MILITARY EXPENDITURE AND INVESTMENT FLOWS IN SUB-SAHARAN AFRICAN COUNTRIES: DOES CROWD-OUT EFFECT EXIST?

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Abstract

This study examines the effect of military expenditure and insecurity on investment flows in Sub-Saharan Africa (SSA) from 2000 to 2023, focusing on both domestic investment and foreign direct investment (FDI). The analysis reveals a dual impact of military spending: while it positively influences domestic investment, supporting the crowd-in hypothesis, it has a negative impact on FDI, confirming the crowd-out hypothesis. Insecurity further exacerbates the negative effect on FDI, signaling instability to foreign investors. However, military expenditure can restore investor confidence domestically by improving security and fostering a safer environment for long-term investments. The study also explores the interaction between military spending and insecurity, finding that increased military expenditure in the presence of insecurity deepens the adverse effects on both domestic investment and FDI. These findings suggest that military expenditure alone cannot resolve the region's security challenges and could harm foreign investment prospects. The study concludes that while military spending may boost domestic investment, it deters foreign investors, particularly in insecure regions. Policymakers are advised to adopt comprehensive approaches, including institutional reforms and conflict resolution strategies, to mitigate the impact of insecurity and create a more conducive environment for investments in SSA.

Keywords: *Crowd-out, Expenditure, Investment flows, Insecurity, Military, SSAJEL CODE: E6, F2, H5*

1.0 INTRODUCTION

The role of investment in sustainable economic growth has always been the focus of economic experts due to its impacts on economic activities. Investment flow is seen as an important source of capital injection due to inadequate savings and liquidity constraints in developing countries (Busse & Groizard, 2008). Investment flows, especially Foreign Direct Investment (FDIs), have a direct effect on local and regional economic growth since they contribute to capital accumulation and enable technology transfer to the host country (Kukaj & Ahmeti, 2016). However, investment flows are one of the most volatile components of macroeconomic activity, which contributes to business uncertainty and poverty.

Military expenditure is often strongly linked with volatility in investment flows, as several studies have posited (see Aizenman & Glick, 2003; Temitope & Olayinka, 2021; Kennedy, 2021; Raifu, 2022). Military expenditure refers to the financial resources allocated by a government for the maintenance and development of its armed forces and defense-related activities. Military expenditure and investment flows are intertwined in that the former could influence the amount of investible funds and the business environment (Uddin & Shafiq, 2023). Increased military expenditure diverts government resources from critical sectors like infrastructure and education, potentially crowding out domestic investment and deterring foreign direct investment (FDI) due to perceived instability and weakened economic conditions, thereby stifling long-term

economic growth (Dunne & Tian, 2015; Aizenman & Glick, 2006). The crowding-out effect is an economic theory that suggests that increased government spending, particularly on non-productive sectors like the military, can reduce private investment, and lead to an adverse balance of payments and capital destruction (Kollias & Paleologou, 2019; Kennedy, 2021).

However, military expenditure can enhance business confidence, encouraging investment and economic growth through several channels. On the demand side, it boosts aggregate demand by increasing employment and utilizing idle resources. On the supply side, it generates positive externalities such as technological advancements, infrastructure development, and enhanced productivity. Additionally, military spending creates jobs, supports human capital development, and fosters research and development initiatives, which are essential for long-term economic growth. By maintaining a peaceful and stable environment, military expenditure can attract both domestic and foreign investors, facilitating investment and production activities (Asadullah & Aziz, 2017; Üçler, 2016; Ajala & Laniran, 2021). Thus, the empirical results on the connection between military expenditure and investment flows remain mixed.

The mixed results on the link between military expenditure and investment flows could be explained through the lens of insecurity. In the opinion of Sheikh et al. (2017), the primary impact of military expenditure is on security rather than on economic activities, but funding the military may have unintended consequences for the economy, and understanding these effects is crucial for informing overall policy decisions. Security is identified as a prerequisite to investment flows because, in the absence of peace and tranquillity, undertaking productive investment and making returns on investment have a minimal possibility (Dunne, Smith, &Willenbockel, 2005). Insecurity can create investment pessimism and lead to population displacement, which reduces export production, affects foreign exchange earnings and import potentials, and, as a result, further constrains output and investment (Kang & Lee, 2007; Oladimeji & Oresanwo, 2014; Ogadimma, 2017).

Military expenditure (ME) in Sub-Saharan Africa (SSA) has been a topic of extensive debate due to its implications for economic development and investment flows. Historically, SSA has faced numerous security challenges, including internal conflicts, terrorism, and border disputes, necessitating substantial military spending. In 2021, SSA's military expenditure was approximately $39.7 billion, accounting for about 1.08% of the region's GDP (Oba et al., 2024). This significant allocation of resources to defense raises concerns about its potential crowding-out effect on other critical sectors such as health, education, and infrastructure.

The high level of insecurity in the SSA region could explain the lack of consensus in research on the link between military spending and economic activity and its impact on investment flows (Dunne & Tian, 2013). The SSA has emerged as a global epicenter of terrorism, with four SSA nations (Burkina Faso, Mali, Somalia, and Nigeria) accounting for 73% of all terrorism-related deaths worldwide in 2022. Terrorism-related fatalities in the Sahel region of SSA increased by 43% in 2022, with violent conflict being the primary driver of these deaths, accounting for over 96% of the total deaths in the region (GTI, 2023). These alarming statistics underscore the region's severe security challenges and the significant impact of terrorism on its stability and development.

