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Military Expenditure, Institutional Quality and Economic Growth in Nigeria

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Abstract

The study investigates the nexus between military expenditure, institutional quality and Nigerian economic growth between 1984 and 2017. Variables such as military expenditure, corruption index as a proxy for institutional quality and growth rate as measure of Nigerian economic growth are included in the model. Other variables used as control are investment, population and macroeconomic variables such as exchange rate and inflation rate. Auto-Regressive Distributed Lag (ARDL) approach is applied and the result shows that there exists a long run relationship between military expenditure, institutional quality and Nigerian economic growth. The result further shows that there exists a positive and significant relationship between military expenditure and Nigerian economic growth but institutional quality in Nigeria was found to have significant negative impact on economic growth while the interaction between military expenditure and institutional quality also indicates a significant negative impact on Nigerian economic growth. It is recommended that military expenditure in Nigeria should be moderately reduced and institutions in Nigeria should monitor its disbursement to ensure that it is spent on what is actually meant for.

Keywords: *Institutional Quality, Military Expenditure, Economic growth*

1. Introduction

Literatures have emphasized strong ties between military expenditure and institutional quality in which they see the positive relationship between the two as very germane for economic growth of any country (Anifowose, 2019). In Nigeria, this assertion appeared not to have been seen because of the incessant upward reviews of the military expenditure even when the economic growth is at the lowest ebb. This is a major concern and calls to question the role of Nigerian government as an institution saddled with the management of military expenditure.

Over the years, there has been a continuous rise in military spending in Nigeria. For instance, available statistics showed that military expenditure grew from 444.6 billion naira to 1,055 billion naira between 2008 and 2013; showing a rapid upward trend in defence expenditure (Obasi, Asogwa & Nwafee, 2018). According to further figures released by the World Bank, it has also risen from 1,210 billion naira in 2015 to 1,509 billion naira in 2017. However, the rising trend in military spending in Nigeria was based on the rising insecurity situations in the country. The need to further protect the territorial integrity of the Federation has also contributed to Nigeria's rising military spending.

According to studies carried out by (Benoit, 1973;1978), it is expected that a safe country guaranteed by sophisticated military apparatus is important for peaceful co-existence that will create enabling environment for economic activities to thrive and in the long run, promote economic growth. However, for the military expenditure to be able to achieve this important task which is germane to economic growth, there is need for good quality institution to administer the spending on the military and make sure that the monies released are spent for the purposes they are actually meant for.

However, numerous efforts have been made by the Nigerian government as an institution in the past to make sure that military expenditure have the desired positive impacts on the nation's economic growth. These efforts were primarily centred on the prevention of mismanagement that are inherent in arms deal and transactions in Nigeria. Most of these efforts culminated in the establishment of various agencies such as the Economic and Financial Crimes Commission (EFCC), Independent Corrupt Practices and Other Related Offences Commission (ICPC) among others to monitor, track and prosecute

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corruption cases that has to do with arms deal and other financial frauds that are prevalent in the country (Obasi, Asogwa, & Nwafee, 2018).

Despite all these efforts and going by the recent statistics on the rising trend of military expenditure in Nigeria and the attendant slow economic growth and poor institutional quality as shown by the worsening corruption perception index of the country, the question then is what has been the effects of institutional quality and military expenditures on Nigerian economic growth? (See Omolehinwa and Naiyeju, 2018; World Bank Database, 2019)

In addition, there is a belief that military expenditure is still short of what can engender good economic growth and hence, the incessant advocate for increase in military expenditure especially in the developing countries (Khalid and Noor, 2015). Therefore, these schools of thought believe that advanced countries that enjoy peaceful environment that attract investment is as a result of their huge investment in the military and prudent management of these funds. This speaks much about the quality of the institutions in these economies. According to Muhammed & Abu (2016), an investment friendly environment which can be guaranteed by improved investment in the military is necessary to accelerate growth of any country. However, in Nigeria, the rising trend in the military expenditure appears not have shown on the economy especially recently when the Nigerian economy has been witnessing snoopy economic growth which drive her to economic recession in 2016 (World bank, 2019). The basic question then is, has military expenditure impacted significantly and positively on the economic growth of Nigeria?

