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Does Financial Sector Development Drives the Building and Construction Sector in Nigeria? VECM Analysis

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ABSTRACT

This study examined the impact financial deepening on non-oil sectors to growth in Nigeria over the period 1985 – 2017 using the Johansen approach to co-integration analysis and Vector Error Correction Model. Controlling for the possible effects of exchange rate and trade openness on economic activities, this study found that financial development exerts impact in the long-term and indicates no relationship in the short run in building and construction. In particular, money supply showed a negative relationship with Building and Construction sector contribution to GDP sector in the long run. Second, credit to private sector showed that there exists a positive relationship with the non-oil contribution to GDP output. Therefore, the development of financial sector intermediation could be the right strategy to lessening the dominance of the mono-resources economy called the oil sector in the Nigerian economy.

1. Introduction

The contribution of building and construction sector to economic growth in Nigeria has increased over the years. Data from the Central Bank of Nigeria (CBN) Statistical Bulletin shows that the Building and Construction sector which accounted for about 1.22% of the total real GDP in 1993 increased to 2.35% in 2013 with an average growth rate of 1.67% over the period 1995-2016. Giving the increasing level of development in this sector, it is crucial in understanding the growth-generating abilities of this sector to identify factors and institutions that stimulate economic activities that promote the contribution of this building and construction sector.

Building on empirical evidence identifying the role of financial intermediaries in driving economic activities via the private sector (see Levine 2004; Beck and Demirguc-Kunt, 2006; Ang, 2008; Beck et al., 2011), enhancing private sector participation in economic activities in the building and construction sectors in Nigeria through the financial sector could be considered a necessary condition to promoting the growth-generating abilities of this sectors. The idea of financial reforms in the Nigerian taken upon the Central Bank of Nigeria (CBN) is to strengthen the intermediary role of banks in the economy especially in the area of promoting private sector participation in economic activities. It has been documented scholars that financial intermediaries played a significant role in mobilization of savings and enhancement of economic activities in the private sector is a significant determinant of economic growth. Notable scholars in this line of argument are (see Ang, 2008; Jalila and Feridun, 2011; Uddin et al., 2013 among others). By attracting deposits from various economic units in the economy and financing investment projects in the private sector, financial intermediaries generate higher levels of economic growth, support firms that depend on external finance and reduce the financing constraints of small- and medium-sized enterprises (Beck et al., 2005; Beck and Demirguc-Kunt, 2006; Beck, et al., 2011). Hence the growth-generating ability of the private sector controlled building and construction sectors in Nigeria could depend significantly on how efficient the financial system could mobilize and allocate savings in the economy.

This study examines the impact of financial sector development on the contribution of Building and Construction sectors to economic growth in Nigeria. Examining the relationship between indicators of financial sector development and the contribution of building and construction sector to economic growth in Nigeria is an area of intense interest to policy makers and researchers as a result of the high dependence of the Nigerian economy on crude oil and the need to diversify the economy and lessen the exposure of the economy to shocks in crude oil prices. This topic therefore has an important role in policy making in Nigeria and other oil-exporting countries seeking for economic diversification. Although Adeniyi et al. (2015) and Nwani and Bassey Orie (2016) suggest that financial sector development is not a significant determinant of the overall economic growth in Nigeria, the development of the domestic financial sector could be influencing economic growth in these sectors of the economy not directly linked to oil production as in the case of Saudi Arabia (See Samargandi et al., 2014). The growth of these non-oil sectors may be very small relative to the size of the oil sector in Nigeria; but the future development of the economy may rely on their performance.

In the recent context, studies have mainly focused on determining the direction of causality between financial deepening variables and economic growth with different conclusions on how both concepts affect each other. Finally, limited studies have shown interest on the impact of financial deepening on the contribution of Non-Oil Sectors to economic growth in Nigeria with special case of Building-Construction Sectors. This study therefore aims to provide further evidence by examining the effects of

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financial deepening on economic growth in the contribution of Non-Oil Sectors to economic growth in Nigeria 1986-2017 period. The remaining of this paper is organized with literature review, methods of analysis, analysis and interpretation and lastly, recommendation and policy implication of the study

2. Methodology

2.1. Sources of Data and Methods of Data Collection

To carry out this empirical analysis, the study employed secondary data. The relevant data for this study were sourced from central bank statistical bulletin covering the period from 1986 to 2017. This study uses annual data to examine the impact of financial sector deepening on the contribution of Building-Construction sectors to economic growth in Nigeria. The choice of the sample period is based on data availability. To avoid perfect collinearity, these variables were transformed in its natural logarithm and excel, E-View10 were applications (software) used for data estimation and analysis.

