



TECHNIUM
SOCIAL SCIENCES JOURNAL

Vol. 8, 2020

**A new decade
for social changes**

www.techniumscience.com

ISSN 2668-7798



9 772668 779000

Macroeconomic variables and banking sector development: Evidence from Nigeria

Ojo Johnson Adelakun¹, Babatunde Afolabi², Uwasejike B Abuh³

¹University of KwaZulu-Natal, ²Department of Banking and Finance, Afe Babalola University, Ado Ekiti, ³Department of Banking and Finance, Afe Babalola University, Ado Ekiti
johnsonadelakun@gmail.com¹, atunde@gmail.com², joadelakun@yahoo.co.uk³

Abstract. The study assessed the relationship between Macroeconomic Variables and Development in the Nigerian Banking Sector using annual time series data. Models were specified using Ratio of Credits to Private Sector to Gross Domestic Product (GDP) as a proxy for Banking Sector Development. At the same time, GDP growth rate, Poverty, Exchange Rate, Oil Price, Poverty, Money Supply, Inflation, and Interest rates were the selected Macroeconomic Variables used in the study. Data used were sourced from the Statistical Bulletin of Central Bank of Nigeria (CBN) for various editions and estimated using ARDL Bound Test and Vector Error Correction Mechanism (VECM). The study found that there exists a long-run relationship between Macroeconomic Variables selected and Banking Sector Development. The VECM coefficients revealed that all variables except Interest Rates have negative effects on Banking Sector Development. The VECM (-1), which showed the speed of adjustment, was rightly signed and significant, indicating a long-run causality relationship running from macroeconomic variables to banking sector development. The Impulse response from restricted VAR revealed that Banking Sector responded to the Macroeconomic Variables of which GDPGR and INT were transmitting negatively to Banking Sector Development while others were transmitting positive impulses. However, the variance decomposition found that oil price, followed by GDPGR and poverty, caused more variation in Banking Sector Development. In contrast, inflation and money supply caused the least variation in Banking Sector Development. The study, therefore, concluded that selected Macroeconomic Variables have a significant long-run relationship with Banking Sector Development. It is therefore recommended, among others that, Macroeconomic indicators should be well monitored and controlled using macroeconomic instruments promptly since when they are well managed would lead to a better developed Banking Sector in Nigeria.

Keywords. Macroeconomic Variables, Credits to Private Sector, Banking Sector Development

1.0 Introduction

It is a well-known fact the world over that a virile Banking Sector is the engine room of any economy, performing very important role such as deposit mobilization, credit facilities, maturity transformation, intermediation role and many others which enhance the growth and sustainability of any economy. Therefore, the development of the banking sector concerning their size, accessibility, efficiency and stability are very essential because when the engine room, that is the Banking sector is unsound and unorganized, it cast doubt on the viability of the nation's economy and also it could trigger financial crises which can lead to economic crises

in a nation. This was supported by Mhadhi, and Bouchrika (2017) as they said that the bank performed distinct roles from other economic units hence, its weakness can cause economic crises as a result of financial crises.

Consequent on the above, this all-important sector turns out to be the most regulated in the economy. In Nigeria, series of banking reforms have been done by past and present CBN governors to ensure that, the banking sector in Nigeria compete favourably well with its counterpart in other emerging and developing economies, for the soundness of the banking sector especially because of the critical adequacy of capital, banks in Nigeria have to uphold corporate governance in all their dealings and to protect depositors' funds or that their interest is well protected. More importantly, regulation of the banking sector could also help the growth and development of the sector and hence foster economic growth.

In recent time attention has been focused on the effects of macroeconomic variables on the development of Banking Sector. This is because the extant literature has widely acknowledged the critical place the Nigerian Banking Sector in engendering economic transformation but as often seen, there are some factors which hinder the sector from performing its roles and also affects its development. Macroeconomic variables which are macroeconomic indicators have been acknowledged to be the most factors affecting the banking sector development. This was supported by Isik and Darrat (2009) who said that macroeconomic variables are the main reason for bank failure and financial crises in some of the economy. This implies that, when macroeconomic indicators fluctuate in such a way that it is difficult to control, its effects on economic units, among which is the banking sector, would be enormous.

Theoretically, macroeconomic variables according to real business cycle could affect businesses and growth. According to Dobrescu, Badea and Paicu (2012) fluctuation of macroeconomic variables causes variation in most of the financial outcome in any nation and its account for reasons why some economy grows and why some do not. Hence, this implies that macroeconomic variables are real but must be controlled to reap the benefits in the long run

However, this study is crucial because of the mixed results in this area. Most of the researches on the influence of macroeconomic variables on banking sector development have necessitated more research especially in emerging economies like Turkey, Europe Azerbaijan, Egypt, Saudi Arabia etc. More importantly, the gap was also found concerning macroeconomic variables and estimation technique used by other studies. For example, panel regression, autoregressive distributed lag and ordinary least square have been widely used but there is a dearth of studies on VECM and inclusion of oil prices as a macroeconomic variable that affect banking sector development. Hence, this study examined the impact of macroeconomic variables on Banking Sector Development in Nigeria covering the period from 1986 to 2018.

