

# Dynamics of Exchange Rate and the Performance of Service Industry: The Nigerian Experience

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**Abstract.** The re-basing of the Nigerian economic data since 2013 has shown the growing relevance of the service sector to the economic development of Nigeria. The need to investigate the nexus between the service sector and macroeconomic variables become imperative in view of inadequate research attention in the past and the present desirable concern for policy shifts in favor of promoting activities in the sector. It is in this context that our paper considered the effects of exchange rate behavior on the performance of the service industry in Nigeria. More so that it is becoming increasingly clear that the openness of the Nigerian economy to the outside world and the seeming dollarization of earnings from economic activities, even with high local content, have varied impacts on economic behavior in many sectors of the economy. A comprehensive study was carried out to determine the relationship between the dynamics of exchange rate and the service industry activities. The data used include services, exchange rates, money supply, domestic credit, interest rate and inflation covering the period of 1981-2015. Using the ARDL, a 10% point increase in exchange rate volatility and domestic credit increases service output growth (SER) by 0.68% and 5.15% respectively. The paper thus suggest that there must be reforms in government polices to remove barriers to entry by private investors into certain services in order to prevent market distortions and reduce cost of capital so as to enhance an integrated services-manufacturing industrial growth.

JEL Classification: F31, L81, L91, L96, G4

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## 1 Introduction

Services sector has been identified to be the apex of economic development going by Clark (1977) economic growth model. The fundamental foundation of the model is resource based, such that when it is fully utilized, the economy only needs to maintain and sustain its tempo of development. Hence sustainable economic development is ensured since the economy has already transited from the primary to secondary industry. By implication and in consonance with the classical economic paradigm, full employment is attained and the economy only needs to be serviced. These services such as transportation, communication, insurance, banking and finance have all been regarded as aids to trade and germane to the functionality of the primary and secondary sectors. It is for this reason also that the service sector is referred to as the tertiary industry.

For an economy that is technologically backward, there is a need for procurement of imported inputs in order to facilitate the service industry, hence the need

for continuous inflow of foreign exchange. But with respect to the high frequency rate of change in currency prices, there is that tendency for the cost in the provision of services to be on the high side. Such is the current predicament of the Nigerian economy, which experiences exchange rate surges and consequently increasing cost of service delivery. This has been attributed to frequent increase in the cost of procuring technical equipments from abroad due to the exchange rate volatility or the persistent fluctuations of Nigerian Naira.

In the heavily industrialized economies, service sector plays very pivotal role in lubricating their economies, as they are making consistent efforts in maintaining the development so far attained. In comparison to Nigeria and other developing economies, there has not been appreciable industrial development and their service industries have focused more on direct services and to aid production of consumer goods rather than on capital goods that could further generate inflow of foreign exchange. While the demand for foreign exchange towards the provision of direct

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consumer services increases, there has not been reciprocal inflow of foreign exchange in the same magnitude. It is this inadequate foreign exchange that catapults the conversion rate of Naira to other currencies of Nigerian trading partners. Whereas, in some developing countries like Gambia and Kenya, the service industry through tourism and hospitality services have been contributing enormous foreign exchange for their economies growth.

The significance of the services sector depends on its contributions to gross domestic product and its annual growth rate. For instance, in 2013 the share of the service sector in the Nigerian GDP was 57% (Rutkowski et al., 2015) with an average annual growth rate of 3.7%. It thus indicates that service sector activities are more prevalent in the Nigerian economy. It is the most easy employment absorber of the economy since the barrier to be engaged is flexible. Furthermore, except for highly technical requirements, it absorbs most of the low-skilled labour intensive technique of production. This is the reason why service delivery is poor and inconsequential in leading and spearheading economic growth in Nigeria.

Whereas, those economies that are high-skilled service sector tend to enhance high productivities in the agriculture and manufacturing, mining and construction industries. This is what has been experienced in the United States and Japan in 2011; While in United States, share of service sector in GDP was 78.6% that of Japan which was 72.7% as at the period of reporting. Rather than experienced acute shortages of goods and commodities due to high percentages of services sector contributions to their GDPs, their productivities in all other sectors increased continuously. With this scenario, this has continued to attract more capital inflows and hence more foreign exchange. Logically therefore, for developed economies that are endowed with high-skilled services sector, foreign exchange is easily accessible compared to low skilled services sector in the developing economies. It is therefore apparent that there is a bivariate relationship between the exchange rate and the services sector of an economy.

