(Essien, M-epbari, Nwikiabeh and Piabari, 2016)

# IMPACT OF GOVERNMENT SPENDING ON SMALL AND MEDIUM SCALE BUSINESSES IN NIGERIA

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**Abstract:**

*This paper examines the impact of public expenditure on the output and productivity of small and medium scale enterprises in Nigeria using annual time series data for the period of 1970-2015. The experiment was conducted using the specifications of the law as outlined in the public expenditure literature. Including others methods and models, first, we check for the time series properties of the valuables used by applying the ADF, PP and the KPSS test statistics, also, the Johansen's co-integration test procedure as well as the autoregressive distributed lag (ARDL) bounds testing approach were employed. Result of the study revealed that: Generally, all the variables were found to be stationary at their first differences, except government expenditure which was stationary at level. The result also shows a long-run unidirectional causality from SMEs output and productivity to public expenditure. However, in other instances, there was bidirectional causality between SMEs output and productivity and public expenditure. Indeed, it was found that while causality runs from SMEs output and productivity to public expenditure in the long-run, short-run changes in SMEs output and productivity was cause by changes in public expenditure. The conclusion from these results is that while there is a strong support for Wagner's postulation of a long-run tendency for public expenditure to grow relative to national income in Nigeria over the period 1970-2015, public expenditure still remains a veritable short-term instrument that can be used to spur economic growth and development in Nigeria.*

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# 1    INTRODUCTION

Micro, Small and Medium Enterprises (MSMEs) sector plays a pivotal role through several pathways that goes beyond job creation. They are growth-supporting sector that not only contribute significantly to improve living standards, but also bring substantial local capital formation and achieve high level of productivity of micro small and medium enterprises.

In Nigeria, the history of MSMEs dated back more than six decades ago during the Colonial era in 1946 with a ten year development plan. The plan was for the then Colonial administration to lay groundwork for the welfare and development of Nigeria. But despite the intensions, the Colonial administration implicitly had preference for large scale industries in a push for industrialization. During the period, trade, price, tax and exchange rate policies as well as enabling environment were prioritized in favour of the large firms to pave way for large industries as catalyst for Nigeria`s industrialization. Despite these, the large manufacturing sector could not drive the economy. The economy was a buyer`s market for outside economies and seller`s market for raw materials (SMEDAN, 2012; Okon, Efremfon and Akaninyene, 2016; Alobari, Paago, Igbara, and Emmah, 2016; Igbara, Paago, Alobari and Zukbee, 2016). Thus, the policy of local sourcing of raw materials was hardly pursued as a result easy availability of cheap exchange rate to import foreign components; this situation hampered the development of MSMEs.

The import substitution policy of the post-Colonial period posted a picture that tolled the anti MSMEs policy. It emphasized on industries that could undertake mass production of consumer goods. In addition, credit and incentives were granted to industries that could not go beyond first step of producing consumer goods. To attract Foreign Direct Investment FDI, policies such as profit tax holidays, import relief which allows firms to import raw designated materials under duty free and concessional arrangements, accelerated depreciation on capital investment and tariff protection. There were also monetary incentives such as the establishment of financial institution for loans and subsidies. A number of financial institutions were drafted to oversee these arrangements such as, Nigeria Industrial Development Bank, and Nigeria Bank for Commerce and   Industry. Generally, both trade and infrastructural polices favoured the large scale industries.

In spite of these incentives, the manufacturing sector remains in comatose. The problem of large scale manufacturers was further aggravated by the collapse of the international oil market in the1980s. The associated unemployment and low capacity utilization created balance of payment problem which forced Nigerian government to seek for a bailout from international credit institutions, International Monetary Fund and World Bank. As one of the pre-conditions and requirements for such credit facilities, the economy embarked on Structural Adjustment Programme

(SAP). In order to drive home the policy objectives of the SAP, an inward-looking policy that emphasizes the use of local raw materials was introduced to encourage local producers, particularly Small and Medium Enterprises (SMEs).

