Responsiveness of Industrial Sector Growth to Commercial Banks' Credit to Industrial Sector in Nigeria

Ozor, Kelechukwu C. PhD
Department of Banking and Finance, Alex Ekwueme Federal University,
Ndufu Alike, Ebonyi State

Nwoko, Nnena Mercy, PhD
Department of Supply Chain Management, Federal University of Technology,
Owerri

Efanga, Udeme Okon, PhD
Department of Banking and Finance, Alex Ekwueme Federal University,
Ndufu Alike, Ebonyi State
udemeefanga@gmail.com

Abstract
This study is carried out to ascertain the responsiveness of industrial sector growth to commercial banks' credit to industrial sector in Nigeria. The study made use of secondary data sourced from Central Bank of Nigeria Statistical Bulletin, World Bank development indicators and Nigerian Bureau of Statistics Bulletin. The ex-post facto research design was employed to ascertain how industrial sector growth response to commercial banks' credit to the same sector in Nigeria. The study used Industrial contribution to Growth in Gross Domestic Product as the dependent variable while Bank Credit to the Manufacturing Sector at time, Bank Credit to Mining/Quarrying, Solid Minerals/Oil and Gas Sector, inflation rate and interest rate were used as the independent variables. Results of data analysis revealed that one-lag period in industrial growth (0.0000) had significant impact on industrial output growth in Nigeria from 1981 – 2023. Similarly, banks' credit to mining, quarrying and solid minerals (Bmqs) at current (0.0418) and one-lag (0.0755) periods were statistically significant at 5% and 10% which means that it impacted positively on growth in industrial output. Correspondingly, inflation rate (infl) in the current (0.0009) and one lag (0.0006) periods had significant impact on growth in industrial output at 1% level of significance level. The researcher therefore recommended that government's capital expenditure on social services other than bank credit should be tailored at providing basic infrastructures like power and good transportation networks that will attract potential and existing industrialists into the industry because the sector remains very vital to any economy. Equally important is the need for the government to revive our moribund textile industry that constitutes a reasonable chunk of our industries as well as either place a ban or increase the tariff on the importation of textiles into the country. These efforts will go a long way to reviving and creating jobs in the industry.

Introduction

The real sector is significant because it plays a crucial role in ensuring that resources (material, human, and capital) are harnessed and utilized efficiently for economic activities that enhance productive efforts and improve the welfare of citizens. This sector is equally strategic in the acquisition of factor inputs used in the manufacture of goods and services that satisfy the needs of citizens which ultimately accelerate economic growth. The strength of an economy depends largely on a vibrant real sector. It is in recognition of the importance of this sector that governments globally strive to create conducive environment that ensures rapid economic growth and development. In the words of Oduyemi (2013), the real sector is responsible for the production of goods and services (from a combination of factor resources) necessary to meet the consumption demand of the economy. The Nigerian real sector is structurally classified into three, viz - primary; secondary and tertiary sectors. According to Central Bank of Nigeria (2013), the primary sector constitutes of agriculture and natural resources; the secondary sector is mainly industry (comprising of processing and manufacturing, mining, quarrying, solid minerals, including building and construction) while the tertiary sector constitutes of services, wholesale and retail trades. The structural division of the real sector agrees with Ovia (2008) classification with the inclusion of what he called "today's new economy" termed information communication technology and services. The catalytic roles and the dynamic benefits of the real sector offer essential economic transformation that is significant to economic growth. Stressing on the importance of the sector, Oduyemi (2013) submits that it drives economic growth and development; provides indication on the standard of living of citizens; explores the effectiveness of government's macroeconomic policies; facilitates creation of economic connection with other sectors, helps in capacity building and promotes job and income generation.

Though, the real sector and economic growth are vital in an economy, the financial sector, nonetheless, is significant. It is adequate therefore, to say that the real sector and economic growth depend on the provision of adequate funds for the acquisition of essential resources (material, labour and machine) required for productive purposes. Finance (credit) is a fundamental resource for economic growth, hence it drives productive activities. The financial sector provides an appropriate avenue to pool funds together to finance economic activities; and banks as major financial institutions are at the epicentre of mobilizing and channelling funds from surplus economic units to productive users in the economy.

Acknowledging the significance of finance in economic growth, Schumpeter (1934) postulated that bank credit (finance) to entrepreneurs has positive effect on economic growth. His seminal work eighty-three years ago emphasized the important role financial institutions credits play in spurring technological innovations inherent in entrepreneurs. He further stressed that credit stimulates entrepreneurial ingenuity which facilitates productive activities that enhance economic growth. Schumpeter's treatise provoked an avalanche of global research in the past and contemporary times with an attempt to affirm or counter the theory. Among the apostles of this octogenarian theorist were scholars like Goldsmith (1969); Shaw (1973); Mckinnon (1973); Fry

(1988); Barro (1991); King and Levine (1993); Jappelli and Pagano (1994) and several others. The theory nonetheless, has in the present time continued to encourage researches on the influence of credit on economic growth and development. While some studies centre on the direction of bank credit, others study the degree and magnitude at which banks' credit stimulates growth and development in economies.

Schumpeter's hypothesis on the effect of banks' credit to stimulate economic growth further generated more debates and contributions from finance researchers. Some of the scholars stressed on the development of the financial sector as key to proper and adequate channelling of funds to enterprises as it will simultaneously bring about long-run economic growth and development. Indeed, ample studies have articulated that economies with functional and well-developed financial systems; efficient mechanism of attracting and proficiency in allocation of funds for productive purposes benefit from economic prosperity. Stressing on proper channelling and prudent management of financial resources, Agbada and Osuji (2013) submit that managing resourcefully the financial intermediation process contributes immensely to vibrant financial system, employment and income, superior levels of output and as well enhance citizens' standard of living.

The degree to which Banks' credit acts as catalyst in economic growth and development is a function of the level of a country's financial development; access to credit and an efficient functioning of banks as financial intermediaries. Sustained economic growth is achieved amidst virile banking system that channels funds (savings) to the hands of those desirous to carrying out investment opportunities. The subsistence of functional banks with an efficient intermediation process is sine-qua-non to growth. Banks' credit affects and changes the amount of liquidity and by extension economic growth. It is on this basis that monetary authorities act as watchdogs to banks with the aim of moderating the volume of money supply; regulate inflationary trends and as well direct credit to the segments of the economy that need adequate attention that will accelerate economic growth. Owing to the importance of bank credit to the real sector, Central Bank of Nigeria has at different periods adopted various policies and reforms aimed at creating access and availability of banks' credit for the financing of viable productive ventures of the real sector. To further use banks' credit to achieve the goal of economic growth, the government adopted a variety of credit policies that will avail real sector access to credit.

