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The Impact of Military Spending on Economic Growth in Nigeria Since 1990

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Abstract
This study presents the impact of military expenditure on economic growth in Nigeria since 1990, multiple linear regressions, the model which used in this study, and expressed the per capita GDP as a dependent variable, and military spending, non-military spending and the real interest rate as independent variables in this model. The results suggest that, there is the negative relationship between military expenditure and economic growth, and positive relationship between non-military spending and economic growth, and negative relationship between the real interest rate and economic growth.
Keywords: military spending, Military expenditures, non-military spending, economic growth, Nigeria

1-INTRODUCTION

Wars and conflicts are an obstacle to economic growth, so countries seek to achieve its internal and external security In order to achieve high rates of economic growth. the lack of security leads to the escape of domestic and foreign investments, and slowing economic growth, so we find countries are spending large military spending, to ensure a stable domestic and international system. Military spending is the financial allocations, which the country provides to its military institutions to achieve security and stability, the volume of military spending reflects the country's vision in the face of perils, internal conflicts, and external threats. Military spending has become an important issue, because the transfer of military spending to other economic activities achieves economic growth and increases its rate (Khilji Nasir & Akhtar Mahmood ,1997), Military spending has a positive impact on the process of economic growth (Pradhan Rudra,2010), through the achievement of security and stability, which helps to increase domestic and foreign investment; On the other hand, military spending in developing countries has a negative effect on economic growth (Suna Korkmaz,2015), Because the decision to spend military in the hands of political leadership. Political leadership often has a military background, which is subject to some pressures in the process of military spending are: the personal interests of some military leaders in the holding of these deals, internal ethnic conflicts, pressure from importers of arms. Pressures in the process of military spending makes the allocation of funds for military spending exaggerated, when compared to the circumstances of internal and external threats to this country, which affects the other allocations to the budget of the country. Military spending becomes an obstacle to economic growth (Makhool & Basem, 1999), so this study is concerned with explaining the impact of military expenditure on economic growth in Nigeria using a multiple linear regression model.

2- LITERATURE REVIEW

Biswas and Ram developed the Feder's 1983-1986 models, which measure the impact of exports on growth in developing countries, to measure the relationship between military spending and economic growth, Several studies have used the same Feder's model to measure the relationship between military spending and economic growth (Paul Dunne & Ron Smith, 2001). Deger and Sen, Clarified the diversion of resources from economic, social, and other non-military activities to military activities reduces investment and consumption and the balance of payments is negative affected, as the purchase of arms requires a significant amount of import. With one exception when aggregate demand is less than supply potential within the country, military expenditures will increase the employment of workers and will positively affect the growth process (deger & sen, 1995).

Mintz and Stevenson Pointing to the military expenditures have no significant impact on economic growth, and the level of development in the country is an important factor in determining the relationship between military spending and other macroeconomic variables in developing countries. Military spending can be use to exploit unused productive capacities, create effective demand for factories, the development of the scientific and technical research sector and the determination of the mechanism for the redistribution of income. They also pointed to the absence of a significant relationship between military expenditure and economic growth in the short term (Mintz & Stevenson, 1994). Wilkins found that the average military expenditure fell from 4.78% in 1988 to 2.95% in 2001, as a result of the end of the Cold War and the arms race(Paul Dunne & Ron Smith, 2001). Halicioglu study indicates a positive relationship between military expenditure and total production in Turkey in the long term (Ferda Halicioglu, 2004). Shahbaz and Tiwari studied the impact of military spending on economic growth using an improved version of the Keynesian model of the Indian economy from 1971 to 2010. Shahbaz and Tiwari found that there was a slight positive impact of military spending on economic growth, There is a negative impact on economic growth if military spending increases for a Specific level, This study