2.2. Model Formulation and Specification

Koutyannis (2003) articulated that model specification is the formulation of a maintained hypothesis. This involves expressing the model to explore the economic phenomenon empirically. The relationship between economic growth and financial sector development can be modeled in different forms To examine the impact of financial deepening on the contribution of each of the three non-oil sectors to economic growth in Nigeria, this study implements a log-linear empirical model (see eq.1) similar to the one implemented by Samargandi et al. (2014) for Saudi Arabia.

$$lnSecRgdp = \alpha_0 + \alpha_1 lnFD + \alpha_2 lnEXTR + \alpha_3 lnTrdgdp + e_t \quad (1)$$

lnSecRgdp represents the contribution of each of the building-construction sectors real GDP(*lnBCrgdp*) as defined in Table 1. *lnFD* represents the degree of financial deepening captured in this study using credit to private sector over GDP (*lnCPSgdp*) and broad money (M2) over GDP (*M2gdp*).*ln*Extr and *ln*Trdgdp are two control variables representing the international crude oil price and trade openness respectively while e_t is the error term.

2.3. Justification of Variables

Economic growth is defined as the real gross domestic product in each of the four non-oil sectors (sector real GDP) over the period. Two widely used measures of financial development are used: the ratio of credit to the private sector to GDP and the ratio of broad money (M2) to GDP. The ratio of credit to the private sector to GDP captures the role of financial intermediaries in enhancing economic activities in the private sector. It is widely believed that credit provided to the private sector generates higher levels of investment and productivity in the economy to a much larger extent than do credits to the public sector (Kar et al., 2011). The ratio of broad money (M2) to GDP is associated with the liquidity and depth of the financial system, which determines the ability of financial intermediaries to provide financial transaction services (Kar et al., 2011) and the degree of risk they could face in response to unexpected demand to withdraw deposits (Ben Naceur et al., 2014). Two control variables are included to capture other components of the Nigerian macroeconomic environment that could influence the growth of the Nigerian economy. The variables include: the international crude oil price (in US dollars per barrel) and the ratio of total trade (exports plus imports) to GDP which explains the degree of openness of the Nigerian economy to trade. The inclusion of crude oil price among the control variables in this study captures the influence of the oil sector on economic activities in the non-oil sectors in Nigeria. The list of variables is summarised in Table 2:

Table 1. List of Variables.

Variable	Definition
BCrgdp	Building and Construction sector contribution to GDP
CPSgdp	The ratio of Credit to the private sector to nominal GDP.
M2gdp	The ratio of broad money (M2) to nominal GDP.
Extr	The market exchange rate of U.S Dollar to Nigerian Naira, expressed in naira.
Trdgdp	Trade openness: Total trade (exports plus imports) to nominal GDP.
Source: Central Bank of Nigeria (CBN) Statistical Bulletin Sector contributions are calculated as % of total GDP (constant 1990local currency)	

Sources: Author's compilation

2.4. Expected Signs of the Variables (A Priori Expectations)

Based on economic theory, we expect the sign of the coefficient of money supply, credit to private sector and trade openness ($\alpha_2\ \alpha_3\ and\ \alpha_4$respectively), to be positive. This is because, economic theory has established that an increase in the supply of money will stimulate economic activities, raise profit and lowers interest rate thereby making capital more accessible to firms in the sector and hence, increase in building-construction output. Increase credit to the private sector means more credit (capital) to the building and sub sector, hence positive relationship.

On the other hand, the sign of the coefficient of exchange rate is expected to be negative (i.e.α_4), as there is an inverse relationship between output and exchange rate. Conventional economic theory shows that devaluation can generally leads to an increase in the level of output, since it can enhance production particularly in export and import competing sectors.

2.5. Technique of Analysis

The study estimated time series unit root test for stationarity state of the variables using different unit roots tests such as The ADF (Augmented Dickey Fuller) test. Based on the unit root test, we conducted Johansen cointegration test to ascertain the long run relationships among the variables and subsequently vector error correction model (VECM) and granger causality test were estimated based on the cointegration test outcome to find out the short run and long run relationships.

2.5.1. Stationarity test (Unit Root Test)

The first step is to investigate the order of integration of the variables used in the empirical study. The ADF (Augmented Dickey Fuller) test will be used in which the null hypothesis is $H_o: \beta = 0$ i.e β has a unit root, and the alternative hypothesis is $H_o: \beta < 0$. If the unit roots tests confirm that the variables are I(1), i.e integrated at first difference, the next step would be to test if they are co-integrated, i.e. if they are bound by long run relationship. The main reason is to determine whether the data is stationary i.e. whether it has unit roots and also the order of integration. It ex expected that the variables be integrated at first difference, I(1). If the variables I(1), we proceed with the Johansen co-integration analysis. This can be achieved through Unit root test.