Quite a number of studies have investigated the nexus between military expenditure and economic growth or growths (Sezgin, 2001; Aizenman and Glick, 2006; Dunne and Nikolaidou, 2001). However, these studies did not take into consideration the effect of institutional quality in managing military expenditure to aid economic growth as emphasized by Biswas (1992). Consequently, this study will, apart from investigating the impact of military expenditure on Nigerian economic growth, assesses the role and influence of institutional quality in Nigeria in efficient management of military expenditure to positively impact on the country's economic growth.

The remaining segments of this paper is divided into the literature review, methodology, results and discussion as well as the conclusion.

2. Literature Review

2.1 Conceptual Framework

Military Expenditure

Military expenditure, also known as defence budget, is the total amount of financial resources dedicated by a country to raising and maintaining armed forces, security formations or other methods essential for defence purposes (NATO, 2017). Military expenditure reflects how strongly a country perceives the likelihood of threats against it, or the amount of aggression it wishes to conjure. It also gives an idea of how much financing should be provided for the upcoming fiscal year. The size of a budget also reflects the country's ability to fund military activities (Khalid & Noor, 2015).

Institutional quality

Institutional quality is a broad concept that captures law, individual rights and high quality government regulation and services. Institutional quality and economic growth reinforce each other over the longer term, However, institutional quality also have symbiotic relationship with economic growth. Importantly, institutional quality unlocks growth potential and does not intrinsically suffer from diminishing returns. Literatures have shown that countries with high institutional quality have been more successful in adopting frontier technology and productivity since the turn of the millennium (Anifowose et al, 2019).

Economic growth

The growth of an economy measures the output growth of the economy. Economic growth is the increase in the inflation-adjusted market value of the goods and services produced by a country over time. It is conventionally measured as the percent rate of increase in the real GDP that is, the Gross Domestic Product. The "rate of economic growth" refers to the geometric annual rate of growth in GDP between the first and the last year over a period of time. This growth rate is the trend in the average level of GDP over the period, which ignores the fluctuations in the GDP around this trend.

2.2 Theoretical Framework

The theoretical framework for this study rests on Azienman and Glick Model (2006). The model postulated relationship among the three variables of interest in the study. This model has been used by previous studies such as Anifowose, Omolade and Mukorera (2019). According to the theory, figure 1 presents relationships among military expenditure, institutional quality and economic growth. The theory suggested that military expenditure-threat level nexus is important to the relationship among the three. From the figure, the absence of threats, z=0, also $\phi^{\check{}}=0$, the optimal amount of military expenditure is zero. For positive threat levels, z>o, however, $\phi^{\check{}}>0$, that is the optimal level of military expenditure is positive. As the threat level increases, the optimal amount of military expenditure rises monotonically.

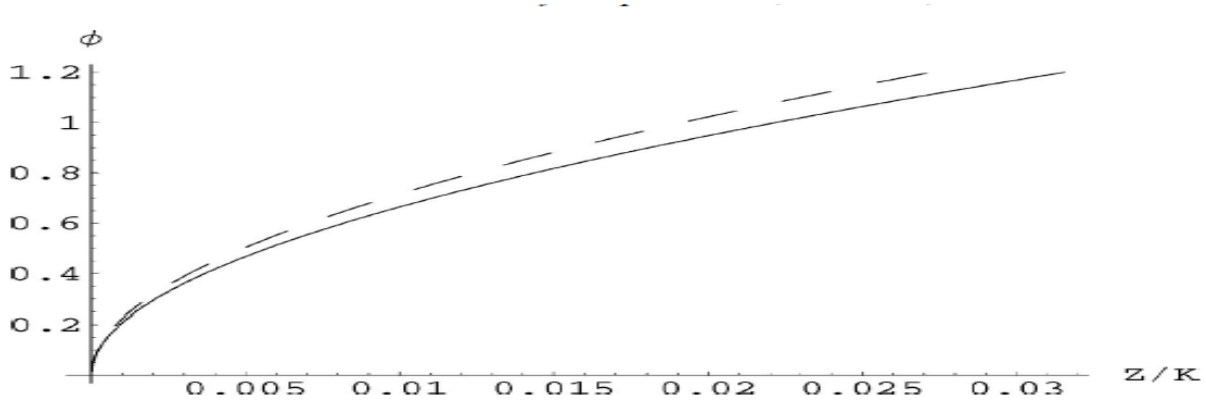

Figure 1: Optimal military expenditure and external threat level.