## 2 Literature Review

The increase in services is a direct response to the rise in an economy's level of income (Fuchs, 1980). This is because higher the level of income available to the economy, more the increase in demand for consumption and capital goods. Hence the need for services sector to lubricate the machines and organize other inputs needed for converting raw materials into intermediate and final goods for further production and final consumption. Services sector has continued to be the sin-

gle largest and leading sector in providing more output and more employment to several people than any other sector. Perhaps the service sector has significantly been the source of impetus to the socio-economic growth of a country. On this note, Van Grastek (1987) upholds that the classification of various services as a tertiary sector includes a non homogenous series of activities ranging from direct consumer services to sophisticated producer services such as data processing. In line with this view, Anyanwu (1997) regard services as one of the service-producing-industries which include all the services that are intangible in nature but very germane to the continuous production of tangible goods. The services sector thus includes all those economic activities outside the agriculture or manufacturing sectors (Iashmi and Kumar, 2012). Whereas, going by the Industrial Standard Classification (ISC) and by Khanna et al. (2016), the total industry includes agriculture, mining and quarrying, manufacturing, electricity and water supply and construction. Hence every other economic activity is regarded as services.

The predominance of the services sector in the Nigerian economy started in the wake of structural adjustment program (SAP), most especially with the high profitability experienced by the country's financial sector. The liberalization of the sector enhances the opportunities of accessing the foreign exchange market, provides an avenue for proliferation of banks and bureau-de-charges. With this liberalization, the growth in production activities experienced, to some extent in Nigeria is attributed by Anyanwu (1997) to increase in government spending, which is also enhanced by fiscal decentralization through creation of additional local governments, thus necessitating additional services. It therefore implies in the context of Nigeria - a low income country that, the underdevelopment of the services sector is tantamount to impeding employment and anti production efforts. This is because services can hardly pollute the environment unlike manufacturing and agriculture.

Despite the reclassification of services into old and new categories, which include petty trading, domestic services, hotel and catering, and communication, insurance, legal, finance, real estate as well as education respectively, (Iashmi and Kumar, 2012) did not fail to reaffirm that the availability of quality services is important for the continuous survival or rapid growth of an economy. Their study identified the causes of the predominance of services to include urbanization, privatization and increase in demand for intermediate and final consumer goods. Furthermore it is crucial to accelerated economic growth, economic efficiency and global competitiveness. The socio-cultural and economic conditions have given more prominence to the service sector more so that it is trajectory to the efficien-

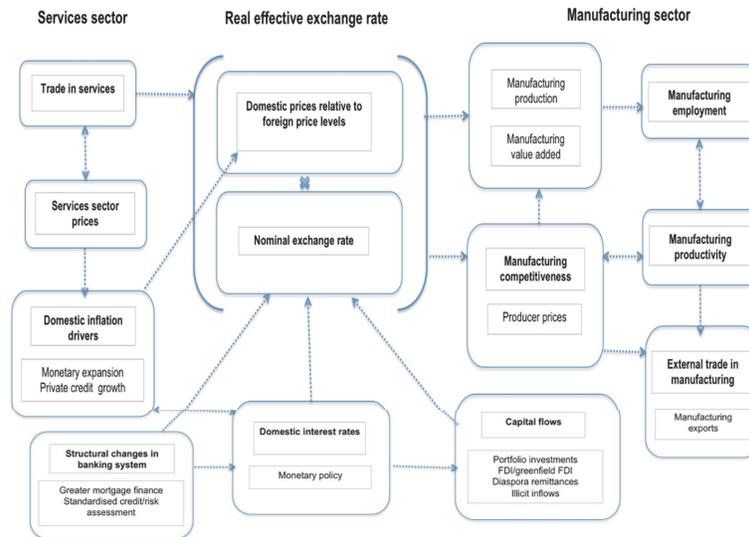


Figure 1: Services development, real effective exchange rate and economic transformation

Source: Adapted from *Khanna et al. (2016)*.

cies in all other sectors of any economy.

Further buttressing the growth of the services sector is *Eichengreen and Gupta (2011)* in which the traditional services play significant role in developing countries due to their low levels of income. Whereas, as the level of income increases in the developed countries, the share of the services increases further, especially in the modern services like communication, finance, computer and business. It is for these dichotomized developed-developing countries responses that made *Mukand and Rodrik (2015)* to conclude that developing countries had only attained premature deindustrialization. This is because their manufacturing sector has reached the peak due to low productivity necessitated by the increasing share of activity and employment in the services sector.

