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FEDERAL GOVERNMENT STATUTORY FUND ALLOCATION AND INFRASTRUCTURAL DEVELOPMENT IN OGUN STATE, NIGERIA

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ABSTRACT: *The level of Federal government revenue allocation to state determines sound infrastructural foundation and overall socio-economic development of a state. However, Ogun state still experiencing poor infrastructural development facilities in terms of environmental management, health, educational and agricultural sectors due to inadequate federal statutory revenue allocation. The main objective of the study is to examine the effect of federal statutory revenue state allocation on infrastructural development in Ogun State, Nigeria. The study employed ex-post facto research design with ARDL method of analysis and data was sourced from National bureau of statistics, Ogun State Inland Revenue Service, Ogun State Ministry of Finance and Ministry of Budget and Planning. Findings revealed that federal statutory revenue state allocation significantly affects environmental management in Ogun State (R^2 = 64%, t-stat$_{(1,19)}$=-6.095293, p<0.05); that federal statutory revenue state allocation significantly affects educational development in Ogun State (R^2 = 73%, t-stat$_{(1,19)}$==-3.811322, p<0.05); that federal statutory revenue state allocation significantly affects agricultural development in Ogun State (R^2 = 34%, t-stat$_{(1,19)}$=-5.707987, p<0.05); that federal statutory revenue state allocation significantly affects health sector in Ogun State (R^2 = 67%, t-stat$_{(1,19)}$=-9.379976, p<0.05) and that federal statutory revenue state allocation significantly affects infrastructural development in Ogun State (R^2 = 77%, F-stat$_{(4,16)}$=89.68, p<0.05). The study concluded that both in the short and long runs federal statutory revenue state allocation significantly affect infrastructural development in Ogun State. The study recommended that more financial control and value for money audit should be carried out to minimize wastages and corruption in the states of the federation, so as to change the direction of influence of states' revenue allocation on infrastructural development.*

KEYWORDS: financial control, infrastructural development, sector, statutory allocation, value for money audit

INTRODUCTION

Infrastructure is often regarded as the wheel of economic activity because of the crucial role they play in providing the foundation upon which production and distribution stands. A sound infrastructural foundation is the key to the overall socio-economic development of a state. This

acts as a magnet for attracting additional investment into a state and thus provides a competitive edge to it over other states. Availability of adequate and efficient infrastructural set up not only promotes rapid industrialization but also improves the quality of life of the people (Kim, 2016). Infrastructure development has been well documented in the economic literature as a critical factor driving an economic (Ogunlana, Yaqub, & Alhassan 2016; Estache, 2006). Development in whatever dimension cannot result into good healthy living if infrastructure such as telecommunications, transport, energy, water, health, housing and education are not invested on. Conversely, deficiency of infrastructure constitutes serious hindrance to sustainable growth and development and possibly worsens poverty level (Srinivasu & Rao, 2013).

Similarly, in the sub-Saharan region like Nigeria in particular traffic congestion, power black outs in major cities, bad quality of roads, access to capital and market, inadequate telecommunication services, ill-equipped schools, shortage of drinkable water, irrigation and industrial water, erratic power supply all bear witness to the inadequate existing infrastructure facilities due to inadequate federal revenue allocation to the states. This implies that there is low quality of life in a nation like Nigeria. Oyedele (2014) posited that the challenges of infrastructure development in a country like Nigeria are numerous and they included finance, technology for development, maintenance and design, and international requirement for sustaining and developing project. These infrastructure development facilities mentioned could not be achieved resulting from inadequate federal government revenue allocation to various states in Nigeria. The infrastructural report of Nigeria just like any sub-Sahara country is nothing to write home about. The housing situation is in a sorry state both quantitatively and qualitatively (Oyedele, 2014; Ajanlekoko, 2001). Most infrastructures are now decayed and need repair, rehabilitation or replacement. According to Omagu (2016) has been plagued with the lack of functional infrastructure in order to grow their economies. This poor state of infrastructure due to low budgeting to infrastructural development has now engaged the attention which is now a concern for both the government and the governed.

