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Revisiting Finance-Growth Nexus in Oil-Dependent Economy: Evidence from the Service-Producing Sector Contribution to Real GDP

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Abstract: *This study examines the impact financial deepening on the contribution of Service-Producing sectors to economic 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 in these non-oil sectors, this study found indicators of financial deepening statistically significant in driving in the long-term and indicates no relationship in the short run in all the non-oil sectors. In particular, money supply showed a negative relationship with Service-Producing sector contribution to GDP 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.*

Keywords: *financial deepening, economic growth; non-oil sectors; Service-Producing sector; Nigeria; johansencointegration.*

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I. Introduction

Financial deepening plays an important role in determining the growth of an economy. It broadens its resource base, raises the capital needed to stimulate investment through savings and credit, and boosts the overall productivity. The origins of this role of financial markets may be traced back to the pioneer work of Schumpeter (1911). In his study, Schumpeter points out that the banking system is the crucial factor for economic growth due to its role in the allocation of savings, the encouragement of innovation, and the funding of productive investments. Early works, such as Goldsmith (1969), McKinnon (1973), and Shaw (1973) put forward considerable evidence that financial development has a positive effect on economic growth. However, the design and implementation of effective interventions and programs in the Nigerian banking sector has led to a continued growth in financial assets, with a direct contribution from financial intermediaries to the country GDP. Economic growth in Nigeria, whether as a result of financial development or other factors has been fluctuating over the last decade with a low rate.Therefore, it is of importance to assess the effects on economic growth of the banking sector deepening in Nigeria. Several studies with mixed results have been conducted across countries to investigate the relationship between financial deepening and economic growth. Some studies have used developed and developing cross-countries data sets. Other studies have used a sub-regional African approach. In individual African countries context such as South Africa and Nigerian, theirfindings suggested mixed results depending on financial deepening indicators employed. 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 Service-Producing Sectors. This study therefore aims to provide further evidence by examining the effects of financial deepening on economic growth in the contribution of Non-Oil Sectors to economic growth in Nigeria 1986-2017 periods considering the contribution of the Service-producing sector to real GDP increased from 13.02% in 1993 to 21.42% in 2013 with an average growth rate of 15.53% over the period.Specifically, it extends the previous studies by narrowing the scope of economic growth indicators to, Service-Producing Sectors, as a measure of the Non-Oil Sectors contribution to economic growth. The study goes further to use extended broad money measured as liquid liabilities, bank credit to the private sectors to measure activity and the size of the banking sector in Nigeria, therefore filling the knowledge gap in the existing literature.

This topic therefore has an important role in policy making in Nigeria and other oil-exporting countries seeking for investment and exporation of other sectors of the economy. In a recent study byAdeniyi et al. (2015) and Nwani and Orie (2016), it was documented that financial sector development is not a significant determinant of the overall economic growth in Nigeria, the development of the domestic financial sector couldbe influencing economic growth in the sector of the economy not directly linked to oil production as in the case of Saudi Arabia(See Samargandi et al., 2014). The growth of the 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.

This study would be the first study to consider the impact of financial sector development on the growth Service-Producing sectorof the non-oil sector in Nigeria. Examining the impact of financial sector deepening on the contribution of Service-Producing sector non-oil sectors to economic growth in Nigeria would allow for a better understanding of the extent of financial sector development in an oil-dependent Nigerian economy. The remainder of this study is structured as follows: section 2 provides a review of existing empirical literature. Section 3 presents the data and methodology of the study. Section 4 presents and discusses the empirical results. Finally, section 5 offers some concluding remarks on the findings.

II. Brief Literature Review

The theoretical foundation between financial development and economic growth takes it origin from the Classical economists. Accounting to their proposition, capital accumulation is at the centre of economic growth. For them a higher degree of financial deepening through saving and investment activities promotes the level of income and raises the rates of economic growth. No economist can disagree that economic advancement is impossible without a reasonable degree of financial deepening as measured in the ratios of capital stock to gross domestic product (GDP). Building on this theoretical foundation, the process of capital accumulation and growth in advanced or emerging economies is enhanced substantially by the financial markets that channel the resources of millions of risk-adverse savers to millions of risk-neutral borrowers (Fama, 2014; Hansen, 2014; Shiller, 2014). At the forefront is Schumpeter (1912) who opined that financial development was a pre-condition for economic growth but Robinson (1953) viewed that financial development is a by-product of the economic growth process. In a study conducted by , King and Levine (1993) using four indicators of financial development for about 119 countries for 1960–1989, they found that in Schumpeterian hypothesis that financial development leads to economic growth over time in contrast with the Robinsonian argument that growth rate of output has little connection to the levels of development of the financial sector.

