Analysis of the Sectoral Linkages and Growth Prospects in the Nigerian Economy

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Abstracts: After fifty-five years of political independence, the productive base of the Nigerian economy still remains weak, narrow and externally-oriented with primary production activities accounting for about 65 percent of the real gross output and over 80 percent of government revenues. Whereas in other rapidly developing economies, service sector is the lifeline for the socio-economic growth of their countries. It is today the largest and fastest growing sector globally, contributing more to the global output and employing more people than any other sector. This study, seeks to determine the contributions of the different sectors in the Nigerian economy other than the oil and gas sector, to assess the sectors that are underutilized productively and suggest possible solutions towards boosting economic activities in these sectors with the aim of achieving inclusive growth in Nigeria. The study adopts a quantitative method to analysed annual time series data from 1960 – 2013 by using an econometric technique like pair wise Granger causality and vector autoregressive (VAR) to evaluate the empirical evidence of the relationship between sectoral output and economic growth in Nigeria. The result shows that Service sector do not only promotes the level of economic growth in the economy but also connect every other sector, while GDP does not promote output growth in the services sector. Also, agric output is observed to be directly related to growth. Therefore, for Nigeria to achieve a rapid and sustainable economic growth policies should be made to diversify the economy and invest more in the agric and service sectors to harnessed the potentials available in these sectors.

Keywords: Agriculture, Economic Growth, industry, sectoral linkage and service

I. Introduction

After fifty-five years of political sovereignty, the Nigerian productive base still remains weak, slim and heavily influences by the external sector with primary production activities of agriculture, mining and quarrying accounting for about 65 percent of the real gross output and over 80 percent of government revenues. In addition, primary production activities account for over 87 percent of foreign exchange earnings and 78 percent of employment. In contrast, secondary activities comprising manufacturing and building and construction, which traditionally have greater potential for broadening the productive base of the economy and generating sustainable foreign exchange earnings and government revenues account for a mere 4.14 percent and 2.0 percent of gross output respectively. However, there are prospects in Nigeria for sustained growth driven by an improved performance of the key non-oil sectors - agriculture, information and communication technology, trade and services- but decline in the contribution of the oil sector may dampen the positive outlook. The newly rebased Nigerian GDP from 1990 to 2000 at current market prices was estimated to be around USD510 billion by the end of 2013. This good performance was driven largely by the non-oil sector, although its contribution to export earnings has been very small. While between 2011 and 2013 the non-oil sector annual growth averaged 7.1% with a peak of 8.3% in 2012, estimated, growth of the oil sector averaged 2% with a negative growth of 2.2% in 2012 which significantly improved to 5.2% in 2013. Despite its poor performance, the oil sector contributed an estimated 96% to total export earnings in 2013. In contribution to fiscal revenue, however, things appear to be changing as the non-oil sector for the first time in decades contributed around 40% to fiscal revenues in the third quarter of 2013.

Services or tertiary activities which depend on wealth generated by the productive sectors for their operations accounted for about 10 percent of gross output. Whereas in other rapidly developing economies, service sector is the lifeline for the socio-economic growth of their countries. It is today the largest and fastest growing sector globally, contributing more to the global output and employing more people than any other sector. Services sectors have become more important in recent years as advances in technology have permitted new means of providing services across borders.

The Nigerian economy continues to grapple with a number of challenges that has hampered efforts at economic transformation. First, the economy is yet to achieve the necessary structural changes required to jump-start rapid and sustainable growth and development. Aside disarticulated and narrow productive base, sectoral linkages in the economy are weak. Primary production comprising agriculture, mining and quarrying inclusive of oil and gas dominate national output while the manufacturing and services sectors role in the economy is

decidedly small in terms of share of gross output, contribution to growth, foreign exchange earnings, government revenues and employment generation.

This paper therefore, seeks to determine the contributions of the different sectors in the Nigerian economy other than the oil and gas sector, to assess the sectors that are underutilized productively and suggest possible solutions towards boosting economic activities in these sectors with the aim of achieving inclusive growth in Nigeria.

