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SECURITY SPENDING AND ECONOMIC GROWTH: THE NIGERIA EXPERIENCE

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Abstract: *This study empirically examined the effect of defense expenditure (DEXP) and internal security expenditure (ISEXP) on economic growth (proxy by GDP) in Nigeria during the period 1981 – 2018. Time series data such as DEXP, ISEXP and Gross Domestic Product (GDP) were obtained from Central Bank of Nigeria (CBN) Statistical Bulletin. Unit root test, Cointegration test and Error Correction Model (ECM) techniques were used to estimate the model while granger causality test was used to check the causal relationship of the variables. The results of the finding revealed that DEXP exerts positive and significant effect on GDP while ISEXP has a negative and insignificant effect on GDP. The results further revealed that there was evidence of unidirectional causality running from GDP to DEXP as well as ISEXP to GDP. Based on these findings, the researchers recommend that federal government should investigate any misappropriation of funds, proper monitoring of the activities of security agencies and overall administration of security architects in the system so as to achieve macroeconomic objective of sustainable economic growth in Nigeria.*

Keywords: GDP, DEXP, ISEXP, ECM, CBN

INTRODUCTION

In this paper, security spending comprises defense expenditure and internal security expenditure. Defense expenditure is the quantum of fund allocated to the purchase and management of military facility (Army, Navy and the Air Force). It involves the administration expenses of the defense departments and other governmental agencies engaged in defense projects. Internal security expenditure refers to spending on the security agencies such as the police, civil defense, legal vigilante, prisons, e.t.c. for the protection of the domestic territory and citizens.

Security of persons and property from domestic or foreign threats is essential for the operation of markets and the incentives to invest and innovate (Olumuyiwa and Olalekan, 2014). Lack of peace and security constitute a distortion in economic activities. Dunne (2000) opined that war and lack of security are some of the major obstacles to development. These results in local and foreign investors being sceptical of investing in the economy leading to a deficiency in capital in-flow, shift of government attention from more productive sectors to defense sector and a great disorder in the socio-economic structure. Peace is an important precondition for economic development in the world. In

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the absence of peace and calmness, there is little or no incentive for people to undertake productive investments in an economy. This accounts for the reason why many nations of the world make effort towards maintaining peace and security in and outside their territories.

Expenditures on defense and internal security in Nigeria have been increasing steadily over the years. In year 1994, defense expenditure and internal security expenditure were N4.21 billion and N4.4 billion respectively. The expenditures on defense and internal security rosed to over 100 percent in 1999 during the birth of democracy in Nigeria, that is, N53.16 billion and N38.66 billion respectively. In year 2006, the security spending rose to N84.15 billion for defense expenditure and N117.96 billion for internal security expenditure. This was as a result of emergence of militants in the Niger Delta region. Expenditures on defense and internal security further increased to N198.71 billion and N224.2 billion in year 2010 respectively. The increase was due to the occurrence of high rate of kidnapping and robbery in the South Eastern region of Nigeria. In years 2012 and 2018, expenditures on defense and internal security were N296.8 billion and N362.5 billion as well as N442.15 billion and N489.65 billion respectively. This was as a result of advent of insurgency and terrorism (Boko Haram, Banditry, Herdsmen fighters etc.) in the Northern region of Nigeria. Given the level of insecurity in Nigeria, the persistent and continuous upward trend of security spending is unjustified. Excluding the introduction, the rests of this study includes empirical literature; materials and method; result and discussion as well as conclusion.

EMPERICAL LITERATURE

Oriavwote and Eshenake (2013) used Error Correction Model and found out that the expenditure on defence has a negative impact on the level of economic growth.

Odusola (1996) who employed simultaneous equation model to estimate the relationship between military expenditure and economic growth in Nigeria found that aggregate military expenditure was negatively related to economic growth.

Olumuyiwa and Olalekan (2014) using ARDL bounds testing approach to co-integration, results showed that military spending has negative and significant effect on output in the short-run but positive and significant effect in the long-run. Labour and capital have positive and significant effects both in the long-run and short-run.

Danek (2013) asserted the military expenditures explain only 46% of the changes of GDP. That is military expenditure has no meaningful effect on growth. Also, the correlation coefficient showed that there is 68% negative relationship between the variables of the military expenditure and GDP.