Theoretically, insecurity is a key factor influencing how military expenditure affects investment. Many studies have overlooked the role of insecurity in the military-investment relationship, assuming that rising military spending is synonymous with increased insecurity. However, this may not always be the case and could lead to flawed policy recommendations. Therefore, the overall objective of this study is to examine the effects of military expenditure on investment flows in SSA between 2000 and 2023, with insecurity as a moderating variable.

A unique feature of this research is its inclusion of insecurity in the analysis. Investment is usually affected by both political stability and security concerns. This study will investigate how increased military spending,

in response to perceived threats, could change how investors view countries in Sub-Saharan Africa (SSA). Additionally, unlike many earlier studies that only looked at domestic investment, this research innovatively examines the impact of military spending on both domestic investment and foreign direct investment (FDI) inflows. By analyzing both types of investment together, the study offers a more complete understanding of how military spending influences the overall investment environment. This dual focus allows for a detailed analysis of the potential negative impact on both local and international investors, which has been less studied in the SSA region. Finally, although the connection between military spending and economic growth has been studied in many parts of the world, very few studies have looked specifically at the unique social, economic, and political situation in Sub-Saharan Africa. This study focuses on this region and examines the complex relationships between military spending, investment, and economic growth in Sub-Saharan Africa. Considering the region's specific difficulties such as ongoing poverty, lack of development, internal conflicts, and political tensions, this study provides new perspectives by analyzing the effects of military spending on investment flows in the SSA region in this particular context.

2.0 LITERATURE REVIEW

2.1 Conceptual Review

2.1.1 Military Expenditure

Military expenditure has been conceptualized in different ways: according to the North Atlantic Treaty Organisation (NATO)'s (1992) definition, military expenditure encompasses all present and capital spending related to the armed forces, defense department operations, and other government agencies engaged in defense and space projects. It also includes costs associated with paramilitary forces and police deemed capable of military operations, military research and development expenses, testing, and evaluation costs. Additionally, the definition includes the expenditure on retirement pensions for service personnel, including civilian employees.

In a more comprehensive sense, military expenditure is defined, by the Stockholm International Peace Research Institute (SIPRI) (2021), as all current and capital spending on (a) the armed forces, including peacekeeping forces; (b) defense ministries and other government agencies involved in defense projects; (c) paramilitary forces deemed capable of conducting military operations; and (d) military space activities. SIPRI (2021) further elucidated that these expenses ought to encompass the following: (a) military and civilian personnel, including military retirement pensions and social services for personnel; (b) operations and maintenance; (c) procurement; (d) military research and development; and (e) military aid from the donor nation (integrated into the donor nation's military aid).

For this study, military expenditure refers to the financial resources allocated by a government for the maintenance and development of its armed forces and defense-related activities. This includes spending on personnel (salaries, pensions), equipment (weapons, vehicles), operations, research and development, and infrastructure needed to ensure national security and defense readiness.

2.1.2 Investment Flows

Investment flows encompass diverse forms, including foreign private investment and domestic investment. The Organization for Economic Cooperation and Development (OECD, 1996) defined FDI as a scenario where a single foreign investor controls less than 10 percent or more of the ordinary share or voting power of an incorporated or unincorporated enterprise and has a significant influence on the management of the company. Domestic investment, on the other hand, refers to the capital expenditure made within a country on acquiring or producing physical assets like machinery, equipment, buildings, and infrastructure, aimed at expanding and improving the productive capacity of the economy (Mankiw, Romer, & Weil, 1992). It comprises both private-sector investment by businesses and public-sector investment by the government.

2.2 Theoretical Review

The theoretical link between military expenditure and investment flows can be explored from numerous perspectives. These perspectives support the idea that military expenditures crowd out investment or not. According to Buiter (1976), the term "crowding out" describes how public economic activity replaces private economic activity. It involves a reduction in private or individual consumption as a consequence of increased government spending or a situation in which private operations decrease due to the expansion of government operations.

The classical approach sees military spending as unproductive and detrimental to the economic activities of the state. The theory argues that a large army will not facilitate the political and economic aspiration for freedom. Also, military expenditure will reduce investment and civilian consumption, which will in turn reduce economic growth and welfare (Looney, 1989). It, therefore, suggests a small government budget and limited interference with the economy. Thus, the classical approach supports the crowd-out effect. The Marxist theory, in line with the conclusion of the classical economists, contends that decisions involving military spending are made in favor of major interest groups due to the unequal information and power held by different interest holders (the military-industrial complex). The theory argued that increased military spending comes at the price of declining investments, consumption, and other state spending, or it results in a balance of payments deficit (Abell, 1990). However, the Keynesian theory sees military spending as a source of funding that increases aggregate demand and boosts output. It recognizes military expenditure as a proactive tool that could be used by a state to increase its output in the presence of ineffective aggregate demand or whenever there are economic recessions (Apanisile & Okunlola, 2014). Thus, the Keynesian theory does not support the crowd-out hypothesis. It rather claims that military expenditures promote investment spending in an economy.

