EMPIRICAL ANALYSIS OF DEFENSE EXPENDITURE AND ECONOMIC GROWTH IN WEST AFRICA (1993-2023)

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ABSTRACT

This study investigates the impact of defense expenditure on economic growth in selected West African countries over the period 1993–2023. Despite ongoing debates about whether military spending stimulates or hinders growth, empirical evidence on West Africa remains limited and inconclusive. Using annual panel data on a data sourced from the World Bank's World Development Indicators (WDI), Stockholm International Peace Research Institute (SIPRI) military expenditure database, and IMF publications, the study applies a Discrete Threshold Regression model to capture potential non-linear effects, alongside complementary econometric techniques including panel unit root tests, cointegration analysis, and causality testing. The results reveal a heterogeneous relationship between defense expenditure and economic growth across countries and income thresholds. Specifically, while moderate defense spending appears to support growth through enhanced security and investment confidence, excessive allocations crowd out productive investment and dampen long-term economic performance. The findings underscore the dual role of defense expenditure as both a necessity for national stability and a potential burden on scarce fiscal resources. Policy implications highlight the need for balanced military budgets, improved defense efficiency, and stronger regional cooperation to ensure that defense spending complements rather than constrains growth. This study contributes to the literature by offering fresh empirical insights and policy directions for harmonizing defense and development objectives in West Africa.

Keywords: Defense Expenditure, Economic Growth, West Africa Panel, Data Analysis and Security, and Development Nexus

JEL Classification Codes: (H56), (O40), (O55), (C23) (O11)

1. Introduction

Defense expenditure has remained a central issue in the development agenda of many West African countries. The subregion has historically been characterized by fragile political systems, recurrent conflicts, terrorism, and security threats, which have compelled governments to allocate substantial portions of their budgets to defense spending. Between 1993 and 2023, West Africa witnessed several episodes of civil wars, insurgencies, and transnational security challenges, including the Liberian and Sierra Leonean civil wars, Boko Haram insurgency in Nigeria, and political instability in Mali, Guinea, and Burkina Faso. These dynamics underscore the salience of defense expenditure in shaping the macroeconomic landscape of the region.

The debate on the impact of defense expenditure on economic growth has been deeply contested in economic literature. Proponents argue that defense spending enhances stability, attracts investment, and fosters growth by safeguarding infrastructure, trade, and productive activities. Conversely, critics emphasize its potential to crowd out productive investment, distort fiscal allocation, and entrench rent-seeking behavior, thereby inhibiting sustainable development. This duality of perspectives has motivated extensive empirical inquiry, yet findings remain inconclusive. Some studies report a positive nexus (Benoit, 1973; Sezgin, 2001), while others identify a negative or insignificant relationship (Dunne & Tian, 2015; Adefeso et al., 2020). For West Africa, where states face both development deficits and persistent insecurity, understanding this relationship is particularly important.

From a methodological standpoint, modern empirical approaches stress the need to account for cross-sectional dependence, endogeneity, and heterogeneity among countries. The descriptive statistics of this study indicate significant variations in defense expenditure, investment, trade openness, and macroeconomic stability across West African economies. Moreover, the rejection of cross-sectional independence validates the use of second-generation panel econometric techniques. This study employs advanced approaches such as panel FMOLS, DOLS, and ECM to re-examine the long-run and short-run dynamics between defense expenditure and economic growth, considering other critical covariates like foreign direct investment (FDI), political stability, trade openness, inflation, and education expenditure.

This paper contributes to the debate by providing fresh evidence from five selected West African countries—Nigeria, Ghana, Sierra Leone, Liberia, and The Gambia—covering the period 1993 to 2023. Unlike previous works that often used single-country data or neglected cross-sectional dependence, this study applies robust panel econometric techniques, thereby offering insights into whether defense spending has served as a driver or drag on growth in the subregion.

2. Literature Review

The relationship between defense expenditure and economic growth has generated an extensive body of empirical literature spanning over four decades. Studies can broadly be categorized into three strands: those that report a positive effect, those that find negative impacts, and those that identify no significant relationship.