also showed a two-way causal relationship between military expenditure and economic growth (Shahbaz & Tiwari, 2011). Dr.Howyda Abd Aazim Zidan found that there is a causal relationship in one direction, between government spending and military spending and per capita income, an increase in government spending will affect military spending and per capita income, On the other hand, there is no impact of military spending on economic growth in long term (Dr.Howyda Abd Aazim Zidan, 2015). Arif and Rashid proved that military spending affects economic growth (Arif and Rashid, 2012). Danek confirmed a negative relationship between military spending and GDP, These results were over a short period for the difficulty of measuring over a large time period Due to the presence of many deviations in the Czech Republic (Danek, 2013). Eniola proved that the relationship between the level of economic growth and military expenditure in Nigeria for 1977-2006 is negative (Eniola, 2008). Olofin study shows that military spending increases poverty rates in Nigeria (Olofin, 2012). Sam S. Enimola and Akungba, say it is better to channel resources to spend on the growth process than to use it for military spending in Nigeria. Olumuyiwa and Olalekan study showed that spending on labor and capital has a positive effect on growth in both the short and long run. Therefore, the government should reduce its military expenditure and increase expenditure on the development of human capital and capital accumulation (Olumuyiwa and Olalekan, 2014).

3-Model

RGDP = a +b RME +b1 RGE - b2 R + UI (Masoud Ali Khalid & Munadhil Abdul Jabar Abdul Razaq, 2015).

RGDP = Average per capita GDP (constant US $).

RME = Military spending in Nigeria (constant US $).

RGE = Public spending excluding military spending in Nigeria (constant US $).

R = the real rate of interest.

a = the intercept term.

b ،b1 ، b2 = The parameters.

UI = Random variables.

4-Data & Unit Root Test & Integration Analysis

Data of the dependent variable GDP And The independent variable R Source: World Bank data ,While the independent variable RME and RGE Source: Stockholm Institute for Peace (SIPRI, 2017).

Variable	Definition	Data Source	Variable type
GDP	Real GDP per capita	World Bank	Dependent
RME	Military expenditure	SIPRI (2017)	independent
RGE	Public spending without military spending	SIPRI (2017)	independent
R	real rate of interest	World Bank	independent

Time-series of study variables, it was not stable at the level except the time-series of variable R, They were stable at this level for both the ADF test, PP. Therefore, the first-order variance test was perform for the remaining time-series, the results indicated that time-series were stable, this means that all time-series are stable, giving a good indicator to complete a form estimate.

Augmented Dickey-Fuller and Phillip-Perron unit root test results Nigeria

Variable	ADF				PP			
	level		The first difference		level		The first difference	
	T-statistic	Prob	T-statistic	Prob	T-statistic	Prob	T-statistic	Prob
GDP	0.237	0.96	-3.67	0.01	0.068	0.95	-3.67	0.01
RME	-1.44	0.54	-5.43	0.0001	-1.44	0.54	-5.43	0.0000
RGE	0.469	0.98	-5.96	0.0001	0.799	0.99	-5.96	0.0000
R	-5.33	0.0002			-5.33	0.0002		

The results of the Johansson-Integration test indicate rejecting the initial hypothesis, that there was no common integration between the time-series of the study variables. The second hypothesis reject by the existence of a single integration vector at most. The third hypothesis reject that there were at least two vectors of integration, and accept the fourth hypothesis that there are three vectors of integration at most. The conclusion is that there are three vectors of the common integration between the time series at most; this is a good indicator to proceed with the estimation of the model.

Johansson test

Likelihood Ratio	Critical value Sig level = 0.05	Hypothesized No. of CE(s)
41.07	47.85	*None
19.50	29.79	*At most 1
7.00	15.49	*At most 2
0.20	3.84	At most 3
denotes rejection of the hypothesis at the 0.05 level		

5-Result

Using the OLS method to estimate the parameters of the standard model used by Eviews8, the results were as follows:

Variable	coefficient	S.E	T-statistics	P-value
Constant	732.931	40.413	18.135	0.0000
RME	-5.113	4.667	1.095-	0.2851
RGE	5.087	3.171	16.044	0.0000
-R	0.366	0.970	0.377	0.7092
R-squared = 0.97, Adj R-squared = 0.97, DW = 1.45.				

