Four Major Service Industries and Economic Growth in Nigeria: An Empirical Analysis

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ABSTRACT

This study has investigated the influence of four major service industries in Nigeria on the economic growth. Data for the study composed of value gross domestic product (GDP), value added of trade, value added of information and communication, value added of financial and insurance, value added of real estate, and indicators of financial deepening. Data were sourced from the Central Bank of Nigeria Statistical Bulletin. All the series were subjected to Unit root test and cointegration test. The results of the Augmented Dickey Fuller showed that all the series were stationary at first difference and there was existence of long run relationship among the series as confirmed by the results of the Johansen' cointegration test. The estimations were carried out using Ordinary Least Squares (OLS) and Dynamic Ordinary Least Squares (Dynamic OLS). The findings of the study showed that trade and real estates were the movers of economic growth in the period under study. Also, the findings showed that pairwise intersections of trade and financial and insurance; financial and insurance, and real estate; and trade and real estate contributed significantly to economic growth during the period under study. The authors recommended that there should be concrete policies on diversification as to ensure that the impact of trade and real estate is spilled- over to other sectors.

Keywords: service sector, economic growth, trade, financial and insurance, information and communication and real estate

INTRODUCTION

Services sector in one of the recent sectors in every economy that begins to receive attention as a result of rapid growth, which has made the sector to outperform some traditional domineering sectors such as agriculture and manufacturing (Siegfried, 2013). In the words of Karahan and Bay (2021), studies have shown that the current productivity and growth rates experienced in all countries of the world have been attributed to services sector. This significant performance of the services sector is quite visible; as the share of the service sector to GDP has risen greatly in Nigeria. It has accounted for over 56.3 per cent of the aggregate GDP in Nigeria in 2022 from 43.79 per cent in 2021 (Izuaka, 2023; O'Neil, 2023).

As described by Cuadrado- Roura (2016, p.108), "the service sector is composed of a wide variety of market and nonmarket activities, ranging from transport and retailing, to hotels, restaurants, financial activities, business and personal services, education, health and the public administrations". In Nigeria, it includes the information and communication, arts, entertainment and recreation and real estate (Central Bank of Nigeria, 2021). Some of these sub- sectors of the services sectors have enhanced the growth of the Nigerian economy, according to recent statistics.

In the list of the four largest sectors contributing to Nigerian economy provided by Oyekanmi (2022), information and communication and trades were included. These two sub- sectors of the services sector were ranked second and third largest sectors in Nigeria. These two accounted for 31.2 per cent of the aggregate GDP in 2021 (Oyekanmi, 2022).

This significant performance of some of the sub- sectors of the services sectors to the GDP requires the need to examine the impact of the largest four of the sector itself on the economic growth. From Central Bank of Nigeria (2021), the four largest sub- sectors of the services sectors, which are trade, information and communication, financial and insurance, and real estates accounted for 71.74 per cent of the services sectors and 33.70 per cent of the aggregate GDP in 2020, and 72.13 per cent of the services sectors and 32.05 per cent of the aggregate GDP in 2021 (Central Bank of Nigeria, 2021). These four sub- sectors have been dominating more than a decade ago (Oh, 2017). In line with Tan (2016), there are need to ask these questions – what are the influence degree of these four largest sub- services sector? Which industry affects Nigerian economy largely among these four largest sub- service sectors? This study will attempt to look at these questions. Nigerian economy is solely based on oil and the recent happenings in the economy has shown its fragile nature. As such, there is high need to diversify the economy. Attention has been recently focused on agriculture, which was once the mainstay of the economy. But the commitment of the government in the last four years has not yielded the much desired growth to reduce the over- dependency on oil. Since the service sector has been performing moderately well, there is need to examine the impact of some of its sub- sectors on the economic growth. Such sub- sectors can be targeted in the diversification policy of the government. The paper is structured as follows: introduction, literature review, methodology, data analysis and discussion and conclusion.

LITERATURE REVIEW

Few theories have been propounded that relate to service sector of the economy; though these theories were not specifically formulated to show the impact of the services sector on the economy. The first among the list of these theories is the Classical and Neo- Classical economist including some more recent schools as pointed out by Cuadrado- Roura (2016). These schools of thought perceived services sector as unproductive. One of the pioneered classical economists, Adam Smith said that the service led to unproductive use of labour (Grubel & Walker, 1989). Adam Smith argued that "labour used in the production of services does not fix or realize itself in any particular subject … which endures after that labour is past and for which an equal quantity of labour could afterward be purchased" (Grubel & Walker, 1989, p.28 citing Adam Smith). Grubel and Walker also stated that Adam Smith included the service of "churchmen, lawyers, physicians, men of letters of all kinds, players, buffoons, musicians, opera singer, opera dancers etc." (Grubel & Walker, 1989). Other figures such as W. Baumol, J. Nusbaumer, J. de Bandit and others as mentioned by Cuadrado- Roura believed that the growth of the services sector would limit economic growth and lead a country into stagnation (Cuadrado- Roura, 2026 citing Baumol, 1967, 1986, 1989; Nusbaumer, 1987; De Bandt, 1991). In conclusion, Giarini (2014) asserted that this view saw whatever economic activity that is not industrial a 'trash can'.