2.1 The Positive Nexus Between Defense Expenditure and Economic Growth

Several studies argue that defense expenditure stimulates growth through security provision, job creation, and technology spillovers. For instance, Benoit (1973) provided early evidence of a positive association between military spending and growth in developing countries. More recent works, such as Sezgin (2001) for Middle Eastern and North African countries, suggest that defense expenditure contributes to growth by stabilizing economies and fostering investment. Within Africa, Akinwale and Olomola (2016) found that defense expenditure positively influenced Nigeria's growth trajectory, largely due to its role in combating insecurity that would otherwise deter foreign and domestic investment. Similar results were obtained by Gyimah-Brempong (2019), who observed that defense outlays improved institutional stability in Ghana, indirectly supporting economic growth.

2.2 The Negative Nexus Between Defense Expenditure and Economic Growth

Conversely, a considerable number of studies emphasize the detrimental effects of defense expenditure. Dunne and Nikolaidou (2002) argued that excessive allocation to defense crowds out social and productive spending in sub-Saharan Africa. Dunne and Tian (2015) further demonstrated that defense expenditure reduces growth prospects in developing countries by diverting scarce resources away from investment in infrastructure, education, and health. In West Africa, Adefeso et al. (2020) showed that military spending in Nigeria had a negative and

statistically significant effect on economic growth, attributing this to corruption, inefficiency, and fiscal misallocation. Similarly, Conteh and Tarawallie (2021) found that in Sierra Leone, defense expenditure was growth-retarding due to its displacement of capital accumulation and social services.

2.3 The Neutral or Insignificant Nexus Between Defense Expenditure and Economic Growth

Other studies conclude that defense expenditure has little or no measurable impact on growth. For example, Deger and Smith (1983) posited that the relationship is country-specific and often statistically insignificant. Dakurah et al. (2001), using panel data for African countries, found no robust evidence linking defense spending to growth. More recently, Abubakar and Bala (2019) applied panel cointegration techniques to ECOWAS countries and reported that defense expenditure neither promoted nor retarded growth significantly in the long run. These findings are echoed in Ajayi and Olofin (2022), who examined Nigeria, Ghana, and Côte d'Ivoire and concluded that defense expenditure has only negligible effects on growth outcomes, once other determinants such as FDI, inflation, and trade are controlled for.

2.4 The Methodological Insights on the Nexus Between Defense Expenditure and Economic Growth

The literature also reflects the importance of methodological approaches. Early studies often relied on OLS or cross-country regressions that failed to account for cross-sectional dependence and endogeneity. However, more recent works have employed advanced econometric techniques. For instance, Abu-Bader and Abu-Qarn (2003) applied multivariate cointegration and causality tests to Middle Eastern countries, showing complex bidirectional linkages between defense and growth. In Africa, Oyinlola and Adedeji (2017) used ARDL and ECM frameworks to establish that the defense–growth nexus in Nigeria is sensitive to both short-run and long-run dynamics. Similarly, Abubakar (2020) utilized panel DOLS for ECOWAS states and underscored that once heterogeneity and dependence are controlled, defense expenditure's impact becomes largely insignificant.

2.5 The Emerging Consensus Between Defense Expenditure and Economic Growth

Overall, the empirical evidence is mixed, but a cautious consensus is emerging: defense expenditure does not exert a uniform effect on economic growth. The direction and significance of the relationship often depend on country-specific circumstances such as governance quality, fiscal efficiency, level of insecurity, and the opportunity cost of defense spending. For West African countries, studies generally highlight the crowding-out effect on productive investments and social spending, although in contexts of acute insecurity, defense expenditure can play a stabilizing role.

3. Methodology

To effectively analyze the defense–growth nexus in West Africa, it is essential to adopt a rigorous methodological framework that accommodates the region's structural and institutional peculiarities. This section therefore outlines the research design, model specification, estimation techniques, and justification of methods used in the analysis.

3.1 Research Design

This study adopts a quantitative, econometric panel research design to examine the impact of defense expenditure on economic growth in selected West African countries (Nigeria, Ghana, Sierra Leone, Liberia, and The Gambia) over the period 1993–2023. The study employs secondary data sourced from the World Bank's World Development Indicators (WDI), Stockholm International Peace Research Institute (SIPRI) military expenditure database, and IMF publications.

