Impact of Government Expenditure on Economic Growth In Sub-Saharan Africa: A Validity of Wagner's Law

Kolapo, Funso Tajudeen[1+], Azeez, Bolanle Aminat[2], Mokuolu, Joseph Oluseye, Oluwaleye, Taiwo Olanire[4], Alabi, Kehinde Miracle[5]

[1, 2, 3, 4 & 5]Department of Finance, Ekiti State University, Nigeria

Abstract:
The study investigated the impact of government expenditure on economic growth with special inclination to testing the Wagner's law in Sub Saharan Africa between 1986 and 2018. Adopting the Panel first generation tests as well as the Panel Auto Regressive Distributed Lag (ARDL) and Pairwise Causality techniques, it was revealed that government expenditure causes economic growth rendering the Wagner's law is invalid in the Sub-Saharan region. Also, it was further discovered that capital and recurrent expenditure exert negative effect on economic growth while total expenditure has positive effect on economic growth in the region. Therefore, based on the negativity of capital and recurrent expenditure, it is recommended that capital and recurrent expenditure must be monitored effectively to ensure that its increase will not exert any negative effect on economic growth while stringent measures as well as checks and balances must be adopted to curb corruption in Sub-Saharan Africa to ensure that funds are used exclusively for their intended purposes especially those pertaining to capital projects.

Keywords: Government Expenditure, Wagner's Law, Panel ARDL, Sub-Saharan Africa
JEL Code: E62, O23, H50, O40, O55

1.0 Introduction

Government intervention is considered very crucial to the growth and stability of every economy. Meanwhile, the fiscal tool of government expenditure has gained a significant position in this adventure of government interference in the economy. However, the nexus between expenditure and economic growth has evolved to become a well debated issue in literature with various empirical contributions from scholars such as Wagner (1893), Peacock and Wiseman (1961) as well as Keynes (1936). Nevertheless, it is pertinent to note that the crux of the debate lies in the determining factor within the two phenomena viz; expenditure and growth. Although, Wagner (1893) who emerged to be the progenitor of the debate suggested that economic growth determines the growth, pattern and rate of government expenditure premised on the findings of a study of various industrialized nations of the world. This has generated a lot of reactions in literature over time as Singh and Sahni (1984) specifically averred that the truism of Wagner's hypothesis therefore portrays public expenditure as a weak tool of correcting, tailoring and regulating the economy because expenditure in itself is a product of the movements within the economy. Meanwhile, Keynes (1936) emerged to chart another course in literature contrary to the then widely accepted Wagner's law. Keynes (1936) posited that it is actually public expenditure that drives economic growth. This implies that the pattern and bulk of government expenditure in a fiscal period will actually predict the rate of growth in the current period and even in subsequent periods. Hence, the policy implication of the Keynesian proposition as discussed by Magazzino, Giolli and Mele (2015) is that public expenditure is therefore a veritable tool of regulating the economy.

In Sub Saharan Africa, the government has maintained a significant position in stabilizing the stakes that guarantee economic growth owing to the developmental stage of the region. The Sub Saharan Africa is a largely developing region with strong reliance on the government to provide certain public goods like security, roads, healthcare and education for the majority of their citizens with more emphasis on education,

health and defense (Darkoh, 2014). Furthermore, the region has been considered a prospect for development with several expatriates finding their way into the region and foreign direct investment (FDI) on the increase. Thus, it is important to return to status quo to really consider the question which is; is increase in government expenditure responsible for the increase in economic growth in the region or the other way round? In literature, the causality test has been considered a veritable tool of analysis to solve this question as this econometric tool will be adopted again in this study.

However, this study differs from previous studies as it considers the sub Saharan region as its basis of analysis contrary to previous studies which carried out country specific analysis. The motivation to study the region lies in the interconnectedness of the countries within the region as they are mostly subjected to similar economic, social and environmental conditions which mostly causes ripple effects from country to country within the region. Also, inasmuch as Wagner (1893) focused his hypothesis on the development of nations, the Sub-Saharan region perfectly fits the description needed to carry out the analysis as it is also in a state of development. Also, this study equally deviates from some other studies that considered the subject matter in Sub-Saharan Africa such as that of Darkoh (2014) by moving further into considering the typology of government expenditure in our analysis. This is because government expenditure can be considered as a universal set with some subsets such as capital and recurrent expenditure; thus, even while total government expenditure may affect growth, these subsets (capital and recurrent expenditure) may prove otherwise by exhibiting differing behaviours. In other words, it cannot be generally assumed that because total expenditure affects growth, capital or recurrent expenditure will equally exert same effect at the same magnitude. Hence, the need to include capital and recurrent expenditure as variables in this cross-country analysis as a step further than the previous contributions in literature in this regard. Thus, this study tests for the validity of the Wagner's law with evidence from Sub-Saharan Africa.