Nigeria, as a nation is blessed with abundant human and natural resources and its varied climatic conditions, is second to none in the world as it supports any kind of agricultural and livestock growths for both consumption and provision of raw materials for the industries, yet an in-depth look at the major contributors to gross domestic product (GDP) reveals that agriculture, services' and industrial sectors rank highest. Nonetheless, with increases in Banks' credit and economic growth over the years of study, economic growth indices (unemployment rate, the level of income per capita, poverty) are abysmal. Worried over this situation, Sanusi again echoes that available statistics have put the national poverty level of Nigeria at 54.4 per cent while unemployment has risen to 19.7 percent by National Bureau of Statistics. Currently, these figures are 62.6% and 13.9% as at 2016 respectively. in further expression of worry, Sanusi expressed that while China and Thailand occupy a 5th and 22nd position in 2009 Global Hunger Index, Nigeria was ranked 64th. The ugly situation of Nigerian economic indicators underscores the United Nations Development Program's Annual Report (2014) that Nigeria continues to be an example to the rest of the World

on many fronts, having attained the rank of being the biggest economy in Africa after rebasing. However, juxtaposing United Nations Development Program's (UNDP) positive remarks and the poor economic growth indices of Nigeria, one is poised to ask if commercial Banks' Credit to industrial sector has any impact on economic growth in Nigeria.

Objectives of the Study

The objective of this study is to ascertain research the impact of Commercial Banks' credits to the industrial sector on the Nigerian economy.

Hypothesis of the Study

$H0_1$:   There is no significant relationship between Commercial Banks' credit to the industrial sector and growth in industrial output in Nigeria.

Conceptual Review

Banks' credit and economic growth in Nigeria

The banking industry represents a vital segment of the economy. Similar to the real sector, banks provide substantial credit required for productive and industrial activities in the economy. Banks perform major functions in the growth and development of an economy. Jhingan (2006) captures economic growth as a quantitative and continuous increase in a country's income per capita or output accompanied by increases in labour force, consumption, capital and volume of trade. For growth in output, consumption, capital and labour force; finance is critical and banks are essential agents that provide credit that foster productive initiatives and stimulate growth. While the real sector and economic growth remain critical to a nation, the financial institutions (banks) that provide the conduit through which funds (credit) that invigorate economic growth are nonetheless vital. Bank credit is the provision of access to bank loans and advances to persons, firms or government by the banking system. On this note, Branch, Cooper and Moxey (2014) assert that bank credit as an essential means of elevating standards of living and achieving economic development remain central in every economy and dominate the financial sector even as they account for an overwhelming proportion of business funds financed externally within the domestic and international markets. Hence, bank credit plays a fundamental role in the growth and development of an economy. The provision of bank credit to individuals and firms increases household consumption and investment in productive ventures respectively. The bank credit provided to the economic units has a multiplier effect that leads to a boost in economic activities which further spurs job creation; poverty reduction; increase in income per capita and literacy level; development of human capital among several other benefits. In their contribution, Safdar, Iqra, Ishfaq and Muhammad (2015) submit that increase in bank credit influences asset price and their obtained value. The scholars explain that a rise in asset price offers the owner the chance to borrow more due to wealth appreciation and further credit produces the sensation of increased wealth which makes people feel happier insofar as they are moving within the kingdom of this ring. Agbada and Osuji (2013) in their submission, propose that economic growth is fostered by raising savings, efficiently improving in the allocation of loanable funds and promoting capital accumulation.

Financial intermediation, financial development and economic growth

The world without finance is unimaginable. Financial intermediation remains an integral function of financial institutions. Financial intermediation is achieved through the mobilization of funds from the surplus–spending groups and simultaneously channelling same to deficit-consuming

economic units for productive purposes. The judicious use of the funds by the productive sector culminates into economic growth and improvement of the welfare of citizens. A notable economist, William Schumpeter in 1934 identified the critical role financial institutions play in facilitating technological innovations through credits given to entrepreneurs. Schumpeter stressed that funds granted to entrepreneurs with innovative and productive ideas consequently enhance economic growth. This treatise by the prominent economist provoked and attracted chronicle of literature and empirical studies in finance- growth nexus all over the globe, then and thereafter. Kasekende (2008), an advocate of Schumpeter and some other researchers emphasized that the mobilization and transfer of funds by financial intermediaries to deficit economic units are not enough to stimulate economic growth but rather a financial system that is active, well organized and capable to ease external finance difficulties that impede industrial expansion and output of firms, hence, will foster and facilitate economic growth. These scholars, however, are opposed to a weak and inefficient financial system with its attendant risk of failure and poor fund accessibility that retards economic growth. It is of note therefore, that economic growth is facilitated under a healthy and functional financial system that offers adequate savings mobilization from the public; ease of transmission of such funds to entrepreneurs with productive investments which culminates to ultimate risk diversification.

It is important to note that an adequate fund mobilization by financial intermediaries leads, amongst several others to amassing of physical and human capital speedily; faster technological progress, real sector growth, and economic development. Contributing to the advantages of an efficient financial system, Thorsten (2013) adds that it enhances economic development by pooling savings from many individual savers thereby assisting to surmount indivisibilities in investment, permits exploitation of economies of scale, aids in liquidity risk reduction and further promotes long-term investment. Therefore, an economic growth process demands for an efficient financial system and accessibility to investible funds. Although these factors may not be adequate conditions but certainly essential conditions for output growth. In assessing credit availability function of financial institutions, Oluitan (2012) submits that financial intermediaries, through credit availability permit the realization of increased output and employment which are important for economic growth. Unarguably, amble evidence abounds to portray that countries that have benefited or benefitting from economic prosperity are linked to economies with active and effective financial system that provide sufficient and proper mechanisms of funds' mobilization and distribution to productive investments. Similarly, Sanusi (2002), stressed that efficient financial intermediation contributes to superior level of output, employment, and income which invariably enhance the standard of living of the citizens. This, nevertheless, is one of the core rationales for the constant reforms experienced by the Nigerian financial system with the objective of making the financial institutions responsive to an efficient fund mobilization and allocation to the deficit economic units to meet their funds' need so as to accelerate growth in the economy. However, to ensure adequate credit mobilization and availability by financial intermediaries especially banks, the Central Bank of Nigeria recently stressed on the need importance of financial inclusion of citizens. In furtherance of this objective, the apex launched policies like the cashless economy, automated teller machines (ATM) and Bank Verification Number (BVN). Stressing on an inclusive financial system, Olowofeso, Adeleke and Udoji (2015) add that "a strong and inclusive financial system and availability of investable funds play vital roles in financing

economic projects". The reason is that access to credit increases the productive capacity of firms and enhances their potential to grow.