Apart from the Classical and Neoclassical approaches, there was Fisher's models of the stages of economic growth. Allen Fisher, an Australian economists (1939) and Collin Clark (1940) (Grubel& Walker, 1989). This model was later called Clark- Fisher Development Theory, also called Fisher Clark Model, and it states that an economy experiences three stages of production, which are primary production, secondary and tertiary production. This theory assumes that further rise in income when a country gets to secondary sector will leads to a situation, where people consumes start consuming more services. As such, tertiary sector continues to grow and develop. The theory pointed out that economic progress tends to cause the emergence of a large service sector and the majority of the labour force will be in the service sector. There are two major reasons for the emergence of the service sector, according to this theory and these are: high- income elasticity of demand and low labour productivity (Economics online, 2020). One weakness of this theory is that a country may have a large tertiary sector in the absence of developed secondary sector. This is quite visible in developing countries (Tripple A Learning, n.d).

Then, there is Engel's law propounded by Ernst Engel in 1857, which states that "the expenditure on

food falls as the household income increases. On a larger scale, working populations move from primary (agricultural) through secondary (manufacturing) to tertiary (service) sector as economic progress is made (Choi & Lee, 2019, p.1). This view of Engel is quite close to Clark- Fisher development theory; in the sense, that the two theories see the tertiary sector as a means of attaining economic progress. In line with Grubel and Walker (1989, p.28), "anything that was not considered to be the output of the agricultural or industrial sector was the output of the service sector. It is clear that this approach does not come to grips with the essential characteristics that distinguish goods from services". Cuadrado- Roura (2016) also affirmed that, Engels law, from the demand side, provides the means to understand how households have the tendency to increase their demand for services when income grows. The following factors account for increase in service expenditure – "changes in social behaviour and working schedule, the widespread incorporation of women into the workforce, the effects of the urbanisation process and the dominant trend in most population pyramids" (Cuadrado- Roura, 2016, p.112).

More recent than Clark- Fisher Development Theory is the General Theory of Economic Development by American economist Victor Fuchs in the 1960s and 1970s. This theory also focused on the service sector. Fuchs formulated this theory through examination of pattern of employment, which resulted from rise of a service sector. The argument of this theory is that unless service sector undergoes industrialisation, it will be difficult for the sector to maintain its current growth (Economics online, 2020). Increased participation of female in the workforce is considered as an important determinant of growth in the service sector. As such, the resulting income from families with working wives increase consumption in service industry (Economics online, 2020).

From the aforementioned theories, it can be seen that the earliest economists did not consider service sector as important sector in the economy but recent theories such as General Theory of Economic Development shed light on how the service sector can become the agent of economic growth. Recent empirical studies have begun to project the impact of service sector on the economy. The review of some of them have been done as follows.

Cuadrado- Roura (2016) examines the need for greater research effort on service industry and the focus should be on the regional and urban. Coudrado – Roura argues that attention has been mainly on manufacturing industries and in the recent times other aspect of services such as finance, commerce, transport and tourism were gradually receiving attention. To Coudrado- Roura, services activities could only occupy the place they deserve when there are ample researches in such aspect of service industry such as regional and urban analyses.

By extending the Cainelli et al. (2004)'s study, Sapprasert investigated the impact of ICT on the growth of the service in Norway. Sapprasert's study entailed using data on ICT R&D and/or organizational change (1999- 2001) on the growth rates (2001- 2003) of firms. Sapprasert's findings showed that the presence of ICT could be seen in the higher growth in productivity and profitability experienced by firms in the service industries.

Using Error Correction Model (ECM), Singh (2010) attempted to understand the empirical relationship between service sector and Gross Domestic Product in Indian. Evidences from Singh's estimations confirmed that there was statistical significant long- run relationship between service sector and GDP. Singh's findings showed that ECM supported unidirectional Granger causality from services sector to GDP while the Variance Decomposition Analysis upheld the bidirectional causality between services sector and economic growth. Islam, Musa, and Das (2012) did a comparative analysis of services sectors, industrial sector and agricultural sector in Bangladesh. Using data 2000-01 to 2009-10, Islam, Musa and Das's findings showed that the average growth rates of the services sector was higher than that of agricultural sector but less than industrial sector. Their findings further showed that there was an increasing trade deficit in the services sector.