Accordingly, emphasis on the services sector arises from accommodating the unemployed resources due to low productivity in the manufacturing sector, inter-industry divisions of labor arising from manufacturing outsourcing and structural changes in the composition of aggregate demand (*Khanna et al., 2016*). In the real sense of it, the increasing demand for services is a growth-escalator because of the increasing wages from the services sector, thus facilitating high production in the manufacturing subsector of the industry. Perhaps the cheaper the services, the more they become integral lubricants in the process of raw inputs. This is the reason for *Lanz and Maurer (2015)* notion of servicification of manufacturing in terms of value added in developed and developing countries.

The cheap labor services most especially arising

from its influx to other countries used frequently as production input tends to increase foreign exchange inflows through remittances to their home countries. This labor migration thus reduces the proportion of people living in poverty through investment-induced multiplier effect. Contrary to this, *Khanna et al. (2016)* uphold that services tending towards export-revenue maximization and capital inflows in isolation of the rest economy most especially in the ICT and financial services risk the danger of inflation, short term capital flows and low competitiveness in the agriculture and manufacturing subsectors. In accordance, the inflow of foreign exchange arising from the shifts of capital and labor away from agriculture and manufacturing hence resource transfer tends to distort growth through production of domestic non-tradable goods.

Empirically in the study conducted on the impact of exchange rate movements on services, *Huang et al. (2014)* using Tobit estimation procedure, confirmed that profits, survival and sales of services sector were affected just as it occurred in the manufacturing subsector in Canada. This was because as the domestic currency appreciated, the survival of less productive firms reduced and consequently lowered the sales of the surviving firms. Furthermore the study while using micro data from the communication, finance, insurance, real estates and insurance agent, business services and part of other services collated from the tax forms and longitudinal employment analysis projects (T2-LEAP), concluded that exchange rates significantly affected profits of service firms but not as much as experienced in the manufacturing sector.

Reasserting the existing relationship between ex-

change rate and services sector in line with Huang et al. (2014) is the significance of export services to foreign exchange inflows in India. According to Iashmi and Kumar (2012), Indias export services increased from US\$5bn in 1990 to US\$74bn in 2006. This exponential increase was attributed to the information technology and electronic services, which further increased the share of the country in global services trade. According to the authors, this was aided by the liberalization policy of the country, especially the migration from fixed to flexible exchange rate system. Furthermore Khanna et al (2015) studied also tilted towards the studies of Huang et al. (2014) and Iashmi and Kumar (2012) by examining finance, ICT, tourism and transport services as a major impetus to economic transformation in Kenya. The study particularly identified tourism as the sector that generates export revenues, value addition and many jobs directly or indirectly using data sourced from the Kenya National Statistical Office for the period of 2009 to 2013 and exhibited in Figure 1.

Figure 1 emphasizes how the services sector influences the real effective exchange rate and consequently leads to economic transformation. Figure 1 further demonstrates how services could be promoted to enhance linkages with manufacturing and or agriculture. In fact, a stronger real exchange rate of Kenyan Shillings was driven by the countrys transport sector due to banking sector inflows and rising corporate credit that benefited from the appreciation of the countrys currency.

Considering the fact that out of the available empirical studies reviewed in this paper, only Huang et al. (2014) used advanced model estimation technique, while other studies by Iashmi and Kumar (2012) as well as Khanna et al. (2016) used only descriptive statistics to analyze the collected data. Though the empirical studies so far are country-specific but none is yet to be found in relation to the Nigerian economy. It is against this background that this paper concentrated on deriving and estimating a robust model for establishing a concrete relationship between exchange rate and efficiency of the services sector in Nigeria.