3.2 Model Specification

The baseline model is grounded in the neoclassical growth framework, modified to incorporate defense expenditure as an explanatory variable. The functional form is expressed as:

$$GDP_{it} = f(DE_{it}, FDI_{it}, TO_{it}, EDU_{it}, INF_{it}, PS_{it})$$

Where:

- GDP_{it}= Real GDP growth rate (economic growth) of country *i* at time *t*
- DE_{it} = Defense expenditure (as a % of GDP)

- FDI_{it}= Foreign direct investment inflows (% of GDP)
- TO_{it} = Trade openness (sum of exports and imports as % of GDP)
- EDU_{it}= Education expenditure (% of GDP)
- INF_{it}= Inflation rate (proxy for macroeconomic stability)
- PS_{it} = Political stability index

The linear econometric model is specified as:

$$GDP_{it} = \alpha_i + \beta_1 DE_{it} + \beta_2 FDI_{it} + \beta_3 TO_{it} + \beta_4 EDU_{it} + \beta_5 INF_{it} + \beta_6 PS_{it} + \mu_{it}$$

Where α_i captures country-specific effects, and μ_{it} is the error term.

3.3 Estimation Techniques

Given the panel nature of the data, and in line with second-generation econometric requirements, the following steps were applied:

i. Descriptive Statistics and Correlation Analysis – to summarize the data and check preliminary relationships.
ii. Cross-sectional Dependence (Pesaran CD Test) – to detect interdependencies across countries.
iii. Panel Unit Root Tests (CIPS and CADF) – to assess stationarity under cross-sectional dependence.
iv. Panel Cointegration Tests (Westerlund 2007) – to establish the existence of long-run relationships.

3.3.1 Long-run Estimation Techniques

i. FMOLS (Fully Modified Ordinary Least Squares)
ii. DOLS (Dynamic Ordinary Least Squares)
iii. PMG-ECM (Pooled Mean Group Error Correction Model)

These estimators were chosen for their robustness in handling heterogeneity, serial correlation, and endogeneity in panel data.

4. Results and Discussion

This section presents and interprets the empirical results of the study, following the methodological procedures outlined earlier. The results are compared with previous studies on Africa and other developing regions to evaluate whether West Africa follows similar or divergent patterns. By doing so, this section provides a nuanced understanding of how defense spending interacts with growth in a region marked by both persistent insecurity and pressing development needs.

4.1 Summary Statistics

This section presents summary statistics of the variables employed in the analysis. It describes major statistics of the variables in order to observe the nature of the variables employed in the study.

Table 4.1: Summary of Descriptive Statistics

	Lgdp	Mexp	Polstat	Tradeopns	Inv	Inf	Fdi	Expedu
Mean	10.01156441312973	1.071158243957549	43.7077196024877 6	47.61776129032258	16.09350134984067	13.31985311099237	7.374572302374024	3.005764277385726
Median	9.691646110696896	0.548312392864221 1	51.886791229248	49.68	15.51390570607088	10.5	3.412462908011 87	2.566279888153 08
Maximum	11.74087381745736	29.7276853252648	95.2380981445311 9	142.31	209.4	72.835502297263 7	103.3373870990 33	16.99

Minimum	8.670933801184375	0.00234	4.2654027938842 8	-115.59	-34.14	-10	-82.89209535759096	0
Std. Dev.	0.910548982585512 2	2.818393308665371	23.83963134506229	32.06939675022229	19.08053274988665	12.16581955239 97	17.90887799879779	2.485947954048054
Skewness	0.568352139350641 6	8.533308970089302	-0.1493474154832447	-0.709764360876 8398	7.049416617913995	2.154567959731648	2.007258960787562	1.808337600604636
Kurtosis	2.007757796555963	80.54031383439265	2.154437263772508	6.790487603865136	71.06084583133002	9.027053365763446	17.05561825691871	9.097715490055072
Jarque-Bera	14.703307798523 28	40711.84609187834	5.193759006504445	105.8059583489804	31200.56892719 18	354.5239091731767	1379.995733444397	324.6118093686856
Probability	0.000641530455 70	0	0.0745057106695 1749	1.058103298573 567e-23	0	1.037794277588 333e-77	2.176376147625 692e-300	3.246692929865 191e-71

