The Service Sector-Led Growth Relationship: The Case of Nigeria

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Authors' contributions

This research work is a strong collaboration between both authors. Author UEE designed the study, managed the analyses of the study, managed the literature review, wrote the protocol, wrote the first draft of the manuscript, carried out the statistical and econometric analysis and carryout the formatting of the article in line with the journal's template. Author JIO compiled the data and wrote the comprehensive literature review. The final copy of the manuscript was read and approved by both authors.

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ABSTRACT

This paper examined the impact of the service sector on economic growth of Nigeria. The study covers the period 1981 to 2019 and data were obtained from the Central Bank of Nigeria statistical bulletin. The Augmented Dickey-Fuller unit root, Granger Causality test, Vector Autoregressive (VAR) approach, Bounds test for cointegration, and vector error correction mechanism were utilized in analysing the data. Findings of the study revealed that a bidirectional causality exist between service sector and economic growth of Nigeria. Meanwhile, the VAR result presented an evidence of weak exogeneity of the service sector in predicting economic growth. However, both broad money supply and total government expenditure exerted a significant impact on economic growth. From the impulse response function, it was discovered that economic growth responded negatively to shocks in service sector output both in the short run and in the long run; while the variance decomposition indicated that gross domestic product (a proxy for economic growth) is strongly endogenous in predicting itself in the short run while such diminishes in the long run. The Bounds test for cointegration revealed evidence of long run equilibrium relationship and the error correction mechanism revealed that 88.30% of the short run disequilibrium in the gross domestic product are

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corrected annually. Meanwhile, it was discovered that professional, scientific and technical services is the major contributor to economic growth as captured by its short run and long run elasticity coefficients of 0.5936 and 0.9455 respectively. The paper recommended the need for stimulating industrialization as this is the major pathway through which the service sector can positively impact economic growth.

1. INTRODUCTION

Scholars have opined that both industrial and service sectors are the vehicle necessary to provide spill overs to cause investment to kick-start economic growth [1,2]. For instance, Ocampo [3] opined that "sustained economic growth is associated with the capacity to diversify domestic production structure which entails generating new activities, strengthening economic linkages within the country and creating domestic technological capabilities". This accession therefore points out the importance of the service sector in promoting economic growth of any nation. As being put forward by Cali & te Velde [4], "the service sector makes a direct and significant contribution to gross domestic product (GDP) and job creation, and provides crucial inputs for the rest of the economy, thus having an important impact on the overall climate of investment, which is key to growth and development" [5]. The linkages between the service sector and development in economic terms can be traced to the importance of the sector in driving industrialization, which has been termed "services-led" industrialization [6].

The Nigeria service sector has witnessed tremendous growth over the years with its huge contribution to the GDP of the nation. The sector contributed about 35.52% to the GDP as at 1981 but the sectorial contribution increased to about 40.11% as at 1983. The sector's contribution to the GDP hovered between 35.47% and 40.35% within the period 1984 to 1999. The early 2000s witnessed a slow but steady increase in service sector contribution to GDP as the sector contributed an average of 38.69%. From 2005 to 2009, the service sector contributed an average of 45.05% to the GDP of Nigeria with a first record high of 49.25% in 2009. The period 2010 to 2019 witnessed a swift upsurge in the service sector contribution to GDP. For instance, the sector contributed about 50.79% to GDP in 2010 but increased to 51.86% as at 2013. Through the rebasing of GDP in 2014, the service sector was reported to have contributed about 52.16% to the

GDP. Thereafter, average service sector contribution to GDP stood at 52.93% between 2015 to 2019.

The snapshot of the movements in both service sector output (SER) and GDP over the period 1981 to 2019 is presented in Fig. 1.

From Fig. 1, it can be observed that there seems to be a positive relationship between the service sector output and gross domestic product of Nigeria. The period 1981 to 2002 shows a somewhat stable value of the SER along with that of the GDP. But as SER rose significantly from 2005 to 2016, we also observe a sharp increase in the GDP. As we experience plateaux in SER between 2017 and 2019, similar behaviour was also expressed by the GDP. The question as to which components of the SER has been propelling the sharp rise in the SER calls for an analysis of its various components over the years.

Based on Nigeria's Central Bank categorization, the Nigeria service sector comprises thirteen (13) key components. These are: trade; accommodation and food services; transportation and storage; information and communication; arts, entertainment and recreation; financial and insurance; real estate; Science, professional and technological services; administrative and support services; public administration; education; health care and support services for human beings; and other services [7]. The respective components' contribution to total service sector output is presented in Table 1.

From 1981 to 1998, we observe that the service sector contributed below 40% to the GDP of Nigeria. The sector contributed 35.53% to GDP in 1981; 38.81% in 1984; 37.18% in 1989; 38.45% in 1994; and 39.01% in 1998. Within this review period, trade and real estate remains the dominant service sector activities that propel the sector's contribution to GDP. For instance, trade contributed 32.66% to total service sector output while real estate contributed about 19.63% to total service output as at 1981. The two activities jointly contributed 52.29% of the total service

sector output in 1981. As at 1994 and 1998, we observe that there is a rising service sector output arising from an increase in the value of activities pertaining to financial and insurance services and in public administration. As at 1998, financial and insurance services and public administration contributed about 12.27% and 12.94% to total service sector output respectively, and jointly account for about a quarter (25.21%) of the total service sector output. With this development, the contribution of trade services and real estate declined from 32.66% in 1981 to 29.49% in 1998 while the contribution of real estate declined from 19.63% in 1981 to 18.69% in 1998. The total contribution of the two activities declined from 52.29% in 1981 to 48.18% in 1998. This is an indication that other service sector activities are evolving and new services are gaining weight in the service sector as a whole.

The period 2000 to 2019 is marked with massive increase in service sector output. With this, trade has been a leading service component followed by real estate. Out of a total service output of 9,359.45 billion in 2000, the value of trade alone was 2,675.45 billion amounting to about 28.59%. Meanwhile, trade as at 2019 accounted for about 30.44% to total service output while real estate contributed about 11.63%. As at 2019, other driving forces for the service sector growth include information and communication (24.80%); finance and insurance (5.72%); professional, scientific and technical services (6.78%); and other services (6.41%). However, there have been improvements in service components such as accommodation and food services along with human health and social services. Ajakaiye, Jerome, Nabena and Alaba [8] has maintained that "many African countries like Nigeria have experienced a structural transformation process involving the transfer from farming to increasingly non-tradable services. This has led to relative bypassing of manufacturing development that is usually characterised by efficiency, formal employment creation, manufactured exports and technological upgrading". With these developments in the service sector growth, this paper aims at examining the impact of the service sector on economic growth of Nigeria. The specific objectives include:

i.   To examine the nature of the relationship between service sector and economic growth in Nigeria;
ii. To empirically investigate the impact of the service sector on Nigeria's economic growth; and
iii. To examine the component of the service sector that is growth inducing.

