An Empirical Investigation of the Determinants of Service Sector Growth in Nigeria (1981-2019)

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Abstract

Service sector is taking the center stage in global economies despite the misconception of services as being non-tradable, unproductive and unable to drive growth in the past. The study seeks to assess the empirical investigation of the determinants of service sector growth in Nigeria from 1981 to 2019 using Autoregressive Distributive Lag model (ARDL). Unit root test was conducted to ascertain that none of the variables are integrated of order two while ARDL bounds test to cointegration was conducted and the result showed that there exists a long-run relationship among the variables employed in the model. The ARDL estimation result revealed that, gross domestic product per capita, human capital, government national expenditure and domestic credit to private sector are determinants of service sector growth in Nigeria while foreign direct investment and trade openness tends to impact service sector growth negatively both in the long-run and short-run. The study recommends that policy makers should optimize policies on services especially on human capital knowledeg-intensive project and programmes that will drive innovation(technology) such that will usher drastic change in not just services but will positively improve other sectors of the economy, attract foreign investors and establish a new path for trade (knowledge export).

Keywords: Service sector, Human capital, Autoregressive Distributive Lag model, Government National Expenditure, Domestic Credit to Private Sector, Foreign Direct Investment and Trade Openness

Introduction

Globally, the trend in the growth of service sector reveals that it is currently the fastest growing sector in the world. It took centuries for the World economy to shift from agriculture to manufacturing, however, for services it is rising so quickly in recent past. Notably, countries like Sri Lanka and India are reported to have broken economic transformation history by heading straight to the services without developing a noteworthy manufacturing sector at all (World Bank, 2017).

The share of the industrial sector to growth and employment is very meager in many Sub-Saharan African countries – SSA and based on the success of some developing countries such as the South Asian economies in services-led growth, the service sector has been identified as a sector with the potential to become a significant driver of sustained growth in Africa (Ghani and O'Connell, 2014; United National Conference on Trade and Development - UNCTAD 2015). There is no doubt that the service sector is an important part of every country's economy and has been identified as a sector with the capacity to becoming a significant driver of sustained growth (Ghani and O'Connell, 2014).

In this thought, a well-functioning service sector is considered crucial for the overall economic performance of African economies and the good of its citizens. More so, a more productive service sector also strengthens the performance of other sectors such as manufacturing (Khanna, Papadavid, Tyson and Willem te Velde 2016).

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The GDP of Nigeria has been thought to be marginal relative to agriculture and industry prior to the GDP revision in 2014 (Mail and Guardian, 2014). The revision revealed major growth in the service sectors including telecommunications, banking, the film industry, as well as the informal economy (National Bureau of Statistics-NBS, 2016) which was earlier rarely accounted for in official statistics.



Figure 1: Trend in Nigeria's Sectorial Contribution to GDP (1985 - 2019)

Source: Researcher's computation using CBN statistical bulletin 2020

The Gross Domestic Product data of Nigeria revealed that from 2006 till date, service sector has been accounting for a significantly high proportion to GDP as displayed in Figure 1. In 2019 the agricultural sector contributed around 25.16 percent to Nigeria's GDP, 22.25 percent came from industries and services contributed around 52.60 percent to the GDP (CBN, 2020). This rapid increase in GDP suggests that services is currently the major sector contributing to Nigeria's GDP.

Despite the misconception of services as being non-tradable, unproductive and unable to drive growth in the past, the sector has in recent past contributed over 50 percent to GDP in both developed and developing countries. It is in this light that the study seeks to empirically investigate the determinants of service sector growth in Nigeria.

Literature Review

The sector composition to GDP according to World Factbook - Central Intelligence Agency (2018) revealed that services is the leading sector in 201 economies of the world. Thirty countries receive more than 80 percent of their GDP from the service sector. However, in sub-Saharan Africa the service sector makes up nearly 60 percent of GDP which is expected to grow as historical data showed that each 15 percent increase in services' contribution to GDP is associated with a doubling increase of income per capita.