Empirically, there is a growing interest among researchers in understanding the effect of financial deepening or financial development on economic growth. The degree of financial sector deepening is expected to stimulate economic growth by creating economic conditions that enhance efficiency in resource allocation. In a recent study, Levine (2004) identified these desired economic conditions to include reducing information asymmetries and transaction costs, management and diversification of risk, screening and monitoring of firms. By providing the framework that links savers and investors in the economy, savings are mobilized from various surplus units (mainly households) and allocated among deficit units (mainly firms) thereby channelling available resources in the economy into profitable investment opportunities (sigh, 2008). Building on this foundation, a number of strand of studies that have examined the relationship between financial sector development and economic growth (see King and Levine, 1993; Levine et al., 2002; Raheem and Oyinlola, 2015 among others). The results of most of these studies show that the degree of financial sector deepening is a significant driver of economic growth.

However, the second strand believed that the effect of financial sector deepening on economic growth could be strongly influenced by country characteristics including institutional, political, geographical and economic conditions (Hondroyiannis et al., 2005; Beck, 2011). This could be observed from the considerable variation in results of recent time series studies on financial sector development and economic growth nexus. From the third strand, most empirical studies from non-oil dependent countries show strong indication of positive long-run interaction between financial sector development and economic growth (see for instance Chang and Caudill, 2005; Seetanah, 2008; Anwar and Nguyen, 2009; Jalila and Feridun, 2011;Uddin et al., 2013), evidence from oil-dependent countries suggest weak or even negative relationship. Most oil-dependent countries depend significantly on oil revenue and are unable to develop other competitive sectors that could stimulate economic activities in the private sector, leaving resource allocation to be dominantly determined by the public sector and economic activities significantly influenced by movements in oil price (see Mehrara andOskoui, 2007; Farzanegan, 2014). Not surprisingly, the role of financial intermediary development in enhancing economic growth in these economies has received very limited attention, even though the overall significance of the financial intermediary development on economic growth has widely been considered (Kurronen, 2015).

Cevik and Rahmati (2013) examined the case of Libya over the period 1970 to 2010 using the ratio of private sector credit to the size of the Libyan economy as a measure of financial intermediary development. Controlling for the possible influence of crude oil price, government spending per capita, trade openness and international sanctions on economic growth, the results of the study show the effect of financial sector intermediation on economic growth over the period to be negative across different model specifications and estimation methods. Quixina and Almeida (2014) examined the relationship between financial sector development and economic growth in Angola over the period 1995 to 2012 using the ratio of broad money (M2) to GDP to capture financial development in Angola. The results of the study show causal relationships running from oil sector to both financial sector development and economic growth in Angola, with financial sector development showing insignificant role in the economic growth of the country. Using data covering the period from 1960 to 2010, Adeniyi et al. (2015) shows that a negative relationship exists between financial sector deepening and economic growth in Nigeria but however, noted a sign reversal on the inclusion of squared terms, indicating a turning point in the finance-growth nexus in Nigeria. Nwani and BasseyOrie (2016) examined the independent effects of stock market and banking sector development on economic growth in Nigerian using the Autoregressive Distributed Lag (ARDL) approach to cointegration analysis over the period 1981 to 2014. The results of the study suggest that both stock market and banking sector development are not significant drivers of economic growth in Nigeria.