2.1 Literature Review

Fisher (1993) explained that macroeconomic indicators are derived from macroeconomic policy and he made mention of the inflation rate, budget surplus or deficit and black-market exchange premium. Inflation is said to serve as an indicator of overall government ability to manage the economy. A government is said to be producing high inflation when it has lost control of the policy objective. Hence, when the government is after the policy objective to reduce inflation, then the macroeconomic situation in such a country would be expected to change.

Macroeconomic factors are determinants that are related to the economic, industrial and legal environment that is not within the control of the banks or banking sector. They comprise variables such as gross domestic product, inflation rate, interest rate and exchange rate

(Chowdhury & Rasid, 2017 as cited by Al-Homaidi1, Tabash, Farhan & Almaqtari 2018). From the point of Mamoud (2014) banking sector may be affected by both macroeconomic indicators which are external factors and microeconomic indicators which are internal factors. The external factors are those variables that are not within what the banking sector can control such as a political, economic and legislative variables. On the other hand, the internal factors are related to bank-specific features such as property rights, liquidity, size, risks and efficiency all these are within the control of the banks.

Bhatti (2018) in his works identified several macroeconomic variables like Inflation rate (Though Consumer Price Index was used as a proxy), Interest Rate, Real Gross Domestic Product, Exchange Rates, Oil Prices, Money Supply Long term Bond Interest Rates Industrial Production etc. and all tend to either enhance the performance of aggregate economic growth and business performance. This was supported by Orogbu, Onyeizugbe and Chukwuma (2017) which explains that macroeconomic variables are those variables that are within economic environments which are interest rate, inflation rate, money supply, foreign aid revenue and many more which in one way or the other influences the performance of the economy. Therefore, these factors or variables are always studied by economy planners to know their direction and likely effects on the economy. For example, the high-interest rate could induce investment which could lead to economic performance however, high inflation affects businesses and household and it tends to erode the purchasing power of money as a result, macroeconomic variables are controlled always

According to Sokservic and Stokovac (2011), two major macroeconomic instruments are used to control macroeconomic variables most especially when they tend to transmit negative effects to the economy and they are monetary policy and fiscal policy. The monetary policy is usually used by the government through monetary authorities to control the cost of money, the supply of money, value of money and direction of credit in an economy to promote macroeconomic objectives which are growth, price stability, employment and a favourable balance of payment (Ayodeji & Ajala, 2017). Also, the use on Non- Monetary policy within the purview of the government and it is used majorly in sharpening and controlling government expenditure and revenue to achieve economic growth and stability (Ismaila & Imoughele, 2015)

Banking sector development cannot be defined without referencing first to what financial development is. According to Eryigit and Dulgeroglu (2015), financial development is a multifacet concept.

Banking sector comprises of all the baking financial institutions in an economy while financial market comprises of the stock market and money market, all carrying on the same function of intermediation in different ways. Hence, Development in the Banking Sector can be referred to a situation that progressively enabled the banking sector to perform its major functions of financial development more effectively and efficiently, in other words, the 5 key functions as stated above. The banking sector is said to be important and vital since it helps to reduce poverty, enhanced competition among firms minimize considerably financing hiccups to both households and firms and also, more importantly, facilitate the economic growth of the nation. (Aluko & Ajayi, 2018)

There are many measurements to banking sector development, they are divided into four major areas stability, access, efficiency and size (World Bank, 2006). While Size measure how deep the financial development of the Banking Industry is, the other measurements are Deposit Money Bank's asset to Gross Domestic Product (GDP), Central Bank of Nigeria's Asset to GDP, Broad Money to GDP, and Deposit Money to GDP, private credit to GDP, private credit to GDP and private credit to total deposit. For accessibility, the measurements are branch ATM density, average loan size GDP per capita, number of loans per capita, distribution of loans to

income distribution. On household access, percentage of people with a bank account, cost of opening an account while for firm access are, the requirement for obtaining loans, the value of collateral needed for a loan and percentage of firms reporting financial obstacles. For efficiency measurement, operating cost to operating income, lending deposit spread and number of days to clear a cheque. It also includes profitability measurements such as return on assets, net interest margin to gross income, the ratio of trading and FX gain over losses to total income and ratio of trading and FX to losses to total assets and lastly on stability, capital adequacy, asset quality, liquidity and sensitivity to market risk and default probability.

The theoretical underpinning of this study is anchored on the theory of Real Business Cycle it came out of the American New School of Thought in 1980. It is a product of the research work of Kydland and Prescott, Barro and King, Long and Plosser, and Prescott. The theory stated that aggregates economic growth fluctuates as a result of the economic variables instability or as a result of economic environments. Their views mainly relate to technology shocks, labour market, interest rate, the role of money, fiscal policy, prices and wages in business cycles.

