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SECURITY EXPENDITURE ON ECONOMIC GROWTH IN NIGERIA

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Abstract

Purpose of study: This study examines security expenditure as an economically contributive or a non-contributive expenditure on human capital development and economic growth in Nigeria.

Methodology: Adopting the ARDL bounds test and Error Correction Model (ECM) on quarterly time-series data from January 2010-December 2018.

Result: The findings and results indicate that security expenditure is economically a contributive expenditure. In the long-run a positive and significant impact on economic growth and human capital development, in the shot-run a negative relationship. The ECM model conveyed the speed of convergence from disequilibrium in the short-run back to long-run equilibrium by 86% quarterly.

Implication/Application: The finding and results have critical implications for the government and policymakers, protection of life, properties, economic, and business assets positively stimulate economic growth. A unit increase in government expenditure on human capital development decreases insecurity and increase economic growth.

Novelty/Originality of this study: Previous studies conducted globally and in Nigeria reported diverse results on the co-integrating relationship between security expenditure and economic growth, using diverse variables and annualized time series data predominantly. This study differs from the previous studies to adopt quarterly time-series data, the ARDL, and the ECM models as the major techniques of analysis along with a battery of pre-test and diagnostic tests.

Keywords: *Security Expenditure, Economic Growth, ARDL, ECM, Nigeria.*

JEL Classification: H56, C32, O40.

INTRODUCTION

Security cuddles military and paramilitary activities and operations tied to the protection of life, properties, and the economy from thoughtful harm internally or externally. According to Adam Smith and the Neo-realist school of thought security is the fundamental obligation of the government (Apanisile&Okunlola, 2014). Section 14 sub (2b) of the Nigerian 1999 Constitution as amended: states "*Security and welfare of the people (of Nigerians) shall be the primary objective of the government*". In this regard, section 14 sub (2b) substantiates the claims of Adam Smith and the Neo-realist (Ben, et al., 2019, pp.182). On the contrary, the postmodernist argued that; security and welfare of the citizens is a contributive effort and not solely the responsibility of government. Therefore, security is far above identifying and eliminating imminent threat by the security personnel, the government should examine, the effect of security expenditure on economic growth and human capital development.

Insecurity globally and specifically in Nigeria has greatly traumatized the Nigerian economic and business climate deteriorating human capital development and security rating from 62.69% in 2007 to 49.49% in 2010, and 38.4% in 2018 (Mbasua, Muhammad & Abia, 2016). Such is profound in the skeptical investment decision of investors investing in capital in-flow dearth economy that has shifted government sensitivity from the productive sectors to the security of the economic and business environment. The anti-economic and human capital development activities of Boko Haram in the North, Militancy in the Niger Delta, and Fulani herdsmen in the Middle Belt among other banditry activities in Nigeria has led to the loss of more than ₦1.4 billion- ₦1.6 billion economic and business assets between 2015-2018, and a drop in daily oil production from 2.2 million-1.7million barrel per day in 2018 (Ben, et al., 2019). This buttresses the significance of security to economic growth and development.

In the bid to ensure a peaceful and secure economic and business environment globally; security expenditure in 2017 witnessed a 2.6% increase to $1822 billion in 2019. The United Nations peacekeeping expenditure increase from $5billion to $ 7.84 billion between July 2011- June 2013. In the United States, security expenditure to GDP average at $649billion of 3.2% to GDP in 2019, China $250billion of 1.9% to GDP, Saudi Arabia $67.6billion of 8.8% GDP, India 66.5% of 2.4% GDP, France $63.8billion of 2.3% GDP, Russia $61.4billion of 3.9%GDP, United Kingdom $50billion of 1.8% GDP among others (World Bank Data 2019). Security expenditure in North Africa total $22.2billion, and in Sub-Saharan Africa $18.4billion.

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Security expenditure is measured by the percentage of government resource allocations to the protection of life and properties from internal and external aggression, along with the upkeep of armed forces (Obasi, et al., 2018). According to Harris (2004), security expenditure is consumption expenditure impacting directly on the economic and business climate and also influencing investment and human capital development. Dumas (2002) argued that security expenditure is economically a non-contributive expenditure in the contemporary world. Reporting a non-causal relationship between security expenditure and human capital development.

