multinational companies should continue to prioritize such that they make use of the internally generated funds (retained earnings) first and if this source of finance has been exhausted, then they resort to the use of debt capital and eventually equity source of financing. Qudus and Ajibola (2018) examined the impact of capital structure on the financial performance of quoted manufacturing firms in Nigeria over the period 2005-2014. Panel methodology was applied to analyse the impact of capital structure on the financial performance of a sample of ten (10) quoted manufacturing firms in Nigeria. The findings of the panel ordinary least square show that a positive statistically significant relationship exists between long-term debt ratio (LTD) (0.0001), total debt ratio

(TD) (0.0065) and return on equity (ROE) while a positive statistically insignificant relationship between ROE (return on equity) and STD (Short term debt ratio). There was also a negative insignificant relationship exists between all the proxies of capital structure (LTD, STD and TD) and ROA which makes ROE a better measure of performance.

Ajayi and Araoye (2017) investigated the effect of debt structure on the financial performance of manufacturing firms in Nigeria. Secondary data derived from the published annual reports of 10 listed manufacturing firms for the period 2008-2014 were employed as the key source of data for ten sampled manufacturing firms. The relationship between debt structure and financial performance was determined using panel least square regression, variables of return on assets and returns on equity were used to measure the financial performance, also variables of debt-equity ratio, asset turnover and age of the firm were used to measure the capital structure of the sampled manufacturing firms. The regression results showed that the debt-equity ratio has a negative but statistically significant effect on financial performance. It was recommended that management should be careful when using debt as its source of financing its activities. Yimka, Oguntodu and Adelakun (2017) determined the relationship between firms' debt structure and its strength in improving the financial performance of food product firms in Nigeria. The sample size of the study comprised nine (9) food product companies that have been quoted on the floor of the Nigeria Stock Exchange over five (5) years between 2009 and 2013. The data were collected through the published annual reports of the firms selected. The study adopted the use of a multiple regression model as the tools of analysis. The findings revealed that firms' debt structure has no significant relationship with ROA, ROE, and ROCE. The study established that debt structure has a negative effect on Return on Assets and Return on Equity but a positive effect on Return on Capital Employed. It was recommended

that the management should reduce the level of gearing to enhance profitability performance.

Oladele, Omotosho and Sarafadeen (2017) investigated the effect of debt structure on the performance of Nigerian listed manufacturing firms from 2004-2013. Secondary data obtained from the annual reports of 58 quoted manufacturing firms from 16 subsectors were utilized. The result of the multiple regression revealed that debt structure has no significant effect on return on equity but has a significant effect on return on assets, earnings per share and sales growth of listed manufacturing firms in Nigeria. It was recommended that the management of Nigerian quoted manufacturing firms should work very hard to optimize the capital structure of their quoted firms to increase the returns on equity, assets, and earnings per share.

3.0 Methods

Ex-post facto research design was adopted for the study. This design was chosen to establish what relationship exists between debt structure and corporate financial performance. Ex-post facto research is systematic empirical inquiry in which the scientist does not have direct control of independent variables because their manifestations have already occurred or because they are inherently not manipulated (Egbunike & Abiahu, 2017).

3.1 Population of the Study

The study population consists of all eight (8) construction/real estate companies that are listed on the floor of the Nigerian Exchange Group (NGX) as of the end of December 2021. The population of the study is shown in Table 3.1 below:

1.	Arbico Plc.
2.	Julius Berger Nig. Plc.
3.	SFS Real Estate Investment Trust

4.	Smart Products Nigeria Plc.
5.	UACN Property Development Company Plc.
6.	Union Homes Real Estate Investment Trust
7.	UPDC Real Estate Investment Trust
8.	Roads Nig. Plc.

Source: *Nigerian Exchange Group (2021)*

Purposive sampling technique was deployed to select six (6) companies that made up the sample size of the study. Purposive sampling is a technique used to select sample participants based on a particular criterion or reason. UPDC Real Estate Investment Trust was excluded from the study on the grounds that it was listed on March 27, 2013, and so does not have complete data for the 2012 accounting period. Also, Roads Nig. Plc. was removed from the sample based on incomplete data. 2012 accounting period was chosen as the base year because, from that accounting year, quoted firms in Nigeria were mandated to be IFRS-compliant. In all, 6 quoted construction companies made up the sample size of the study and are listed below in Table 3.2.