2.0 Literature Review
In theory, the tenet of the Wagner's expenditure hypothesis is that increase in economic activities stimulates government expenditure. Wagner (1893) formulated his assumptions based on his study of industrialized nations at that time whose growth was accompanied with an increase in state activities and expenditure. One of his assumptions include the organic nature of the state which ensures that the state interferes in regulating the economy since the private system was not strong enough to holistically handle the issues pertaining to economic organization (Hutter, 1982). Therefore, the state is expected to grow proportionally with the growth of the economy, hence, a vital link between government size and level of economic activity with causality running from government activities to economic growth in contrast with the Keynesian theory (Mohammad, 2006). Furthermore, the Wagner's hypothesis positioned its assumptions as a way out to close in on the deficiencies of the private sector in handling economic activities which then necessitates the need for the government's intervention and as a result, expenditure. Thus, the need which is three pronged in nature captures first, the need for enforcement of law and order, second, provision of public goods and finally, public ownership in natural production (Mohammad, 2006). The theory later led to various propositions by Peacock and Wiseman (1961), Gupta (1967) as well as Musgrave (1969).

In a divergent view to Wagner's law, Keynes (1936) postulated another law considering the link between government expenditure and economic growth from another school of thought. The Keynesian law assumed that it is an increase in government expenditure that stimulates an increase in economic growth as public expenditure was considered as an exogenous factor in ensuring economic growth. This is made possible through an increase in government spending which will then lead to an increase in aggregate demand and then improve national income.

In a review of previous empirical findings, Egbuwalo and Abere (2019) examined the relationship between government expenditure and economic growth in Nigeria between 1970 and 2016. The study adopted the Error Correction Mechanism revealing that capital expenditure exerts negative effect on economic growth contrary to recurrent expenditure which had a positive effect on economic growth.Gumus and Mammadov (2019) examined the relationship between government expenditure and economic growth between 1990 and 2016 for three countries namely Azerbaijan, Armenia and Georgia. The study used pooled Ordinary Least square, ECM and causality techniques for analysis revealing that there exists a bi-directional causality between expenditure and growth. In the South African context, Iwegbunam and Robinson (2019) studied the

applicability of the Wagner's law to economic growth between 1970 and 2016. The study used the causality test for analysis revealing that the Wagner's law does not apply to South Africa.

In Ghana, Gatsi, Appiah and Gyan (2019) tested for the presence of the Wagner's hypothesis between 1960 and 2017. The study made use of the ARDL bounds test as well as the causality test for analysis revealing that the assumptions of the Wagner's law does not hold in Ghana. In the United Kingdom, Paparas, Richter and Kostakis (2018) studied the relevance of the Wagner's Law for a period of two centuries covering 1850 to 2010. The study used the co-integration techniques as well as the causality test revealing that causality is bi-directional providing evidence in support of both the Wagner and Keynesian hypotheses. Eedme, Okolo, Idenyi and Okolomike (2018) studied the relationship between expenditure and growth in Nigeria as an authentication of the Wagner's law between 1981 and 2015. The causality test was used for analysis revealing that the Wagner's law is evidently present in Nigeria.

Uzuner, Bekun and Akadiri (2017) examined the substantiation of the Wagner's law in Turkey between 1975 and 2014 as regards expenditure and economic growth. The study used the co-integration and causality test for analysis confirming the presence of the Wagner's law in Turkey. In Zambia, Salwindi and Seshamani (2016) examined the relevance of Wagner's law of expenditure to Zambia between 1980 and 2013. Results emanating from the causality test revealed that the Wagner's Law to be relevant to the Zambian economy. Ifeyinwa, Idenyi, Chibuzor and Agbi (2016) made use of the causality technique to test the validity of the Wagner's law in Nigeria between 1980 and 2015. The study revealed that the Wagner's law is not valid in the Nigerian context.