At the level of 5%

GDP = 732.931 - 5.113*RME + 5.087*RGE + 0.366*-R

The results of the multiple linear regression model estimate for time series variables indicate that R-squared = 0.97 means that independent variables show 97% of the change in the dependent variable, The high R-squared value can indicate results are false and misleading. But the value of F-Statistic = 277.5 and F-Statistic Prop = 0.000 Denies it, indicating a significant relationship between the dependent variable and independent variables in general, DW = 1.45 indicates that the model is free from the self-correlation, which also indicates the quality of the model, As well as the validity of the relationship between the economic variables to be estimated. The results show that there is a negative correlation between military expenditure and economic growth in Nigeria. The increase in military expenditure affects Nigeria's average GDP per capita (increase in military expenditure by 1unit leads to a 5.1units per capita GDP reduction). There is also a positive correlation between non-military spending and economic growth in Nigeria. The increase in non-military spending leads to an increase in average per capita GDP (one-unit increase in non-military spending leads to increase in per capita GDP by 5.09 units). There is a negative correlation between the real rate of interest and economic growth in Nigeria. The increase in the real interest rate leads to decrease in per capita GDP (increase in the real interest rate by one-unit leads to decrease in per capita GDP by 0.366 units).

In light of the estimation of the standard model of the study on the method of the lower squares, there are some tests necessary to verify the validity and quality of the estimated model, in order to rely on the results of the assessment are:

a- Normal distribution condition for random error: Using the Jarque-Bera test, the value of the test (J = 2.08) was estimated at (p-value = 0.35), this result indicates the acceptance of the nihilistic assumption that random error follow normal distribution.

b- Variance of the error boundary is constant: using the white test, the test value (N * R-squared = 8.31) with a probability of (p-value= 0.5023) and (F-statistic = 0.836), which means acceptance of the nihilistic hypothesis that consistently assumes variance of the error boundary constant.

c- no self-association: Previously, the estimated DW value of the model was 1.45, Which means the absence of the model of the problem of self-association, Using the LM test, the value of the test (N * R-squared = 1.587) was p-value = 0.4521 and (F-statistic=0.02), which confirms the hypothesis of no self-correlation in the estimated model locks.

d- no linear duplication: variance inflation factors (VIF), it found that all the values of the inflation coefficients for the study variables ranged between 1 and 3.7 indicating no linear duplication in this model.

The previous results of the statistical tests on the model of the study confirm the quality of the model and its safety from any standard defect. Therefore, the results of the model can use in the measurement.

6-CONCLUSIONS

This study examined the impact of military spending on economic growth in Nigeria since 1990 and presented the most important previous studies that dealt with this relationship. The appropriate model was selected, with model formulation in a linear way, because it is the best way to represent the study data. The variables of the

independent interpret more than 97% of the change in the dependent variable. The variables of the independent interpret more than 97% of the change in the dependent variable The Johansson test confirmed the existence of three vectors for the combined integration of the time series of variables.

The results of the estimation of the regression model used for the study: Indicates a negative correlation between the per capita GDP and military expenditure in Nigeria. Moreover, a positive relationship between non-military spending and average GDP per capita. In addition, a negative relationship between the average interest rate and average per capita GDP.