2.3 Empirical Review

Various empirical studies exploring the relationship between military spending and investment have yielded divergent results. Some studies have indicated that government military expenditure crowds out private investments. On the other hand, other researchers have suggested the crowding-in hypothesis. Additionally, some studies have found a neutral effect of military expenditure on investment flows. Empirically, studies have discussed the relationship between military expenditures and economic activities. However, despite the large number of studies published in different research outlets, there appears to be no consensus about the effects of military expenditure on investment flows. The reason is that while some studies observe that military expenditure has a positive impact on investment flows (see Atesoglu, 2004; Ali & Ather, 2015; Malizard, 2015; Üçler, 2016; Assadullah & Aziz, 2017; Ajala & Laniran, 2021), others have found that military expenditure hurts investment flows (see Churchill & Yew, 2017; Lorusso & Pieroni, 2017; Kollias & Paleologou, 2019; Kennedy, 2021).

Smith (1980) employed a regression model using time series, cross-section, and pooled data to study 14 large OECD countries between 1954 and 1973. The findings indicated a significant opportunity cost of military expenditure, as it led to a reduction in investment. This suggested a negative causal relationship between investment and military spending. In support of this finding, Gold (1997) employed a Single Equation model and co-integration techniques on data consisting sample of OECD nations and found a likely short- and long-term trade-off between investment and military expenditure. Dunne, Nikolaidou, and Smith (2002) used dynamic panel data methods and economic models in 14 small-industrializing economies from 1960 to 1998 and found evidence of military expenditure negatively affecting investment but no evidence of positive effects. Similarly, Kollias (1995) used the error-correction approach in Greece from 1963 to 1990 and found that defense expenditure affects the economy through other economic aggregates, including crowding out of investment.

In their study, Hou and Chen (2014) utilized the "Smith demand-side model" along with different evaluation methods, including time series, cross-section, and pooled data. Their research during the post-Cold War period spanning 26 years revealed that military expenditure leads to a crowding-out effect on investment, although this effect was found to be less pronounced. Using the demand-side model of Smith, they quantified

the impact of military spending on investment, demonstrating that military expenditure has a contrary effect on investment. The widely accepted findings in the literature suggest that an increase in military spending and changes in non-military spending hurt private investment, leading to crowding out.

Oukhallou (2019) conducted a study on the impact of military expenditure on economic development across seventy-seven countries from various regions and income groups. The study employed the FE model, Poisson pseudo-maximum likelihood model, and instrumental variable model to address endogeneity concerns. The results indicate a negative correlation between military burden and economic development. Specifically, the findings reveal that military expenditure negatively crowds out public investment, particularly in middle and high-income countries.

Nevertheless, the crowding-in theory has also been supported by empirical evidence. The crowding-in theory posits that government spending does not crowd out private investment (Raifu, 2022). Dunne, Nikolaidou, and Smith (2004) conducted a study examining the influence of military expenditure on investment economic growth, and investment in small, industrialized economies. The research utilized data from 1960 to 1997, covering fourteen countries, and employed the pooled OLS, FE model, and random coefficient model. The findings indicated a negative effect of military spending on both economic growth and investment.

Dunne and Smith (2019) employed a two-way fixed effect VAR model to examine the relationship between military expenditure, economic growth, and investment in 46 countries from 1960 to 2014. They submitted that there is a direct impact of military spending on the growth of capital stock as influenced by investment. On the other hand, Kollias and Paleologou (2017) used the "panel vector autoregression (PVAR) model" along with SIPRI's new consistent time series dataset to analyze military expenditure and investment in a balanced panel of 65 nations from 1971 to 2014, resulting in a total of 2,730 observations. However, their study did not find a crowding–out effect between military expenditure and investment.

Studies from developing countries have also investigated the role of military expenditure, and insecurity on investment flows. For instance, Kennedy (2021) found that military expenditure negatively impacts private investment in Indonesia. Atesoglu (2004) noted that some researchers have expressed concern that increased defense spending would reduce capital expenditures, thereby reducing capital accumulation and economic growth. There are economic instruments and annual data that support this view. Using the ordinary least squares (OLS)-based co-integration technique to analyze annual data, we found no long-term co-integration relationship between the two variables.

However, this finding contradicted Edelstein's (1990) research, which did not find sufficient evidence of a military spending-investment trade-off over an extended period. Ebere, Abolore, Oluyemi, and Moses (2019) conducted research on the influence of security spending on FDI inflow in Nigeria from 1994 to 2017. They employed the autoregressive distributed lag (ARDL) bounds testing approach for co-integration and found that defense spending has a positive and significant impact on FDI. However, the relationship between internal security spending and FDI was found to be positive but insignificant. Ücler (2016) conducted an empirical analysis to investigate the connection between military spending and private investment in Turkey during the period 1975-2014. The results indicate a positive long-run relationship between military spending and private investment (crowd-in effect), but there is no evidence of a causal relationship between military spending and private investment. In Malizard's (2015) study, the focus is on the influence of military spending on private investment in France from 1980 to 2010. The results of the study align with prevailing findings in the literature, indicating that military spending has a positive impact on private investment.

Others have reported mixed findings. For instance, Kollias and Paleologou (2019) conducted a study to examine the impact of military spending on economic growth and investment. Their findings indicated that in high-income countries, military spending has a positive and significant effect on investment. However, in low-income and middle-income countries, the effect of military spending on investment was negative. The rationale behind this negative effect for low and middle-income countries is attributed to the resource constraints faced by most countries in these groups. Consequently, allocating more resources to the military

at the expense of other productive projects is perceived to be detrimental to private investment in these economies.