In Romania, Paparas and Stoian (2016) tested the validity of the Wagner's Law between 1995 and 2015. Adopting the co-integration and causality tests, it was revealed that expenditure patterns follow the Wagner's law in Romania. Kargi (2016) tested the applicability of the Wagner's Law to 10 fast growing economies between 1961 and 2013. The study used the causality technique revealing that the Wagner's law is not valid for most growing economies in the world. In Romania, Wang, Peculea and Xu (2016) studied the relationship between public expenditure and economic growth between 1991 and 2004 as an authentication of the Wagnerian law. The study used the ARDL Bounds test as well as the Error Correction Modeling (ECM) and the causality technique revealing that the Wagner's Law is the prevalent law of expenditure in Europe.

Thabane and Lebina (2016) examined the nexus between government spending and economic growth between 1980 and 2012. Employing the ARDL bounds test as well as the causality test, it was observed that the Wagner's law is valid in Lesotho in contrast to the Keynesian theory. Mohammadi and Ram (2015) tested the validity of Wagner's hypothesis in East Asia for a period of 48 years between 1960 and 2008. The study used the panel co-integration technique for analysis revealing that there exists little evidence authenticating the presence of Wagner's hypothesis in East Asia.In Asia, Lahirushan and Gunasekara (2015) studied the impact of government expenditure on economic growth between 1970 and 2013. Adopting the Panel Ordinary Least Square and Pairwise causality techniques, it was revealed that government expenditure exerts positive effect on economic growth with a unidirectional causality running from economic growth to expenditure.

In the European Union, Magazzino, Giolli and Mele (2015) examined the validity of the Wagner's Law as well as the Peacock and Wiseman's displacement effect as regards the nexus between public expenditure and economic growth for the period covering 1980 to 2013. Adopting the panel data least square techniques as well as the causality test, it was divulged that expenditure patterns in the EU tend more to be Wagnerian in nature. In Nigeria, Aladejare (2013) studied the relationship between government spending and economic growth as a test for the substantiation of the Wagner's hypothesis for the period 1961 to 2010. The study used the Vector Error Correction Modeling (VECM) and Pairwise causality test for analysis revealing that expenditure is an increasing function of economic growth which therefore means that the Wagner's hypothesis is valid in Nigeria. In the Cameroonian context, Njimanted (2012) studied the applicability of the Wagner's law using the Vector Auto-Regressive Approach between 1980 and 2012. The study rejected the Wagner's Law as expenditure was found to exert an insignificant effect on economic growth.

Kesavarajah (2012) studied the validity of Wagner's law in Sri Lanka between 1960 and 2010. The study used the co-integration test and the ECM for analysis revealing that the Wagnerian law is not valid in Sri Lanka. Ighodaro and Oriakhi (2010) tested the validity of the Wagner's law in the Nigerian context with data spanning from 1961 to 2007. The study used the causality technique and revealed that expenditure causes economic growth in line with the Keynesian perspective contrary to the Wagner's law. Hence, it was concluded that the Wagner's law is not valid in Nigeria. A cross examination of these contributions in literature provides a gap which this study fills; particularly as it provides evidence from a cross-country analysis with special inclination to Sub-Saharan Africa on the subject matter. Moreover, it further provides evidence on the typology of government expenditure in disagreement with other Sub-Saharan studies in extant literature as it considers capital and recurrent expenditure in the Panel analysis.

3.0 Materials and Methods

The study made use of Panel data for 17 Sub-Saharan countries sourced from the World Bank database from 1986 to 2018. The countries were selected based on the availability of data for the years considered. The Panel regression techniques such as the Panel Unit Root Tests, Panel Cross Section Dependence Test, Panel Co-Integration Test and Panel ARDL tests were used to examine the effect of government expenditure on economic growth. Meanwhile, the validity of the Wagner's law was tested employing the Pairwise Causality test.

