DEFENSE EXPENDITURE AND ECONOMIC GROWTH: THE NIGERIA EXPERIENCE 1977-2006

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ABSTRACT

The study presents empirical evidence on the relationship between the level of economic growth and defense expenditures in the case of Nigeria from the period of 1977 to 2006. The study employed the supply model based on the production function proposed in Feder(1983) as extended by Biswas and Ram(1986).It further explore the use of unit root tests and found that the variables of capital stock, labor stock, defense expenditure are all stationary at the first difference except for labor stock which was stationary at the first level. The result of the Granger causality test shows that there is a unidirectional causality running from economic growth to defense spending. This study suggests that for Nigeria, a policy of increasing the defense budget to promote economic development growth might be inappropriate, but that same funds channeled towards other governmental program.

KEYWORDS: Defense Spending, Aggregate Output, Stationarity Test, Causality Test, Feder-Ram model

JEL Classification: C30, O49, E69, H50

1.0 INTRODUCTION

There has been wide literature on defense spending and economic growth. However, the conclusion about the direction of the causal relationship between the two is ambiguous. Studies have found that defense expenditure can influence an economy both positively and negatively. For example, military expenditure can affect an economy positively through an expansion of aggregate demand or through increase security (Waheeduzzaman and Rahman, 2003); and negatively through a crowding out of investment (Deger, 1986). However there are limited study as to the direction of causal effect between defense expenditure and economic growth.

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In the Keynesian submission, defense expenditure which is an integral part of government expenditure serve as an injection to the economy, and as such could positively stimulate the economy through the multiplier mechanics. The increase in any of the aggregate demand variables will increase the capital stock in the society, which will lead to higher profit and may induce higher investment, thus generating short run multiplier effects and higher growth rates on the aggregate economy.

Benoit (1973, 1978) argued that with increase in military expenditure, economic growth can be promoted by increasing human capital capabilities of the workforce through provisions of education where the military industries may provide valuable skill. There are also externalities in defense spending that are crucial to economic growth like the provision of road infrastructure which can be used by both the military and civilian (Barro and Sala.i Martins 1995)

On the contrary, arguments equally suggested, that there exists a negative relationship between defense spending and economic growth. Levine and Renant (1992) argued that, since defense spending is financed by taxation, taxation will not only reduce the amount of resources available to the private sector, but equally affects relative prices like real wage and real interest rates which ultimately distorts economic decisions. Moreover, this negative trend may have a negative impact on economic growth. Defense spending may also crowd out not only private investment but other government spending that could stimulate human capital formation (Shieh et at, 2002). Also, defense spending could create bottlenecks in the demand for highly qualified labor and take resources away from civilian Research and Development activities. Given that government sector is prone to low productivity, the diversion of resources away from civilian to military purposes may impede long term country productivity, technological projects and growth.

The objective of this paper is to examine the direction of the causal effect between defense expenditure and economic growth in Nigeria from 1977-2006. The choice of this period is underscore by the fact that considerable part of the period under discussion fall under Nigeria military rule couple with the involvement of Nigeria state in heavy international military peace keeping in some Africa countries; these developments influenced the amount expended on defense. The paper is divided into five sections. Section two reviews related literature while section three provides the methodology for the study. Section four contains the analysis of the findings and the last section provides for the summary, conclusion and policy recommendations.

2.0 LITERATURE REVIEW

2.1 THEORETICAL FRAMEWORK

There has been towering controversy over the role of the state in the regulation of the economic system. While the Classical and the Neo classical Economists do not see any reason why government should intervene in the economy, Keynesian school of thought advocates the use of fiscal instruments to stimulate economic activities in time of recessions. The Classicists are of the opinion that the market forces will automatically bring the economy to long run equilibrium through adjustment in the labor market, while Keynesian argued that market mechanism regulation of the economy will fail to propel the economy back to equilibrium in the face of any maladjustment due to the rigidities inherent in the labor market. Thus, Keynesian prescribed expansionary fiscal policies to avoid long recessions.

Because of the effects of crowding out phenomena, there is the tendency for public goods to be substituted for private goods; this will create a gap in the private spending on some economic activities like education, health, transportation and other goods and services. The Classical and the Neo-classical schools found fiscal policy to be ineffective. In the same vein, the pressure of the public sector to increase their spending may compel them to source for financial resources in the credit market. This will result into higher interest rate which may hamper private investment.