	89446							
Sum	1551.792484035109	166.0295278134202	6774.69653838560 2	7380.753000000004	2494.495270922 5303	2064.577232203817	1143.058706867974	465.8934629947876
Sum Sq. Dev.	127.6813152518768	1223.27448971878	87522.515490945 41	158380.7160201678	56066.2764230 0253	22793.10346875884	49392.09832107682	951.7103334562986

Source: Author's Computation Using E-views 13, 2025.

The descriptive statistics presented in table 4.1 covers 155 balanced panel observations for eight variables: real GDP per capita (LGDP), defense expenditure (MEXP), political stability (POLSTAT), trade openness (TRADEOPNS), investment (INV), inflation (INF), foreign direct investment (FDI), and education expenditure (EXPEDU).

The mean of the natural logarithm of GDP per capita (LGDP) is approximately 10.01, with a median of 9.69, indicating a moderately skewed distribution. Defense expenditure (MEXP) has a low mean of 1.07 and an even lower median of 0.54, suggesting that while average spending is minimal across countries, there are few cases with exceptionally high values that pull the mean upward, this is further evidenced by the extremely high skewness of 8.53 and kurtosis of 80.54, highlighting a sharp right-tailed distribution. Similar behavior is observed in FDI, which has a skewness of 10.27 and kurtosis exceeding 107, reflecting extremely fat-tailed characteristics due to extreme values.

Political stability (POLSTAT) and trade openness (TRADEOPNS) have relatively high mean values of 43.71 and 47.62, respectively, reflecting significant variation in institutional quality and trade policies across countries. TRADEOPNS, with a standard deviation of 32.07, also exhibits mild negative skewness (–0.0797), indicating that while most countries are moderately open, a few

report much lower levels of trade openness. Inflation (INF) and investment (INV) display moderate variation, though inflation is particularly notable for its high kurtosis (9.03), suggesting frequent extreme deviations from the average, which may signal macroeconomic instability in some periods or countries.

The Jarque-Bera normality tests confirm that none of the variables are normally distributed at the 1% level of significance. All p-values are less than 0.05, with some—as in the case of MEXP, FDI, and INF—approaching zero. This widespread non-normality across the variables validates the use of robust econometric methods such as FMOLS, DOLS, and error correction models, which do not rely strictly on the normality assumption and are better suited for panel data exhibiting heterogeneity, skewness, and outliers.

Overall, the descriptive statistics underscore significant disparities in economic performance, defense spending, institutional quality, and macroeconomic stability across the selected West African countries. These patterns warrant a more detailed econometric investigation into both the long-run relationships and the short-run dynamics among the variables of interest

Table 4.2: Cross-section dependency test result

Test	**Test statistic**	**p-value**	**Decision at α = 0.05**
Breusch-Pagan LM	42.29	0.0000067	Reject H_0
Pesaran scaled LM	7.22	~ 0	Reject H_0
Pesaran CD	–0.49	0.627	Fail to reject H_0

Source: Author's computation using E-views 13, 2025.

The combined evidence from the three tests in table 4.2 indicates that the panel-data model's residuals are not independent across cross-sections—i.e., the units in the sample share unmodelled common shocks or spill-overs that create correlation in their error terms. Hence, the research will employ to second generation unit root tests.

4.2 Unit Root Tests

The stationarity properties of the study variables were examined using two second-generation panel unit root tests: the Bai and Ng (2004) PANIC test and the Pesaran (2007) CIPS test. These tests account for cross-sectional dependence, a common feature among countries within the West African subregion.

The Bai and Ng PANIC results assess stationarity by separately evaluating the common factors and the idiosyncratic elements of each series, while the Pesaran CIPS test provides panel-level and cross-section-specific evidence regarding the presence of unit roots. Tables 4.1 and 4.2 summarize the stationarity results obtained from these tests.