According to World Bank report and the Office of Disarmament Affairs (ODA) report funds apportioned for security purposes globally average at $4.7 billion daily of about 79% of which 21% is available to drive economic growth and human capital development, translating to the negligence of indicators growth and development and other sectors of the economy (International Peace Bureau, (2012).The findings and claims of the World Bank and the Office of Disarmament Affairs (ODA) are buttressed in the sectoral allocation of funds in Nigeria for security and other sectors of the economy as presented in figure 1 below:

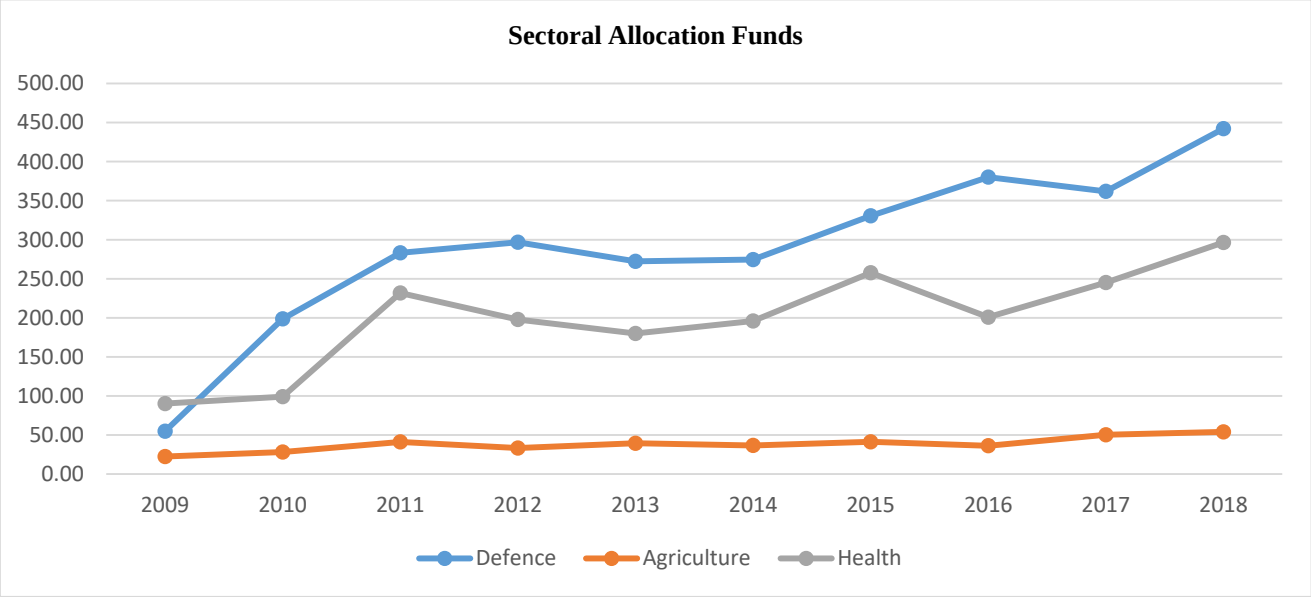

Figure 1: Sectoral Allocation of Funds

Source: Authors Computation of Sectoral Allocation of Funds (2020)

Khalid and Mustapha (2014) observed that a unit increase in security expenditure and negligence of other sectors of the economy decreases economic growth and human capital development through an increase in extreme and moderate poverty level, infant and material mortal rate, adult illiteracy and out of school children among others. Danek (2013); Oriavwote and Eshenake (2013); Okoro(2013); Chipaumire, et al. (2014); Korkmaz (2015) examined security expenditure and economic growth, findings and results show a negative relationship. Danek (2013) also reported a non-significant relationship. According to Danek (2013), security expenditures explain only 46% of the changes in economic growth in the Czech Republic. Shieh et al, (2002), observed that a unit increase in security expenditure crowds out private investments and decreases long term productivity, technological innovation, technical know-how, and crowds out of private investments. Oriavwote and Eshenake (2013) substantiate the findings of Shieh et al, (2002), in Nigeria using the Error Correction Model.

On the contrary, Khalid and Mustapha (2014); Anyanwu (2011); Anfofum et al. (2014); Rashid and Arif (2012); Olofin (2012); Apanisile and Okunlola, (2014); Umar and Abu Bakar (2016) among others reported a positive relationship between security expenditure, economic growth and human capital development in Nigeria.