According to Dobrescu *et al.* (2012), the business fluctuation is explained from three points of views. The first is from the classical economists' point of view who x-rayed the business cycle theory within the market-clearing model, the second is from the New Keynesians who attributes business fluctuations to various market failures and the third is Austrian economists who analyzed the cycle in terms of intertemporal disequilibrium.

When there is the instability of these economic variables, they tend to affect economic activities and also business decisions. This theory can also be applied to the relationship that exists between macroeconomic variables and the banking sector among nations. It is the objective of any nation to have a developed banking sector which is a veritable tool in engendering economic growth, however, fluctuations of some macroeconomic variables or indicators affect the banking sector and or any economic activities.

On the empirical fronts, Hardy and Pazarbaşıoğlu (1998) identified some signs of Banking distress which he pinned down to the relationship between macroeconomic and financial conditions. In research where cross-sectional data from 38 countries and analyzed using a panel regression and multinomial logit model framework. It found that the huge possibility of banking sector collapse was related to the worsening economic growth. The study assumed that the financial conditions are as a result of macroeconomic variables in an economy, most especially when it is not stable,

Baboucek and Jancar (2005) assessed the impact of Macroeconomic fluctuations on quality of Loans in the Czech Banking Sector for data that span a period between 1993 and 2006. The quality of Loan in the study was proxy using the ratio of non-performing loans, unemployment, inflation, credit risk loan stock, real exchange rate and M_1 were represented by macroeconomic variables. Secondary data were sourced and estimated using a vector autoregression method. It was found that a robust causal relationship exists between the quality of loans and some macroeconomic variables as shown by the impulse response analysis, that is, unemployment, inflation and credit risk shock was found to have negative influences on the NPL ratio, while other macroeconomic variables such as the loan stock, real exchange rate positively affects loan quality except M_1 . It further revealed that an accelerating NPL ratio, high unemployment and inflationary tendencies were cited as important early warning indicators of credit portfolio deterioration.

Gerlach, Peng and Shu (2005) focused on the relationship between macroeconomic developments and the banking performance in Hong Kong using annual data for 1994- 2002. The study focused on two important variables such as non-performing loan and net interest margin as the dependent variables while changes in macroeconomic variables such as real GDP

growth, CPI inflation, unemployment rate, property prices, and short-term interest rate were used as proxies for explanatory variables. It was found that macroeconomic environment changes and financial conditions have a significant impact on the banking performance; It further explained the case of a positive GDP growth shock the net interest margin seems to increase and non-performing loans start reducing; a sharp fall in property prices causes stress for the banking sector in Hong Kong; property loans are more likely to be less risky and relatively less depending on the macroeconomic environmental indicators and property prices. Shahbaz, Shamim and Aamir (2008) examined the relationship between the macroeconomic environment and the banking sector's performance in Pakistan. The dependent variable was proxied by the log of financial development while the macroeconomics variable such as real gross national product per capita, inflation, government spending, saving, remittances, and literacy rate as a proxy of human capital were all used as independent variables. Loglinear models were used to estimate the relationships among financial development measures and several macroeconomic variables that reflect general macroeconomic conditions in any country. It was found that previous policies and economic growth improved financial development in the country. Which mean that the performance of the financial sector has been significantly influenced by government spending and foreign remittances, the study identified that the following indicators such as political stability, qualified financial institutions, constant innovations of financial products, small and medium enterprise (MSE) financing, and foreign remittances are most relevant factors

Isik and Darrat (2009) concentrated on the effects of internal and external macroeconomic factors on the banking system in Turkey from 1970 to 2000. The model was specified using age, ownership, size, capital level, on-performing loans, efficiency as proxies for internal factors while external factors include prices, economic growth. Secondary data were sourced and standard probit methodology was used as the estimation technique. It was found that internal factors play an important role in survival performance of commercial banks; banks' productive performance indicators such as cost efficiency, managerial and technical and scale efficiencies are depended on the accuracy and prudence of the management; during a banking crisis in Turkey the main reasons of banks' failure seems to be a macroeconomic factor – liquidity; banks' failure in developing countries are mostly caused by macro-environmental factors rather than by internal (managerial) factors

Seferli (2010) examined macroeconomic factors on the performance of the banking sector in Azerbaijan over the period 2003–2008. The study represented the dependent variable by bank performance and the independent variables were represented by gross domestic product and inflation. Secondary data were sourced from 29 commercial banks and was analyzed using an unbalanced panel with individual random effect to the 109 data points. It was found that gross domestic product and inflation have an insignificant and significant impact on bank performance. A result which is at variance with the theoretical expectation.

Adeishvil (2013) assessed the impact of real macroeconomic indicators on financial stability covering a time scope 2008 to 2012. Financial soundness indicators such as capital adequacy and asset quality were used as the dependent variable while real economic indicators variables such as real GDP, Inflation, real effective exchange rate, interest rate, unemployment rate, and terms of trade index. Panel data were sourced from 55 countries and analyzed using panel regression of fixed and random effects. It was found that variables business cycle, unemployment rate and terms of trade index are significant in the process of predicting percentage change in non-performing loans. The variable business cycle was also important in predicting change in the capital to asset ratio. It further explained that the real exchange rate

increases change in capital to asset ratio, while inflation has a decline effect on it. Increase in the lending rates is associated with an increase in the non-performing loan.