Note ϕ is the optimal ratio of military and to non-military expenditure; Z / K connotes the external threat level (normalized by the capital stock). The plots are calibrated by assuming A=1,

Furthermore, the figure depicts the impact of parametrically increasing the corruption rate, t_c. The solid line denotes the benchmark relation between ϕ and z (for t_c=0.1); the dashed line represents the impact of rising corruption rate for (t_c=0.2). Obviously, rising corruption connotes a higher optimal of military expenditure for any given threat level.

An important feature of equilibrium government expenditure is described as the optimal share of military expenditure equal directly to the output cost of external threat,1-f

$$\widetilde{\phi} = \frac{1-f}{\alpha} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(1)$$

In the situation of no threats, the optimal level of military expenditure is zero, the output cost of threats is zero (f=1), and output is a standard CRS function of k and g. Similarly, the optimum tax rate ($\widetilde{\tau}$) equals the output proportion of government services (α). The presence of threats and hostile actions, however, shows positive military expenditure and output costs (f <1) and adds a non-linear multiplicative term (f) to output.

This, in turn, adds a scale consideration to the design of optimal t x and expenditure rates, summarized

$$\alpha\widetilde{\phi} = 1 - f = \frac{z}{\widetilde{g_m}(1-t_c)+Z} \ldots\ldots\ldots\ldots\ldots\ldots(2)$$

Where$\widetilde{g_m} = \frac{\check{\phi}\check{\tau}\check{y}}{1+\phi}$. The optimal ratio of military to non-military government expenditure(ϕ) times the output share of non military expenditure α equals the output cost of external threats (1-f), which invariably equal the magnitude of the external threats (z) relative the aggregate effective expenditure by the domestic country and its unfriendly neighbours $\widetilde{g_m}(1-t_c)+Z$, where "effective" denotes net of corruption tax. Consequently, an exogenous rise in the external threat level, z, rises the optimal expenditure and tax rates,$\check{\phi}$ and$\check{\tau}$.

Therefore, unfriendly external threats affect growth negatively due to two factors: the direct negative on growth linked to the reduction of marginal product of capital, linked to the negative effect with a higher tax rate as a result of lower productivity. Therefore, a rise in corruption t_c and reduction in domestic productivity with rise military expenditure have negative effect on gowth. This is presented in the following reduced form for optimal output growth:

$$\check{\gamma} = \check{\gamma}(z, t_c, A); \check{\gamma}_z < 0, \check{\gamma}_A > 0 \ldots\ldots\ldots\ldots\ldots(3)$$

To determine that

$$\frac{\partial\check{\gamma}}{\partial\check{\phi}} =< 0 \; and \; \frac{\partial^2\check{\gamma}}{\partial\check{\phi}\partial z} =>0 \; \ldots\ldots\ldots\ldots(4)$$

However, for the optimal growth levels and military expenditure, while holding constant the levels of external threats and corruption, higher military expenditure retards growth, all being equal. A rise in threat level moves the entire locus upwards.

In conclusion, the theoretical models imply that the relationship between military expenditure and growth depends on corruption and rent-seeking behaviour. Thus, acting as a fiscal tax expenditures, corruption increases the desired level of military expenditure. They opined that military expenditure asserts negative or insignificant effect on growth because of its non-linearity and omitted variable biases. However, they concluded that the interaction of military expenditure and corruption is what matters for growth and not military expenditure alone. According to the theory, a positive and significant relationship between the interactions of military expenditure and corruption will promote growth as this will improve domestic output.

Limitation of the theory: The theory was majorly criticized by Sala and Matins (2008) on the ground that it is biased regarding the level of economic development of countries. In other words, they believed that the theory is not general and that it is more applicable to developing countries more than the developed countries.

2.3 Prior evidence

There have been quite a number of literatures around the focus of the study across countries. However, these studies revolve one or two of the three major variables in the study namely military expenditure, institutional quality and economic growth. Notwithstanding, the review of empirical literature is done based on the focus of each of the study as it relates to the three major subjects of the study.

Military Expenditure and Economic Growth

Apanisile and Okunola (2014) investigated the impacts of military expenditure on output in Nigeria. The study applied Auto-regressive distributed Lag techniques of cointegration with the bound test approach. They made use of variables such as military expenditure as a percentage of the GDP, inflation rate, capital, labour and exchange rate and data were based on the years from 1980 to 2012. They found that the effect of military expenditure was negative in the short run while it was significant in the long run. However, other shift factors of output such as capital and labour have significant impacts in both long and short run periods. It was recommended that government might need to reduce military expenditure and focus on more productive activities for the economy. However, the study did not consider the role of government as an institution that is meant to administer the military budget. Hence, the recommendation referring to government role is not from their findings.