Industrial sector

The industrial sector is comprised of manufacturing; crude petroleum; solid minerals; building and construction; and mining and quarrying. Manufacturing segment is responsible for the processing of inputs from the primary sector into either semi-finished or finished good. Crude petroleum and solid minerals involve the extraction and exploration of crude oil, tin ore, coal and other solid minerals. Prior to the finding of crude oil in the 1970s, the manufacturing sector thrived and contributed meaningfully to gross domestic product. Although the agricultural sector, like the manufacturing segment of the industry lost its glory due to neglect with the advent of crude petroleum, gas production and exploration. By extension too, tin ore and coal that were the primary mining activities of the citizens in the 1960s and 1970s lost their glory as one of the main sources of government revenue. These two foremost solid minerals (tin ore and coal) have gone into extinction during the last three decades or more. It is necessary to emphasize that the increasing contribution of crude petroleum and gas in aggregate gross domestic product is not attributable to the refining of crude oil or an enhanced industrial components of petrochemicals but accounted by crude oil production.

The manufacturing segment is comprised of micro; small; medium and large scale enterprises engaged in agro based businesses, cottage and handicrafts. Nigeria, as an independent nation in 1960, embarked on various policies and programmes (including indigenization decree of 1974) as enshrined in Nigerian's development plans aimed at transforming the country from its predominantly agrarian nature, to a highly industrialized economy. The decline in Gross Domestic Product (GDP) contribution by the industrial sector is attributed to various factors including inconsistencies and reversals of policies, and infrastructural bottlenecks. Other factors include: overdependence on foreign raw materials inputs; poor foreign exchange earnings; low patronage of domestic goods by citizens owing to their preference to foreign substitutes; double taxation; absence or poor power generation and inaccessibility to credits. Statistically, industrial sector's contribution to total gross domestic product in the past ten years is relatively low when compared to the other sectors of the economy. For instance, manufacturing contributed 3.8%; 4.02%; 4.17%; 4.16%; 4.23%, 9.35% and 9.28%, in 2005; 2007; 2009; 2011; 2013, 2015 and 2016 respectively to total Gross Domestic Product.

The decline in industrial sector's contribution to the gross domestic product in the past decade especially the manufacturing segment is worrisome due to its adverse effect on the economy, i.e. unemployment; low productivity; poverty; crime and depletion of foreign reserve.

Theoretical Review

Financial liberalization hypothesis

This study is anchored on Financial liberalization theory.

Financial liberalization theory was developed by McKinnon (1973) and Shaw (1973) as a counter to theory of financial repression that is considered as anti-market forces in allocating credit to the economy. The advocates of the hypothesis postulates that artificial ceilings on interest rates by created developing countries many a time lead to reduction in savings, capital accumulation and creation of disincentive in efficient allocation of resources. The duo asserted that free interaction of market forces determines the appropriate pricing of financial resources thereby stimulating

savings and investment. The underlying assumption of the hypothesis is that savings respond to interest rates, and with higher savings rates, higher level of investment is financed and this eventually leads to economic growth. In the view of the supporters of the theory, financial liberalization is akin to higher savings rates and increased level of investment and growth.

Supporting the hypothesis, Gemech and Struthers (2003), Stulz (1999) and Mishkin (2001) assert that financial liberalization helps in improving the functioning of financial systems; increase availability of funds and allow cross-country risk diversifications; nonetheless, it reduces adverse selection and moral hazard; fosters transparency and accountability and lessens liquidity problems in financial markets while ensuring that financial resources are channeled to their most productive uses irrespective of country of need.

Accordingly, the theory irrespective of its numerous proponents has its critics. It is argued that notwithstanding the pros of financial liberalization, the theory is an anathema to countries with poor corporate governance and low legal protection. Some antagonists of the theory proffer that financial liberalization leads to macroeconomic instability in some countries. In his analogy on the weakness of the theory, Diaz-Alejandro (1985) posits that in an attempt to end financial repression in Latin American economies during the 1970s, liberalization of the financial sector led to crises that resulted in overall failoure of institutions and low-domestic savings.

Empirical Review

Omosebi and Saheed (2016) examined the relationship between agricultural credit and economic growth in Nigeria. The study collected data from Central Bank of Nigeria Statistical Bulletin and National Bureau of Statistics while the coverage period was, 1986-2014. The study used Autoregressive Distributed Lag (ARDL) method of regression analysis to investigate the relationships of the variables. The findings revealed that both short and long run relationships existed between agricultural credit and economic growth during the period covered by the study. Similarly, the control variables of real exchange rate and private domestic investment have positive effect on economic growth while inflation rate has an inverse relationship with the predictor variable.

Adenkule, Salami and Adedipe (2013) carried out a study on the impact of financial sector development on economic growth in Nigeria, 1992 - 2008. During the conduct of the research financial development was proxied by these variables - ratio of liquidity liabilities to Gross Domestic Product, interest rate, ratio of credit to private sector to Gross Domestic Product while real gross domestic product was a measure for economic growth. By using the Ordinary Least Square (OLS) method of regression for estimation and analysis, the study found that only interest rate was conformed to apriori expectation while other explanatory variables were statistically insignificant, though the overall statistics showed that independent variables explained 74 percent of the variation in the dependent variable. The result also showed that the relationship between finance and real sectors remain weak and could not propel the needed growth towards Vision 202020.

An empirical study to investigate the relationship between financial development and economic growth was carried out by Ayadi, Arbak, Naceur and Groen (2013) across the Mediterranean during the period 1985-2009, using a sample of countries. The results showed that credit to the private sector and bank deposits inversely related to gross domestic product during the study. The

study attributed the result to weak financial allocation and supervision within the Mediterranean region and the prevailing deficiencies in credit allocation in the economies sampled.