AbdelazizTouny (2014) researched on the macroeconomic determinants on the development of the banking sector in Egypt and Saudi Arabia. The dependent variable was proxied by economic growth. However, financial liberalization, trade openness, economic globalization and monetary policies were determinants of the development of the banking sector. Johansen cointegration and panel regression were used as the main technique. The study found that economic growth has a long-run negative impact, whereas financial liberalization and the real interest rate record a significant positive effect on credit to the private sector in both countries, that is, Egypt and Saudi Arabia. It also found that economic globalization, trade openness and money supply exert a positive and significant impact on the banking sector in Egypt and Saudi Arabia

Ayunku and Etale (2014) investigated the relationship between banking sector development and economic growth in Nigeria within a temporal period from 1977 to 2010. The model was specified by representing banking sector development by changes in trade openness, credit to the private sector, domestic credit, deposit liability and interest rate while economic growth is represented by real gross domestic product. Secondary data were sourced from the CBN Statistical Bulletin and estimated using Johansen cointegration and error correction model. It found that trade openness and other variables used had a significant and positive relationship on economic growth. On the other hand, it also found that private credit and deposit liability have a negative relationship with RGDP. The study further found strong support for the existence of a short and long-run relationship between banking sector development and economic growth in Nigeria.

Singh and Sharma (2016) investigated bank-specific and macroeconomic factors that determine the liquidity of Indian banks on a data set of 59 banks from 2000 to 2013. Some of the bank-specific factors used in the study are bank size, profitability, cost of funding, capital adequacy and deposits while GDP, inflation and unemployment were the macroeconomic factors considered. Cross-sectional data from 59 banks Indian were later analyzed using OLS, fixed effect and random effect estimates. Findings revealed that bank ownership affects the liquidity of banks and that bank-specific (except the cost of funding) and macroeconomic (except unemployment) factors significantly affect bank liquidity. Furthermore, bank size and GDP were found to have a negative effect on bank liquidity. On the other hand, deposits, profitability, capital adequacy and inflation showed a positive effect on bank liquidity. Cost of funding and unemployment showed an insignificant effect on bank liquidity.

Hasanov, Bayramli and Al-Musehel (2018) investigated bank-specific and macroeconomic determinant of bank profitability in Azerbaijan using quarterly data spanning 2012 to 2017. The dependent variable was represented by return on assets, macroeconomic economics factors comprised of cyclical non-oil GDP, cyclical total GDP, inflation expectation, change in the exchange rate and change in oil price while bank-specific factors include capital bank size, liquidity risk, loans and deposit. Cross-sectional data were sourced and analyzed using panel generalized method of moments estimated technique. It was found that bank size, capital, and loans, as well as the economic cycle, inflation expectation, and oil prices, were positively related to the profitability, whereas deposits, liquidity risk, and exchange rate devaluation were negatively associated with it. Further findings revealed that bank profitability demonstrated moderate persistence and ignoring the country-specific features could lead to bias and poor performance in estimations.

3.0 Model, Data and Methodology

The ex-post facto research design was employed in this study and the study relied on the annual series data covering a time frame 1986 to 2018. Banking sector development can be measured using the traditional method or new method which covers four areas such as accessibility, size, stability and efficiency (World Bank, 2006). However, in the study banking sector development in term of size would be researched on. Hence, banking sector development which stands for dependent variable is represented by a credit to the private sector as a percentage of GDP while macroeconomic indicators such as GDP growth rate, unemployment, poverty, inflation and exchange rate. Because, the subject area of this study has not been well researched on, hence, it would be difficult to adopt a model from the existing studies.

3.1 Model Specification

The model for this study is specified in a functional form as

$$BSD = f(GDPGR, OIP, POV, INF, EXR, M_2, INT) \text{-----1}$$

Here banking sector development is represented by the ratio of CPS as a percentage to GDP.

Therefore, in a more explicit form, the model is specified as

$$CPS/GDP = \beta_0 + \beta_1 GDPGR_t + \beta_2 OIP_t + \beta_3 POV_t + \beta_4 INF_t + \beta_5 EXR_t + \beta_6 M_{2t} + \beta_7 INT_t + U_t \text{-----2}$$

Where, β_0 = constant term, CPS/GDP = ratio of private sector credit to GDP, GDPGR = gross domestic product growth rate, OIP = oil price, POV = poverty rate, INF = Inflation, EXR = exchange rate, M_2 = Broad Money supply, INT = interest rate, U = stochastic error term, $\beta_1 \dots \beta_7$ are parameters to be estimated