3.1 Model Specification

The study adapted the model used by Ighodaro and Oriakhi (2010). This study deviates from their study with its specific focus on capital and recurrent expenditure as well as the inclusion of external debt. The model for this study is therefore specified hereunder as:

$$GDP_{it} = \alpha + \beta_1 CEXP_{it} + \beta_2 RCEXP_{it} + \beta_3 TGEXP_{it} + \beta_4 EDBT_{it} + \varepsilon_{it} \ldots\ldots\ldots\ldots\ldots\ldots \text{(3.1)}$$

Where:

GDP	=	*Gross Domestic Product*
CEXP	=	*Capital Expenditure*
RCEXP	=	*Recurrent Expenditure*
TGEXP	=	*Total Government Expenditure*
EDBT	=	*External Debt*
μ	=	*Error term*
it	=	*Country and Time respectively*
$\beta_0, \beta_1, \beta_2, and, \beta_3$	=	*Coefficients of the Estimates*

3.2 Estimation Techniques

Panel Ordinary Least Square (OLS) Technique

The Panel OLS technique was used to carry out the short run analysis of the study. The analysis was carried out with the inclusion of the Cochrane Orcutt iterative method for the correction of autocorrelation which then limits the analysis to the presentation of the common and fixed effects results. Furthermore, the Durbin Watson test statistics was used as the parameter for testing serial correlation in the study

Panel Cross Section Dependence Test

One common assumption about panel data models is that disturbances are cross sectional dependent especially when the cross section is large (Baltagi, 2005). The absence of this cross-sectional dependence can then guarantee the use of first-generation methods such as the Panel IPS, ADF, LLC, ADF and PP Unit Root Tests as well as Engle-Pedroni, Kao and Hadri Co-integration Tests. However, the presence of cross-sectional dependence will then necessitate the use of second-generation methods such as the CIPS and

CADF unit root tests and the Westerlund co-integration techniques. The panel Cross Section Dependence Test was carried out based on the Breusch and Pagan (1980) LM criterion, Pesaran (2004) scaled LM criterion, Baltagi, Feng and Kao (2012) bias-corrected scaled LM criterion and Pesaran (2004) CD criterion.

Panel Unit Root Test
Ordinarily, time series data are prone to non-stationarity which may generate spurious results. Therefore, the presence of time series element in panel data may make panel data susceptible to non-stationarity. This, it is essential that Unit Root Tests are conducted to ascertain the Stationarity of data. These tests will be carried out using the various panel URT parameters such as the Levin, Lin and Chu (2002), Breitung (2000), Im, Pesaran and Shin (2003) and the Fisher type tests embracing the ADF and PP tests by Maddala and Wu (1999) and Choi (2001). Meanwhile, the stationarity of variables at first difference guarantees the test for co-integration between the variables.

Panel Co-Integration Test
The panel co-integration test determines the presence of long run equilibrium relationship between variables. The co-integration test as it pertains to panel data analysis can be conducted when variables are found to be stationary at first difference. It can be conducted through the Pedroni or Kao co-integration test when first generation tests are used and Westerlund co-integration test when second generation tests are considered.

AutoRegressive Distributed Lag (ARDL)
The ARDL technique bounds testing approach to cointegration was developed by Pesaran and Shin (1999) to be preferred to the Johansen and Juselius (1990) approach to cointegration because it can handle low power problems related with cointegration analysis. Furthermore, the ARDL approach is preferred for long run analysis where there is presence of mixed order of integration both at level and first difference. The ARDL analysis is accompanied with its various diagnostics or post-estimation tests such as the serial correlation and heteroskedasticity tests among others

Pairwise Causality Test
One major shortcoming of the ARDL is that it fails to provide evidence on the direction of causality between the variables. The causality test as developed by Granger (1969) is used to determine the causal direction between variables. This may end up as either unidirectional, bidirectional or no causality at all.

4.0 Results And Discussion

4.1 Pre-Estimation Tests
Preliminary Diagnostics
This captures the test for cross-sectional dependence and serial correlation which are usual problems encountered in panel regression. Also, the test for the optimal lag length criteria needed for the panel ARDL analysis is also captured here. The test for serial correlation was carried out using the Durbin Watson statistics as autocorrelation had been corrected using the Cochrane Orcutt Iterative method.

Table 1: Preliminary Diagnostics

Statistics	Values
Serial Correlation Test	
Durbin Watson	1.9478
Cross-Sectional Dependence Test	
Breusch-Pagan LM	158.8467 (0.0878)
Pesaran scaled LM	0.354511 (0.7230)
Bias-corrected scaled LM	0.080318 (0.9360)
Pesaran CD	-0.492803 (0.6222)

Source: Authors' Computation (2020)
Note: Stated in parentheses are the probability values of the respective test statistics.