In evaluating the empirical relationship between the economic growth of Nigeria and private sector Bank' Credit during the period, 1974 - 2010, Aliero, Abdullah and Adamu (2013) employed the Autoregressive Distributed Lag Bound (ARDL) technique for estimation and analysis. The findings from the study revealed that there is prevalence of significant long-run relationship between private sector banks' credit and Nigeria's economic growth. However, the Pair- wise Granger test indicated the absence of the study variables to Granger cause the other.

Aliyu and Yusuf (2013) investigated the impact of credit to the private sector on real sector growth of Nigeria with a view to assessing the impact of credit to private sector on real sector growth. Aggregate time series data from 1986 - 2011 and multiple regression model for estimation were used for the study. The result of coefficient of determination revealed a 96.1% variation between credit to private sector (CPS) and real sector growth in Nigeria. The findings showed that credit to the private sector statistically impact on real sector output in Nigeria.

In a study to assess the strength of Banks' Credit on Nigeria's economic growth, Ugoani (2013) used the survey research design to examine the relationships of the study variables. Data generated were analysed through tables, frequencies, percentages and the Chi square statistics. The result of the findings showed that bank credit has significant relationship with economic growth and socio-infrastructural development.

Onuorah and Ozurumba (2013) studied the relevance of Banks' credit as an aid to economic growth in Nigeria, from 1980 – 2011 and used secondary data from the sectoral distribution of Banks' credit to the economy. Diagnostic and estimation tests that include unit root, causality and Co-integration Vector Autoregressive (VAR) model were used to test for stability and causality effects in the variables. The results of the analysis showed that Banks' credit to Production; General Commerce; Services and Others' Sectors did not Granger cause gross domestic product rather gross domestic product exerted influence on the subsectors of real sector.

An empirical study by Udoh and Ogbuagu (2012) was carried out to investigate the influence of financial sector development on industrial production in Nigeria, using an autoregressive distributed lag (ARDL) cointegration technique on an annual time series data from 1970 – 2009. The scholars found in their study the existence of cointegration relationship between the predictor and explainable variables in the study. The result of the analysis likewise revealed the long-run and short-run dynamic coefficients of financial sector development variables exert an inverse and significant influence on industrial production in Nigeria during the study period.

Egbetunde (2012) examined the relationship between commercial Banks' credit indicators and rural economic growth in Nigeria, from 1982-2009. The variables used in the study include gross domestic product, rural deposits with Commercial Banks and Commercial Banks' loan to rural areas. The result showed that there exists one co-integration relationship among the variables in the study. The evidence of multi-variant co-integration test suggested that Commercial Banks' credit indicators and rural economic growth indicator are co-integrated, which means that the variables move together in the long-run.

Chisasa and Makina (2015) empirically examined the dynamic relationship between banks' credit and agricultural output in South Africa by using annual time series data from 1970 to 2011. Johansen cointegration test and Error Correction Model were employed in the study for estimation

purposes. The results from the findings showed that bank credit and agricultural output co-integrated in the long-run, credit and capital formation have positive and significant impact on agricultural output while error correction model indicated that, in the short-run there was a negative impact of bank credit on agricultural output which is a reflection of the uncertainties of institutional credit in South Africa. However, the positive of error correction model showed that agricultural gross domestic product rapidly adjusts to short term disturbances, an indication that there is no room for tardiness in the sector.

An empirical investigation was done by Murtala, Siba, Ahmad, Muhammad and Ali (2015) to establish the relationship that exists between financial intermediaries and economic growth in Nigeria. Annual time series data from 1970 - 2013 was used to analyse the long-run and short-run relationship between the development of financial intermediaries and economic growth and the direction of causality relationship between the indicators. The stationarity test showed that the variables were integrated at first difference and there was co-integration between the series and the presence of a structural break in 1987, 1992 and 1996. The bound test for co-integration showed a stable long-run relationship between the indicators of financial intermediaries and economic growth while the coefficient of error correction was statistically significant. The findings revealed however, that bank credit has a negative influence on economic growth; causality test revealed a bi-directional relationship between bank credit and economic growth while a unidirectional causality moved from economic growth to insurance premium and value of stock transactions during the study frame.

The current study by Safdar, Iqra, Ishfaq and Muhammad (2015) investigated the relationship between bank credit to private sector and economic growth in Pakistan, ranging from 1973 - 2013. Economic growth was the dependent variable in the study while bank credit to private sector, interest rate, inflation and investment to Gross Domestic Product and government consumptions were the independent variables. Data was collected from World Bank Indicators. Unit root test established stationarity of variables in the study. Co-integration VECUM and Granger causality tests were employed to test relationships, causality effects and analyse the impact of bank credit on economic growth. The findings from the analysis revealed that Bank credit has a strong relationship with economic progression and in the short-term, the relationship between the variables was significant. The study further showed that Bank credit has an adverse impact on economic growth in Pakistan.

Mikhail (2015) studied the causality relationship between the ratio of domestic private credit to gross domestic product and growth in the real gross domestic product per capita using a framework of country-by-country time-series for twenty four OECD economies, from 1980–2013. A proposed threefold methodology that included - lag-augmented Vector Auto-Regressive Granger causality tests; Breitung-Candelon causality tests and causal inference based on a Fully Modified Ordinary Least Square (FMOLS) approach were used to test for causal linkages. The results revealed that the three tests in 12 out of 24 countries in the sample, yielded uniform results in terms of causality presence (absence) and direction. Causality relationship from credit depth to economic growth was found in UK, Australia, Switzerland, and Greece, hence, refuting the findings that financial development shifts from a supply-leading to the demand-following pattern as economic development proceeds.

Suna (2015) investigated the effect of domestic credits created by banking sector on macroeconomic variables for ten selected European countries by using annual panel data from 2006-2012 and regression model for estimation. The result of the study revealed that domestic credits created by banking sector for ten European countries has no effect on inflation but affected economic growth.

Methodology

Research design

This study adopted the ex-post facto research design. The data for this research work were obtained from the following sources: Central Bank of Nigeria Statistical Bulletin for various years, Central Bank of Nigeria Economic and Financial Review for various years, National Bureau of Statistics (NBS) for various years and World Economic Indicators.

Model Specification

This study adapted the model used by Omosebi and Saheed (2016). This study adopted real gross domestic product (RGDP) as proxy for economic growth.