Furthermore, in Nigeria resources channelled to the provision of infrastructure services were largely inadequate and sub optimal. However, funds directed to the provision of infrastructures were either embezzled or out rightly diverted to less productive needs which are susceptible to corruption (Ogunlana *et al.*, 2016). This, however, created a lacuna in infrastructure development process. According to Mbah and Onuora (2018), the allocation of revenue to the state government does not match the expenditure requirements of the state, thus reduced state government expenditure on budgeted infrastructural facilities. The fiscal imbalance leaves states government with no viable option other than to map out strategy for enhancing internally generated revenues beyond allocations from federation account. Mbah and Onuora (2018) and Olaoye and Bankole (2019) posited that the increasing cost of running government at state level coupled with dwindling tax revenue has left various state governments in Nigeria with poor provisions of infrastructural

facilities to the populace, caused annual budget deficits and insufficient funds for meaningful growth and viable projects development. Based on the problem identified of mis-match of statutory federal government revenue allocation of funds resource to state government infrastructural expenditure, this study investigate how federal government statutory fund allocation affect infrastructural development (environmental sector management, educational development sector, agricultural sector development and health sector development) in Ogun State, Nigeria.

Objectives of the study

The main objective of the study was to investigate the effect of federal government statutory allocation on infrastructural development in Ogun State. Other specific objectives were to:

i. examine the effect of federal statutory state allocation on environmental sector management in Ogun State, Nigeria;
ii. ascertain the effect of federal statutory state allocation on educational development sector in Ogun State, Nigeria;
iii. establish the effect of federal statutory state allocation on agricultural sector development in Ogun State, Nigeria; and
iv. assess the effect of federal statutory state allocation on health sector development in Ogun State, Nigeria

LITERATURE REVIEW

The sub-section of this paper covered conceptual definitions, empirical review, gap, hypothesis development and theoretical framework for this study.

Conceptual Definition

Federal Statutory Revenue Generation Allocation

Oluwatobi and Ogunrinola (2011) broadly defined revenue allocation to include allocation of tax powers and the revenue sharing arrangements not only among the three levels of government but among the state governments as well. Under government's distribution function, it redistributes incomes and resources to promote national unity and equity (Oluwatobi & Ogunrinola, 2011). Revenue allocation can be described as a method of sharing the centrally generated revenue among different tiers of government and how the amount allocated to a particular tier is shared among its components for economic development (Dang, 2013). Revenue is allocated to the Nigeria federating units to meet up with their various constitutional assigned expenditures. Components of Revenue Allocation Formula in Nigeria The Vertical and Horizontal Formulae:- Fundamentally,

there are two components of the revenue allocation formula used for the disbursement of the Federation Account as indicated here under. Vertical Allocation Formula (VAF) Horizontal Allocation Formula (HAF) The Vertical Allocation Formula: This formula shows the percentage allocated to the three tiers of government i.e. federal, states and local governments. This formula is applied vertically to the total volume of disbursable revenue in the Federation Account at a particular point in time. The VAF allows every tier of government to know what is due to it; the Federal Government on one hand and the 36 States and 774 Local Governments on the other (Mbah & Onuora, 2018).

The Horizontal Allocation Formula: The formula is applicable to States and Local Governments only. It provides the basis for sharing of the volume of revenue already allocated enbloc to the 36 States and 774 Local Governments. Through the application of the principles of horizontal allocation formula, the allocation due to each State or Local Government is determined. Thus, it can conveniently be concluded that the vertical allocation formula is for inter-tier sharing between the three tiers of government while the horizontal allocation formula is for intra tier sharing amongst the 36 States and the 774 Local Governments in Nigeria (Bashir, 2008).

Infrastructural Development

Infrastructure development is referred to as social overhead capital by many development economists (Ogunlana *et al.,* 2016). Infrastructure is the basic physical and organisational structures needed for the operation of a society like industries, buildings, roads, bridges, health services, governance and so on. It is the enterprise or the products, services and facilities necessary for an economy to function. Hirshman (2008) defined infrastructure as social overhead capital that encompasses activities that share technical features such as economies of scale and economic features like spillovers from users to non-users. Infrastructure can be described generally as the set of interconnected structural elements that provide framework supporting an entire structure of development. Infrastructure is the means of achieving an objective or set of objectives and also includes the objectives. It is an important term for judging a country, region or state's and individual's developments/status (Oyedele, 2014). Kumar (2015) see Infrastructure refers to all the institutions which are required to maintain the economic, health, and cultural and social standards of a country, such as the financial system, the education system, the health system, the governance system, and judiciary system, as well as security (Omagu, 2016).

Infrastructural development is a strategic economic growth driver and it serves as a catalyst for public development in the entire government agenda, such as healthcare delivery, transportation, education and food security (Babatunde, 2018). Infrastructure level affects the developmental ratings of a nation. Infrastructure contributes to the score of Nigerian economic growth. Nwachukwu and Emoh (2010) explained that the investment attraction of building development

by the public sector is strategic to all areas of the economy. Oyedele (2014) postulated that there are two type of infrastructure, “Hard and Soft" infrastructure. Hard refers to the large physical networks necessary for the functioning of a modern industrial nation, while "soft" infrastructure refers to all the institutions which are required to maintain the economic, health, and cultural and social standards of a country, such as the financial system, the education system, the health system, the governance system, and judiciary system, as well as security.