This paper is structured into five major sections. This introduction section is followed by the literature review in section 2. Section 3 discusses the methodology of the research; while section 4 presents the empirical findings and discussion. Finally, section 5, which is the last section, presents the conclusion and recommendations. The literature review in section 2 will present the theoretical developments in process of economic transformation from primary to tertiary production. The section will also present the empirical studies of earlier studies. The methodology in section 3 will present the model used in the study, the analytical technique, and the sources of data. The analytical techniques will include the unit root test, Granger causality test, and the vector autoregressive (VAR) approach. In section 4, the data will be analysed and the empirical findings are presented and discussed. Finally, section five will give the conclusions arrived in the study and make recommendations for policy actions.
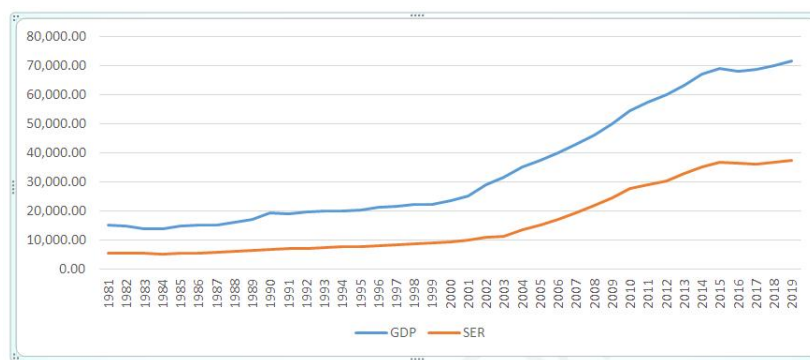

Fig. 1. Trend of gross domestic product (GDP) and service sector output (SER)

Table 1. Service sector output by activities (in ₦' billions)

Activities	1981	1984	1989	1994	1998
Trade	1,770.38	1,662.30	2,156.75	2,434.99	2,569.09
Accommodation and Food Services	53.78	35.97	34.56	36.68	40.29
Transportation and Storage	264.51	170.28	180.96	205.59	229.60
Information and Communication	263.41	253.76	210.16	255.67	363.18
Arts, Entertainment and Recreation	4.56	3.54	3.66	5.05	9.30
Financial and Insurance	282.17	267.29	539.66	905.50	1,068.61
Real Estate	1,063.96	1,086.93	1,139.87	1,386.53	1,628.65
Professional, Scientific and Technical Services	421.38	518.36	675.18	774.99	904.81
Administrative and Support Services	3.23	3.98	5.18	5.95	6.95
Public Administration	807.08	863.61	957.84	1,059.74	1,127.46
Education	242.56	259.55	287.87	318.49	338.84
Human Health and Social Services	110.70	118.45	131.38	145.35	154.64
Other Services	132.70	103.09	106.43	147.05	270.70
Total Service Output	5,420.43	5,347.11	6,429.50	7,681.60	8,712.13
Contribution to GDP	35.53%	38.81%	37.18%	38.45%	39.01%

Table 1. Continues

Activities	2000	2005	2010	2015	2019
Trade	2,675.45	4,790.51	8,992.65	11,697.59	11,430.55
Accommodation and Food Services	43.24	136.22	245.76	654.22	637.86
Transportation and Storage	246.35	495.13	694.77	805.46	1,059.27
Information and Communication	455.91	1,765.77	5,955.06	7,708.11	9,309.92
Arts, Entertainment and Recreation	12.06	18.93	30.93	141.33	162.94
Financial and Insurance	1,151.59	1,491.76	1,908.81	2,123.90	2,148.39
Real Estate	1,756.08	2,408.82	4,127.99	5,264.70	4,366.35
Professional, Scientific and Technical Services	985.26	1,252.58	1,711.70	2,516.07	2,547.30
Administrative and Support Services	7.56	9.62	13.14	14.47	14.72
Public Administration	1,165.15	1,612.04	1,998.47	1,644.78	1,470.22
Education	350.17	503.44	826.67	1,498.71	1,519.66
Human Health and Social Services	159.81	203.68	330.96	484.34	474.17
Other Services	350.82	550.89	900.02	2,151.38	2,405.54
Total Service Output	9,359.45	15,239.40	27,736.94	36,705.05	37,546.90
Contribution to GDP	39.51%	40.67%	50.79%	53.18%	52.60%

Source: Central Bank of Nigeria [7]

2. LITERATURE REVIEW

Researchers such as Fisher [9], Clark [10] and Fourastie [11] have earlier developed the model of three sectors in which the model classified the economic activities into primary, secondary and tertiary. Under primary production, economic activities such as agriculture and mining were the leading economic activities while the secondary component involves manufacturing and construction. The tertiary production captures economic activities like transportation, trade, government, communication, and personal services [12]. According to Fisher [9], the tertiary production is noticed with the production of 'immaterial goods'. Also, he noted that with rising income level, there is bound to be a shift in demand from primary to secondary and subsequently to the tertiary sectors.

Also, Bell [13] in his attempt to examine the demand side of the growth of services described human development to pass through three phases of pre-industrial, industrial and post-industrial society. In the pre-industrial phase, economic activities are dominated by the extraction of natural resources with no or low technological know-how. With technological advancement, the economy moved into the industrial phase where mechanised production of goods replace human labour. Further, service-related economic activities pops up and take an important position in the post-industrial stage. In this stage, "economic life is determined by the possession of skills and knowledge which is increasingly demanded in the society" [13].

On the service sector effect in promoting economic growth, two strands of observations have been made by scholars so far. The first is that the service sector help to promote economic growth while the second strand of though is that the sector is dependent and neither alternate mining, agriculture, and manufacturing. Meanwhile, Glasmeier and Marie [14] have posited that these two opposing views impact on economic growth. On the direction of the effect of the service sector on economic growth, Hoekman and Eschenbach [15] have so far registered a direct association between service sector and economic growth. That is, there is bound to be a rise in economic growth when there is growth in the service sector. As far back as 1950, there have been studies who posited that the service sector is the dominating sector in the economy of developed nations [16]. Thus, the service sector reign accounts to 66.67% (two thirds) of developed countries' output and employment [17].

The role of the service sector in stimulating economic growth has also been viewed from the standpoint of promoting international competitiveness. For instance, the key components of the service sector are finance, transport and telecommunications, which have facilitated business and free international market competition. [18]. Improvements in India's banking, telecommunication, insurance and transport policies were observed to have promoted manufacturing productivity in the country [19]. One can therefore say that the ability of the service sector to play a dominant role in nationwide competiveness agenda is due to its robust connection with other sectors of the economy. Thus, the service sector plays a major role in the in the national economy either directly or indirectly. Evidence was observed by Miroudot, Sauvage and Shepherd [20] that validates the preposition that greater output growth is connected with the service sectors that are more open to international competition.

In regards to air service, Button and Taylor [21] analyzed the economic benefits that accrue to American communities who have direct access to air service in 1996. The study utilized the ordinary least squares approach to multiple regression on a cross-sectional data of 41 US airports. Their findings revealed that availability of air services to the European Union markets generates more employment than communities where such is not available. Also, Green [22] studied the link that exists between airport activity and economic development in the United States using first stage regression technique. He observed that there exists a positive relationship between airport activity and economic development.

In the tourism sub-sector, Qasenivalu [23] examined the contribution of tourism to economic growth of Fiji for the period 1968 to 2006 by utilizing the ARDL approach. Findings of the study indicate that tourism is growth-inducing thus, the validation of the service-growth hypothesis in Fiji. The study recommended the need for effectively harnessing the growth potential of the tourism and air services so as to maximize economic growth; and that the country should exploit on service export as a source of economic growth. Similar study was conducted by Durbarry [24] in Mauritania where he concluded that tourism has had a positive and

significant effect on Mauritania's economic development.

