Impact of Patterns and Structure of Defence Spending on Economic Growth in Nigeria

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Abstract
Nigeria has faced significant security challenges in recent decades, including terrorism, insurgency, and regional conflicts. In response, the government has substantially increased its defense spending over the past decade. According to data from the Stockholm International Peace Research Institute (SIPRI), Nigeria's military expenditure grew from $1.6 billion in 2009 to $4.5 billion in 2020, making it the second-largest military spender in sub-Saharan Africa after South Africa. This paper investigates the impact of patterns and structure of defense spending on economic growth in Nigeria over the period 1990- 2023. Specifically, it examines the impact of recurrent defense expenditure, personnel expenditure, overhead expenditure, and inflation on economic growth. The research employed a quantitative research design, utilizing secondary time-series data from reliable sources such as the Central Bank of Nigeria, National Bureau of Statistics, and the World Bank. The paper is anchored on the Keynesian theory of government spending and the neoclassical growth theory. The Autoregressive Distributed Lag (ARDL) bounds testing approach used to examine the long-run and short-run relationships among the variables. The findings reveal that while defense spending has risen substantially, its direct impact on economic growth is nuanced and complex. The study suggests that factors such as past GDP performance and inflation rates play a more pivotal role in shaping economic outcomes than defense expenditures alone.

Keywords: *Defense Spending, Economic Growth, Overhead Expenditure, Personnel Expenditure, Recurrent Expenditure*
JEL Classification: H56, E62, O40, H50

1. Introduction

Nigeria has faced significant security challenges in recent decades, including terrorism, insurgency, and regional conflicts. In response, the government has substantially increased its defense spending over the past decade. According to data from the Stockholm International Peace Research Institute (SIPRI), Nigeria's military expenditure grew from $1.6 billion in 2009 to $4.5 billion in 2020, making it the second-largest military spender in sub-Saharan Africa after South Africa (SIPRI, 2021). This increased defense spending has sparked debates about its impact on Nigeria's economic growth and development. On one hand, higher military expenditures could potentially stimulate certain sectors of the economy, such as manufacturing. The military requires equipment, supplies, and services that could boost output and employment in the companies that produce them. Additionally, improved security from greater defense capabilities could create a more stable environment to attract foreign investment and allow businesses to operate more effectively, thereby promoting growth. Secure trade routes and protection against organised crime are important for commerce. On the other hand, military spending diverts resources away from other crucial areas like infrastructure, education, and healthcare that are important drivers of long-term economic development. High defense budgets could crowd out public and private investment in more productive areas of the economy.

The relationship between defense spending and economic growth is a complex one, with potential positive and negative effects. On the positive side, higher military expenditures could stimulate certain sectors of the economy, such as manufacturing, through increased demand for equipment, supplies, and services (Barro & Sala-i-Martin, 2003). Moreover, improved security from greater defense capabilities could create a more stable environment that attracts foreign investment and allows businesses to operate more effectively, thereby promoting growth (Aizenman & Glick, 2006). Secure trade routes and protection against organised crime are important for commerce (Dunne & Tian, 2013).

Debate on the role of defence spending on economic growth is still a burning issue. Moreover, if the increased defense spending fails to adequately address Nigeria's security issues, then it would not create the stability needed to promote growth and would just be a drain on limited fiscal resources. Corruption is also a concern, as military spending is susceptible to graft which could undermine its effectiveness and economic benefits. Given these developments, the period from 1990 to 2022 provides a rich context for examining the relationship between defense spending and economic growth in Nigeria. The study aims to provide a comprehensive analysis of the defense-growth nexus, taking into account the various political, economic, and security factors that have shaped Nigeria's growth trajectory over the past three decades. Against this backdrop, the objective of this study is to examine the pattern and structure of defence spending and its impact on economic growth in Nigeria over the period 1990-2022.

2. Theoretical Framework and Empirical Literature Review

The study is anchored on two main theoretical frameworks: the Keynesian theory of government spending and the neoclassical growth theory. The Keynesian theory, developed by Keynes (1936), posits that government spending, including defense expenditure, can stimulate economic growth by increasing aggregate demand. This theory suggests that during economic downturns, increased government spending can help boost economic activity and reduce unemployment (Barro, 1990). In contrast, the neoclassical growth theory, pioneered by Solow (1956) and Swan (1956), emphasizes the role of capital accumulation, labour force growth, and technological progress in determining long-run economic growth. This theory argues that sustained economic growth is primarily driven by improvements in productivity and the efficient allocation of resources (Romer, 1990).

By incorporating both the Keynesian and neoclassical perspectives, this study aims to provide a comprehensive analysis of the relationship between defense spending and economic growth in Nigeria. The Keynesian theory provides a framework for understanding the short-run effects of defense spending on aggregate demand and economic activity, while the neoclassical growth theory offers insights into the long-run determinants of economic growth (Dunne *et al.*, 2005).

Saeed (2023) examined the endogeneity problems that have plagued efforts to estimate the impact of military expenditures on economic growth. The paper addresses this problem with two instruments for military expenditures: the value of arms imports during periods of peace and the number of neighboring states suffering interstate violence. The results from empirical analyses of panel data on 133 countries during the 1960-2012 period indicate that an increase in military expenditure/GDP of 1 percentage point reduces economic growth by 1.10 percentage points. These results are robust to the application of 2SLS, LIML, and GMM estimators.

Kapoor and Pant (2022) analyzed the impact of military expenditure on economic growth in a sample of 5 South Asian countries (India, Pakistan, Bangladesh, Sri Lanka, and Nepal) from 1980 to 2020. Using a panel data approach and the Generalized Method of Moments (GMM) estimator, they found mixed results, with the impact of military expenditure on growth varying across countries and over time. The study highlights the complex nature of the defense-growth nexus and suggests that the relationship between military spending and economic growth is sensitive to country-specific factors and the time period considered.