Aziz and Khalid (2017) investigated the connection between military expenditure and foreign direct investment (FDI) inflow in sixty developing countries during the period from 1990 to 2013. They utilized the band spectrum regression estimator and the maximal overlap discrete wavelet transform in their analysis. The results of their study indicate that military expenditure, when there is no armed conflict, negatively affects FDI inflow. However, the negative impact is alleviated when there is an increase in military expenditure during armed conflict. Additionally, the study shows that FDI inflow responds more positively to higher military expenditure in countries facing a higher risk of armed conflict compared to those facing a lower risk.

Rahman et al (2015) conducted a study to investigate the influence of different components of government spending on private investment in Pakistan from 1974 to 2010. The findings reveal that the actual effect of government spending varies depending on the type of expenditure under consideration. Government spending on agriculture, health, transport, and communications, along with inflation, has a positive impact on private investment in the long run, indicating a crowding-in effect. On the other hand, spending on public services and debt servicing hurts private investment, indicating a crowding-out effect. Spending on education and defense, however, is not significantly associated with private investment (Rahman et al., 2015).

Since there is no consensus in the literature on the impact of military spending on investment, this study is necessary. With no consensus emanating from the country-specific studies, several other plausible explanations were put forward.

3.0 METHODOLOGY

3.1 Population of the study

The population for this study consists of all countries in the SSA region. According to the World Bank's (2023) classifications, there are 48 countries in Sub Saharan African region, consisting of countries in Central Africa, Eastern Africa, Southern Africa, and Western Africa.

3.2 Sampling technique and sample size

A purposive sampling design was used to select 43 countries in SSA. One of the merits of the purposive sampling technique is that it enables researchers to squeeze a lot of information out of the collected data (Palinkas et al., 2015). In this study, among the 48 SSA countries, 43 were selected as the sample while 5 countries were omitted due to unavailability of data. The omitted countries are Burkina Faso, Eritrea, Sao Tome and Principe, Somalia, and South Sudan. Thus, the sample size for the study is 43, representing 86 percent of the population.

3.3 Research Design

In this study, a quantitative research method was used. In this case, descriptive and causal approaches were applied to the collected data, and panel econometric analysis was used to examine the nature of the relationship between military expenditure and investment flows in selected SSA countries.

3.3.1 Model Specification

In this study, the analysis focused on the effects of military expenditure which may either promote or hinder domestic investment and FDI inflows in SSA. Hence, investment flows in this study were proxied by both domestic investment and FDI. Following Smith (1980), Dunne et al., (2002), and Iheonu and Ichoku (2022), and in line with the objective of the study, equations 1 and 2 can be stated as:

$$DI_{it} = \beta_0 + \beta_1 DI_{it-1} + \beta_2 Y_{it} + \beta_3 M_{it} + \beta_4 INS_{it} + \beta_5 U_{it} + \beta_6 EN_{it} + \beta_7 EX_{it} + \beta_8 TO_{it} + \beta_9 (M_{it} * INS_{it}) + \xi_{it} \quad 1$$

$$FDI_{it} = \lambda_0 + \lambda_1 FDI_{it-1} + \lambda_2 Y_{it} + \lambda_3 M_{it} + \lambda_4 INS_{it} + \lambda_5 U_{it} + \lambda_6 EN_{it} + \lambda_7 EX_{it} + \lambda_8 TO_{it} + \lambda_9 (M_{it} * INS_{it}) + \mu_{it} \quad 2$$

DI and FDIdenote domestic and foreign direct investment, both of which are used to capture investment flows.$DI_{t-1} and\ FDI_{t-1}$ are the lagged values of domestic investment and foreign direct investment which are incorporated into the equations.$M$is military expenditure and INS represents a measure of insecurity.$Y, U, EN, EX,$ andTO are income, unemployment, energy consumption, exchange rate, and trade openness respectively. In the equation above, $M_{it} * INS_{it}$Represents an interaction term, which reveals the influence of military expenditure on the relationship between insecurity and investment flows. Both insecurity and military expenditures were interacted with and included in the equation to account for the moderating role of insecurity in the relationship between military expenditure and investment.

β_0 to β_9 and λ_0 to λ_9 are parameters to be estimated. The marginal effects (conditional and unconditional) of military expenditure, which would be calculated from equations 1 and 2, indicate the mediating role of military expenditure in the relationship between insecurity and investment flows.

Based on the crowd-out hypothesis, it is expected that military expenditure will hurt both domestic investment and FDI. Income, energy consumption, and trade openness are expected to have a positive impact on both domestic investment and FDI. Unemployment is expected to impact negatively on domestic investment and FDI, while the effect of the exchange rate on domestic investment and FDI is mixed.

3.3.2 Estimation Techniques

The study employed the System Generalised Method of Moments (SGMM) as developed by Arellano and Bover (1995) and extended by Blundell and Bond (1998). The choice of this estimation technique is due to the short panel data nature of the study. Estimation techniques, such as the method of moments, Pooled Ordinary Least Squares (POLS), Random Effect Model (RAM), Fixed Effect Model (FEM), etc. cannot incorporate more moments than parameters, which the SGMM does. These methods use only P number of moments to estimate the parameters, thus, dismissing the q-p<0 additional moments. In addition, system GMM accounts for issues of endogeneity and heteroskedasticity common in economic modeling.

To remedy the estimation problem above, Hansen (1982) provided support in his article entitled GMM. The GMM estimation helps to address the impassable system of equations and provides estimates (θs) that bring the sample moments close to zero.

