“Economic analysis of growth finance and liquid liabilities in Nigeria”

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ECONOMIC ANALYSIS OF GROWTH FINANCE AND LIQUID LIABILITIES IN NIGERIA

Abstract

Liquid liabilities are required to develop key sectors that drive the Nigerian economy by ensuring that loans are available for investment purposes. However, controversies concerning the effectiveness of growth finance in fostering liquid liabilities in Nigeria exist. Thus, this study examines the relationship between growth finance and liquid liabilities in Nigeria, with insight into Nigeria's real sector. In achieving its objective, the study utilizes secondary data from the annual reports of the Central Bank of Nigeria (1980–2018). The study finds that gross domestic savings significantly drive liquid liabilities in the long run compared to other growth finance indicators, which include stock market development and remittance inflows. Therefore, the study recommends that to improve liquid liability, gross domestic savings, among other growth finance indicators, should be harnessed as a tool to efficiently influence liquid liabilities in the Nigerian economy. The study concludes that attention should be paid to development policies that drive all stakeholders' gross domestic savings.

Keywords credit, financial development, growth finance, market capitalization, investment management

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INTRODUCTION

In the past few decades, Nigeria has witnessed significant development of financial instruments, financial intermediaries, and financial markets, which can be attributed largely to deregulation, globalization, and advancement in technology (Ejemeyovwi & Osabuohien, 2020). Thus, there has been an eruption of the availability of numerous borrowing and financing options leading to various investment choices (Babajide, Adegboye, & Omankhanlen, 2015). For instance, households are beginning to broaden their portfolio beyond bank deposits to mutual funds, securities, and derivatives. In the same vein, firms are increasingly sourcing funds from stock and bond markets (Babajide, Adegboye, & Omankhanlen, 2015). Despite the varying pace of developments and importance of financial intermediation in the country, the following notable situation exists: while commercial banks have been playing an essential role in channeling funds to borrowers from savers, making it the singular finance provider, its role concerning intermediation, however, appears to be threatened by non-banks intermediation intense competition (Egoro & Obah, 2017).

Liquid liabilities are required to develop key sectors that drive the Nigerian economy by ensuring that excess credits are made available for investment purposes by those who need it. However, commercial banks are considered effective in fostering economic growth when it can make credit available to other sectors of the economy essential for growth. Three major sectors of concern are the energy sector (Ejemeyovwi, Adiat, & Ekong, 2019), telecommunications (Ejemeyovwi, Osabuohien, Johnson, & Bowale, 2019), and the man-

ufacturing sector (Ejemeyovwi, Osabuohien, Bowale, Abuh, Adedoyin, & Ayanda, 2019). The development of these sectors can act as a catalyst to stimulate growth and spur development. Furthermore, banks need to remain solvent, in the long run, to be able to make available long-term funds for investments by adequately managing the associated risks. Therefore, the importance of having a stable and developed banking system in any economy that can withstand external shocks and still plays its role as a financial intermediary cannot be overemphasized.

Observation of data from the Central Bank of Nigeria (CBN, 2019) has shown that liquid liabilities in Nigeria have fluctuated over time with economic trends. This fluctuation has been reflecting on the performance of the various sectors and the Nigerian economy as a whole. For instance, there was a sharp increase in 2007, which later dropped dramatically in 2010. This noticeable decline for liquid liabilities implied a decrease in investors' ability to buy and sell securities easily. However, after the crisis, liquid liabilities were far quicker at recovery than the Nigerian stock market. Following the financial outcomes in 2007 and 2010 for domestic and international markets, innovations were affected, causing a relatively stable Nigerian economy with mixed results to be achieved. Since 2009, the financial sector's control of strong liquidity remains a major problem of monetary and economic policies. Private sector credit growth has slowed substantially, in particular. Interest rates fell during the first half of 2009 due to the global financial crisis triggering tight financial liquidity and CBN assurances on all interbank loans.

Financial intermediation activity can transmit significant economic risks that can potentially disrupt the system (Demirguc-Kunt, Klapper, & Singer, 2016). The rationale for which laws and regulations closely guide modern financial intermediation activity is the awareness of these risks. Financial intermediaries are more restricted to entities that can obtain explicit corporate authorization and permission from a sole regulatory body, mostly monetary authorities or as appropriate in some economies. Given the potential for systemic risk, there appears a need to cross-examine the role of various sources of liquidity in ensuring a significant measure, aimed at strengthening investors' confidence in bank's intermediation activities (Osabuohien & Efobi, 2013; Efobi, Beecroft, & Osabuohien, 2014; Efobi, Osabuohien, & Oluwatobi, 2015).