Table 3.2: Sample Size of the Study

1.	Arbico Plc.
2.	Julius Berger Nig. Plc.
3.	SFS Real Estate Investment Trust
4.	Smart Products Nigeria Plc.
5.	UACN Property Development Company Plc. (UACN)
6.	Union Homes Real Estate Investment Trust

Source: *Nigerian Exchange Group (2021)*

The instruments used for the collection of data were the annual reports of the listed construction firms that made up the study sample. The instruments used covered the accounting period of ten years from 2012 to 2021 to generate sufficient data that could be used to make a reliable

inference. Statement of financial position was the source of the information on the debt structure of the firms, while Income Statement was the source of the information on the corporate financial performance of the firms. Information about the firms' return on assets, debt-to-asset ratio, total debt-to-equity ratio, and noncurrent debt-to-asset ratio were obtained. Mean, standard deviation, minimum and maximum values were used to carry out the descriptive analysis of the data. The descriptive analysis was used to summarize the data collected from the sampled firms to show their central tendencies and dispersion. The central tendency gave information as to how the data converged to a centre while the measures of dispersions showed how the data deviated from the mean value. In addition to the descriptive analysis of the sampled data, Panel Least Square Regression was deployed to determine whether the effect of debt structure on financial performance was positive or negative, significant, or non-significant. The level of significance used was 5% which otherwise means 0.05 alpha level. The statistical software used was Eviews version 10.

The proxies for the independent variables are debt to asset ratio, total debt-to-equity ratio, and noncurrent debt-to-asset ratio while the proxy for the dependent variable is the return on asset. Their measurements are given in **Table 3.3** below.

Table 3.3 Measurement of Variables

Variable	Type	Measurement
1. Return on Assets	Dependent	$\frac{Earnings\ after\ tax}{Total\ Assets}$
2. Debt to Asset ratio	Independent	$\frac{Total\ Liabilities}{Total\ Assets}$
3. Debt to Equity ratio	Independent	$\frac{Total\ Liabilities}{Total\ Equity}$

4. Noncurrent Debt to Asset ratio	Independent	$\frac{Noncurrent\ Liabilities}{Total\ Assets}$

Source: *Researchers' Compilation, (2022)*

The model representing the relationship between the variables is given thus:

$$ROA_{it} = \alpha_0 + \beta_1 TDAR_{it} + \beta_2 TDER_{it} + \beta_3 NDAR_{it} + \mu_{it}. \ldots\ldots \text{eqn (i)}$$

Where,

ROA	=	*Return on Asset*
TDAR	=	*Total Debt to Asset Ratio*
TDER	=	*Total Debt to Equity Ratio*
NDAR	=	*Noncurrent Debt to Asset Ratio*
α_0	=	*constant*
β_{1-3}	=	*coefficient of the independent variable*
μ	=	*Disturbance*
i	=	*Firm of interest*
t	=	*Period of interest*

4.0 Data Analysis and Result

4.1 Data Presentation

Secondary data were obtained from the annual reports of six (6) listed construction firms on the floor of the Nigerian Exchange Group. The data covered a ten (10) year accounting period spanning 2012-2021. The secondary data for the study are presented in the tables below.

Table 4.1 Presentation of Data of ROA

Year	Arbico	Julius Berger	SFS	Smart	UACN	Union Homes
2012	-.02	.04	.05	.10	.04	.05
2013	.04	.02	.05	.11	.06	.04
2014	-.06	.03	.05	.11	.03	-.10
2015	.06	.01	.06	.13	.02	.04
2016	.00	-.01	.06	.09	-.03	.03
2017	.01	.00	.06	.05	-.03	.02
2018	-.14	.02	.06	.07	-.44	.03
2019	.08	.02	.06	.03	-.45	.03
2020	.13	.02	.06	.04	-.05	.03
2021	-.05	.02	.06	.04	-.78	.04