## 3 Methodology

### 3.1 Model Specification

This study relies on the endogenous growth framework to investigate the relationship between the exchange rate and the service industry in Nigeria. The need to investigate the nexus between the service sector and macroeconomic variables become imperative in view of inadequate research attention in the past and the present desirable concern for policy shifts in fa-

vor of promoting activities in the sector. Following the studies of Baggs et al. (2009), Ogun et al. (2012), and Iashmi and Kumar (2012), the empirical model adapted and modified for this study is stated as:

$$SER_t = \phi_0 + \phi_1 EXRV + \phi_2 MS_t + \phi_3 DCP_t + \phi_4 INT_t + \phi_5 INF_t + \mu_t$$

Where:  $SER$  is service output as a ratio of gross domestic product (GDP);  $EXRV$  is exchange rate volatility;  $MS$  is money supply as a ratio of GDP;  $DCP$  is domestic credit to private sector by banks as a ratio of GDP;  $INF$  is inflation rate;  $INT$  is interest rate;  $\phi_0$  is constant;  $\phi_{1-5}$  are slopes;  $\mu$  is error term; and  $t$  is time. Exchange rate volatility is measured using the generalized autoregressive conditional heteroskedasticity (GARCH) developed by Bollerslev (1986) and Taylor (2008) since it captures past values and also capable of forecasting the conditional variance of exchange rate. The conditional variance is specified as a function of three terms which is stated as:

$$\sigma_t^2 = \omega + \alpha \varepsilon_{t-1}^2 + \beta \sigma_{t-1}^2$$

Where;  $\omega$  is a constant term;  $\varepsilon_{t-1}^2$  (the ARCH term) is information about volatility from the previous period which is measured by the squared residual from the mean equation; and  $\sigma_{t-1}^2$  (the GARCH term) is the last period's forecast variance.

The theoretical expectation of the model expects the slope of exchange rate to be positive or negative. An increase in exchange rate (price of a country's currency with respect to other currencies of the world) will make the domestic currency cheaper in the foreign exchange market. This depreciation in the domestic currency will make exports cheaper and imports expensive in the international market for goods and services. As a result of this, the demand for domestic goods and services would increase appreciably thus leading to a rise in the output of the service industry. The financial deepening indicators are expected to enhance the performance of the service industry. An increase in money supply will bring about an increase in the total money in circulation in the country. Invariably, it will increase aggregate demand and lead to a rise in productive activities and investment opportunities in the economy. This rise in the productive activities in the economy will lead to a rise in output of all sectors. However, domestic credit is expected to have a positive relationship with the growth in output of the services sector. Moreover, interest rate and inflation are expected to have negative relationship with output growth in an economy.

### 3.2 Data Sources and Estimation Techniques

The data used are mainly secondary and were all sourced from the Central Bank of Nigeria (CBN) Statistical Bulletin, 2015 and National Bureau of Statistics (NBS). The period spans within 1981–2015. The study used the Autoregressive Distributed Lag (ARDL) bounds test by Pesaran et al. (2001) to investigate the impact of exchange rate volatility on the performance of the service industry in both long and the short run periods in Nigeria. Using this approach, the performance of the service industry is expressed as a function of the lagged value of itself and the current and the lagged values of the exchange rate volatility, financial deepening indicators, interest rate and inflation rate.

$$\begin{aligned} \Delta SER_t = & C_0 + \sum_{p=1}^n \phi_p \Delta SER_{t-p} + \sum_{p=1}^n \gamma_p \Delta EXRV_{t-p} \\ & + \sum_{p=1}^n \lambda_p \Delta MS_{t-p} + \sum_{p=1}^n \omega_p \Delta DCP_{t-p} + \sum_{p=1}^n \theta_p \Delta INT_{t-p} \\ & + \sum_{p=1}^n \vartheta_p \Delta INF_{t-p} + \delta_1 SER_{t-1} + \delta_2 EXRV_{t-1} \\ & + \delta_3 MS_{t-1} + \delta_4 DCP_{t-1} + \delta_5 INT_{t-1} \\ & + \delta_6 INF_{t-1} + \nu_t \end{aligned}$$

Where:  $\Delta$  is the first difference operator;  $\delta_{1-6}$ , are the long run multipliers;  $\phi, \gamma, \lambda, \omega, \theta, \vartheta$  are the short run dynamic coefficients of the underlying ARDL model in the equation;  $\nu$  denotes the white noise error term. The Bounds cointegration test estimates equation 3 and restricting the parameters of the lag level variables to zero. Based on this equation, we tested the following null hypothesis ( $H_0 = \delta_1 = \delta_2 = \delta_3 = \delta_4 = \delta_5 = \delta_6 = 0$ ) of no cointegration or level relationship against the alternative hypothesis ( $H_1 = \delta_1 = \delta_2 = \delta_3 = \delta_4 = \delta_5 = \delta_6 \neq 0$ ) that there is cointegration.