UNECA (2015) recorded that the top ten African countries by share of services in its GDP are Seychelles (81.1 percent), Djibouti (77.0 percent), Mauritius (71.5 percent), Cabo Verde (70.3 percent), South Africa (69.1 percent), Botswana (61. 8 percent), Senegal (60.1 percent), Eritrea (60.0 percent), Lesotho (60.0 percent) and Gambia also having a 60.0 percent. According to Ehigiator, (2017) the service sector is, undeniably contributing significantly to the Nigerian economy through its contribution to Gross Domestic Product, employment, trade and capital imports. Although the contribution of the knowledge-intensive services to employment is still low in Nigeria but with its current contribution to the growth of services value added to Gross Domestic Product, it exudes positive signs that services can indeed offer a new growth path for Nigeria.

There are several empirical studies on the determinants of service sector growth some of which includes, Mujahid and Alam (2014) who analyzed the process of growth in service sector and assessed its potential contribution toward growth in the case of Pakistan. They employed VAR technique, and the results showed that there is significant effect of population, foreign direct investment, consumption and investment on service sector growth in Pakistan. Thus, there is a significant relationship between service sector and trade liberalization, and analysis demonstrates that trade liberalization policy is beneficial for Pakistan's service sector growth.

Jain, Nair, and Jain (2015) used ordinary least square method for annual data from 2000 to 2012 to identify the factors affecting services sector in India. The authors concluded that foreign direct investment, net foreign institutional investment equity and imports have positive impact on services sector growth while foreign institutional investment, debt and exports affected services sector negatively. Similarly, Enu, Addey and Okonkwo (2015) carried out research on the driving forces of the service sector of the Ghanaian economy, using ordinary least squares estimation technique to determine the potency of service subsectors and also to determine the contributions and impact of some macroeconomic variables on service sector output of Ghana. They further found that labour force, and real GDP per capita were the key macroeconomic variables that drive the service sector output of Ghana.

Uwitonze and Heshmati (2016) studied the development and determinants of the service sector over the years in Rwanda's economy. This analysis was based on micro-data collected during Rwanda enterprise survey 2011 and the 2014 establishment census. They employed multivariate linear regression, logistic regression and ordered logistic regression techniques and their result showed that openness, ICT and financial services contribute to the development of the service sector. Antai, Udo and Effiong (2016) determined the contribution of different sectors in the Nigerian economy other than the oil and gas sector. They adopted the VAR technique and were able to prove that the service sector does not only promote the level of economic growth in the services sector. Also, agricultural output is observed to be directly related to growth.

Ajmair, Hussain, Akram and Zeb (2017) evaluated the factors affecting services sector output growth in Pakistan employing Time Varying Parametric Approach (Kalman filter) on annual data spanning from 1976 to 2014. The result showed that foreign direct investment and gross national expenditure are positive and significant determinants of services sector growth while inflation, domestic credit to private sector, gross fixed capital formation and remittances received and trade openness have negative impact on service sector growth.

Iqbal, Salam, and Nosheen (2018) examined the determinants of service sector growth: a cross section analysis using data set from 14 countries (seven developed countries and seven developing countries) covering the period 1990 to 2014. They adopted both the static, as well as the dynamic panel data estimation techniques. Findings revealed that in both the developed and developing countries, GDP per capita and FDI play a significant role in growth of services sector, while trade openness tends to affect the growth, negatively. Productivity differential does not have any significance on the growth of the service sector in both developed and developing countries, also, innovation has significant effect on the growth of service sector in developing countries only.

Raboloko (2018) examined the factors affecting service sector growth and development in Botswana using annual time series data from 1980 to 2015. The study employed the Auto Regressive Distributed Lag (ARDL) estimation technique to find out the factors that contribute to service sector growth. The results found that gross national expenditure, domestic credit to the private sector and gross fixed capital formation contribute positively to the growth of the service sector in Botswana. However, trade openness was found to have negative effect on the growth of service sector in the country.

Olusoji and Odeleye (2018) focused on the contributions of economic sectors to economic growth in Nigeria using quarterly data from 1981 to 2015. Multiple regression analysis was employed wherefore, results of the analysis indicates that agricultural sector is the highest contributor to GDP followed by the service sector during the pre-rebasing period 1981-2013 but the result differs slightly when the period was extended to cover post-rebasing era 1981-2015. The extension of estimation to post-rebase period shows an increase in the contribution of the service sector to GDP.