Also, Demiroz and Ongan [25] carried out an empirical study to investigate how receipts from tourism impacted on Turkey's economic growth. The study utilized quarterly time series data from 1980:Q1 to 2004:Q2 and the data were analysed through cointegration and Granger causality test. From the result, the short run and long run period are characterised tourism receipts triggering the country's economic development. In Korea, Oh [26] analysed the causality existing between tourism and economic expansion. The study utilized the Engle-Granger two-stage approach and bivariate vector autoregressive model on time series data covering 1975 to 2001. No long run relationship was observed to exists between growth in tourism and expansion in the economy of Korea. Meanwhile, it was observed that economic growth causes tourism growth.

Kabeta and Sidhu [27] utilized Shapely decomposition approach to analyse the how the service sector components contribute to the Ethiopian GDP per capita over two periods of 1999 – 2005 and 2005 – 2013. With the GDP per capita being decomposed into productivity, demographic changes, and employment, the growth period of 1999 – 2005 shows that employment changes related to agricultural sector was the main contributor to the per capita GDP in Ethiopia. Meanwhile, the service sector had the greatest contribution to productivity but its effect on contribution to employment was negative. For the period 2005 – 2013, the productivity growth from the service sector (distributive service sector in particular) was the paramount driver of the growth in Ethiopian GDP per capita.

Mujahid and Alam [28] empirically examined the determinants of service sector growth in Pakistan for the period 1976 to 2010. The study employed the cointegration approach and error correction model to investigate both the short run and long run effects. It was observed that population, foreign direct investment, consumption and investment exert a positive and substantial impact on service sector growth.

Onakoya [29] analysed the contribution of the service sector to the Nigerian economy for the period 1970 – 2010. The study used the "*Two Stage Least Squares* (2SLS) and *Seemingly Unrelated Regression* (SURE) which is encompassed in the *Three Stage Least Squares* (3SLS)*". The findings revealed that a

unidirectional causality runs services to industrial, oil, and agricultural sectors. The study further revealed that the "sectors are inter-wined and apart from the manufacturing sector, the service sector plays a crucial positive role in the overall growth of the Nigerian economy" [29].

Recently, Ishola and Olusoji [5] investigated how the service sector interacts with the industrial sector to propel growth in Nigeria. The study used data from a quarterly time series covering 2010 – 2016 and the data were analysed using unit root test, Johansen cointegration test and error correction model. It was observed that both service sector and industrial sector contributed significantly to Nigeria's economic growth over the study period. Meanwhile, the study further identified deficiencies in most of the service sub-sectors such as public administration, professional, scientific and technical services, transport, and utilities.

Also, Adetokunbo and Edioye [30] examined how the Nigerian economic growth respond to the service sector dynamics from the standpoint of governance indicators. The study utilized annual time series data under the framework of endogenous growth model and the autoregressive distributed lag technique. The study observed that "transportation and communication, and health service subsectors exert positive and significant effect on economic growth when governance indicators were accounted for" [30]. Meanwhile, when the subservice sectors were interacted with governance indicators, the subservice components influenced economic growth positively, though none of them had a significant effect. However, education component of the service sector was observed to have no significant effect on the growth of the Nigerian economy. The paper therefore recommended that "there is need to increase budgetary allocation to the education sector so as to make the sector to contribute significantly to growth" [30].

3. METHODOLOGY

Since our study is geared towards examining the impact of the service sector in propelling growth in the Nigerian economy, the study utilizes different methods so as to achieve the desired objectives. The study uses the Granger causality test to examine the nature of causal relationship that exist between the service sector and economic growth. Also, the impact of the service sector on the growth of the Nigerian economy is

captured in the VAR model; while the component of the service sector that is growth inducing is captured through the use of the long run Ordinary Least Squares (OLS) estimation by capturing the various components of the service sector in a single model and to trace their effect on economic growth.

3.1 Model Specification

Model I: In examining the impact of the service sector on Nigeria's economic growth, the model for the study is specified as follows.

GDP = f(SER, MSS, GEX) -   -   (1a)
Where GDP is the gross domestic product (a proxy for economic growth); SER is the service sector output; MSS is the broad money supply (a proxy for monetary policy); and GEX is the total government expenditure (a proxy for fiscal policy). Further disaggregating Equation (1a) into its estimable form gives rise to Equation (1b) as follows.

GDP = $\beta_0 + \beta_1 SER + \beta_2 MSS + \beta_3 GEX + \mu$ -(1b)

Where β_0 to β_3 are the parameters to be estimated and μ is the error term.

Similarly, to examine the component of service sector that is growth-inducing, Model II for this study is specified as follows.

GDP = f(TRD, EDU, FNI, TRS, INC, PST, AER, ASS, RES, ACT) -   -   -   (2)

Where:
TRD = Trade services
EDU = Education Services
FNI = Financial and Insurance Services
TRS = Transport and Storage Services
INC = Information and Communication Services
PST = Professional, Scientific and Technical Services
AER = Arts, Entertainment and Recreation Service
ASS = Administrative and Support Service
RES = Real Estate
ACT = Accommodation and Food Services

3.2 A Priori Expectations

The a priori sign of the parameters are as follows:
$$\frac{\delta GDP}{\delta SER} > 0; \frac{\delta GDP}{\delta MSS} > 0; and \frac{\delta GDP}{\delta GEX} > 0$$

And
$$\frac{\delta GDP}{\delta TRD} > 0; \frac{\delta GDP}{\delta EDU} > 0; \frac{\delta GDP}{\delta FNI} > 0; \dots \frac{\delta GDP}{\delta ACT} > 0$$

This implies that the signs of the parameters are expected to be all positive.

3.3 Data and Sources

The data for the study include gross domestic product, service sector output, broad money supply, and total government expenditure. These data were all obtained from the Central Bank of Nigeria [6] statistical bulletin. The data span through 1981 to 2019 indicating a time series data of twenty-nine (39) years.

3.4 Technique of Estimation

The estimation technique employed in this study include unit root test, the Granger causality test, vector autoregressive model, Bounds test for cointegration, and the vector error correction mechanism.

3.4.1 Unit root test

The unit root is employed to free the time series variables used in the study from the effect of time. This is necessary because regressing two or more non-stationary series can lead to spurious regression result. The test helps us to ascertain the order of the variables' integration in the study. This paper employs the Augmented Dickey-Fuller (ADF) unit root test. The general form of the ADF unit root test model is specified in Equation (3a) for the constant assumption; and Equation (3b) for the constant, and linear trend assumption.

$$\Delta Y_t = \beta_0 + \beta_1 Y_{t-1} + \sum_{i=1}^{k} \beta_2 \Delta Y_{t-i} + \mu_t - -(3a)$$

And

$$\Delta Y_t = \vartheta_0 + \beta_1 Y_{t-1} + \delta t + \sum_{i=1}^{k} \beta_2 \Delta Y_{t-i}\ \mu_t \quad (3b)$$

The null hypothesis is that $\beta_0 = 1$ against the alternative that $\beta_1 < 0$. The rejection of the null hypothesis implies that there is no unit root.