To harness the potentials of the MSMEs, the sector became particularly a focus of attention during the era of the Structural Adjustment programme (SAP) in 1986. Thus, the Structural Adjustment Policy of 1986 saw the rising profile of increased number of MSMEs. As form of encouragement, policies were adopted to use the sector as stepping stone for both job creation and industrialization. Industrial development centres, industrial estates, World Bank assisted programme were put in place to encourage the sector. Various SMEs institutions were also established, small scale industrial scale, the National Economic Reconstruction Fund, the small and medium scale loan scheme, the people's bank of Nigeria, and National Directorate of Employment were also established. These institutions were however not sustained because they were products of political regimes and went into extinction as soon as the regimes were brought to an end. Moreover, there were no enabling laws to formally establish MSMEs in Nigeria; as they suffered neglects, constraint to effective development, and fund starvation.

To address the problems of access to credits and establish MSMEs as polar axis for Nigeria`s industrialization, Small and Medium Industry Equity Investment Scheme (SMEIS) was initiated by the Central Bank of Nigeria in collaboration with Bankers Committee in June 19, 2001. This was in response to the Federal Government`s concerns and policy measures for the promotion of Small and Medium Enterprises (SMEs) as vehicles for rapid industrialization, sustainable economic development, poverty alleviation and employment generation. Consequently, on August 21, 2001 the scheme was launched by the Obasanjo administration. The main purpose is to salvage and develop the SME sector, by addressing the problems of limited access to long-term credit; remove burden of interest rate changes; and eliminate other charges associated with normal bank lending. It requires that all banks in Nigeria develop and package viable industries with private investors and to set aside 10% of their pre-tax profit for equity investment in SMEs. In addition, banks are expected to provide financial, advisory, technical and managerial support for the SMIs in which they have invested. Ten percent (10%) of the fund set aside goes to the Micro finance enterprises. Every legal business activity is covered under the scheme (Micro, Small and medium Enterprises) with the exception of trading/Merchandising and financial services.

Given the successful establishment of funding window foe MSMEs, it was imperative to take census of the size of MSMEs in Nigeria as a further step towards having efficient funding. In addressing the problems of non-availability of comprehensive information on SMEs, the CBN commissioned Universities in Nigeria

to conduct a nation-wide baseline economic study of MSMEs in 2004. The number of persons employed by the SMIs has generally risen over the years. The number employed by Small scale industries (SSIs) rose from 33, 843 at inception to 53, 686 at the time of the survey in 2004. Similarly, the number of persons employed by medium scale industries (MSI) increased from 15,308 at inception to 40,130 in the same period.

Several factors were found to be major hindrances to the realization of the SMI in Nigeria. These factors include, production technology, cost structure and financing entrepreneurship, firm characteristics, management structure, and marketing strategies, poor infrastructures (roads, electricity, energy, communication, manufacturing environment); economic environment ( Venture Capital, Fluctuating value of the Naira, etc); Production inputs (raw materials, equipment, land, energy, etc), government policies; and political considerations. It is the complex interaction of these factors and variables that determines the success or failure of both SMI operations and the attendant public policy interventions.

## 2    METHODS AND MODELS

### 2.1   The Model and Data:

The focus of this study is to examine the extent to which government expenditure affect Small and medium scale enterprises in Nigeria over the period 1970 to 2015. To achieve this, a simple linear regression equation is specified below:

$$SMEO_t = f(GEX_t) \tag{1}$$

Where:

$SMEO_t$ = dependent variable; that is Output of Small and Medium Scale Enterprises (SMEs).

GEX = aggregate government expenditure and t is the current time period.

Drawing insight from the work of Akingunola (2011), who studied the relationship between SMEs performance and economic growth. This study incorporates other explanatory variables such as commercial bank loan to SMEs which is used to proxy financing options available to SMEs. Other explanatory variables considered are lending cost proxy by interest rate, cost of doing business captured by inflation rate and infrastructural facilities. Hence equation (1) becomes:

$$SMEO_t = f(GEX_t; LSME_t; LC_t; CDB_t; INF_t) \tag{2}$$

The following log-linear model as shown below were further employed:

In SMEOi$_t$ = α + п$_1$InGEX$_t$ +п$_2$InLSME$_t$ + п$_3$InLC$_t$ + п$_4$InCDB$_t$ + п$_5$InIFA$_t$ + μ$_t$      (3)

Where:
In = natural logarithm,
SMEOi = Output of Small and Medium Scale Enterprises (SMEs),
GEX = aggregate government expenditure,
LSME = SMEs financing options proxy by commercial bank loan to SMEs;
LC = Lending cost proxy by interest rate;
*CDB* = Cost of doing business captured by inflation rate;
**α** = is constant; п$_1$, п$_2$, п$_3$, п$_4$, and п$_5$ are coefficients of respective parameters; and
μ$_t$ is serially uncorrected random disturbance term and t is time.