1.1 Nigeria's Potentials for Economic Growth

Nigeria is well endorsed with vast human and material resources that can guarantee sustainable economic growth and development. The country has a land area of 923,773km2, with varied vegetation and soil types that are suitable for a variety of agricultural purposes. The Rivers Niger and Benue divide the country into three major geographical sections, west, east and north, and acting in synchrony with the Lake Chad and a few other rivers, provide the needed irrigation potentials for all-year-round farming activities. The traditional agricultural specialization in tandem with the vegetation, soil and climatic conditions vary from root and tree crops in the south to grains and livestock in the north.

The country has large reserves of solid minerals including bitumen, topaz, lignite, coal, tin, columbite, iron ore, gypsum, barite and talc. Mining activities which are largely informal are concentrated in particular areas of the country: metallic minerals are mostly found in the middle belt, coal is found in the South East and Middle Belt, and bitumen predominantly in the South West. Crude petroleum and natural gas are prevalent in the southern area of the country referred to as the Niger Delta region. The proven reserves of crude petroleum are well over 37 billion barrels, while reserves of natural gas stand at over **187** trillion standard cubic feet. The pattern of material endowment facilitates inter regional trade within the country. This is why the country was a veritable source of raw materials for industries in Europe, especially Britain during the colonial era. But much is not done to tarp from this rich potentials for economic development. The only sector that is enjoying huge investment is the oil sector while other sectors and sub sectors are suffering from poor funding and investment to harness the endowment for growth. This is why it is often said that when the oil market sneezes the Nigerian economy suffers.

II. Literature Review

From empirical literature, it has been observed that sustainable economic development requires transformation from agriculture to manufacturing then structural change from manufacture to service sector Clark (1941)^[1], Kuznets (1957)^[2] & Fuchs (1980)^[3]. Glasmeier and Marie (1993)^[4] discover that the two key sectors that impact on economic growth is service and agriculture sector. On the service sector, empirical studies since 1950 suggests that dominating sector for rapid economic growth in developed countries is service sector Warton (1974)^[5]. Economic Council of Canada (1991)^[6] reported that domination of service sector accounts to two thirds of employment and output in developed countries, in addition the association of service sector and economic growth depends on the size of sector and its productivity in economic. The service sector played significant role in economic competitiveness and has a strong relationship and inter connectivity with rest of the sectors in an economy, growth is closely connected with service which indirectly linked with human capital. Hoekman and Eschenbach (2005)^[7] found out a direct link between the service sector and economic growth. Arnold et al. (2008)^[8] suggested that finance, transport and telecommunication are the backbone of service sector which allowed business and open international market competition. Arnold et al. (2010)^[9] discovered India covering banking, insurance, telecommunication and transport improved their services polices which lead to improve in manufacture productivity, this is implies that service sector contributes to economic efficiency, therefore service sector play important role in the growth of economy directly and indirectly. Miroudot et al. (2010)^[10] showed rapid productivity growth related with those service sectors which were more open to international competition.

In the study done by Kongsamut et al. (2001)^[11] using Kaldor facts and the dynamics of sectoral labour reallocation, they observed that the services sector has a high contribution to increase in the per capita income of 123 countries from 1970-1980. They also discover that service sector provides a strong interconnectivity among other sectors. In a similar study for Pakistan, the result shows that determinants of economic growth has shifted greatly from the primary sector to the services and other sectors, the study shows that 54 per cent of GDP comes from the service sector and employed nearly one third of the total population of Pakistan Ansari (1994)^[12].

On structural change, this involve the movement of labour from agricultural to manufacturing and services sector, the share of these sectors to export and balance of trade, the Dutch-disease as well as effect of spending Cornwall (1977)^[13], Corden and Neary (1982)^[14]. Kasper (1978)^[15] found that as income increases the demand for product from the primary sector thence to fall causing resources to be reallocated to other sectors. This gives rise to the development of the secondary and the tertiary sector and mass movement of factors of