Examining the contribution of government expenditure on service sector growth in Nigeria using data between 1970 to 2017, Nwosa and Tijani (2020) employed unit root test, co-integration

and error correction modelling techniques and the regression result showed that government expenditure had a negative and significant impact of service sector growth in Nigeria. Implying that over the years, government spending on service sector has not positively contributed to the service sector growth in Nigeria.

Theoretical Framework

The theoretical framework underpinning the study is Romer endogenous growth model (1986). The major tenet of this model is that the economic growth of a nation and improvement of productivity is directly tied to increased technological knowledge which comes through government conscious effort in developing human capital in terms of proper and adequate spending in education and health to ensure that workers are well trained and intellectually equipped.

The theory holds that economic growth are induced by economic forces from within rather than without lying heavy emphases on improvement of human capital, knowledge and technology. However, the theory advocates for government intervention via increased expansionary and developmental policies, exercises externality effect on output in the private sector necessary to put the economy in the path of economic growth. Thus, the Nigerian services sector depends on government interventions in providing social overheads needed to leverage on for economic growth and development.

The model is expressed using the simple production function model; Y=f(K,L).....(2.1)

Where; Y measures output, K denotes the amount of capital while L denotes the amount of labour. We consider a Cobb-Douglas production function which is specified as; Y=AL $^{a}K^{a}$(2.2)

Where L and K denotes the amount of labour and capital, A is the parameter that captures the effects of other factors of production. Thus, this study adopted this model to investigate the determinants of service sector growth and also to ascertain the relationship between economic growth and service sub sectors.

Methodology

Model Specification

The paper adopted the work of Raboloko (2018) on the determinants of service sector growth in Botswana. The model showed that service sector growth is measured by foreign direct investment, inflation, gross national expenditure, gross fixed capital formation, trade openness and domestic credit to private sector.

 $SER = f (INF, FDI, GNE, K, DCPS, TOP) \dots (3.1)$

However, this study replaced gross fixed capital formation and inflation by human capital and gross domestic product per capita respectively as expressed in the equation below: SER = f (GDPP, FDI, HC, DCPS, GNE, TOP)(3.2)

Where: SER is services value added growth which is determined by; GDPP is Gross Domestic Product per capita, FDI is Foreign Direct Investment net inflows, HC is Human Capita, DCPS is Domestic Credit to Private Sector, GNE is Gross National Expenditure, and TOP is Trade Openness.

Taking the natural log of Equation 3.3, the stochastic form is expressed as; $logSER = \hat{a}_0 + \hat{a}_1 logGDPP_t + \hat{a}_2 logHC + \hat{a}_3 logFDI_t + \hat{a}_4 logDCPS_t + \hat{a}_5 logGEX_t + \hat{a}_6 logTOP_t + [_t$(3.3)

Where: t represents the time period under review, \hat{a}_0 to \hat{a}_5 are the parameters to be estimated and [is the exogenous demand shock (error term).

The apriori expectation is read thus: $\hat{a}_1 > 0$, $\hat{a}_2 > 0$, $\hat{a}_3 > 0$, $\hat{a}_4 > 0$, $\hat{a}_5 > 0$, $\hat{a}_6 > < 0$.

Technique of Data Analysis

The choice of the Autoregressive Distribution Lag (ARDL) Model technique was informed by the data properties of the variables employed in this model which has a combination I(0), I(1) or both. ARDL is suitable for small samples and takes adequate number of lags to capture the data generating process in a general-to-specific modelling framework. It also provides unbiased estimates of the long run model and valid t-statistics even when some of the regressors are endogenous (Harris and Sollis, 2003).

From equation 3.3, we specify our model as;

Where, \ddot{A} is the difference parameter, δ_{1i} to δ_{7i} are the short-run components of the variables in the model, λ is the speed of adjustment which must be negative and statistically significant, *ECM* is the error correction term and is the white noise.