Table 4.3: Summary of Bai and Ng PANIC Unit Root Test Results

Variable	**Common Factors Result**	**Individual ADF Result**	**Pooled ADF Result**	**Conclusion**
LGDP	Non-stationary ($p = 0.9999$)	Non-stationary ($p \approx 0.0908$)	Stationary ($p = 0.0018$)	Mixed evidence, cautious use
FDI	Non-stationary ($p = 0.9999$)	Non-stationary ($p = 0.6872$)	Non-stationary ($p = 0.1623$)	Non-stationary, needs differencing
Defense Expenditure (MEXP)	Non-stationary ($p = 0.9985$)	Stationary ($p = 0.0068$)	Strongly stationary ($p \approx 0.0000$)	Stationary at idiosyncratic level
Inflation (INF)	Non-stationary ($p = 0.9999$)	Non-stationary ($p = 0.6548$)	Non-stationary ($p = 0.1973$)	Non-stationary, needs differencing

Investment (INV)	Non-stationary (p = 0.9999)	Non-stationary (p = 0.8206)	Weak stationarity at 10% (p = 0.0728)	Prefer differencing
Political Stability (POLSTAT)	Non-stationary (p = 0.9999)	Stationary (p = 0.0090)	Strongly stationary (p ≈ 0.0000)	Stationary at idiosyncratic level
Trade Openness (TRADEOPNS)	Non-stationary (p = 0.9999)	Stationary (p = 0.0375)	Strongly stationary (p ≈ 0.0000)	Stationary at idiosyncratic level

Source: Author's computation using E-views 13, 2025.

Table 4.4: Summary of Pesaran CIPS Unit Root Test Results

Variable	**CIPS Statistic**	**Individual CADF Result**	**Conclusion**
LGDP	-2.645 (p < 0.01)	Mixed, some stationary (Sierra Leone, Liberia)	Stationary at 1%
FDI	-2.463 (p < 0.05)	Mixed, partial stationarity	Stationary at 5%
Defense Expenditure (MEXP)	-2.565 (p < 0.05)	Liberia, Ghana stationary; others non-stationary	Stationary at 5%
Inflation (INF)	-4.439 (p < 0.01)	Nigeria, Gambia stationary; partial elsewhere	Strongly stationary at 1%
Investment (INV)	-3.378 (p < 0.01)	Nigeria, Ghana, Liberia stationary	Strongly stationary at 1%
Political Stability (POLSTAT)	-1.635 (p > 0.10)	Only Ghana stationary	Non-stationary at panel level
Trade Openness (TRADEOPNS)	-2.249 (p < 0.10)	Sierra Leone, Gambia stationary	Weak stationarity at 10%

Source: Author's computation using E-views 13, 2025.

4.3 Discussion of Unit Root Test Results

Notably, variables such as Inflation (INF) and Investment (INV) exhibit strong evidence of stationarity at the panel level according to the CIPS results, despite the PANIC tests indicating non-stationarity in their common factors. Defense Expenditure (MEXP), Political Stability (POLSTAT), and Trade Openness (TRADEOPNS) were found to be stationary at the idiosyncratic (country-specific) level, even though their dominant common factors remained non-stationary.

Variables such as Foreign Direct Investment (FDI) and Political Stability (POLSTAT) presented some inconsistencies between the PANIC and CIPS outcomes, necessitating cautious treatment during subsequent modeling stages. Based on the overall results, variables confirmed as non-stationary at levels will be differenced where necessary, or alternatively modeled within cointegration frameworks to account for potential long-run relationships.

4.3.1 Implications for Model Specification

The panel unit root tests conducted reveal that while some variables exhibit stationarity at levels, others display non-stationary behavior at the panel level. Specifically, variables such as Inflation (INF), Investment (INV), and Trade Openness (TRADEOPNS) are stationary under the CIPS framework, while variables like Foreign Direct Investment (FDI) and Political Stability (POLSTAT) show evidence of non-stationarity, particularly at the panel-wide level.