Source: *Financial Reports of the Sampled Firms, 2012 to 2021*

The maximum ROA of Arbico was .13 in 2020 while its minimum ROA was -.14 in 2018. Julius Berger's maximum ROA was .04 in 2012 while its minimum ROA was -.01 in 2016. The highest ROA for SFS Real Estate Investment Trust was .06 from 2015 to 2021 while its lowest ROA was .05 from 2012 to 2014. Smart Products Nigeria Plc. had its highest ROA of .13 in 2015 while it had its lowest ROA of .03 in 2019. The highest ROA of UACN Property Development Company Plc. was .06 in 2013 while it had its lowest ROA of -.78 in 2021. Union Homes Real Estate Investment Trust had its highest ROA of .05 in 2012 while it had its lowest ROA of -.10 in 2014. A cross-firm examination showed that Arbico and Smart Products Nigeria Plc had ROA of .13 in 2020 and 2015, respectively, and performed better than the rest of the firms for ROA. On the other hand, UACN Property Development Company Plc., which had a ROA of -.78 in 2021 performed worse than the rest of the firms in terms of ROA.

Table 4.2 Presentation of Data of Total Debt to Asset Ratio

Year	Arbico	Julius Berger	SFS	Smart	UACN	Union Homes
2012	1.09	.92	.02	.53	.54	.05
2013	.99	.93	.04	.44	.47	.05
2014	1.04	.92	.03	.46	.46	.09
2015	.98	.92	.11	.44	.50	.04
2016	.98	.95	.11	.49	.52	.04
2017	.98	.95	.12	.43	.47	.05
2018	1.19	.94	.13	.45	.65	.11
2019	1.10	.93	.13	.47	.92	.11
2020	.92	.92	.15	.47	.55	.10
2021	.99	.93	.16	.47	.92	.13

Source: *Financial Reports of the Sampled Firms, 2012 to 2021*

The maximum TDAR of Arbico was 1.19 in 2018 while its minimum TDAR was .92 in 2020. Julius Berger's maximum TDAR was .95 in 2016 and 2017 while its minimum TDAR was .92 in 2012, 2014, 2015 and 2020. The highest TDAR for SFS Real Estate Investment Trust was .16 in 2021 while its lowest TDAR was .02 in 2012. Smart Products Nigeria Plc. had its highest TDAR of .53 in 2012 while it had its lowest TDAR of .43 in 2017. The highest TDAR of UACN Property Development Company Plc. was .92 in 2019 and 2021 while it had its lowest TDAR of .46 in 2014. Union Homes Real Estate Investment Trust had its highest TDAR of .13 in 2021 while it had its lowest TDAR of .04 in 2015 and 2016. A cross-firm examination showed that Arbico had TDAR of 1.19 in 2018 the highest TDAR among all the firms while SFS Real Estate Investment Trust had TDAR of .02 in 2012 and had the least TDAR among all the firms for the period under study.

Table 4.3 Presentation of Data of Total Debt to Equity Ratio

Year	Arbico	Julius Berger	SFS	Smart	UACN	Union Homes
2012	-12.42	11.08	.02	1.13	1.19	.06
2013	71.57	12.50	.04	.79	.90	.05
2014	-23.51	11.78	.03	.84	.85	.10
2015	60.41	12.28	.12	.80	1.01	.04
2016	58.97	18.20	.12	.95	1.07	.05
2017	41.09	17.90	.13	.76	.88	.05
2018	-6.27	15.04	.16	.82	1.85	.12
2019	-10.91	12.38	.14	.89	11.20	.12
2020	10.97	11.80	.18	.88	1.21	.12
2021	105.60	14.21	.19	.90	11.83	.15

Source: *Financial Reports of the Sampled Firms, 2012 to 2021*

The maximum TDER of Arbico was 105.60 in 2021 while its minimum TDER was -23.51 in 2014. Julius Berger's maximum TDER was 18.20 in 2016 while its minimum TDER was 11.08 in 2012. The highest TDER for SFS Real Estate Investment Trust was .19 in 2021 while its lowest TDER was .02 in 2012. Smart Products Nigeria Plc. had its highest TDER of 1.13 in 2012 while it had its lowest TDER of .76 in 2017. The highest TDER of UACN Property Development Company Plc. was 11.83 in 2021 while it had its lowest TDER of .85 in 2014. Union Homes Real Estate Investment Trust had its highest TDER of .15 in 2021 while it had its lowest TDER of .04 in 2015. A cross-firm examination showed that Arbico with the TDER of 105.60 in 2021 had the highest TDER among all the firms while same Arbico with TDER of -23.51 in 2014 had the least TDER among all the firms for the period under study.