However, the introduction of new growth theories (Romer 1986, Lucas 1988) suggests that there exist both temporary effect from government intervention during the transition to equilibrium; and a possible long term effect from government spending on growth. This submission is against the thesis of neoclassical growth model as formulated by Solow (1956) which did not prescribe the channels through which government spending may influence long run economic growth.

There are many ways that government activities can affect economic growth. The action may be beneficial and at the same time be detrimental. The positive side of government action can result in:

(i) The supply of pure public goods which may constitute a sizeable component of aggregate demand

(ii) The use of fiscal instrument like income taxes and transfer payments which can lead to more equitable redistribution of income

(iii) Government often acts as facilitator in the markets with asymmetric and imperfect information (Poot, 2000.)

The action of the state may also impede economic growth. This is possible as a result of competition between the less efficient public sector and the private sector in the credit market which may jack up interest rate thereby dislocating private investment and eventually hampering economic

growth. Also, taxes imposed by the state can equally distort market prices and effective resources allocation.

Wagner's (1980) law suggested a different direction of causality between government spending and economic growth. Wagner argued that as the economy improves or expand, government spending tends to expand relative to national income. This thesis was built on the hypothesis that:

(i) Public functions can substitute for private activities

(ii) Government intervention is required to manage and finance natural monopolies

(iii) Expansion in the economy will lead to improvement in cultural and welfare expenditures

In summary, expanding state spending is seen as the product of economic development and not vice – versa.

The Keynesian effects of Wagner's law, present two opposite positions concerning the relationship between economy growth and government spending. While according to Keynes, causality runs from government spending to economic growth, Wagner law postulated that causality runs in the opposite direction.

From the foregoing, military spending can be captured within the logic of explaining government spending. Defense spending can have an adverse effect on economic growth through the crowding out of private investment. It may also distort resources allocation, and the diversion of resources from productive activities to the accumulation of armaments and the maintenance of sizeable military forces.

Defense spending can equally affect the economy positively through an expansion of the aggregate demand (Keynesian effects). This will lead to increase in the utilization of idle capital, higher employment, profit and higher investment which will cause the economy to grow.

2.1 EMPIRICAL REVIEW

There have been growing empirical evidence of the impact of defense spending and economic growth. However, the results that emerged have been mixed and subject to criticism due to the use of inappropriate empirical techniques. The neoclassical single supply side model of growth based on Feder (1982), Ram (1986) Biswas and Ram (1986) which is referred to as the Feder – Ram model has been used to analyze the effect of defense spending on growth. The Keynesian demand side model derived from the Keynesian representation of aggregate demand and built on the initial work of Smith (1980) has also been adopted to analyze the relationship between defense spending and growth.

Another group consists of simultaneous equation model which incorporate the demand and supply sides to measure the impact of defense expenditure on growth and is based on the work of Deger and Smith (1983) and Deger (1986), and is known as the Deger type model. However, there appears to be no clear agreement on the nature and extent to which the growth effects of military expenditure from there empirical studies.

Using the Feder – Ram model, Ram (1986), Atesoglu and Mueller (1990) and Ward *et al* (1991) found a positive impact while Biswas and Ram (1986), Alexander (1990) and Huang and Mintz (1991) concluded that there exists no relationship at all. With regard to the single demand side equation, Smith (1980) Fiani et al (1984) and Raster and Thomson (1988) showed a negative impact of defense spending on economic growth. Dakurah *et al* (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.

Cross section growth regressions have been used to assess the relationship between military spending and economic growth. Benoit (1973, 1978) used the spearman rank order correlation and regression analysis showed that defense spending positively affects economic growth in a sample of 44 Less Developed Countries in the period 1950 to 1965. However, other studies found a negative effect of defense spending either directly Lim (1983) or indirectly through their negative impact on savings Deger and Smith (1985), investment Deger and Sen (1983) or Exports.

Smith and Smith hypothesized that defense expenditure might help growth through resource mobilization and modernization of equipment. However, they found out that the small positive impact was far outweighed by the indirect effects of lower saving rates in the economy. Taylor *et al* (1980) found out that increases in defense spending had a negative impact on economic growth for all developing countries and for separate regional groupings. Other studies which have grouped developing countries to examine the relationship between defense and growth, have been carried out by Dabelko and McCormick (1977), who grouped the countries by form of government and del Pando (1980), who focused on five South American countries.