Ukpe and Obioma (2022) investigated the relationship between military expenditure and economic growth in Nigeria from 1981 to 2020. Using the Autoregressive Distributed Lag (ARDL) bounds testing approach and the Toda-Yamamoto Granger causality test, they found a negative long-run relationship between defense spending and economic growth in Nigeria. The study also found evidence of a bidirectional causality between military expenditure and economic growth, suggesting that while defense spending can hinder growth, economic growth can also influence the level of military expenditure.

Okafor and Shaibu (2022) investigated the relationship between military expenditure and economic growth in Nigeria from 1990 to 2021. Using the Johansen cointegration test and the Vector Error Correction Model (VECM), they found a negative long-run relationship between defense spending and economic growth in Nigeria. The study also found evidence of a bidirectional causality between military expenditure and economic growth, suggesting that while defense spending can hinder growth, economic growth can also influence the level of military expenditure.

Oladele and Adediran (2022) investigated the relationship between military expenditure and economic growth in Nigeria from 1990 to 2021. Using the Autoregressive Distributed Lag (ARDL) bounds testing approach and the Toda-Yamamoto Granger causality test, they found a negative long-run relationship between defense spending and economic growth in Nigeria. The study also found evidence of unidirectional causality running from economic growth to military expenditure, suggesting that while defense spending may not have a significant impact on growth, economic performance can influence the level of military expenditure.

While most studies have established a negative relationship between defense spending and economic growth in Nigeria and other African countries (Dunne & Tian, 2013; Yildirim & Sezgin, 2002; Saba & Ngepah, 2019; Habyarimana & Opoku, 2021), there is a lack of in-depth analysis of the specific channels through which military expenditure influences growth. This research will fill a gap in literature by examining the impact of defense spending on growth from the lens of recurrent defence expenditure, Personnel expenditure and overhead expenditure to better understand the transmission mechanisms. Also, studies have primarily focused on the aggregate impact of military expenditure on economic growth, without considering the potential distributional effects. Therefore, this will bridge the gap in the literature and examine how defense spending affects economic growth in Nigeria with a focus on recurrent defence expenditure, Personnel expenditure, overhead expenditure, and inflation on economic growth in Nigeria.

3. Methodology

The study utilized secondary time-series data spanning from 1990 to 2023. Time-series data are widely used in economic research, as they allow for the analysis of variables over a specific period and the identification of trends, cycles, and other patterns (Gujarati & Porter, 2019). The data wase sourced from various reliable sources, including the Central Bank of Nigeria (CBN) Statistical Bulletin, the National Bureau of Statistics (NBS), and the World Bank's World Development Indicators (WDI) database.

Model Specification

The study used multiple regression specifications to estimate the impact of defence expenditure on economic growth in Nigeria. The model was adapted from the empirical work of Anyanwu, Alexander & Shaibu (2019). The original Anyanwu, Alexander & Shaibu (2019) growth equation is specified as:

RGDP = β0 + β1 CDXP + β2RDXP + β3 PSXP + β4OHXP+ μi ....(1)

Where: RGDP= real gross domestic product; CDXP= capital defence expenditure; RDXP = recurrent defence expenditure; PSXP = personnel expenditure; OHXP = overhead expenditure and μ_i ì = error term which is normally distributed. To capture non-linear properties and to correct for heteroscedasticity, the variables employed were all transformed into logarithms. In the new model, inflation is added as a control variable, therefore, the new model to be estimated is:

RGDP = f(RDEF, PEXP, OEXP, INFL)
RGDP = β0 + β1 RDEF + β2PEXP + β3 OEXP + β4INFL+ μi ....(2)

Where: RGDP = Real Gross Domestic Product (a proxy for economic growth); RDEF = Recurrent Defense Expenditure; PEXP = Personnel Expenditure; OEXP = Overhead Expenditure and INFL = Inflation Rate. Based on the foregoing, the study will specify and estimate our parsimonious ARDL model to investigate the stated objectives of the study:

$$\Delta RGDP_t = \beta_0 + \sum_{i=1}^{P} \beta_1 \Delta RDEF_{t-1} + \sum_{i=1}^{q2} \beta_2 \Delta PEXP_{t-1} + \sum_{i=1}^{q3} \beta_3 \Delta OEXP_{t-1}$$
$$+ \sum_{i=1}^{Q4} \beta_4 \Delta INFL_{t-1} + \lambda ECM_{t-1} + e_t \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \dots \quad (3)$$

Where: β_0= Constant parameter; Δ= First difference operator; β_i, = The parameter of the of the explanatory variables; ECM_{t-1}= Error correction term; λ= The parameter of the of the Error correction term and e_t= error term. The terms with the summation signs (∑) in the equations above represent the error correction dynamics and the long-run relationship. p and q are the optimal lag length. The null hypothesis in the two ARDL equations is $H_0 = \beta_1 = \beta_2 = \beta_3 = \beta_4 = 0$. This denotes the absence of a long-run relationship while the alternative hypothesis is H_1: $\beta_1 \neq \beta_2 \neq \beta_3 \neq \beta_4 = 0$. The calculated F-statistic is compared with two sets of critical values.

One set assumes that all the variables are I(0) and the other assumes they are I(1). If the calculated F – statistic exceeds the lower and upper critical value, the null hypothesis of no co-integration will be rejected irrespective of whether the variables are I(0) or I(1). If it is below the upper value bound, there is no cointegration. Once a co-integration relationship has been ascertained the long-run and short-run parameters of the relationship are then estimated. Co-integration analysis helps to clarify the long-run relationships between integrated variables.

The study will employ various statistical and econometric techniques to analyze the data and test the hypotheses.