Enimola (2008) studied the relationship between the level of economic growth and defense expenditure in Nigeria between 1977 and 2006. He employed the supply model based on the production function extended by Biswas and Ram (1986). The result showed that there is a unidirectional causality running from economic growth to defence spending. In the study of the impact of security expenditure on the level of economic growth in Nigeria.

Yildirim, Ocal, and Keskin (2011) argued that there is positive relationship between military expenditure and economic growth. They also stated that disarmament does indeed provide an opportunity for improved economic performance.

Dakurah, Davies and Sampath (2001) using granger causality testing procedures found some evidence of unidirectional causality from military expenditure to growth and from growth to military expenditure in a number of countries, as well as a feedback relationship in others.

Halicioglu (2004) in his study on defense expenditure and economic growth in turkey using macroeconomic theory and multivariate co-integration procedure, there exists a positive relationship between aggregate defense spending and aggregate output in turkey.

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Tiwari and Shahbaz (2011) investigated the effect of defense spending on economic growth using ARDL bounds testing approach to co-integration in augmented version of Keynesian model for Indian economy. They found out that there is long run relationship between the variables, and also there is positive effect of the defense spending on economic growth.

Anyanwu (2011) investigated defence spending and economic growth in Nigeria using a Vector Error Correction model. The study found that there is a positive relationship between military expenditure and economic growth in the long and short run.

Smith (1980) and Fiani, Anne and Taylor (1984) in their study on defence burdens, capital formation and economic growth showed a negative impact of defense spending on economic growth.

Joerding (1986) in a study on economic growth and defence spending used granger causality test and concluded that defence expenditure are not strongly exogenous and that it is reasonable to assume economic growth as an endogenous variable.

Ferda (2004) using new macroeconomic theory and multivariate cointegration procedure studied defense spending and economic growth in Turkey for the period 1950-2002 and found a positive long run relationship between aggregate defense spending and aggregate output in the country.

Olaniyi (1993) observed that the defense sector in Nigeria contributed positively for real growth of GDP and has a dampening effect on inflation rate. However, the impact was statistically low.

Dakurah, Davies and Sampath (2001) used cointegration and error correction model to study the causal relationship between the military burden and economic growth for 62 countries and found no common causal relationship between the military burden and economic growth among these countries.

Hassan, Waheeduzzanan and Rahman (2003) in their study on defence expenditure and economic growth in the SARCC countries. Using data covering the period between 1980 and 1999 found a positive relationship between military expenditure and economic growth.

Aigbedion, Idris & Osuoha (2019) employed Ordinary Least Squares and Error Correction Model to study government security spending, foreign direct investment and economic growth in Nigeria from 1986-2017and found that government internal security spending shows strong and positive impact on economic growth in Nigeria.

Materials and Method

Systematic time series econometrics approach is used to analyse the effect of expenditures on defense and internal security on economic growth of Nigeria during the period 1981-2018. Unit root test, Cointegration test, Error correction model (ECM) and Granger casuality test were used to verify the stationarity of the variables, determine the number of cointegration equations between the variables, check the speed of adjustment from short-run to long-run equilibrium and finally check the casual relationship between the variables.

The model is specified in the functional form as follows:

$GDP = f(DEXP, ISEXP)$ ..... (1)

The functional transformation of the model is thus:

$GDP = f(DEXP, ISEXP) + \mu$ .....(2)

Therefore, the mathematical form of the model is thus:

$GDP = \alpha_0 + \alpha_1 DEXP + \alpha_2 ISEXP + \mu$ .....(3)

Where:

GDP = Gross Domestic Product (proxy of economic growth)

DEXP = Defense Expenditure

ISEXP = Internal Security Expenditure

μ = Error term

α_0, α_1, and α_2 are parameters.

Hence, the expectations of the parameters are $\alpha_1, \alpha_2, > 0$.

The re-specification of the model so as to include an error correction term (ECT) is thus:

$\Delta GDP = \alpha_0 + \alpha_1 \Delta DEXP_{t-1} + \alpha_2 \Delta ISEXP_{t-1} + \alpha_3 ECT_{t-1} + \mu_t$ .....(4)

Where ECT = Error Correction Term.