Using one sample of 15 observations from each of the 57 countries, Joerding (1986) concluded that defense expenditure are not strongly exogenous and that it is reasonable to assume economic growth as an endogenous variable. He assumed a common time lag between the cause and the effect; and this might be different for different countries. By aggregating the samples, Joerding (1986) has assumed a common time lag structure for all countries in the sample (four years in the defense growth variable).

Frederikesen and Lacivita (1987) using Philippine data from 1950 – 1982 suggested that causality runs from economic growth to defense spending and not the other way round as had been suggested by Benoit (1973). A lag structure of two year was found to be correct specification in his model. This suggests that, at its level of economic development, a policy of increasing the defense budget to promote economic growth might be appropriate.

Ferda Halicioglu (2004) using new macro – economic theory and multivariate cointegration procedure to study defense spending and economic growth in Turkey for the period 1950 – 2002, found a positive long run relationship between aggregate defense spending and aggregate output in the country. In addition,the CUSUM and CUSUMSQ tests confirmed the stability of the aggregate output function. Kalyoncu and Yucel (2005) in their study of the relationship between defense spending and economic growth for Turkey and Greece in the period 1950 – 2003 made use of EG cointegration test results. They found that long run equilibrium exist between defense expenditure and income for the two countries and also that long run equilibrium between Turkey defense expenditure and Greece defense expenditure. The causality tests showed that there is a unidirectional causality running from economic growth to defense expenditure only for Turkey.

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. 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. He decomposed expenditure into recurrent and capital military expenditure and found that the former was more growth inhibiting than the latter.

Jeofferey and Edward (2008) using cross national panel regression and causal analysis of Developed and Less Developed countries from 1990 – 2003 showed that military expenditure per soldier inhibit the growth of per capital GDP, net of control variables with the most pronounced effects in Less Developed Countries. The inhibition is manifested in the slowing down of the expansion of the labor force. According to the duo, labor intensive militaries may provide a pathway for upward mobility, but comparatively capital intensive military organization limit entry opportunities for unskilled and under, or unemployed people. They equally argued that deep investment in military hardware also reduce the investment capital available for more economic productive opportunities. However, they found that arms inputs have a positive effect on growth, but only in LDCs.

3.0 METHODOLOGY

3.1 THE ECONOMETRIC MODEL

The econometric model used for this study is the supply model based on the aggregate production function approach. The model is based on the production function proposed in Feder (1983) when looking at how exports affects economic growth and then extended by Biswas and Ram (1986) to include a defense expenditure variable.

Given a two sector economy with a defense M production functions as

$$M = m(L_m, K_m) \qquad 1$$

and a civilian G production function

$$G = G(L_G, K_G, M) \qquad 2$$

when the inputs L_m, L_G, K_m, K_G are labor and capital share allocated to the defense and civilian sectors productivity respectively. The inclusion of *M* in 2 allows for an externality effect for the defense sector to the civilian sector. This externality effect can either be in form of a positive marginal product for defense in (2) or as a relative factor productivity differential for labor and capital in both sectors. The aggregate labor and capital supplies are

$$L = L_m + L_G \qquad 3$$

and

$$K = K_m + K_G \qquad 4$$

and Q is total national income or output

$$Q = M + G \qquad 5$$

Taking the total differential of (5) and dividing by Q gives

$$\frac{dQ}{Q} = \frac{\partial G}{\partial L}\frac{dL}{Q} + \frac{\partial G}{\partial K}\frac{dk}{Q} + \frac{\partial G}{\partial M}\frac{dM}{Q} \qquad 6$$

Multiplying the first term on the RHs of (6) by L/L and the third by M/M becomes

$$\dot{Q} = F_L \dot{L}\frac{L}{Q} + F_k \frac{dk}{Q} + F_m \dot{M}\frac{M}{Q} \qquad 7$$

Equation 7 is the simple form of the Feder Ram model and shows how economic growth depends on labor and capital growth and defense all weighted by their relative shares in output. The partial derivatives, F are then found as estimated coefficients.