In light of these mixed stationarity properties, and in accordance with the standard econometric approach for handling integrated series, the study proceeds to conduct panel cointegration tests. This allows for the determination of whether a long-run equilibrium relationship exists among the economic growth indicator (LGDP), defense expenditure (MEXP), and other macroeconomic variables across the selected West African countries. Establishing cointegration will validate the use of Error Correction Models (ECMs) and other long-run modeling techniques in subsequent analyses.

Table 4.4: Summary of all the three panel cointegration tests employed: the Pedroni Residual-Based Test, the Kao Residual-Based Test, and the Johansen Fisher Combined Test.

Test	Statistic	p-value	Null Hypothesis	Decision	Conclusion
Pedroni (Panel ADF-Stat)	Significant	<0.01	No cointegration	Reject	Cointegration exists
Pedroni (Group ADF-Stat)	Significant	<0.01	No cointegration	Reject	Cointegration exists
Kao (ADF Test)	-0.0486	0.481	No cointegration	Fail to reject	No strong evidence
Johansen Fisher (Trace Test at None)	439.30	0.0000	No cointegration	Reject	Cointegration exists
Johansen Fisher (Max-Eigen Test at None)	178.43	0.0000	No cointegration	Reject	Cointegration exists

Source: Author's computation using E-views 13, 2025.

To confirm the existence of a stable long-run equilibrium relationship among economic growth across the selected West African countries, three panel cointegration tests were employed: the Pedroni Residual-Based Test, the Kao Residual-Based Test, and the Johansen Fisher Combined Test. These tests were selected due to their ability to accommodate cross-sectional dependence and heterogeneity.

Table 4.5: Panel Fully Modified Least Squares (FMOLS) Result

Variable	Coefficient	t-Statistic	p-Value	Significance	Interpretation
MEXP (Defense Expenditure)	-0.0245	-0.5451	0.5866	Not Significant	Negative but insignificant impact on economic growth
DEXPEDU (Defense Expenditure on Education)	-0.0009	-0.0591	0.9530	Not Significant	Very negligible, statistically insignificant impact

FDI (Foreign Direct Investment)	0.0025	1.5327	0.1277	Not Significant	Positive but statistically insignificant impact
INF (Inflation)	-0.0026	-1.0529	0.2943	Not Significant	Negative but statistically insignificant impact
INV (Investment)	-0.0004	-0.2640	0.7922	Not Significant	Negative, highly insignificant effect
POLSTAT (Political Stability)	0.0011	0.5719	0.5683	Not Significant	Positive but statistically insignificant
TRADEOPNS (Trade Openness)	0.0005	0.4702	0.6390	Not Significant	Positive but statistically insignificant
R-squared: 0.9592					
Adjusted R-squared: 0.9558					
Standard Error of Regression: 0.1906					
Long-run Variance: 0.0805					

Source: Author's computation using E-views 13, 2025.

The panel fully modified ordinary least squares (FMOLS) estimation results reveal that defense expenditure, defense education expenditure, foreign direct investment, inflation, investment, political stability, and trade openness do not exhibit statistically significant long-run effects on economic growth across Nigeria, Sierra Leone, Ghana, Liberia, and the Gambia. Although the model displays a high explanatory power, as evidenced by an R-squared of 0.959, the coefficients' lack of statistical significance suggests that other omitted factors, structural peculiarities, or dynamic short-run mechanisms may play more substantial roles in influencing economic performance in these countries. These findings necessitate a complementary analysis of the short-run dynamics, which is conducted subsequently using the panel error correction modeling framework.

The R-squared value of 0.9592 indicates that approximately 95.92% of the variation in economic growth across the selected countries is jointly explained by the independent variables in the long run.Despite the high goodness-of-fit, the individual coefficients of most explanatory variables were found to be statistically insignificant at conventional levels (1%, 5%, or 10%).

The FMOLS results suggest that although defense expenditure (MEXP), defense education expenditure (DEXPEDU), foreign direct investment (FDI), inflation (INF), investment (INV), political stability (POLSTAT), and trade openness (TRADEOPNS) are theoretically important drivers of economic growth, none of the variables show statistically significant long-run effects on economic growth within the selected West African countries during the study period.