4. Results and Discussion

Table 1: Descriptive Statistics

	GDP	DFE	RDE	CDE	INFL	EXCH
Mean	54043.07	289.612	197.5923	92.01973	17.81438	153.8033
Median	32191.31	181.3252	74.19877	75.02127	13.11111	130.5357
Maximum	173527.7	853.6791	642.0121	264.6905	72.8	358.8108
Minimum	489.7665	7.457962	4.206067	1.4917	5.4	8.0378
Std. Dev.	56927.93	288.8929	217.4756	80.23522	15.78912	102.5075
Skewness	0.788392	0.851138	0.930993	0.510363	2.322183	0.616278
Kurtosis	2.214586	2.431636	2.459105	1.987383	7.300081	2.37408
Jarque-Bera	4.396086	4.56277	5.326039	2.928637	56.75285	2.707207
Probability	0.11102	0.102143	0.069737	0.231236	4.75E-13	0.258308
Sum	1837464	9846.807	6718.137	3128.671	605.6889	5229.311
Sum Sq. Dev.	1.070000	2754150	1560756	212443.8	8226.773	346757
Observations	34	34	34	34	34	34

Source: *Author's computation from Eviews, 2024*

From Table 1, For all variables, the Jarque-Bera test results (except for inflation) suggest that we cannot reject the null hypothesis of normal distribution at the 5% significance level, as the p-values are greater than 0.05. However, inflation shows a very low p-value, indicating that its distribution significantly deviates from normal.

Correlation matrix

The correlation matrix is a table showing the correlation coefficients between the variables used in this project. Each cell in the table shows the correlation between two variables. This correlation matrix is used as a way to summarize data, as input into a more advanced analysis, and as a diagnostic for advanced analyses.

Table 2: Correlation coefficients between the variables

	GDP	DFE	RDE	CDE	INFL	EXCH
GDP	1					
DFE	0.989652	1				
RDE	0.986063	0.989358	1			
CDE	0.890617	0.918945	0.851781	1		
INFL	-0.31115	-0.32949	-0.29443	-0.38831	1	
EXCH	0.948865	0.949961	0.941134	0.869487	-0.34891	1

Source: Author's computation from Eviews, 2024

From Table 2, this matrix paints a picture of an economy where growth, defence spending, and currency valuation are closely linked, while inflation appears to have a more complex and less direct relationship with these factors. It is important to note that while these correlations indicate strong relationships, they do not necessarily imply causation and other underlying factors may be influencing these observed patterns.

Unit Root Test Result

Time-series models are often confronted with the problem of nonstationary data series, which generates biased estimates and high R^2 due to spurious regression of explanatory variables with trends which leads to the overestimation of t-values in the case of autocorrelation. Hence, the unit root test is required and the unit root tests considered in this research include the conventional unit root tests of Augmented Dickey-Fuller (ADF) is used. The null hypothesis for ADF is that an observable time series is not stationary (i.e. has a unit root). The reports of the unit root test results for the series are presented below:

Table 3: Summary of the unit root result

	At level	At first difference	Critical Value (%) 1	5	10	P- Vale	Order of Integration
LGDP		-5.1222*				0.0012	I(1)
LDFE		-6.82552*	-4.27328	-3.55776	-3.21236	0	I(1)
LRDE		-7.55486*	-4.27328	-3.55776	-3.21236	0	I(1)
LCDE		-8.51205*	-4.27328	-3.55776	-3.21236	0	I(1)
INFL		-4.5946**	-4.27328	-3.55776	-3.21236	0.0046	I(1)
EXCH	2.243021**		-2.6369				I(0)
			-4.27328	-3.55776	-3.21236		

Source: *Authors computation from Eviews, 2024.*
Note: **, ** and *** imply significance at 1%, 5% and 10% respectively.*
Source: *Author's computation from Eviews 9, 2024*

The table shows the results of unit root tests for six variables: The variables (LGDP, LDFE, LRDE, LCDE, and INFL) are integrated in order 1, denoted as I(1). This means they become stationary after first differencing. The exchange rate (EXCH) is an exception, being integrated of order 0, or I(0), indicating it is stationary at level.

Table 4: ARDL Bounds Test for Cointegration (ARDL Model)

F-Bounds Test Null Hypothesis: No levels relationship								
Test Statistic	Value	Signif.	I(0)	I(1) F-statistic 22.36165		10%	2.08	3.0
K	5	5%	2.39	3.38	2.5%	2.70	3.73	
		1%	3.06	4.15				

Note: **** Statistical significance at 1% level; ** statistical significance at 5%;* Statistical significance at 10% Critical values are obtained from Pesaran et al. (2001).*

Source: *Authors' computation using E-views*

The bound test results reveal the existence of a long-run relationship between variables. In the function (LGDP / LRGE, LCGP, LFGDD), the null hypothesis that there is no cointegration is rejected at 1% level as the F-statistic, 17.05122 is greater than the critical value, 4.66, at the upper bound indicating that there is cointegration between the variables. Since the calculated F-statistic (22.36165) is much higher than the upper bound critical values at all significance levels (1%, 2.5%, 5%, and 10%), we can confidently reject the null hypothesis of no cointegration. There is a statistically significant long-run relationship among GDP, Recurrent Defence Expenditure, Capital Defence Expenditure, Inflation Rate, and Exchange Rate in this model. This suggests that changes in these independent variables are associated with changes in GDP over the long run.

Table 5: ARDL Model ; Short run coefficients

ECMRegression

Variable	Coefficient	Std.Error	t-Statistic	Prob.
D(LGDP(-1))	1.025888	0.126056	8.138364	0
D(INFL)	0.006584	0.001542	4.269456	0.0004
ECM(-1)	-1.2057	0.228832	-5.26892	0
R-squared	0.847901	Mean dependent var		0.175559
Adjusted R-squared	0.751838	S.D. dependent var		0.130856
S.E. of regression	0.065187	Akaike info criterion		-2.33191
Sum squared resid	0.080737	Schwarz criterion		-1.73646
Log likelihood	50.3106	Hannan-Quinn criter.		-2.13454
F-statistic	8.82652	Durbin-Watson stat		1.815545
Prob(F-statistic)	0.00002			
	LONG RUN			
LGDP(-1)	0.9006	0.067004	13.44093	0
LDFE	-0.5269	0.391248	-1.34671	0.1924
LDFE(-1)	0.144656	0.284269	0.508871	0.6161
LRDE	0.336534	0.197857	1.700893	0.1037
LRDE(-1)	-0.07255	0.155178	-0.46753	0.6449
LCDE	0.244404	0.144628	1.689883	0.1058
LCDE(-1)	-0.00129	0.115435	-0.01118	0.9912
INFL	0.005204	0.001561	3.333855	0.0032
INFL(-1)	-4.9E-05	0.001896	-0.02589	0.9796
EXCH	0.000168	0.000825	0.203608	0.8406
EXCH(-1)	-0.0007	0.00081	-0.86751	0.3955
C	0.920041	0.362033	2.541315	0.019