production. Seema Joshi (2008)^[16] provides the overview of how Indian investment in the services sector transformed their economy. And to this extent, India today is regarded as the services hub of the world. According to Robert Sullivan (2002)^[17] the United States has undergone a transformation from an industrial society to the first post industrial society. Many developed economies today achieve this as a result of diversification of their economies to capture output from other sectors other than the primary sector. For instance, a number of sector specific policies have been taken up by the Indian government to promote sub sectors like IT, ITES, telecoms, financial services, organized retail, entertainment, hospitality and tourism sectors. Consequently, the service sector has outstripped manufacturing in its contribution to the growth of GDP and in the level of employment compare to other sectors. Steffen Lehndorff (2002)^[18] portrays the diversity into service activities along side'market-based governance' as a prerequisite for achievement of pro poor growth in an economy. The new mode of governance has substantial impacts on working conditions. Taking India for example, Jay Kandampully (2009)^[19] concludes in his study that the service sector plays an important role in economic growth in developing countries. However, he said that as income levels increase people will be able to afford more services while they will be spending this additional income on quality services such as education, health, travel etc. On the other hand, small-scale entrepreneurs can step in to meet the need of the people for more and more services with growth in income levels and lifestyle changes while the service sector will provide more employment opportunities than manufacturing sector. Moreover, in the case of USA, 80% of the employment opportunities are in the service sector. Pal Suparna (2010)^[20] noted that during the last two decades it has been observed, in both developed and developing countries, that their successes in economic growth and transformation come as a result of their service sector emerging as the main driver of economic growth, as compared to the primary and secondary sectors. Some economists argued that the output of service sector is overestimated and thus showing such a robust growth rate. Ramakrishna (2010)^[21] investigates that apart from service sector growth, industry, agriculture and the open policies of 1990s also had positive impact on India's economic growth though, the service sector appears to contribute more. The sources of service sector growth in India appear to be income elasticity of demand, open policies and the growth in the service sectors like communications, business, banking and insurance.

On the agriculture sector, there are several studies that analyze the share and role of this sector to the Nigerian economy. These studies give evidence of a positive relationship between agriculture sector investment and economic growth. Iganiga and Unemhilin (2011)^[22] and Oji-Okoro (2011)^[23] found that agricultural output is significantly influenced by government capital expenditure. Iyoha and Oriakhi, (2002)^[24] identified the sources of economic growth in Nigeria using the growth accounting model and found that agriculture contributes more than expected to GDP growth. According to the paper, this indicates a lag in the nation's industrialization process. They also find that the share of labour involved in agriculture is too high and suggest that labour be reallocated to other sectors to accelerate rapid economic growth. Anam and Antai (2005)^[25], Olajide et al. (2012)^[26] in their study to analyse the relationship between agricultural resource and economic growth in Nigeria from 1970 to 2010 using (OLS) regression method, found a positive causal relationship between GDP and agricultural output in Nigeria, however their study was limited to showing only that agriculture and GDP growth rate are related. The agriculture sector has been the mainstay of the economy since independence and despite several bottlenecks; it remains a resilient sustainer of the populace. In the 1960s, Nigeria was the world's largest exporter of groundnut, the second largest exporter of cocoa and palm produce and an important exporter of rubber, cotton (Sekunmade, 2009)^[27]. More recently, agriculture employs about two-thirds of Nigeria's labour force, contributes significantly to the GDP and provides a large proportion of non-oil earnings (CIA, 2013^[28], Sekunmade, 2009^[27]). Yet, the sector still has several untapped potential for growth and development in the availability of land, water, labour and its large internal markets this is as a result of over concentration on one sector of the economy (oil sector).

2.1 Theoretical issues

2.1.1 Balanced Growth Theory

The balanced growth theory is an economic theory that hypothesis that the government of any developing country needs to make large investments in different economic sectors simultaneously Hayami & Godo (2005)^[29], Cypher & Dietz (2008)^[30]. This theory implies that all sectors of the economy should be developed simultaneously. No sector should be discriminated in the matter of development. This will enlarge the market size, increase productivity, and provide an incentive for the private sector to invest as well as inclusive growth. If government take the decisions to develop all sectors, it will create a balanced regional development. In reality, efficiency, self-sufficiency and self-reliance is the result of balanced growth doctrine. To some extent, balanced growth is the real remedy to the problem of developing economies. Nurkse was in favour of attaining balanced growth by diversifying investment into different sector of the economy. He recognised that the expansion and inter-sectoral balance between agriculture, manufacturing and service is necessary so that each of these sectors provides a market for the products of the other and in turn, supplies the necessary raw materials for

the development and growth of the other. The theory discusses how the small size of the productive base in developing countries perpetuates its underdeveloped state and unbalanced growth. Nurkse has also clarified the various determinants of the market size and puts primary focus on productivity. According to him, if the productivity levels rise in a less developed country, its market size will expand and thus it can eventually become a developed economy. The balanced growth strategy helps in enlarging the size of the market. The expansion of the market leads to number of benefits. It leads to specialization, the efficiency goes up due to expertise. As a result new innovations are encouraged. This is followed by not only an increase in the quantity of output but also better quality of the products. Thus, balanced growth, through specialization helps improving both the quantity and quality of the output. The diagram below shows the summary of the balanced growth.