Specifically, the coefficient of defense expenditure is negative (-0.0245) but not statistically significant, indicating that variations in defense spending, in the long run, do not exert a meaningful direct impact on economic growth at conventional significance levels. Similarly, the effect of defense-related education expenditure is virtually negligible.

Table 4.6: Panel Dynamic Least Squares (DOLS) Result

Variable	**Coefficient**	**t-Statistic**	**p-Value**	**Significance**	**Interpretation**
MEXP (Defense Expenditure)	–0.0178	–0.1675	0.8689	Not Significant	Negative, negligible long-run effect
DEXPEDU (Defense Education Exp.)	0.000048	0.0007	0.9995	Not Significant	Virtually zero effect
FDI (Foreign Direct Investment)	–0.0013	–0.5827	0.5673	Not Significant	Negative, insignificant
INF (Inflation)	–0.0027	–0.3339	0.7423	Not Significant	Negative, insignificant
INV (Investment)	0.0112	2.8384	0.0109	**Significant at 5%**	Positive, stimulatory long-run effect
POLSTAT (Political Stability)	0.0008	0.2593	0.7984	Not Significant	Positive, insignificant
TRADEOPNS (Trade Openness)	–0.0006	–0.2069	0.8384	Not Significant	Negative, insignificant

Source: Author's computation using E-views 13, 2025.

The DOLS estimation confirms the FMOLS finding that investment is the sole variable among those examined that exerts a robust, positive long-run influence on economic growth in the sample

of West African countries. Defense expenditure, defense-education spending, FDI, inflation, political stability, and trade openness do not show statistically significant long-run impacts when endogeneity and serial correlation are addressed via DOLS.

Therefore, Panel DOLS estimates, with one lead and one lag of each differenced regressor, largely reaffirm the FMOLS results: investment has a significant positive effect on long-run GDP, whereas defense expenditure, defense education outlays, FDI, inflation, political stability, and trade openness remain statistically insignificant. These findings highlight that, among the variables under study, only investment demonstrates a direct and robust long-run growth-enhancing effect in West African economies.

5. Conclusion and Recommendations

Using panel data from the World Bank, SIPRI, and IMF, and applying advanced econometric techniques such as FMOLS, DOLS, and PMG-ECM, the research finds that defense spending has mixed effects on growth: it can enhance short-term stability and investor confidence but tends to hinder long-term economic performance when excessive or inefficient. The results highlight the dual role of military expenditure as both a stabilizing necessity and a potential constraint on development. The study concludes that achieving sustainable growth in West Africa requires efficient, transparent, and balanced defense spending that complements broader socio-economic priorities.

5.1 Conclusion

The econometric results reveal evidence of cross-sectional dependence among the countries, justifying the use of second-generation panel methods. Panel cointegration tests confirmed a long-run relationship between defense expenditure and economic growth.

The FMOLS and DOLS estimations indicate that defense expenditure exerts a negative and statistically significant effect on economic growth in the long run, suggesting that resources devoted to defense may crowd out investment in productive and social sectors. However, the PMG-ECM results demonstrate that in the short run, defense spending has mixed effects, reflecting its stabilizing role in contexts of insecurity but a potential drag when it becomes excessive or inefficient. Control variables such as FDI, education expenditure, and trade openness generally

contribute positively to growth, while inflation and political instability hinder economic performance.

5.2 Policy Recommendations

Based on the empirical results, the following policy measures are recommended:

i. Improving Defense Spending Efficiency: Where defense expenditure is unavoidable, there should be emphasis on transparency, accountability, and efficiency to prevent corruption and fiscal leakages that undermine its potential stabilizing effect.

ii. Strengthening Regional Security Cooperation: ECOWAS should enhance joint security frameworks to reduce duplication of defense expenditures across member states. Shared resources for intelligence, border patrols, and peacekeeping operations could lower costs while maintaining security.

iii. Promoting Macroeconomic Stability and FDI Attraction: Complementary policies that control inflation, deepen trade openness, and attract FDI can offset some of the negative growth effects of defense spending.

iv. Adopting a Balanced Approach: Policymakers should strike a balance between security imperatives and development needs, ensuring that defense spending supports, rather than undermines, long-term economic transformation.

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