2.5.2. Testing for lag Structure

In the assertion of Ender (1995) the section of an appropriate lag length is as significant as determining the

variables to be included in any system of equations. Based on that, the study employs that Akaike Information Criterion (AIC) to choose the appropriate optimal lag length of the variables for this study.

2.5.3. Johansen co integration test

The test of the presence of long run equilibrium relationship among the variables using Johansen Co integration test involves the identification of the rank of the n by n matrix Π in the specification given by.

$$\Delta Y_t = \beta + \sum_{i=1}^{k-1} \Gamma_i \Delta Y_{t-1} + \prod Y_{t-k} + \varepsilon_t \quad (2)$$

Where Y_t is a column vector of the n variables Δ is the difference operator, Γ and $\prod$ are the coefficient matrices, k denotes the lag length and β is a constant. In the absence of cointegrating vector, $\prod$ is a singular matrix, indicating that the cointegrating vector rank is equal to zero. Johansen co integration test will involve two different likelihood ratio tests: the trace test (λtrace) and maximum eigen value test (λmax) shown in equations below:

$$J_{trace} = -T \sum_{i=r+1}^{n} \ln(1 - \hat{\lambda_i}) \quad (3)$$

$$J_{max} = -T ln(1 - \hat{\lambda_{r+1}}) \quad (4)$$

Where r the number of individual series, T is the number of sample observations and and λ is the estimated eigen values. The trace test tests the null hypothesis of *r* cointegrating vectors against the alternative hypothesis of *n* cointegrating vectors. The maximum eigen value test (λmax), on the other hand, tests the null hypothesis of *r* cointegrating vectors against the alternative hypothesis of *r* +1 cointegrating vectors. If the two series are found to be co-integrated, then vector error correction model (VECM) is appropriate to investigate causality relationship.

2.5.4. Vector Error-Correction Modelling (VECM)

The Short run equilibrium relationship is tested using Vector Error-Correction Model (VECM). VECM is a restricted VAR that has cointegration restriction built into the specification. The VECM analysis in this study is based on the function: y_t = f(financial deepening, Exchange rates, and trade openness). The VECM involving three co-integrated time series is set as:

$$\Delta lnSecRgdp_t = \beta_0 + \sum_{i=1}^{n} \beta_{1i} \Delta lnSecRgdp_{t-i} + \sum_{i=o}^{n} \beta_{2i} \Delta lnFD_{1t-i} + \sum_{i=0}^{n} \beta_{3i} \Delta lnEXTR_{2t-i} + \sum_{i=0}^{n} \beta_{4i} \Delta lnTrdgp_{t-i} + \lambda_1 ECM_{t-1} + u_{1t} \quad (5)$$

A negative and significant ECM_{t-1} coefficient (λ_1) implies that any short term disequilibrium between the dependent and explanatory variables will converge back to the long-run equilibrium relationship.

The error correction coefficients λ_1, indicates the rate at which it corrects its previous period disequilibrium or speed of adjustment to restore the long-run equilibrium relationship. Hence, it is expected to capture the adjustment in $\Delta lnSecRgdp_t$ $\Delta lnFD_{1t-i}$ towards the long-run equilibrium whereas coefficients of $\Delta lnSecRgdp_t$ $\Delta lnFD_{1t-i}$ are expected to capture the short-run dynamics of the model. This method of analysis permits us to test for the direction of causality, if it exists,. Moreover, it captures the dynamics of the interrelationships between the variables. It is essential to appropriately specify the lag length k for the VECM model; if k is too small the model is misspecified and the missing variables create an omitted variables bias, while overparameterizing involves a loss of degrees of freedom and introduces the possibility of multicollinearity (Gujarati and Porter, 2009). The study uses Akaike information criterion (AIC) to determine the optimum lag length.

2.6. Econometric Diagnosis Tests

Econometrics diagnosis test will be done to detect whether the research model consists of econometric problems. Such test include as follows: multicollinearity, autocorrelation and heteroscedasticity.

2.6.1. Autocorrelation

The assumption of no autocorrelation between the error terms is one of the classical linear regression model assumptions. If the errors are not uncorrelated with one another, it would be stated that they are "auto correlated" or that they are "serially correlated". A test of this assumption is therefore required.

To test the presence of autocorrelation, the popular Breush-Godfrey serial correlation LM test and Durbin-Watson Test will be employed.

Ho: The model does not have autocorrelation problem.

Hi: The model has autocorrelation problem.