Thus the estimated equation for the study derived from the Feder – Ram model is

$$y = \alpha_0 + \alpha_1 \ln l + \alpha_2 \ln k + \alpha_3 \ln def + \varepsilon \qquad 8$$

Where y = real GDP

l = labor force proxy by expenditure an education and Health

k = Capital stock proxy by Gross fixed capital formation

def = defence expenditure

ε = error term

α_0 = constant

α_1 ..... α_3 = parameter of estimate

$\alpha_1, \alpha_2 \ \alpha_3 > 0$

The use of expenditure on health and education as a proxy for labor in Nigeria is as a result of non availability of correct and up to date data on labor force. Since education and health can be used to measure human capital development, and since human capital development can be used as a measure of labor force, thus the use or expenditure on health and education as a proxy for labor force.

3.2 THE DATA

The study utilized secondary data to obtain values for the variables in the model. The data were sourced from the Bureau of Statistics Abstract of Statistics and Central Bank of Nigeria Statistical Bulletin (various issues 1978-2008).

The nature of the data is time series. It has been established in literature that time series process if not checked for stationarity could lead to spurious results, hence the need to check for the order of integration using the conventional method of Augmented Dickey – Fuller (ADF) and Philip – Perron (PP) tests.

4.0: ESTIMATION AND ANALYSIS OF RESULTS

4.1: UNIT ROOT

TABLE 1 UNIT ROOT TESTS RESULT

Variable	ADF	Order of integration	PP	Order of integration
L_n Q	-6.975	1(1)	-8.125	1(1)
L_n L	-3.624	1(1)	-3.758	1(0)
L_n K	-3.736	1(1)	-3.736	1(1)
L_n Def	-8.097	1(1)	-8.863	1(1)

5% ADF critical values for the test is -2.986

5% PP critical values for the test is – 2.99

Table 1 reports results of non – stationary test for lng, lnk, lnl, indef using ADF and PP tests. We reported a constant but no time trend result of ADF test. Test results indicate that the hypothesis of

a unit root in lnq, lnl, lnk and indef cannot be rejected swhile the hypothesis of a unit root in $\Delta \ln Q,\ \Delta \ln k, \Delta \ln l\ \ and\ \Delta \ln def$ is rejected at 5 percent level of significance, indicating that all the variables in question are integrated of order one I(1). The results from the PP tests further confirm the ADF test indicating all the data series are integrated of order are I(1) except for lnL which is integrated at level i.e. I(0).

4.2 COINTEGRATION TEST

Table 2 shows the cointegration test. It examines the co-movement of the variables in the long – run following the methodology of Johnson (1988) and Johansen and Juselius (1990). The estimation results provide evidence of statistical long run relationship among lnQ, lnK, lnL, lnDEF. As shown in the table, there exists evidence of one long run relationship. However, this evidence by itself does not identify the dynamics or mechanism by which the variables relate. Such dynamics are captured by the VAR results discussed below and presented in table 4.4a and 4.4b

TABLE 2: JOHASEN COINTEGRATION TEST

Sample (adjusted): 1982- 2005

Include observations: 24 after adjustments

Trend assumption: Linear Deterministic trend

Series: LNDEF LNK LNL LNQ

Lags interval (in first differences): 1 to 2

Hypothesized	**Eingen**	**Trace**	**0.05 percent**	**Prob ****
No of CE(s)	Value	Trace	Critical value	
None *	0.704771	56.91455	47.85613	0.0300
At most 1	0.530507	27.63445	29.79707	0.1245
At most 2	0.277958	9.488007	15.49471	0.3977
At most 3	0.067291	1.671892	3.841466	0.1960

Trace test indicates 1 cointegrating equation at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

** Mackinnon – Haug – Michelis (1999) p – values.

4.3: VECTOR ERROR CORRECTION ESTIMATE

The cointegration result indicates the present of error correction model (ECM). Thus the Vector Error Correction Model (VECM) is tested. This indicates short run dynamics of the model. The

ECM combines the short and long term relations between analyzed variable. The results of the ECM is given in table 3 confirmed the cointegration result and indicate the presence of error correction terms for defense expenditure, labour force and real gross domestic products. Error correction equation shows correct negative sign for defense expenditure, labour force and real gross domestic product. The value of real GDP and defense expenditure are highly significant, indicating that about 58% of the previous disequilibrium has been removed in the present period for defense expenditure. However, labour force participation shows insignificant and Gross Fixed Capital formation show no short run impact.