The F-test was used to test the existence of cointegrating relationship among the variables by testing the significance of the lag levels of the variables. The calculated F-statistic is compared with the two critical values for the upper and lower bounds tabulated by Narayan (2004). If the calculated value is greater than the upper bounds limit, there is long-run relation. There is no long run relationship if the calculated value is less than the lower bounds value. However, the result is inconclusive if it falls between the two bounds. Prior to the ARDL test, the unit root tests using the Augmented Dickey Fuller test were estimated to confirm the appropriateness of the estimation technique. The study also conducted diagnostic tests such as serial correlation, normality, and heteroskedasticity tests and the stability test.

## 4 Results and Discussions

### 4.1 Descriptive Analysis

Table 4.1 presents the descriptive analysis of the time series properties of the variables included in the model. The descriptive statistics was carried out among exchange rate volatility, financial deepening variables, inflation, interest rate and service sector output growth in Nigeria from 1981 to 2015. The table shows that the average value of service output (SER), money supply (MS) and domestic credit (DCP) to the size of the economy stood at 28.6%, 17.3% and 12.8% correspondingly. The mean value of the exchange rate volatility (EXRV) is 0.0673 which indicates that the country's currency is less volatile. The annual growth of interest rate (INT) and inflation rate (INF) stood at 12.9% and 20.4% correspondingly. The standard deviation of service output (SER), exchange rate volatility (EXRV), money supply (MS), domestic credit (DCP), interest rate (INT) and inflation rate (INF) from their respective long term mean values every year point at 3.81%, 0.302, 5.84%, 6.55, 4.16% and 18.5% respectively. The probability value of Jarque-Bera statistics for all variables shows their distribution level at mean zero and constant variance. It indicated that interest rate and service output are normally distributed among all the variables of interest.

Figure 2 illustrate the relationship between exchange rate volatility, interest rate and inflation rate in Nigeria. The figure reveals the volatile nature of Naira to dollar and how it fluctuates with interest rate and inflation throughout the periods. Thus, the directions of the trends are inconclusive moving positive and negative.

Figure 3 illustrate the relationship among service output, financial deepening indicators (money supply and domestic credit as percentage of GDP) and exchange rate volatility in Nigeria during the period of 1981 to 2015. The performance of the service sector improved over the periods as the trend (real service output as a percentage of real GDP) shows an upward movement. However, the relationship of the financial deepening indicators and exchange rate volatility are not clear enough to indicate whether it is positive or negative. The growth rate of service output to GDP fluctuates between 24.04% and 36.76%.

Consequently, the inconclusiveness of the direction of our variables necessitates the need for an empirical analysis.

### 4.2 Unit Root Test Results

The time series properties of the variables using the Augmented Dickey Fuller (ADF) are presented in Table 4.2. This was carried out before establishing the long-run and short-run relationship and their estimates. The

Table 4.1: Descriptive Statistics

	SER	EXRV	MS	DCP	INT	INF
<b>Mean</b>	28.58250	0.067275	17.25827	12.84335	12.88189	20.35057
<b>Maximum</b>	36.76229	1.345124	37.95685	36.89332	26.00000	72.81000
<b>Minimum</b>	24.04271	-0.157800	8.577088	5.917133	6.000000	4.670000
<b>Std. Dev.</b>	3.805036	0.302197	5.838363	6.547699	4.159491	18.44539
<b>Skewness</b>	0.874476	2.720339	1.655927	1.877912	0.733065	1.453957
<b>Kurtosis</b>	2.490928	10.77281	6.868021	6.880788	4.281029	3.829618
<b>Jarque-Bera</b>	4.838728	131.2757	37.81453	42.53481	5.527921	13.33533
<b>Probability</b>	0.088978	0.000000	0.000000	0.000000	0.063042	0.001271
<b>Obs.</b>	35	35	35	35	35	35

Source: Authors' computation (2017)