Decision rule: Reject Ho if the p-value of the test is less than significance level of 0.05. Otherwise, do not reject Ho.

2.6.2. Heteroscedasticity

Heteroscedasticity refers to the circumstance in which the variability of a variable is unequal across the range of values of a second variable that predicts it which means that the variances of error terms are not constant. The assumption of homoscedasticity is one of the classical linear regression model assumptions. The presence of heteroscedasticity will cause the variance or standard errors to be underestimated, eventually leading to higher T-statistic or F-statistic value and causes the null hypothesis to be rejected too often (Gujarati & Porter, 2009).

The statistical test that establishes whether the residual variance of a variable in a regression model is constant will be adopted.

Ho: The model does not have heteroscedasticity problem.

Ho: The model has heteroscedasticity problem.

Decision rule: Reject Ho if the p-value of the test is less than significance level of 0.05. Otherwise, do not reject Ho.

3. Analysis and interpretation of results

This chapter presents the empirical analysis for the study. The issues discussed are the data presentation and result interpretation. The results and findings of the various estimation techniques start with a simple OLS and empirical analysis. In doing so, the objectives and hypothesis stated in the introductory section shall be evaluated. The findings arrived at this section will be done with aid of analytical framework stated in the previous section. The main aim of this study is to analysis the impact of financial deepening on the contribution of non-oil sectors to economic growth in Nigeria: the case of Wholesale-Retail, Service-Producing and Building-Construction Sectors. This session therefore presents the results with the aforementioned econometrics techniques, The tests involved are root-Augmented Dickey Fuller (ADF), Johansen Co-integration, VECM, Granger Causality Test, Stability test.

3.1. Data Presentation

Data for empirical tests were sourced mainly from the Central Bank of Nigeria Statistical Bulletin. These data cover

the period 1985 – 2017. The study used three groups of variables. The leading economic indicators as dependent variables measured by:

The complete data for the study is presented in table 1 see Appendix 1.

3.2. Presentation and Interpretation Of Empirical Results

Here we present results of empirical analyses of the study. Unit root was first conducted, followed by regression, Johansen co integration, Vector Error Correction Model, Granger causality test and stability test. In this section, we present the empirical results on the long and short run and causality effects of financial deepening on the contribution of non-oil sectors to economic growth in Nigeria. Test for the stationarity of the variables are presented in tables 4.3.1 below.

3.2.1. Unit Root Test (ADF Tests)

Unit Root Test was applied to determine whether those variables are stationary. Stationary variable can be defined as variable with a constant mean, constant variance and constant auto covariance. A variable is stationary if its t-statistic is greater than Mckinnon critical value at 0.05% and at absolute term (Brooks, 2014). Stationary property also means when there is a change in a variable during a particular time, the effect will continue for the following time which is t+1, t+2 (Cheng, Goh, Japheth, Lai & Yong, 2013).

The results presented in Table 1 below clearly indicate that all series exhibit unit root property using ADF test statistics. The results implied that all series has to be differenced once in our models in order to avoid spurious results.

Table 1 above reports the result of ADF unit root test. The test indicates that, all the variables are found to be stationary in their first difference at 1% level of significance. As such the variables are integrated of the same order i.e I (1) integrated of orders one.

Result of Johansen Cointegration Result

Given that the unit root test established the variables as I(1), we proceed to apply the Johansen‟ approach to determine whether there is at least one combination of these

Table 1. ADF Unit Root Test Results for Annual Series (1986-2017).

1St diff	**Augmented Dickey-Fuller test**					
Variables	lag	t-statistic	Critical values			remark
			0.01	0.05	0.1	
LBNCGDP	0	-4.818937	-4.296729	-3.568379	-3.218382	I(1)
LM2GDP	0	-4.989962	-4.296729	-3.568379	-3.218382	I(1)
LCPSGDP	0	-5.37515	-4.296729	-3.568379	-3.218382	I(1)
LEXTR	0	-5.679395	-4.296729	-3.568379	-3.218382	I(1)
LTRADE	6	-4.479273	-4.394309	-3.612199	-3.243079	I(1)

Source: Author's estimation using E-view 10

VAR Lag Order Selection Criteria:

Table 2. VAR Lag Order Selection Criteria.

VAR Lag Order Selection Criteria						
Endogenous variables: LBNCGDP LM2GDP LCPSGDP LEXTR LTRADE						
Lag	LogL	LR	FPE	AIC	SC	HQ
0	56.42151	NA	2.80E-08	-3.201484	-2.730002	-3.053821
1	119.2805	95.37232*	2.16e-09*	-5.812451	-4.162266*	-5.295634*
2	137.7461	21.64926	4.20E-09	-5.361799	-2.532911	-4.475827
3	173.8475	29.877	3.54E-09	-6.127411*	-2.11982	-4.872284

* indicates lag order selected by the criterion LR: sequential modified LR test statistic (each test at 5% level), FPE: Final prediction error, AIC: Akaike information criterion, SC: Schwarz information criterion ,HQ: Hannan-Quinn information criterion

Table 3. Johansen Cointegration Test Results.