3.4.2 The granger causality test

The Granger causality test is utilized to ascertain the direction of the relationship that exist between two variables. This study employs the Granger Causality test. The model for this test is specified in its general form as follows:

$$\begin{cases} y_t = \theta + \sum_{k=1}^{k} \beta_1 y_{t-1} + \sum_{k=1}^{k} \beta_2 x_{t-1} + \varepsilon_t \\ x_t = \theta + \sum_{k=1}^{k} \beta_1 x_{t-1} + \sum_{k=1}^{k} \beta_2 y_{t-1} + \varepsilon_t \end{cases} - (4)$$

Where k is the lag order; t is the time period; while y_t and x_t are the variables to be tested for the existence of causality. In its specific form, the model for Granger causality test is specified below.

Replicating Equation (4) to the service sector-led economic growth relationship in Nigeria, the model for the Granger causality test is specified in Equation (5)

$$\begin{cases} GDP_t = \theta + \sum_{k=1}^{k} \beta_1 GDP_{t-1} + \sum_{k=1}^{k} \beta_2 SER_{t-1} + \varepsilon_t \\ SER_t = \theta + \sum_{k=1}^{k} \beta_1 GDP_{t-1} + \sum_{k=1}^{k} \beta_2 SER_{t-1} + \varepsilon_t \end{cases} \quad (5)$$

Where GDP_t is gross domestic product at time t; SER_t is the service sector output at time t; and ε_t is the error term.

3.4.3 Vector autoregressive (VAR) model

The VAR model to capture the impact of the service sector on economic growth is specified in its general form as follows.

$$Y_t = V + AY_{t-1} + \mu_t - \qquad (6)$$

Which in the specific form, as a VAR(1) model, is in the form of systems of simultaneous equations specified below.

$$GDP_t = \beta_{01} + \sum_{i=0}^{1} \vartheta_1 GDP_{t-i} + \sum_{i=0}^{1} \beta_1 SER_{t-i} + \sum_{i=0}^{1} \beta_2 MSS_{t-i} \\ + \sum_{i=0}^{1} \beta_3 GEX_{t-i} + \mu_t - - - - - (7)$$

$$SER_t = \beta_{02} + \sum_{i=0}^{1} \vartheta_1 GDP_{t-i} + \sum_{i=0}^{1} \beta_1 SER_{t-i} + \sum_{i=0}^{1} \beta_2 MSS_{t-i} \\ + \sum_{i=0}^{1} \beta_3 GEX_{t-i} + \mu_t - - - - - (8)$$

$$MSS_t = \beta_{03} + \sum_{i=0}^{1} \vartheta_1 GDP_{t-i} + \sum_{i=0}^{1} \beta_1 SER_{t-i} + \sum_{i=0}^{1} \beta_2 MSS_{t-i} \\ + \sum_{i=0}^{1} \beta_3 GEX_{t-i} + \mu_t - - - -(9)$$

$$GEX_t = \beta_{04} + \sum_{i=0}^{1} \vartheta_1 GDP_{t-i} + \sum_{i=0}^{1} \beta_1 SER_{t-i} + \sum_{i=0}^{1} \beta_2 MSS_{t-i} \\ + \sum_{i=0}^{1} \beta_3 GEX_{t-i} + \mu_t - - - - (10)$$

Equations (7) to (10) are estimated as a simultaneous equation model under the VAR framework. The result also yields the impulse response functions and the variance decomposition. The impulse response functions (IRFs) captures the response of the variables to several shocks. These shocks include real output shock (ε_t^{GDP}), service sector shock (ε_t^{SER}), monetary policy shock (ε_t^{MSS}), and fiscal policy shock (ε_t^{GEX}). The total shocks will be given as $\varepsilon_t = [\varepsilon_t^{GDP}, \varepsilon_t^{SER}, \varepsilon_t^{MSS}, \varepsilon_t^{GEX}]$. The IRFs captures the dynamic one-time effect (or a one-standard deviation or a one Cholesky's factor) shock or innovation (that is, shock to one endogenous variable) on the present and potential values of the other variables in the structural VAR.

3.4.4 Vector error correction mechanism

The error correction mechanism reveals how the short run errors in the dependent variable is being corrected annually. The error correction mechanism is done under the ARDL framework. This framework helps us to easily estimate both the short run and the long run estimates. It is expected that the coefficient of the error correction mechanism must be negative and statistically significant. The model for the ARDL error correction mechanism in its general form based on Model II is specified in Equation (11) as follows.

$$\Delta GPD_t = \beta_0 + \sum_{i=1}^{m} \emptyset_i \Delta X_t + \lambda ECM_{t-1} + \mu_t \quad (11)$$

Where X_t is the vector of regressors (the various service components), λ is the error correction coefficient, and t is time.

4. EMPIRICAL FINDINGS AND DISCUSSION

The empirical findings capture descriptive statistics of the variables, correlation test, unit root test, granger causality test, the VAR result, impulse response function, variance decomposition, Bounds test for cointegration, and the ARDL error correction mechanism.

4.1 Descriptive Statistics

The mean, maximum, minimum, and the standard deviations of the variables are presented in Table 2.

Table 2 indicates that gross domestic product (GDP) averaged 34,690.67 billion naira over the

study period with a standard deviation of 20,237.78 billion naira, while the maximum GDP over the period stood at 71387.83 billion naira and the minimum was 13,779.26 billion naira. Similarly, service sector output (SER) averaged 15,952.52 billion naira with its minimum value of 5,347.115 and its maximum value of 37,546.90 billion naira; while broad money supply (MSS) and total government expenditure (GEX) averaged 6,585.141 billion naira and 2,040.908 billion naira respectively, and their minimum values were 14.471 billion naira and 9.637 billion naira respectively. Meanwhile, the maximum broad money supply was 34,251.70 billion naira and that of government expenditure stood at 97,14.843 billion naira.

4.2 Correlation Matrix

The result of the correlations between the variables in the study is presented in Table 3.

The correlation coefficients indicated that all the variables have strong positive correlations with the explanatory variable. Thus, as service sector output, broad money supply, and total government expenditure increase, GDP also increases and vice versa. Also, service sector output also exhibits strong positive correlations with both broad money supply and total government expenditure. Meanwhile, a strong positive correlation is also observed to exists between broad money supply and total government expenditure. The correlations coefficients which are all above 0.90 makes the correlations to be very strong. However, all the variables correlate perfectly with themselves making them to have a correlation coefficient of unity (1).

4.3 Unit Root Test

The result of the unit root test with respect to Model I and Model II are presented in Table 4 and Table 5 respectively.

From Table 4, it is observed that the variables are integrated in mixed order. For example, both gross domestic product and service sector output are stationary at second difference hence, they are integrated of order two I(2). Meanwhile, both broad money supply and total government expenditure are integrated at the first order I (1).

All the components of the service sector output along with gross domestic product are stationary at first difference. This implies that the variables are all I(1) series. The test for cointegration will be carried out to ascertain the existence of any long run equilibrium relationship.

4.4 Granger Causality Test

The examination of the nature of the relationship between service sector and economic growth is carried out through the Pairwise Granger causality test and the result is presented in Table 6.