Table 4.4 Presentation of Data of Noncurrent Debt to Asset Ratio

Year	Arbico	Julius Berger	SFS	Smart	UACN	Union Homes
2012	.36	.54	.00	.21	.19	.00
2013	.66	.46	.00	.18	.09	.00
2014	.47	.45	.00	.17	.13	.00
2015	.47	.51	.00	.14	.10	.00
2016	.54	.56	.00	.13	.06	.00
2017	.36	.54	.00	.00	.01	.00
2018	.28	.66	.00	.00	.10	.00
2019	.26	.71	.00	.00	.16	.00
2020	.23	.64	.00	.00	.21	.00
2021	.15	.69	.00	.01	.51	.00

Source: *Financial Reports of the Sampled Firms, 2012 to 2021*

The maximum NDAR of Arbico was .66 in 2013 while its minimum NDAR was .15 in 2021. Julius Berger's maximum NDAR was .71 in 2019 while its minimum NDAR was .45 in 2014. SFS Real Estate Investment Trust and Union Homes Real Estate Investment Trust had .00 NDAR from 2012 to 2021. Smart Products Nigeria Plc. had its highest NDAR of .21 in 2012 while it had its lowest NDAR of .00 in 2017, 2018, 2019 and 2020. The highest NDAR of UACN Property Development Company Plc. was .51 in 2021 while it had its lowest NDAR of .01 in 2017. A cross-firm examination showed that Julius Berger with an NDAR of .71 in 2019 had the highest NDAR among all the firms while Smart Products Nigeria Plc., SFS Real Estate Investment Trust and Union Homes Real Estate Investment Trust with NDAR of .00 in some of the years had the least NDAR among all the firms for the period under study.

4.2 Descriptive Statistical Analysis of the Data

Table 4.5 provides a summary of the descriptive statistics of the sampled companies between 2012 -2021. The descriptive analysis was aimed at summarizing the data collected from the sampled firms to show their central tendencies and dispersion.

Table 4.5 Descriptive Statistical Analysis

	ROA	TDAR	TDER	NDAR
Mean	0.002360	0.533266	7.924204	0.198982
Median	0.034650	0.474776	0.864515	0.114132
Maximum	0.131842	1.189828	105.6041	0.705148
Minimum	-0.782194	0.022437	-23.50693	0.000000
Std. Dev.	0.142481	0.378077	20.39186	0.233398
Skewness	-3.859189	0.068516	2.907719	0.846687
Kurtosis	19.22114	1.519198	12.41024	2.260339
Jarque-Bera	806.7467	5.528884	305.9299	8.536535
Probability	0.000000	0.063011	0.000000	0.014006
Sum	0.141586	31.99596	475.4522	11.93892
Sum Sq. Dev.	1.197742	8.433575	24533.86	3.214008
Observations	60	60	60	60

Source: *Researchers' Computation (2022) using E-View 10 Output*

The EViews version 10 software was used to run the descriptive analysis of the data with statistical tools such as mean, maximum value, minimum value, kurtosis, skewness, Jarque-Bera statistic, and standard deviation. Skewness measures the degree of asymmetry of the observations while Kurtosis is a measure of peakedness or flatness of the distribution of the series. The descriptive statistics result in Table 4.5 provides some insight into the nature of the selected listed construction firms that were used in the study. Firstly, it was observed that over the period under review, the sampled firms had an average positive ROA of 0.002360. Within the period under review, the firms have a maximum value of ROA of 0.131842 while the minimum value

was -0.782194. The large difference between the maximum and minimum values of ROA indicates that the performance of the construction firms differs greatly among the selected firms from 2012 to 2021. In other words, the financial performance of the firms with respect to their ROA is not similar. This extremely large value of ROA implies that some firms in the sample performed poorly while some had added value. This, therefore, means that firms with a mean value higher than or equal to 0.002360 are highly profitable firms while firms with a value below the mean of 0.002360 are low profitable firms. Hence, it can be argued that the selected firms on average had been efficient enough to generate 0.002360 naira per 1 naira asset in use. The standard deviation for ROA was 0.142481 while the skewness for ROA was -3.859189 implying that data on ROA was skewed to the left hence most values were bunched to the right of the distribution. The kurtosis for ROA was 19.22114 which was greater than 3, hence the distribution is said to be leptokurtic. Jarque-Bera Probability for ROA indicated that the data on ROA did not significantly meet the characteristics of a normal distribution since the probability value of 0.000 is less than 0.05.