Empirical Review, Empirical Gap and Hypothesis Development

There are extant studies such as Ohiomu and Oluyemi (2018) examined the structure and formula for revenue allocation in Nigeria and highlights its implications for sustainable national development. The work uses the methodology of Error correction model (ECM) in conjunction with diagnostic tests of variables using Johansen Co-integration tests for robust policy recommendations. Using the Gross Domestic Product (GDP) as the dependent variable and Revenue allocation to the three levels of government, inflation, and lending interest rate as the independent variables, the results from the study show that revenue allocations and the other variables have a significant relationship with economic growth in Nigeria. Mbah and Onuora (2018), and Eteng and Agbor (2018), on the role of tax revenue, federal allocation using different forms of taxes and infrastructural development as a variable and sub-variable. They found that tax revenue and allocation enhanced infrastructural growth of any economy. Yoshino and Abidhadjaev (2017), Oliver, Edeh and Chukwuani (2017) and Ajiteru, Adaranijo and Bakare (2017) found that tax revenue have positive and insignificant effect on state development.

Boukbech, Bousselhami and Ezzahid (2019) examined determinants of tax revenues: Evidence from a sample of lower middle income countries. The descriptive statistics, correlation and regression analyses results showed that per capita GDP and the value added of agriculture are significantly and positively correlated with tax revenues. Mbah and Onuora (2018) investigated effect of internally generated revenue on infrastructural development of South East states of Nigeria. Findings from the study revealed that there a significant relationship between internal generated revenue and the cost of infrastructure in the South East States as at the date of the study. Eteng and Agbor (2018) explored on the challenges of internal revenue generation and inclusive development of local government areas in Cross River state, Nigeria. The study concluded that corrupt tendencies of council functionaries, and evasion of tax as protest against poor handling of public funds by government functionaries among others contribute to poor internal revenue generation by local government. The study of Yoshino and Abidhadjaev (2017) on impact of infrastructure on tax revenue: railway transport in Japan revealed that tax revenue in the region significantly increased during construction in 1991–2003, and dropped after the start of operations in 2004–2010.

Okolo, Edeme, and Emmanuel (2018) revealed that found that capital expenditure, construction expenditure and non-oil revenue have the potency of accentuating infrastructural development in the long-run in their study on economic analysis of capital expenditure and infrastructural development using autoregressive distributed lag (ARDL) model. Similarly, Babatunde (2017) employed weighted least square and vector error correction model to indicate that government spending on transport and communication, education and health infrastructure has significant effects on economic growth; spending on agriculture and natural resources infrastructure recorded a significant inverse effect on economic growth in Nigeria. Oliver, Edeh and Chukwuani (2017) investigated the effect of Federal Government of Nigeria's Tax resources on infrastructural development of Nigeria. Income from value added tax (VAT), and petroleum profit taxes (PPT) were used as proxies for Tax revenues while Infrastructural Development was applied as proxy for Infrastructural Development of Nigeria. Data were analyzed using the multiple linear regression technique. The result reveals tax revenue resources (PPT, CIT and VAT) had positive and insignificant effect on infrastructural development in Nigeria. Ajiteru, Adaranijo and Bakare (2017) examined the relationship between tax revenue and infrastructural development in Osun State. The study adopted survey research design and purposive sampling technique was used. It was found that tax revenue is a very strong tool for infrastructural development in the State.

Onakoya, Afintinni and Ogundajo (2017) studied taxation revenue and economic growth in Africa. The study employed fixed and random effect test using the Hausman test. Findings indicated that tax revenue is positively related to GDP and promotes Economic Growth in Africa. The study concluded that tax revenue has a significant positive relationship with Gross Domestic Product. Abata (2017) examined the impact of tax revenue on Nigerian economy (Case of Federal Board of Inland Revenue). The findings showed that tax revenue significantly impact on Federal Government Budget implementation in Nigeria; tax administrative system significantly affected the revenue generated in Nigeria, tax evasion significantly affected government revenue in Nigeria, and lack of training on the part of tax officers significantly affected the generation of government revenue in Nigeria. Popoola, Jimoh and Oladipo (2017) studied tax revenue and Nigerian economic growth. The study adopted time series research design and secondary data was used. The findings showed that, oil and non-oil tax revenue were positive and strongly correlated with Real Gross Domestic Product (RGDP) with coefficient. Considering majority of these past studies, no studies within and outside Nigeria context have examined the effect of Federal government statutory fund allocation on infrastructural development in Ogun State, Nigeria. Based on this empirical gap, this study hypothesized that;