Thus, the model is mathematically represented in this form:

$\Delta Igdp = f (Bmfg, Bmqs, infl, lend)$

Econometrically, the functional model is specified thus:

$\Delta Igdp_t = \beta_0 + \beta_1(Bmfg_t) + \beta_2(Bmqs_t) + \beta_3(infl_t) + \beta_4(lend_t) + \mu_t$

Putting some of the above relationships in their semi-natural logarithm form, the model is thus expressed as follows:

$\Delta Igdp_t = \beta_0 + \beta_1 logBmfg_t + \beta_2 logBmqs_t + \beta_3 infl_t + \beta_4 Lend_t + \mu_t$

Where:

Log = Natural Logarithm

$\Delta Igdp_t$ = Industrial contribution to Growth in Gross Domestic Product at time t

$Bmfg_t$ = Bank Credit to the Manufacturing Sector at time t

$Bmqs_t$ = Bank Credit to Mining/Quarrying, Solid Minerals/Oil and Gas Sector at time t

$infl_t$ = Inflation rate proxied by consumer price index at time t

$lend_t$ = Interest rate proxied by commercial banks' lending rate at time t

μ = stochastic or error term

t = time series

β_0 = Constant

$\beta_1 - \beta_4$ = Coefficients of the explanatory variables

Method of Data Analysis

The time series data sets were analysed using Autoregressive Distributed Lag (ARDL) method of Least Square Regressions form. The choice of Autoregressive Distributed Lag (ARDL) method of estimation is because it offers built-in lag-length selection methods and contains lags of the dependent and explanatory variables as regressors as well as post-estimation views.

Data Analysis

The analysis of data was carried out with regards to trend; descriptive; stationarity; lag selection; co-integration and ARDL regression estimations.

Trend analysis on industrial GDP and explanatory variables

The analysis shows the graphical representation of the variables in model three which include:- Dependent variable (Industrial Gross Domestic Product) and independent variables that include: Banks' credit to

manufacturing (Bmfg), Banks' credit to mining, quarrying, solid minerals inclusive of Oil and Gas sector i.e. (Bmqs); inflation (infl) and lending (lend) rates.
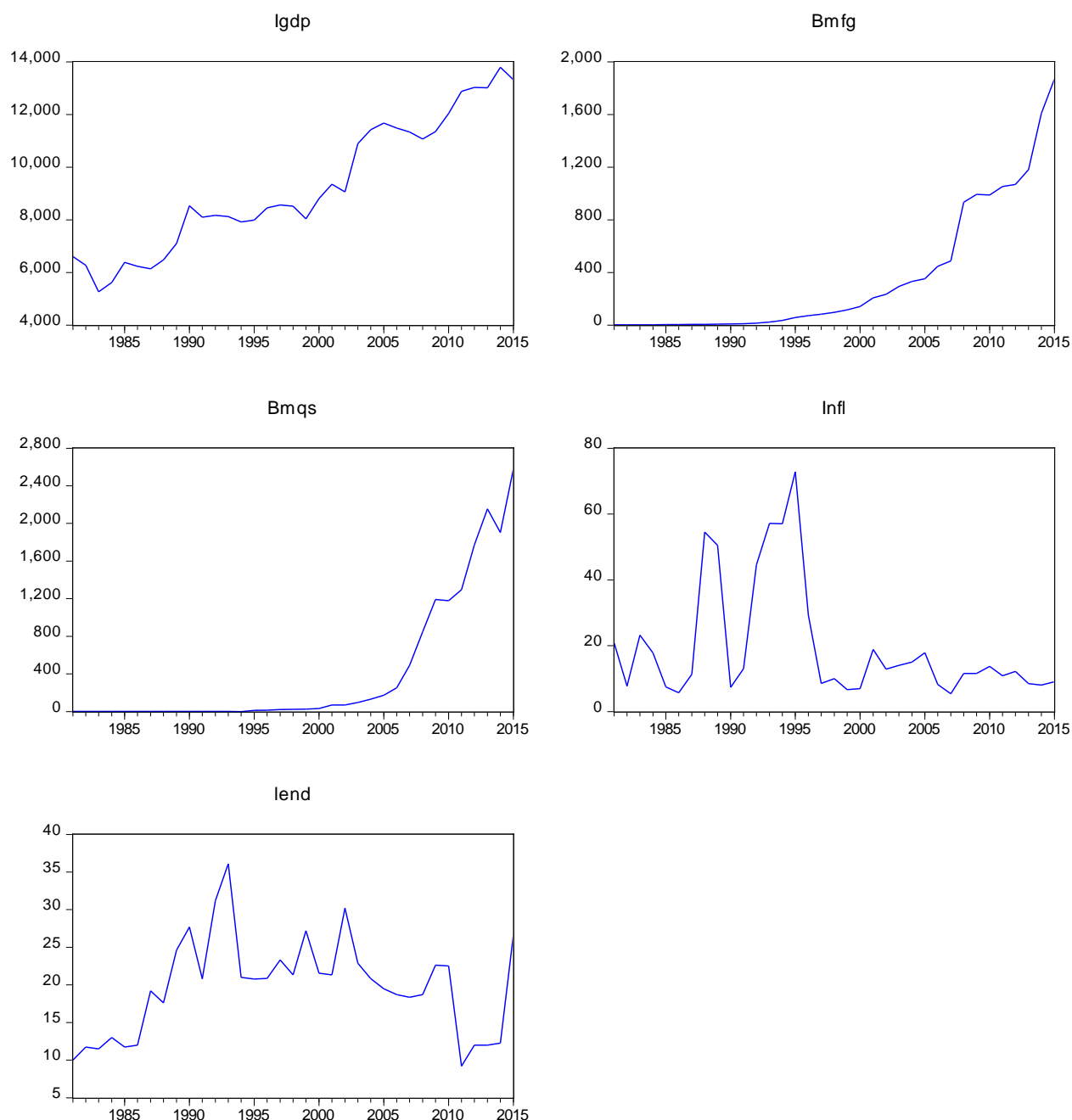

Figure 1 – Trend Analysis of Industrial GDP and Explanatory Variables
Source: Researcher's Compilation from E-views 9.0 output
Figure 1 above shows positive and uneven movement in Industrial output during the study period.
Banks' credit to manufacturing (Bmfg) and Banks' credit to mining, quarrying, solid minerals

(Bmqs) that are components of the industrial sector depict similar graphical trend. Noticeable increases in credit to the sectors are seen post-1995 and post 2000 in both manufacturing and mining, solid minerals respectively.