The variables of defense expenditure, labour force and GDP implies that there is no problem of adjustment in the long run in case of shock in the short run i.e. considerable high speed of adjustment to long run equilibrium every year after short run shock. The model diagnostic test statistics fulfill the conditions of no specification errors, normality of residual and homoscedasticity. The stability test further confirmed the stability of the estimated coefficient.

Table 3: VECTOR ERROR CORRECTION ESTIMATE RESULTS

Error Correction	**D(LNE)**	**D(LNK)**	**D(LNL)**	**D(LNQ)**
CointEq1	-0.588138 (0.16569) [-3.54955]	0.033442 (0.25802) [0.12961]	-116190.1 (17607.) [-0.65981]	-0.169064 (0.29449) [-0.57408]
D(LNDEF(-1))	-0.455063 (0.15596) [-2.91785]	-0.021798 (0.24286) [-0.08976]	50124.96 (165750.0) [0.30241]	-0.031585 (0.27719) [-0.11395]
D(LNDEF(-2))	-0.384877 (0.07946) [-4.84341]	0.019501 (0.12374) [0.15760]	42430.57 (84453.1) [0.50242]	0.023638 (0.14123) [0.16737]
D(LNK(-1))	-0.380656	-0.338552	254130.1	-0.485916

	(0.40222) [-0.94638]	(0.62634) [-0.54052]	(427476.0) [0.59449]	(0.71489) [-0.67971]
D(LNK(-2))	-0.026867 (0.37171) [-0.07228]	0.339993 (0.57883) [0.58738]	-130667.4 (395051.0) [-0.33076]	0.218648 (0.66066) [0.33095]
D(LNL(-1))	8.99E-07 (3.28-07) [2.84015]	-7.04E-07 (4.9E-07) [-1.42794]	-0.505890 (0.33655) [-1.50315]	1.39E-07 (5.6E-07) [0.24711]
D(LNL(-2))	4.46E-07 (2.9E-07) [1.55206]	-4.08E-07 (4.5E-07) [-0.91215]	-0.513642 (0.30525) [-1.68271]	2.29E-07 (5.1E-07) [0.44939]
D(LNQ(-1))	0.036754 (0.17576) [0.20911]	0.115093 (0.27370) [0.42051]	-109258.0 (186800.0) [-0.58489]	-0.306282 (0.31239) [-0.98043]
D(LNQ(-2))	0.090932 (0.16413) [0.55403]	-0.104677 (0.25558) [-0.40957]	-80245.53 (174431.0) [-0.46004]	-0.285377 (0.29171) [-0.97829]
C	0.328031 (0.13044) [2.51471]	0.325502 (0.20313) [1.60244]	31897.93 (138635.0) [0.23009]	0.440311 (0.23185) [1.89916]

Table 4: RESULTS OF DIAGONISTIC TEST

	1	2	3	4
Serial Correlation X^2 (Ln)	26.14548 (0.0520)	6.10949 (0.9869)	14.6043 (0.5538)	8.13271 (0.9448)
Normality (Jarque Bera)	33.5701 (0.000)	4.01197 (0.1340)	7.1334 (0.0282)	13.1548 (0.0014)
Hetroscedasticity X^2	17.4311 (0.4937)	22.9989 (0.1906)	20.5176 (0.3044)	13.7575 (0.7448)
R^2	0.72	0.95	0.85	0.57
F	0.737	6.381	1.636	0.373

Probability value in parenthesis

4.4: VARIANCE DECOMPOSITION FUNCTION OF lnQ

Variance decomposition (VDC) is the breaking down of the variance of unanticipated changes in dependent variable according to the contribution of each variable's innovation. The VDC of variable in the basic model reveal that movements in each variable are largely explained by its own past values.

From table 6 we observe that the variation in economic growth explained by defense expenditure assumed a peak in the second year and the reflection declined progressively to 0.382 percent in the tenth year. It is evident that the ability of defense spending to influence economic growth dies out steadily on the long run.

The influence of capital stock proxy by gross fixed capital formation to the economy increase steadily from 0.00 level in the first year and getting to the peak in the fifth year ; decline but picked up in the seventh year and rise steadily to 4.59 percent in the tenth year. This indicates that the influence of capital formation on economic growth improve steadily on the long run.

The ability of real GDP to sustain itself dies out steadily over the period. It dies out steadily from 100 percent in the first year to 92.57 percent in the tenth year. This shows that the influence dies out as the economy progress.