*Note: *** Statistical significance at 1% level; ** statistical significance at 5%;* Statistical significance at 10% Critical values are obtained from Pesaran et al. (2001).*
Source: *Authors' computation using E-views*

The results in Table 5 show the estimated short run relationship. This table presents the results of the short-run equation of an Autoregressive Distributed Lag (ARDL) model, focusing on the short-term dynamics of GDP growth. The Error Correction Term (ECM(-1)) has a significant negative coefficient (-1.205697), which is crucial in an ARDL model. This indicates a rapid speed of adjustment towards long-run equilibrium. The coefficient suggests that about 120% of any disequilibrium is corrected within one period, which is unusually high and might warrant further investigation. The model has a good R-squared (0.847901) and adjusted R- squared (0.751838), indicating it explains a substantial portion of the variation in short-term GDP growth changes. The F-statistic (8.826520) with a very low probability (0.000020) suggests the model as a whole is statistically significant. The Durbin-Watson statistic (1.815545) is close to 2, indicating no severe autocorrelation in the residuals.

The results suggest that short-term changes in GDP are strongly influenced by their immediate past values, indicating momentum in economic growth patterns. The positive and significant effect of changes in inflation on GDP growth changes is noteworthy and consistent with the long-run results. The lack of significant coefficients for changes in defence expenditures and exchange rates suggests these factors may not have substantial direct short-term impacts on GDP growth changes.

The high speed of adjustment indicated by the ECM term suggests that deviations from the long-run equilibrium are corrected very quickly, which is unusual and might reflect some model specification issues or unique characteristics of the studied economy. Overall, while the model shows a good fit to the data, the limited number of significant variables suggests that short-term GDP growth dynamics might be influenced by factors not captured in this model or that the relationships are more complex than this linear model can capture.

The long-run equilibrium relationship between the variables was estimated using OLS. From the results, the model uses log-transformed GDP (LGDP) as the dependent variable and includes lagged values of GDP and other independent variables. The sample covers the period from 1991 to 2023, with 33 observations after adjustments. This suggests a time series analysis of economic factors over 33 years. The lagged GDP (LGDP(-1)) shows a highly significant positive coefficient (0.900600), indicating strong persistence in GDP growth. Among the other variables, only inflation (INFL) shows a statistically significant coefficient (0.005204) at the 5% level, suggesting a positive relationship between current inflation and GDP growth. Other variables, including defence expenditures (LDFE, LRDE, LCDE) and exchange rate (EXCH), do not show statistically significant coefficients at conventional levels. The model demonstrates an extremely high R-squared (0.998758) and adjusted R-squared (0.998107), indicating that it explains nearly all of the variation in GDP. The F-statistic is very high (1534.924) with a probability of 0.000000, suggesting that the model as a whole is statistically significant. The Durbin-Watson statistic (2.308347) is close to 2, indicating no severe autocorrelation in the residuals.

By Implication, the results suggest that past GDP values are the strongest predictor of current GDP, indicating a high degree of persistence in economic growth. The positive and significant effect of current inflation on GDP is noteworthy and might warrant further investigation. The lack of significant coefficients for defence expenditures and exchange rates in this long-run model suggests that these factors may not have a substantial direct impact on GDP growth over the period studied.

Autocorrelation Test for ARDL Model

Table 6: Breusch-Godfrey Serial Correlation LM Test

F-statistic	0.599711	**Prob. F(2,22)**	0.5590
Obs*R-squared	1.959508	**Prob. Chi-Square(2)**	0.3754

Source: *Authors' computation using E-views 9*

The null hypothesis is that the no autocorrelation in the error terms versus its alternative hypothesis of serial dependence among error terms. The probability of the chi-square statistics in the result has the value 0.3754(37.54%) which is greater than the 5% level of significance, hence the null hypothesis of no autocorrelation is accepted and we conclude that the result of this analysis is reliable and free from serial correlation.

Stability Test of ARDL Model

The study examined the stability tests for the first ARDL model that indicate a long-run relationship among the variables used (i.e.ARDL). This study relied on the cumulative sum (CUSUM) test and the results are presented as follows.