The result of the pairwise Granger causality as presented in Table 6 indicates that there is a bidirectional causality running between SER and GDP. Also, there is no causality between total government expenditure and GDP, as well as between total government expenditure and SER. Meanwhile, a bidirectional causality exists between broad money supply and gross domestic product along with such causality flowing between broad money supply and SER. However, a unidirectional causality exists between government expenditure and broad money supply hence, government expenditure causes broad money supply and not the other way round. Since a bidirectional causality flows between GDP and SER, the VAR model is utilized to capture how each of the variables respond to shocks in the other variables coupled with macroeconomic shocks.

4.5 VAR Estimates

In examining the impact of the service sector on economic growth in Nigeria, the result of the VAR model is presented in Table 7.

We observe from the VAR result that GDP, SER, MSS, and GEX are strongly endogenous in explaining themselves. Thus, the past realization in GDP is associated with 1.21% increase in GDP; while the past realization in SER is associated with 0.75% increase in SER. Also, the past realization in MSS is associated with 0.86% increase in MSS while the past realization in GEX is associated with 1.12% increase in GEX.

Both broad money supply (monetary policy) and total government expenditure (fiscal policy) exert significant impact on gross domestic product. However, monetary policy exerts a negative impact while fiscal policy generates a positive effect. Thus, a unit percentage increase in MSS will lead to a 0.34% decrease in GDP while a unit percentage increase in total government expenditure will yield a 1.51% increase in GDP.

Service sector generates no significant impact on GDP thus, SER is weakly exogenous in predicting GDP under both monetary and fiscal policy shocks.

All the explanatory variables yield a significant impact on service sector output. Thus, GDP, GEX, and MSS are strongly exogenous in predicting SER. Thus, a unit percentage increase in GDP will cause service sector output to increase by 0.18% while a unit percentage increase in broad money supply will cause service sector output to decrease by 0.19%. A unit percentage increase in total government expenditure is observed to account for a 0.56% increase in service sector output.

Only government expenditure is observed to have a significant impact on broad money supply. Hence, government expenditure is strongly exogenous in explaining MSS while GDP and SER are weakly exogenous in predicting broad money supply. It therefore follows that a unit percentage increase in total government expenditure will result to a 0.99% increase in broad money supply.

For total government expenditure, all the variables are strongly exogenous in predicting it. A unit percentage increase in GDP is likely to yield a 0.08% increase in GEX while a unit percentage increase in service sector output will cause government expenditure to decrease by 0.19%. Also, a unit percentage increase in broad money will lead to a 0.08% increase in total government expenditure.

4.6 Impulse Response Function

To also observe the response of each of the variables to shocks in other variables, the result of the IRF and variance decomposition is done to validate the VAR result.

From the IRF (see Fig. 2), service sector responded positively to shocks in GDP over the short run but negatively in the long run. Also, GDP responded negatively to shocks in service sector output both in the short run and in the long run. Further, GDP responded negatively to shocks in broad money supply over time but positively to shocks in total government expenditure.

4.7 Variance Decomposition

From the variance decomposition (see Table 8), GDP is strongly endogenous in the short run

accounting for up to 91% of the forecasted error variance in the short run. However, it becomes weakly endogenous in the long run with government expenditure and service sector output jointly accounting for more than 60% of the forecasted error variance. The service sector is observed to exhibit a joint effect of both itself and GDP in the short run by explaining up to 38% of its forecasted error variance while other variables jointly explains the remaining 62%. This presents a somewhat weak endogeneity in SER. The GDP and GEX jointly explains up to 84% of the forecasted error variance in SER while SER only explains about 13.5% indicating weak long run endogeneity.

Broad money is strongly endogenous in the short run explaining about 83% of its forecasted error variance. But in the long run, MSS becomes weakly endogenous explaining about 46% of its forecasted error variance. In the long run, GDP and GEX are strongly exogenous in predicting MSS and jointly account for 52% of the forecasted error variance hence, they are strongly exogenous in explaining broad money supply. In regards to total government expenditure, the variable is strongly endogenous in the short run with about 84% of the forecasted error variance being accounted for by itself. But in the long run, we observe that SER, GDP, and MSS showcases some degree of strong exogeneity and jointly account for 42% of the forecasted error variance. This result therefore supports our earlier findings from the VAR result were some of the variables have strong exogeneity in one case and weak exogeneity in another.

4.8 Bounds Test for Cointegration

The result of the Bounds test for levels relationship in respect to Model II is presented in Table 9.

Table 9 presenting the Bounds test result for levels relationship can best be explained by utilizing the F-statistic. Based on the F-statistic, it is observed that it is statistically significant at the 1% level because the F-statistic is more than the 1%, 5% and 10% critical values in both the upper bound and the lower bound. Thus, the significance of the F-statistic induces the rejection of the null hypothesis of no levels relationship. Therefore, there is an existence of a long run equilibrium relationship. This necessitates the estimation of both the short run and the long run estimates of the model under the ARDL framework.

4.9 ARDL Error Correction Regression

Since the Bounds test for levels relationship presents evidence of long run equilibrium relationship, the result of the error correction mechanism is presented in Table 10.

From the outcome of the error correction model presented in Table 10, the coefficient of the error correction mechanism (ECM) is rightly signed (negative) and statistically significant at the 1% level of significance. This implies that the short run error is corrected so as to achieve long run equilibrium. From the coefficient of the ECM (-0.8830) it is evident that 88.30% of the short run errors is corrected annually so as to achieve a long run equilibrium. The R-squared (0.9791) indicates that the explanatory variables explain 97.91% of the total variations in economic growth in the short run.

The short run estimates of the parameters present the short run effect of the various components of the service sector on economic growth of Nigeria. For instance, trade exerts a positive and substantial impact on economic growth in the short run. Thus, a unit percentage increase in trade causes economic growth to increase by 2.97% while the past realization of trade reduces gross domestic product by 7.26%. Also, education exerts a positive and substantial impact on economic growth at the 1% level of significance, implying that a unit percentage increase in education services will prompt a 5.63% increase in economic growth; while the past realization of education services reduces economic growth by 6.23%.

Financial and insurance services also exert a positive and significant effect on economic growth at the 5% level of significance. The implication here is that a unit percentage increase in financial and insurance services will lead to a 5.78% increase in economic growth. Meanwhile, the past realization of financial and insurance services increases economic growth by 8.99%. Transport and storage services pose a negative and significant effect on economic growth at the 5% level of significance. A unit percentage increase in transport and storage services will lead to a 7.69% decrease in economic growth; while the past realization of transport and storage services increase economic growth by 8.99%.

Information and communication also affect economic growth positively in the short term. Thus, a unit percentage increase in information and communication services yields a 9.14% increase in economic growth. It is observed that PST yield the highest short term effect on economic growth based on its elasticity coefficient of 0.5936 and its past realization elasticity coefficient of 0.6724. It follows that a unit percentage increase in PST will lead to a 59.36% increase in economic growth while its past realization increases economic growth by 67.24%.

Both logAER and administrative and support services (logASS) along with their past realizations exert negative and significant effect on economic growth. A unit percentage increase in arts, communication and recreation service and its past realization reduces economic growth by 6.93% and 11.51% respectively. Further, a unit percentage increase in administrative and support service and its past realization leads to a decrease in economic growth by 54.54% and 67.15% respectively.

