

Original Research Article

Defense Budget and Response of Foreign Direct Investment (FDI) in Nigeria: Co-integration and VECM Approach

Abstract

The research was conducted on the topic: Defense Budget and Response of Foreign Direct Investment (FDI) in Nigeria: Co-integration and Vector Error Correction Model (VECM) Approach. The time series data spanned from 1981 to 2019 and was subjected to unit root test, co-integration test and vector error correction estimation. The results showed long run equilibrium among variables. It was found also that there existed short-run relationship existed or ran from GDP, MNFO, INF and LFP to FDI and recommended improvement in security spending and sincere intention in the approach to finding lasting solutions to insecurity among others

1.0 Introduction

Security has been a very important public good and in delivering products of governance to the people should be the first on the list. Without guaranteed security the achievement of government could be wiped within the shortest period of time. It is for this reason that the mercantilist in the 17th century advocated for security as the next item after accumulation of gold.

It has been an established fact that expenditure on security could bring about increased economic growth through increased capability of the army personnel by training and expansion of aggregate demand through increased investment (Benoit in Omowunmi and Awe (2014). When government spends on defense and the aim is achieved with a guaranteed security, investors will troop in from all over the globe to do business. Omowunmi and Awe (2014) has reported that government defense budget as a percentage of its total spending has been on the increase over some decades. According to him, it grew from 10.13% in 1974 to 11.99% in 1975. It dropped slightly in 1976 and since then has continues to increase.

Geographically, the mid-1970s Security spending has been on the increase especially in the Middle East and North Africa which stood at 22% yearly while in 1995 total security expenditure by developing nations amounted to about 19.3% of global security spending (Todaro and Smith 2011).

Adekunle and Oyewole (2022) have said that the governments of developing nations have spent heavily on their military but, rising conflict such as terrorism, ethnic, political, insurgency, religious and border fights etc. have being the major obstacle to their economic growth. Conflict especially war can destroy a state within an hour and creates a setback that will take decades to recover and correct.

Nigeria particularly has been over bordered with different security problems such as boko haram, banditry, kidnapping and host of other social vices perpetrated mostly by youths. For the purpose of progress, it is imperative of government to safeguard its territory to pave way for economic growth and development.

Security is a vital element for the existence of peace and so has become a major concern in the dispensation of products of governance by every government all over the world. According to Raymond and Ibyingibo (2021), government and the opposition should make national security a central concern because it is a social contract entered into by the people and the government. Recently, security problem has posed serious challenges to different nations especially African countries with no exception to Nigeria. Various countries have resorted to addressing insecurity in their domains through budgetary provision, foreign aid and help from NGOs.

For business to thrive and for government to properly carry out its functions, peace must be guaranteed. The business atmosphere must be conducive for investors to operate and must be free to do so too. There have been problem of capital flight in the past and present as a result of insecurity. Foreigners play huge role in contributing to the National income of Nigeria but, with the insecurity in the country they may not be willing to import their moneys for investment. This indeed will impact negatively on the Gross Domestic Product (GDP) of Nigeria and the resultant consequence is a strain on the budget. The government intent to provide solution to insecurity through defense budget and the response of FDI in Nigeria from 1990 – 2016 is the task for this research.

1.2 *Objective of the study*

The broad objective of the research is to find out what could be the response of FDI to security spending in Nigeria from 1981 – 2019 and to see the causal and long run relationship among FDI, DBGTT, GDP, INF, LFP and MNFO

2.0 *Literature Review*

2.1 *The Defense Budget*

Budget encompasses the proposed earnings and spending of government in a year. This proposal of earnings and spending by the government covers all sectors of the economy of the nation. The sectors include education, health, trading and finance, agriculture, manufacturing and construction, defense, and welfare.

Edame in Uzonwanne *et al*, (2022) perceived budget as an instrument that control the size of government revenue and expenditure. The expenditures include both capital and recurrent, subsidies, servicing of debt etc. An effective budgetary system should be capable of inducing economic growth and development in an economy.

Budget is understood as the estimated revenue and expenditures of government in the coming year. So, it is a futuristic proposal and estimates of the government revenue and expenditures for the next financial year. The part of the budget allocated to defense is what we refer to as defense budget. It covers the military costs of wares, arms and ammunition, salaries and so on.

Adedayo *et al* (2019), opined that it is imperative for all levels of government to make it a routine by preparing, approving and signing into law a budget which is revenues and expenditures in advance for a financial year if it wants to deliver. The deliverance here means economic stability which spread to comfort in doing business, desirable welfare, secured business environment, availability of infrastructures and so on that could bring about growth and development.