The Durbin Watson statistics revealed that serial correlation is absent in the study as the statistics showed great affinity with 2 in the region of no autocorrelation. On the other hand, the cross-sectional dependence statistics with their accompanying probability values revealed that the panel data distribution is cross sectional independent. As a result, the first-generation unit root and co-integration tests such as the IPS, LLC and Pedroni tests among others can be used in the study.

Panel Unit Root Tests (URT)
The URTs were conducted at first difference as stationarity at first difference can then guarantee the procession to the panel co-integration test. The first generation URTs were used as presented in table 2.
Table 2: Panel Unit Root Tests

Variables	LLC Test		IPS Test		ADF Test		PP Test		Order of Integration
	LLC Stat	Prob. Value	IPS W-Stat	Prob. Value	ADF Stat	Prob. Value	PP Stat	Prob. Value	
GDP	-7.21	0.00	-10.34	0.00	171.39	0.00	301.77	0.00	I(1)
CEXP	-8.36	0.00	-11.65	0.00	195.79	0.00	304.48	0.00	I(1)
REXP	-8.32	0.00	-11.02	0.00	182.60	0.00	320.15	0.00	I(1)
TGEXP	-7.65	0.00	-10.47	0.00	173.89	0.00	284.88	0.00	I(1)
EDBT	-8.07	0.00	-9.55	0.00	158.29	0.00	301.05	0.00	I(1)

Source: Authors' Computation (2020)

The panel unit root tests revealed that at first difference, all variables are stationary as displayed by the first-generation panel URT. Thus, the study can proceed in its analysis to the panel co-integration test.

Optimal Lag Length Selection Criteria
This was conducted to determine the most suitable lag for the panel ARDL analysis. This is carried out as presented in table 3.

Table 3: Optimal Lag Length Selection Criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-766.3421	NA	1.42e-05	3.024871	3.066385	3.041147
1	2059.383	5584.964	2.41e-10*	-7.958367*	-7.709284*	-7.860710*
2	2078.236	36.89099	2.47e-10	-7.934257	-7.477605	-7.755220
3	2100.802	43.71606*	2.49e-10	-7.924712	-7.260491	-7.664294

Note: * signifies the appropriate lag length according to each criterion.
Source: Authors' Computation (2020)

The Akaike Information Criterion (AIC) revealed that the most suitable number of lags for the Panel ARDL analysis is 1. This will be considered subsequently in the panel ARDL analysis.

4.2 Panel Co-Integration Test
This was carried out to determine the presence of long run equilibrium relationship between government expenditure and economic growth in Sub-Saharan Africa.

Table 4: Pedroni Co-Integration Test

Panel Statistics				Panel Group Statistics		
V-Stat	rho-Stat	PP-Stat	ADF-Stat	rho Stat	PP-Stat	ADF-Stat
0.3066 (0.3796)	-0.3293 (0.3710)	-3.5057 (0.0002)	-3.7879 (0.0001)	0.0829 (0.5331)	-6.4548 (0.0000)	-3.0500 (0.0011)

Note: Stated in parentheses are the probability values of the test statistics.
Source: Authors' Computation (2020)

The test in table 4 according to the PP and ADF statistics revealed the of presence of long run relationship in the model. As a result, the study proceeded to the Panel ARDL analysis for the long run estimation of the model.

4.3 Short and Long Run Estimates

The short run estimation of the model was carried out using the Panel OLS technique at the fixed effect parameter together with the inclusion of the Cochrane Orcutt iteration for the correction of autocorrelation. Meanwhile, the long run analysis was conducted using the Panel ARDL technique. Both results are presented in table 5.

Table 5: Panel OLS (Short Run) and ARDL (Long Run) Results
Dependent Variable: GDP

Variable	Coefficient	T-Statistics	Prob.
(a)	**OLS Short Run Relationship**		
CEXP	-0.167726***	-46.49007	0.0000
REXP	0.013219**	3.710359	0.0002
TGEXP	1.155016***	201.1361	0.0000
EDBT	-0.001714	-0.570515	0.5686
C	-0.435744	-5.738923	0.0000
AR(1)	0.661033	19.70500	0.0000
D*W Stat	1.947822		
R-Squared	0.999903		
F-Statistics	256063.0		0.0000
(b)	**ARDL Long Run Relationship**		
CEXP	-0.191620***	-75.24113	0.0000
REXP	-0.001151	-0.433468	0.6649
TGEXP	1.192037***	272.6498	0.0000
EDBT	0.001269**	2.523260	0.0120
C	-0.172434	-5.609320	0.0000

Note: reported in the parentheses are the standard error while *, **, and *** represent respective significance level at 10%, 5%, and 1%.
Source: Authors' Computation (2020)

The short run-oriented result in table 5a revealed that government expenditure in all its forms as considered in the study exerts significant effect on economic growth. Specifically, capital expenditure was found to exert a negative effect on economic growth while recurrent and total expenditure affected economic growth positively in the short run. Although, external debt exerted a negative but insignificant effect on economic growth in the short run.