One of the studies that examined the determinants of service sector growth is Mujahid and Alam (2014)'s study in Pakistan. Using Co-integration technique and Vector Error Correction Model, Mujahid and Alam regressed data on external debt, population, gross domestic product per capita, foreign direct investment, government consumption, and labour force in the service industry and service sector growth. Mujahid and Alam discovered that population, foreign direct investment, consumption and investment exerted significant impact on service sector growth.

In the study conducted by Pylak and Majerek (2015), the focus was on analyzing the role of the service sector in creating companies from industries in Poland. Pylak and Majerek made use of data from 86 industries and the sample period was from 2009 and 2013. Then, Pylak and Majerek used Gephi to show the complex interconnections of development of path, which they used to reveal the complexity of the processes of creating new companies and identified the rule the governing the creation of service companies.

Tan (2016) empirically examined the impact of four leading service sectors on the economy of Hong Kong. Using data from 1995 to 2014, Tan's findings showed that financial services, trade and logistics, tourism, and professional service and industrial services have significant impact on the economic growth. His findings further showed that their pairwise intersections also have significant impact on economic growth. Privankara (2018) tested Export-led growth hypothesis (ELGH) in Sri Lanka, using Granger Causality and Vector Autoregressive model (VAR Model). The result of Privankara's study showed that there was evidence to support that ELGH existed in Sri Lanka. Privankara also found out that unidirectional causality ran from services exports of Sri Lanka to GDP.

In one of the recent studies on services sector by Ahmed, Lubna and Sumon (2019) in Bangladesh, there was also a uni- directional Granger causality, which ran from services sector to the GDP. This finding is in tandem with that Singh (2010)'s study in Indian. Ahmed, Lubna and Sumon's finding of existence of positive relationship between services sector and economic growth also in line with Singh (2010).

Using quarterly data from 2010 to 2016 and introducing new subsectors that emerged from the rebasing of the Nigerian economy, Ishola and Olusoji (2020) examined the impact of service- industrial sector on the economic growth. The findings of Ishola and Olusoji showed that services and industry significantly impacted the Nigerian economy. The authors also confirmed the existence of some subsectors in the service such as pubic administration, professional, scientific and technical services, transport and utilities, which did not contribute to the economic growth in Nigeria.

Adetokunbo and Edioye (2020) took a look at response of economic growth to the dynamics of the service sector in Nigeria. Drawing data from some subsectors of service sector such as transportation and communication, health service, and education. The findings of the study showed that transportation and communication matter for economic growth but with inclusion of interaction term for these subsectors and governance, none was significant. Employing Autoregressive Distributed Lag Model (ARDL Model) and data on service sector and economic growth in Tanzania from 1970 to 2015, Magoti and Mtui (2020) discovered that growth rate of the service sector significantly contributed to economic growth. Magoti and Mtui's findings further showed that there was bidirectional causality between economic growth and growth rate of the service sector.

The focus of the study by Shieh (2020) was to examine the contribution of services to economic growth. Shieh used panel data of 89 countries over a period of 1970 to 2018 and found out that there long run relationship between the two. Shieh also found out that strong causality ran from services export to GDP while it was weak from GDP to services export. From the study of Effiong and Okon (2021), it was discovered that there was bidirectional causality between service sector and economic growth. In addition, Effiong and Okon's results showed that there was a weak exogeneity between service sector and economic

growth; and the shocks that occurred in the service sector negatively affect the economic growth in the short run and the long run. The findings of Effiong and Okon's study further showed that professional, scientific and technical services exhibited larger impact on the economic growth.

The argument posed by Karahan and Bay (2021) in their study on the services sector was that there should be a correlation between services sector and innovation in the economies. In the need to verify this assertion, Karahan and Bay empirically examined, with the aid of pane data from 2000 to 2017, the relationship between services sector and innovation in 13 Eastern European countries and found out that there was varied impact.

METHODOLOGY

Data for this study were drawn from the Central Bank of Nigeria 2021 Statistical Bulletin. Data were collected on gross domestic product, gross fixed capital formation, labour compensation, and output of trades sub service sector, output of finance and insurance sub- service sector, and output of information and communication sub- service sector, ratio of credit to private sector to GDP (CSP/GDP in %), and ratio of M_3 to GDP (M_3/GDP in %) from 1981 to 2021. All values were expressed in billion naira except ratio of credit to private sector to GDP (CSP/GDP in %), and ratio of M_3 to GDP (M_3/GDP in %). The estimation was done with the use of Ordinary Least Squares and Dynamic Ordinary Least Squares. The model for this study was derived from Tan (2016)'s model. The Tan's model was specified as follows:

$$Y_t = \phi + \alpha_0 X_t + \sum_{i=1}^{n} \alpha_i Z_{it} + v_t \tag{1}$$

In this Tan's model, Y = log of GDP (lnGDP), X_i = explained variable – log of value added of Financial and Insurance (lnFIN), log of value added of Real Estate (lnRES), log of value added of Information and Communication (lnIFC), and log of value added of Trade (lnTRA) and Z = added control variables – log of Capital (lnCAP), log of Labour (lnLAB) and log of number of patients approved in Hong Kong, and β_0 = coefficient, "which indicates the effect elasticity of the added value in four pillar industries on GDP" (Tan, 2016, p.118). As a result of lack of data or no innovation that led to patient, the authors dropped number of patients and replaced the variable with indicators of financial deepening, which were CSP/GDP in % (FDP1) and M_3/GDP in % (FDP2).