Stockholm International Peace Research Institute (SIPRI) explained defense budget to include all spending on military wares, building and maintenance of the armed forces. This include spending on peacekeeping forces, defense ministry and other ministries directly involved in the peace process and paramilitary if they are trained for both military and civil responsibilities.

Adekunle and Oyewole (2022) defined defense budget as finances generated and dedicated for the maintenance of the armed forces. According to him, the amount of budgetary allocation depends on the aggression the country wants to employ based on the present or future security threat and the size of the budget. Military spending is the expenditure of government that provides benefits than what is spent especially for fomenting peace and creating enabling environment for economic activities. It is a component of the total budget proposal of a nation for the next year.

The revelations of a proposal of the plan of action for the purpose of achieving an optimised defense target in a medium term (Folscher and Cole in Julius and Stella 2020). The government considers both internal and external threats and then draw a proposal as an expression of what it intend to spend out of its total budget for the year.

Adejoh and Ukhammi (2022) viewed military spending as a measure that gives a clear picture of the part of a country's resources that it would spend on its armed forces. To them expenditure on the armed forces does not mean capability and also not effective and efficient resource allocation, but it shows how countries prepare against one another and prioritization of national defense in comparison to other public expenses. The extent of the need for security determine its place in the list of items to be given priorities and also the amount to be allocated to it compared to other items that require public expenditure.

2.2 Foreign Direct Investment (FDI)

Okonkwo, *et al* (2015) viewed FDI as an avenue for a country to exploit opportunities or as a strategy with the intention of seeking business enhancement, economic emancipation and general improvement in its finance and economy outside the shores of its borders.

IMF (1999), FDI is a long term investment reflecting a lasting interest and control by a foreign direct investor or parent enterprise, of an enterprise entity resident in an economy other than that of the foreign investor.

FDI is seen as a vital source of capital that lends support to domestic investment, generates jobs and motivate transfer of technology between nations. It increases factor productivity and creates efficiency in resource utilization leading to growth and development. Lateef and Muhammad (2014).

Graham in Awe (2013) opined that FDI is an increase in the book value of the net worth of investment held, managed and controlled in a host country by nationals of other nations

FDI involves the flow of dollars from foreign countries to Nigeria for investment to compliment domestic businesses. This encompasses finances, skills and personnel, equipment and machinery and technology. It complements domestic investment, closes saving gap, improves government revenue, allows for passing on of skills and expertise and making available the resources required to achieve economic growth.

According to Lateef and Muhammad (2015) saw FDI as source that is used to aid local investment, generates employment and serves as a channel for technology transfer. According to them, free movement of labour and transfer and spillover of technology allow for increase factor productivity and efficient use of economic resources.

Akpan (2000) has affirmed Nigeria's commitment to accelerate economic growth and development by encouraging private investment through introduction of incentives. This is for the reason that the gap created by inadequate domestic resources could be partly filled by FDI. He said the availability of foreign exchange is made possible with the inflow of FDI and would

increase the capacity of the country to import. The benefits that could accrue to the host country include; tapping of skills and managerial knowledge resulting in organisational competence and access to foreign market, transfer of technology from technologically advanced nations and making possible the availability of diverse goods and services in the recipient country.

Omowunmi and Awe (2014) opined that FDI closes gaps of domestic saving for investment, revenue planned expenditure, term of trade and discrepancies in balance of payment which contribute greatly to economic growth in the country. Inflow of FDI complements the shortage of capital for investment in the recipient country. Most nations of the world have leveraged from the idea of the Salamanca school that preached against importation of finished goods and believed they have the capacities to produce those goods hence the reason for their progress. The incursion of FDI will make foreign exchange available which will ease production and importation of raw material from abroad to produce home made goods for exports.

2.3 *Advocacy for Trade and State Security*

The various schools of thoughts in economics have encouraged international trade and suggested strong military power. Prominent among them is the mercantile school of thoughts that existed between 16th and the 18th century as political movement with economic theory that advocates the use of the state's military power to protect local markets and supply source which they call protectionism. They are of the view that not all nations will benefit from foreign trade at the same time. According to them money and precious metals are the only source of wealth to any nation. They advised that scarce resources should be distributed among participating countries in trade and that trade should be motivated through tariff. They opined that since export generates

money for the country, it should be encouraged over import that sends money abroad. They held that surplus export over import ensures positive balance of trade backed by military might.