In this study, the modified model for macroeconomic variables and banking sector development using vector autoregression model is stated below;

$$\Delta CPSG_t = \lambda_1 + \alpha_{11} \sum CPSG_{t-1} + \alpha_{12} \sum GDPGR_{t-1} + \alpha_{13} \sum OIP_{t-1} + \alpha_{14} \sum POV_{t-1} + \alpha_{15} \sum INF_{t-1} + \alpha_{16} \sum EXR_{t-1} + \alpha_{17} \sum M2_{t-1} + \alpha_{18} \sum INT_{t-1} + ECM(-1) + \varepsilon_1 \dots \dots \dots 3$$

Where Δ = difference ve, \sum = summation, α , t-1 = lag length

3.2 Data and Estimation Technique

The study employed data from secondary sources and they are essentially from Central bank of Nigeria's Statistical Bulletins of various editions. In estimating the above-stated model as specified, the study employed the ARDL Bound Test to establish the long-run relationship while Vector Error Correction Mechanism (VECM) was adopted for the main estimation.

Table 1: Summary of Philip Perron Unit root

Stationarity test was done using Philip perron unit root. Although unit root testing is not a prerequisite for estimating ARDL as it can be applied on variables whether integrating at the level or at first difference but not at the second difference, hence, to confirm that there are no second differences variables in the model, unit root is therefore necessary.

Table 1: Philip Perron Unit Root

Variables	Critical Value	@ 1 st Diff	@ 2 nd Diff	Integration
CPS/GDP		-0.7991	-5.1324	I(1)
GDPGR		-3.0348	*****	I(0)
OIP		-1.2765	-5.2908	I(1)
POV		-2.2506	-6.6882	I(1)
INF		-2.7579	-7.0371	I(1)
EXR		-2.5153	-5.6703	I(0)

M ₂		-2.4908	-3.5761	I(1)
INT		-3.1039	*****	I(0)

Source: Authors Computation from EViews, 9

Findings revealed that variables were integrated at difference order, that is at the level I(0) and at the first difference I(1). Based on this, the study, therefore, accepts the alternate hypothesis and rejects the null hypothesis, that series is free from unit root

AEDL Bound test

Estimating the existence of a long-run relationship between Macroeconomic indicators and Banking Sector Development, the study made use of the ARDL bound test. In estimating ARDL, lag selection becomes very important, therefore, lag order selection criteria were done using lag order criteria structure from VAR environment.

The result is presented in Table 2.

Table 2: Lag Order Selection

Lag	LogL	LR	FPE	AIC	SC	HQ
0	- 219.565	NA	0.000536	15.17101	15.54466*	15.29054*
1	-143.54	106.4346*	0.000280*	14.36936	17.73223	15.44517
2	- 66.3778	66.87422	0.000337	13.49185*	19.84395	15.52394

Source: Authors Computation from EViews, 9

It was found that the ARDL bound test would be best estimated using lag 2 based on the Akaike information criteria. This is because, at lag 2, AIC gives the least value.

The result of the ARDL Bound Test is therefore presented. According to Nasaran (2005), the long-run relationship would be confirmed when f-statistics is found to be greater than the lower bound and \Upper bound, otherwise, no-cointegration would be accepted, the results are presented in Table 3.

Table 3: Summary of ARDL Bound test for Co-integration

Test Statistic	Value	K
F-statistic	4.151928	7
Critical Value Bounds		
Significance	I0 Bound	I1 Bound
10%	2.03	3.13
5%	2.32	3.5
2.50%	2.6	3.84
1%	2.96	4.26

Source: Authors Computation from EViews, 9

It was found that f-statistics of 4.1519 is greater than the lower limit bound of 2.32 and upper bound of 3.5 to 5% level of significance, indicating that macroeconomic indicators and banking

sector development moves in a long run, showing the existence of co-integration between dependent and independent variables

3.3 Estimation of VECM

Since there is the existence of a long-run relationship between macroeconomic indicators and banking sector development, the study, therefore, used VECM as an estimation method. The result is presented in Table 4.

Table 4: Summary of Vector Error Correction Mechanism

Variables	Coefficients	standard error	t-statistics	Prob
VECM	-0.9156	0.3637	-2.5171	0.0205
GDPGR	-0.0033	-0.002	-1.6857	0.5644
DLOIL	-0.0595	-0.055	-1.0818	0.9388
DLPOV	-1.1304	-0.2627	-4.3018	0.5285
INF	-0.005	-0.0007	-7.2181	0.4876
DLEXR	-0.4978	-0.0507	-9.8087	0.0727
DLM2	-0.1612	-0.0818	-1.9695	0.379
INT	0.0295	-0.0026	-11.1779	0.8555
C	-0.0075	0.0411	-0.1828	0.8567
R2= 0.7812	Adj-R2=0.6122	Chi-S= 0.786	Prob=0.345	