The sampled firms equally had an average positive TDAR of 0.533266. Within the period under review, the firms had a maximum value of TDAR of 1.189828 while the minimum value was 0.022437. The large difference between the maximum and minimum values of TDAR indicates that the TDAR of the construction firms differed greatly among the selected firms from 2012 to 2021. In other words, the debt structure of the firms to their TDAR is not homogenous. The mean value of 0.533266 showed that the selected firms on average financed about 53.33% of their assets using debts. The standard deviation for TDAR was 0.378077 while the skewness for TDAR was 0.068516 implying that data on TDAR were skewed to the right hence most values were bunched to the left of the distribution. The kurtosis for TDAR was 1.519198 which was less than 3, hence the

distribution is said to be platykurtic. Jarque-Bera Probability for TDAR indicated that the data on TDAR significantly met the characteristics of a normal distribution since the probability value of 0.063011 is greater than 0.05. The sampled firms equally had an average positive TDER of 7.924204. Within the period under review, the firms had a maximum value of TDER of 105.6041 while the minimum value was -23.50693. The standard deviation of 20.39186 and the large difference between the maximum and minimum values of TDER indicates that the TDER of the construction firms differed greatly among the selected firms from 2012 to 2021. In other words, the debt structure of the firms to their TDER is not homogenous. The mean value of 7.924204 indicated that the shareholders' fund in the selected firms, on average, is 7.92 times the debts owed by the selected firms. The skewness for TDER was 2.907719 implying that data on TDER were skewed to the right hence most values were bunched to the left of the distribution. The kurtosis for TDER was 12.41024 which was greater than 3, hence the distribution is said to be leptokurtic. Jarque-Bera Probability for TDER indicated that the data on TDER did not significantly meet the characteristics of a normal distribution since the probability value of 0.000000 is less than 0.05.

The sampled firms equally had an average positive NDAR of 0.198982. Within the period under review, the firms had a maximum value of NDAR of 0.705148 while the minimum value was .00000. The standard deviation of 0.233398 and the large difference between the maximum and minimum values of NDAR indicates that the NDAR of the construction firms differed greatly among the selected firms from 2012 to 2021. In other words, the debt structure of the firms to their NDAR is not homogenous. The mean value of 0.198982 implied that the selected firms, on average, financed about 19.9% of their total assets through noncurrent liabilities. The skewness for NDAR was 0.846687 implying that data on NDAR was skewed to the right hence most values were bunched to the left of the distribution. The

kurtosis for NDAR was 2.260339 which was less than 3, hence the distribution is said to be platykurtic. Jarque-Bera Probability for NDAR indicated that the data on NDAR did not significantly meet the characteristics of a normal distribution since the probability value of 0.014006 is less than 0.05.

4.2.1 Hausman Test

A dataset with a cross-sectional dimension and time series such as the one used for the present study requires a panel regression approach, whereby either Fixed Effect or Random Effect Model will be applied. The Hausman Specification test was carried out to identify the most appropriate model for regression analysis.

Table 4.6 Correlated Random Effects - Hausman Test

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	48.878345	3	0.0000

Source: *Researchers' Computation (2022) using E-View 10 Output*

The results revealed a considerable difference between the Fixed Effect Model and the Random Effect Model based on which the Hausman specification test was carried out to enable the selection of the most appropriate estimator between the two models. The result of the Hausman test revealed a X^2 value of 48.878345 with a p-value of 0.000, which is statistically significant at 5%. Based on the Hausman result, the Fixed Effect Model of Panel Least Square regression was considered the best-fitted model and therefore used for analysis.

4.3 Testing of Hypotheses

Fixed Effect Model of Panel Least Square regression was used to estimate the results necessary for hypotheses testing. The regression model examined was:

$ROA_{it} = \alpha_0 + \beta_1 TDAR_{it} + \beta_2 TDER_{it} + \beta_3 NDAR_{it} + \mu_{it}$

The output of the Panel Least Square regression analysis is presented in **Table 4.7** below.