It is a valid recommendation to examine the extent to which underwriters, servicers, trustees, and securitization process as issuers have engaged with the financial intermediation. Regulatory roles of monetary authorities essentially need to come into play in this regard (Olayiwola, Okodua, & Osabuohien, 2014). Based on the above statements, this study seeks to probe the economic effect of growth finance in ensuring a significant measure of liquid liability by adopting a standard measure of intermediation (from a growing strand of finance literature) – liquid liabilities, which is aimed at strengthening investors' confidence in bank's intermediation activities.

1. LITERATURE REVIEW

The studies on intermediation in recent times (Estrada, Park, & Ramayandi, 2010; Sarma & Pais, 2011; Swamy, 2014; Babajide, Adegboye, & Omankhanlen, 2015; Kim, Yu, & Hassan, 2018; Adeleye, Osabuohien, & Asongu, 2020) now posit a new narrative where financial intermediation is viewed not only as majorly bank-centered but also as a decentralized system with non-bank institutions, as well as specialized market playing a part in linking supply of funds to the demand of funds (Adeleye, Osabuohien, Bowale, Matthew, & Oduntan, 2018). Therefore, it might be necessary to reconsider the regulatory control boundaries since there is a possibility of financial intermediation occurring as non-bank agents. Cognately, studies contend that non-bank intermediation comes into play as banks have been supporting economic growth (De la Torre, Ize, & Schmukler, 2011; Mehrotra & Yetman, 2015; Neaime & Gaysset, 2018). More so, banks continue to provide intermediation and innovative ways of linking supply to demand of funds showing its evolving nature and capacity to adapt to modern processes (Demirguc-Kunt, Klapper, & Singer, 2017).

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In investigating the trends of output and financial intermediation in Nigeria, Agbada and Osuji (2013) utilized the data from 1981 to 2011 while paying attention to financial crisis periods. The study used variables such as Time/Savings Deposit and Demand deposits and Credits (Loan and Overdraft) to capture financial intermediation, while output was captured with Gross Domestic Products (GDP). The result showed the existence of a negative short-run relationship between financial intermediation and output in Nigeria. The global financial crisis that led to financial institutions suffering from unforeseen financial shocks could perhaps be the reason for the elements of a negative relationship in the analysis. Similarly, the study carried out by Iwedi and Onuegbu (2014) exhibited negative and positive signs after the variables were lagged twice. The study equally revealed that economic growth and financial intermediation indicators have a long-run equilibrium. The results were deduced from a time series data analysis from 1970 to 2015 using Johansen cointegration technique, Vector Autoregressive (VAR) testing approach, and the Engle-Granger causality test.

According to Bist (2018), in the study of economic growth and financial development from 1995 to 2014 covering a 20-year time frame among a selection of low-income countries using panel data cointegration analysis, financial development was found to have a significant positive influence on economic growth. Beck, Demirguc-Kunt, Levine, and Maksimovic (2000) also investigated the nature of the relationship between stock markets, banks, and economic growth using the Generalized Method of Moments (GMM) technique developed on the data for 40 countries ranging from 1976 to 1998. The result showing no existence of bias indicated a positive influence on banks and stock markets' economic growth.

Sulaiman and Aluko (2015), using the Toda-Yamamoto Granger causality test, analyzed the direction of causality between economic growth and financial intermediation from 1990 to 2013. It was observed that no causality exists from economic growth to financial intermediation, and vice versa. On the other hand, Iwedi (2016), using data from 1970 to 2015, employed the VAR testing technique to examine the short-run and long-run dynamics of financial intermediation and economic growth in Nigeria. The study's findings revealed the existence of a long-run relationship between the indicators for economic growth and financial intermediation. However, it was obvious that economic growth proxied by Gross Domestic Product is more influenced by financial intermediaries' indicator proxied by money supply than the credit to private sector proxy after using the Johansen cointegration and the Engle-Granger causality test.