TABLE 6: VARIANCE DECOMPOSITION OF ECONOMIC GROWTH (LNQ)

Period	SE	LNQ	LNK	LNL	LNDEF
1	0.757587	100.0000	0.000000	0.000000	0.000000
2	0.885561	96.20641	2.923629	0.536960	0.333006
3	0.972163	96.12778	2.919959	0.646125	0.306135
4	1.121747	94.46829	3.832510	1.406428	0.292771
5	1.232367	93.31688	3.891345	2.437571	0.354208
6	1.326698	94.10891	3.439732	2.103324	0.348036
7	1.430569	93.18486	4.314792	2.136498	0.363851
8	1.524516	92.17839	4.689744	2.762659	0.369203
9	1.605972	92.62417	4.449401	2.558390	0.368044
10	1.688855	92.57718	4.599153	2.440822	0.382852

Cholesky Ordering: LNE LNK LNL LNQ LNT

4.5: IMPULSE RESPONSE OF LNQ

Table 7 shows the impulse response pattern of economic growth to a stimulated one percent permanent increase in itself and in every other endogenous variable. The results indicate that the response of economic growth to defense expenditure was negative thought out the 10 years forecast horizon except for the first year which shows no response. Similarly for almost 7 years of the forecast horizon, the response of economic growth to labour force was negative however in most part of the forecast horizon for the response of growth in real GDP to capital formation shock; it was found out that the response was positive. Evidently, the trend over the 10years period was characterized by cyclical fluctuation.

TABLE 7: IMPULE RESPONSE OF LNQ

Period	LNQ	LN K	LN L	LN DEF
1	0.757587	0.000000	0.000000	0.000000
2	0.424889	-0.151419	-0.064892	-0.051103
3	0.394377	0.068661	0.043654	-0.016928
4	0.527929	0.143468	-0.107614	-0.028035
5	0.478038	0.104278	-0.139006	-0.041176
6	0.48908	0.038010	0.001058	-0.027321
7	0.500615	0.166612	-0.081870	-0.036338
8	0.485087	0.143851	-0.143123	-0.033682
9	0.496540	0.075895	-0.042147	-0.030192
10	0.504600	0.128147	-0.060276	-0.037782

Cholesky Ordering: LNE, LNK, LNL,LNQ, LNT

4.6: CAUSALITY TEST RESULTS.

The Granger test for causality is such a technique searching the direction of causality between variable. As Granger (1988) pointed out, if there is a cointegrating vector between defense spending and economic growth, there is causality among these variables at least in one direction. Thus, Granger causality test are employed to determine the causal relationships between defense spending and economic growth. There are four possible outcomes regarding causal relationships between economic growth and military expenditures: unidirectional causality from economic growth to military expenditures or vice versa; bi-directional causality between the two variables. Finally, lack of any causal relationship.

Table 8: Pairwise Causality Tests

Null Hypothesis	Obs	F Statistic	Probability	Remark
LNK does not Granger cause LN DEF	25	12.0403	0.00037	R
LNDEF does not Granger cause LNK		0.03766	0.96311	A
LNL does not Granger cause LN DEF	25	0.24137	0.78781	A
LNDEF does not Granger cause LNL		2.30821	0.12533	A
LNQ does not Granger cause LNDEF	25	6.08275	0.00864	R
LN DEF does not Granger cause LNQ		0.01920	0.98100	A
LNL does not Granger cause LNK	25	1.11335	0.34798	A
LNK does not Granger cause LNL		2.08046	0.15107	A
LNQ does not Granger cause LNK	25	0.60023	0.55827	A

LNK does not Granger cause LNQ		0.97460	0.39456	A
LNQ does not Granger cause LNL	25	1.09113	0.35501	A
LNL does not Granger cause LNQ		0.03479	0.96587	A

N.B: R = rejection; A=Acceptance of the Null Hypothesis.

The table 8 above reports the causality test results. Lag length is selected by using the AIC criteria. The probability values of f statistics are given on the right side of the table. We found unidirectional causality running from economic growth to defense expenditure. This is in agreement with the findings of Kalyoncu and Yucel (2005) for Turkey, and Frederisken and Lacivita (1987) for Philippines. Similarly, there is a unidirectional causality running from capital stock to defense spending. On the other hand, we found no causality between other variables.