With most empirical studies from oil-exporting countries suggesting weak or even negative relationship between financial sector development and economic growth in oil-dependent economies as a result of the dominant role of the oil sector in these economies (other studies include Nili and Rastad, 2007; Barajas et al., 2013), attention is beginning to shift from the general assessment of the effect of financial sector deepening on the overall economic growth to understanding the effect of financial sector deepening on non-oil sectors contribution to economic growth. The argument is that the degree of financial deepening could be influencing economic activities in sectors of the economy not directly linked to oil production (Quixina and Almeida, 2014). Even though the growth-generating ability of these sectors may be very small relative to the size of the oil sector, itis considered very crucial to oil-exporting countries seeking for diversification. Following this argument, Samargandi et al. (2014) considered the role of financial sector development on economic growth in Saudi Arabia over the period 1968 - 2010. Distinguishing between the effects of financial sector development on the oil and non-oil sectors of the Saudi Arabian economy, the study shows that financial sector development has a positive impact on economic growth in the non-oil sector. In contrast, its impact on the overall economic growth and the oil-sector growth in Saudi Arabia is either negative or insignificant. The results of the study thus suggest that financial sector development may be driving economic growth in the private sector dominated non-oil sectors in oil-dependent economies.

From the foregoing, the impact of financial sector deepening on the contribution of the non-oil sectors to economic growth in Nigeria has received no research attention. This study seeks to fill this gap in the literature by examining empirically the dynamic effects of indicators of financial sector deepening on the contribution of the non-oil sectors: Service-Producing sectors to economic growth in Nigeria.

III. Data Collectionand Research Methodology

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 Service-Producing 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.

3.1 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.

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

*lnSecRgdp*represents the contribution of each of the the non-oil sectorsto real GDP, *lnSPrgdp,* 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.

3.2 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 deepening 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
SPrgdp	Service-Producing 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

3.2.1 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 manufacturing firms and hence, increase in manufacturing output. Increase credit to the private sector means more credit (capital) to the manufacturing 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.

3.3 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.

3.3.1 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.

3.3.2 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.

3.3.3 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.

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

Where Y_t is a column vector of the n variables Δ is the difference operator, Γ and Π are the coefficient matrices, k denotes the lag length and β is a constant. In the absence of cointegrating vector, Π 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:

$$J_{trace} = -T \sum_{i=r+1}^{n} \ln(1 - \hat{\lambda}_i) \quad (2)$$

$$J_{max} = -T ln(1 - \hat{\lambda}_{r+1}) \quad (3)$$

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 thenull 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.

3.3.4. 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:

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

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 coefficientsλ_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

3.4 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.

***3.4.1*Autocorrelation**

The assumption of no autocorrelation between the error terms is one of the classical linear regression model assumptions. The problem of autocorrelation normally occurs in a pure time series data but less likely to be occurred in a pure cross-sectional data. There are two types of autocorrelation, they are pure autocorrelation which are caused by internal data problem, and impure autocorrelation which are caused by external factors such as specification bias. Once the error terms are independent and not correlated to each other, the OLS estimators will achieve best, linear, unbiased and efficient (BLUE) properties, as a result all the hypothesis testing will become valid and reliable (Gujarati & Porter, 2009). 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.

3.4.2 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).

Therefore, it is important for the model to achieve homoscedasticity so that OLS estimators will achieve best, linear, unbiased and efficient (BLUE) properties, as a result all hypothesis testing will become valid and reliable. The Arch test which is 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.

IV. Empirical Results

4.1. Unit Root Tests Results

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 4.3.1 below clearly indicate that all series exhibit unit root property using both ADF test statistics. Thus, according to the ADF test, all the seven variables of LSERVGDP, LM2GDP, LCPSGDP, LEXTR, LTRADE were non-stationary at their levels but became stationary after the first differencing. Hence the series are all integrated series of order I (1) and therefore showed that all the variables are stationary (no unit root) at first difference using 5 per cent level of significance ($\alpha = 0.05$). This is because their respective ADF test statistics value is greater than Mckinnon critical value at 5% and at absolute term. The results implied that all series has to be differenced once in our models in order to avoid spurious results.

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	
LSERVGDP	0	-4.411516	-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

Table 4.3 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. Thus, the variables are not stationary at level but are all stationary (do not have unit root) in their first difference. As such the variables are integrated of the same order i.e*I (1) integrated of orders one.*

4.1.2 VAR Lag Order Selection Criteria:

Table 2VAR Lag Order Selection Criteria

VAR Lag Order Selection Criteria						
Endogenous variables: LSERVGDP LM2GDP LCPSGDP LEXTR LTRADE						
Lag	LogL	LR	FPE	AIC	SC	HQ
0	37.4208	NA	7.36E-08	-2.235917	-2.000177	-2.162086
1	129.48	146.0249*	7.43e-10*	-6.860689	-5.446245*	-6.417702*
2	156.335	33.33721	7.75E-10	-6.988618	-4.39547	-6.176476
3	185.3841	26.04407	9.58E-10	-7.267870*	-3.496019	-6.086573