H_{01}: There is no significant effect of federal statutory state allocation on environmental sector management in Ogun State, Nigeria

H_{02}: There is no significant effect of federal statutory state allocation on educational development sector in Ogun State, Nigeria

H_{03}: There is no significant effect of federal statutory state allocation on agricultural sector development in Ogun State, Nigeria

H_{04}: There is no significant effect of federal statutory state allocation on health sector development in Ogun State, Nigeria

Theoretical Framework

This study is anchored on Endogeneous Growth theory; as established that government expenditure enhances provision of infrastructural facilities in order to achieve economic growth.

Endogeneous Growth theory

This study anchored on endogeneous growth theory proposed by Schumpeter (1911). Endogeneous growth theory critically explained the link between federal statutory allocation and infrastructural development compared with other theories reviewed in this study. Based on the objectives of this study explained by endogeneous growth theory, this study therefore anchored on endogeneous growth theory. In the endogenous growth model, technological advances result from R&D activity, and technological progress and knowledge accumulation are treated as endogenous variables, thus it is also termed the endogenous growth theory. According to the theory, the long-run growth rate depends on infrastructural facility and a stable business environment: government policies and actions on taxation, law and order, provision of infrastructure services, protection of intellectual property rights, and regulation of international trade, financial markets, and other aspects of the economy (Maingi, 2017). Hence, the government guides long-term growth.

Under endogenous growth theory and despite the law of diminishing returns, marginal factor productivity can be increased. For example, technical progress that is funded by capital investment increases productivity (Aeesh & Sheikha, 2015). Also, the endogenous growth approach argues that there is a role for government institutions that can overcome any market failures associated with the various types of investment. Hence, investment in public infrastructure is crucial to economic development and growth. Further, endogenous growth theory states that the improved investment drives growth; thus, investment may contribute to a long- run rate of economic growth (Maingi, 2017).

METHODOLOGY

This study employed *ex-post facto* research design using secondary data. The require time series data was sourced from Ogun State Ministry of Finance within the period of 2000 to 2018 that is 19 years period. The nature of data used for this study was mainly time series in nature and the data were secondary data source that were published by National Bureau of Statistics, Ogun State Ministry of Finance and Ministry of Budget Planning. The data were collected on the study

variables of dependent variables (environment management, youth and social development, education, health, agriculture and transport sectors) and independent variables was federal allocation to Ogun State, Nigeria. The study employed Autoregressive Distributive Lag (ARDL) and the study variables were subjected to unit root tests which exhibit both stationary at level and at first difference i.e I(0) and I(1). Resulting from the combination of I(0) and I(1), ARDL models were employed to obtain numerical values of the model coefficient. The probability of the t-test statistics was used to evaluate the estimated numerical values of the coefficients of the multiple regression for statistical significance at 5% level while the probability of the F-test statistics was used to evaluate the estimated numerical values of the coefficients of the ARDL model for statistical significance at 5% level.

Model Specification

In this study, there are two constructs; independent and dependent variables. The independent variable of the study is state statutory allocation. The dependent variable of the study is infrastructural development which is proxied by environmental management, education, health, and agriculture sectors. The model was therefore stated in the equation below:

Y = Dependent Variable

X = Independent Variable = Federal Government Statutory Allocation

Y = Infrastructural Development (ID)

$Y_{IFD} = (y_1, y_2, y_3, y_4)$

y_1= Environmental Management (EMGT)

y_2 = Education Sector Development (ED)

y_3 = Agricultural Sector Development (AGRID)

y_4 = Health Sector Development (HS)

x_{1SSA} = State Statutory Allocation (SSA)

The model specification for the ARDL was specified and formulated for each of the hypotheses as follows:

Hypothesis One

$y_1 = f(x_{1SSA})$

$EMGT = f(x_{1SSA})$

$EMGT = \beta_0 + \beta_1 SSA_1 + \varepsilon_i$

$$\Delta lnEMGT = \partial_0 + \partial_1 lnEMGT_{t-1} + \partial_2 lnSSA_{t-1} + \sum_{i=1}^{k} \gamma_{1i} \Delta lnEMGT_{t-i} + \sum_{i=1}^{k} \gamma_{2i} \Delta lnSSA_{t-i} + \varepsilon_t$$ ---------- Eqn 1