While modeling the possibility of the likely relationship between economic growth and banks intermediation roles, Igbanibo and Iwedi (2015) used a selection of data from 1970 to 2014 and employed banks deposit liabilities, credit to private sector, and money supply for bank financial intermediation functions. The result showed that economic growth and financial intermediation have a long-run relationship. Likewise, Chinweoke, Onydikachi and Nwabekee (2014) discovered that the financial sector's intermediation has a positive influence on economic growth after the study used time series analysis on a dataset from 1992 to 2011.

Looking at the progress that the financial sector has experienced over the years, Shittu (2012) found that financial intermediation and economic growth have a long-run relationship after employing the 1970–2010 dataset. Also, the study of Ogiriki and Andabai (2014) indicated the existence of a highly significant relationship between economic growth and the financial sector after analyzing the data set from 1988 to 2013 to understand the relationship between financial intermediation and economic growth in Nigeria.

In summary, there exists a plethora of empirical works on the financial intermediation-growth nexus. However, a gap is observed in the literature as the role of liquid liabilities in the growth-finance relationship in Nigeria has not been fully explored. Furthermore, a comparison of the various growth finance variables' efficacy has not been explicitly and empirically identified in the literature, especially with connections to liquid liabilities. Some studies argue extending the scope of financial intermediation in an economy using having a greater number of firms involved, while some studies argue otherwise. Such differences in

findings and assumptions could be related to the fact that numerous metrics are available to capture the stock market and financial intermediation and the diverse estimation technique present and diversity in country variable and volume of the sample size and survey data. The present study is country-specific, aiming to investigate how the various growth-finance measures with attention to the liquid liability measure in Nigeria and add to knowledge the most effective growth finance measure.

2. METHOD

In carrying out this research's objective, one shall lean on finance literature (Law & Habibullah, 2009). This is specified in equation (1) as follows:

$$LL_t = \alpha_0 + \alpha_1 DGS_t + \\ + \alpha_2 SMC_t + \alpha_3 RINF_t + \varepsilon_{it}. \quad (1)$$

Equation (1) depicts a long-run relationship between financial intermediation measures (gross domestic savings, stock market capitalization, and remittances inflow) and finance for growth (ffg) measure (liquid liabilities). However, before estimating the long-run model, the existence of a long-run relationship needs to be established. Following Khan, Qayyum, and Sheikh (2005), Ang and Mckibbin (2007), Pesaran (1997), Pesaran and Shin (1999), Osabohien, Osabuohien, and Urhie (2018), an autoregressive distributed lag (ARDL) specification of equation (1) is as specified in equation (2) as follows:

$$LL_t = \tau_0 + \tau_1 LL_{t-i} + \tau_2 DGS_{t-i} + \\ + \tau_3 SMC_{t-i} + \tau_4 RINF_{t-1} + \\ + \sum_{i=0}^{P} \beta_i \Delta LL_{t-i} + \sum_{i=0}^{q_i} \gamma_i \Delta GDS_{t-i} + \\ + \sum_{i=0}^{q_2} \delta_i \Delta SMC_{t-i} + \sum_{i=0}^{q_3} \theta_i \Delta RINF_{t-i} + \varepsilon_{it}, \quad (2)$$

where ε_{it} is the white error noise term, Δ is the first difference operator, LL_t is limited liabilities (% of GDP), GDS_t is gross domestic savings (% of GDP), SMC_t is stock market capitalization limited liabilities (% of GDP), $RINF_t$ is remittance inflow (% of GDP). This Ordinary Least Squares (OLS) will be employed in this model, while for $(p+1)(q1+1)(q2+1)(q3+1)$ regressions to be estimated, the optimal lag lengths using either Schwarz information criterion or Akaike information criterion will help determine the appropriate lag lengths to be used. Following Pesaran and Shin (1995) studies, the Schwarz information criterion has more 'parsimonious' specification, which makes it more preferred to the Akaike information criterion.

In estimating the impact of finance-growth and liquid liabilities in Nigeria, this study builds on the Autoregressive Distributive Lag (ARDL) model. According to Pesaran (1997), 'the model provides a lucid and reliable approach to data description, forecasting, structural inference, and policy analysis'. To integrate the difference and un-difference series in this study, the ARDL model is most appropriate. In addition to this, preliminary analyses, which consist of a stationarity test, were also done in this study.