* 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

4.1.3 TEST FOR 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 variables that is I(0). The result of Juhansencointegration test is presented in the table below:

Table 3: Johansen Cointegration Test Results

Series: LSERVGDP LM2GDP LCPSGDP LEXTR LTRADE Unrestricted Cointegration Rank Test (Trace)				
Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.821038	90.41934	69.81889	0.0005
At most 1	0.509841	40.52254	47.85613	0.2043
At most 2	0.331297	19.8448	29.79707	0.4334
At most 3	0.209024	8.174774	15.49471	0.4469
At most 4	0.046295	1.374629	3.841466	0.241
Trace test indicates 1 cointegratingeqn(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 No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.821038	49.8968	33.87687	0.0003
At most 1	0.509841	20.67774	27.58434	0.2962
At most 2	0.331297	11.67003	21.13162	0.5805
At most 3	0.209024	6.800145	14.2646	0.513
At most 4	0.046295	1.374629	3.841466	0.241
Max-eigenvalue test indicates 1 cointegratingeqn(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*
Note: * shows the rejection of null hypothesis at 5%

Table 4.3.3 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.

4.1.4*Long Run Estimates*

The long run relationship of the variables from the normalized cointegration result with respect to Service-Producing sector contribution to GDP output provides the evidence regarding the long-run dynamic adjustment among Service-Producing sector contribution to GDP 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:

Table 4.Long run Estimates

LSERVGDP(-1)	LM2GDP(-1)	LCPSGDP(-1)	LEXTR(-1)	LTRADE(-1)	C
1	-0.421688	0.408135	0.053135	-0.043411	3.497379
	(0.02938)	(0.01752)	(0.00227)	(0.00836)	
	[-14.3552]	[23.2927]	[23.4366]	[-5.19439]	

Source: *Extraction from estimation output using E-views 10*

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 Service-Producing sector contribution to GDP 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 Service-Producing sector contribution to GDP output by 0.4216% 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 Service-Producing sector contribution to GDP 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 Service-Producing sector contribution to GDP output by 0.4081% 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 Service-Producing sector contribution to GDP 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 Service-Producing sector contribution to GDP output by 0.0531% 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 Service-Producing sector contribution to 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 Service-Producing sector contribution to GDP output by -0.0434% and vice versa

4.1.5. 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 Service-Producing sector contribution to GDPresponds 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 Service-Producing sector contribution to GDPoutput respectively. The table below present the detail result regarding the short run causalities:

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

Error Correction:	D(LSERVGDP)	D(LM2GDP)	D(LCPSGDP)	D(LEXTR)	D(LTRADE)
CointEq1	-0.89654	-2.957156	0.466791	-4.602476	1.196581
	-0.33773	-1.74066	-2.69379	-4.80321	-3.35496
	[-2.65462]	[-1.69887]	[0.17328]	[-0.95821]	[0.35666]
D(LSERVGDP(-1))	0.413376	1.669264	1.183973	0.270731	2.543606
	(0.21458)	-1.10596	-1.71155	-3.05181	-2.13164
	[1.92643]	[1.50933]	[0.69175]	[0.08871]	[1.19326]
D(LSERVGDP(-2))	0.345319	3.150632	2.658143	2.102067	1.55735
	(0.2284)	-1.17716	-1.82175	-3.24829	-2.26887
	[1.51192]	[2.67646]	[1.45912]	[0.64713]	[0.68640]
D(LM2GDP(-1))	0.387927	1.032364	0.21257	2.86195	-0.844602
	(0.13613)	-0.70164	-1.08583	-1.93611	-1.35234
	[2.84960]	[1.47136]	[0.19577]	[1.47819]	[-0.62455]
D(LM2GDP(-2))	0.178251	1.019733	0.628081	1.556049	-1.288149
	(0.11091)	-0.57162	-0.88463	-1.57735	-1.10175
	[1.60720]	[1.78393]	[0.71000]	[0.98650]	[-1.16919]
D(LCPSGDP(-1))	-0.220584	-0.72081	-0.231441	-1.842754	-0.037887
	(0.09609)	-0.49527	-0.76646	-1.36665	-0.95458