Empirical Analysis and Discussion of Findings

Annual time series data for all variables employed in this model were sourced from World Bank database 2020. As a justification for the selection of ARDL estimation technique to estimate the determinants of service sector growth in Nigeria, the unit root test was conducted to certify that none of the variables are integrated of order 2. The unit root test is essential because using non-stationary macroeconomics time series produces spurious regression problem leading to misleading results hence, to solve this problem, the study employed Augmented Dickey Fuller (ADF) unit root tests.

Variables	ADF Unit Root Test					Order of	
	LEVEL			DIFFEREN	DIFFERENCE		
	t-stats	5% critical	Prob.	t-stats	5% critical	Prob.	
		value	Value		value	Value	
LOGSER	0.236142	-2.943427	0.9713	-3.125762	-2.943427	0.0332	I(1)
LOGGDPP	-0.945045	-2.945842	0.7620	-3.874490	-2.943427	0.0052	I(1)
LOGHC	-3.683906	-2.943427	0.0085	-4.501555	-2.943427	0.0009	I(0)
LOGFDI	-3.071929	-2.941145	0.0373	-9.401351	-2.943427	0.0000	I(0)
LOGGNE	-0.537720	-2.941145	0.8725	-6.317562	-2.943427	0.0000	I(1)
LOGDCPS	-1.707176	-2.941145	0.4197	-5.658251	-2.948404	0.0000	1(1)
LOGTOP	-0.068301	-2.943427	0.9518	-8.956778	2.943427	0.0000	1(1)

Table 4.1: Unit Root Test

Source: Extracted from estimation output using EViews 11.0

Table 4.1 showed that LOGHC and LOGFDI are stationary as the t-statistics values were greater than the critical values at 5 percent level of significance, which is 1(0) while LOGSER, LOGGDPP, LOGGNE and LOGTOP are stationary after first difference at 5 percent significance level, that is, 1(1). Having confirmed the levels of stationarity of the variables, the study therefore concludes that our variables have a combination of 1(0) and 1(1) levels of stationarity, hence, ARDL model of estimation was appropriate for this model.

Autoregressive Distribution Lag Bounds Test to Cointegration Result

Given the result of a combination of 1(0), 1(1) from our unit root test, the study employed ARDL Bounds test to test for long-run relationship among the variable. The model has an unrestricted constant and unrestricted trend. It was found that there is cointegration which

implies the existence of a long-run relationship among the variables. From the bounds test result as shown in Table 4.2, the F-statistic value is 17.70071 is greater than lower bound (2.87) and upper bound (4) at 5 percent level of significance clearly showing the existence of a long-run relationship between the dependent and independent variables. Therefore we reject the null hypothesis of no cointegration.

Test statistic	Value	Significance	Lower bound 1(0)	Upper bound 1(1)
F-statistic	17.70071	10%	2.53	3.59
K	6	5%	2.87	4
Variables		2.5%	3.19	4.38
LOGGDPP LOGHC LOGFDI		1%	3.6	4.9
LOGGNE LOGDCPS	LOGTOP			

Table 4.2: Bounds Test to Cointegration

Source: Extracted from estimation output using EViews 11.0

Autoregressive Distribution Lag (ARDL) Long-run Estimates

The long-run ARDL estimate as presented in Table 4.3 revealed that, GDPP, HC, GNE, and DCPS have a significant positive impact on Services value-added growth in the long-run. Their coefficient showed that a unit change in GDPP, HC, GNE, and DCPS will result in 0.780401, 0.166395, 0.107303 and 0.075869 percent increase in Services value-added growth in Nigeria respectively. Whereas, FDI and TOP has negative impact on Services Value-added growth in the long-run. However, TOP showed a significant impact while FDI showed an insignificant impact. This implied that a unit change in FDI will result to 0.012336 percent insignificant reduction in Services value-added growth in Nigeria for the period under study. The coefficient suggests that a unit change in TOP will lead to 0.091900 percent significant decrease in Service value-added growth in Nigeria.