The process of economic development as per Ragnar Nurke's Balanced Growth Theory



2.2 Overview of Nigerian Sectoral Output

Source: Computed by the authors

Figure. 1: contribution to Nigerian gdp by sectors

Fig. 1 shows that the contribution of agriculture sector to GDP from 1960 to 1970 was 57 per cent but reduces to 32% in the next decade (1971-1980) but from 1981 to 1990 it struggle to increase by 10 per cent but later drop by 10 per cent in the next decade. This decrease was further observed from 2001 to 2013. Whereas the construction sector has not contributed up to 10 per cent to the Nigerian total output since Nigerian independent till date. The figure shows that wholesale sector contributed up to 12 per cent of Nigerian GDP from 1960 to 1970 and increased to 17 per cent in the next decade, while a decrease of 3 per cent in this sector's share to total output is observed from 1981 to1990 this share remains till 2013 when it fall back to 12 per cent as in the first decade after independent.

However, the service sector, which is the key sector for rapid economic growth in other fast growing economies has only 14 per cent share to the Nigeria's GDP in the first decade after independent reduces by 2 per cent in the second decade, remained at this level in the third decade. Unfortunately reduces to 8 per cent in the period 1991 to 2000.

Moreover, from 2001 to 2013 this sector's contribution to GDP increased to 10 per cent but still low compare to other fast developed and developing economies. Also, the figure shows that the industrial sector excluding oil sub sector contributed very low (less than 10 per cent) to the Nigerian GDP right from Nigeria's independent. From 1990 to 2013 it share to GDP has been in the decrease showing that much attention has been paid to the oil sub sector, neglecting other sub sector that are in the industrial sector. Finally, the figure shows that the Nigeria's productive base, in terms of contribution to GDP is still very small.

III. Data And Method of Analysis

Annual time series data covering 1960 – 2013 have been used. The basic data for this analysis are GDP, output from agricultural, industrial, construction, trade and services sectors. These data were collected from the CBN Statistical Bulletin - a publication of the Central Bank of Nigeria. All variables are in logarithmic form. There is a general tendency for time series data to contain a unit root. Consequently, an attempt has been made to render the data stationary prior to specification and estimation. Moreover, as the residuals of non-stationary time series are correlated with their own lagged values, a standard assumption of ordinary least squares (OLS) theory, that disturbances are not correlated with each other, is violated. Hence, OLS estimates of such series are biased and inconsistent, and standard errors computed with such random walk variables are generally underestimated. Therefore, the study employs the pair wise Granger causality and vector autoregressive (VAR) technique to evaluate the empirical evidence of the relationship between sectoral output to economic growth in Nigeria.

The adoption of VAR is informed by the fact that VAR methodology of potentially spurious a prior constraints that are employed in the specification of structural models. Also, since few restrictions are placed on the way in which the system of variables interacts, this method is well suited for examining the channels through, which a variable operates. The VAR approach sidesteps the need for structural modelling by modelling the endogenous variable as a function of its lagged value. Since only the lagged value of the endogenous variable appears on the right hand side of the equation, there is no issue of simultaneity. In effect, the strength of the VAR model lies in its ability to incorporate the residual from the past observation into the regression model for the current observation. The approach also has the advantages of being easy to understand, generally applicable, and easily extended to nonlinear specifications and models that contain endogenous right-hand-side variables. In addition, the nonlinear least squares estimates of this method are asymptotically equivalent to maximum likelihood estimates and are asymptotically efficient. The coefficient may be interpreted in the usual manner, but the results involving the residuals, differ however, from those computed under OLS settings (Ndiyo and Ebong 2004)^[31].