Empirical findings based on the different models and variables of analysis adopted universally revealed diverse results; the single supply-side growth model of Feder – Ram Feder (1982), Ram (1986), Biswas and Ram (1986) used by the neoclassical economists, reported a positive relationship while Biswas and Ram (1986), Alexander (1990) and Huang and Mintz (1991) report no relationship.

The Keynesian demand-side model of aggregate demand based on the initial work of Smith (1980); Fiani et al. (1984) and Raster and Thomson (1988)also revealed a negative relationship.

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The Deger type model employ by Deger and Smith (1983), and Deger (1986), integrate the demand and supply sides model to measure the effect of security expenditure on economic growth. Findings revealed the inconclusive result.

The variations in the reported result offshoot the need to examine the effect of security expenditure on economic growth and human capital development and if security expenditure is economically a contributive or a non-contributive expenditure in Nigeria as argued by Dumas (2002).

Theoretical Framework

The Romer (1986), and Lucas (1988) new growth theories propose the presence of temporary government intermediation effect from the period of economic transition to equilibrium, and a long term effect of government expenditure on economic growth. The Romer (1986), and Lucas (1988) theories contravene the Solow (1950), and the neoclassical growth model. The neoclassical growth model ignored the channels and causality through which government expenditure may influence economic growth. Wagner's (1890) law proposed causality from economic growth to government expenditure through national income. The Keynesians proposed no causality from government expenditure to economic growth. Theoretically, there is a lack of consensus on the exact relationship between security expenditure, economic growth, and human capital development. This study adopts the supply-based model of the aggregate production function approach proposed by Feder in 1983.

Table 1: Empirical Review

Name	Objective/ Scope	Data	Methodology	Findings
Aderemi, Olayemi, Ebere and Adeniran (2018)	Security expenditure and foreign direct investment on economic growth Nigeria	Time Series 1994-2016.	Co-integration, DOLS and Granger Causality Approach	Bidirectional causality
Obasi, Asogwa, andNwafee, 2018)	Military expenditure on human capital development in Nigeria	Time Series 1970- 2014	ARDL	Negative relationship.
Masoud&Munadhil (2015)	Military expenditure on economic growth in the United States of America	Time Series 1970-2011	ARDL	Negative relationship
Abdul, Mohd, and Dewi (2015)	Conflict and military expenditure on three levels of school performance	Time Series 1980 to 2013	Panel regression methods.	Positive Relationship
Umar and Abu Bakar (2016)	Defense expenditures and political instability on economic growth in Nigeria.	Time Series 1980 to 2013	Toda and Yamamoto (1995) dynamic Granger causality test.	A positive relationship between defense expenditures and political instability. A negative relationship between political instability and economic growth.

Source: Authors Computation (2020)

METHODOLOGY

This study adopts the *ex post facto* design and supply-based model of the aggregate production function approach proposed by Feder in 1983. The dataset is of the secondary source and nature, covering the quarterly period from January 2010-December 2018 from the Central Bank of Nigeria Statistical bulletins. The frontier of the model was extended by Biswas and Ram in 1986 to capture defense variables of security expenditure. The model is a two-sector economic model; Security production function (M), and Civilian production function (C) (other economic sectors).

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

$$C = c(L_C, K_C, M) \quad (2)$$

Where; L_m, L_C, K_m, K_C = labor, and capital allocated for security and other sectors of the economy respectively.

The Min equ (2) measures the externality effect of security production function on other sectors. The externality effect on the marginal product in equ (2) can be positive or in relative factor productivity differential for labor and capital.

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Labour and Capital aggregate supplies:

$L = L_M + L_C$ (3)

$K = K_M + K_C$ (4)

O denote total output or national income.

$O = M + C$ (5)

Divide O by differentials of equ (5) equals:

$$\frac{dO}{O} = \frac{\partial c\, dL}{\partial L\, O} + \frac{\partial C\, dK}{\partial K\, O} + \frac{\partial C\, dM}{\partial M\, O} \quad (6)$$

The first term of the RHs in equ (6) is multiplied by $\frac{L}{L}$ and the third by $\frac{M}{M}$

$$O = F_L\, L\, \frac{L}{O} + F_K \frac{dk}{O} + F_M M\, \frac{M}{O} \quad (7)$$

Equ (7) revealed the simplified Feder Ram Model of the relationship between economic growth on Labour, capital, and the security measured by their relative shares in output. The partial derivatives, (F) are the estimated coefficients.