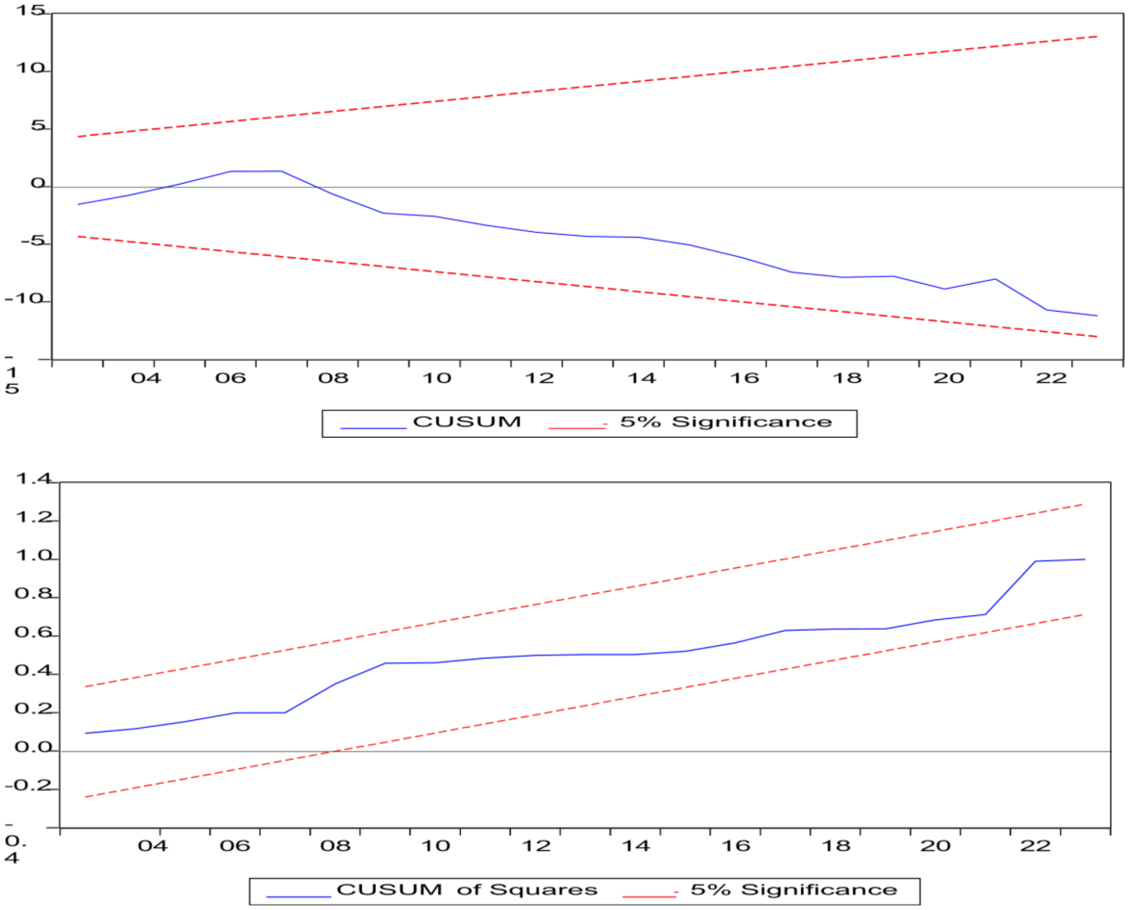

Figure 1: Stability test for ARDL Model
Source: Authors computation using E-views 9

Figure 1 plots the CUSUM and CUSUM of Squares statistics for the ARDL equation revealed the existence of cointegration. It can be seen in the figure that the plot of the CUSUM and CUSUM of Squares stays within the critical 5% bounds which confirms the long-run relationship among the variables and thus shows the stability of the ARDL model.

Discussion of Findings

This interpretation and discussion of the findings based on the ARDL model results for both long-run and short-run equations. Both the long-run and short-run models show strong persistence in GDP growth. This suggests that economic growth in this country has significant momentum, with past performance being a strong predictor of future growth. This persistence could indicate structural factors in the economy that maintain growth patterns over time.

Inflation emerges as a significant factor in both long-run and short-run models, showing a positive relationship with GDP growth. This positive relationship might suggest that moderate inflation has been associated with economic growth in this context. However, it's important to note that this relationship could be complex and non-linear over a broader range of inflation rates. The short-run model reveals rapid adjustment to equilibrium, as indicated by the error correction term. This suggests that the economy quickly corrects deviations from its long-run growth path. However, the unusually high speed of adjustment (over 100%) warrants further investigation and might indicate model specification issues. Both models show very high R- squared values, indicating they explain a large proportion of the variance in GDP growth.

However, the limited number of significant variables suggests that other important factors might be omitted or that the relationships are more complex than linear models can capture.

While the models provide insights into the dynamics of GDP growth, they also highlight the complexity of economic relationships. The strong role of past GDP and inflation, coupled with the surprising lack of significance for defence expenditures and exchange rates, suggests a need for nuanced economic policies and further research to fully understand the drivers of economic growth in this context.

5. Conclusion and Recommendations

This study examined the impact of patterns and structure of defence spending on economic growth in Nigeria from 1990 to 2023. The analysis revealed several important findings that contribute to our understanding of the complex relationship between defence expenditure and economic growth in the Nigerian context. First and foremost, the ARDL bounds test results confirmed the existence of a long-run relationship between defence expenditure and economic growth in Nigeria. This suggests that over time, changes in defence spending are indeed associated with changes in economic output. However, the nature of this relationship proved to be more nuanced than initially anticipated. A striking finding was the strong persistence in GDP growth patterns, as evidenced by past GDP values emerging as the strongest predictor of current GDP growth in both long-run and short-run models. Both long-run and short-run models showed high R-squared values, indicating that they explain a large proportion of the variance in GDP growth and it corroborated with Oladele and Adediran (2022) and Saeed (2023). However, the limited number of significant variables suggests that other important factors might be omitted or that the relationships are more complex than linear models can capture. This underscores the need for more sophisticated modeling approaches in future research. Finally, the CUSUM and CUSUM of Squares tests confirmed the stability of the ARDL model, lending credibility to the long-run relationships identified. This stability is crucial for the reliability of the findings and their potential application in policy formulation.

Based on the findings and conclusions of this study, the following recommendations are made for policymakers and stakeholders in Nigeria's economic and defence sectors.

i. The government should conduct regular cost-benefit analyses of defence expenditures, considering both direct and indirect economic effects.
ii. Efforts should be made to maximize potential positive spillovers from defence expenditures into the broader economy.
iii. Monetary policy should aim to maintain inflation at levels that support economic activity without jeopardizing long-term economic stability.
iv. Economic diversification efforts should be intensified to reduce vulnerability to external shocks and enhance sustainable growth. A flexible exchange rate regime that can absorb external shocks may be beneficial, but this should be balanced with measures to maintain confidence in the currency and manage imported inflation.

References

Acemoglu, D., & Robinson, J. A. (2021). Rents and economic development: *The perspective of Why Nations Fail. Public Choice, 187*(1-2), 13-28.

Acemoglu, D., Naidu, S., Restrepo, P., & Robinson, J. A. (2022). Democracy does cause growth. *Journal of Political Economy, 130*(5), 1259-1320.