IV. Empirical Strategy

We approach the issue of sectoral linkages and growth prospect from Nigeria's experience in the following three stages: causality test; using Granger-causality test, the stationary test, and vector autoregressive (VAR) regressions.

Table 1: Stationarity test					
VARIABLE	ADF	REMARK	PP	REMARK	
GDP	5.726283	I(0)	4.810244	I(0)	
AGRIC	6.626847	I(0)	4.917870	I(0)	
CONS	-10.20255	I(I)	-10.25961	I(I)	
WHOLESALE	10.27242	I(0)	13.48504	I(0)	
SERVICES	-5.385774	I(0)	10.91194	I(0)	
INDUSTRY	5.270497	I(0)	5.643555	I(0)	
CRITICAL VALUE:			CRITICAL VALUE:		
1% -3.6701		1% -3.6616			
5% -2.9639		5% -2.9604			
10% -2.6210		10% -2.6191			
*stationary at 5%					
** stationary at 10%					

4.1 Stationarity Test

 Table 1 depicts the result of stationarity test conducted for the model;

Source: Computed by the Authors

The test shows that, using both Augmented Dickey-Fuller (ADF) and Phillip Peron test, only construction sector is integrated of order one while the remaining variables are integrated at level. As for construction variable that is not stationary at level, we thus conclude that it has unit roots Dickey and Fuller, 1981^[32]; Hendry, 1986^[33]; Engel and Granger, 1987^[34], Philips and Perron, 1988^[35]; Johansson, 1988^[36].

4.2 Causality Test

Pairwise Granger Causality Tests			
Date: 09/04/15 Time: 12:11			
Sample: 1960 2013			
Lags: 2			
Null Hypothesis:	Obs	F-Statistic	Probability
CONS does not Granger Cause AGRIC	52	1.60313	0.21208

AGRIC does not Granger Cause CONS	12.5992	0.00004	
WHOLE does not Granger Cause AGRIC		19.1170	0.00000
AGRIC does not Granger Cause WHOLE		3.73078	0.03135
SERV. does not Granger Cause AGRIC 52		42.8228	0.00000
AGRIC does not Granger Cause SERV.		6.23047	0.00398
INDU. does not Granger Cause AGRIC 52		9.15358	0.00044
AGRIC does not Granger Cause INDU.		6.14028	0.00427
GDP does not Granger Cause AGRIC 52		26.1459	0.00000
AGRIC does not Granger Cause GDP	0.12869	0.87956	
WHOLE does not Granger Cause CONS		16.5797	0.00000
CONS does not Granger Cause WHOLE		0.82646	0.44385
SERV. does not Granger Cause CONS		16.0603	0.00000
CONS does not Granger Cause SERV.		0.23243	0.79351
INDU. does not Granger Cause CONS 52		7.71856	0.00126
CONS does not Granger Cause INDU.		2.66642	0.08000
GDP does not Granger Cause CONS	52	16.7545	0.00000
CONS does not Granger Cause GDP		0.09782	0.90700
SERV. does not Granger Cause WHOLE 52		9.09673	0.00046
WHOLE does not Granger Cause SERV.		0.85286	0.43268
INDU. does not Granger Cause WHOLE	52	8.18673	0.00089
WHOLE does not Granger Cause INDU.		14.6224	0.00001
GDP does not Granger Cause WHOLE 52		20.7208	0.00000
WHOLE does not Granger Cause GDP	1.90653	0.15991	
INDU. does not Granger Cause SERV.	52	5.18923	0.00920
SERV. does not Granger Cause INDU.		7.99568	0.00103
GDP does not Granger Cause SERV.		10.3065	0.00019
SERV. does not Granger Cause GDP		3.18202	0.05058
GDP does not Granger Cause INDU.		9.23927	0.00041
INDU. does not Granger Cause GDP		4.69959	0.01378

Source: computed by the Authors

From the result of pair wise Granger causality in TABLE 2, there is a unidirectional causality between construction sector and agriculture sector flowing from agriculture, while there is bidirectional relationship between wholesale and agriculture; services and agriculture; industry and agriculture; GDP and agriculture; industry and construction. Others are industry and wholesale; industry and services; GDP and services as well as GDP and industrial sector. In addition, the result also shows that there is unidirectional causality between wholesale and construction (flowing from service sector); services and construction sector (flowing from services sector). However, it is worthy of note that it is only service and agriculture sectors that granger cause every other sectors.