Series: LBNCGDP LM2GDP LCPSGDP LEXTR LTRADE				
Unrestricted Cointegration Rank Test (Trace)				
Hypothesized		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.998863	265.6935	69.81889	0
At most 1 *	0.737621	75.87573	47.85613	0
At most 2 *	0.664744	38.4127	29.79707	0.004
At most 3	0.159192	7.81263	15.49471	0.4856
At most 4	0.100243	2.957658	3.841466	0.0855
Trace test indicates 3 cointegrating eqn(s) at the 0.05 level				
* denotes rejection of the hypothesis at the 0.05 level				
**MacKinnon-Haug-Michelis (1999) p-values				
Unrestricted Cointegration Rank Test (Maximum Eigenvalue)				
Hypothesized		Max-Eigen	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.998863	189.8178	33.87687	0.0001
At most 1 *	0.737621	37.46302	27.58434	0.002
At most 2 *	0.664744	30.60007	21.13162	0.0017
At most 3	0.159192	4.854972	14.2646	0.76
At most 4	0.100243	2.957658	3.841466	0.0855
Max-eigenvalue test indicates 3 cointegrating eqn(s) at the 0.05 level				
* denotes rejection of the hypothesis at the 0.05 level				
**MacKinnon-Haug-Michelis (1999) p-values				

Source: Extraction from estimation output using E-views 10

Table 4. Long run Estimates.

LBNCGDP(-1)	LM2GDP(-1)	LCPSGDP(-1)	LEXTR(-1)	LTRADE(-1)	C
1	-1.835889	1.269987	0.041546	-0.130584	3.27806
	(0.01823)	(0.01206)	(0.00143)	(0.00575)	
	[-100.731]	[105.311]	[29.1111]	[-22.7243]	

Source: Extraction from estimation output using E-views 10

variables that is I(0). The result of Johansen cointegration test is presented in the table below:

Table 3 above, reports the result of Cointegration based on Johansen‟s procedure. The test indicates the existence of one (1) cointegrating equation based on Trace Statistic and Max-Eigen Statistics at 5% level of significance. Thus, the null hypothesis that there is no cointegration can therefore be rejected at 5% level as both trace test and maximum eigenvalue statistics are greater than their critical values. The result therefore indicates the existence of long run relationship among the included variables.

Long Run Estimates

The long run relationship of the variables from the normalized cointegration result with respect to Building and Construction sector contribution to GDP (BCrgdp) output provides the evidence regarding the long-run dynamic adjustment among Building and Construction sector contribution to GDP (BCrgdp) output as a proxy of the performance of the sector, on ratio of money supply to GDP (MS/GDP), the ratio credit to private sector to GDP (CPS/GDP), foreign exchange rate (FXR),Trade openness: Total trade (exports plus imports) to nominal GDP (Trdgdp) as presented below:

The normalized cointegration equation as presented in the table above shows the long run coefficients of our independent variables as they affect the dependent variable. The sign of the variables are reversed due to the normalization. It specifically shows the effect of each individual variable on the dependent variable. The result of each individual variable is explained below:

1. Ratio of money supply to GDP (MS/GDP): The estimate for the long run coefficient of money supply indicates a negative relationship between output in the Building and Construction sector contribution to GDP (BCrgdp) and money supply in the long run. The result specifically implies that a one unit increase in the ratio of money supply to GDP (MS/GDP) holding the effect of other variables constant, will lead to a corresponding decrease in Building and Construction sector contribution to GDP (BCrgdp) output by -1.8358 % and vice versa. This although does not comfort with theoretical postulations, may be due to the fact that (see: discussion of findings)

2. Credit to Private Sector (CPS): The coefficient of the credit to private sector shows that there exist a positive relationship between credit and Building and Construction sector contribution to GDP (BCrgdp) output. The result specifically implies that a one unit increase in the rate of credits to the private sector holding the effect of other variables constant, will lead to a corresponding increase in Building and Construction sector contribution to GDP (BCrgdp) output by 1.26998% and vice versa. This is however in conformity with theoretical postulations and confirms the result of previous studies.