0					
Dependent Variable = log(SER)					
Variables	Coefficient	Std. Error	t-Statistic	Prob. Value	
LOGGDPP	0.780401	0.086501	9.021887	0.0000	
LOGHC	0.166395	0.063407	2.624225	0.0146	
LOGFDI	-0.012336	0.007393	-1.668617	0.1077	
LOGGNE	0.107303	0.019877	5.398248	0.0000	
LOGDCPS	0.075869	0.033707	2.250873	0.0334	
LOGTOP	-0.091900	0.037959	-2.421025	0.0231	

Table 4.3: Long-run ARDL Coefficients

Source: Extracted from estimation output using EViews 11.0

From our findings, the estimated coefficients of Gross Domestic Product per capita, Human Capital, Government National Expenditure and Domestic Credit to Private Sector showed positive and significant impact on Service value-added growth in Nigeria in that, as a nation prospers, more people are left with increased wealth to embark on more service sector activities. This however confirms to theory. While Foreign Direct Investment inflows showed insignificant negative impact, Trade Openness showed significant negative impact on Service value-added growth in Nigeria. This result is consistent with the findings of Raboloko (2018), Iqbal, Salam, and Nosheen (2018), Enu, Addey and Okonkwo (2015), and Ajmair and Hussain (2016).

Autoregressive Distribution Lag (ARDL) Short-Run Estimates

The study presents the estimated short-run model using Akaike info criterion (AIC) for an optimal lag selection and automatically selects ARDL (1,0,0,0,2,1,0) and the result of the short-run ARDL model is presented in Table 4.4.

Dependent variable = D(log(SER))							
Variables	Coefficient	Std. Error	t-statistic	Prob. Value			
D(log(SER(-1)))	0.379157	0.074356	5.099239	0.0000			
D(log(GDPP))	0.484507	0.083963	5.770480	0.0000			
D(log(HC))	0.103305	0.041780	2.472629	0.0206			
D(log(FDI))	-0.007659	0.005113	-1.497813	0.1467			
D(log(GNE)	0.021097	0.010967	1.923601	0.0659			
D(log(GNE(-1)))	0.012070	0.012971	0.930564	0.3610			
D(log(GNE(-2)))	0.033451	0.011427	2.927287	0.0072			
D(log(DCPS))	-0.004274	0.019482	-0.219406	0.8281			
$D(\log(DCPS(-1)))$	0.051377	0.019363	2.653341	0.0137			
D(log(TOP)	-0.057056	0.022134	-2.577699	0.0162			
R-Squared	0.999589	F-Statistic	5533.865				
Adjusted	0.999409	Prob	0.000000				
R-Squared		(FStatistic)					

Table 4.4: Short-run	ARDL	Coefficients	(1,0,0,0,2,1,0))
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Source: Extracted from estimation output using EViews 11.0

The p-values of constant and trend shows significant values less than 0.05 percent, therefore we utilized constant and trend to estimate this analysis. The rule of thumb states that if p-value is less that 5 percent it shows are positive significance order wise, it is insignificant. The results however suggest that, the coefficient of lagged dependent variable (SER(-1)) has positive and significant at 5 percent level, implying that the current level of service value added growth significantly depends on previous information of service value added growth in Nigeria.

The coefficients of Gross Domestic Product per capita and Human Capital showed positive and significant value at the current period (GDPP, HC) using 5 percent level, implying that GDPP and HC increases service value-added growth in the short-run. This suggests that, a unit change in GDPP and HC will bring about 0.4845070 and 0.103305 percent significant increase in Services value-added growth respectively in the short-run.

The coefficient of Foreign Direct Investment has an insignificant negative value at 5 percent level using the current period (FDI), indicating that, Foreign Direct Investment has an insignificant negative impact on Services value-added growth in the short-run. The coefficient explained that a unit change in Foreign Direct Investment will result in 0.007659 percent insignificant decrease in Services value-added growth in Nigeria for the period under study.

Also, it showed that Government National Expenditure at the current period and lag 2 (GNE(-2)) has positive and significant values at 5 percent level, suggesting that, GNE at the current period and lag 2 have significant positive impact on Services value-added growth in Nigeria in the short-run. Thereby, indicating that, a unit change in Government National Expenditure will lead to increase in services value-added growth in Nigeria by 0.021097 and 0.033451 percent respectively.