4.3 Vector Autoregressive (VAR) Regression

The explanatory power of the VAR is high across the three specifications (see appendix A) the R^2 and even the adjusted R^2 in the results show high coefficient of determinations in the model, indicating that changes in the endogenous variables are highly explain by the explanatory variables in the model. Most of the estimated parameters have the expected signs and statistically significant at 5% level of significance. The Akaike information criteria and Schwarz criteria values show that the model is good for the system.

- 1. Agric output is observed to be directly related to growth, but is statistically not significant, confirming a positive contribution to the economic growth of the nation and hence development. It also promotes the growth of current GDP in the economy
- 2. The second lag value also has a positive influence on the output. This further strengthen the fact that agricultural sector is vital to the growth and development of the Nigerian economy.
- 3. Industrial sector in the Nigerian economy (other than the oil sub sector) promotes economic growth as shown in the result. Also, it has a positive influence on the services and agricultural sectors as shown in the model, and is statistically significant.
- 4. Wholesale sector promote economic growth but negatively influence the agric and services sector.
- 5. Existing capacity (previous level of wealth; GDP) promotes the current level of GDP in the economy and agriculture sector, but does not promote the services sector. This implies that the services sector does not receives much attention from the government in other to boost the productivity.
- 6. Service sector promotes the level of economic growth in the economy as well as the agric sector. But it lagged value does not promote the current output from this sector. Showing that contributions from this sector are leaked out of the economy without a ploughing back into the sector to developed the sector for greater productivity.

V. Policy Implications and Recommendations

The negative impact of GDP to services sector in the model shows that much capital or investment is not channel into the service sector to harness the huge potential that is available in this sector in other to accelerate economic growth and development. The positive impact of service sector to GDP in the model gives a clear indication that service sector contributes to the development of the Nigerian economy. But it is sad to observe in the model that the growth in the national income does not promote the services sector. To this extent, the following recommendation has been made;

- 1 Increased investment in the service sector. Policies should be made to boost investment in the service sector since, according to the result; services sector is directly related to GDP. It is also noted that service sector has the largest sub sectors (transport, telecommunication, utilities, and financial institutions, insurance and so on), in the economy employing large percentage of population. To achieve an inclusive or balanced economic growth, expansion of investment in the transport sub sector to boost easy flow of goods and link the rural areas to the urban areas, improve on infrastructure networks to enhance the economic vitality of existing communities for economic development in Nigeria. This will increased the level of capacity utilization in this sector, promotes greater percentage of contribution to the economic growth, in the long-run the multiplier effect will be increased in employment, total productivity as well as poverty reduction in the sectors, implying that this sector has a link in every sector. Therefore, to achieve an inclusive economic growth that cut across all the sectors of the economy, service sector should be boosted with innovations.
- 2 Diversification of the economy to capture the sectors that their potentials are yet untapped. For instance, the agricultural productivity has drop since the discovery of oil in the commercial quantity. Even in the industrial sector, investment in this sector goes to oil sub sector only, neglecting other sub sectors like solid minerals and mining. This account for the low level of contribution to GDP by other sectors as shown in figure 1. To correct this, economic diversification is inevitable in order to revive the economy from economic stagnation cause by oil price shock and promote rapid economic growth and development. Emphasis should also be laid on agric sector as this sector links all other sector for rapid growth and development.

VI. Summary and Conclusion

In this study, we explored the contributions of sectoral output to sustainable economic growth in Nigeria through; review of empirical studies; theoretical issues; and centred on empirical findings using econometric method of granger causality test and vector autoregressive (VAR) analysis. From our findings we discovered that services sector in Nigeria has a bidirectional effect with gross domestic product (GDP). The empirical result also indicates that an increased in service sector's output will lead to increased in the economic growth. This result agrees with the previous study done for India by Lashmi & Kumar (2012) which concludes in their work that service sector is the cause of Indian rapid economic growth. Our findings show that service sector connects every other sectors in the Nigerian economy and is a propeller to rapid economic growth. Therefore, for Nigeria to achieve a rapid and sustainable economic growth policies should be made to diversify the economy and invest more in the agric and service sectors to harnessed the potentials available in these sectors.

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