## 2.2   Test of stationarity and co-integration

In order to avoid obtaining spurious regression results that would make the estimates biased and inconsistent, the stationarity properties of the data were examined. Stationarity or non- Stationarity in time series is clearly related to the test for unit roots. Precisely, Stationary denotes the non-existence of unit roots. Various methods exist for testing the Stationarity condition of time series data. The most widely used are the Dickey-Fuller (DF), Augmented Dickey-Fuller (ADF) and the Phillips-Perron (PP) tests. The ADF test involves running the following regression:

$\Delta Y_t = \beta_1 + \beta_2 t + \delta Y_{t-1} + \sum_{i=1}^{m} \alpha i \, \Delta Y_{t-1} + \varepsilon_t$      (4)
Where:

$Y_t$ -represents the relevant variable under investigation and

$\varepsilon_t$ = random error term.

The optimal period of lag m is selected large enough (using the Akaike, information criterion) to render the residual $\varepsilon_t$ not auto correlated (white nose). The null hypothesis is that time series has '2a unit root (H$_0$: δ = 0) and the alternative is that series is trend stationary (H$_1$: δ < 0). The null hypothesis of non-stationary is rejected if the t-statistic is more than the critical t-value.

However due to probability of structural changes that might have occurred in the period under analysis, the ADF might be biased in identifying integrated data. This shortcoming is overcome by the PP test develop by Perron (1997). According to Herzer, et al (2004), this test evaluates the time series properties in the presence of structural changes at unknown points in time and, thus, endogenises this structural break. The specification is given as:

$$t_\alpha^* = t_\alpha \left(\frac{\gamma_0}{f_0}\right) - \frac{T(f^0 - \Upsilon^0)[se(\bar{\alpha})]}{2f_0^{\frac{1}{2}}s} \tag{5}$$

Where:

$\bar{\alpha}$ = the estimate,

$t_\alpha$ = the t-ratio of $\alpha$,

$se(\bar{\alpha})$ = the coefficient standard error,

$s$ = the standard error of the regression equation.

$\Upsilon_0$ - is a consistent estimate of the error variance,

$f_0$ - is the residual spectrum at frequency zero.

After testing for stationarity of the time series, we carried out the test for co-integration to see whether the time series can be used together to give meaning results in the long run. Instead of using the traditional Engle and Granger (1987) two step method, we adopted the Full Information Maximum Likelihood (FIML) co-integration approach developed by Johansen (1995). One possible weakness of the Engle-Granger approach that has been identified in the literature is that Engle-Granger approach usually involved the estimation of the regression equation and testing of the residuals for co-integration which according to some authors might be biased. However, to provide a sensitivity check on our result, we further employed the Autoregressive Distributed Lag (ARDL) bounds testing approach to examine the long-run dynamic relationship between Gross Domestic Product (GDP) and Foreign Direct investment (FDI) in Nigeria. The ARDL approach to co-integration was developed by Pesaran and Shin (1999) and latter extended by Pesaran, et al (2001). The various advantages of this approach over other methods include (i) it does not impose a restrictive assumption that all the variable under study must be integrated of the same order (ii) it provides an efficient estimator even if the sample size is small (as in the case for this study) and some of the regressors and endogenous, (iv) it allows that the variables may have different optimal lags, and (iv) it employs a simple reduced form equation.

$$\Delta Le_t = \delta_0 + \sum_{i=1}^{p} \varphi 1_i \Delta Le_{t-i} + \sum_{i=0}^{q} \varpi_{2i} \Delta Ly_{t-i} + \theta_3 Le_{t-1} + \theta_4 Ly_{t-1} + \mu_t \tag{6}$$

The outcome of the bounds test depends largely on the choice of the lag order. The schwar2 Bayesian Criterion (SBC) is generally used in preference to other criteria because it tends to define more parsimonious specific (see Pesaran

and Shin, 1999). Thus with the limited observations in this study, an appropriate lag for the ARDL model will be based on the SBC.