Muhammed and Abu (2016) assessed the nexus between defence expenditure on arms and economic growth in Nigeria. The authors used some macroeconomic variables and expenditure on military and the data which span through 1990 to 2015 was analysed using ARDL. Findings indicated that defence expenditure have negative effect on the economic growth of the country. The study therefore recommends a collaboration between the defence development and the industrial sector for better impact on the economy as a whole. Again, the recommendation has to do with institutional quality which was not captured in the study.

Sezgin (2001) selected Turkey to examine if there is any significant nexus between military expenditure and growth between 1956-1984. The military expenditure, investment, savings and exchange rate are used as variables in the model. The estimating techniques used is the two and three stage least square (2 SLS and 3 SLS) and findings indicated that military expenditure have significant positive effect on economic growth but again, it is an anti-incentive to savings and investment. The study was based on Turkey and not Nigeria which is our case study; hence, the findings might not be binding on Nigeria.

Ramos, Ranieri and Lammens (2013) investigated military expenditure–growth nexus on Mexico for period of 1984-2000. The study, which made use of variables such as GDP growth rate, military expenditure, investment and exchange rate, was analysed using 3 SLS estimation technique. The findings indicate that military expenditure stimulate Mexican economic growth, however, it crowds out savings and investment. The study was more on causality and not impact analysis and again institutional quality was not included which has been identified as very germane to assessment of the impact of military expenditure.

2.2.2 Institutional Quality and Economic Growth

Valeriani and Peluso (2011) explored the effect of institutional quality on economic growth over thirty years (1980-2010) among some Asian countries at different stages of development. Variables used included civil liberties, number of veto players and quality of government was used to proxy institutional quality and GDP growth rate was used to proxy economic growth. Pooled regression fixed effects model was used and the findings revealed that institutional quality impacted positively on economic growth. However, further findings from the study showed that the size of the institutional impact on growth varies between developed and developing countries considered. Thus, in conclusion, the study claimed that institution mattered for growth. The study did not cover the interaction between institutional quality and military expenditure and how they affect economic growth.

Also, Berggren, Bergh and Bjørnskov (2013) investigated the impact of institutions on economic growth in the EU-27, seven other similar European countries and Israel over the period from 1984 to 2009. Variables that include some socio economic factors, investment and GDP growth rate of the countries were used in the study. Panel data analysis was embraced

as the estimating technique. Findings of the study showed that quality of policy, which included stability of government, favourable socio economic condition, strong investment environment, and democratic accountability, was growth-enhancing. However, the new trend in institutional quality indicator which is corruption index was used in the study while military expenditure is not included among the independent variables.

Hypothesis

The overall objectives of the study are clearly shown in Figure 2. That is, to investigate the impact of military expenditure and institutional quality on Nigeria's economic growth and to also assess the role and influence of institutional quality in the efficient management of military expenditure to impact positively on the country's economic growth.

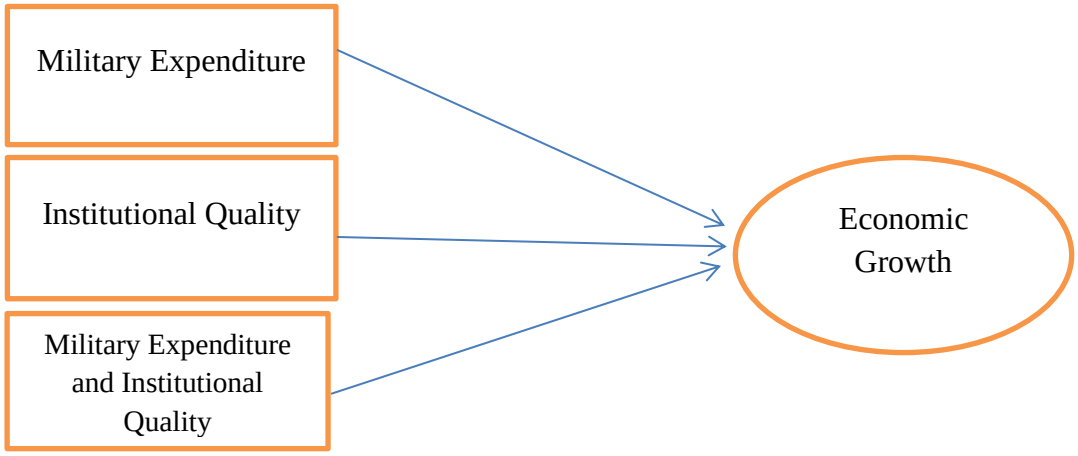

Figure 2: Conceptual framework of the relationship between the variables of the study.
Source: Author's Conceptualization, 2019.