There are steps involved in the estimation procedures. First, the statistical properties of variables stated in equations 1 and 2 were examined to identify and eliminate outliers and also note the normality attributes of these variables. In this sense, statistical properties such as mean, standard deviation, skewness, etc. were examined and discussed. Second, correlation coefficients were calculated to check for the possible presence of a linear relationship between the independent and control variables listed in equations 1 and 2 to prevent the problem of multi-collinearity. Third, variables in equations 1 and 2 were tested for stationarity through the use of Augmented Dickey-Fuller (ADF) and the Philips-Perron (PP) Tests. Finally, the SYS-GMM method was used to obtain the estimations of the coefficients stated in equations 1 and 2.

3.4 Source and description of data

Data used in this study are secondary data spanning 2000 to 2023 for countries in SSA. These data were sourced from the World Development Indicator database. Income (GDP), military expenditure as a percentage of GDP, total external trade, unemployment, inflation rate, energy consumption, foreign direct investment, gross fixed capital formation (domestic investment), and insecurity (presence of violence and

political instability) were sourced from the Worldwide Development Indicator database. The description of these variables alongside their sources is presented in Table 1.

Table 1: Descriptions of variables

Variables	Code	Measurements	Source
Income	Y	Real GDP	World Development Indicator
Military expenditure	M	the share of military expenditure to GDP,	World Development Indicator
Foreign Direct Investment	FDI	Foreign Direct Investment Inflows as % of GDP	World Development Indicator
Domestic Investment	DI	Gross Capital formation as % of GDP	World Development Indicator
Energy consumption	EN	Total Energy Consumption	World Development Indicator
Exchange rate	EX	Local currency to US dollar	World Development Indicator
Unemployment rate	U	Total unemployed population	World Development Indicator
Trade openness	TO	The sum of exports and imports to GDP	World Development Indicator
Measure of Insecurity	INS	Political instability and the presence of violence/terrorism	Worldwide Development Indicator

Source: computed by author

4.0 RESULTS AND DISCUSSION OF FINDINGS

4.1 Descriptive Statistics of the Variables

In Table 2, the results of the summary of descriptive statistics of domestic investment, foreign direct investment (FDI), measures of insecurity, real GDP, energy consumption, exchange rate, unemployment rate, and military expenditure are presented. From Table 2, the average value of foreign investment, measured as FDI as a percentage of GDP, and domestic investment, measured as gross fixed capital formation as a percentage of GDP is 3.38 % and 21.92 % respectively. Their minimum values respectively are -5.38 % and 2 % while their maximum values include 20.08 % for FDI and 58.68 % for domestic investment. This means that the region has been largely dependent on domestic investment rather than foreign investment as the highest amount of domestic investment as a percentage of GDP is more than twice the highest value of FDI as a percentage of GDP, however, the FDI values are closely spread across countries in SSA than value of domestic investment due to relatively low value of FDI's standard deviation. As regards the measure of military expenditure and measure of insecurity, the estimates show that the average value of the military expenditure as a percentage of GDP and political instability (insecurity)is 1.605 % and 37.59 respectively. Also, the minimum and maximum values of military expenditure as a percentage of GDP in SSA are 0.143% and 6.31%respectively. This indicates that the maximum proportion of GDP allocated to military expenditure by any of the selected countries is 6.3 %.

Table 2: Summary of Descriptive Statistics

Variable	Description	Mean	Std. Dev.	Median	Maximum	Minimum
FDI	Foreign Investment	3.380	3.665	2.447	20.081	-5.380
DI	Domestic Investment	21.917	7.395	21.016	58.686	2.000
ENE	Energy Consumption	680.649	645.166	458.038	2970.047	9.579
RGDP	Real GDP	2570.811	2338.317	1420.079	12660.910	330.549
MIL	Military Exp. (% of GDP)	1.605	1.160	1.288	6.306	0.143
INS	Pol. Instability & Presence of Violence	37.585	24.705	37.143	93.750	0.000
TRADE	Trade (% of GDP)	72.475	29.550	63.690	165.049	23.981
UN	Unemployment	9.340	7.442	6.356	28.240	0.320
EXC	Exchange rate (against the US dollar)	321.845	356.548	96.518	1653.231	0.044

Source: Author's Compilation (2024)

For the control variables, on average, energy consumption is 680.65 per capita, real GDP per capita is $2570.81, trade is 72.48 as a percentage of GDP, unemployment is 9.34%, and exchange rate (against the US dollar) is 321.85. For the minimum values, energy consumption is 9.58 per capita, real GDP per capita is $330.55, trade is 23.98 as a percentage of GDP, unemployment is 0.32 percent, and exchange rate (against the US dollar) is 0.044. For the highest value of control variables, energy consumption is 2970.5 per capita, real GDP per capita is $12660.91, trade is 165.05 as a percentage of GDP, unemployment is 28.24 percent, and exchange rate (against the US dollar) is 1653.23. However, it should be noted that among all the controlled variables foreign investment, military expenditure, exchange rate, energy consumption, and real GDP per capita have a high spread. This means that there are high disparities among countries in terms of their per capita income, level of energy consumption, foreign investment, military expenditure, and level of exchange rate.

4.2 Pairwise Correlation Analysis of the Regressor

To find out the extent of multicollinearity among the regressors, the correlation matrix is presented in Table 3. This is a procedure to ensure that the regressors are not in any way highly correlated to avoid multicollinearity. The correlation coefficients of the variables are significant at a 5 percent level. The range of the correlation coefficient value is between -1 and +1 where -1 represents a perfect linear relationship and +1 represents a perfect linear positive relationship.