The Salamanca school existed almost the same time with the mercantile school and mostly at times not differentiated from the later school of thought. They share the same idea. The only difference is, the Salamanca do not see gold as the only source of riches. They are concerned with domestic production of goods and attention to the population. They also suggested that foreign goods should not be exchanged for gold but should be exchanged for other domestic wares. The foreign goods should not be imported as finished products but as raw materials to be used further in the production of domestic goods which should be sold to foreign countries. The scholars here suggested absolute stoppage to importation and to encourage sufficient supply of suitable quality domestically. They also advocated for self-sufficiency and national power.

17th and the 18th century marked the reigns of the pre-classical school that were conscious of the impact of interest rates and the value of money on trade. Prominent among this group is John Locke who held that man possess a property in his person in the form of his body strength which he uses for work otherwise referred to as labour and the work of his hands which are personally his. Locke abhors government interference in the economy but, suggested that government should work positively to ensure protection of lives and properties.

The classical school of thought emerged between 18th and 19th century. This group preached Laissez-faire and little government interference in the economy. Among them is David Hume who wrote on the possible influence of international trade on local prices in his quantity theory of money. The classical economists believed that is demand and supply and the natural flow of prices and trade that control the amount of money in circulation. They believed in a world of

harmony and peace and never envisaged world of struggle where conflict and war exist as was thought by the mercantile school.

2.4 *Theoretical Framework and Empirical study*

The theoretical basis for this research is built on the views of the mercantile school of thought. The research designed to study pattern of the inflow of FDI into Nigeria as a response to defense budget within the coverage period is subject to the security situation in the country since no rational individual will invest in a country where conflict, banditry, terrorism and all sorts of social vices is the order of the day. The mercantilist idea is about wealth accumulation with absolute consciousness of insecurity that may arise as a result. So, they advocated for a strong state military for the protection of lives and property.

Several researches have been carried out on security spending and FDI or on similar topic and the outcomes differ from one researcher to the other and slight similarity in some cases. This study's reviews of few researches are;

Omowunmi and Awe (2014) researched into foreign direct investment in Nigeria giving consideration to corruption, internal conflict, law and order and socioeconomic condition. Their data range covered 1970 to 2010. They analysed their data using OLS regression, ran some relevant econometric test such as causality, Johansen co-integration, error correction and unit root test. The results of their research showed that FDI in Nigeria is relatively low and discouraging due to high inflation rate, poor economic growth motivated by political instability, lack of openness, insecurity, internal conflict, corruption and poor infrastructure. They recommended that government should fund, equip, train and retrain security personnel to be able

to fight internal insecurity to make the country safe for investors to encourage the inflow of FDI to guarantee the expected economic growth for the country.

Dickson and Priesly investigated the impact of national security on foreign direct investment in Nigeria: an empirical analysis. They sourced for time series data covering 1980 to 2009 and OLS was used to analyse the data. The results indicated a negative relationship between FDI and national security. They recommended a strong stance by government to address the state of insecurity in Nigeria so as to attract more inflow of FDI to the country which are essential for economic growth and development.

Eberre *et al* conducted a study on security spending and foreign direct investment inflow in Nigeria: an autoregressive distributive lag model approach. Time series data on Nigeria's security spending and FDI inflow between 1994 and 2017 was sourced. They use bound test and ARDL approach for data analysis and found out that lag of FDI have significant and positive impact on current FDI inflow. The results also showed a positive and significant relationship between defense expenditure and inflow of FDI while internal security spending and FDI inflow have positive but insignificant relationship. There is also a positive but not significant relationship between inflation and inflow of FDI. They recommended an urgent need for serious attention to internal security spending and mobilization of adequate resources toward it to combat internal security problem that is hindering investment in the country.

Ayoola (2022) investigated insecurity and pattern of foreign direct investment in Nigeria (1999 – 2014) covering both the oil and non-oil sector. He sourced both primary and secondary data and subjected them to both qualitative and descriptive method of analysis and found out that insecurity negatively impacted on the pattern of FDI in Nigeria both in the oil and non-oil sector.

He however recommended the proactive efforts of government and an increase effort of security persons in creating a conducive, less risky and safe business environment so as to attract investment into the country.