Real estate services are observed to exert a negative and significant effect on economic growth while its past realization exerts a positive effect on economic growth. This means that a unit percentage increase in real estate services will lead to 7.57% decrease in economic growth while the past realization of real estate services increases economic growth by 20.75%. Finally, accommodation and food services exert no significant effect on economic growth although its effect is positive.

To ensure that the short term result is valid, the stability test is conducted and the result is presented in Fig. 3.

In the long term, the only components of the SER that exert significant effect on economic growth are arts, entertainment and recreation (AER); administrative and support services (ASS); information and communication services (INC); and PST. It is also observed that out of the afore mentioned components, only information and communication services and PST generated a positive and substantial effect on economic growth. From their elasticity coefficients, a unit percentage increase in information and communication services will lead to a 27.04% increase in economic prosperity on a long-term basis; while a unit percentage increase in PST will cause economic growth to increase by 94.55% in the long term. However, a unit percentage increase in arts, entertainment and recreation services will cause economic growth to decline by 12.85% while a unit percentage

Table 2. The descriptive statistics of the variables

	GDP	SER	MSS	GEX
Mean	34,690.67	15,952.52	6,585.141	2040.908
Maximum	71,387.83	37,546.90	34,251.70	9714.843
Minimum	13,779.26	5,347.115	14.4711	9.6365
Standard Deviation	20,237.78	11,663.59	9,911.373	2544.412
Observations	39	39	39	39

Source: Output Extracted from Eviews 10 Software Package

Table 3. Correlation coefficients

	GDP	SER	MSS	GEX
GDP	1			
SER	0.9960	1		
MSS	0.9352	0.9523	1	
GEX	0.9580	0.9638	0.9777	1

Source: Output Extracted from Eviews 10 Software Package

increase in administrative and support service will lead to a 94.37% decrease in economic growth. Though some of the variables yields an insignificant long term effect on economic growth, it is worth noting that financial and insurance services, real estate services, trade services, and transport and storage services all yield a positive effect on economic growth.

The blue line, which is the CUSUM of Squares, lies between the 5% upper and lower bounds. This therefore prove the fact that the short run estimates are stable and as such, the result is valid for making inferences.

4.10 Long Run Estimates

In the long term, the result of the effect of the various service sector components on economic growth in Nigeria is presented in Table 11.

4.11 Discussion of Findings

Recall that our objectives were to examine the nature of the relationship between service sector and economic growth in Nigeria; empirically investigate the impact of the service sector on Nigeria's economic growth; and to examine the component of the service sector that is growth inducing. From our empirical findings, a bidirectional causality was observed to exist between the service sector and economic growth. Therefore, growth in the service sector also drives growth in the overall economy. In the same vein, as the economy grows and different economic activities spring up, there will be greater demand for services hence, growth in the service sector will also be stimulated. This is because modern economies have the dare need for services and the service sector becomes more vibrant and competitive as the economy grows.

The service sector was also observed to have a positive impact on economic growth as presented in the VAR result. This positive impact is felt both in the short term and in the long term as captured by the Bounds test for cointegration and the error correction mechanism. It is therefore imperative to note that the development of the service sector will have a spill over effect on every sector of the economy and thus culminate to greater economic prosperity. However, it should be noted that not all the service sector components are growth inducing. This is evidence in the long run estimates were some service sector components such as Accommodation and Food Services; Arts, Entertainment and Recreation Service; and Administrative and Support Service yield negative effect on economic growth. Meanwhile, other key components such as trade services; financial and insurance services; transport services; real estate; and professional and scientific services are all growth inducing.

Table 4. ADF Unit Root Test Result for Model I

Variables	ADF statistic @ level	ADF Statistic @ first difference	ADF Statistic @ second difference	Critical value	Order of integration
GDP	-1.9389 (0.6142)	-2.6862(0.2478)	-6.5672***(0.0000)	1% = -.2349 5% = -.5403 10% = -.2024	I(2)
SER	0.2622(0.9730)	-2.7972*(0.0703)	-7.0903***(0.0000)	1% =-3.6268 5% = -2.9458 10% = -.6115	I(2)
MSS	2.6568(1.000)	-5.1063**(0.0010)	----------------	1% = -4.2268 5% = -3.5366 10% = -.2003	I(1)
GEX	2.1690(1.000)	-5.0202**(0.0015)	--------------	1% = -4.2627 5% = -3.5529 10% = -.2096	I(1)

Note: Estimation follows a constant linear trend assumption; probabilities are presented in the brackets (); while *, **, and *** denotes significance at 10%, 5%, and 10% respectively.

Table 5. ADF unit root test result for model II

Variables	ADF statistic @ level	ADF statistic @ first difference	Critical value	Order of integration
logGDP	-0.0967(0.9424)	-3.4340**(0.0160)	1% = 3.6210 5% = -2.9434 10% = -2.6102	I(1)
logAER	-0.5296(0.8739)	-3.2959**(0.0223)	1% = 3.6210 5% = -2.9434 10% = -2.6102	I(1)
logAFS	0.8159(0.9931)	-4.4774**(0.0010)	1% = 3.6210 5% = -2.9434 10% = -2.6102	I(1)
logASS	-0.3174(0.9129)	-4.4122**(0.0012)	1% = 3.6210 5% = -2.9434 10% = -2.6102	I(1)
logEDU	-0.5960(0.8597)	-4.8730***(0.0003)	1% = 3.6210 5% = -2.9434 10% = -2.6102	I(1)
logFNI	-0.7143(0.8310)	-6.1540***(0.0000)	1% = 3.6210 5% = -2.9434 10% = -2.6102	I(1)
logINC	0.1985(0.9689)	-3.0201**(0.0422)	1% = 3.6210 5% = -2.9434 10% = -2.6102	I(1)
logPST	-0.1394(0.9376)	-4.4603**(0.0010)	1% = 3.6210 5% = -2.9434 10% = -2.6102	I(1)
logRES	-1.0193(0.7359)	-3.1765**(0.0295)	1% = 3.6210 5% = -2.9434 10% = -2.6102	I(1)
logTRD	-1.7751(0.3865)	-3.5357**	1% = 3.6210	

Variables	ADF statistic @ level	ADF statistic @ first difference	Critical value	Order of integration
		(0.0124)	5% = -2.9434	I(1)
			10% = -2.6102	
logTRS	-0.7399(0.8226)	-2.8730(0.0494)	1% = -3.6463	
			5% = -2.8540	I(1)
			10% = -2.6158	

Note: ** and *** denotes significance at 5% and 1% respectively; probabilities are enclosed in bracket; and the estimation follows a constant assumption