Source: Authors Computation from EViews, 9

Finding revealed that all variables have negative effects on banking sector development except interest rate. As it can be viewed from the table, poverty of -1.1304 has the highest negative effect on banking sector development, followed by an exchange rate of -0.4978 and money supply of -0.1612 while other variables such as GDPGR, OIP and INF have values below 10%. Furthermore, the level of significance of the variables revealed that at 5% none was significant. This implies that a unit increase GDPGR, OIP, INF, EXR and M₂ would bring about a reduction of banking sector development while a unit increase in interest rate would bring about increase in the banking sector development. The speed of adjustment, that is, VECM (-1) revealed that the coefficient was rightly signed and significant at 5% level of significance. Indicating that, disequilibrium in the short run would be incorporated in the long run and it is corrected at the speed of 91.56% annually. VECM results also confirmed that long causal relationship runs from macroeconomic indicators to banking sector development. Further to this, Wald test and its probability for testing the significance of the short-run relationship revealed that chi-square of 0.786 and its corresponding prob of 0.345 revealed that short-run relationship does not exist between macroeconomic indicators and banking sector development.

The coefficients of determination which is R² revealed that about 78.12% variation independent variable are caused by the joint effects of all the seven macroeconomic indicators, which implies that, these indicators have a great relationship with banking sector while the remaining fraction of 21.88% was accounted for by variables not included in the model. This is also confirmed by adjusted R² which revealed that explanatory variables cause variation in the dependent variable to the tune of 61.22%

3.4 Impulse Response Function Analysis

Impulse response traces out the time path of the effect of structural shocks on the dependent variable of the model. The result of the impulse response is presented in Table 5

Table 5: Summary of Response of LCPSGP

Period	DLCPSG	GDPGR	DLOIP	DLPOV	DINF	DLEXR	DLM2	INT
1	0.224930	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
2	0.121396	-0.02291	0.055760	0.035123	0.009020	0.008419	-0.01522	-0.02252
3	0.097068	-0.03584	0.053399	0.031040	0.024052	0.044155	0.046739	-0.0133
4	0.128706	-0.03517	0.019071	0.021351	0.019481	0.009642	0.003707	-0.0106
5	0.138714	-0.02304	0.045679	0.030752	0.012402	0.017287	0.010154	-0.01405
6	0.116408	-0.03102	0.038523	0.025316	0.016761	0.023071	0.017289	-0.01448
7	0.122262	-0.03143	0.039432	0.028429	0.019027	0.018944	0.015408	-0.0129
8	0.128539	-0.02852	0.036656	0.026214	0.015232	0.019873	0.012251	-0.01318
9	0.123633	-0.02986	0.039333	0.027726	0.017033	0.019111	0.014551	-0.01371
10	0.124161	-0.02975	0.038947	0.026834	0.016721	0.020164	0.014413	-0.01345

Source: Authors Computation from EViews, 9

It was revealed that Banking Sector Development was influenced by its shock or innovation in the first quarter while other variables transmitted no impulses to the banking sector. In 2nd quarter, the banking sector was reduced to 0.1213 from 0.2249 as a result of a negative shock from GDPGR, DLM2 and INT, other variables such as OIP, POV, INF and EXR transmitted positive impulses to banking sector development. It further reduced to 0.0970 in quarter 3 as a result of a negative shock from GDPGR of -0.0358 and INT of -0.0225 while other variables transmitted positively to banking sector development. From quarter 4 to 10, it was found that GDPGR and INT consistently transmitted negative shock to banking sector development while others also consistently transmitted positively to banking sector development. However, the shock from these variable causes banking sector development innovation to increase from quarter 4 of 0.1287 and 5 of 0.1387 but reduces in quarter 6 to 0.1164. In quarter 7 and quarter 8, there was also increase in the response of banking sector development from the macroeconomic variables, although it reduces in quarter 9 to 0.1236 in quarter 10, it increases to 0.1241. This result implies that more negative impulses were recorded from GDPGR and INT, thereby reducing banking sector development. On the other hand, positive impulses from the oil price, poverty, exchange rate and inflation help in enhancing the innovation of CPSC

3.5 Variance Decomposition Error

To determine the variable that causes more variation in banking sector development, variance decomposition error was estimated. Hence the results of variance decomposition error from the restricted VAR model for a forecast horizon of the first ten years is presented in Table 7.

Table 6: Variance Decomposition Error

Period	S.E.	DLCPSG	GDPGR	DLOIP	DLPOV	DINF	DLEXR	DLM2	INT
1	0.224930	100.0000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
2	0.266626	91.89937	0.738401	4.373604	1.735271	0.114454	0.099693	0.325801	0.713409
3	0.300833	82.59941	1.999155	6.586316	2.427673	0.729118	2.232592	2.669783	0.755955
4	0.331242	83.22758	2.776538	5.764042	2.417862	0.947291	1.926228	2.214623	0.725835
5	0.365073	82.95374	2.684027	6.310779	2.700065	0.895259	1.809974	1.900534	0.745625