On the other hand, the long run result as presented in table 5b revealed that capital and recurrent expenditure exerted negative effect on economic growth while total government expenditure and external debt were found to exert a positive effect on economic growth. However, recurrent expenditure was discovered to exert an insignificant effect on economic growth in the long run.

4.4 Pairwise Causality Test

The Pairwise causality test was employed to examine the validity of the Wagner's law in this study. The direction of causality between the variables is considered to determine the validity of the Wagner's law. The causality test is presented in table 6.

Table 6: Pairwise Causality Test

Direction of Causality	Obs	F-Statistics	Prob.	Direction
Runs from CEXP to GDP	527	4.501	0.012	
Runs from GDP to CEXP	527	2.858	0.058	CEXP ⟷ GDP
Runs from REXP to GDP	527	1.060	0.347	
Runs from GDP to REXP	527	5.692	0.004	GDP ⟶ REXP

Runs from TGEXP to GDP	527	3.178	0.043	TGEXP ⟶ GDP	
Runs from GDP to TGEXP	527	0.685	0.505		
Runs from EDBT to GDP	527	0.500	0.607	GDP ⟶ EDBT	
Runs from GDP to EDBT	527	12.871	0.000		

Source: Authors' Computation (2020)

Table 6 revealed that total government expenditure causes economic growth in Sub-Saharan African contrary to the provisions of the Wagner's law.

4.5 Discussion and Implications of Findings

The essence of this study is to investigate the effect of government expenditure on economic growth with special inclination to examining the validity of the Wagner's law of increasing state activities which was ascertained through the use of the Pairwise Causality test. The preliminary diagnostics comprising of the Durbin Watson serial correlation test revealed the absence of autocorrelation after the correction of serial correlation through the Cochrane Orcutt iterative method. Also, the test for cross section dependence revealed the absence of same which guaranteed the use of first-generation tests. Furthermore, the panel unit root tests conducted at first difference revealed that all variables were stationary at first difference guaranteeing the use of the panel co-integration test. The Panel Co-integration test revealed that a long run equilibrium relationship exists between the variables. As a result, the panel ARDL analysis was conducted.

As regards the long run estimates as revealed through the ARDL analysis, it was discovered that capital and recurrent expenditure exerted negative effect on economic growth contrary to theoretical expectations while total government expenditure and external debt had positive effect on economic growth. This implies that an increase in capital and recurrent expenditure in Sub-Saharan Africa will undermine growth. Ordinarily, this should not be the case but a possible explanation for this significant negativity as regards capital expenditure may be because of the widespread dominance of corruption in the Sub-Saharan region. Often times, funds may have been allocated for capital projects, yet, some of such projects may be poorly executed or not executed at all while a significant portion of the funds end up in uncertain coffers. As a result, capital expenditure already marked out on paper may not translate to economic growth in reality because of the diversion of such funds. The consistent presence of such leakage in the name of capital expenditure may likely position capital expenditure as a negative contributor to growth as discovered in the study. In other words, the failure of capital expenditure to translate to economic growth in Sub-Saharan Africa implies that capital expenditure has been diverted to other uses which do not translate to economic growth most especially for the private use of government functionaries (Chude & Chude, 2013). This discovery is in line with the findings of Ewubalo and Abere (2019) and in disagreement with the findings of Lahirushan and Gunasekara (2015).In the same vein, recurrent expenditure which captures expenditures on salaries and allowances in the Sub-Saharan region was found to exert a negative but insignificant effect on growth. This implies that an increase in recurrent expenditure will decrease growth but with an insignificant effect. One major explanation for this is the possibility of inflation which may arise due to increase in wages and salaries. In other words, when recurrent expenditure is increased without commensurate increase in real economic activities, inflation begins to set in leading to an adverse effect on economic growth.