3. Exchange Rate (EXR): The long run coefficient of the rate of exchange of the Nigerian naira against dollar as presented in the table above shows a positive relationship between exchange rate and Building and Construction sector contribution to GDP (BCrgdp) output. The result specifically implies that a one unit increase in the exchange rate holding the effect of other variables constant, will lead to a corresponding increase in Building and Construction sector contribution to GDP (BCrgdp) output by 0.04154% and vice versa.

4. Trade Openness to GDP (trade): The coefficient of the trade openness to GDP shows that there exist a negative relationship between Trade Openness to GDP and Building and Construction sector contribution to GDP (BCrgdp) GDP output. The result specifically implies that a one unit increase in the Trade Openness to GDP holding the effect of other variables constant, will lead to a corresponding increase in Building and Construction sector contribution to GDP (BCrgdp) output by -0.13058% and vice versa

Result of Vector Error Correction Model (VECM)

The estimates of the VECM provides the short run elasticities of the variables and how output in the Building and Construction sector contribution to GDP (BCrgdp) responds to changes in its own lagged value and the lagged value of the other variables in the short run. It therefore indicates the short run causality between ratio of money supply, exchange rate, credit to private and the Building and Construction sector contribution to GDP (BCrgdp) output respectively. The table below presents the detail result regarding the short run causalities:

Table 5. Estimates of Error Correction Model (short run estimates).

Error Correction:	D(LBNCGDP)	D(LM2GDP)	D(LCPSGDP)	D(LEXTR)	D(LTRADE)
CointEq1	-0.40187	-0.800596	-0.210619	-0.993061	-1.308513
	(0.09624)	-0.24427	-0.46477	-1.13389	-0.75747
	[-4.17583]	[-3.27746]	[-0.45317]	[-0.87580]	[-1.72748]
D(LBNCGDP(-1))	0.597632	1.129633	1.647845	0.626168	-0.035139
	-0.17432	-0.44247	-0.84186	-2.05388	-1.37205
	[3.42835]	[2.55303]	[1.95738]	[0.30487]	[-0.02561]
D(LBNCGDP(-2))	0.203572	-0.120411	-0.554115	0.239855	-0.290073
	-0.19492	-0.49474	-0.94132	-2.29654	-1.53416
	[1.04441]	[-0.24338]	[-0.58865]	[0.10444]	[-0.18908]
D(LBNCGDP(-3))	-0.436733	-0.414255	-0.50873	-0.807277	-0.6473
	-0.1562	-0.39647	-0.75434	-1.84035	-1.22941
	[-2.79603]	[-1.04487]	[-0.67441]	[-0.43865]	[-0.52651]
D(LM2GDP(-1))	0.294883	1.060572	0.449028	2.775404	1.618144