Tan also specified another model to capture the common influence of interaction of four pillars industries on economic growth. This model of Tan was as follows:

$$Y_t = \delta + \beta_0 X_t \bullet X_t^{/} + \sum_{i=1}^{n} \beta_i Z_{it} + \varepsilon_t \tag{2}$$

The main difference between Equation 1 and Equation 2 is the inclusion of $X^{/}$. According to Tan (2016, p. 119), $X^{/}$ "can also be used as the explaining variable of the four pillar industries, which are LnFC, LnTD, LnTR and LnPS separately with guaranteeing that X_t and $X^{/}_t$ will not appear the same variable simultaneously". The coefficient β_0 indicates the effect index of cross terms on GDP (Tan, 2016).

The data used in the study were described in Table 1 as follows:

Table 1: Description, measurement and type of variable

Variable	Description	Measurement	Type	Remark	A priori
GDP	Gross domestic product	Amount in naira	Dependent	Taking logarithm	
TRA	Value added of trade (output of trade in the real sector)	Amount in naira	Explained	Taking logarithm	+
FIN	Value added of financial and insurance (output of financial and insurance in the real sector)	Amount in naira	Explained	Taking logarithm	+
IFC	Value added of information and communication (output of information and communication in the real sector)	Amount in naira	Explained	Taking logarithm	+
RES	Value added of real estate (output of real estate in the real sector)	Amount in naira	Explained	Taking logarithm	+
CAP	Capital (proxy by gross fixed capital formation)	Amount in naira	Control	Taking logarithm	+
LAB	Labour (proxy by labour compensation)	Amount in naira	Control	Taking logarithm	+
FDP1	Financial deepening indicator (CSP/GDP in %)	Percentage	Control	Ratio	
FDP2	Financial deepening indicator (M_3/GDP in %)	Percentage	Control	Ratio	+

Source: Tan (2016) with slight modification by the authors

In estimating Equation 1 and Equation 2, the authors adopted Ordinary Least Squares (OLS) and Dynamic Ordinary Least Squares (Dynamic OLS). Following Tan (2016), the authors anaylsed the effect of each of the added value of the four pillar industries on economic growth independently using OLS. The use of OLS emerged as a result of violation of one of the properties of Dynamic OLS, which says that there must be at least one cointegration equation in among the series to be estimated. The results reported in Table 4 Column I, Column III, Column V, and Column VII, as well as, in Table 5 Column I, Column III, Column V, Column VII, Column IX, and Column XI were gotten through the use of OLS. The occurrence of serial correlation in the results led to inclusion of *AR(1)* and *AR(2)* and the model was re- estimated. The results obtained with inclusion of *AR(1)* and *AR(2)* was reported.

The adoption of Dynamic OLS came from the fact that it helps to remove endogenity and possibility of the occurrence of serial correlation. The model for the estimation of Dynamic OLS was specified as follows:

Estimating model using Dynamic OLS requires testing some properties about the series. One, all series must be stationarity at first and a must property for the dependent variable. Two, there must be a long run relationship among the series. In order to verify these two properties, the authors conducted stationarity test using Augmented Dickey Fuller (ADF) unit root test and conducted the cointegrating test using Johansen's cointegrating test. The summary of the results obtained was displayed in Table 3.

The authors transformed Equation 1 and Equation 2 into Dynamic OLS models, and resulted into Equation3 and Equation 4.

$$Y_t = X_t M' + \sum_{i=-m_i}^{i=1 m_i} \alpha_0 \Delta X_t + \sum_{i=-n_i}^{i=n_i} \alpha_1 \Delta Z_{it} + v_t i \qquad (3)$$

$$Y_t = X_t M' + \sum_{i=-m_i}^{i=m_i} \beta_0 \Delta X_t \bullet \Delta X_t' + \sum_{i=-n_i}^{i=n_i} \beta_1 \Delta Z_{it} + v_t \qquad (4)$$

In Equation 3 and Equation 4, X = vector of all explanatory variables and control variables; M'= subset of I(1) variables of X and Z_i; β_0, β_1, β_0, and β_1 = vectors of long run coefficients, m_i and n_i = leads of the first difference of explanatory variables and control variables, $-m_i$ and $-n_i$ = lags of the first difference of explanatory variables and control variables; ? = first difference operator. The inclusion of leads and lags of the first difference of explanatory variables occur in order to eliminate the problems of endogeneity and autocorrelation (Craigwell& Wright, 2004)

DATA ANALYSIS AND DISCUSSION

In this section, the authors intends to explain the results obtained from the estimation of the data used for the study.