	[-2.29551]	[-1.45539]	[-0.30196]	[-1.34837]	[-0.03969]
D(LCPSGDP(-2))	-0.152189	-0.953826	-0.695484	-1.03737	0.422504
	(0.07443)	-0.38361	-0.59367	-1.05855	-0.73938
	[-2.04474]	[-2.48643]	[-1.17150]	[-0.97999]	[0.57143]
D(LEXTR(-1))	-0.070103	-0.180116	-0.140947	-0.275019	0.258226
	(0.02357)	-0.12149	-0.18801	-0.33523	-0.23415
	[-2.97414]	[-1.48261]	[-0.74969]	[-0.82039]	[1.10281]
D(LEXTR(-2))	-0.013949	-0.026635	-0.044822	-0.199399	0.334872
	(0.01907)	-0.09829	-0.15212	-0.27123	-0.18945
	[-0.73139]	[-0.27098]	[-0.29466]	[-0.73516]	[1.76759]
D(LTRADE(-1))	0.000331	0.00292	0.051051	-0.123493	-0.175174
	(0.02341)	-0.12067	-0.18675	-0.33298	-0.23258
	[0.01414]	[0.02420]	[0.27337]	[-0.37087]	[-0.75316]
D(LTRADE(-2))	0.008831	0.162316	0.246012	0.288007	0.245363
	(0.01938)	-0.09989	-0.15459	-0.27565	-0.19254
	[0.45566]	[1.62489]	[1.59136]	[1.04483]	[1.27437]
C	0.014222	-0.001366	0.022839	0.173634	-0.116329
	(0.00648)	-0.0334	-0.05169	-0.09216	-0.06437
	[2.19482]	[-0.04090]	[0.44189]	[1.88407]	[-1.80716]
R-squared	0.560667	0.468751	0.414773	0.228189	0.475815
Adj. R-squared	0.276393	0.125001	0.036097	-0.271219	0.136636
Sum sq. resids	0.009028	0.239807	0.574331	1.825983	0.890857
S.E. equation	0.023044	0.11877	0.183805	0.327736	0.228918
F-statistic	1.972274	1.36364	1.095324	0.456919	1.402845
Log likelihood	75.93501	28.38143	15.71753	-1.054147	9.352355
Akaike AIC	-4.409311	-1.129754	-0.256381	0.900286	0.182596
Schwarz SC	-3.843534	-0.563976	0.309396	1.466064	0.748374
Mean dependent	0.012632	0.019746	0.028689	0.145196	-0.008235
S.D. dependent	0.02709	0.12697	0.187215	0.290679	0.246367

Source: Extraction from estimation output using E-views 10

Table 4.3.5 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 (-0.89654), 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 89% of the deviation from long run equilibrium are corrected in the next period.

From the table also, the estimated coefficient (M2GDP) has the expected sign and CPSGDP do not. The (lag value of M2GDP (lag1), CPS at lag 1 and 2) variables are statistically significant and this shows that there is a short run causality running from these variables to SPrgdp. In other words, the result vindicates that in the short run, the value which the Service-Producing sector contribution to GDP output 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 Service-Producing sector contribution to GDP 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.

4.1.6 Results of Granger Causality Test

Table6 Result of Granger Causality tests

Pairwise Granger Causality Tests				
Null Hypothesis:	Obs	F-Statistic	Prob.	Remark
LM2GDP does not Granger Cause LSERVGDP	30	2.63485	0.0915	no directional
LSERVGDP does not Granger Cause LM2GDP		3.30551	0.0532	
LCPSGDP does not Granger Cause LSERVGDP	30	1.41207	0.2624	uni directional
LSERVGDP does not Granger Cause LCPSGDP		3.52606	0.0448	
LEXTR does not Granger Cause LSERVGDP	30	3.34031	0.0518	no directional
LSERVGDP does not Granger Cause LEXTR		0.53912	0.5899	
LTRADE does not Granger Cause LSERVGDP	30	1.37633	0.271	uni directional
LSERVGDP does not Granger Cause LTRADE		3.7446	0.0378	
LCPSGDP does not Granger Cause LM2GDP	30	1.15581	0.3311	no directional
LM2GDP does not Granger Cause LCPSGDP		0.61274	0.5498	
LEXTR does not Granger Cause LM2GDP	30	0.91458	0.4137	no directional
LM2GDP does not Granger Cause LEXTR		0.9743	0.3913	
LTRADE does not Granger Cause LM2GDP	30	0.0168	0.9834	no directional
LM2GDP does not Granger Cause LTRADE		6.07253	0.0071	
LEXTR does not Granger Cause LCPSGDP	30	1.37747	0.2707	no directional
LCPSGDP does not Granger Cause LEXTR		0.1013	0.904	
LTRADE does not Granger Cause LCPSGDP	30	0.32413	0.7262	uni directional
LCPSGDP does not Granger Cause LTRADE		6.67145	0.0048	