The Granger causality test is predicated in this case, on the following regression analysis:

$GDP_t = \beta_0 + \Sigma a_i GDP_{t-i} + \Sigma b_i DEXP_{t-i} + \Sigma c_i ISEXP_{t-i} + \mu_{1t}$ ..... (5)

$DEXPt = z_0 + \Sigma \Omega_i GDP_{t-i} + \Sigma \partial_i DEXP_{t-i} + \Sigma R_i ISEXP_{t-i} + \mu_{2t}$ ..... (6)

$ISEXPt = n_0 + \Sigma v_i GDP_{t-i} + \Sigma f_i DEXP_{t-i} + \Sigma g_i ISEXP_{t-i} + \mu_{3t}$ ..... (7)

Where μ_{1t} , μ_{2t} , μ_{3t} are the idiosyncratic terms.

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RESULTS AND DISCUSSION

The results of the various tests are presented below:

Table 1. Augmented Dickey- Fuller (ADF) Unit Root Test

Variables	ADF test Statistic	5% critical value	Order of integration	Probabilty
D(GDP)	-5.566220	-3.540328	1(1)	0.0003
D(DEXP)	-6.203531	-3.540328	1(1)	0.0001
D(ISEXP)	-6.089502	-3.540328	1(1)	0.0291

Source: Researchers' Computation, 2020.

The result of the ADF test as presented in **table 1**, shows that the dependent variable (GDP) and the independent variables (DEXP and ISEXP) are integrated of order one, lag one, 1(1), all at 5% level of significance. That is, they are integrated of the same order. In other words, GDP, DEXP and ISEXP are found to be stationary at first difference. Thus, the model follows integrating process. Therefore, this conclusion is informed because the ADF test statistic for difference one (1) is more negative than the critical values at 5% level of significance.

Table 2. Engle-Granger co-integration test

Date: 03/31/20 Time: 19:05
Series: GDP DEXP ISEXP
Sample: 1981 2018
Included observations: 38
Null hypothesis: Series are not cointegrated
Cointegrating equation deterministics: C
Automatic lags specification based on Schwarz criterion (maxlag=9)

Dependent	tau-statistic	Prob.*	z-statistic	Prob.*
GDP	-4.064774	0.0419	-23.51583	0.0304
DEXP	-4.311734	0.0246	-25.18444	0.0187
ISEXP	-3.550876	0.1139	-19.20712	0.0946

*MacKinnon (1996) p-values

Source: Researchers' Computation, 2020.

The result in **table 2** above indicates the presence of 2 co-integrating equations at 5% level of significance for the GDP model and therefore confirms the existence of long-run equilibrium relationship between GDP and its explanatory variables (DEXP and ISEXP). The conclusion is based on the values of t-prob. against values of z-prob. at 5% significance level.

Table 3. Parsimonious Error Correction Model Result

Dependent Variable: D(GDP,1)
Method: Least Squares
Date: 03/31/20 Time: 19:14
Sample (adjusted): 1982 2018
Included observations: 37 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(DEXP,1)	1.589839	22.73975	6.991452	0.0000
D(ISEXP,1)	-3.174434	20.35024	-1.559901	0.1283
ECM(-1)	-0.276537	0.126078	-2.193383	0.0354
C	1.938214	704.9480	2.749443	0.0096

R-squared	0.604978	Mean dependent var	3.450492
Adjusted R-squared	0.569067	S.D. dependent var	5.849527
S.E. of regression	3839.952	Akaike info criterion	19.44611
Sum squared resid	4.877808	Schwarz criterion	19.62027
Log likelihood	-355.7531	Hannan-Quinn criter.	19.50751
F-statistic	16.84654	Durbin-Watson stat	1.798408
Prob(F-statistic)	0.000001		

Source: Researchers' Computation, 2020.

The parsimonious result in **table 3** above shows that the model has a good-fit as the coefficient of determination (R-squared) is 60% with no autocorrelation as suggested by Durbin-Watson (D.W) statistic. Hence, the overall regression is also highly significant. The error correction model (ECM) coefficient is negatively signed and significant. This implies that about 28% deviation from the long-run equilibrium relationship

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between GDP and its determinants are corrected every one year. There is therefore empirical evidence that there exist a long-run relationship between GDP and explanatory variables (DEXP and ISEXP).