Descriptive analysis

Descriptive analysis

Below in table 1, is the descriptive analysis of the result from 140 quarterly periods used in the model of the study. The mean values of industrial GDP; Commercial banks' credit to manufacturing; mining, quarrying and solid minerals; inflation and lending rates respectively are N390.32B; N423.71B; N476.46B; 18.43% and 21.4%.

The maximum and minimum values of IGDP, N3568Billion and N71.38Billion were recorded in 1981 - 2023 respectively; similarly, the maximum and minimum values of N2215.7B and N2.44B were recorded for banks' credit to manufacturing (Bmfg) during the study period while banks' credit to mining, quarrying and solid minerals (Bmqs) has maximum and minimum values of N4103B and N0.09B respectively between 1981 and 2016. Similarly, the range of inflation and lending rates are 1.86% to 76% and 8.9% to 37.38% respectively. Jarque-Bera goodness-of-fit test of whether the data set has both skewness and kurtosis matching a normal distribution showed that our data was normally distributed and kurtosis around the value of three.

Table 1 Summary of Descriptive Statistics, Model 3 Variables

Variable	IGDP	BMFG	BMQS	INFL	LEND
Mean	390.33	423.71	476.46	20.03	21.04
Minimum	71.38	2.44	0.087	1.86	8.91
Std. Dev.	885.81	582.93	845.20	18.25	5.86
Skewness	2.98	1.49	2.24	1.86	0.03
Kurtosis	9.96	4.23	8.21	4.21	3.29
Jarque-Bera	489.84	60.38	274.96	63.32	1.04

Source: Researcher's compilation from E-views 9.0 output

Unit root test

Summary result of unit root test

	Augmented Dickey-Fuller with constant		
Variables	I(0) Level	1(1) FD	Order of Integration
ΔIgdp	-4.76939***	-8.158269***	I(0)
LBmfg	-0.733407	-4.204664***	I(1)
LBmqs	-0.294553	-3.638369***	I(1)
Infl	-2.597707*	-4.033725***	I(1)
Lend	-2.268556	-3.032004**	I(1)
Test critical values: 1% level	-3.478189	-3.478189	
5% level	-2.882433	-2.882433	
10% level	-2.577990	-2.577990	

Note: ***, ** and * denote significance at 1%, 5% and 10% levels, respectively.

Source: Researcher's compilation from E-view 9.0 version

Test of the impact of commercial banks' credit to industrial sector explanatory variables on growth of industrial output in Nigeria

This sub-hypothesis states as follows;

H01: There is no significant impact of Commercial Banks' Credit to the Industrial sector on growth of Industrial output in Nigeria.

The impact of banks' credit to the industrial sector on industrial growth in Nigeria was carried using the Autoregressive Distributed Lag approach (ARDL) with the inclusion of lags of the dependent and independent variables as regressors in the study.

Table 2: Summary of the ARDL Regression Estimation results for Lead Hypothesis 1 on the Relationship between Commercial Banks' Credit to the Industrial Sector and Industrial Growth in Nigeria.

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
ΔIGDP(-1)	1.033341	0.086028	12.01173	0.0000***
ΔIGDP(-2)	-0.157970	0.124553	-1.268298	0.2071
ΔIGDP(-3)	-0.133753	0.125840	-1.062882	0.2899
ΔIGDP(-4)	-0.137528	0.087724	-1.567735	0.1195
LBMFG	6.747455	5.785696	1.166230	0.2458
LBMQS	-22.50735	10.94192	-2.056984	0.0418**
LBMQS(-1)	18.04827	10.07042	1.792207	0.0755*
INFL	-0.263646	0.077277	-3.411724	0.0009***
INFL(-1)	0.257678	0.073148	3.522668	0.0006***
LEND	0.058145	0.089016	0.653198	0.5148
C	-7.104323	5.517798	-1.287529	0.2003
R-squared	0.823380			
Adjusted R-squared	0.809136			
F-statistic	57.80710			
Prob(F-statistic)	0.000000			
Durbin-Watson stat	1.860373			

Source: Researcher's computation from E-view 9.0 software

NB: ***; **; * = Significant @ 1%; 5% and 10% respectively

The result of ARDL estimation in table 4.9.6 showed that one-lag period in industrial growth (0.0000) had significant impact on industrial output growth in Nigeria from 1981 – 2016. Similarly, banks' credit to mining, quarrying and solid minerals (Bmqs) at current (0.0418) and one-lag (0.0755) periods were statistically significant at 5% and 10% which means that it impacted positively on growth in industrial output. Correspondingly, inflation rate (infl) in the current (0.0009) and one lag (0.0006) periods had significant impact on growth in industrial output at 1% level of significance level.

Further revelation from table 2 above, showed that commercial bank credit to the manufacturing sector met apriori expectation with positive coefficient value (6.747455) which means that a unit increase in commercial bank credit to the manufacturing sector increased growth in industrial output by 6.75 units. It was also observed that banks' credit to the manufacturing sector demonstrated insignificant impact on industrial output. On the other hand, the coefficient values of commercial bank credit to mining, quarrying and solid minerals in the current period and one lag period were (-22.50735) and (18.04827). These values depict that while growth in industrial output reduced by 22.51 units in the current period, it improved by 18.05 units in the one lag period during 1981 -2016 study.

The coefficient value of current inflation was correctly signed and in line with the apriori expectation but violated the theoretical expectation in its one-lag period even as it is statistically impacted on industrial growth in both periods. While inflation retarded growth in industrial output during the current period by 26%, it improved it by an almost equivalent percentage of 25.8%. Simultaneously, commercial bank lending rate on the other hand, contravened the apriori expectation and insignificantly impacted on industrial growth.

The result of the coefficient of determination R^2 (82.34%) explains that the total variation observed in the predictor variable (Industrial growth) was explained by the independent variables (bank credit to manufacturing, bank credit to mining, quarrying and solid minerals; inflation and bank lending rates) in Nigeria while 17.63% could be accounted by stochastic variable.

The p-value of F-statistic (0.0000) showed that the model posted a good fit. The result proved strongly that the independent variables positively influenced the predictor variable.

Durbin-Watson value of close to 2 indicated an absence of autocorrelation in the model.