6	0.388893	82.06291	3.001449	6.542633	2.803201	0.974699	1.946974	1.872482	0.795648
7	0.413112	81.48179	3.238754	6.709087	2.957724	1.075895	1.935658	1.798477	0.802615
8	0.437011	81.46481	3.319951	6.698908	3.002893	1.082927	1.936533	1.685737	0.808243
9	0.458831	81.16127	3.435057	6.811779	3.089215	1.120191	1.930217	1.629795	0.822473
10	0.479728	80.94303	3.527004	6.890364	3.138816	1.146212	1.942389	1.581168	0.831015

Source: Authors Computation from EViews, 9

It was found that oil price throughout the first ten quarters causes more variation in the banking sector and it ranges from 4.37 in quarter 2 to 6.89 in quarter 10. This is followed by money supply though only in quarter 3 when it recorded 2.66 but was taken over by GDPGR in quarter 4 and from quarter 6, GDPGR takes second in explaining variation in banking sector development. The third variable causing variation in the banking sector is poverty level and from quarter 5, 7, 8, 9, 10, poverty takes third in explaining variation in banking sector development. This is followed by the exchange rate, money supply, inflation but the interest rate causes the least variation in banking sector development. The results showed that fluctuation in oil price is a major macroeconomic indicator causing variation in banking sector development. However, banking sector development values have continued to fluctuate from 100 % in quarter one and continue to decline up to 80.94% in quarter 10.

3.6 Discussion of Findings

The study empirically examined the influence of Macroeconomic indicators on Nigerian Banking Sector development using annual series data spanning 1986 to 2018. The model was specified using the ratio of credit to the private sector to GDP as a proxy for banking sector development while gross domestic product growth rate, oil price, poverty, inflation exchange rate and interest rate were selected macroeconomic indicators in this study. Oil price as a macroeconomic indicator makes this work distinct from other as most did not make use of it. In Nigeria, the oil price is a very strong macroeconomic indicator to be considered as it influences the direction of the economy, revenue and expenditure pattern of government. In estimating the model, the study made use of autoregressive distributed lag bound test and VECM as an estimation technique. Findings revealed that there exists a long-run relationship between macroeconomic indicators and banking sector development in Nigeria. The result further revealed that banking sector responds more to macroeconomic indicators majorly, the GDPGR and INT were found to consistently transmitting negative impulses to banking sector thereby affecting its development level while others such as oil price, poverty, inflation, exchange rate transmitted positive impulses to banking sector development and as such, it shows that banking sector responded to these variables. The result of variance decomposition error also revealed that the most macroeconomic variable causing more variation in banking sector development is the oil price, followed by GDPGR, poverty, exchange rate while shocks from money supply and interest rate caused less variation in banking sector development. In relating the outcome of this study with existing empirical literature, it was found that the outcome of this study supported that of Hardy and Pazarbaşıoğlu (1998) who said that banking distress was caused mainly as a result of economic growth decline and increase in interest rate. The findings of this study also showed that GDPGR reduces banking sector development. This implies that, when the growth rate is sluggish or declining, it would affect the banking sector in the discharge of its intermediation role. Although, the interest rate was found to be positive with banking sector development which negates their findings. Increase in interest rate would lead to an increase in lending rate which would reduce the credit to the private sector and as a

consequence, affect the banking sector development. In the same manner, the findings of Baboucek and Jancar (2005) based on impulse response found that inflation causes a negative effect on loan quality while the exchange rate causes a positive effect on loan quality. This result is supported by the findings of this study which also found a negative effect of inflation on banking sector development. Though, Baboucek and Jancar used loan quality as a dependent variable which is also one of the measurements of banking sector development, the result of inflation showed that inflation when it is not well controlled, could have a negative effect on the banking sector development.

Although, limited studies were found on the subject matter, however, the little empirical findings on it found that macroeconomic indicators matter in determining the development of the banking sector in any nation. Continuous fluctuation in these variables is likely to cause havoc if not well monitored, controlled and checked. This was supported by Isik and Darrat (2009) which said that most reasons for bank failure are attributed to macroeconomic variables, hence, macroeconomic variables must be well monitored through the macroeconomic policies.

4. Conclusion and Recommendations

Based on the findings above, the study, therefore, concluded that macroeconomic indicators have a significant long-run relationship with banking sector development and also negatively impacted it in the period under study. It is therefore recommended that macroeconomic indicators should be well monitored and controlled using macroeconomic instruments promptly and mostly on those things that can cause a decline in growth and high-interest rate so that, when managed could transmit positively to banking sector development. Secondly, the oil price should be well controlled as it influences many other macroeconomic variables in the economy, when well checked and regulated, would transmit positive impulses to banking sector thereby enhancing its development and lastly, the interest rate also need to be well managed as it dictates the direction of other interest rates in the economy.