7-Reference

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Data of study variables

year	GDP	RME	RGE	R
1990	1374.436761	755,813,462.37	104,843,135,560.99	14.64821
1991	1331.611999	724,630,295.18	104,090,112,625.59	2.206736
1992	1304.090283	623,396,443.29	112,856,496,357.04	-22.7671
1993	1298.440953	842,682,358.97	112,381,934,934.41	7.90249
1994	1277.992926	591,287,276.57	110,446,069,302.41	-8.25068
1995	1242.738047	681,106,269.17	111,647,810,020.31	-43.5883
1996	1272.72925	577,702,427.28	125,924,936,290.63	-10.2519
1997	1276.24082	621,416,318.85	121,258,858,794.50	16.6779
1998	1278.651315	793,254,600.85	123,066,432,725.16	25.06584
1999	1253.047894	1,342,423,908.89	122,237,847,344.92	3.647892
2000	1287.059256	1,036,663,230.61	126,985,380,543.40	-10.2785
2001	1310.505968	1,476,452,441.17	150,531,037,383.06	26.38775
2002	1326.242969	2,228,700,224.25	153,545,835,370.83	-13.8007
2003	1426.903307	1,371,902,038.11	171,916,735,781.52	7.593118
2004	1860.062377	1,336,520,887.74	225,518,595,222.05	19.09787
2005	1875.029642	1,180,074,691.07	235,702,912,210.50	-3.47832
2006	1976.708469	1,230,020,753.30	229,002,886,319.64	-0.00663
2007	2056.838591	1,428,416,731.54	289,135,610,534.58	11.15699
2008	2128.666632	2,006,354,696.16	281,392,146,366.00	4.731978
2009	2216.499394	2,104,130,364.43	336,350,873,956.66	24.40501
2010	2327.32067	2,470,441,118.82	337,521,540,145.07	-43.2154
2011	2376.638773	2,749,958,569.96	326,203,648,268.28	6.611175
2012	2412.860782	2,422,668,179.77	327,852,326,831.76	6.652029
2013	2475.948058	2,329,213,653.42	379,149,289,461.59	10.5189
2014	2563.092124	2,117,664,192.65	387,548,187,113.32	10.71765
2015	2562.522216	2,065,557,663.35	387,214,637,138.90	13.70285
2016	2455.918559	2,090,770,598.81		6.885399

Source: world Bank, SIPRI (2017).

Johansson test

Date: 08/26/18 Time: 11:07
Sample (adjusted): 3 26
Included observations: 24 after adjustments
Trend assumption: Linear deterministic trend
Series: GDP RGE RME R
Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)

Prob.**	0.05 Critical Value	Trace Statistic	Eigenvalue	Hypothesized No. of CE(s)
0.1864	47.85613	41.07342	0.592844	None
0.4569	29.79707	19.50799	0.405969	At most 1
0.5767	15.49471	7.008233	0.246679	At most 2
0.6468	3.841466	0.209908	0.008708	At most 3

Trace test indicates no cointegration at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Prob.**	0.05 Critical Value	Max-Eigen Statistic	Eigenvalue	Hypothesized No. of CE(s)

0.2435	27.58434	21.56543	0.592844	None
0.4992	21.13162	12.49976	0.405969	At most 1
0.5133	14.26460	6.798325	0.246679	At most 2
0.6468	3.841466	0.209908	0.008708	At most 3

Max-eigenvalue test indicates no cointegration at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegrating Coefficients (normalized by b'*S11*b=I):

R	RME	RGE	GDP
0.069904	6.81E-10	-5.97E-11	0.010766
-0.021521	-2.75E-09	2.44E-12	0.002590
0.048932	-2.22E-09	8.26E-11	-0.014244
0.010003	-7.02E-10	1.46E-11	0.000169

Unrestricted Adjustment Coefficients (alpha):

2.655634	5.610293	-45.72326	-20.52927	D(GDP)
1.33E+09	-2.78E+09	-5.80E+09	3.86E+09	D(RGE)
15004600	1.07E+08	1.11E+08	7575732.	D(RME)
0.700800	-4.239958	2.126050	-13.91805	D(R)

-1336.845	Log likelihood	1 Cointegrating Equation(s):	

Normalized cointegrating coefficients (standard error in parentheses)

R	RME	RGE	GDP
6.492740	6.33E-08	-5.54E-09	1.000000
(1.60684)	(5.8E-08)	(4.2E-10)	

Adjustment coefficients (standard error in parentheses)