Adebayo, A. A. (2014). Implications of 'Boko Haram' terrorism on national development in Nigeria: A critical review. *Mediterranean Journal of Social Sciences, 5*(16), 480-489.

Aghion, P., Antonin, C., & Bunel, S. (2021). The power of creative destruction: Economic upheaval and the wealth of nations. Harvard University Press.

Aghion, P., Bergeaud, A., Boppart, T., Klenow, P. J., & Li, H. (2022). A theory of falling growth and rising rents. *American Economic Review, 112*(4), 1417-1449.

Aizenman, J., & Glick, R. (2006). Military expenditure, threats, and growth. *Journal of International Trade & Economic Development, 15*(2), 129-155.

Akcigit, U., & Ates, S. T. (2021). Ten facts on declining business dynamism and lessons from endogenous growth theory. *American Economic Journal: Macroeconomics, 13*(1), 257-298.

Akinola, O. A., & Olatunji, O. E. (2021). Informal sector and economic growth in Nigeria: A NARDL approach. *Journal of Economics and Sustainable Development, 12*(6), 1-11.

Aliyev, K., & Gasimov, I. (2022). Institutional quality and economic growth: The case of post-communist countries. Post-Communist Economies, 34(6), 743-766.

Alptekin, A., & Levine, P. (2012). Military expenditure and economic growth: A meta- analysis. *European Journal of Political Economy, 28*(4), 636-650.

Ando, S. (2009). The impact of defense expenditure on economic growth: Panel data analysis based on the Feder Model. *The International Journal of Economic Policy Studies, 4*(8), 141-154.

Anyanwu, S., Alexander, A., & Shaibu, Y. (2019). Pattern and structure of defence spending and its impact on economic growth in Nigeria. *Nigerian Journal of Management Sciences, 7*(1), 159-167.

Baba, S. H., & Asgharpour, H. (2022). The impact of military expenditure on economic growth: A comparative analysis of developed and developing countries. *Defence and Peace Economics, 33*(2), 137-155. https://doi.org/10.1080/10242694.2020.1859614

Bandyopadhyay, S., Sandler, T., & Younas, J. (2011). Foreign aid as counterterrorism policy. *Oxford Economic Papers, 63*(3), 423-447.

Barro, R. J. (1990). Government spending in a simple model of endogenous growth. *Journal of Political Economy, 98*(5), S103-S125. https://doi.org/10.1086/261726

Barro, R. J. (1991). Economic growth in a cross section of countries. The Quarterly Journal of Economics, 106(2), 407-443. https://doi.org/10.2307/2937943

Barro, R. J. (2013). Inflation and economic growth. *Annals of Economics and Finance, 14*(1), 121-144.

Barro, R. J. (2020). Convergence and modernisation. *Economic Journal, 130*(631), 2343-2374.

Behl, A., & Singh, M. (2019). Military expenditure and economic growth in India: An Empirical investigation. *Defence and Peace Economics, 30*(5), 554-569. https://doi.org/10.1080/10242694.2018.1450405

Benoit, E. (1978). Growth and defense in developing countries. *Economic Development and Cultural Change, 26*(2), 271-280.

Brzoska, M. (1995). World military expenditures. In K. Hartley & T. Sandler (Eds.), *Handbook of Defense Economics 1*, 45-67). Elsevier.

Collier, P., & Hoeffler, A. (2002). Aid, policy and peace: Reducing the risks of civil conflict. Defence and Peace Economics, 13(6), 435-450.

Collier, P., & Hoeffler, A. (2002). Military expenditure: Threats, aid, and arms races. World Bank Policy Research Working Paper No. 2927.

d'Agostino, G., Dunne, J. P., & Pieroni, L. (2012). Corruption, military spending and growth. *Defence and Peace Economics, 23*(6), 591-604.

Deger, S., & Sen, S. (1995). Military expenditure and developing countries. In K. Hartley & T. Sandler (Eds.), *Handbook of Defense Economics 1,* 275-307). Elsevier.

Deger, S., & Smith, R. (1983). Military expenditure and growth in less developed countries. *Journal of Conflict Resolution, 27*(2), 335-353.

Destek, M. A., & Gokmenoglu, K. K. (2021). The impact of military expenditure on economic growth in the Middle East: A panel data analysis. *Defence and Peace Economics, 32*(4), 487-501. https://doi.org/10.1080/10242694.2020.1730113

Dickey, D. A., & Fuller, W. A. (1979). Distribution of the estimators for autoregressive time series with a unit root. *Journal of the American Statistical Association, 74*(366), 427- 431. https://doi.org/10.2307/2286348

Dickey, D. A., & Fuller, W. A. (1979). Distribution of the estimators for autoregressive time series with a unit root. *Journal of the American Statistical Association, 74*(366), 427- 431. https://doi.org/10.2307/2286348

Dimitraki, O., & Menla Ali, F. (2015). The long-run causal relationship between military expenditure and economic growth in China: revisited. *Defence and Peace Economics, 26*(3), 311-326.

Dimitraki, O., & Win, S. (2020). Military expenditure and economic growth in the European Union: A causality analysis. *Defence and Peace Economics, 31(*5), 541-553.
https://doi.org/10.1080/10242694.2019.1678415

Ductor, L., & Grechyna, D. (2022). Trade openness, financial development, and economic growth. *Journal of International Money and Finance, 124*, 102717.

Duella, A. (2014). Military burden and economic growth: Evidence from a nonlinear approach. *Journal of Global Economics, 2(*3), 1-13.

Dumas, R. D., Harding, R., & Park, C. (2022). The non-linear relationship between military expenditure and economic growth: Evidence from a global sample. *Defence and Peace Economics, 33*(1), 95-111. https://doi.org/10.1080/10242694.2020.1850026

Dunne, J. P., & Tian, N. (2015). Military expenditure, economic growth and heterogeneity. *Defence and Peace Economics, 26*(1), 15-31.