Table 2: Descriptive statistics

	lnGDP	lnFIN	lnCAP	lnLAB	lnRES	lnTRA	lnIFC	FDP1	FDP2
Mean	8.79	5.51	7.63	7.85	5.88	6.87	5.99	11.47	15.42
Med	9.02	5.32	7.81	8.09	6.41	7.13	5.54	8.09	12.78
Max	12.08	8.58	10.97	10.74	9.13	10.06	9.79	22.76	24.90
Min	4.94	2.05	4.47	4.80	1.66	2.53	2.79	5.81	8.46
STD	2.44	2.15	1.97	2.13	2.80	2.60	2.59	5.53	5.35
Skew	-0.27	-0.09	-0.23	-0.17	-0.32	-0.36	0.18	0.69	0.55
Kurt	1.64	1.62	1.77	1.45	1.52	1.73	1.42	1.72	1.63
J-Bera	3.68	3.30	2.94	4.28	4.44	3.65	4.47	6.04	5.25
Pro	0.16	0.19	0.23	0.12	0.11	0.16	0.11	0.05	0.07
Obs	41	41	41	41	41	41	41	41	41

Source: Author's computation using Eview

Table 2 presents descriptive statistics of the series used in the analysis and the basic statistics are explained to reflect their behaviour as to their relevance to the study under investigation. The values for mean and median seemed to show moderately good degree of consistency because the values for standard deviations were low. As such, the values obtained for the standard deviation showed that each of the series seemed to cluster round the mean. It can therefore, be concluded that there is no problem of outlier in the series and presence of extreme large values.

From the table also, it is seen that the values obtained for Skewness were moderate and negative for log of GDP (lnGDP), log of value added of financial and insurance (lnFIN), log of local capital stock (lnCAP), log of labour compensation (lnLAB), log of value added of real estate (lnRES), and log of value added of trade (ln

TRA) but positive in series such as log of value added of Information and communication (lnIFC) and financial deepening I (FDP1) and financial deepening II (FDP2). All these values for Skewness vary between -0.36 and 0.69, which showed that they were symmetrical around the mean. Thereby, they were quite close to normal distribution.

The values obtained in computation of Kurtosis further confirmed the existence of the series being close to normal distribution. All the values were less than 3 in the series. Lastly, the values obtained for Jarque Bera statistics showed all series were normally distributed. Each of the probability values was greater than or close to 0.05. From the above illustration, there is clear evidence to conclude that all series were fit to be included in the analysis.

Since there were no issues with each of the series to be used in the analysis, the authors moved further to test for the Unit root in each of the series. The result obtained is shown in Table 3 and the Augmented Dickey Fuller (ADF) Unit Root test was used.

Table 3: Results of Augmented Dickey Fuller (ADF) Unit Root Test

Variable	ADF Calculated Value In Level	ADF Calculated Value At 1st Difference	Mckinnon 5% Critical Value	Order Of Integration
lnGDP	-1.40	-3.50[b]	-2.94	1(1)
lnCAP	0.67	-3.93[b]	-2.94	1(1)
lnLAB	-0.49	-8.80[b]	-2.94	1(1)
lnTRA	-1.95	-3.56[b]	-2.94	1(1)
lnFIN	-0.82	-6,.31[b]	-2.94	1(1)
lnICT	0.54	-4.49[b]	-2.94	1(1)
lnRES	-1.18	-3.21[b]	-2.94	1(1)
FDP1	-1.08	-5.85[b]	-2.94	1(1)
FDP2	-0.81	-5.77[b]	-2.96	1(1)
lnTRA*lnFIN	0.47	-5.23[b]	-2.94	1(1)
lnTRA*lnIFC	1.06	-4.12[b]	-2.94	1(1)
lnTRA*lnRES	0.47	-5.23[b]	-2.94	1(1)
lnFIN*lnIFC	1.22	-5.14[b]	-2.94	1(1)
lnFIN*lnRES	0.64	-3.85[b]	-2.94	1(1)
lnIFC*lnRES	0.01	-3.31[b]	-2.94	1(1)

Note:[a]1%, [b]5% and [c]10% level of significance

Source: Authors' computation using Eview

From Table 3, it can be seen that all the series exhibited stationarity at first difference. Since this result is a clear evidence for using Dynamic OLS, though not a sufficient condition. It is a necessary condition to proceed to cointegration test. The authors proceed to execute cointegration test using Johansen cointegration technique. The authors report the summary of the results obtained for each of the cointegration tests and this can be seen in Table 4. The authors reported the Trace statistics.