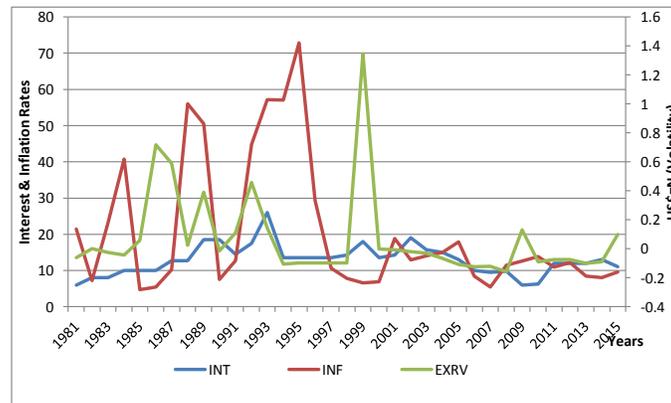


Figure 2: Exchange Rate Volatility, Inflation and Interest Rates

Source: Authors (2017)

results show that exchange rate volatility (EXRV) and inflation rate (INF) are stationary at levels [I(0)]. On the other hand, interest rate (INT), money supply (MS), domestic credit (DCP) and service output (SER) were

reported to be stationary at first difference [I(1)]. Thus, these series are non-mean reverting at levels and do not converge to their long-run equilibrium until they are first differenced.

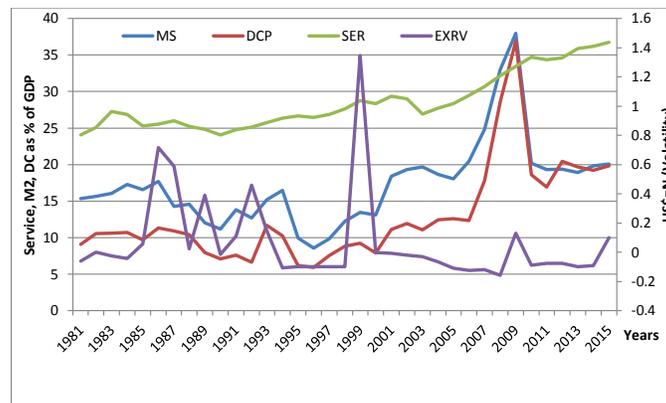


Figure 3: Exchange Rate volatility, Service Output, M2 and Domestic Credit

Source: Authors (2017)

Table 4.2: ADF Unit Root Test Results

Variables	ADF Tau Statistics		Order of Integration
	Intercept	Linear Trend	
INT	-3.0628 (0) [-2.9511]**	-6.3428 (1) [-4.2733]*	1
MS	-5.4703 (0) [-3.6463]*	-5.3824 (0) [-4.2627]*	1
DCP	-5.8298 (1) [-3.6537]*	-5.7631 (1) [-4.2733]*	1
EXRV	-5.0314 (0) [-3.6394]*	-5.3859 (0) [-4.2529]*	0
INF	-2.9696 (0) [-2.9511]**	-4.1011 (1) [-3.5530]**	0
SER	-4.60847 (0) [-3.6463]*	-4.8488 (0) [-4.2627]*	1

Note: \* significant at 1%; \*\* significant at 5%; \*\*\* significant at 10% Mackinnon critical values and are shown in parenthesis. The lagged numbers shown in brackets are selected using the minimum Schwarz and Akaike Information criteria.

Source: Authors' computation (2017).

Empirical literature demonstrated that running a regression of a stationary series on non-stationary series has severe implications in drawing policy inference. The data series provides evidence for the use of Autoregressive Distributed Lag (ARDL) technique of analysis. As posited by Pesaran et al. (2001), ARDL is more suitable for variables with different orders of integration.

### 4.3 ARDL Cointegration Result

Table 4.3 presents the F-statistics estimates for testing the existence of long-run relationship between exchange rate volatility and service output growth in Nigeria. The estimated F-statistics of the normalized equations ( $F_{cat} = 5.2638$ ) is greater than the lower and upper critical bound at 1% significance level. This implies that the null hypothesis of no long-run relationship is rejected at 5% significance level. The implication of the result is that exchange rate volatility (EXRV), money supply (MS), domestic credit (DCP), interest rate (INT), inflation rate (INF) and service output growth (SER), all have equilibrium condition that keeps them together in the long-run.

### 4.4 Results of Long-run Estimates of Exchange Rate Volatility and Service Sector Performance using the ARDL Approach

Table 4.4 revealed the long-run estimates between exchange rate volatility, financial deepening, interest rate, and inflation rate and service sector output growth in Nigeria. The long-run estimates suggested that exchange rate volatility (EXRV) and domestic credit (DC) have positive and significant impact on service performance (SER) in Nigeria and all these conform to the theoretical expectation. In magnitude terms, a 10% point increase in exchange rate volatil-

ity and domestic credit increases service output growth (SER) by 0.68% and 5.15% respectively.