Dunne, J. P., & Uye, M. (2010). Military spending and development. In A. Tan (Ed.), The Global Arms Trade: A Handbook (pp. 293-305). Routledge.

Dunne, J. P., Perlo-Freeman, S., & Smith, R. P. (2008). The demand for military expenditure in developing countries: Hostility versus capability. *Defence and Peace Economics, 19*(4), 293-302.

Dunne, J. P., Smith, R. P., & Willenbockel, D. (2004). Theoretical and econometric issues in analysing the military expenditure-growth nexus. SCIES Research Paper No. 8.

Dunne, J. P., Smith, R. P., & Willenbockel, D. (2005). Models of military expenditure and growth: A critical review. *Defence and Peace Economics, 16*(6), 449-461. https://doi.org/10.1080/10242690500167791

Eniola, J. O., & Oluwafemi, F. (2018). Impact of defence expenditure on economic growth in Nigeria. *Journal of Advances in Social Science and Humanities, 4*(8), 445-456.

Faini, R., Annez, P., & Taylor, L. (1984). Defense spending, economic structure, and growth: Evidence among countries and over time. *Economic Development and Cultural Change, 32*(3), 487-498.

Fan, F., Su, C. W., Xiang, H., & Jia, Z. (2022). Defense spending and economic growth in China: New evidence from asymmetric and nonlinear analysis. *Defence and Peace Economics, 33*(2), 217-232. https://doi.org/10.1080/10242694.2021.1877582

Fox, M. V., & Erickson, J. D. (2020). Genuine Economic Progress in the United States: A fifty state study and comparative assessment. *Ecological Economics, 172*, 106568.

Goldsmith, B. E. (2003). Bearing the defense burden, 1886-1989: Why spend more? *Journal of Conflict Resolution, 47*(5), 551-573.

Gujarati, D. N., & Porter, D. C. (2019). Basic econometrics (6th ed.). McGraw-Hill Education.

Gupta, S., Sawhney, A., & Kalra, P. (2021). Military expenditure and economic growth in India: *Evidence from linear and nonlinear causality tests. Defence and Peace Economics, 32*(6), 707-724. https://doi.org/10.1080/10242694.2020.1808896

Habyarimana, F., & Opoku, E. E. O. (2021). Military expenditure and economic growth in Africa: Evidence from a panel of 48 countries. *Defence and Peace Economics, 32*(2), 206-223. https://doi.org/10.1080/10242694.2020.1721441

Hartley, K. (2011). The economics of defence policy: A new perspective. Routledge.

Hatemi-J, A., Gupta, R., Kasongo, A., Mboweni, T., & Netshitenzhe, N. (2018). Does military expenditure spur economic growth? Evidence from BRICS countries using a panel data approach. *Defence and Peace Economics, 29*(5), 611-628. https://doi.org/10.1080/10242694.2017.1361272

Heo, U. (2010). The relationship between defense spending and economic growth in the United States. *Political Research Quarterly, 63*(4), 760-770.

Hewitt, D. P. (1992). Military expenditures worldwide: Determinants and trends, 1972-1988. *Journal of Public Policy, 12*(2), 105-152.

Hirnissa, M. T., Habibullah, M. S., & Baharom, A. H. (2009). Military expenditure and economic growth in ASEAN-5 countries. *Journal of Sustainable Development, 2*(2), 192-202.

Huang, C., An, H., & Chen, X. (2020). Military expenditure and economic growth in Asia: A Panel data analysis. *Defence and Peace Economics, 31*(7), 741-757. https://doi.org/10.1080/10242694.2019.1697892

Iwuoha, V. C., & Aniche, E. T. (2021). Military expenditure and economic growth in Central Africa: Evidence from a panel of six countries. *African Security Review, 30*(3), 283- 301.

Jervis, R. (1978). Cooperation under the security dilemma. World Politics, 30(2), 167-214.

Jorda, O., Singh, S. R., & Taylor, A. M. (2020). The long-run effects of monetary policy. Working Paper No. 26666. National Bureau of Economic Research.

Kapoor, A., & Pant, R. (2022). Military expenditure and economic growth in South Asia: A Panel data analysis. *Defence and Peace Economics, 33*(3), 343-358. https://doi.org/10.1080/10242694.2021.1942555

Karadam, D. Y., Celik, M. U., & Yildirim, J. (2021). Military expenditure and economic growth in Middle Eastern and North African countries: Evidence from asymmetric panel causality tests. Defence and Peace Economics, 32(3), 351-366. https://doi.org/10.1080/10242694.2020.1736493

Keynes, J. M. (1936). The general theory of employment, interest, and money. Palgrave Macmillan.

Kollias, C., & Paleologou, S. M. (2017). The globalization and peace nexus: Findings using two composite indices. *Social Indicators Research, 131*(3), 871-885.

Kollias, C., Manolas, G., & Paleologou, S. M. (2007). A panel data analysis of the nexus between defence spending and growth in the European Union. *Defence and Peace Economics, 18*(1), 75-85.

Kuimova, A. (2021). Military expenditure and economic growth in the post-Soviet states: A Panel data analysis. *Defence and Peace Economics, 32*(5), 579-598. https://doi.org/10.1080/10242694.2020.1782900

Malizard, J. (2015). Does military expenditure crowd out private investment? A disaggregated perspective for the case of France. *Economic Modelling, 46*, 44-52.

Manamperi, N. (2016). Does military expenditure hinder economic growth? Evidence from Greece and Turkey. *Journal of Policy Modeling, 38*(6), 1171-1193.

Menla Ali, F., & Dimitraki, O. (2014). Military spending and economic growth in China: A regime-switching analysis. *Applied Economics, 46*(28), 3408-3420.