Table 4: Summary of Johansen Co-Integration Trace Statistics

Series	Hypothesized No. of CE(s)	Eigen Value	Trace Statistics	0.05 Critical Value	No. of CE(s)
lnGDP, lnRES, lnCAP, lnLAB, FDP1, FDP2	None[b]	0.65	104.31	95.75	1
lnGDP, lnFIN, lnCAP, lnLAB, FDP1, FDP2	None[b]	0.81	123.17	95.75	1
lnGDP, lnRES, lnCAP, lnLAB, FDP1, FDP2	At most 2[b]	0.51	54.09	47.86	3
lnGDP, lnRES, lnCAP, lnLAB, FDP1, FDP2	None[b]	0.70	99.20	95.75	1
lnGDP, lnTRA*lnFIN, lnCAP, lnLAB, FDP1, FDP2	None[b]	0.70	86.17	95.75	1
lnGDP, lnTRA*lnIFC,lnCAP, lnLAB, FDP1, FDP2	At most 1[b]	0.75	140.38	69.82	2
lnGDP, lnTRA*lnRES,lnCAP, lnLAB, FDP1, FDP2	None[b]	0.86	137.21	95.75	1
lnGDP, lnFIN*lnIFC, lnCAP, lnLAB, FDP1, FDP2	At most 1[b]	0.60	70.90	69.82	2
lnGDP, lnFIN*lnRES, lnCAP, lnLAB, FDP1, FP2	None[b]	0.82	134.10	95.75	1
nGDP, lnIFC*lnRES, lnCAP, lnLAB, FDP1, FDP2	At most 1[b]	0.68	85.56	69.82	2

Note:[a]1%, [b]5% and [c]10% level of significance

Source: Authors' computation using Eview

The above results showed the Johansen Co-Integration Trace Statistics for the ten different groups of series to be estimated. It can be seen that there is at least one cointegrating equation in each of the different groups of the series to be estimated. As such, it is concluded that there is a long run relationship in each of the groups of series to be estimated. Since the second conditions is satisfied, the model can be estimated using Dynamic Ordinary Least Squares.

Table 5 reports the regressional output without interaction term.

Table 5: Regressional output without interaction term

Dependent Variable: lnGDP								
Method: Dynamic OLS								
Sample: 1981- 2021								
Variable	I	II	III	IV	V	VI	VII	VIII
C	3.06 (6.67)[a]	1.34 (5.00)[a]	7.65 (3.36)[a]	0.21 (0.22)	7.79 (2.90)[a]	-0.50 (-0.39)	5.01 (4.54)[a]	2.55 (6.20)[a]
lnTRA	0.85 (16.11)a	0.63 (8.12)a						

	1	2	3	4	5	6	7	8
lnTRA	0.85 (16.11)[a]	0.63 (8.12)[a]						
lnFIN			0.21 (2.88)[a]	0.15 (0.35)				
lnIFC					0.15 (1.13)	-0.17 (-0.40)		
lnRES							0.65 (14.45)a	0.60 (6.86)[a]
lnCAP		0.25 (2.11)b		0.79 (2.75)[b]		0.60 (2.32)b		0.25 (2.45)b
lnLAB		0.15 (2.17)b		0.23 (0.86)[b]		0.71 (1.36)		0.02 (0.25)
FDP1		-0.02 (-0.84)		0.10 (1.42)		0.13 (2.16)b		0.04 (2.54)b
FDP2		0.02 (1.30)		-0.08 (-1.86)c		-0.08 (-1.35)		-0.01 (-0.27)
AR(1)	0.97 (16.66)[a]		1.82 (24.67)a		1.82 (24.05)a		0.99 (22.68)a	
AR(2)			-0.83 (-11.14)		-0.83 (-11.14)			
Adjusted R^2	0.998	0.999	0.998	0.996	0.998	0.995	0.997	0.999
F- Statistics	11057.99		5962.77		4991.40		4591.89	
Pro (F-Statistics)	0.00		0.00		0.00		0.00	
DW Statistic	1.79		2.25		2.43		1.66	
Long- run Var		0.04		0.04		0.04		0.01

Note: [a]1%, [b]5% and [c]10% level of significance, t- statistics in parenthesis.

Source: Authors' computation using Eview.

The above table showed the results obtained through the estimation of the relationship between log of GDP and the independent variables. The authors left the coefficient of determination in four decimal places in order to avoid showing same results in all estimations. It can be seen that the big four; that is, log of value added of financial and insurance (*ln*FIN), log of value added of real estate (*ln*RES), and log of value added of trade (*ln*TRA) except the log of value added of information and communication (*ln*IFC), exhibited high positive significant impact on the log of GDP in the period under study.