Table 4. Granger Causality Test Result

Pairwise Granger Causality Tests
Date: 03/31/20 Time: 19:18
Sample: 1981 2018
Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
DEXP does not Granger Cause GDP	36	1.13743	0.3337
GDP does not Granger Cause DEXP		10.1360	0.0004
ISEXP does not Granger Cause GDP	36	9.48606	0.0006
GDP does not Granger Cause ISEXP		3.02123	0.0633
ISEXP does not Granger Cause DEXP	36	3.85089	0.0321
DEXP does not Granger Cause ISEXP		0.77834	0.4679

Source: Researchers' Computation, 2020.

The causality test result in **table 4** above shows that there is unidirectional causality between GDP and DEXP as well as ISEXP and GDP as explained by the probability values. It means that, GDP granger causes DEXP and DEXP does not granger causes GDP but ISEXP granger causes GDP and GDP does not granger causes ISEXP. This simply implying that GDP can be used to predict the future behaviour DEXP and ISEXP can also be used to predict the future behaviour GDP of Nigeria.

The result in **table 3** above revealed that DEXP has significant positive effect on GDP. This meets the a priori expectation that a unit increase in DEXP will lead to an approximately 1.6 units increase in GDP. This contradicts the findings of Oriavwote and Eshenake (2013), Odusola (1996), and Olumuyiwa and Olalekan (2014) who found that defense expenditure exerts negative and significant effect on gross domestic product (GDP) in Nigeria. But the result confirms the findings of Anyanwu (2011), Olaniyi (1993) and Yildirim, Ocal, and Keskin (2011) on the effect that defense expenditure and gross domestic product are positively and significantly related. The result further revealed that internal security expenditure exerts negative and insignificant effect on GDP. This does not meet the a priori expectation. By implication it means that economically the increase in internal security expenditure is expected to increase GDP, but from the result obtained in this study, it has contributed negatively to GDP in Nigeria within the study period.

CONCLUSION

The major aim of this study is to examine the effect of expenditures on defense and internal security on economic growth of Nigeria proxied by GDP during the period 1981-2018 using Error Correction Model (ECM). Analysis from the estimation suggests that all the variables were stationary at first difference, thus, there exist a long-run relationship between security spending and economic growth. Defense expenditure has significant positive effect on GDP. This implies that as defense expenditure rises, GDP will also rise and vice versa. It was also discovered that the relationship between internal security expenditure and GDP did not conform to a priori expectations. Hence, the economic and statistical result of this part nullified the a priori expectation in Nigerian contest which stated that internal security expenditure ought to improve GDP in Nigeria, rather, it has performed otherwise over time. Therefore, the researchers recommend that federal government should investigate any misappropriation of funds, proper monitoring of the activities of security agencies and overall administration of security architects in the system so as to achieve macroeconomic objective of sustainable economic growth.

The results from the estimation also revealed that there is evidence of causality running from GDP to DEXP and ISEXP to GDP. That is, GDP granger cause DEXP and ISEXP granger cause GDP, indicating existence of two different unidirectional causality.

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APPENDIX 1

GDP, DEXP AND ISEXP DATA

Year	GDP	DEXP	ISEXP
1981	94.33	-	-
1982	101.01	-	-
1983	110.06	-	-
1984	116.27	-	-
1985	134.59	-	-
1986	134.6	-	-
1987	193.13	-	-
1988	263.29	-	-
1989	382.26	-	-
1990	472.65	-	-
1991	545.67	-	-
1992	875.34	-	-
1993	1089.68	-	-
1994	1399.7	4.21	4.4
1995	2907.36	6.6	5.26
1996	4032.3	10.82	11.16
1997	4189.25	14.21	11.06
1998	3989.45	14.76	11.98
1999	4679.21	53.16	38.66
2000	6713.57	43.4	25.15
2001	6895.2	47.07	38.85