The bounds testing procedure is based on the joint F-statistic or Wald statistic. The asymptotic distribution of the F-statistic is nonstandard under the null hypothesis of no co-integration between the examined variables. As shown by Narayan and Smyth (2005), the bounds testing procedure for the absence of any level relationship between $Le_t$ and $Ly_t$ is through the exclusion of the lagged level variables, $le_{t-1}$ and $Ly_{t-1}$ in equation (4) above. In other words, the null hypothesis of no co-integration in equation (4), ($H_0$: $\theta_3 = \theta_4 = 0$) is tested against the alternative ($H_1$: $\theta_3 \neq \theta_4 \neq 0$). The test is conducted by comparing the calculated F-statistic with two sets of critical values provided by Pesaran *et al* (2001). One set assumes that all variable are 1(0) and the other assumes they are 1(1). If the calculated F-statistic exceeds the upper bound of the critical values, then the null hypothesis of no co-integration is rejected, irrespective of whether the variables is1(0) or 1(1). If the computed F-statistics is below the lower bound of the critical values, then the null hypothesis of no co-integration cannot be rejected. Finally, if it lies between the critical bounds, a conclusive inference cannot be made. However, Narayan (2005) has argued that the critical bounds values of Pasaran et al. (2001) are inappropriate in small sample size*. To this and, Narayan (2005) generated new sets of critical value for samples ranging from 30 to 80 observations. Given the small sample of the present study (40 observations), appropriate critical bounds values will also be extracted from the latter source.

## 2.3  Causality Test

Causality is inferred when lagged values of a variable $x_i$ have explanatory power in a regression of a variable $y_1$ that contains lagged values of both $y_1$ and $x_1$. We use Granger causality to test the direction of causality between government expenditure and the productivity of small and medium scale enterprises in Nigeria, using the specification of equation (1) above. Once co-integration or long run relationship is established in any of the specification, we follow the tradition adapted by Narayan, *et al* (2008) and Aregbeyen (2006) and examine the short-run and long-run Granger causality test based on an error correction model.  Accordingly, a vector error correction model (VECM) is formulated to reintroduce the information lost in the differencing process thereby allowing for long-run equilibrium as well as short-run dynamics. For instance, using equation (1), the VECM can be specified as follows.

$$\Delta In\text{SMEO}_t = a_1 + \sum_{i=1}^{m}\beta_1 \Delta In\text{SMEO}_{t-i} + \sum_{i=0}^{m}\varphi_1 \Delta InGEX_{t-i} + \partial_1 ECT_{t-1} + \mu_t \qquad (7a)$$

$$\Delta InGEX_t = a_2 + \sum_{i=1}^{m}\beta_2 \Delta In\text{SMEO}_{t-i} + \sum_{i=0}^{m}\varphi_2 \Delta InGEX_{t-i} + \partial_2 ECT_{t-1} + \varepsilon_t \qquad (7b)$$

Where:

Δ represents the first difference operator,

**α**, β, $\partial$, and φ are the coefficients

$\mu_t$ and $\varepsilon_t$ are the error terms.

$ECT_{t-1}$ is the error correction term, lagged one period (representing the disequilibrium residuals of the given co-integrating equation).

The inclusion of the error correction term (ECT), introduce a useful long-run channel through which Granger causality could be detected to validate the theoretical framework.

In the absence of any co-integrating relations, an error correction procedure cannot be used to model short-run dynamics between productivity and government expenditure (Ansari et al, 1997). However, as noted by Gemmell (1990) and Manning and Adriacanos (1993), if there is no evidence of co-integration among variables, it may still be of interest to examine their short-run relationships. The argument is that even though the long-run relationship between the variable cannot be established for the given time period, it may still be possible that they are causally related in the short-run. Thus, in such situations, we follow the practice of Demirbas (1999) and Aregbeyen (2006) by applying the standard Granger causality test to the variables of interest, taking note of their stationarity properties. For 1(1) series, the standard Granger causality test equations for equation (1) are specified as follows:

$$\Delta In SMEO_t = a_i + \sum_{i=1}^{m} \varphi_i \, \Delta In GEX_{t-i} + \sum_{j=0}^{m} \partial_j \, \Delta In SMEO_{t-j} + \mu_{1t} \qquad (8a)$$

$$\Delta In GEX_t = b_i + \sum_{i=1}^{m} \Upsilon_i \, \Delta In SMEO_{t-i} + \sum_{i=0}^{m} \omega_j \, \Delta In GEX_{t-j} + \mu_{2t} \qquad (8b)$$