Ministry of Budget and National Planning. (2017). Economic Recovery and Growth Plan 2017-2020.https://nationalplanning.gov.ng/wp-content/uploads/2017/03/Economic-Recovery-and-Growth-Plan-2017-2020.pdf

Ministry of Budget and National Planning. (2017). Economic Recovery and Growth Plan 2017-2020. https://nationalplanning.gov.ng/wp-content/uploads/2017/03/Economic-Recovery-and-Growth-Plan-2017-2020.pdf

Moldovan, I. R., Paun, D., Cirstea, S. D., Gombos, S., & Paun, C. V. (2019). Military expenditure and economic growth: Evidence from the G7 countries. *Defence and Peace Economics, 30*(6), 732-746. https://doi.org/10.1080/10242694.2018.1529552

Narayan, P. K. (2005). The saving and investment nexus for China: Evidence from Cointegration tests. *Applied Economics, 37*(17), 1979-1990. https://doi.org/10.1080/00036840500278103

Nkoro, E., & Uko, A. K. (2016). Autoregressive Distributed Lag (ARDL) cointegration technique: Application and interpretation. *Journal of Statistical and Econometric Methods, 5*(4), 63-91.

Odehnal, J., & Neubauer, J. (2020). Economic, security, and political determinants of military spending in NATO countries. *Defence and Peace Economics, 31*(5), 517-531. https://doi.org/10.1080/10242694.2019.1676233

Ogbuabor, J. E., & Malaolu, V. A. (2013). Size and causes of the informal sector of the Nigerian economy: Evidence from error correction MIMIC model. *Journal of Economics and Sustainable Development, 4*(1), 85-103.

Oladimeji, M. S., Ajisafe, R. A., & Olofin, O. P. (2020). Military expenditure and economic growth in Nigeria: A bounds testing approach. *Pakistan Journal of Social Sciences, 40*(2), 1007-1025.

Oladimeji, M. S., Ajisafe, R. A., & Olofin, O. P. (2020). Military expenditure and economic growth in Nigeria: A bounds testing approach. *Journal of Economics and Sustainable Development, 11*(16), 91-103. https://doi.org/10.7176/JESD/11-16-10

Onuoha, F. C. (2010). The Islamist challenge: Nigeria's Boko Haram crisis explained. *African Security Review, 19*(2), 54-67.

Perlo-Freeman, S., & Sköns, E. (2008). The private military services industry. SIPRI Insights on Peace and Security No. 2008/1.

Pesaran, M. H., Shin, Y., & Smith, R. J. (2001). Bounds testing approaches to the analysis of level relationships. *Journal of Applied Econometrics, 16* (3)289-326. https://doi.org/10.1002/jae.616

Phillips, P. C., & Perron, P. (1988). Testing for a unit root in time series regression. Biometrika, 75(2), 335-346. https://doi.org/10.1093/biomet/75.2.335

Phillips, P. C., & Perron, P. (1988). Testing for a unit root in time series regression. *Biometrika,75*(2), 335-346. https://doi.org/10.1093/biomet/75.2.335

Rodrik, D. (2021). Why does globalization fuel populism? Economics, culture, and the rise of right-wing populism. *Annual Review of Economics, 13*, 133-170.

Romer, P. M. (1990). Endogenous technological change. Journal of Political Economy, 98(5), S71-S102. https://doi.org/10.1086/261725

Rosh, R. M. (1988). Third world militarization: Security webs and the states they ensnare. *Journal of Conflict Resolution, 32*(4), 671-698.

Saba, C. S., & Ngepah, N. (2019). Military expenditure and economic growth: Evidence from a heterogeneous panel of African countries. *Economic Research-Ekonomska Istraživanja, 32*(1), 3586-3606. https://doi.org/10.1080/1331677X.2019.1674179

Saeed, L. (2023). The Impact of Military Expenditures on Economic Growth: A New *Instrumental Variables Approach. Defence and Peace Economics,* 1–16.
https://doi.org/10.1080/10242694.2023.2259651

Sandler, T., & Hartley, K. (1995). The economics of defense. Cambridge University Press.

Saunders, M., Lewis, P., & Thornhill, A. (2019). Research methods for business students (8th ed.). Pearson Education.

Smaldone, J. P. (2006). African military spending: Defence versus development? *African Security Review, 1*5(4), 18-32.

Smith, R. P. (2009). Military economics: The interaction of power and money. Palgrave Macmillan.

Solow, R. M. (1956). A contribution to the theory of economic growth. *The Quarterly Journal of Economics, 70*(1), 65-94. https://doi.org/10.2307/1884513

Spolaore, E., & Wacziarg, R. (2022). Ancestry, culture, and economic development. In S. N. Durlauf, C. Hurst, A. B. Krueger, & B. A. Weinberg (Eds.), Measuring and understanding economic differences across places (31-81). University of Chicago Press.

Stiglitz, J. E., Fitoussi, J. P., & Durand, M. (2020). Measuring what counts: The global movement for well-being. The New Press.

Stockholm International Peace Research Institute. (2021). SIPRI military expenditure database. https://www.sipri.org/databases/milex

Swan, T. W. (1956). *Economic growth and capital accumulation. Economic Record, 32*(2), 334-361. https://doi.org/10.1111/j.1475-4932.1956.tb00434.x

Ukpe, O. U., & Obioma, B. K. (2022). Military expenditure and economic growth in Nigeria:
Further evidence from nonlinearity and asymmetric analysis. *International Journal of Economics and Financial Issues, 12*(1), 1-11.

United Nations Development Programme. (2021). The next frontier: Human development and The Anthropocene. *Human Development Report 2021.*
http://hdr.undp.org/sites/default/files/hdr2021.pdf

Usman, S. A., & Abbo, U. (2020). Military expenditure and economic growth in Nigeria: Implications for inclusive growth. *Journal of Economics and Sustainable Development, 11*(18), 43-51.

Wooldridge, J. M. (2019). Introductory econometrics: A modern approach (7th ed.). Cengage Learning.

World Bank. (2021). Nigeria overview. https://www.worldbank.org/en/ country/nigeria/ overview

Yildirim, J., & Sezgin, S. (2002). Defence, education and health expenditures in Turkey, 1924-96. *Journal of Peace Research, 39*(5), 569-580