Conclusion

This study is carried out to ascertain the responsiveness of industrial sector growth on commercial banks' credit to industrial sector in Nigeria. On the basis of results of data analysis, the study therefore concludes that commercial banks' credit to the economy has not performed satisfactorily, given the insignificant nature of most of the explanatory variables under all the models. Also, it is instructive to note that under all the models, most of the key explanatory variables failed the apriori expectation test.

Recommendation

Based on the findings of this study and discussions thereto, we make the following recommendation. With a revelation of an insignificant impact of bank credit to the industrial sector on Nigerian economic growth during the study, it is therefore, recommended that government's capital expenditure on social services other than bank credit should be tailored at providing basic infrastructures like power and good transportation networks that will attract potential and existing industrialists into the industry because the sector remains very vital to any economy. Equally important is the need for the government to revive our moribund textile industry that constitutes a reasonable chunk of our industries as well as either place a ban or increase the tariff on the importation of textiles into the country. These efforts will go a long way to reviving and creating jobs in the industry.

References

Acha, I. (2011). Financial intermediation by banks and economic growth in Nigeria, 1990-2008. *Journal of Economics and Sustainable Development, Vol.2*(4), 129-139.

Acha, I. (2011). Does bank financial intermediation cause growth in developing economies: The Nigerian experience. *International Business and Management, 3*(1), 156-161.

Adebiyi, M.A. (2000). Financial sector development and demand for money in Nigeria: A re-examination of McKinnon financial hypotheses. *First Bank of Nigeria Plc, Bi-Annual Review, 8*(16).

Adekunle, O.A., Salami, G.O., & Adedipe, O. A. (2013). Impact of financial sector development on the Nigerian economic growth. *American Journal of Business and Management, 2*(4).

Agbada, A.O., & Osuji, C.C. (2013). An empirical analysis of trends in financial intermediation and output in Nigeria. *Global Journal of Management and Business Research in Finance*, *13*(13), 18-27.

Aigiobenebo, T.I. & Ezirim, C.B. (2002). Impact of financial intermediation on the profitability of insurance companies in Nigeria. *First Bank of Nigeria Plc Quarterly Review*, *2*(1).

Beck T., Demirguc-Kunt A., & Levine, R. (2005). Bank supervision and corruption in lending. *NBER Working Paper* No. 11498.

Beck, T., Cull, R., & Jerome, A.T. (2005) Bank privatization and performance: Empirical evidence from Nigeria. *World Bank policy Research working paper No. 3511.*

Bencivenga, V., & Smith, B. D. (1991). Financial intermediation and economic growth. *Review of Economic Studies, 58*(194), 195-209.

Bencivenga, V.R., Smith, B.D. & Starr, R.M. (1996). Equity markets, transaction costs and capital accumulation: An illustration. *World Bank Economic Review,* 10: 241-265.

Bert S., & Dick, V.W. (2000). A critique on the theory of financial intermediation. *Journal of Banking & Finance, Elsevier, 24*, 1243-1251.

Boyreau-Debray, G. (2003). Financial intermediation and growth: Chinese style. *Policy Research Working Paper 3027*, World Bank.

Boyreau-Debray, G., & Shang-Jin, W. (2005). Pitfalls of a state-dominated financial system: The case of China, *NBER Working Paper,* 11214.

Box, G.E.P., & Jenkins, G. M. (1970). Time series analysis, forecasting and control. *San Francisco: Holden-Day*.

Branch, S., Cooper, Y., & Moxey, M. (2014). An empirical analysis of the nexus between private sector credit, economic growth, government expenditure, interest rate and inflation: Case of the Bahamas. *The Central Bank of the Bahamas, Research Department*.

Bundesbank (2005). Credit growth, bank capital and economic activity. *Deutche Bundesbank Monthly Report*, March.

Calderon, C., & Liu, L. (2003). The direction of causality between financial development and economic growth. *Elsevier Journal of Development Economics*, 72, 321– 334.

Calomiris, C., Himmelberg, C. P., & Wachtel, P. (1995). Commercial paper, corporate finance, and the business cycle: A microeconomic perspective. *Carnegie-Rochester Conference Series on Public Policy*, 42(1), 203-250.

De La Torre, A., Gozzi, J. C., & Schmukler, S. L. (2007). Financial development: Maturing and emerging policy issues. *The World Bank Research Observer, 22*(1).

Dewett, K.K. (2005). Modern economic journal of development economics theory. New Delhi: Shyam Lev Charitable Trust.

Demetriades, O. P. & Hussein, A. K. (1996). Does financial development cause economic growth? Time series evidence from 16 countries. *Journal of Development Economics*, Vol. 51.

Dermetriades P. & Audrianova, S. (2004). Financial and growth: What we know and what we need to know, *University of Leicester*.

Demirgue-Kunt, A. & Levine, R. (2008). Finance sector polices and long run growth. *The World Bank Development Research Group, Policy Research Working Paper*.

Diamond, D. W. & Dybvig, P.H. (1983). Bank runs, deposit insurance, and liquidity. *Journal of Political Economy 91*, 401-19.

Ekpenyong, D. B., & Acha, I. A. (2011). Banks and economic growth in Nigeria. *European Journal of Business and Management*, *3*(4), 155-166.

Ehigiamusoe, U.K., Umar, A., Okoro, S., Jumare, F., & Ogunyomi, R. (2015). Examining finance-led growth hypothesis in Nigeria: Challenges of policy and leadership. *National Legislative Studies, National Assembly, Abuja, Nigeria.*

Engle, R.E., & Granger, C.W.J. (1987). Co-integrated and error correction: Representation, estimation and testing. *Econometrica, 55*: 251-276.

Essien, S.N., & Akpan, N, (2007). Credit policies and private sector investment in Nigeria. *Bullion Publication of the Central Bank of Nigeria, 31(*1), 1-10.

Ewetan, O.O., & Ike, D.N. (2014). Does financial sector development promote industrialization in Nigeria? *International Journal of Research in Social Sciences, 4*(1), 17-25.

Golin, J. & Delhaise, P. (2013). The bank credit analysis handbook, A Guide for Analysts, Bankers and Investors, 2nd Ed, Singapore Pte Ltd, John Wiley & Sons.

Granger, C. (1969). Investigating causal relations by econometric models and cross-spectral methods, *Econometrica,* 37, 424–38.