Hypothesis Two

$y_2 = f(x_{1SSA})$

$y_2 = f(x_{1SSA})$

$ED = \beta_0 + \beta_1 SSA_1 + \varepsilon_i$

$$\Delta lnED = \partial_0 + \partial_1 lnED_{t-1} + \partial_2 lnSSA_{t-1} + \sum_{i=1}^{k} \gamma_{1i} \Delta lnED_{t-i} + \sum_{i=1}^{k} \gamma_{2i} \Delta lnSSA_{t-i} + \varepsilon_t$$ ---------- Eqn 2

Hypothesis Three

$y_3 = f(x_{1SSA})$

$AGRID = \beta_0 + \beta_1 SSA_1 + \varepsilon_i$

$$\Delta lnAGRID = \partial_0 + \partial_1 lnAGRID_{t-1} + \partial_2 lnSSA_{t-1} + \sum_{i=1}^{k} \gamma_{1i} \Delta lnAGRID_{t-i} + \sum_{i=1}^{k} \gamma_{2i} \Delta lnSSA_{t-i} + \varepsilon_t$$ ---------- Eqn 3

Hypothesis Four

$y_4 = f(x_{1SSA})$

$y_4 = f(x_{1SSA})$

$HS = \beta_0 + \beta_1 SSA_1 + \varepsilon_i$ ----------Eqn 4

$$\Delta lnHS = \partial_0 + \partial_1 lnHS_{t-1} + \partial_2 lnSSA_{t-1} + \sum_{i=1}^{k} \gamma_{1i} \Delta lnHS_{t-i} + \sum_{i=1}^{k} \gamma_{2i} \Delta lnSSA_{t-i} + \varepsilon_t$$ ---------- Eqn 4

Where β_0 = the constant of the equation

β_1-β_4 = the coefficient of variables in the equations;

ε_i = the stochastic function that accounts for the errors that may arise in the equation.

Data Analysis, Results and Discussion of Findings

Table 1: Descriptive Statistics

	LOGEMGT	LOGED	LOGAGRID	LOGHS	LOGSSA	LOGID
Mean	233.8124	1504.5098	1.97209	32.13897	7.02465	15.09138
Median	4.876531	6.875488	6.527562	27.865672	2.445641	7.908765
Maximum	596.1	3104.0	5.134	153.9	70.45	38.38376
Minimum	49.8	697.6	0.760	7.63	7.26	8.701209
Std. Dev.	137.0	752.3	1.452	44.21	16.5	6.083109
Skewness	3.986574	2.865590	4.245760	4.234575	0.821340	2.876541
Kurtosis	6.98762	11.81121	19.03515	18.97404	3.302873	6.945120 9
Jarque-Bera	10.10786	5.87987	10.29156	35.89709	123.61205	95.85289
Probability	0.108721	0.090987	0.061980	0.298763	0.295029	0.410094
Sum	4.89765	2.66767	7.70786	7.98893	6.08908	8.943876
Sum Sq. Dev.	0.106	1.052	1.005	2.340	0.560	1.945392
Observations	19	19	19	19	19	19

Source: Authors' computation (2020)

The descriptive statistics of the variables of this study are presented in table 1. The table shows that, for the dependent variables of this study were Infrastructural Development (ID) measure with Environmental Management (EMGT), Education Sector Development (ED), Agricultural Sector Development (AGRID), and Health Sector Development (HS) while the dependent variable was State Statutory Allocation (SSA). Where average Environmental Management is 233.8 billion naira, with standard deviation of about 137.0 billion naira, minimum of 49.8 billion naira and maximum of 596.1 billion naira. Average Education Sector Development is 1,504.5 billion naira, with standard deviation of about 752.3 billion naira, minimum of 697.6 billion naira and maximum of 3,104.0 billion naira. Average Agricultural Sector Development is 1.972 billion naira, with standard deviation of about 1.452 billion naira, minimum of 0.76 billion naira and maximum of

5.134 billion naira. Average Health Sector Development is 32.13 billion naira, with standard deviation of about 44.21 billion naira, minimum of 7.63 billion naira and maximum of 153.9 billion naira. For the explanatory variables, average State Statutory Allocation over the period is 7.02 billion naira, with standard deviation of about 16.5 billion naira, minimum of 7.26 billion naira and maximum of 70.45 billion naira. Average Infrastructural Development (ID) over the period is 15.09 billion naira, with standard deviation of about 6.08 billion naira, minimum of 8.7 billion naira and maximum of 38.38 billion naira. The descriptive statistics also shows from the Jarque-Bera normality statistic that Environmental Management, Education Sector Development, Agricultural Sector Development, Health Sector Development, State Statutory Allocations are normally distributed, evident from the small statistic values with large p-values suggesting non-rejection the normality hypothesis.