Where;

$\mu_{1t}$ and $\mu_{2t}$ are the un-correlated white-noise series;

m is the maximum number of lags.

If $\Delta In GEX_{t-1}$ fails to Granger cause $\Delta In\ SMEO_t$, the coefficients of the latter equation (8a), for instance, will be zero. Thus, we test null hypothesis (using the standard F-test) that $H_0$: $\varphi_1 = \varphi_2 = - - - = \varphi_m = 0$ in equation (8a) against the alternative hypothesis that $H1$: $\varphi_{i's}$ are jointly significant. If we reject $H_0$, then we would conclude that SMEs productivity Granger cause public expenditure. Similarly, in equation (8b), the null hypothesis ($H_0$: $\Upsilon_1 = \Upsilon_2 = - - - = \Upsilon_3 = 0$) is tested against the alternative ($H_1$: $\Upsilon_{i's}$ are jointly significant). If we reject H0, then we would conclude that growth in public expenditure Granger cause growth in SMEs output

and productivity. Generally, according to Gujarati (2003:697), there are three possible outcomes in any Granger causality test:

i.    Unidirectional causality which occurs when one of the null hypothesis is accepted and other rejected , meaning that either causality runs from public expenditure to SMEs output and productivity (in which case Keynesian model will be valid) or vice versa (validating Wagner's hypothesis);

ii.   Both null hypotheses can be rejected, indicating that the set of SMEs output and productivity and public expenditure coefficients are statistically significant, different from zero in both regressions. In this case we say that there is a feedback or bilateral causality (or bidirectional causality) between SMEs output and productivity and public expenditure (in which case neither Keynesian nor Wagner's approach is valid).

iii.  Lastly, both null hypotheses can be accepted; meaning that there is independence. This indicates that the set of SMEs productivity and public expenditure coefficients are not statistically significant in both regressions (i.e., neither "Granger cause" the other).

## 3     RESULTS AND DISCUSSION

## 3.1   Unit Root Test Results:

The results of our test for the integration of each of the time series data using the traditional ADF and the PP tests procedure test are presented in Table 1. The test statistics are computed using regression with an intercept with the E-views package, version 5.0.

Table 1: Test Results for Unit Roots (Regression with an Integration)

| Variables | ADF | PP | KPSS | Order of Integration |
|---|---|---|---|---|
| In SMEO t | -5.88 | -6.15 | 0.09 | 1(0) |
| ΔIn SMEO t | -9.84** | -18.65** | 0.24* | |
| InGEX | -2.28 | 5.36** | 0.67** | |
| ΔInGEX | -5.68** | -5.42** | 0.39* | 1(0) |
| InLSME | 0.48 | 0.57 | 0.22 | |
| Δ InLSME | -5.96** | -5.96** | 0.26* | 1(1) |
| InLC | -1.92 | -1.95 | 0.14* | |
| ΔInLC | -6.75** | -6.74** | 0.10* | 1(1) |
| InCDB | -0.09 | 0.18 | 0.75 | |
| ΔInCDB | -9.63** | -14.21** | 0.37* | 1(1) |
| InIFA | -2.34 | -2.36 | 0.64** | |

| ΔInIFA | -8.42** | -9.45** | 0.30* | 1(1) |
|---|---|---|---|---|
| 1%  Critical value | -3.61 | -3.62 | 0.74 | |
| 5%  Critical value | -2.94 | 2.94 | 0.46 | |

Note:        Δ        indicates        the        first        difference        operator.
* * (*) denotes significant at 1% and 5% levels respectively Critical values for ADF and PP tests are taken Mackinnon(1996) while that of KPSS are taken from Kwiatkowski-Schmidt-Shin(1992) as reported by E-views, Version 5.0

As shown in Table 1 the ADF test statistic confirmed that all variables (except government expenditure) are not stationary at levels, but at their first difference. Similar result is obtained using PP test, except that LC is now stationary at level. However, generally, both test statistics are proved that all variables are integrated of the same order, the time series may be tested for the existence of co-integration relationship.