The estimated equation for this study is derived from the Feder – Ram model;

$y = \alpha_0 + \alpha_1 InEdu + \alpha_2 InHlt + \alpha_3 InGOF + \alpha_4 InMEXP + \alpha_5 InREV + \mu$ (8)

Where; y = real GDP

Labour Force (lnEdu) = Government on Expenditure Education (Edu)

Labour Force (lnHlt) = Government on Health (Hlt)

Capital stock = Gross Fixed Capital Formation (GOF)

Defence = (Security expenditure) (MEXP)

R = Government generated revenue (REV)

μ = error term

α_0= constant and α_1- α_4= parameter of estimate

Expectation = $\alpha_1, \alpha_2, \alpha_3, \alpha_4 > 0$

a. Government expenditure on health and education sectors proxy for (labor force and human capital development).
b. Defends expenditure proxy for (security expenditure)
c. Government revenue measures government financial strength.
d. Gross Fixed Capital Formation proxy government expenditure on fixed assets
e. Real Gross Domestic Product is deflated by a general price level measuring economic growth.

MODEL ESTIMATION

Before the model estimation, an array of pretest of; descriptive Statistics and unit root test on the variables were conducted through the Augmented Dickey-Fuller (ADF) (Dickey and Fuller, 1979), and the Phillips–Peron (PP) (Phillips and Perron, 1988). To examine and confirm the stationarity properties of the datasets for a meaningful analysis. The violation of the Gauss Markov assumption and stationarity properties of the dataset might lead to spurious results.

Pre Test

Figure 2, displays the basic descriptive statistics of mean, median, and standard deviation, of the observations. Standard deviation measures dispersion. The Skewness, kurtosis, and the Jacque Bera Statistics measure the normality of the distributions. The kurtosis of (4.362) is (>3). Therefore, the distributions are largely Leptokurtic with a long tail and are more peaked than the normal distribution of (3).

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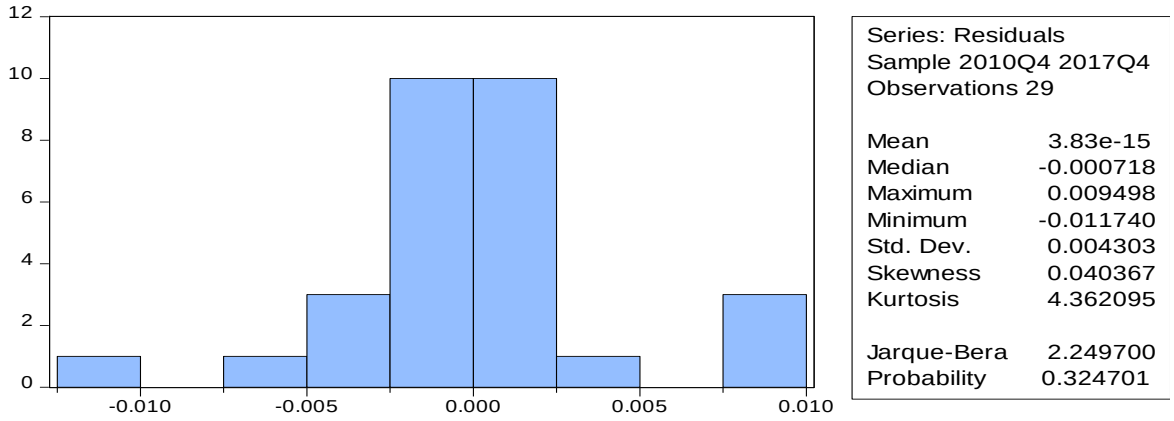

Figure 2: The Descriptive Statistics

Table 2: Unit Root

Variables	ADF	Critical Value @ 5%	Order of integration	PP	Critical Value	Order of integration @ 5%
$LogL_nEdu$	-6.077	-3.548	I(1)	-6.119	-3.548	I(1)
$LogL_nHlt$	-5.806	-3.548	I(1)	-5.873	-3.548	I(1)
LogInGOF	-5.218	-3.568	I(1)	-5.214	-3.568	I(1)
LogInMEXP	-5.214	-3.568	I(1)	-6.172	-3.548	I(1)
LogInGREV	-5.597	-3.548	I(1)	-5.593	-3.548	I(1)
LogRGDP	-6.089	-3.544	I(0)	-5.744	-3.544	I(0)

Source: Processed data, (2020)

The Unit root test result of trend and intercept presented in Table 2 shows that the variables are integrated after first differencing I(1) expect RGDP at level order I(0) zero. The PP unit root test results confirm the ADF results. The combination of I(1) and I(0) according to Pesaran, et al. (2001) provide theoretical support for the adoption of Autoregressive distributed lag approach (ARDL) to test for a co-integrating relationship.