Conversely, the positive effect of total government expenditure on the economic growth of Sub-Saharan countries implies that government expenditure can be increased. Meanwhile, such increase should translate to performance as it will enhance economic activities through the provision of infrastructures and other necessities needed for growth. Similarly, external debt was found to positively affect economic growth implying that an increase in external borrowing will lift the economic status of the Sub-Saharan region. This is probable as debts efficiently expended for intended developmental purposes will definitely improve economic growth within the economy.

Furthermore, in a bid to test for the validity of the Wager's law, the causality test was adopted revealing that there exists a unidirectional causality running from total government expenditure to economic growth and as such invalidating the Wagner's law in Sub-Saharan Africa. This implies that it is the magnitude, use, direction and behavior of government expenditure that determines economic growth in the Sub-Saharan

region. This provides support for the Keynesian law rather than the Wagner's law. This is in line with the findings of Ighodaro and Oriakhi (2010), Njimanted (2012) as well as Gatsi, Appiah and Gyan (2019) and in divergence with the findings of Eedme, Okolo, Idenyi and Okolomike (2018) and Uzuner, Bekun and Akadiri (2017).

5.0 Conclusion And Recommendations
This study examined the effect of government expenditure on economic growth as a substantiation of the Wagner's Law in 17Sub-Saharan African countries between 1986 and 2018. The study used Gross Domestic Product as the dependent variable and then used capital expenditure, recurrent expenditure, total government expenditure and external debt as independent variables. The panel URT revealed that all variables were stationary at first difference while the panel co-integration test revealed that there exists a long run relationship between the variables. The study concluded that the Wagner's law is not applicable to the Sub-Saharan African region

Meanwhile, the long run results as estimated through the Panel ARDL technique revealed that capital and recurrent expenditure exert negative effect on economic growth contrary to the positive effect exerted by total government expenditure and external debt on economic growth in Sub-Saharan Africa. Also, the Pairwise Causality test revealed that the Wagner's law is invalid in Sub-Saharan Africa.

The result discovered above is not far away from reality coupled with its consistency with previous studies. This is because expenditure in the Sub-Saharan region has been discovered to be weakly linked to economic growth owing mostly to the corrupt nature of government agencies and functionaries in this region which divert public funds for uses other than the ones intended. As such, government expenditure especially on capital projects has found difficulty in translating to economic growth. Also, the empirical findings that expenditure patterns do not follow either the Wagner's law therefore portrays that government expenditure still determines the pace of growth in the region and not the other way round. This may be attributed to the expenditure patterns in the region where in most countries, new governments disrupt the existing expenditure pattern and develop new ones. As such, development in an economic sector may be jettisoned for development in another sector in a new tenure; thus, dictating the tune of economic growth and development. Thus, based on the negativity of capital and recurrent expenditure, it is recommended that capital and recurrent expenditure must be monitored effectively to ensure that its increase will not exert any negative effect on economic growth. Also, increase in recurrent expenditure should be balanced with growth in the real productive sector of the economy while stringent measures as well as checks and balances must be adopted to curb corruption in Sub-Saharan Africa to ensure that funds are used exclusively for their intended purposes especially those pertaining to capital projects. Also, certain fiscal agencies of the government ordained to handle government expenditure should be made independent of political interference so as to ensure consistency and continuity in expenditure patterns irrespective of changes in government.

List of Abbreviations
ARDL: Auto Regressive Distributed Lag; FDI: Foreign Direct Investment; ECM: Error Correction Modeling; VECM: Vector Error Correction Modeling; AIC: Akaike Information Criteria; URT: Unit Root Test; PP: Philips-Perron; ADF: Augmented Dickey Fuller; OLS: Ordinary Least Square; CEXP: Capital Expenditure; REXP: Recurrent Expenditure; TGEXP: Total Government Expenditure; EDBT: External Debt

Availability of Data and Materials
All data generated and analysed for all countries considered during the study are publicly available in the WORLD BANK DATABASE and can be assessed at https://data.worldbank.org/.

Competing Interests

The authors declare that they have no competing interests.

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Authors' Contributions

All authors contributed to the concept of the manuscript. FT and JO monitored the gathering of data for the analysis, BA and TO handled the review of literature and problem, KM analysed the data. The authors read and approved the final manuscript.

Authors' Information

[1, 2 & 4]Department of Finance, Ekiti State University, Nigeria

[3]Department of Financial Studies. Federal Polytechnic, Ado-Ekiti.

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