-0.221027	D(GDP)
(0.20264)	
41507945	D(RGE)
(4.6E+07)	
81563.73	D(RME)
(814025.)	
-0.149848	D(R)
(0.04196)	

-1330.595	Log likelihood	2 Cointegrating Equation(s):	

Normalized cointegrating coefficients (standard error in parentheses)

R	RME	RGE	GDP
-6.156466	-8.98E-07	0.000000	1.000000
(8.33431)	(1.5E-07)		
-2.28E+09	-173.5201	1.000000	0.000000
(1.5E+09)	(27.5465)		

Adjustment coefficients (standard error in parentheses)

1.11E-09	-0.339455	D(GDP)
(9.2E-10)	(0.17088)	
-0.244192	26480847	D(RGE)
(0.24169)	(4.5E+07)	
-0.000182	368238.6	D(RME)

	(0.00424)	(785831.)	
	8.36E-10	-0.144341	D(R)
	(2.3E-10)	(0.04280)	
-1327.196	Log likelihood	3 Cointegrating Equation(s):	

Normalized cointegrating coefficients (standard error in parentheses)

R	RME	RGE	GDP
-204.4966	0.000000	0.000000	1.000000
(59.4084)			
-4.06E+10	0.000000	1.000000	0.000000
(1.2E+10)			
-2.21E+08	1.000000	0.000000	0.000000
(6.4E+07)			

Adjustment coefficients (standard error in parentheses)

9.93E-08	1.58E-09	-0.419370	D(GDP)
(5.5E-08)	(1.6E-09)	(0.27739)	
24.74614	-0.473655	66043862	D(RGE)
(14.3740)	(0.40716)	(7.2E+07)	
-0.537698	0.008698	-1162716.	D(RME)
(0.23856)	(0.00676)	(1196005)	
-5.92E-09	4.85E-10	-0.083946	D(R)
(1.3E-08)	(3.8E-10)	(0.06737)	

Eviews8

Model estimation

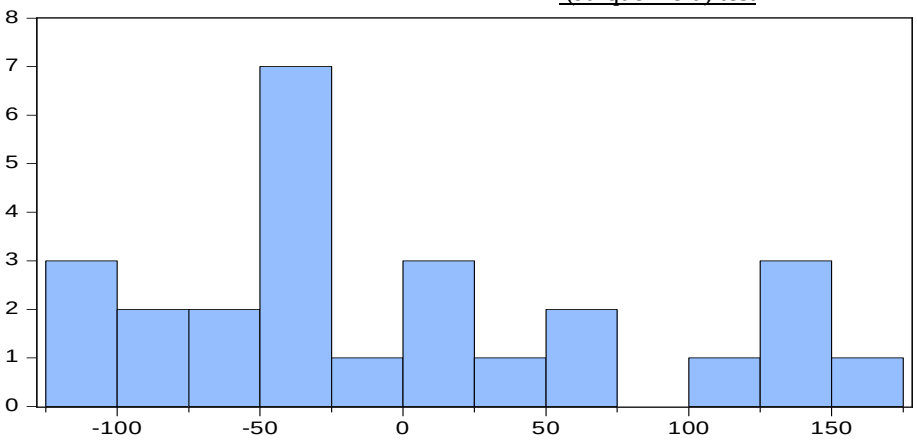
Dependent Variable: GDP
Method: Least Squares
Date: 08/26/18 Time: 13:27
Sample (adjusted): 1 26
Included observations: 26 after adjustments

Prob.	t-Statistic	Std. Error	Coefficient	Variable
0.0000	18.13567	40.41381	732.9315	C
0.2851	-1.095584	4.67E-08	-5.11E-08	RME
0.0000	16.04499	3.17E-10	5.09E-09	RGE
0.7092	0.377789	0.970682	0.366713	-R