Table 6. Pairwise granger causality test result

Null hypothesis	F-statistic	Probability	Decision	Nature of causality
SER does not Granger Cause GDP	17.3574	0.0002***	Reject	Bidirectional Causality
GDP does not Granger Cause SER	27.7726	0.0000***	Reject	
GEX does not Granger Cause GDP	0.93981	0.3390	Accept	No Causality
GDP does not Granger Cause GEX	1.39263	0.2459	Accept	
GEX does not Granger Cause SER	0.08284	0.7752	Accept	No Causality
SER does not Granger Cause GEX	2.82541	0.1017	Accept	
MSS does not Granger Cause GDP	17.6912	0.0002***	Reject	Bidirectional Causality
GDP does not Granger Cause MSS	7.09211	0.0116**	Reject	
MSS does not Granger Cause SER	19.5767	0.0000***	Reject	Bidirectional Causality
SER does not Granger Cause MSS	7.39616	0.0101**	Reject	
GEX does not Granger Cause MSS	15.3734	0.0004***	Reject	Unidirectional Causality
MSS does not Granger Cause GEX	1.01795	0.3199	Accept	

*Note: ** and *** denotes significance at 5% and 1% level*

Table 7. The VAR result

	GDP	SER	MSS	GEX
GDP(-1)	1.2072	0.1823	-0.0767	0.075875
	(0.1169)	(0.0728)	(0.0852)	(0.03711)
	[10.3287]***	[2.5060]**	[-0.8996]	[2.04433]**
SER(-1)	0.3417	0.7523	0.1429	-0.187033
	(0.2289)	(0.1424)	(0.1670)	(0.07268)
	[1.4926]	[5.2816]***	[0.8561]	[-2.57322]**
MSS(-1)	-0.3462	-0.1879	0.8582	0.075030
	(0.1025)	(0.0637)	(0.0747)	(0.03254)
	[-3.378]**	[-2.946]**	[11.4828]***	[2.30604]**
GEX(-1)	1.5129	0.5646	0.9916	1.116550
	(0.5081)	(0.3162)	(0.3706)	(0.16135)
	[2.9773]**	[1.7855]*	[2.6756]**	[6.92006]***
C	-1010.466	-1429.299	295.8845	-79.95005
	(868.238)	(540.300)	(633.281)	(275.702)
	[-1.1638]	[-2.6454]**	[0.4672]	[-0.28999]
R-squared	0.9979	0.9975	0.9953	0.9865
F-statistic	3852.462***	3312.955***	1755.592***	601.7628***

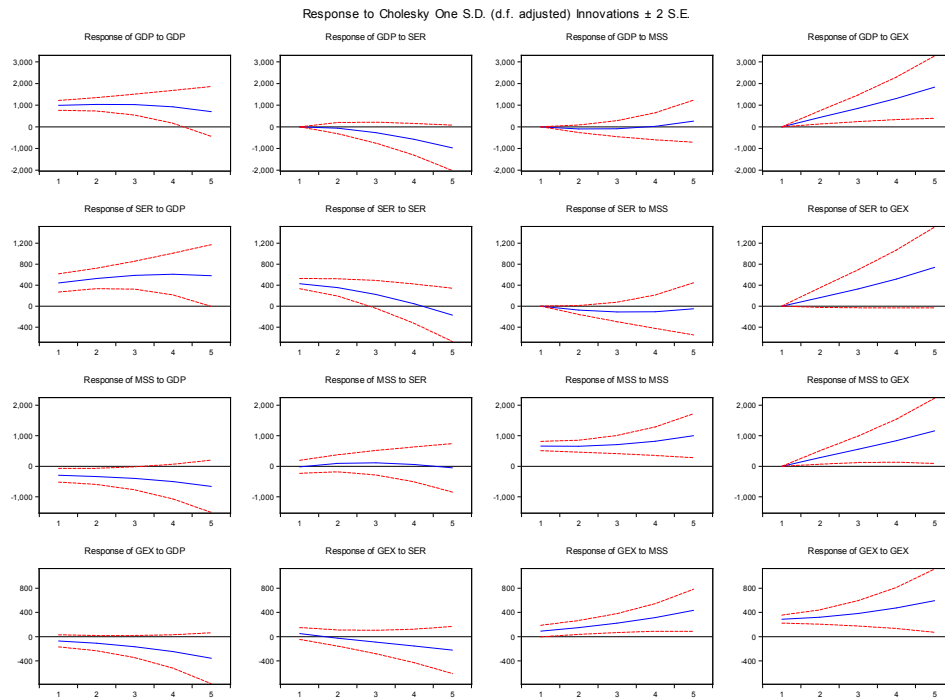*Note: Standard errors in ( ) & t-statistics in [ ]; *** and ** denotes significance at 1% and 5% respectively*

Response to Cholesky One S.D. (d.f. adjusted) Innovations ± 2 S.E.

Fig. 2. The Impulse Response Function for model III

Table 8. Variance decomposition result

Variance Decomposition of GDP					
Period	Standard Error	GDP	SER	MSS	GEX
1	991.3226	100.0000	0.000000	0.000000	0.000000
2	1505.833	91.03104	0.174786	0.379214	8.414960
3	2034.804	75.29227	1.833615	0.391384	22.48273
4	2656.693	56.26960	5.819505	0.238535	37.67236
5	3455.645	37.42523	11.34192	0.713765	50.51908
Variance Decomposition of SER					
Period	Standard Error	GDP	SER	MSS	GEX
1	616.8945	51.41148	48.58852	0.000000	0.000000
2	904.7692	58.02960	38.06659	0.657522	3.246287
3	1156.310	61.45384	27.07048	1.319270	10.15641
4	1411.460	59.98629	18.27772	1.451424	20.28456
5	1705.724	52.73540	13.50415	1.082105	32.67834
Variance Decomposition of MSS:					
Period	Standard Error	GDP	SER	MSS	GEX
1	723.0575	16.50097	0.069911	83.42912	0.000000
2	1075.390	17.17856	0.824314	74.90858	7.088548
3	1462.420	16.76315	1.045963	63.94538	18.24551
4	1941.718	16.21576	0.685031	54.09783	29.00138
5	2561.835	15.97802	0.437170	46.32004	37.26477
Variance Decomposition of GEX:					
Period	Standard Error	GDP	SER	MSS	GEX
1	314.7865	5.084896	2.637599	8.141561	84.13594
2	487.7832	7.093425	1.356511	12.82702	78.72304
3	686.6393	9.466565	2.473382	17.03946	71.02059
4	939.3293	12.04358	4.092192	20.45241	63.41182
5	1267.109	14.64973	5.340888	23.11080	56.89858

Table 9. Bounds test for long run relationship

F Statistic	Number of Parameters	Significance Level	I(0) Bound	I(1) Bound
Null Hypothesis: No levels Relationship				
8.6132***	10	1%	2.41	3.61
		5%	1.98	3.04
		10%	1.76	2.77