There seemed to be changes in their influenced when control variables were included. The results showed that log of value added of trade (*ln*TRA) and log of value added of real Estate (*ln*RES) were highly positively significant in the period under study. The log of value added of financial and insurance (*ln*FIN) has positive sign as expected, which showed that financial and insurance sub- sector contributes to the growth of Gross Domestic Product but the series of domestic financial crises including global financial crises might have resulted in the coefficient not being significant. On the contrary, the log of value added of information and communication (*ln*IFC) contributes negatively to the log of the GDP. A good explanation for this is that information and communication sub- sector in Nigeria mainly characterises by the existence of foreign investors and capital intensive in nature. In addition, the sub- sector is still at the infancy stage, taking note that rapid expansion in the industry emerged in late 1990s with emergence of Global System for Mobile Communication (GSM communication).

Table 6 reports the regressional output with interaction term.

Table 6a: Regressional output with interaction term

Variable	I	II	III	IV	V	VI
C	7.32 $(3.97)^a$	-0.71 $(-2.86)^b$	7.34 $(3.59)^a$	-0.31 (-0.18)	5.69 $(6.56)^a$	-0.73 $(-2.80)^b$
*ln*TRA**ln*FIN	0.03 $(4.60)^a$	$-1.1x\ 10^{-5}$ $(-3.58)^a$				
*ln*TRA**ln*ICT			0.03 $(5.00)^a$	$-3.5x\ 10^{-3}$ (-0.13)		
*ln*TRA**ln*RES					0.06 $(6.68)^a$	$-9.11x\ 10^{-6}$ $(-3.26)^a$
*ln*CAP		0.97 $(9.65)^a$		0.78 $(2.42)^b$		0.99 $(9.69)^a$
lnLAB		0.21 $(2.17)b$		0.39 (0.75)		0.20 $(2.00)b$
FDP1		0.07 $(2.77)b$		0.10 (1.61)		0.05 $(2.34)b$

Variable						
*ln*LAB		0.21 (2.17)[b]		0.39 (0.75)		0.20 (2.00)[b]
FDP1		0.07 (2.77)[b]		0.10 (1.61)		0.05 (2.34)[b]
FDP2		-0.01 (-0.41)		-0.06 (-0.96)		-0.01 (-0.18)
AR(1)	1.81 (21.32)[a]		1.78 (20.66)[a]		1.39 (7.88)[a]	
AR(2)	-0.81 (-9.68)		-0.79 (-9.11)[a]		-0.41 (-2.46)[b]	
Adjusted R^2	0.999	0.998	0.999	0.996	0.998	0.998
F- Statistic	6728.01		5705.06		5545.47	
Prob (F- Statistic)	0.00		0.00		0.00	
DW Statistic	2.27		2.41		2.06	
Long- run Var		0.01		0.0		0.01

Note:[a]1%, [b]5% and [c]10% level of significance, t- statistics in parenthesis.

Source: Authors' computation using Eview.

Table 6b: Regressional output with interaction term

Variable	VII	VIII	IX	X	XI	XII
C	7.98 (3.30)[a]	-1.70 (-1.38)	7.07 (3.94)[a]	-0.71 (-0.18)	7.49 (3.37)[a]	-0.59 (-2.07)[b]
*ln*FIN * *ln*ICT	0.02 (1.90)[c]	$-3.0 x\, 10^{-2}$ (-1.40)				
*ln*FIN * *ln*RES			0.04 (3.73)[a]	$-1.1\, x\, 10^{-5}$ (-3.57)[a]		

lnICT*lnRES					0.03 (1.32)	$-8.2x10^{-6}$ (-2.62)b
lnCAP		0.80 (2.80) b		0.97 (9.65) a		0.93 (7.77) a
lnLAB		0.55 (1.54)		0.21 (2.17) b		0.25 (2.20) b
FDP1		0.13 (2.90) b		0.07 (2.77) b		0.07 (2.35) b
FDP2		-0.02 (-0.37)		-0.01 (-0.41)		-0.02 (-0.60)
AR(1)	1.83 (25.52) a		1.75 (14.60) a		1.77 (18.11) a	
AR(2)	-0.84 (-11.91) a		-0.76 (-6.33)a		-0.77 (-7.87)a	
Adjusted R^2	0.998	0.996	0.998	0.998	0.968	0.999
F-Statistic	5495.12		6029.84		5153.82	
Pro (F-Statistic)	0.00		0.00		0.00	
DW Statistic	2.33		2.24		2.44	
Long-run Var		0.04		0.01		0.01

Note: [a]1%, [b]5% and [c]10% level of significance, t- statistics in parenthesis.