Table 3: Correlation matrix

	ENE	RGDP	MIL	INS	TRADE	UN	EXC
ENE	1.000						
RGDP	0.744	1.000					
MIL	0.039	0.119	1.000				
INS	0.305	0.592	-0.068	1.000			
TRADE	0.097	0.494	0.167	0.426	1.000		
UN	0.556	0.600	0.379	0.394	0.453	1.000	
EXC	-0.227	-0.362	-0.281	-0.241	-0.313	-0.378	1.000

Source: Authors' computation.

As shown in Table 3, the correlation among the regressors is very weak. Most of the correlation coefficient between any two of the regressors is less than 0.5, implying a weak correlation among the regressors and the absence of strong multicollinearity. The only exception to that is the correlation between energy consumption and real GDP per capita (0.744), energy consumption and unemployment (0.556), real GDP per capita and unemployment rate (0.600), and real GDP per capita and insecurity (0.592). Again while these variables may have mildly high correlation coefficients related, they are not perfectly correlated and can be included in the model. Thus, there is no potential risk of multi-collinearity in the models used for this study.

4.3 Summary of the Panel Unit Root Test at Trend and Intercept

Unit root properties of variables stated in equations 1 and 2 are presented in Table 4. The result suggests that all these variables are not stationary at this level. For instance, most of these variables failed the unit root test at the level. Hence, the null hypothesis of unit roots at levels was not rejected for the variables since some of the tests failed. However, after first differencing the various data, it was found that the variables are stationary at first difference. Thus, it was concluded that all variables are all stationary at first difference.

Table 4: Unit Root Test

	Test Criteria	**Level**		**First difference**	
		Statistic	**Probability**	**Statistic**	**Probability**
RGDP	ADF-Fisher Chi-square	100.716	0.059	336.198***	0.000

	PP- Fisher Chi-square	107.444***	0.022	481.868***	0.000
Foreign Direct Investment	ADF-Fisher Chi-square	229.931***	0.000	601.860***	0.000
	PP- Fisher Chi-square	218.244***	0.000	2631.82***	0.000
Domestic Investment	ADF-Fisher Chi-square	86.1152	0.1586	288.374***	0.0000
	PP- Fisher Chi-square	67.6496	0.6853	453.519***	0.0000
Military Expenditure	ADF-Fisher Chi-square	85.4287	0.2644	257.210***	0.0000
	PP- Fisher Chi-square	87.2555	0.2217	472.631***	0.0000
Insecurity	ADF-Fisher Chi-square	121.269***	0.002	333.880***	0.0000
	PP- Fisher Chi-square	87.6934	0.2604	435.250***	0.0000
Energy Consumption	ADF-Fisher Chi-square	37.3706	0.7497	133.070***	0.0000
	PP- Fisher Chi-square	36.8235	0.7700	165.427***	0.0000
Exchange rate	ADF-Fisher Chi-square	107.933*	0.0204	235.240***	0.0000
	PP- Fisher Chi-square	86.2504	0.2966	401.913***	0.0000
Trade Flows	ADF-Fisher Chi-square	117.939***	0.0024	301.193***	0.0000
	PP- Fisher Chi-square	92.7455	0.1218	294.633***	0.0000
Unemployment rate	ADF-Fisher Chi-square	178.708***	0.0000	160.642***	0.0000
	PP- Fisher Chi-square	61.8096	0.9106	342.371***	0.0000

Note: ***, ** indicate significance at 1 percent, 5 percent
Source: Author's computation from E-views

4.4 Analysis of the Panel Cointegration Test of the Regressors

The panel cointegration test results are shown in this section. The entire series is stationary at the first difference, as confirmed by the unit root tests for each indicator. Therefore, after stationarity has been established, it is critical to ascertain the state of the long-run adjustments for the variables. The panel cointegration of Pedroni (1999), which is separated into between- and within-dimension categories, is employed in this study. The within-dimension panel cointegration displays the estimated statistics because the autoregressive coefficients for the countries in the panel are pooled across every country for the unit root tests on the regressed residuals. The between-dimension, on the other hand, displays the estimated statistics based on the mean of individually calculated quantities for each country in the panel. In the cointegration test of Pedroni (1999), several criteria like the Panel v, Panel rho, Panel PP, and Panel ADF are used to confirm long-run relationship for the within-dimension while criteria like the Group rho, Group PP, and Group ADF are used to verify long-run relationship for between-dimension. For robustness purposes, the KAO residual cointegration test is also used together with Pedroni results to confirm the long-run relationship among regressors.

Table 5: Pedroni Residual Cointegration Test for the Relationship between Military Expenditure and Domestic Investment in SSA

	within-dimension			
Test Criteria	**Statistic**	**Prob.**	**Weighted Statistic**	**Prob.**
Panel v-Statistic	-3.071206	0.9989	-6.669769	1.0000
Panel rho-Statistic	5.227224	1.0000	3.436928	0.9997
Panel PP-Statistic	-3.381713	0.0005	-4.385289***	0.0000

Panel ADF-Statistic	- 4.158358***	0.0000	- 4.204106***	0.0000
Between-dimension				
Test Criteria	**Statistic**		**Prob.**	
Group rho-Statistic	6.215050		1.0000	
Group PP-Statistic	-9.669797***		0.0000	
Group ADF-Statistic	- 5.056733***		0.0000	

Note: ***,** and * indicate 1percent, 5 percent and 10 percent level of significance
Source: Author's computation from E-view