## 3.2   Co-integration Test Result:

Table 2 presents the Johansen co-integration test results for the specified model.  The result shows that there is a t least co-integration between variables. This implies that there exist a long-run relationship between SMEs productivity and government expenditure as specified in the equation (1).

Table 2 Johansen Hypothesized Co-integrating Relations

| Model | Null hypothesis | Alternative hypothesis | Trace statistic | 5% critical level | Max-engine statistic | 5% critical level | No of co-integrating Equations |
|---|---|---|---|---|---|---|---|
| 1 | R=0* | R=1 | 23.43 | 15.49 | 17.49 | 14.27 | |
| | R≤1* | R=2 | 5.93 | 3.84 | 5.93 | 3.84 | 2 |
| 2 | R=0 | R=1 | 21.81 | 15.49 | 14.57 | 14.27 | 2 |
| | R≤1* | R=2 | 7.23 | 3.84 | 7.23 | 3.84 | |
| 3 | R=0 | R=1 | 7.00 | 15.49 | 4.68 | 14.27 | |
| | R≤1 | R=2 | 2.33 | 3.84 | 2.33 | 3.84 | |
| 4 | R=0 | R=1 | 8.81 | 15.49 | 8.27 | 14.27 | |
| | R≤1 | R=2 | 0.54 | 3.84 | 0.54 | 3.84 | |
| 5 | R=0 | R=1 | 7.36 | 15.49 | 6.87 | 14.27 | |
| | R≤1 | R=2 | 0.49 | 3.84 | 0.49 | 3.84 | |
| 6 | R=0 | R=1 | 9.72 | 15.49 | 8.39 | 14.27 | |
| | R≤1 | R=2 | 1.33 | 3.84 | 1.33 | 3.84 | |

Note: * denotes rejection of the null hypothesis at 5% level.

Source: Author's computation using E-view 5.0

Given that none of the variables is 1(2) or above, it is safe to carry out the ARDL bounds test approach to co-integration in order to provide a sensitivity check for the above results. The results reported in Table 2 below confirmed that there is no evidence against a co-integration relationship between public expenditure and real income in Models 1 and 2. The calculated F-statistic in Models 1 and 2 exceed the upper critical bound value provided by Pesaran, et al (2001) and Narayan (2005) at 5% significance level. The implication of the co-integration results of both models indicates that linear combinations of the variables in equation (3) were found to be stationary and co-integrated.

## 3.3   Causality Test Results:

The ARDL co-integration method only tests the existence or absence of long-run relationships between the included variables. It does not indicate the direction of causality. Thus, in view of our co-integration test results where co-integrating relationships were found in only two of our models 1 and 2 based on vector error correction model following the tradition adopted by Narayan, et al (2008) and Aregbeyen (2006). The results are presented in Table 3.

In Equation 8a, the results suggest that there is unidirectional (long-run) relationship between SMEs productivity and public expenditure in Nigeria, with the direction of the causality running from national income to public expenditure invalidation of Wagner's law. This conclusion is because the error correction term is not only correctly signed but statistically significant. However, the error correction term in the second equation in Model 1 was not only statistically insignificant, but bears the wrong sign.

In the second part of Equation 8a, there is a bi-directional causality between public expenditure and national income. Most importantly, the result indicates that in short run, public expenditure came close to national income in line with Keynesian view, while in the long-run, the causality tends to run from national income to public expenditure, which validate Wagner's law.

Table 3: causality test based on vector error-correction for equation 8a and 8b

| Source of causation | Equation 8a | | |
|---|---|---|---|
| | $\Delta \ln SMEO_{t-1}$ $ECT_{t-1}$ | | $\Delta \ln GEX_{t-1}$ |
| $\Delta \ln SMEO_t$ | 0.0712 (0.1714) [0.4154] | 0.2478 (0.3838) [0.6455] | -1.0881 (0.2438) [-4.4625]** |
| $\Delta \ln GEX_t$ | 0.0242 (0.0780) [0.3097] | 0.0405 (0.1747) [0.2321] | 0.0016 (0.1110) [0.0143] |
| | | | |

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Note: Values in parentheses ( ) show the standard error while values in [ ] show the t-values ** Indicates statistical significance at 5% level. The optimal lag length of 1 was chosen based on the AIC and Schwarts criterion.