Further to this, the coefficient of Domestic Credit to Private Sector at lag 1 (DCPS(-1)) has significant positive value at 5 percent level. This implied that, Domestic Credit to Private Sector has a positive and significant impact on Services value-added growth in the short-run. The coefficient value suggests that a unit change in Domestic Credit to Private Sector will result in 0.051377 percent increase in Services value-added growth. More so, the coefficient of Trade Openness at lag 0 (TOP) reveals a significant negative value at 5 percent level in the short-run suggesting that a unit change in TOP will lead to a 0.057056 percent decrease in Services value-added growth in Nigeria.

In term of the goodness of fit, the value of R-Square and adjusted R-squared reveals a very high goodness of fit with values close to 1. This indicate that about 99 percent of total variation in Services value-added growth is explained by the variables included in the model while only less than 1 percent is explained by the error term.

Error Correction Model (ECM) Result

The coefficient of the Error Correction Mechanism (ECM) conforms to a priori expectation as it was found to be negative, less than one and statistically significant with a probability value less than 0.05 at 5 percent level as presented in Table 4.5. The coefficient of the ECM which represents the speed of adjustment is |-0.620843|, suggesting that 62 percent of disequilibrium in the long-run will be adjusted annually. The adjusted R-squared reveals that the independent variables explained approximately 88 percent of the total variation in Services value-added growth and the remaining 12 percent is explained by the error term.

	Case 5: Unrestricted	Constant and Ur	nrestricted Trend	
Variables	Coefficients	Std. Error	t-statistic	Prob. Value
С	5.219039	0.418934	12.45791	0.0000
@TREND	0.024543	0.001914	12.82079	0.0000
D(LOGGNE)	0.021097	0.007909	2.667335	0.0132
D(LOGGNE(-1))	-0.033451	0.008945	-3.739641	0.0010
D(LOGDCPS)	-0.004274	0.014311	-0.298688	0.7676
CointEq(-1)*	-0.620843	0.050087	-12.39525	0.0000
R-square	0.882364		Adjusted R-	0.863391
			square	
F-statistic	46.50501		Prob. Value	0.000000

Table 4	l.5 on	Error	Correction	Model	(ECM)
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Source: Extracted from estimation output using EViews 11.0

Post Estimation Test

Table 4.6 showed that, the probability value of the Jarque-Bera statistics, Breusch-Godfrey test of serial correction LM test and Breusch- Pagan-Godfrey Heteroskedasticity test is greater than 5 percent, implying that the model has a residual that is normally distributed and free from the problem of serial correlation and heteroskedasticity respectively. Durbin-Watson statistic has a value very close to 2 which suggests that the model is free from autocorrelation problem.

Table 4.6: P	ost Estimation	Test
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Test	Statistic	P-value
Normality test; Jarque-Bera statistic	0.974474	0.614321
Breusch-Godfrey Serial Correlation LM test	1.183510	0.3242
Breusch- Pagan-Godfrey Heteroskedasticity test	1.514836	0.1878
Durbin-Watson statistic	1.910286	

Source: Extracted from estimation output using EViews 11.0

Conclusion and Recommendations

This study empirically investigated the determinants of service sector growth in Nigeria using ARDL model of estimation from 1981 to 2019. the findings revealed that gross domestic product per capita, human capital, government expenditure and domestic credit to private sector determines service sector growth while foreign direct investment inflows and trade openness impacted on services value added negatively in both long-run and short-run. Error Correction Mechanism (ECM) conforms to a priori expectation as it was found to be negative, less than one and statistically significant indicating that 62 percent of disequilibrium in the long-run is adjusted annually.

Based on the findings, this study suggests that a conscious government effort is pivotal to revamp the service sector through improvement in human capital. Hence, policy makers should optimize policies on services especially on knowledeg-intensive projects that will drive innovation(technology) such that will usher drastic change in not just services but will positively improve other sectors of the economy, by this, foreign investors will be attracted and a new path for trade (Knowledge export) is established .

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