Table 2: Correlation Coefficients for Multicollinearity Test

Variables	EMGT	ED	AGRID	HS	SSA	Variance Inflation Factor (VIF)
EMGT	1					2.67
ED	0.321	1				1.76
AGRID	0.242	0.155	1			1.82
HS	-0.132	-0.350	0.341	1		1.13
SSA	0.233	-0.410	0.312	0.110	1	2.90

Source: Authors' Computation (2020)

The correlation matrix of variables is presented in Table 2 in order to show the relationship that exists among the variables and to also verify if none of the relationships among the explanatory variables of the models have correlation coefficient as high as 0.8, which is a threshold above which inclusion of such variables in the same model would cause a problem of severe multicollinearity in the model. Table 2 shows the relationship that exists among the variables employed in this study. The analysis was specifically carried out as a pre-test descriptive to verify if the explanatory variables do not have high relationship that could cause severe multicollinearity problem in the models. The result shows that the correlation coefficients of the relationship among the explanatory variables are quite below the rule of thumb threshold of 0.8. This implies that including these explanatory variables in the same model will not cause a problem of severe multicollinearity.

Table 3: Augmented Dickey Fuller Test for Unit Root Phillip Perron Test for Unit Root

Variables	Test Statistic	1% Critical Value	5% Critical Value	10% Critical Value	Order	Test Statistic	1% Critical Value	5% Critical Value	10% Critical Value	Order
State Statutory Allocation (SSA)	6.891	4.263	3.553	3.210	I(1)	6.913	4.262	3.552	3.209	I(1)
Environmental Management (EMGT)	1.241	4.263	3.553	3.210	I(0)	1.412	4.262	3.552	3.209	I(0)
Educational Sector Development (ED)	2.256	4.263	3.553	3.210	I(0)	2.783	4.262	3.552	3.209	I(0)
Agricultural Sector Development (AGRID)	1.934	4.263	3.553	3.210	I(0)	2.812	4.262	3.552	3.209	I(0)
Health Sector (HS)	5.762	4.263	3.553	3.210	I(1)	5.984	4.262	3.552	3.209	I(1)
Infrastructural Development (ID)	5.943	4.263	3.553	3.210	I(1)	6.321	4.262	3.552	3.209	I(1)

Source: Author's Computation (2020)

Non-stationarity is a common feature of time series data. The problem with non-stationary or trended data is that the standard Ordinary Least Square estimator produces bias and incorrect regression estimates which mislead the researcher to incorrect conclusions. In other words, the application of OLS on non-stationary series leads to spurious regression results. It is vital therefore, to perform unit root test to examine the order of integration of the series and avoid spurious regression. Regression becomes spurious when both the dependent and independent variable(s) are not stationary at level. A spurious regression usually has a very high R^2, *t* statistics that appear to provide significant estimates, but the results may be intuitively meaningless. This is because the OLS estimates may not be consistent, and therefore the tests of statistical inference are not valid. To avoid the aforementioned problems, Augmented Dickey Fuller (ADF) and Philips-Perron unit root tests was conducted in this study and the result is presented in table 3 above.

The result both the Augmented Dickey Fuller and Philips-Perron test reveal that educational sector development, environmental management and Agricultural Sector Development are stationary at levels. This indicates that they are integrated of order zero [I(0)]. On the other hand, both unit root test procedures reveal that health sector development, state statutory allocation and IGR are stationary at first difference which mean that they are integrated of order one, that is I(1). However, The Augmented Dickey Fuller test shows that domestic credit is I(0) while Philips-Perron test shows that the variable is I(1). In any case, the results clearly show that the variables that would

make up the models of this study are combination of I(0) and I(1) series. As a consequence, the use of ARDL bounds test procedure to cointegration is required.

Table 4.1: Cointegration Test (Bound Testing Approach)

Model	Test F-Statistic	5% Critical Value Bounds	
		Lower Bound (I_0)	Upper Bound (I_1)
EMGT model	5.80	2.14	3.3
ED model	4.76	2.14	3.3
AGRID model	8.55	2.14	3.3
HS model	9.76	2.14	3.3
Aggregate (ID) model	28.61	2.14	3.3

Source: Authors' computation (2020)

The result of the unit root tests show that some variables are integrated of order one I(1) while others are stationary at level I(0). So, the most appropriate test of cointegration is the Autoregressive Distributive Lag (ARDL) bound test approach. This was employed for all the four models (Environmental Management (EMGT); Educational Sector Development (ED) model; Agricultural Sector Development (AGRID) model; and Health Sector Development model (HS) and Aggregate Infrastructural Development (ID) model estimated in this study. The result is contained in Table 4. The null hypothesis of the test is that, there is no long-run relationship (no cointegration). The decision rule is to reject the null hypothesis when F-statistics of the test is greater than the critical value of upper bound at a chosen level of significance (5% in this study). On the other hand, the null hypothesis is not rejected when the F-statistics is less than that of the critical value of the lower bound. When the F-statistics falls between the upper and the lower bound, the test is inconclusive.