1734.342	Mean dependent var	0.974255	R-squared
504.1166	S.D. dependent var	0.970744	Adjusted R-squared
11.89245	Akaike info criterion	86.22553	S.E. of regression
12.08600	Schwarz criterion	163566.5	Sum squared resid
11.94818	Hannan-Quinn criter.	-150.6018	Log likelihood
1.450376	Durbin-Watson stat	277.5119	F-statistic
		0.000000	Prob(F-statistic)

Eviews8

(Jarque-Bera) test



Series: Residuals	
Sample 1 26	
Observations 26	
Mean	-2.99e-13
Median	-29.66213
Maximum	152.0903
Minimum	-111.2187
Std. Dev.	80.88672
Skewness	0.561433
Kurtosis	2.185035
Jarque-Bera	2.085412
Probability	0.352500

Eviews8

White test

Heteroskedasticity Test: White

0.5942	Prob. F(9,16)	0.836572	F-statistic
0.5023	Prob. Chi-Square(9)	8.319800	Obs*R-squared
0.9396	Prob. Chi-Square(9)	3.529496	Scaled explained SS

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 08/26/18 Time: 16:30
Sample: 1 26
Included observations: 26

Prob.	t-Statistic	Std. Error	Coefficient	Variable
0.9268	0.093315	11272.31	1051.870	C
0.9742	0.032829	1.13E-14	3.72E-16	RME^2
0.6702	0.433828	1.30E-16	5.63E-17	RME*RGE
0.6698	-0.434414	4.21E-07	-1.83E-07	RME*-R
0.6685	-0.436164	1.72E-05	-7.49E-06	RME
0.3871	-0.889083	5.23E-19	-4.65E-19	RGE^2
0.7866	0.275372	3.26E-09	8.99E-10	RGE*-R
0.4546	0.766458	1.28E-07	9.79E-08	RGE
0.6493	0.463374	3.705699	1.717124	-R^2
0.8348	-0.211932	198.3559	-42.03789	-R

6291.020	Mean dependent var	0.319992	R-squared
6983.985	S.D. dependent var	-0.062512	Adjusted R-squared
20.88499	Akaike info criterion	7198.968	S.E. of regression
21.36887	Schwarz criterion	8.29E+08	Sum squared resid
21.02433	Hannan-Quinn criter.	-261.5048	Log likelihood
1.433586	Durbin-Watson stat	0.836572	F-statistic
		0.594221	Prob(F-statistic)

Eviews8

LM ختبا

Breusch-Godfrey Serial Correlation LM Test:

0.5325	Prob. F(2,20)	0.650451	F-statistic
0.4521	Prob. Chi-Square(2)	1.587888	Obs*R-squared

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 08/27/18 Time: 10:06
Sample: 1 26
Included observations: 26
Presample missing value lagged residuals set to zero.

Prob.	t-Statistic	Std. Error	Coefficient	Variable
0.9890	0.013978	41.13620	0.575008	C
0.6827	0.414858	5.09E-08	2.11E-08	RME
0.6710	-0.431109	3.49E-10	-1.50E-10	RGE
0.8320	-0.214877	1.071323	-0.230203	-R
0.3868	0.884720	0.232430	0.205636	RESID(-1)
0.5718	0.574908	0.244896	0.140793	RESID(-2)

-2.99E-13	Mean dependent var	0.061073	R-squared
80.88672	S.D. dependent var	-0.173659	Adjusted R-squared
11.98328	Akaike info criterion	87.62908	S.E. of regression
12.27361	Schwarz criterion	153577.1	Sum squared resid
12.06688	Hannan-Quinn criter.	-149.7826	Log likelihood
1.738105	Durbin-Watson stat	0.260180	F-statistic
		0.929512	Prob(F-statistic)

Eviews8

variance inflation factors

Variance Inflation Factors
Date: 08/27/18 Time: 10:25
Sample: 1 28

Included observations: 26

Centered VIF	Uncentered VIF	Coefficient Variance	Variable
NA	5.711645	1633.276	C
3.573288	19.09002	2.18E-15	RME
3.649368	19.35244	1.01E-19	RGE
1.040497	1.055830	0.942223	-R

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