References

- [1] AbdelazizToun, M. (2014). Macroeconomic determinants of banking sector development: a comparison study between Egypt and Saudi Arabia. *Advances in Management & Applied Economics*, 4(3), 139-156
- [2] Adeishvili, G. (2013). The impact of real macroeconomic indicators on financial stability indicators. A Thesis Paper Submitted in Partial Fulfillment of the Requirements of the Degree of Master of Science in International Economics and Finance. Tto-von-Guericke- University Magdeburg
- [3] Al-Homaidi, E.A., Tabash, M.I., Farhan, H.S., & Almaqtari, F.A. (2018). Bank-specific and macro-economic determinants of profitability of Indian commercial banks: A panel data approach, *Cogent Economics & Finance*, 6, 1-26
- [4] Aluko, AO., & Ajayi, M.A. (2018). Determinants of banking sector development: Evidence from Sub-Saharan African countries. *Borsa Istanbul Review*, 18(2), 122-139
- [5] Ayunku, P.W., & Etale, L. (2014). Macroeconomic analysis of banking sector development and economic growth in Nigeria. *International Journal of Economics, Commerce and Management*, 2(2), 1-11
- [6] Babouček, Ivan and M. Jančar, 2005, "Effects of a macroeconomic shock to the quality of the aggregate loan portfolio", Czech National Bank, *Working Paper Series*, No. 1, pp. 1 – 62.
- [7] Bhatti, U. (2018). Impact of macroeconomic factors on the stock market: the study on London stock exchange. DOI: 10.13140/RG.2.2.11130.18885

- [8] Chowdhury, M. A. F., & Rasid, M. E. S. M. (2017). Determinants of performance of Islamic banks in GCC countries: Dynamic GMM approach. *Advances in Islamic Finance, Marketing, and Management*, 49 –80.
- [9] Dobrescu, M., Badea, L., & Paicu, C.E. (2012). Business cycle theories and their relevance to the current global crisis. *Procedia - Social and Behavioral Sciences* 62, 239 – 243
- [10] Eryigit, S.B. & Dulgeroglu, E. (2015). How to measure the level of financial development Handbook of Research on Strategic Developments and Regulatory Practice in Global Finance DOI: 10.4018/978-1-4666-7288-8.ch017
- [11] Fischer, S. (1993). The role of macroeconomic factors in growth. *Working Paper No.* 4565
- [12] Gerlach, S.R., Peng, W., & Shu, C.J. (2005). Macroeconomic conditions and banking performance in Hong Kong SAR: A panel analysis. *Working Paper*, 12/2003
- [13] Hardy, D., & Pazarbaşıoğlu, C. (1998). Leading indicators of banking Crisis: Was Asia Different? IMF Working Papers, No. 98/91), pp. 1 – 32.
- [14] Hasanov, Bayramli and Al-Musehel (2018). Bank-specific and macroeconomic determinants of bank profitability: Evidence from an Oil-Dependent Economy. *International Journal of Financial Studies*, 6(78), 1-21
- [15] Isik, I., & Darrat, A. (2009). The effect of the macroeconomic environment on productive performance in Turkish Banking. Working paper No. 487
- [16] Ismaila, M., & Imoughele, L.E (2015). Macroeconomic determinants of economic growth in Nigeria: A Co-integration Approach. *International Journal of Academic Research in Economics and Management Sciences*, 4(1), 34-46
- [17] Levine, R. (1977). Finance and growth: Theory, and evidence. Retrieved on 130819 on http://faculty.haas.berkeley.edu/ross_levine/Papers/Forth_Book_Durlauf_FinNGrowth.pdf
- [18] Mhadhbi, K., Terzi, C., Bouchrika, A. (2017). Banking sector development and economic growth developing countries: A bootstrap panel Granger causality analysis. A bootstrap panel Granger causality analysis. 2017. fahal-01528104
- [19] Ray, T. (2009). Financial development and economic growth: A review of the literature. Retrieved from <http://www.isid.ac.in/planning/Slides-ISI-LitReview.pdf> on 13082019
- [20] Seferli, E. (2010). The effect of macroeconomic factors on the performance of Azerbaijan banking system. Master's dissertation, Dokuz Eylul University, Izmir, Turkey, June 29. Available online: [http://acikerisim.deu.edu.tr/xmlui/bitstream/handle/12345/10837/261492 .pdf](http://acikerisim.deu.edu.tr/xmlui/bitstream/handle/12345/10837/261492.pdf) (accessed on 11 August, 2019).
- [21] Singh, A., & Sharma (2016). An empirical analysis of macroeconomic and bank-specific factors affecting the liquidity of Indian banks future business journal, 2(1), 40-53
- [22] Shahbaz, Shamim and Aamir (2008). Macroeconomic environment and financial sector's performance: Econometric Evidence from Three Traditional Approaches. *The IUP Journal of Financial Economics*, 1&2: 103-12
- [23] Sokcevic, S., & Stokovac, D. (2011). macroeconomic stability and economic growth in european transition countries. Retrieved from www.intechopen.com/books/the-economic-geography-of-globalization, 11/08/2019

- [24] World Bank (2006). Financial sector development indicators: Comprehensive assessment through enhanced information capacity. Sourced from www.siteresources.worldbank.org/INTTOPACCFINSER/Resources/Webintro. On the 11th of August, 1-9