5: SUMMARY AND CONCLUSION

This study provides an empirical relationship between the real Nigerian defense spending and the real output by employing Feder – Ram supply side production function model. The study employed the unit root test of ADF and PP and found that the variables are stationary at first difference. Until recently, most economists examining the relationship between defense and growth assumed that the direction of causality was from defense spending to economic performance. In an initial attempt to examine this assumption, Joerding conducted a Granger causality test for 57 developing countries and concluded that previous studies which assumed the causality direction to be from defense to growth were Haired. Using Nigerian data from 1980 – 2006, our results suggest that, for this country, causality runs from economic growth to defense spending and not the other way around as had been suggested by Benoit (1973, 1978) and concluded by authors writing on Nigeria (Olaniyi ,1993). A lag structure of two years was found to be the correct specification in the model. For Nigeria, this suggests that at its level of economic development, a policy of increasing the defense budget to promote economic growth might be inappropriate. Instead, our finding suggested that to promote economic growth, these same funds might be better used at the margin in other government program such as investment in infrastructure.

REFERENCES

Atesoglu H.S and M.J Muller (1990)"Defence Spending and Economic Growth". *Defence Economics* 2(1) 89-100

Alexander W.R.J (1990) "The Impact of Defence Spending on Economic Growth: A Multi-Sectoral Approach to Defence Spending and Economic Growth with Evidence From Developed Economies". *Defence Economics* 2(1) 39-55.

Barro R.J and Xavier Salai Martin (1995) Economic Growth. New York Mc graw Hill Benoit Emile (1973) Defence and Economic Growth in Developing Countries. Lexington: Lexington Books.

----------(1978) "Growth and Defence in Developing Countries" *Economic Development and Cultural Change* 26(2) 271-80.

Bird R.M (1971) "Wagner's Law: A Pooled Time Series and Cross Section Comparison" *National Tax Journal* 38 209-218.

Dakurah H; S. Davies and R. Sampath (2001) "Defence Spending and Economic Growth In Developing Countries: A Causality Analysis" *Journal of Policy Modelling* 23 (6) 651-658

Chang T.W.Fang; Wen and C. Liu (2001) " Defence Expenditure, Economic growth and Temporal Causality: Evidence from Taiwan and Mainland China-1952-1995" *Applied Economics* 33 pp 1289-1299.

Deger Smith (1986) "Economic Development and Defence Expenditure" *Economic Development and Cultural Change* 34(2) 361-372.

----------and R.P Smith (1983) "Military Expenditure and Growth in LDC" *Journal of Conflict Resolution* 27(2) 335-353.

----------and S.Sen (1983) "Military Expenditure, Spin off and Economic Development". *Journal of Development Economics* 13(1-2):67-83.

Dalbelko D and J. McCormick(1977) "Opportunity Cost of Defence: Some cross Sectional Evidence". *Journal of Peace Research* 145-54.

del Pando J.(1980) "Declaration of Ayacudio: Analysis and Quatification of a Possible Agreement on Limitation of Military Expenditure in Latin America" Paper Prepared for the UN Group of Government Experts on the Relationship Between Disarmanent and Development.

Biswas R and R.Ram (1986) "Military Expenditure and Economic Growth in LDC: An Augmented Model and Further Evidence" *Economic Development and Cultural Change* 34(2) 361-37.

Dunne J.p, R.P Smith and D.Willenbocked (2005) "Model of Military Expenditure and Growth: A Critical Review" *Defence and Peace Economics* 16(6) 449-461.

Eralp D.U and N. Beriker (2005) "Assesing the Conflict Resolution Potential of the E.U: The

Conflict and Accession Negotiations "*Security Dialogue"* 36. 175-192.

Feder G (1982) "On Exports and Economic Growth" *Journal of Development"* 12(1-2) 59-73.

Fiani R; P. Anne and L.Taylor (1984) "Defence Spending and Economic Growth: Time Series Evidence On Causality for the Philippines 1950-1982" *Journal of Philippine Development* 25,(2) 354-360.

Ferda Helicioglu (2004) "Defence Spending and Economic Growth in Turkey: An Empirical Application of New Macroeconomic Theory." *Review of Middle East Economic and Finance* vol 2 no3 193-20.

Galvin H (2003) "The Impact of Defence Spending on Economic Growth on Developing Countries: A Cross Section Study" *Defence and Peace Economic* 14(1) 51-59.

Gerace M.P (2002) "U.S Military Expenditure and Economic Growth: Some Evidence From Special Methods". *Defence and Peace Economics* vol 3 (1) 1-11.