Source: Output Extracted from Eviews 10 Software Package

Table 10. Short run error correction estimate

Variable	Coefficient	Standard error	T-statistic	Probability
D(logTRD)	0.0297*	0.0156	1.9064	0.0983
D(logTRD(-1))	-0.0726**	0.0188	-3.8571	0.0062
D(logEDU)	0.0563***	0.0095	5.9246	0.0006
D(logEDU(-1))	-0.0623***	0.0107	-5.7930	0.0007
D(logFNI)	0.0578**	0.0143	4.0404	0.0049
D(logFNI(-1))	0.0899***	0.0104	8.5773	0.0001
D(logTRS)	-0.0769**	0.0237	-3.2427	0.0142
D(logTRS(-1))	0.0899**	0.0269	3.3335	0.0125
D(logINC)	0.0914**	0.0190	4.8119	0.0019
D(logPST)	0.5936**	0.1304	4.5509	0.0026
D(logPST(-1))	0.6724***	0.1194	5.6292	0.0008
D(logAER)	-0.0693**	0.0208	-3.3276	0.0126
D(logAER(-1))	-0.1151***	0.0157	-7.3218	0.0002
D(logASS)	-0.5452**	0.1352	-4.0309	0.0050
D(logASS(-1))	-0.6715***	0.1196	-5.6119	0.0008
D(logRES)	-0.0757**	0.0181	-4.1839	0.0041
D(logRES(-1))	0.2075***	0.0247	8.3725	0.0001
D(logACT)	0.0141	0.0183	0.7713	0.4657
ECM(-1)	-0.8830***	0.0541	-16.302	0.0000
R-squared = 0.9791			Adjusted R-squared = 0.9562	

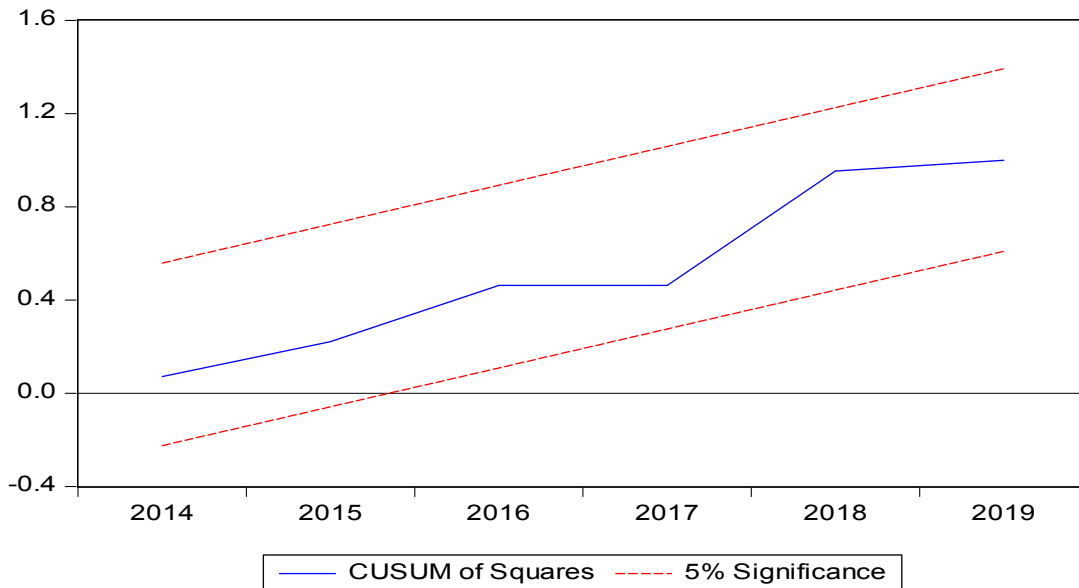*Note: *, **, and *** represents significance at 10%, 5% and 1% respectively.*

Fig. 3. The cumulative sum (CUSUM) of squares test for stability

Table 11. Long run result

Variable	Coefficient	Standard Error	t-statistic	Probability
C	3.3900**	1.5822	2.1424	0.0410
logACT	-0.0448	0.0560	-0.7996	0.4306
logAER	-0.1285**	0.0519	-2.4720	0.0198
logASS	-0.9437**	0.2633	-3.5832	0.0013
logEDU	-0.0419	0.0284	-1.4718	0.1522
logFNI	0.0248	0.0379	0.6544	0.5182
logINC	0.2704***	0.0379	7.1218	0.0000
logPST	0.9455**	0.2760	3.4251	0.0019
logRES	0.0938	0.0609	1.5395	0.1349
logTRD	0.0610	0.0393	1.5546	0.1313
logTRS	0.0014	0.0568	0.0248	0.9803
R-squared = 0.9976			Adjusted R-squared = 0.9968	
F-Statistic = 1173.459			Probability of F-statistic = 0.0000	

*Note: ** and *** denotes significance at 5% and 1% respectively*

5. CONCLUSION

The main feature of modern economies is the spreading out of a vibrant and competitive services sector [28]. The service sector has been noted to be a driving force of economic growth through its significant interaction with other economic sectors. The sudden upsurge in the Nigeria service sector growth calls for a study to examine the service sector's effect in stimulating economic growth of the country. The research was carried out towards achieving this along with examining the components of the service sector that are growth-inducing. Through the ADF test for unit root, it was found that (in Model I) both gross domestic product and service sector output were stationary at second difference while broad money supply and total government expenditure were stationary at first difference. In disaggregating the service sector into various components in Model II, it was discovered that all the components of the service sector were stationary at first difference. The study revealed, from the Granger causality test, that a bidirectional causality exists between the service sector and economic growth of Nigeria and this captures the first objective in which the study seeks to achieve. In achieving the second objective of ascertaining the impact of the service sector on economic growth in Nigeria, it was also discovered that the service sector exerted a positive impact on economic growth, though the VAR result indicated that that the service sector is weakly exogenous in predicting Nigeria's economic growth.

The study forged ahead to determine the components of the service sector that is growth-inducing based on the third objective by utilizing the ARDL error correction mechanism. The Bounds test for cointegration revealed that there is a long run equilibrium relationship between the service sector components and economic growth. In the short run, it was discovered that accommodation and food services do not have any significant effect on economic growth. Meanwhile, every other components as specified in the study exerted a significant effect on economic growth though with varying dimensions. For instance, arts, entertainment and recreation; transport and storage services; administrative and support services; and real estate exerted a negative effect on economic growth while trade; education services; financial and insurance services; information and communication services; and professional, scientific and technical services all exerted a positive effect on economic growth. However, it was noted that professional, scientific and technical services contributed highest to economic growth as captured by its elasticity coefficient of 0.5936 indicating that a unit increase in professional, scientific and technical services will cause economic growth to increase by 59.36%. Moreover, administrative and support services have been observed to be the one with the highest militating effect on economic growth as indicated by its elasticity coefficient of -0.5452 indicating that its unit percentage increase will reduce economic growth by 54.52% in the short run. The error correction mechanism indicated that 88.30% of the short run disequilibrium is corrected annually so as to achieve along run equilibrium.

In the long run, administrative and support services still maintain as the components with the greatest militating effect on economic growth. This is because a unit percentage increase in leads to a 94.37% decrease in economic growth.

Also, professional, scientific and technical services still maintain the leading service sector components that greatly drive economic growth in the long run. A unit percentage increase in professional, scientific and technical services is observed to generate a 94.55% increase in economic growth. Meanwhile, information and communication also follows as one of the key growth-inducing service sector components by generating a 27.04% increase in economic growth if it is increased by a unit percentage. Service sector components such as arts, entertainment and recreation and accommodation and food services exerted a negative effect on economic growth in the long run.

For a sound and greater service-led growth effect to be achieved, there is need to promote industrialization since it is believed that the service sector can actually impact on economic growth through its impact on the industrial sector. Key service sectors such as the professional, scientific and technical services; information and communication; arts, entertainment and recreation; financial and insurance services; trade; and education services should be duly promoted since they are observed to be the leading drivers of growth either in the short run or in the long run.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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