Granger, C.W. & Newbold, P. (1977). The time series approach to econometric model building, in Obadan, M.I. & Iyoha, M.A. eds. (1996). Macroeconomic analysis: Tools, techniques and applications. *NCEMA,* Ibadan: Polygraphics Venture Ltd.

Granger, C.W.J. & Newbold, P. (1974): Spurious regressions in econometrics, *Journal of Econometrics* 2(2).

Greenwood, J. & Jovanovic, B. (1990). Financial development, growth, and the distribution of income. *Journal of Political Economy*, 98.

Jhingan, M.L., (2006). The economics of development and planning. (38th ed.). Delhi: Virnda Publication (P).

Johansen, S., (1991). Estimation and hypothesis testing of co-integration vectors in Gaussian vector autoregressive models. *Econometrica*. 59: 1551-1580.

Johansen, S., (1995). Likelihood-based inference in co-integrated vector autoregressive models. *Oxford: Oxford University Press.*

Jordan S. & Qi, J. (2006). Does financial development lead economic growth? The case of China. *Annals of Economics and Finance 1,* 197-217.

Josephine, N. O. (2009)*.* Analysis of bank credit on the Nigerian economic growth (1992-2008). *Jos Journal of Economics, 4*(1).

Kai, G. & Vahram, S. (2011). Determinants of bank credit in emerging market economies. *IMF Working Paper WP/11/51,* 1-20.

Mckinnon, R. (1973). Money and capital in economic development. Washington D.C.: The Brookings Institution.

Mikhail, S. (2015). Causality between credit depth and economic growth: Evidence from OECD Countries, *Bank of Finland, BOFIT Discussion Papers 15,* 4-37.

Miller, M.H. (1998). Financial markets and economic growth. *Journal of Applied Corporate Finance*, *11*, 8–14.

Mishkin, F. (2001). Financial policies and the prevention of financial crises in emerging market countries. *NBER Working Paper* No. 8087.

Modebe, N. J., Ugwuegbe, S.U., & Ugwuoke, R.O. (2014). The impact of bank credit on the growth of Nigerian economy: A co-integration approach. *Research Journal of Finance and Accounting, 5*(10), 87-95.

Murtala, B. U.; Siba, D.; Ahmad, U. G.; Muhammad R. D.; & Ali, U. A. (2015). An empirical study on the relationship between financial intermediaries and economic growth in Nigeria: A co-integration and causality analysis. *IOSR Journal of Economics and Finance, 6*(4), 15-31.

Nwaru, N.M., & Okorontah, C.F. (2014). Banks' credit as an instrument of economic growth in Nigeria. *International Journal of Business and Law Research, 2*(2), 25-33.

Nwite, S.C. (2014). Determinants of financial intermediation and its implications on economic growth in Nigeria. *British Journal of Marketing Studies, 3*(9), 49-56.

Nwosa, P.I., Ajibola, M.A., & Olufemi, M.S. (2011). Causal relationships between financial development, foreign direct investment and economic growth – The case of Nigeria. *International Journal of Business Administration, 2*(4), 93-102.

Nzotta,S.M. (2004). Money, banking and finance (theory and practice). (2nd ed.). Owerri, Nigeria: Hudson -Jude.

Obademi, O. E. & Elumaro, A. (2014). Banks and economic growth in Nigeria: A re-examination of the financial repression hypothesis. *American Journal of Business and Management, 3*(1), 1-9.

Osinubi, T. B., Amaghionyeodiwe, L. A., & Folawewo, A. F. (2002). Lag in the monetary transmission mechanism and policy effectiveness in Nigeria. *First Bank of Nigeria Quarterly Review, 2*(2).

Osuala, E. C. (1993). *Introduction to research methodology*. Onitsha, Nigeria: Africana-FEP.

Osuala, A.E. (2010). *Econometrics: Theory and problems*. ToniPrints Services.

Ovia, J. (2008). Blossoming the Nigerian economy: Real sector financing. *CBN's National Seminar on Banks & the Nigerian Economy,* February.

Patrick, H.C. (1966). Financial development and economic growth in underdeveloped countries. *Economic Development and Cultural Change, 14*(12).

Pesaran, H. M., Shin, Y., & Smith, R .J. (2001). Bounds testing approaches to the analysis of long- run relationships. *Journal of Applied Econometrics*, *16*, 289-326.

Pesaran, M. H. & Shin, Y. (1999). An autoregressive distributed lag modeling approach to co-integration analysis. Econometrics and economic theory in the 20th century, Strom, S. (ed.). The Ragnar Frisch Centennial Symposium: *Cambridge University Press*.

Phillips, P. C. B. & Perron, P. (1988). Testing for a unit root in time series regression. *Biometrika, 75*: 335-346.

Robinson, J. (1952). *The generalization of the general theory: In the rate of interest and other essays*. London: Macmillan.

Sanusi J. O. (2002). The importance of financial intermediation in sustaining economic growth and development. *The Banking Sector Review*.

Sanusi, L.S. (2010). Growth prospects for the Nigerian economy: *Convocation lecture delivered at the Igbinedion University, Eight convocation ceremony*, Okada, Edo State.

Sanusi, L.S. (2011). Growing Nigeria's real sector for employment and economic development: The role of Central Bank of Nigeria. *A paper delivered at the inaugural memorial lecture in honour of the late Professor Uzoaga at the University of Nigeria, Nsukka,* 1-26.

Scholtens, B. & Wensveen, D.V. (2000). A critique on the theory of financial intermediation. *Elsevier Journal of Banking & Finance, 24,* 1243-1251.

Scholtens, B., & Wensveen, D. V. (2003). The theory of financial intermediation: An essay on what it does (not) explain, *SUERF – The European Money and Finance Forum, Vienna,* 7-51.

Schumpeter, J. A. (1934). *The theory of economic development: An inquiry into profits, capital, Credit, interest and the business cycle.* In Redvers Opie translation from German. Cambridge, Massachusetts: Harvard University Press.

Stiglitz, J. E. (1994). The role of the state in financial markets. *Proceedings of the World Bank Annual Conference on Development Economics*.

William, Greene (2004). *Gujarati: Basic econometrics* (4th ed.). McGraw-Hill.

Yakubu, Z., & Affoi, A. Y. (2014). An analysis of commercial banks' credit on economic growth in Nigeria. *Current Research Journal of Economic Theory*, *6*(2), 11-15.