Furthermore, the table 4.4 revealed that money supply (MS), interest rate (INT) and inflation rate (INF) have negative impact on service output growth (SER) in Nigeria. This does conform to a *a priori* expectation except money supply. A 10% decrease in interest rate and inflation rate improve the performance of the service industry by 0.21% and 0.29% respectively. Also, if money supply increases by 10%, the output growth of the service industry deteriorates by 5.72%. The table shows that money supply was statistically significant respectively at 5% significance level.

### 4.5 Error Correction Models using the ARDL Approach

The short-run dynamic relationship between exchange rate volatility and service sector performance in Nigeria reveals the second part of the estimated ARDL model. The results were reported in Table 4.5. The lag lengths were selected based on Akaike Information Criterion (AIC).

The short-run estimates suggested that the first, second and third lags of service sector output have positive impact on the current service sector output in Nigeria. Thus, the short-run estimates of the exchange rate volatility, money supply, domestic credit, interest rate and inflation rate were also shown in the table. The error correction term indicates the speed of adjustment back to equilibrium in the model. The value is negative at 5% significance level. Specifically, the lag of the error correction term (ECT) was found statistically significant at 5% level with the co-efficient of -0.1291. This indicates that 12.91% of the distortion in the short-run is corrected in the first year in attaining equilibrium or service output growth on the basis of the changes in exchange rate volatility, financial deepening variables, interest rate and inflation rate in Nigeria.

Table 4.3: Existence of Long-Run Relationship between monetary policy and output growth

Test Statistic	Value	K
F-statistics (SER EXRV, MS, DC, INT, INF)	5.2638	5
Critical Value Bounds		
Significance	I0 Bound	I1 Bound
10%	2.26	3.35
5%	2.62	3.79
2.5%	2.96	4.18
1%	3.41	4.68

Source: Authors' computation (2017).

Table 4.4: Long Run Coefficients [ARDL: 4,4,3,3,4,4]

Dependent Variable: Service output growth (SER)				
Variables	Coefficients	Std. Error	t-Statistic	Prob.
EXRV	0.068320	0.006730	10.151318	0.0625
MS	-0.572168	0.049475	-11.564852	0.0549
DCP	0.515178	0.028966	17.785845	0.0358
INT	-0.021248	0.046018	-0.461732	0.7246
INF	-0.029257	0.014531	-2.013396	0.2935
C	3.708281	0.165140	22.455430	0.0283

\*\*\*, \*\*, \* indicate 1%, 5% and 10% level of significance respectively

Source: Authors' computation (2017).

## 4.6 Diagnostic and Stability Tests

The post estimation tests examined for the suitability of our estimated ARDL model are heteroskedasticity, serial correlation, parameter stability and normality tests. The results are presented in Table 4.6. The results revealed that the ARDL model passed the serial correlation, normality test, heteroskedasticity and Ramsey RESET tests. They were also satisfactory for the ARDL model. This implies that the error terms are uncorrelated and normally distributed. They also have the same variance and the model is well specified.

## 5 Conclusion and Recommendations

The significance of services sector to any economy is no doubt an embodiment of growth stimulation and economic development. It has remained a crucial source of engaging the unemployed and income generation most especially in the developing countries thereby reducing poverty. However it has rather de-industrialized the developing economies due to negligence of integrating services sector in stimulating

the agriculture and manufacturing activities. Perhaps, there is no concrete linkage between the services sector and other sectors in the Nigerian economy, more so that those services that are highly technical and skilled have been subjected to exchange rate volatility. Hence the cost of inputs required for highly technical services increases and consequently affects the other sectors in the economy. In the overall context, service sector has failed to compliment the manufacturing subsector of the Nigerian industry.

In order to mitigate this problem of resource transfer from agriculture and manufacturing, there should be coordinated efforts by the government towards documentation of migrants to various parts of the world. In doing this, the Ministry of Labor and Productivity while taken the census of unemployed could assist in exporting the labor services such that remittances from abroad can be accounted for and properly channeled into small scale agriculture and manufacturing industry. This is because the remittances are bottom-up flows by providing lower sources of income to a much larger proportion of the population and potentially lead to more efficient resource allocation as private agents naturally work to maximize individual utility.