LTRADE does not Granger Cause LEXTR	30	0.75298	0.4813	no directional
LEXTR does not Granger Cause LTRADE		1.81098	0.1843	

Source: Extraction from estimation output using E-views 10

The result of granger causality as presented by the table above shows that, there is a unidirectional causality running from, Service-Producing sector contribution to GDP output to ratio of Credit to Private Sector.

4.2 DIAGNOSTIC TEST AND STABILITY TESTS

From the diagnostic test results (see results in Table 4.3.15 (1-3)). 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 model specified.

Table: 7 Diagnostic test

Diagnostic Test	Df	Rao F-stat	Chi-sq	Prob	Remark
Serial correlation	25	1.321682		0.2282	Do not reject Ho
VEC Residual Heteroskedasticity Tests	330		336.0998	0.3967	Do not reject Ho

Sources: Extract from eview10

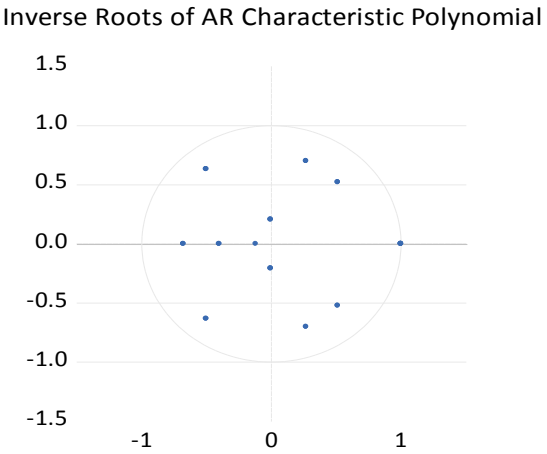

Figure 1 Inverse roots of AR characteristics polynomial model

The first objective is to assess the impact of financial deepening variables (ratio of broad money to GDP) on the contribution of Non-Oil Sectors to Economic Growth in Nigeria.The estimate for the long run coefficient of money supply indicates a negative relationship between output of the Service-Producing sector contribution to real GDP in Nigeria and money supply in the long run. This although does not comfort with theoretical postulations, may be due to the fact that (1) increase in the supply of money may have resulted to constant demand for higher wages by the labor force as there is an increase in the price of goods and services which reduce their real wages due to increase in the supply of money in the economy. (2) increase in the supply of money are meant to reduce the cost of money (lending rate) yet, in Nigeria due to continuous increase in the demand for money the rate of lending remains relatively constant at high level which result to high cost of borrowing to the investors and limit their ability to borrow capital for expansion. These altogether results to a negative response in Service-Producing sector contribution to real GDP in Nigeria to a change in money supply. This is similar to the findings by, Adeniyi et al. (2015).

V. Summary And Conclusion

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 deepening on economic growth in the non-oil sectors: Service-Producing 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 these non-oil sectors in Nigeria. The results show that contrary to the conclusion that financial intermediaries are unable to stimulate economic activities in oil-dependent economies through resource mobilisation and allocation as documented by Nili and

Rastad (2007), Beck (2011) and Barajas et al. (2013), financial sector intermediary development (from the credit to private sector) remains a major driver of long-term economic growth in these non-oil sectors 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.

Our analysis have shown that the relationship between financial deepening and economic growth is strong in the long run and indicates no relationship in the short run, nevertheless, we recommend as follows:Effective means of improving credit channels and liquidity to private firms by 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. Thus, the policy that established Asset Management Corporation should be strengthened in other to free the deposit money banks from a high incidence of non-performing loans, and thereby, enhance their ability to extend more credit to the economy.

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