The non-stationarity of the data should be well defined while using the ARDL technique and the result of the stationarity does that with the order of integration. If the order of the variables to be used is greater than one, then the ARDL model cannot be used. Besides, it is necessary to carry out a stationarity test on time series data to prevent the regression from being spurious. It is not unusual for the variables to be analyzed in the ARDL model to have different optimal lag lengths, which is uncommon in other cointegration tests. However, this does not hinder the ARDL model from giving an unbiased estimation of the variables' long-run relationship. According to Nayaran and Nayaran (2004), the ARDL model with a small sample performs better than other conventional techniques given that it gives allowance for dynamics in the model to give valid *t*-statistics. The ARDL procedure, according to Pesaran and Shin (1999), is represented by equation (3):

$$\alpha(L,p) y_t = \alpha_0 + \sum_{i=1}^{k} \beta_i (L,q) x_{i,t} + \varepsilon_t, \quad (3)$$

where α is a constant term, $i\,t$ denotes the dependent variable, L is a lag operator, $x_{i,t}$ is the vector of regressors, where (i = 1, 2, 3,..., k), L, p are dependent variables, and ε_t is the disturbance term.

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Table 1. Description of variables

Source: Authors' compilation.

Variable	Descriptions and sources
The stock market capitalization to GDP ratio (SMC)	The value of listed shares divided by GDP. Market capitalization (also known as market value) is the share price times the number of shares outstanding. Listed domestic companies are the domestically incorporated companies listed on the country's stock exchanges at the end of the year. This is scoured from the Central Bank of Nigeria (2019) annual statistical bulletin
Gross domestic savings as a share of GDP (DGS)	Gross domestic savings are calculated as GDP less final consumption expenditure (total consumption). This is scoured from Central Bank of Nigeria (2019) annual statistical bulletin
Remittance inflows to GDP (RINF)	This comprises workers' remittances and compensation of employees, current transfers by migrant workers, and wages and salaries earned by non-resident workers. This data is sourced from the Central Bank of Nigeria (2019) annual statistical bulletin
Liquid liabilities (LL)	It is liquid liabilities of the financial system (currency plus demand and interest-bearing liabilities of banks and non-bank financial intermediaries) divided by GDP. This is a typical measure of financial depth' and thus of the overall size of the financial intermediary sector (King & Levine, 1993a). This is scoured from Central Bank of Nigeria (2019) annual statistical bulletin
Private credit (CPS)	The value of credits by financial intermediaries to the private sector divided by GDP. This measure of financial intermediation is more than a simple measure of financial sector size. This is scoured from Central Bank of Nigeria (2019) annual statistical bulletin

This study employs data ranging from 1980 to 2018. Most data were sourced from the Central Bank of Nigeria Statistical Bulletin. The variables used in analysis and their respective sources are described in Table 1.

3. RESULTS AND DISCUSSION

This section presents the results obtained from the empirical analysis. It sets out with the preliminary analysis of the stationarity test. The results of the unit root test are presented in Table 2.

Table 2 presents a summarized display of the unit root test results. In all the three approaches and four variations, the results clearly show that the null hypotheses of DGS have unit roots [are stationary]; this means the series is stationary at 5% level of significance; therefore, stationary at level I(0). On the contrary, the variables *LL*, *RINF*, and *SMC* are not stationary at the level both at 1% and 10% level of significance. Therefore, the null hypothesis is rejected. This means that these variables are stationary at first and, as a result, integrated of order one, I(1). With the combination of different integration levels among the variables, the

Table 2. Stationarity test

Source: Authors' computation using EViews 10 software.

Variables	@LEVEL		@1st diff.		Order of integration
	No trend	Trend	No trend	Trend	
Augmented Dickey-Fuller (ADF)					
DGS	–4.471***	–4.601***	–	–	I(0)
LL	–1.776	–2.702	–4.308***	–4.242**	I(1)
RINF	–2.036	–2.581	–6.404***	–6.323***	I(1)
SMC	–1.871	–3.238*	–6.576***	–5.000***	I(1)
Phillips-Perron (PP)					
DGS	–4.556***	–4.623***	–	–	I(0)
LL	–1.928	–2.858	–4.309***	–4.243***	I(1)
RINF	–2.055	–2.582	–6.404***	–6.323***	I(1)
SMC	–1.886	–3.254*	–6.574***	–6.473***	I(1)
Dickey-Fuller GLS (DF-GLS)					
DGS	–3.736***	–4.518***	–	–	I(0)
LL	–1.616*	–2.762	–4.370***	–4.365***	I(1)
RINF	–1.853*	–2.677	–6.499***	–6.507***	I(1)
SMC	–1.748*	–3.233**	–	–	I(0)

Note: ***, **, and * denote significance at 1%, 5%, and 10%, respectively. The Akaike information criterion was employed.

next step is to carry out for short-run and long-run dynamics using the ARDL bounds test.