Table 4.7 Regression Result for Hypotheses Testing

Dependent Variable: ROA
Method: Panel Least Squares

Variable	Coefficient	Std. Error	t-Statistic	Prob.
TDAR	-1.205775	0.121607	-9.915348	0.0000
TDER	-0.001072	0.000544	-1.971071	0.0542
NDAR	-0.078793	0.102117	-0.771594	0.4439
C	0.669533	0.062616	10.69268	0.0000
Effects Specification				
Cross-section fixed (dummy variables)				
R-squared	0.789355	Mean dependent var		0.002360
Adjusted R-squared	0.756312	S.D. dependent var		0.142481
S.E. of regression	0.070335	Akaike info criterion		-2.333609
Sum squared resid	0.252299	Schwarz criterion		-2.019458
Log likelihood	79.00828	Hannan-Quinn criter.		-2.210727
F-statistic	23.88917	Durbin-Watson stat		1.570191
Prob(F-statistic)	0.000000			

Source: *Researchers' Computation (2022) using E-View 10 Output*

The result of the Fixed Effect Model above is an output of the regression analysis examining the effect of debt structure on the

financial performance of listed construction firms in Nigeria. The model was evaluated using R^2, Adjusted R^2, F-statistic, Prob>F and Durbin-Watson Stat. Given the value of $R^2 = 0.789355$, the number of changes in Return on Assets that can be explained by changes in debt structure (proxies by TDAR, TDER and NDAR) was 78.94%. In a situation where irrelevant predictors were added to the model, Adjusted R^2 reduces the actual coefficient of determination. Thus, the actual amount of variation in ROA explained by relevant predictors in the model was 75.63%. The F-statistic = 23.88917 with its Prob>F = 0.000000 indicated that the model significantly predicts ROA using TDAR, TDER and NDAR. In other words, the model formulated is reliable and fit for use. Durbin-Watson's stat of 1.570191 signposted that the problem of autocorrelation did not affect the model.

4.3.1 Hypothesis One

H_{o1}: *Total debt to asset ratio has no significant effect on the return on assets of quoted construction firms in Nigeria.*

H_{a1}: *Total debt to asset ratio has a significant effect on the return on assets of quoted construction firms in Nigeria.*

The regression analysis results in **Table 4.7** showed that TDAR had a coefficient value of -1.205775, a t-statistics value of -9.915348 and a probability value of 0.0000. Thus, these suggest that the Total Debt to Asset Ratio appears to have a negative influence on the ROA of listed construction firms in Nigeria. An increase in TDAR by a margin leads to a decrease in the ROA by 1.205775. The absolute t-statistics value (above 2) shows that TDAR has a strong effect on the ROA of the firms. The probability value reveals that the negative effect of the Total Debt to Asset Ratio on the Return on Assets of the firms under study is statistically significant at 5% level. This conclusion was because the Prob>t = 0.0000 is less than 0.05. Therefore, the null hypothesis was rejected while the alternate hypothesis was accepted. The total debt-to-asset ratio has a significant negative effect on the return on assets of

quoted construction firms in Nigeria (β_1 = -1.205775, Prob>t = 0.0000).

4.3.2 Hypothesis Two

H_{o2}: *Total debt to equity ratio has no significant effect on the return on assets of quoted construction firms in Nigeria.*
H_{a2}: *Total debt to equity ratio has a significant effect on the return on assets of quoted construction firms in Nigeria.*

The regression analysis results in **Table 4.7** showed that TDER had a coefficient value of -0.001072, a t-statistics value of -1.971071 and a probability value of 0.0542. Thus, these suggest that the Total Debt to Equity Ratio appears to have a negative influence on the ROA of listed construction firms in Nigeria. An increase in TDER by a margin leads to a decrease in the ROA by 0.001072. The absolute t-statistics value (below 2) shows that TDER has a weak effect on the ROA of the firms. The probability value reveals that the negative effect of the Total Debt to Equity Ratio on the Return on Assets of the firms under study is not statistically significant at 5% level. This conclusion was because the Prob>t = 0.0542 is greater than 0.05. Therefore, the null hypothesis was accepted while the alternate hypothesis was rejected. The total Debt to Equity ratio does not have a significant negative effect on the return on assets of quoted construction firms in Nigeria (β_2 = -0.001072, Prob>t = 0.0542).