The results of the test indicate that the F-statistics of EMGT, ED, AGRID, HS and ID models are 4.80, 4.76, 8.55, 9.76 and 28.61 respectively with critical value of upper bound of 3.3 in each case. This shows that the F-statistic of each of the five models is higher than the critical value of the upper bound in all the models. It implies the rejection of the null hypothesis. Hence, the test shows that there is co-integration in all the models, hence, there is long-run equilibrating relationship among the variables in all the models. As a consequence, both the ARDL short-run error correction model and the long-run coefficients are appropriate procedures to estimating the parameters of these models. Presented in Table 4 is the ARDL short-run error correction model and its long-run coefficients for the Environmental Management (EMGT) model. The result shows that the overall model, measured by the F-statistic, is statistically significant with statistic value of 12.08 and p-value of (0.000). This indicates a rejection of the null hypothesis that the Environmental

Management (EMGT) model is not statistically significant. The model R-squared is seen to have a value of approximately 0.640, indicating that about 64 percent of variation in Environmental Management (EMGT) is explained by the model. The error correction term {ECT(-1)} in the short run model shows that about 82.9 percent of model disequilibrium is corrected in each period.

Test of Hypotheses

Test of Hypothesis 1

Table 4.2: ARDL Short and Long Run Coefficients – Environmental Management (EMGT) Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(SSA)	-0.005188	0.003453	-1.502487	0.1672
D(SSA(-1))	0.004199	0.004012	1.046584	0.3226
ECT(-1)	-0.829241	0.136046	-6.095293	0.0002
Long Run Coefficients				
D(SSA)	0.026957	0.010658	2.529197	0.0323
C	16.327981	4.659006	3.504606	0.0067
R-squared	0.641892	F-stat (p-value)	12.08 (0.000)	

Source: Authors' computation (2020)

The results of the coefficients of the EGMT model show that State Statutory Allocation (SSA) has an insignificant short run coefficient but a positive significant long run coefficient. This is revealed by the p-value of its short run coefficient being greater than the conventional levels of significant (i.e. 0.01, 0.05, and 0.1) and the p-value of its long run coefficient being less than two of these levels of significance. The significant positive long run coefficient signifies that an increase in SSA will lead to a long run increase in EMGT by about 2.69 percent. This implies that SSA is not a short run but a long run determinant of EMGT. Based on this finding, this study rejected the null hypothesis (H_{01}) that federal statutory state allocation has no significant influence on environmental management sector in Ogun State, Nigeria.

Test of Hypothesis 2

Table 4.3: ARDL Short and Long Run Coefficients – Educational Development sector (ED) Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(SSA)	0.002132	0.000793	2.689206	0.0227
D(SSA(-1))	0.001418	0.004917	0.288382	0.7789
ECT(-1)	-0.495124	0.129909	-3.811322	0.0034
Long Run Coefficients				
D(SSA)	0.008119	0.003728	2.177644	0.0545
C	16.772299	1.653782	10.141785	0.0000
R-squared	0.727743	F-stat (p-value)	184.17 (0.000)	

Source: Authors' computation (2020)

The results of the coefficients of the educational development sector model show that SSA has both short and long run positive significant coefficients. This is revealed by their respective p-values being less than the significance level. The significant positive short and long run coefficients signify that an increase in SSA will lead to a decline of about 0.21 percent and 0.81 percent in ED in the short and long run respectively, and vice versa. This implies that SSA is both short and long run determinant of ED. Presented in Table 4.6 is the ARDL short-run error correction model and its long-run coefficients for the ED model. The result shows that the overall model, measured by the F-statistic, is statistically significant with statistic value of 184.17 and p-value of (0.000). This indicates a rejection of the null hypothesis that the Educational Development Sector (ED) model is not statistically significant. The model R-squared is seen to have a value of approximately 0.727 indicating that about 73 percent of variation in Educational Development Sector is explained by the model. The error correction term {ECT(-1)} in the short run model shows that about 49.5 percent of model disequilibrium is corrected in each period. Based on this finding, this study rejected the null hypothesis (H_{02}) that federal statutory state allocation has no significant influence on educational development sector in Ogun State, Nigeria.