There is a need for encouraging and improving

Table 4.5: Estimated Short-run Error Correction Model [ARDL: 4,4,3,3,4,4]

<b>Dependent Variable: Service output growth (<math>\Delta</math>SER)</b>				
<b>Variables</b>	<b>Coefficient</b>	<b>Std. Error</b>	<b>t-Statistic</b>	<b>Prob.</b>
$\Delta$ (SER(-1))	1.368341	0.688508	1.987401	0.1178
$\Delta$ (SER(-2))	1.733219	0.952665	1.819337	0.1430
$\Delta$ (SER(-3))	1.196243	0.602432	1.985689	0.1180
$\Delta$ (EXRV)	0.008722	0.008633	1.010300	0.3695
$\Delta$ (EXRV(-1))	-0.096765	0.041219	-2.347595	0.0787
$\Delta$ (EXRV(-2))	0.082306	0.034099	2.413725	0.0733
$\Delta$ (EXRV(-3))	-0.047890	0.018306	-2.616059	0.0590
$\Delta$ (MS)	-0.505013	0.216984	-2.327424	0.0805
$\Delta$ (MS(-1))	0.463704	0.175054	2.648912	0.0570
$\Delta$ (MS(-2))	0.342574	0.125389	2.732078	0.0523
$\Delta$ (MS(-3))	0.274308	0.115694	2.370971	0.0767
$\Delta$ (DCP)	0.538422	0.191396	2.813129	0.0482
$\Delta$ (DCP(-1))	-0.281068	0.117079	-2.400658	0.0743
$\Delta$ (DCP(-2))	-0.323350	0.103736	-3.117042	0.0356
$\Delta$ (DCP(-3))	-0.162422	0.099419	-1.633715	0.1777
$\Delta$ (INT)	0.012609	0.029996	0.420370	0.6958
$\Delta$ (INT(-1))	-0.020458	0.053294	-0.383867	0.7206
$\Delta$ (INT(-2))	0.132941	0.085573	1.553532	0.1953
$\Delta$ (INT(-3))	0.191440	0.110540	1.731857	0.1583
$\Delta$ (INF)	0.002736	0.001137	2.406283	0.0739
$\Delta$ (INF(-1))	0.107047	0.126405	0.846851	0.4593
$\Delta$ (INF(-2))	-0.058514	0.061050	-0.958456	0.4085
$\Delta$ (INF(-3))	-0.803951	0.153750	-5.228953	0.0136
<b>ECT(-1)</b>	-0.129144	0.024342	-5.305334	0.0131

Source: Authors' computation (2017).

Table 4.6: Diagnostic and stability tests

<b>Results</b>	
<b>Serial Correlation: 1.6177 [0.3525]</b>	<b>Normality Test: 1.0963 [0.4708]</b>
<b>Functional Form: 1.3488 [0.3974]</b>	<b>Heteroskedasticity Test: 1.7421 [0.3317]</b>

Source: Authors' computation (2017).

skilled based services in Nigeria. Towards this direction government should provide more funds to vocational education that will encourage local production of technical equipments needed to facilitate services provision. This will reduce dependence on for-

eign exchange and hence reduce its negative impact on the performance of the services sector. Furthermore, the polytechnics in Nigeria should be restructured in terms of curriculum development and well equipped for the purpose of achieving its original goals of pro-

viding pure technical education. Selected few could be upgraded also to degree-awarding institutions as it is being done in other developing countries.

It is important that government should offer support services and promotional measures for certain services in order to be integrated with the global economy. Such services in Nigeria include the information technology, tourism, banking insurance and real estate. All these would be avenues for inflows of foreign exchange that can further be invested in manufacturing and non-manufacturing industry. Some of these measures may be removal of barriers to private investment in these services in order for competition to thrive. Perhaps reducing the regulatory barriers to foreign entry into certain services like information technology, real estate and insurance would eliminate market distortions and consequently reduce cost of capital through the inflows of foreign exchange.

Finally it is important that smooth interactions should be encouraged among the various service sectors. For the financial sector to be virile, it needs the ample support of an efficient and large information and communication technology while the tourism on its part also needs an efficient transportation system. It is therefore important that the exchange rate needed in these part of the services sector should be prevented from fluctuating so as to encourage investors and subsequently enhance growth in all other sectors of the economy. However, corruption should be mitigated by preventing round tripping and other sharp practices that could hamper the realization of government policies towards achieving strong services sector that would compliment other sectors and finally ensure economic growth and development in Nigeria.

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