The ARDL Bound Test Model Expression

$$\Delta RGDP_{qt} = \alpha_0 + \sum_{i=1}^{p} \alpha_i \Delta RGDP_{qt-i} + \sum_{i=0}^{p} b_i \Delta L_n Edu_{qt-2} + \sum_{i=0}^{p} c_i \Delta L_n Hlt_{qt-3} + \sum_{i=0}^{p} d_i \Delta L_n GOF_{qt-4} + \sum_{i=0}^{p} e_i \Delta L_n MEXP_{qt-5} + \sum_{i=0}^{p} b_i \Delta L_n GREV_{qt-6} + \delta_1 RGDP_{qt-1} + \delta_2 L_n Edu_{qt-2} + \delta_3 L_n Hlt_{qt-3} + \delta_4 I_n GOF_{qt-4} + \delta_5 I_n MEXP_{qt-5} + \delta_6 I_n GREV_{qt-6} + \mu_{qt} \quad (9)$$

Where; Δ = first difference operator

Decision Rule: The null hypotheses: $H_0 = \beta_1 = \beta_2 = \beta_3 = \beta_4 = \beta_5 = \beta_6 = 0$ (There is no long-run relationship).

The alternative hypotheses: $H_0 \neq \beta_1 \neq \beta_2 \neq \beta_3 \neq \beta_4 \neq \beta_5 \neq \beta_6 \neq 0$ (There is a long-run relationship exists)

The *F* test determines whether there is a long-run relationship between the variables.

a. If the calculated value of F-statistic is greater than the upper critical bound (UCB) value, there is a long-run relationship.

b. If the calculated F-statistic value is smaller than the lower critical bound (LCB) value, there is no long-run relationship.

c. If the computed F-statistic value falls within the range of upper bound and lowers bound the result is inconclusive.

ESTIMATION AND ANALYSIS OF RESULTS

Table 3: The ARDL Result

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
LOGRGDP(-1)	0.130	0.064	2.014	0.055
LOGREV	-0.047	0.017	-2.690	0.012
LOGMEXP	0.065	0.031	2.049	0.051
LOGHLT	0.011	0.012	0.950	0.351
LOGGOF	0.55	0.045	12.191	0.000

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LOGEDU	0.13	0.018	7.315	0.000
C	3.729	0.475	7.842	0.000
Other Parameter Estimate				
R^2	0.99	Prob-Value	0.000	
F-statistic	756.829	Durbin-Watson (DW) stat	1.011	
BG-F	0.34	*x*2(HET)	0.59	RESET-F(0.24)

Source: Processed data, (2020)

Table 3the R^2 of 99%, revealed the goodness of the ARDL model explaining the variation in the dependent variable as accounted for by the independent variables. The F-statistics of (756.829), and P-value (0.000) confirms the goodness of fit of the model. The (D-W) Stat of 1.011 creates suspicion for the presence of first-order positive autocorrelation.

The F-stat (p-value of 0.34) of the Breusch Godfrey Lagrange Multiplier Serial Correlation (LM), override the (D-W) Stat result (with its inherent limitation). The heteroscedasticity test result of (p-0.59) reveals that our model is homoscedastic the assumption of homoskedasticity was not violated. The error specification test (RESET-F) shows that relevant variables were not omitted and irrelevant variables were not included.

Table 4: Bound Test Result for Co-integration

Selected Model ARDL	(1, 0, 0, 0, 0,0)	
Dependent Variable	F- Statistics	K
RGDP	35.07981	5
Critical Value Bounds		
Significance level	Lower Bounds I (0)	Upper Bounds I (1)
10 percent	2.08	3
5 percent	2.39	3.73***
1 percent	3.06	4.15

Source: Processed data, (2020)

Table 5: Error Correction Model (ECM)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CointEq(-1)*	-0.869	0.049	-17.519	0.0000

Source: Processed data, (2020)

Test of Hypotheses

Hypothesis 1

The null of this hypothesis is stated thus;

H_0: Security expenditure has no significant impact on economic growth and human capital development.