Granger C.W.J (1988) "Some Recent Development in a Concept of Causality". *Journal of Econometrics.*

Huang C. and A. Mintz (1991) "Defence Expenditure and Economic Growth: The Externality Effect. *Defence Economics* 3 (2) 35-40.

Jeffery K and K. Edward (2008) "Bringing the Military Back in Military Expenditure and Economic Growth 1990-2003". *Journal of World system Research* vol xiv(2) 142-172.

Joerding Wayre (1986) "Economic Growth and Defence Spending: Granger Causality" *Journal of Development Economics* 35-40.

Kalyoncu H and F Yucel (2005) "An Analytical Approach to Defence Expenditure and Economic Growth: The Case of Turkey and Greece". *MPRA Paper* no 4262.

Klein T (2004) "Military Expenditure and Economic Growth Peru 1970-1996". *Defence and Peace Economics* 15(3) 275-288.

Kollias C; C. Naxakis and L.Zarangas (2004) "Defence Spending and Growth in Cyprus: A Causal Analysis" *Defence and Peace Economics* 15(3) 299-307.

Lai C.N; B.N Huang and C.W Yang (2005) "Defence Spending and Economic Growth Across the

Taiwan States: A Threshold Regression Model". *Defence and Peace Economics* 16(1) 45-57.

Levine Ross and D. Renalt (1992) "Sensitivity Analysis of Cross Country Growth Regression" *America Economic Review* 82(4) 942-963.

Lucas R.E (1988) "On the Mechanics of Economic Development." *Journal of Monetary Economics* 22(1) 3-42.

Mehan R.A (2004) "An Econometric Contribution to the U.S Defence Growth Nexus: Evidence From Error Correction Model". *Conflict Management and Peace Science* 21 121-131.

Odusola F.A (1990) "Military Expenditure and Economic Growth in Nigeria". *Nigeria Journal of Economic and Social Studies* 38(1).

Olaniyi O (1993) "Nigeria Nation Defence and Economic Development: An impact Analysis". *Scandinavian Journal of Development Alternative* Xll (2-3).

Poot J. (2000) "A synthesis of Empirical Research on the Impact of Government on Long Run Growth". *Growth and Change 31 516-546.*

Ram R (1986) "Government Size and Economic Growth: A New Framework and Some Evidence from Cross-Section and Time Series Data" *America economic review* 76(1) 191-203.

Raster K and W.R Thompson (1998) "Defence Burdens, Capital Formation and Economic Growth". *Journal of Conflict Resolution* 32(1) 61-86.

Reitschnller, G and J.L Loeming (2005) "Modelling the Defence Growth Nexus in Guatemala". *World Development* 33(3) 513-521.

Romer P.M (1986)"Increasing Return and Long Run Growth" *Journal of Political Economy* 94(5): 1002-1037.

Rufael W.Y (2001)" Causality between Defence Spending and Economic Growth, the Case of Mainland China: A comment". *Journal of Economic Studies* 28(3) 227-230.

Stieh Jhy-Yuan; Ching-Chang Lai and Wer-Ya Change (2002) "The Impact of Military Burden on Long Run Growth and Welfare" *Journal of Development Economics* 68(2) 443-454.

Smith Dan and R. Smith (1980) "Military Expenditure Resources and development". Paper Presented for the UN group of Governments Experts on the Relationship Between Disarmament

and Economic Development.

Smith R (1980) "Military Expenditure and Investment in OECD Countries 1954-1973" *Journal of Comparative Economics* 4(1) 11-32.

Solow R.M (1950) "A Contribution to the Theory of Economic Growth", *Quarterly Journal of Economics* 70(1) 65-94.

Taylor Lance; R. Fiani and P.Amez (1980) "Defence Spending Economic Structure and Growth: Evidence among Countries over Time". Paper prepared for the UN group of Government Experts on the Relationship between Disarmament and Development.

Wagner A (1890) *Finanzwissens chaft* (3ed) Partly Reprinted in R.A Musgrave and A.T Peacock (ed) The Classics in the Theory of Public Finance. Macmillan, London 1958.

Ward M.D; D. Davis; M. Denubarti; S. Rajimaira and M. Cochrane (1991) "Military Spending in Indian Country Survey "*Defence Economics* 3(1) 41-63.