	-0.17	-0.4315	-0.821	-2.00299	-1.33805
	[1.73460]	[2.45785]	[0.54693]	[1.38563]	[1.20933]
D(LM2GDP(-2))	0.466423	1.690895	1.950286	1.72239	1.543151
	-0.16992	-0.4313	-0.82061	-2.00202	-1.33741
	[2.74497]	[3.92050]	[2.37664]	[0.86032]	[1.15383]
D(LM2GDP(-3))	0.323594	0.833339	0.823835	0.743222	1.349319
	-0.12933	-0.32826	-0.62456	-1.52374	-1.0179
	[2.50217]	[2.53866]	[1.31906]	[0.48776]	[1.32559]
D(LCPSGDP(-1))	-0.285822	-0.803678	-0.655633	-1.786849	-1.615719
	-0.11248	-0.2855	-0.5432	-1.32524	-0.8853
	[-2.54113]	[-2.81502]	[-1.20698]	[-1.34832]	[-1.82505]
D(LCPSGDP(-2))	-0.229697	-1.076445	-1.062056	-1.185348	-0.912873
	-0.0945	-0.23986	-0.45637	-1.11341	-0.74379
	[-2.43069]	[-4.48779]	[-2.32718]	[-1.06462]	[-1.22733]
D(LCPSGDP(-3))	-0.237453	-0.661564	-0.703676	-0.478195	-0.876282
	-0.09028	-0.22914	-0.43597	-1.06364	-0.71054
	[-2.63033]	[-2.88716]	[-1.61404]	[-0.44958]	[-1.23326]
D(LEXTR(-1))	-0.062038	-0.134075	-0.154783	-0.269332	-0.019564
	-0.02806	-0.07123	-0.13553	-0.33065	-0.22089
	[-2.21060]	[-1.88220]	[-1.14204]	[-0.81454]	[-0.08857]
D(LEXTR(-2))	0.034755	0.009634	-0.115303	-0.116157	0.031094
	-0.02753	-0.06988	-0.13295	-0.32435	-0.21668
	[1.26248]	[0.13787]	[-0.86728]	[-0.35812]	[0.14351]
D(LEXTR(-3))	-0.021352	-0.20762	-0.403398	-0.044066	0.058937
	-0.02563	-0.06507	-0.1238	-0.30203	-0.20177
	[-0.83293]	[-3.19085]	[-3.25845]	[-0.14590]	[0.29210]
D(LTRADE(-1))	-0.036039	0.082814	0.280843	-0.203096	-0.219107
	-0.03973	-0.10085	-0.19188	-0.46812	-0.31272
	[-0.90708]	[0.82117]	[1.46365]	[-0.43385]	[-0.70065]
D(LTRADE(-2))	-0.017376	0.093318	0.231597	0.171846	-0.148523
	-0.0362	-0.09189	-0.17483	-0.42652	-0.28493
	[-0.48001]	[1.01559]	[1.32473]	[0.40290]	[-0.52126]
D(LTRADE(-3))	0.015961	0.056019	-0.100046	0.32764	0.036018
	-0.03819	-0.09694	-0.18445	-0.44999	-0.30061
	[0.41791]	[0.57786]	[-0.54241]	[0.72810]	[0.11982]
C	0.018153	0.072255	0.150112	0.185576	-0.018349
	-0.00986	-0.02502	-0.0476	-0.11612	-0.07757
	[1.84189]	[2.88837]	[3.15385]	[1.59814]	[-0.23654]
R-squared	0.86051	0.832192	0.717336	0.292544	0.491052
Adj. R-squared	0.657616	0.588107	0.306189	-0.736484	-0.249235
Sum sq. resids	0.011436	0.073679	0.266723	1.587558	0.708469
S.E. equation	0.032243	0.081842	0.155716	0.379899	0.253784
F-statistic	4.241171	3.409439	1.744717	0.284291	0.663326
Log likelihood	69.51436	43.43319	25.42222	0.449824	11.74567
Akaike AIC	-3.751026	-1.888085	-0.601587	1.182155	0.37531
Schwarz SC	-2.942187	-1.079246	0.207251	1.990994	1.184148
Mean dependent	0.015101	0.023644	0.03551	0.132949	-0.027695
S.D. dependent	0.055104	0.127521	0.186945	0.288292	0.227061

Source: Extraction from estimation output using E-views 10

Table 5 above, shows the result of Error-Correction Model using two lags. From the result, the Error Correction Term which shows the speed of adjustment, is statistically significant and has a negative sign (-0.40187), this confirms the long-run equilibrium relationship between these variables. The result denotes a satisfactory convergence rate to equilibrium point per period that is about 40.187% of the deviation from long run equilibrium are corrected in the next period.

From the table also, all the estimated coefficients have the expected sign and six out of the twelve (lag value of M2GDP CPSGDP EXTR TRADE) variables are statistically significant and this shows that there is a short run causality running from these variables to Building and Construction sector contribution to GDP (BCrgdp). In other words, the result vindicates that in the short run, the value which the Building and Construction sector contribution to GDP (BCrgdp) takes is influenced by these variables. The goodness of fit of the estimated relationship and the significance of the model as indicated by the value of the coefficient of determination (R2 and the adjusted R2) and F-Statistics respectively are good. These all together implies that, the output of the Building and Construction sector contribution to GDP (BCrgdp) output in Nigeria largely depends on the ratio of money supply, and amount of credit awarded to the private sector for the period under study.

Results of Granger Causality Test

The result of granger causality as presented by the table above shows that, there is a bidirectional causality between, broad money supply to Building and Construction sector contribution to GDP (BCrgdp). There is also a unidirectional causality running from credit to private sector to Building and Construction sector contribution to GDP (BCrgdp). Thus, exchange rate and lending rate is the variables that granger causes Building and Construction sector contribution to GDP (BCrgdp) in our model.

Table 6. Result of Granger Causality/Block Exogeneity Wald Tests.