Following the foregoing discussions and reviews, the following hypotheses are formulated for the study:

Ho_1: There is no significant relationship between military expenditure and economic growth of Nigeria
Ho_2: There is no significant relationship between institutional quality and economic growth of Nigeria
Ho_3: The joint effect of military expenditure and institutional quality is not significant on Nigerian economic growth.

3. Research Methods and data

3.1 Research Design

The study is a secondary data based research and it makes use of quantitative analysis to explore and empirically analyse the relationship among military expenditure, institutional quality and economic growth.

3.2 Model Specification

Leveraging on the theoretical framework, particularly the Azienman and Gilick model earlier discussed as applied by Anifowose, Omolade and Mukorera (2019), institutional quality and the interaction between institutional quality and military expenditure are added as independent variables while other growth shift factor such as investment, population, exchange rate and inflation rate are also included as explanatory variables in the model. Consequently, the model is stated thus:

$$Egrowth = f\ (\ Me, InsQ, InsQ * Me, Inv, POP, INF, EXR\ ) \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (2)$$

Where Egrowth is economic growth and it is proxy by annual growth rate of the RGDP of Nigeria, Me is military expenditure, InsQ is institutional quality (corruption index as proxy) and $InsQ * Me$ is the interaction between institutional quality and military expenditure, Inv is investment, POP is population, INF is inflation rate and EXR is exchange rate.

3.3 Definition, Measurement and Sources of the Variables

Economic growth: This is measured by the annual growth rate of the real GDP of Nigeria. It is measured in percentages and sourced form the World Bank Database, 1984-2017.

Military expenditure: this is measured by the annual percentage of military expenditure of the GDP. It is sourced from the World Bank Database, 1984-2017.

Institutional quality: This is measured by the annual corruption index and it is sourced form the International Country Risk Guide 1984-2017.

Interaction of military expenditure and institutional quality: It is measured by the annual Interactive form of military expenditure and institutional quality. It is sourced from both the World Bank and International Country Risk Guide Database 1984-2017.

Investment: this is measured by the annual gross fixed capital formation and it is sourced from the World Bank Database, 1984-2017.

Population: this is measured by the annual growth rate of population in Nigeria. It is sourced from the World Bank Database, 1984-2017.

Inflation rate: This is measured by the annual rate of consumer price index and sourced from the World Bank Database, 1984-2017.

Exchange rate: This is the average exchange rate of naira to US dollar. It is sourced form the World Bank Database, 1984-2017.

3.4 Method of Analysis

The study applies ARDL due to the fact that it makes possible the inclusion of the lagged dependent variable as part of the predictors and hence, influence of past economic growth can be investigated. Again, the techniques relaxed the condition that all variables must be stationary after the first difference as it accommodates variables that are stationary at levels and the application is dependent on the unit root test.

For the study, there are both I(1) and I(0) variables which indicates that ARDL is suitable for the analysis. According to this technique, the null hypothesis of no cointegration is rejected whenever the critical values is greater than the upper bound at 5% otherwise, we fail to reject the null hypothesis and the alternative hypothesis is accepted. However, if the critical value is less than the lower bounds, we conclude that the test is not conclusive (Gujarati, 2009).

3.5 Diagnostic Tests

The following diagnostic tests namely: stability test, serial correlation and heteroskedasticity will be carried out. The bench mark null hypotheses that are tested for the serial correlation and heteroskedasticity are:

- $H_0: \alpha = 1$, no serial correlation and heteroskedasticity in the model.
- $H_1: \alpha < 1$, there is serial correlation and heteroskedasticity in the model.

Serial correlation means similarity between observations as a function of the time lag between variables. It is a mathematical tool for finding repeating patterns, such as the presence of a periodic signal obscured by noise, or identifying the missing fundamentals in frequencies. Heteroskedasticity, on the other hand, refers to the circumstance in which the variability of a variable is unequal across the range of values of a second variable that predicts it.