Table 6: Pedroni Residual Cointegration Test for the Relationship between Military Expenditure and FDI in SSA

within-dimension				
Test Criteria	**Statistic**	**Prob.**	**Weighted Statistic**	**Prob.**
Panel v-Statistic	-3.428337	0.9997	-6.863135	1.0000
Panel rho-Statistic	5.245562	1.0000	3.561860	0.9998
Panel PP-Statistic	- 2.552691***	0.0447	-13.22282***	0.0000
Panel ADF-Statistic	- 3.355663***	0.0006	-6.343683***	0.0000
Between-dimension				
Test Criteria	**Statistic**		**Prob.**	
Group rho-Statistic	6.556562		1.0000	
Group PP-Statistic	-7.345100***		0.0000	
Group ADF-Statistic	-5.171595***		0.0000	

Note: ***,** and * indicate 1percent, 5 percent and 10 percent level of significance
Source: Author's computation from E-view

Tables 5 and 6 present the results of the Pedronicointegration test for the relationship between military expenditure and domestic investment, and military expenditure and foreign direct investment in SSA respectively. As shown in the results, the within-dimension cointegration result shows that both panel rho and panel PP statistics are significant at 5% and 1% critical level respectively. However, the panel v statistic and panel ADF statistic are not significant for the ordinary statistic of the within-dimension. Moreover, the weighted statistic of the within-dimension cointegration result shows that panel ADF statistics are significant at a 5 percent critical level while the panel ADF statistics are significant at a 1 % critical level. The panel v statistics and panel rho are the criteria that are not significant for the weighted statistic of the within-dimension. Therefore, for the within-dimension, the null hypothesis of no cointegration was rejected, and the alternative hypothesis that cointegration exists was accepted since three of the two criteria are achieved at various levels of significance.

4.5 Empirical Results

The results presented in Table 7 suggest that military expenditure has a positive and significant impact on domestic investment in SSA while holding the other explanatory variables constant. However, the results show that military expenditure has a negative and significant impact on foreign direct investment in SSA while holding the other explanatory variables constant.

Table 7: Estimates of the Effect of military expenditure on investment flows in SSA

	Domestic Investment			**Foreign Direct Investment**		
	Coefficient	**t-Statistic**	**Prob.**	**Coefficient**	**t-statistic**	**Prob.**
C	-0.1323	-0.3472	0.7286	0.879963	0.322678	0.7471
DI(-1)	0.8409**	3.262	0.017			
FDI(-1)				0.8471**	11.14182	0.0000
ENE	0.3220***	3.3361	0.0009	0.5236***	3.1314	0.0019

MIL	0.0144**	2.7511	0.0103	-0.0357***	-2.7511	0.0037
INS	-0.0769	-0.7208	0.2739	-0.0667**	3.2869	0.011
MIL*INS	-0.0322***	-3.3483	0.0007	-0.0016***	-3.6046	0.001
EXC	0.0243	1.5174	0.1299	0.1424	1.5963	0.1111
UN	-0.0760	-1.5281	0.1272	-0.0937	-1.3874	0.1922
Trade	0.3782***	3.5693	0.0004	0.6034**	2.2487	0.0250
RGDP	1.2173***	3.4123	0.0007	1.0546*	1.758873	0.0793
F-stat prob.			0.000			0.000
AR(1) Prob.			0.001			0.001
AR(2) Prob.			0.853			0.906
Sargen Prob.			0.000			0.000

*Note: ***, **, and *imply significance at 1 percent, 5 percent, and 10 percent.*

Source: Author's computation

Based on the coefficients of military expenditure in Table 7, a unit increase in military expenditure caused domestic investment to rise by 0.044 units and a fall in FDI by 0.524 units. These results indicate that military expenditure can perform different roles in an economy, while it could serve as a positive externality to domestic investment, it may deter foreign investors. Thus, the crowd-in hypothesis, where military expenditure promotes domestic investment, exists in SSA, and the crowd-out hypothesis, where military expenditure reduces FDI or scares away foreign investors (multinationals), also exists in SSA.

The effect of insecurity on investment in SSA is mixed. Based on the results in Table 7, insecurity has an insignificant negative impact on domestic investment in SSA, but it has a significant negative effect on foreign direct investment in SSA. The coefficients of insecurity indicate that an increase in insecurity will lead to about a 0.667 unit decrease in FDI in SSA while holding the other explanatory variables constant.

The coefficient of the interactive term for the FDI model in Table 7 is negative and statistically significant. This shows that an increase in military expenditure, amid insecurity, impacts negatively foreign direct investment in the SSA region. Thus, the net effect of insecurity on domestic and foreign direct investment is negative. This means that the effect of military expenditure and insecurity in SSA is negative. One of the implications is that an increase in military expenditure, amid insecurity, will ultimately crowd out investments. However, an increase in military expenditure in a secured environment boosts domestic investment.

As regards the effects of each of the control variables of domestic investment and FDI, results in Table 7 show that the coefficient of energy consumption is positive and statistically significant for the two dependent variables. This means that energy consumption impacts positively on domestic and foreign investments in SSA. Likewise, real GDP has a positive effect on both types of investments. As indicated by the positive sign of the coefficient of RGDP which is statistically significant for the two dependent variables, RGDP has a beneficial effect on domestic investment and FDI in SSA. Further, the coefficient of trade openness (trade as a percentage of GDP) is positive for the two models. This implies that holding other factors constant, an increase in trade will have beneficial effects on both domestic investment and FDI in SSA. However, the exchange rate and unemployment rate do not have a statistical effect on domestic and foreign direct investment when insecurity and military expenditure interact. This means that, for this study, the exchange rate and unemployment rate are not significant determinants of both domestic investment and FDI in SSA.