Following the unit root result, the study employed the ARDL cointegration approach, which is the bounds test to investigate if a long-run relationship exists among the variables (see Table 3).

Table 3. ARDL bounds test for liquid liabilities and growth finance indicators

Source: Authors' computation using EViews 10 software.

Test statistic	Value	K
F-statistic	4.39	3
Critical value bounds		
Significance	I(0) bound	I(1) bound
10%	2.72	3.77
5%	3.23	4.35
2.5%	3.69	4.89
1%	4.29	5.61

The study further employed the ARDL cointegration approach, which is the bounds test to investigate if a long-run relationship exists among the variables. From the result in Table 3, the upper critical bound value of 4.35 at 5% level of significance is lesser than the computed F-statistic value is 4.393. This signifies that at a 5% level of significance, the null hypothesis that no cointegration occurred is rejected. Alternatively, this implies that the variables exhibit the presence of a long-run relationship.

Table 4 shows the result obtained on the model for liquid liabilities and finance-growth indicators. This study employed ARDL approach in achieving the impact of financial intermediation on finance for growth. The dependent variable is *LL*, while the independent variables are *GDS*, *RINF*, and *SMC* and lag of liquid liabilities. The selected ARDL representation for the model presented is ARDL (1, 2, 0, 0).

From the result in Table 4, the F-statistics (42.462; p = 0.000) is highly significant at 1% level. This confirms the usefulness of the model. Also, the R^2 (coefficient of determination) is 0.900, implying that about 90.0 % of the current LL variations is explained by the finance for growth indicators. Another diagnostic is that endorses the usefulness of the model is Durbin-Watson statistics. The Durbin-Watson statistics of 2.236 indicates the absence of serial correlation.

The Error Correction Model results and the long-run model are shown in Tables 5 and 6, respectively.

The error term of variables in the model does not correlate, as shown in Table 5. Following the result of the long-run cointegration, the error term ECT (–1) coefficient is –0.179, which happens to be the short-run dynamics of the variables analyzed. As shown in Table 4, at a 5% level of significance, the value for ECM (–1) is negative, indicating that the model is stable. Alternatively, it means that should

Table 4. ARDL model for liquid liabilities and finance for growth indicators

Source: Authors' computation using EViews 10 software.

Variable	Coefficient	Std. error	*t*-statistic	Prob.*
LL(–1)	0.820083***	0.071850	11.41389	0.0000
GDS	–0.073560	0.061865	–1.189042	0.2444
GDS(–1)	–0.020762	0.061536	–0.337392	0.7383
SMC	0.000132	0.000126	1.043996	0.3054
RINF	0.512996*	0.255235	2.009896	0.0542
C	–3.225706	2.670659	–1.207832	0.2372
R-squared	0.900982	Mean dependent var.		17.45357
Adjusted R-squared	0.879764	S.D. dependent var.		6.865491
S.E. of regression	2.380614	Akaike info criterion		4.749450
Log-likelihood	–76.11538	Hannan-Quinn criterion		4.856831
F-statistic	42.46285	Durbin-Watson stat.		2.236065
Prob. (F-statistic)	0.000000	–		–

Note: *** and * denote significance at 1% and 10%, respectively. Others are as defined in Table 2. The selected lag for the variables was 1, 2, 0, 0.

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disequilibrium occur in the economy in the short run; the variables will adjust with the speed rate of 17.9% to achieve equilibrium in the long run.

Table 5. Error Correction Model (ECM) for liquid liabilities and growth finance indicators

Source: Authors' computation using EViews 10 software.

Cointegrating form				
Variable	**Coefficient**	**Std. error**	***t*-statistic**	**Prob.**
D(*GDS*)	–0.073	0.060	–1.18	0.240
D(*GDS*(–1))	–0.179***	0.050	–3.28	0.002
D(*SMC*)	0.0001	0.0001	1.04	0.305
D(*RINF*)	0.510*	0.250	2.01	0.054
CointEq(–1)	–0.170**	0.071	–2.50	0.018
Cointeq = *LL* – (0.4730·*GDS* + 0.0007·*SMC* + 2.8513·*RINF* – 17.9289)				

Note: ***, **, and * denote significance at 1%, 5%, and 10%, respectively. Others are as defined in Table 2.