Source: Authors' computation using Eview

In Table 6, the authors attempt to present regressional output with inclusion of interaction terms. The results of the inclusion of interaction term for the log of value added of trade (TRA) and log of value added of financial and insurance (FIN) appeared in Column I and Column II. In the results, the interaction terms was positive and significant in Column I but it was negative and significant in Column II. One fact to draw out is that the financial sub- sector of the economy has not really contributed to the growth of the GDP because of different financial crises that have occurred in the recent times, and lack of sophistication has really madethe crises to have great impact on the sub-sector. Similar results were obtained in Column III and Column IV for interaction term for the log of value added of trade (TRA) and log of value added of information and

communication (IFC). The coefficient was positive and highly significant in Column III but this could not be said of Column IV. With the inclusion of the control variables, the coefficient of the interaction term for the log of value added of trade (TRA) and log of value added of information and communication (IFC) was negative and neither significant. A deduction from this is that there is possibility of capital- importing nature of the sub- sector to restrict it influences on trade and thereby constrained the growth of the GDP in the period.

Also, in Column V and Column VI, the results seemed not to be better as the signs were not different from the previous in regards to interaction term for the log of value added of trades (TRA) and other sub-sectors. Both coefficients for the interaction term for the log of the value added of trade (TRA) and log of the value added of real estates (RES) were significant in Column V and Column IV. The fact to be drawn is that the interaction of the log of the value added of trade (TRA) and log of the value added of real estates (RES) matters for economic growth in the developing countries such as Nigeria. The negative sign in the coefficient showed that investment in real estates may reduce the value of GDP. Since investment in real estates is for consumption purpose rather than productive purpose, following Keynesian argument, it is not worthwhile for the economy to concentrate investment on real estate sub- sector. Looking at the three results, where trade interacted with other variables, one can conclude that trade in a country where large volume of the goods and services exchange in such trade are not locally produced may not enhance growth because it weakens foreign exchange reserves.

Moving further to Column VIII, the inclusion of the control variables in the model containing the interaction term for the log of value added of finance and insurance (FIN) and the log of value added of information and communication (IFC) changed the sign for the interaction term into negative. The coefficient was also not significant. What this result has pointed out is the fact that finance and insurance (FIN) and information and communication (IFC) are mainly capital intensive rather than labour intensive. The concentration of investment on the two may not enhance the desired growth in the economy. This may be the reason why the coefficient of log of labour compensation (LAB) was negative despite being positive. Considering the interaction term for the log of value added of finance and insurance (FIN) and the log of value added of real estate (RES), it was shown in Column IX and Column X that both coefficients were negative but significant at 5% and 1% respectively.

This result showed that using scarce resources in the finance and insurance sub- sector for investment purpose in real estate sub- sector will constrain economic growth. This has the tendency to cause increase in interest rate and cripple production; as a result of the business firms' inability to secure funds at high interest rate.

Lastly, in the table, it is the inclusion of the interaction term for the log of the value added of information and communication sub- sector (IFC) and the log of the value added of real estate (RES) in Column XI and Column XII. The coefficient of the interaction term was positive, which showed that investment in real estate cum investment in information and communication strenthened economic growth in the period under study. As such, the pairwise intersections of information and communication sub- sector (IFC) and the real estate (RES) matters for economic growth. The relevance of local capital stock (CAP) can be seen in all estimations. It was positive and significant. The log of labour compensation and ratio of credit to private sector to GDP (FDP1) were positive all through the estimations; though they were not significant in some estimations. The ratio of M_3 to the GDP (FDP2) performed poor through the estimations; it was negative and not significant. This showed that increase in money supply has not yielded the desired growth in the economy.

The findings of this study contradict that of Tan (2016), who carried out similar study in Hong Kong. The findings of Tan's study showed that the four major service industries in Hong Kong contributed significantly to the economic growth of the country. The major reason that can be attributed to this is the stage of the economy in which Nigeria is. Nigeria is purely a capital importing country and the economy is highly fragile.

CONCLUSION

This study has intended to examine the impact of the four leading sub- sector in the service industries in Nigeria. The four identified pillars in the service industries were trade, financial and insurance, information and communication, and the real estates. Data were drawn from the CBN statistical bulletin and regressional analyses were carried out to investigate the influence of the four leading sectors in service industries on economic growth. Trade and real estates of the service industries were the main movers of economic growth in the period under study. In addition, it is also confirmed that the pairwise intersections of trade and financial and insurance; financial and insurance, and real estate; and trade and real estate enhanced economic growth during the period under study. These findings have reflected the main reasons why the rapid growth of the service sectors have not spill- over to the manufacturing sectors in Nigeria. From these findings, it can be seen that financial and insurance was the channel in which the growth in trade and real estates have been sustained. Based on these findings, the authors recommend that there is need for policy makers to develop concrete policy, which will diversify the economy especially from trade and real estates into more productive service sectors such as information and communication.

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