Adeyeye *et al* (2016) researched on the nexus between security expenditure and foreign direct investment in Nigeria. They obtained secondary data with the range 1985 – 2015. The data were subjected to unit root test, Philip-perron approach, co-integration and error correction mechanism. The results showed a negative relationship between FDI and internal security expenditure and inflation while defense expenditure had long-run positive relationship with FDI. They have recommended tight border check to stop importation of arms and ammunition. It also recommended unrelenting efforts by government to creating enabling environment for investment and business to thrive.

Ayoola (2019) conducted a survey on insecurity and major determinants of foreign direct investment in Nigeria. His study covered both primary and secondary data spanning from 1999 – 2014. He applied qualitative and descriptive methods. According to him, he uses internalization and dunning eclectic paradigm for data analysis. The research findings showed that the relationship between insecurity and FDI is insignificant. His recommendations were that for the citizens to benefit from the flow of FDI, there should be revaluation of the regulatory guidelines and policy framework for foreign operations in Nigeria should be put in place.

There are few similarities in previous researches but this study used FDI as dependent variable and included Labour Force Participation (LFP) as an explanatory variable which is the gap covered.

3.0 Methodology

3.1 Model Specification

The first model specified for the study is the Ordinary Least Square (OLS) regression model given as;

$$1. \quad Y = \beta + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \mu$$

$$2. \quad FDI = \beta_0 + \beta_1 GDP + \beta_2 INF + \beta_3 MNFO + \beta_4 LFP + \mu$$

FDI = foreign direct investment

GDP = gross domestic product

INF = inflation

MNFO = manufacturing output

LFP = labour force participation

$\beta_0 - \beta_4$ are the parameters

μ = residual or error term

3. The Vector Error Correction Model (VECM)

$$\Delta FDI_t = \beta_0 + \sum_{i=1}^k \beta_{1i} \Delta FDI_{t-i} + \sum_{i=1}^k \beta_{2i} \Delta GDP_{t-i} + \sum_{i=1}^k \beta_{3i} \Delta INF_{t-i} + \sum_{i=1}^k \beta_{4i} \Delta MNFO_{t-i} + \sum_{i=1}^k \beta_{5i} \Delta LFP_{t-i} + \alpha \mu_{i=1}$$

Where, α is the speed of adjustment towards long run equilibrium

4.0 Analysis of Results

Table 1: Augmented Dickey Fuller (ADF) unit root test at first difference with trend and intercept

Variable	Test Statistics	t-statistic at 5%	P-value
FDI	-5.6268	-3.5366	0.0002***
DBGT	-4.3720	-3.6032	0.0100*

GDP	-3.7938	-3.5366	0.0282*
INF	-6.8016	-3.5403	0.0000***
MNFO	-4.2208	-3.5530	0.0111*
LFP	-8.6363	-3.5366	0.0000***

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Table 1 showed that the variables contain no unit roots at first difference. This can be read by comparing between the test statistic and the critical value at five percent. Looking through the test statistic, one could observe that the values of the test statistic are greater than the critical values at 5% in absolute terms. For this reason, we rejected the null hypothesis that there is unit root in the variables and conclude that the variables are stationary at first difference.

Table 2: Output of Johansen Co-integration test

No. of CE	Eigenvalue	Trace Stat.	0.5% critical value	Prob.**
0	0.7758	149.9400	95.7537	0.0000***
1	0.6606	94.5125	61.8189	0.0002***
2	0.5092	54.6366	47.8561	0.0101*
3	0.3564	28.3018	29.7971	0.0736*
4	0.2485	11.9979	15.4947	0.1570*
5	0.0378	1.4252	3.8415	0.2325*

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Table 2 is the e-views output of Johansen co-integration. The '0' in the first column mean no co-integration among the variables as null hypothesis but since the trace statistic greater than the 5% critical value, the null hypothesis is rejected. Meaning there is co-integration among the variable

which is also the same result shown by the Max. Statistic. Another criterion for accepting or rejecting is the significance of the values. For instance the trace statistic may be greater or less than the 5% critical value but if the probability value is greater than 5%, the null hypothesis is rejected. From Table 2 it can be observed that the probability values are less than 5% which indicate that our variables are co-integrated. What this mean is that there is a long run relationship among the variables or a long-run equilibrium exist among variables of the research.