## 3.4   Regression Result:

Having established the existence of a co-integrating relationship among the variables, the parameters of their relationships were estimated, without any fear of arriving at spurious estimates. The ordinary least squares (OLS) are as shown in equation 3 below:

Table 4:   Regession Test Result

| Variable | Coefficient | Standard Error | t-Statistics |
|---|---|---|---|
| GEX | 5.68 | 1.06 | 0.536018* |
| LSME | 49.2 | 0.03 | 0.247 |
| LC | 5.4 | 67.815 | 0.596 |
| CDB | 2.06 | 5.436058 | -1.163* |
| IFA | 128.31 | 0.718198 | 0.784295 |
| R² = 0.625145 | F(5,32) = 8.5046 | D-W = 1.3465 | |

As shown in the ordinary least square (OLS) regression result above, all the variables appear with the expected a priori signs. While bank credit to SMEs (LSME) and interest rate (LC) and public expenditure are significant determinants of SMEs productivity (SMEO), output of SMEs (CDB) and inflation rate are not significant. The adjusted $R^2$ value of 0.625145 indicates that the model explains about 63% of the variability in Nigeria's gross domestic product. An F-value of 8.504642 shows that the joint influence of the explanatory variables is highly significant both at 5% and 1% level in the determination of Nigeria's gross domestic product. With a Durbin-Watson statistic of 1.34658 at 5% level of significance indicates the presence of positive autocorrelation in the model

The implication of these results is that there are strong evidence in support of both the Keynesian and Wagner's law in Nigeria. This finding is in tandem to an earlier result by Aegbeyen (2006) who also found strong support for Wagner's law in Nigeria. Then implied policy implication of our findings is that fiscal policy (especially public expenditure) still remains a variable short term instrument that can be used to stimulate economic growth and development in Nigeria, in support of Keynesian theory whereas in the long-term, as real income increases, there is a

(Essien, M-epbari, Nwikiabeh and Piabari, 2016)

long run tendency for the share of public expenditure to increase relative to national income as postulated by Wagner.

## 4    CONCLUSION

This paper examined the impact of public expenditure on the output and productivity of small and medium scale enterprises in Nigeria using annual time series data for the period of 1970-2015. The experiment was conducted using the specifications of the law as outlined in the public expenditure literature. First, we check for the time series properties of the valuables used in the study of applying the ADF, PP and the KPSS test statistics. Generally, all the variables were found to be stationary at their first differences, except government expenditure which was stationary at level. Next, we applied the Johansen's co-integration test procedure as well as the autoregressive distributed lag (ARDL) bounds testing approach to determine the long-run co-integrating relationship between the included variables. The results indicate that there were co-integration in only two out of the six models. Informed by these results, we conduct granger causality test on the two models (equation 8a and 8b) within the context of a vector error correction model (VECM), while the standard Granger causality test technique was applied to the rest of the existence of any possible short run linkages between the variables.

The result obtained from the error correction model in Equation 8a shows a long-run unidirectional causality from SMEs output and productivity to public expenditure, indicating that Wagner's law holds for Nigeria. However, in equation 8b, there was bidirectional causality between SMEs output and productivity and public expenditure. Indeed, it was found that while causality runs from SMEs output and productivity to public expenditure in the long-run, short-run changes in SMEs output and productivity was Granger cause by changes in public expenditure as Keynes postulated.

The conclusion from these results is that while there is a strong support for Wagner's postulation of a long-run tendency for public expenditure to grow relative to national income in Nigeria over the period 1970-2015, public expenditure still remains a veritable short-term instrument that can be used to spur economic growth and development in Nigeria, in support of Keynes postulation of active government intervention in the economy. However, it is important to ensure effective channeling of such expenditure to productive activities if the goal of enhancing economic growth in Nigeria must be achieved.

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