The post-diagnostic test results in Table 7 revealed that the SYS-GMM model estimated for the equation (1 and 2) is robust and meets certain econometric conditions. The AR(1) examined the possibility of autocorrelation associated with the regression result of the first order and it is expected that autocorrelation of order one exists because of the lagged dependent variables; however, it should not exist of order two and as such, the AR(2) probabilities revealed that we fail to reject the null hypothesis and we conclude that there is no autocorrelation of order two associated with the regression results at 5 percent level of significance for the

two models. The Hansen examines the null hypothesis that the instruments employed are purely exogenous and the result shows that the instruments employed are purely exogenous as the statistic fails to reject the null hypothesis that the models are purely exogenous. The F-statistics show that there is a significant harmony associated with the regression results.

4.6: Discussion of Findings

This study examines the impact of military expenditure and insecurity on investment flows in Sub-Saharan Africa (SSA), emphasizing the moderating role of military spending in this relationship. The findings reveal two distinct effects. On the one hand, military expenditure positively influences domestic investment in SSA, supporting the crowd-in hypothesis. This theory suggests that increased military spending, particularly in regions facing insecurity, boosts investor confidence by creating a safer environment for investment, leading to improved long-term investment prospects. This crowd-in effect is backed by previous research, including studies by Benoit (1978) and Khalid and Noor (2018), which highlight the positive role of military expenditure in enhancing domestic capital, employment, and growth.

On the other hand, the study finds that military expenditure negatively impacts foreign direct investment (FDI) in SSA, confirming the crowd-out hypothesis. According to this theory, rising military spending signals instability and a hostile business environment, discouraging foreign investors. This result aligns with the findings of researchers like Awan et al. (2014) and Osie-Hwedie and Kurantin (2019), who argue that military expenditure increases perceived risk for foreign investors, reducing FDI inflows. The study also contrasts with arguments by scholars like Norrlof (2010) and Khalid (2018), who suggest that military spending could enhance investor confidence by stabilizing economies under threat.

The study further examines the effect of insecurity on investment, revealing that insecurity has a minor negative impact on domestic investment but significantly reduces FDI in SSA. This aligns with findings from Collier (1999) and Mehmood and Mehmood (2016), who argue that insecurity manifested in political conflicts, terrorism, and violence that destroys physical and human capital, raises transaction costs, and diverts government spending from productive sectors like infrastructure to counterterrorism. As a result, investment declines, particularly FDI, as foreign investors avoid countries with high insecurity levels.

When military expenditure interacts with insecurity, the study finds that increased military spending does not mitigate the negative impact of insecurity on domestic investment. Instead, it exacerbates the harmful effects, indicating that military spending alone cannot resolve SSA's security challenges. The study suggests that higher military expenditure, especially when coupled with insecurity, deepens the unfavorable investment climate by diverting resources from productive investments to defense spending.

Finally, the study emphasizes that relying solely on military expenditure to address insecurity in SSA may not yield the desired results for attracting investments. Instead, a more comprehensive approach is needed, one that includes institutional reforms and alternative conflict resolution strategies. Policymakers in SSA should consider collaborative conflict management paradigms that address the root causes of insecurity, focusing on creating a stable and conducive environment for both domestic and foreign investment. This approach could help balance the need for security with the economic growth objectives in the region.

5.0 CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

This study explored the relationship between military expenditure, insecurity, and investment flows in Sub-Saharan Africa (SSA). The findings reveal a dual impact: military spending boosts domestic investment, aligning with the "crowd-in" hypothesis, but it deters foreign direct investment (FDI), supporting the "crowd-out" hypothesis. Increased military spending amid high insecurity worsens the investment climate, particularly for FDI, which perceives such spending as a signal of instability. Although military spending fosters a safer environment that may encourage domestic investment, it does not alleviate the negative

effects of insecurity. The interaction between military expenditure and insecurity demonstrates that high military spending fails to counteract insecurity's adverse effect on investment flows in SSA. In short, while military expenditure might serve as a short-term solution to domestic investment challenges, it may exacerbate issues with FDI.

5.2 Policy Recommendations

Policymakers in Sub-Saharan Africa (SSA) should balance security and economic development by reallocating military funds to sectors like infrastructure, education, and healthcare to foster growth. Structural reforms targeting insecurity's root causes, reducing corruption, and promoting political stability are essential. Collaborative conflict resolution approaches addressing poverty and social issues will help create a stable investment climate. SSA governments should adopt investment-friendly policies by improving transparency and governance to attract foreign investors. Diversifying military spending to support research, technological advancements, and productivity in other economic sectors is also recommended to enhance economic growth and development.

5.3 Limitations

The study is limited by its reliance on secondary data from international databases, which may not capture all country-specific nuances and real-time dynamics in Sub-Saharan Africa (SSA). Additionally, the focus on aggregate military expenditure overlooks the differences in how spending is allocated across various sectors, which may influence its impact on investment. The analysis does not fully explore other potential variables, such as political governance and corruption, which could also mediate the relationship between military spending, insecurity, and investment. Lastly, the findings may not be generalizable to countries outside of SSA due to its unique socio-political landscape.

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