Table 6. Long-run model for liquid liabilities and finance for growth indicators

Source: Authors' computation using EViews 10 software.

Variable	**Coefficient**	**Std. error**	***t*-statistic**	**Prob.**
GDS	0.472955*	0.270514	1.748357	0.0914
SMC	0.000732	0.000598	1.224833	0.2308
RINF	2.851298	2.003182	1.423384	0.1657
C	–17.928887	16.503609	–1.086362	0.2866

Note: * denotes significance at 10%. Others are as defined in Table 2.

The result in Table 6 shows the long-run dynamics of the relationship between *LL* and finance-growth indicators. As seen in the result, a positive and significant relationship exists between *GDS* and *LL* at a 10% significance level. This implies that a unit increase in *DGS* causes *LL* to increase by 0.4729 units. SMC exhibits a positive relationship with *LL*, and the positive relationship is not significant; the coefficient of *RINF* is positive and insignificant (coef. = 2.851; *p*-value = 0.165). Overall, the results show that the gross domestic savings are a significant determinant of *LL* in Nigeria. Stock market development and remittance inflow also contribute positively to the liquid liability ratio; however, the contribution level is somewhat insignificant at a 5% level of significance.

A robust liquid liability ratio has unique implications for sectors such as the Nigerian energy sector. The robust liquid liability ensures that the energy companies' intensive capital need is met due to liquidity availability through financial intermediation. This provision enables research for clean energy extraction (Fubara, Iledare, Gershon, & Ejemeyovwi, 2019), development, energy production, and distribution due to the high cost and associated high profit. Clean energy production and distribution, in turn, transmit into sustainable manufacturing practices (Ejemeyovwi, Obindah, & Doyah, 2018), inclusive growth (Ejemeyovwi, Osabuohien, & Osabohien, 2018), and overall sustainable development, which is one of the major goals to be achieved by Nigeria (Matthew, Ede, Osabohien, Ejemeyovwi, Fasina, & Akinpelumi, 2018) and the key agenda of the Sustainable Development Goals (SDGs) of the United Nations.

CONCLUSION

There has been a rising interest in the relationship between growth finance and liquid liabilities. The general consensus is that improved financial development and liquid liabilities promote growth by efficiently allocating resources. However, little is known about the effects of growth finance on liquid liabilities of banks. The level of financial sector supervision has a bearing on the enforcement of bank regulation and the effectiveness with which supervisory discretion is applied to deal with funds' channeling. Central banks are best placed to act as lender of last resort and supplier of adequate liquidity to the financial sector and the Nigerian economy's real sector.

The study finds that gross domestic savings significantly drive growth finance in the long run. The conclusion drawn from the study's findings is that given the various finance sources in the Nigerian economy, gross domestic savings are more efficient in influencing liquid liabilities. This implies that to finance growth efficiently in the Nigerian economy, attention should be paid to liquid liability development policies such as driving gross domestic savings by all stakeholders spearheaded by the Central Bank and Nigerian financial institutions. Furthermore, attention should be paid to the Nigerian energy sector and

the real sector as a whole, as they can be both a source of liquid liability and a viable investment option. As indicated by McKinnon (1973) and Gurley and Shaw (1967), this is intended to improve the efficiency of capital accumulation and/or increase the level of savings and, therefore, increase investment. The Central Bank of Nigeria, as the monetary authority, should promote and enforce strong regulations to enhance credit channeling that will undoubtedly lead to growth in the economy as investors will be motivated to invest. Achieving this requires the provision of adequate physical and financial infrastructure and low liquidity to breach the gap between the lending rate and savings rate as it is well known that investment and savings in an economy are stimulated by interest rate.

AUTHOR CONTRIBUTIONS

Conceptualization: Bello Hassan, Folorunso Ayadi.
Data curation: Bello Hassan.
Formal analysis: Bello Hassan, Jeremiah Ejemeyovwi.
Investigation: Victoria Okafor, Evans Osabuohien, Jeremiah Ejemeyovwi.
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Writing – review & editing: Victoria Okafor, Evans Osabuohien.

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