Table 3: The Error Correction

Error Correction	D(FDI)	D(DBGT)	D(GDP)	D(MNFO)	D(INF)	D(LFP)
CointEq ₁	-01184	0.05076	-12.6574	-16825	133.3599	0.2857
D(FDI(-1))	-01160	0.0086	-1.7964	-0.4814	7.1342	0.1334
D(DBGT(-1))	0.0110	0.0606	-9.6690	-0.7887	353.2684	-0.1578
D(GDP(-1))	0.0440	0.0014	0.0251	-0.0029	-1.8952	-0.0147
D(MNFO(-1))	-0.2828	-0.0182	-0.3191	0.1688	-7.4818	-0.1293
D(INF(-1))	-0.0009	-9.0000	-0.0652	-0.0085	-0.2180	0.0016
D(LFP(-1))	-0.3930	-0.0496	-14.7688	-2.1406	87.3796	-0.1136
C	-0.2559	-0.0096	6.8089	.07925	48.7841	0.3136

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Table 3 is the extract from VECM output from e-views 12. First, it is a point to note that e-views automatically convert all variable into first difference in analysis. The essence of error correction is to allow for commoving of the variables or to ensure long run equilibrium among variables. The table showed a co-integrating equation that indicates whether there is a long run relationship among the variables which depends on its sign and significance as we shall see in the next session. Our target variable is FDI. The table showed how FDI commove with its vector and the other variables and their lags and each of the other variables with FDI and their own lags.

Table 4: System equation

	Coefficient	t-Statistic	Prob.
C(1)	-0.1184	-1.0023	0.3177

R-Squared = 0.6996, F-Statistic = 3.9406, Prob. (F-Statistic) = 0.0023

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Table 4 showed a negative sign for C_1 the speed of adjustment towards equilibrium. The probability value is more than 5% which is insignificant. The negative coefficient indicated a long run causal relationship among the variables. To find out whether there is a short-run causality running from the independent variables to FDI, Wald test was conducted.

Table 5: Wald Test

Test Statistic	Value	Prob.
F-Statistic ($c_4=c_5=0$)	2.9459	0.0735
F-Statistic ($c_6=c_7=0$)	9.6084	0.0010
F-Statistic ($c_8=c_9=0$)	6.4435	0.0063
F-Statistic ($c_{10}=c_{11}=0$)	4.3222	0.0251
F-Statistic ($c_{12}=c_{13}=0$)	2.1806	0.1368

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Table 5 is the e-views Wald test output. The equations in parentheses are the null hypotheses. For instance $c_4=c_5=0$ means there is no short-run causal relationship running from DBGT to FDI when the probability is greater than 5%. That is rejecting the null hypothesis and accepting the alternative which says there is short-run equilibrium running from DBGT to FDI.

From Table 5, it could be observed that there is a short run equilibrium running from DBGT, MNFO, INF and LFP except for GDP.

4.1 Test for Model Error

From our system equation, R-Squared is 0.6996 and significant at less than 5% which indicated that our model is a good one.

Table 6: Breusch Pagan Godfrey LM serial Correlation test

F-Statistic	0.3030	Prob. F(2,20)	0.7419
Obs*R-Squared	1.0588	Prob. Chi-Square(2)	0.5890

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Table 6 has shown that the residuals are free from serial correlation. This is shown by the observed R-Squared probability which is more than 5%.

Table 7: Breusch Pagan Godfrey Heteroskedasticity Test

F-Statistic	1.8256	Prob. F(18, 17)	0.1106
Obs*R-Square	23.7256	Prob. Chi-Square(18)	0.1642

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Table 7 showed that the model is free from heteroskedasticity. The observed R-Square probability value is more than 5% which led to the conclusion that there is no heteroskedasticity in the model.

Table 8: Jarque Bera Test for Normality

Statistic	t-Statistic	Prob.
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Jarque Bera	0.2704	0.8735
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Table 8 is the result of Jarque Bera test. The probability of the test value is 0.8735, which is greater than 5%. It means that the residuals are normally distributed.

5.0 Conclusions and Recommendations

The findings of this study showed that borne out of confidence and risk taking in business, FDI moves with other variables in the long run. It is an indication that if government continues to fight insecurity through improvement in the defense budget, all things being equal the flow of FDI will increase with time.

There was short-run equilibrium that ran from GDP, MNFO, INF and LFP to FDI but, no short-run relationship existed between DBGT and FDI. This result is desirable because if measures are taking, they may not manifest immediately even though it may not be defined by length of time in most cases.

The study recommended improvement in security voting and sincere fight against all form of social vices to create an enabling environment where business will thrive without hitches to encourage foreign investors.

The government should always bring the perpetrators of evil acts to book to serve as deterrent to others. There should be orientation on the need to maintain good societal values and norms and the government should provide jobs for the youths and the necessary infrastructures that will aid businesses.

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