VEC Granger Causality/Block Exogeneity Wald Tests							
Included observations: 28							
Dependent variable: D(LBNCGDP)				Dependent variable: D(LM2GDP)			
Excluded	Chi-sq	df	Prob.	Excluded	Chi-sq	df	Prob.
D(LM2GDP)	8.472582	3	0.0372	D(LBNCGDP)	7.823451	3	0.0498
D(LCPSGDP)	8.52266	3	0.0364	D(LCPSGDP)	21.69693	3	0.0001
D(LEXTR)	9.012532	3	0.0291	D(LEXTR)	15.79412	3	0.0012
D(LTRADE)	0.960921	3	0.8107	D(LTRADE)	2.089191	3	0.5541
All	28.2558	12	0.0051	All	46.2624	12	0
Dependent variable: D(LCPSGDP)				Dependent variable: D(LEXTR)			
Excluded	Chi-sq	df	Prob.	Excluded	Chi-sq	df	Prob.
D(LBNCGDP)	4.441192	3	0.2176	D(LBNCGDP)	0.293825	3	0.9612
D(LM2GDP)	6.363751	3	0.0952	D(LM2GDP)	2.085581	3	0.5548
D(LEXTR)	13.03684	3	0.0046	D(LCPSGDP)	2.018404	3	0.5686
D(LTRADE)	3.435566	3	0.3292	D(LTRADE)	0.647255	3	0.8855
All	26.36282	12	0.0095	All	4.202907	12	0.9795
Dependent variable: D(LTRADE)							
Excluded	Chi-sq	df	Prob.				
D(LBNCGDP)	0.586867	3	0.8994				
D(LM2GDP)	2.189025	3	0.5341				
D(LCPSGDP)	3.535118	3	0.3162				
D(LEXTR)	0.105835	3	0.9911				
All	8.065382	12	0.78				

Source: Extraction from estimation output using E-views 10

This implies that passed values of broad money supply and credit to private sector have a predictive ability in determining the present values of Building and Construction sector contribution to GDP (BCrgdp) and vice versa. In the same vein also, Building and Construction sector contribution to GDP (BCrgdp) helps in the prediction of the future value of broad money supply. Thus, there is a strong dynamic causal relationship among the variables in our model.

Diagnostic Test and Stability Tests

From the diagnostic test results (see results in Table 7) The essence of these diagnostic tests is to ascertain the authenticity of the model so as to be sure that we are not working with a misleading model that yields inconsistent estimates and spurious results. The test below shows the adequacy of the model indicating no evidence of serial correlation, heteroscedasticity and functional form misspecification in each of the VAR models (1-3) specified.

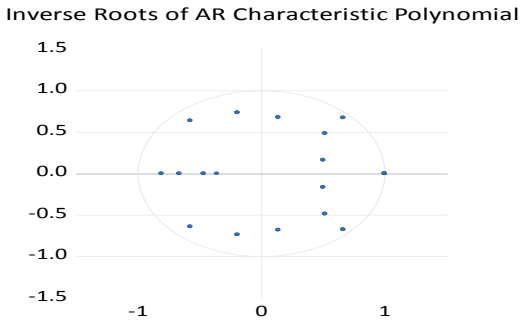

Figure 1. Inverse roots of AR characteristics polynomial model

The VAR model must be stable. The stability of our estimated VAR model is not difficult to check, since the data is integrated of order zero. Figure (1) indicates that the VAR model with various lags satisfies the stability condition, since there are no roots lying outside the unit circle in each model.

4. Summary, Conclusions and Recommendations

Inspired by the growing interest among researchers and policy makers in understanding the impact of financial sector intermediary development on economic growth and the scare attention given to the special case of non-oil sectors in oil-dependent economies, this study empirically examines the impact of financial development on economic growth Building and Construction sectors, over the period 1986 – 2017 using the Johansen approach to co-integration analysis and Vector Error Correction Model, controlling for the possible effects of exchange rate and trade openness on economic activities in Nigeria. The results show that financial sector intermediary development (from the credit to private sector) remains a major driver of long-term economic growth in Nigeria. The results are significantly similar to what Samargandi et al. (2014) documented for Saudi Arabia. Although financial sector intermediary development may not be the key driver of the overall Nigerian economy as a result of the dominant role of the other macroeconomic factors in Nigeria as documented by Nwani and BasseyOrie (2016), financial sector intermediary development remains the key driver of the private sector dominated non-oil sectors. In general, the results highlight the importance of the Nigerian financial intermediary sector in resource mobilisation and allocation and in stimulating economic activities through the private sector in the non-oil sectors. Effective means of improving credit channels and liquidity to private firms by

Table. 7 Diagnostic test.

VEC Residual Serial Correlation LM Tests						
Null hypothesis: No serial correlation at lag h						
Lag	LRE* stat	df	Prob.	Rao F-stat	Df	Prob.
1	33.25342	25	0.1249	1.461702	(25, 8.9)	0.2848
2	24.25593	25	0.5046	0.813781	(25, 8.9)	0.6777
3	40.41598	25	0.0264	2.225425	(25, 8.9)	0.1067

banks should be encouraged by Central Bank of Nigeria and an aggressive policy should be pursued to remove all obstacles that could undermine the growth of credit to the private sector. The government should encourage monetary authorities like the Central Bank of Nigeria to build a conducive and enabling environment for friendly interest rates so that prospective investors can increase their investment and raise the nation's production capacity.

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