Ha: Security expenditure has significant impacts on economic growth and human capital development.

This hypothesis was tested using the ARDL from table 3. The estimated co-efficient shows that a unit increase in government expenditure on Labour Force proxy by education and health positively and significantly increases economic growth by 13% and 1% respectively. A unit increase in capital stock proxy by gross capital formation increases economic growth by 55%. Security expenditure impact positively and significantly on economic growth and human capital development by 65%. A unit decrease in totally federal generated revenue decreases economic growth and human capital development significantly by 47%.

Hypothesis 2

The null of this hypothesis is stated thus;

H_0: There is no co-integrating relationship between security expenditure, economic growth, and human capital development.

Ha: There is a co-integrating relationship between security expenditure, economic growth, and human capital development.

This hypothesis was tested using the ARDL bound test and error correction model from Tables 4 and 5. Table 4: The computed *F*-statistic (35.07981) is higher than the upper critical bound at a p-value of 5%. The *F*-statistic result rejects the null hypothesis of no co-integration. The result shows a long-run co-integrating relationship between security expenditure,

economic growth, and human capital development. Validating the results of Khalid and Mustapha (2014); Anyanwu (2011); Anfofum et al. (2014); Rashid and Arif (2012); Olofin (2012); Apanisile and Okunlola, (2014); Umar and Abu Bakar (2016). The error correction model in table 5was conducted to correct for the errors responsible for the disequilibrium in the long run. The ECM coefficient of (-0.86) and the p-value (0.000) indicate that disequilibrium caused by security expenditure on economic growth and human capital development in the short run can converge back to equilibrium by86% quarterly at a p-value of 0.05%. This result substantiates the findings and results of Apanisile and Okunlola (2014) in Nigeria and contravenes Duma's (2002) argument of security expenditure as economically a non-contributive expenditure. This study established that secure and stable economic and business positively stimulate economic growth and human capital development and security expenditure is economically a contributive expenditure.

CONCLUSION AND POLICY IMPLICATIONS

The study examines the co-integrating relationship between security expenditure on economic growth and human capital development and whether security expenditure is economically a non-contributive expenditure as established by Dumas (2002) in the Nigerian context. The ARDL and ECM model was used on quarterly time-series data from January 2010 to December 2018 a departure from the conventional annualized time-series data used by previous studies. The results revealed a long run co-integrating relationship between security expenditure on economic growth and human capital development confirming the results of Khalid and Mustapha (2014); Anyanwu (2011); Anfofum et al. (2014); Rashid and Arif (2012); Olofin (2012); Apanisile and Okunlola, (2014); Umar and Abu Bakar (2016). The disequilibrium caused by security expenditure in the short run is converged back to equilibrium by 86% quarterly at a p-value of 0.05%. This result substantiates the findings and results of Apanisile and Okunlola (2014) in Nigeria and contravenes Duma's (2002) argument of security expenditure as economically a non-contributive expenditure. This study established that the security of the economic and business climate will positively and significantly attract investors and stimulate economic growth. Therefore, security expenditure is economically a contributive expenditure. A unit decrease in government expenditure on human capital development increases insecurity and decrease economic growth. The study recommends an increase in government expenditure on human capital development to curtail insecurity, rather than increase security expenditure to checkmate insecurity.

LIMITATION AND STUDY FORWARD

Despite impressive empirical studies (for developed countries) using advanced econometric methods and theoretical advances in growth theory, there is a dearth of empirical studies, and comprehensive data on security expenditure in Nigeria. Findings showed that most security expenditure is unreported in Nigeria. Further research can examine the relationship of other variables especially in the North East and North West Nigeria using the primary source of data. Additionally, future studies can also conduct a comparative study across the various geopolitical zones in Nigeria the examine the effect.

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AUTHORS CONTRIBUTION

First Author did the planning and supervision of the research; Second Author has done the data collection, designing of figures, tables, data analyzes, and result in interpretation; the Third Author has done the processing, and drafting of the manuscript.

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