Test of Hypothesis 3

Table 4.4: ARDL Short and Long Run Coefficients – Agricultural Development Sector Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(SSA)	-0.001902	0.000739	-2.574468	0.0300
D(SSA(-1))	0.001481	0.000770	1.924542	0.0864
CointEq(-1)	-0.581456	0.101867	-5.707987	0.0003
Long Run Coefficients				
SSA	-0.009285	0.003463	-2.681225	0.0252
C	-34.761275	1.533046	-22.674650	0.0000
R-squared	0.3428760	F-stat (p-value)	21.32 (0.000)	

Source: Authors' computation (2020)

The results of the coefficients of the agricultural development sector model show that SSA has both short and long run negative significant coefficients. This is revealed by their respective p-values being less than the significance level. The significant negative short and long run coefficients signify that an increase in SSA will lead to a decline of about 0.2 percent and 0.9 percent in AGRID in the short and long run respectively, and vice versa. This implies that SSA is both short and long run determinant of AGRID. Presented in Table 4.7 is the ARDL short-run error correction model and its long-run coefficients for the AGRID model. The result shows that the overall model, measured by the F-statistic, is statistically significant with statistic value of 21.32 and p-value of (0.000). This indicates a rejection of the null hypothesis that the Agricultural

Development Sector (AGRID) model is not statistically significant. The model R-squared is seen to have a value of approximately 0.342 indicating that about 34.2 percent of variation in Agricultural Development Sector is explained by the model. The error correction term {ECT(-1)} in the short run model shows that about 58.1 percent of model disequilibrium is corrected in each period. Based on this finding, this study rejected the null hypothesis (H_{03}) that federal statutory state allocation has no significant effect on agricultural sector development in Ogun State, Nigeria.

Test of Hypothesis 4

Table 4.5: ARDL Short and Long Run Coefficients – Health Sector Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(SSA)	0.051458	0.000679	-2.148097	0.0548
CointEq(-1)	-0.444253	0.047362	-9.379976	0.0000
Long Run Coefficients				
SSA	0.096307	0.002516	-2.506429	0.0292
R-squared	0.679272	F-stat (p-val)	56.37 (0.000)	

Source: Authors' computation (2020)

The results of the coefficients of the Health Sector (HS) model show that SSA has both short and long run positive significant coefficients. This is revealed by their respective p-values being less than the significance level. The significant positive short and long run coefficients signify that an increase in SSA will lead to an increase of about 5.1 percent and 9.6 percent in HS in the short and long run respectively, and vice versa. This implies that SSA is both short and long run determinant of HS. Presented in Table 4.8 is the ARDL short-run error correction model and its long-run coefficients for the HS model. The result shows that the overall model, measured by the F-statistic, is statistically significant with statistic value of 56.37 and p-value of (0.000). This indicates a rejection of the null hypothesis that the Health Sector (HS) model is not statistically significant. The model R-squared is seen to have a value of approximately 0.679 indicating that about 68% percent of variation in Health Sector is explained by the model. The error correction term {ECT(-1)} in the short run model shows that about 44.4 percent of model disequilibrium is corrected in each period. Based on this finding, this study rejected the null hypothesis (H_{04}) that federal statutory state allocation has no significant influence health sector development in Ogun State, Nigeria.

CONCLUSION AND RECOMMENDATIONS

This study concluded that Federal statutory state allocation has significant effect on infrastructural development (health sector, agricultural sector, educational sector and environmental management

sector) in Ogun State, Nigeria. Based on the findings of the study, the following recommendations were made;

i. More financial control, fiscal discipline, and value for money audit should be embarked by all tiers of government but with more emphasis to state governments so as to correct the direction of the relationship between revenue allocation to states and infrastructural development in the State
ii. The continuous agitation for more revenue allocation to states should be reviewed properly by federal government and state governments to ensure change of direction of the impact of it on infrastructural development in the State, that is, from negative impact to positive impact of the increment especially in the agricultural sector since the government wants to diversify the economy to agricultural sector.
iii. There should be a review of the 1999 Constitution of the Federal Republic of Nigeria to enhance the participation of states in fiscal policy, so as to give states more tax powers and expenditure jurisdictions to stabilize the economy for increase in infrastructural development in the State. This will reduce the dependence of states on federation account and open new revenue sources, so as to enhance increment of infrastructural facilities in the state.

Suggestion for Further Studies

i. The study recommends that study should investigate the link between federal statutory state revenue allocation and infrastructural development measures in the South-west region, Nigeria
ii. The study recommends that study should investigate the link between federal statutory state revenue allocation and infrastructural development measures in the Northern region, Nigeria
iii. The study recommends that study should investigate the link between federal statutory state revenue allocation and infrastructural development measures in the Eastern region, Nigeria

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