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2002	7795.76	69.13	63.24
2003	9913.52	51.06	68.38
2004	11411.07	76.32	97.8
2005	14610.88	71.67	81.95
2006	18564.59	84.15	117.96
2007	20657.32	72.1	181.29
2008	24296.33	95.85	196.9
2009	24794.24	54.84	221.65
2010	54612.26	198.71	224.2
2011	62980.4	283.2	280
2012	71713.94	296.8	362.5
2013	80092.56	272.33	292.72
2014	89043.62	274.53	273.14
2015	94144.96	330.59	410.2
2016	101489.49	380.17	417.66
2017	113711.63	361.92	397.95
2018	127762.55	442.15	489.65

Source: CBN Statistical Bulletin, 2019

GDP = Gross Domestic Product

DEXP = Defense Expenditure

ISEXP = Internal Security Expenditure

APPENDIX 2

ADF TEST ON GDP

Null Hypothesis: D(GDP) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.566220	0.0003
Test critical values:	1% level	-4.234972	
	5% level	-3.540328	
	10% level	-3.202445	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(GDP,2)
Method: Least Squares
Date: 03/31/20 Time: 18:57

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Sample (adjusted): 1983 2018
Included observations: 36 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(GDP(-1))	-0.977264	0.175570	-5.566220	0.0000
C	-3401.380	1743.802	-1.950554	0.0596
@TREND("1981")	352.6040	94.11318	3.746595	0.0007

R-squared	0.485908	Mean dependent var	390.1178
Adjusted R-squared	0.454751	S.D. dependent var	6306.924
S.E. of regression	4657.094	Akaike info criterion	19.80983
Sum squared resid	7.16E+08	Schwarz criterion	19.94179
Log likelihood	-353.5769	Hannan-Quinn criter.	19.85588
F-statistic	15.59542	Durbin-Watson stat	1.992836
Prob(F-statistic)	0.000017		

Source: Researchers' Computation, 2020.

APPENDIX 3

ADF TEST ON DEXP

Null Hypothesis: D(DEXP) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-6.203531	0.0001
Test critical values:	1% level	-4.234972	
	5% level	-3.540328	
	10% level	-3.202445	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(DEXP,2)

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Method: Least Squares
Date: 03/31/20 Time: 18:59
Sample (adjusted): 1983 2018
Included observations: 36 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(DEXP(-1))	-1.112566	0.179344	-6.203531	0.0000
C	-11.51803	11.69471	-0.984892	0.3318
@TREND("1981")	1.278546	0.550296	2.323377	0.0265

R-squared	0.540033	Mean dependent var	2.228611
Adjusted R-squared	0.512156	S.D. dependent var	46.90805
S.E. of regression	32.76333	Akaike info criterion	9.896152
Sum squared resid	35423.37	Schwarz criterion	10.02811
Log likelihood	-175.1307	Hannan-Quinn criter.	9.942209
F-statistic	19.37211	Durbin-Watson stat	1.992973
Prob(F-statistic)	0.000003		

Source: Researchers' Computation, 2020.

APPENDIX 4

ADF TEST ON ISEXP

Null Hypothesis: D(ISEXP) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 8 (Automatic - based on SIC, maxlag=9)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-6.089502	0.0291
Test critical values:	1% level	-4.323979	
	5% level	-3.580623	
	10% level	-3.225334	

*MacKinnon (1996) one-sided p-values.

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Augmented Dickey-Fuller Test Equation
Dependent Variable: D(ISEXP,2)
Method: Least Squares
Date: 03/31/20 Time: 19:00
Sample (adjusted): 1991 2018
Included observations: 28 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(ISEXP(-1))	-2.728707	1.305912	-6.089502	0.0291
C	-48.38422	25.43786	-1.902055	0.0742
@TREND("1981")	3.727076	1.645809	2.264585	0.0369

R-squared	0.934327	Mean dependent var	3.275000
Adjusted R-squared	0.895696	S.D. dependent var	59.61814
S.E. of regression	19.25435	Akaike info criterion	9.040075
Sum squared resid	6302.413	Schwarz criterion	9.563441
Log likelihood	-115.5610	Hannan-Quinn criter.	9.200073
F-statistic	24.18586	Durbin-Watson stat	2.151340
Prob(F-statistic)	0.000000		

Source: Researchers' Computation, 2020.