4.3.3 Hypothesis Three

H_{o3}: *Noncurrent debt to asset ratio has no significant effect on the return on assets of quoted construction firms in Nigeria.*
H_{a3}: *Noncurrent debt to asset ratio has a significant effect on the return on assets of quoted construction firms in Nigeria.*

The regression analysis results in **Table 4.7** showed that NDAR had a coefficient value of -0.078793, a t-statistics value of -0.771594 and a probability value of 0.4439. Thus, these suggest that the Noncurrent Debt to Asset Ratio appears to have a negative influence on the ROA of listed construction firms in Nigeria. An increase in NDAR by a margin leads to a decrease in the ROA by 0.078793. The absolute t-statistics value (below 2) shows that NDAR has a weak effect on the ROA of the firms. The probability value reveals that the negative effect of the Noncurrent Debt to Asset Ratio on the Return on Assets of the firms under study is not statistically significant at 5% level. This conclusion was because the Prob>t = 0.4439 is greater than 0.05. Therefore, the null hypothesis was accepted while the alternate hypothesis was rejected. The noncurrent Debt to Asset ratio does not have a significant negative effect on the return on assets of quoted construction firms in Nigeria (β_3 = -0.078793, Prob>t = 0.4439).

4.4 Discussion of Findings

The output of the analysis revealed that corporate debt structure has a significant negative effect on the Return on assets of listed construction firms in Nigeria. The disaggregated results of the Fixed Effect Model of Panel Least Square regression showed that the coefficients of TDAR, TDER and NDAR are β_1 = -1.205775, β_2 = -0.001072 and β_3 = -0.078793, respectively. These coefficients of Debt Structure implied that a marginal increase in TDAR will result in a decrease in ROA by 1.205775; a unit increase in TDER will lead to a decrease in ROA by 0.001072 while increasing NDAR by 1 percentage point will lead to a decrease in ROA by 0.078793. That is to say, leveraging on debt financing contributes nothing positive to the financial success of listed construction firms in Nigeria. However, only the effect of Total Debt to Asset Ratio on ROA was shown to be significant at 5% level of significance.

The findings of this study that debt structure negatively affects the financial performance of firms were also reported by Nazir, Azam and Khalid (2021); Hasan et al. (2021); Abosede (2020); Adegbola, Nwanji, Eluyela and Fagboro (2020) and Abbas and Aziz (2019). However, the results of the present study does not agree with those of Udisifan, Akeem, Bako and Olalere (2021); Akaji, Nwadialor and Agubata (2021); Udobi, Gbajumo, Umoru, Babatunde and Ilimezekhe (2020). The reason for the dissimilarity between the results may be because of the sample data used by the different studies.

5.0 Conclusion and Recommendations

5.1 Conclusion

The financial performance of firms is ideally meant to meet the interest of various stakeholders through effective and efficient operating activities such as increased turnover and efficient asset utilization. Debt structure becomes important when the firm wants to ascertain the point whereby the combination of both equity capital and debt capital will yield the highest profit at the barest cost of capital. Between the two extremes of whole equity financing and whole debt financing, a particular debt-equity mix is to be decided. Although firms design their debt-capital mix to yield optimal returns, poor debt structure decisions lead to a possible reduction in the value derived from strategic assets. When no or less effort is made to achieve the best approximation to the optimal debt structure, the long-term solvency and stability of the firm are threatened. In addition, the inefficient management of corporate debt structure in the face of economic and political crises in Nigerian businesses today can be considered one of the major causes of loss of profit, especially in the construction sector of the Nigerian Exchange Group. This conclusion is because the study found that:

1. Total debt-to-asset ratio has a significant negative effect on the return on assets of quoted construction firms in Nigeria (β_1 = -1.205775, *p*-value = 0.0000).

2. Total debt-to-equity ratio has no significant negative effect on the return on assets of quoted construction firms in Nigeria (β_2 = -0.001072, *p*-value = 0.0542).
3. Noncurrent debt-to-asset ratio has no significant negative effect on the return on assets of quoted construction firms in Nigeria (β_3 = -0.078793, *p*-value = 0.4439).

5.2 Recommendations

The recommendations of the study are:

1. There is a need for Nigerian construction firms to rely less on debts, which form a major part of their leverage and focus more on developing internal strategies that can help improve their profitability.
2. Managers of construction firms should continue to prioritize equity financing and also make use of the internally generated funds (retained earnings) first but only resort to the use of debt capital if these sources of finance are exhausted.
3. Management should ensure that proper debt level is maintained to improve profitability and to ensure there are sufficient funds for business expansion.

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