However, for stability test, the recursive chow test, the benchmark for the VAR model is expected to be stable over the sample period. That being the case, according to Lee and Chang (2005), it is more likely that macroeconomic series may experience one or multiple structural breaks due to the structural changes in developing economies. Therefore, it imperative to check for the stability of the short-run and long-run coefficients through the cumulative sum (CUSUM) and cumulative sum of squares (CUSUMSQ) tests proposed by Brown et al. (1975). The graphical CUSUM and CUSUM of squares tests will be used to determine whether the model is stable or not. At 5 percent confidence interval, the benchmark hypotheses to be tested are:

$H_0: \alpha = 1$, the model is stable.
$H_1: \alpha \neq 1$, the model is non-stable.

4. Results and Discussion

4.1 Descriptive Statistics

The descriptive statistics which is the summary of statistics is presented in table 1:

Table 1. Summary of statistics

	COR	EXR	GDPGR	INF	INV	MIL_COR	MILEXP	POP
Mean	1.602941	134.1216	4.399159	19.72017	32.99828	1.190751	0.750156	2.577634
Median	1.500000	96.32597	4.823564	12.54718	32.51772	0.873496	0.664590	2.582130
Maximum	2.000000	541.4648	15.32916	72.83550	58.94738	2.873573	1.556795	2.677659
Minimum	1.000000	50.16845	-2.035119	5.382224	14.90391	0.617561	0.406178	2.488183
Std. Dev.	0.367022	111.6691	3.963252	18.09597	13.72118	0.597023	0.328865	0.066373
Observations	34	34	34	34	34	34	34	34

The summary of statistics is important to explore the time series distribution of the data collected on each of the variables. Table 1 indicates that all the variables used as endogenous variables for economic growth are positive. Specifically, the mean distribution of data on military expenditure in Nigeria is 0.750156. This figure falls between the minimum and maximum limit of the distribution. This indicates that during the period under review, military expenditure is relatively moderate indicating a not-too-high and not-too-low scenario. However, the mean of economic growth is 4.399159 which is an indication that during the period under review, the economic growth rate of Nigeria is very low on the average because the mean distribution is closer to the minimum limit than the maximum limit. It should also be noted that economic growth has a minimum value of -2.03; this is a pointer to the fact that during the period under review, there are some years with negative growth rates. In variance, the standard deviation for military expenditure and economic growth are 0.328865 and 3.963252. The implication is that the data on the two variables are not widely dispersed during the period under consideration, that is 1984 to 2017.

4.2 Diagnostic Tests' Results

4.2.1 Unit Root test

The unit root test is necessary in order to confirm the stationarity of the variables. This is very important to the determination of the suitability of the estimating technique that is ARDL

Table 2: Stationarity test

	ADF		PP		
	LEVEL	**FIRST DIFFER**	**LEVEL**	**FIRST DIFFER**	ORDER OF INTEGRATION
GDP	-5.502230	-	-5.514354	-	I(1)
COR	-2.154503	3.959316	-1.456715	-3.965749	I(1)
INV	-3.203835	-	-3.178961	-	I(1)
MIL*COR	-2.490513	-6.690804	-2.459081	-7.339347	I(1)
MILEXP	-1.800639	-10.97283	-1.6929	-10.26586	I(0)
POP	19.9604	0.0296	30.1069	0.0008	I(0)
EXR	-0.919753	-3.494956	-0.801051	-3.819408	I(1)
INF	-1.19624	0.1158	-6.7073	0.0000	I(1)

The unit root estimates is conducted using Augmented Dckey Fuller ADF and Philip Perror (PP) Methods and the results are presented in Table 3. Both tests show that economic growth, Corruption (INQ), M*Cor. (interactive form of military expenditure and corruption) and Investment (INV), Inflation (INF) and Exchange rate (EXR) are I(1) series while military expenditure (ME) and Population (POP) are I(0) series. Sequel to the mix in the unit root test result, the study proceeds to estimate ARDL equation by starting with the test for cointegration using the ARDL bound test

4.2.2 ARDL Bound Test

The ARDL Bound testing provides the log likelihood ratio statistics for determining the number (r) of long run relationship between GDP growth rate, Me, Corr., EXR, Pop, M*Corr and INF. If calculated value of the F statistics is greater than 95% critical value at both upper and lower bounds, the null of r= 0, which indicates no long-run relationship is rejected and the conclusion will be that there is long run relationship. Now that we have established that GDP growth rate Me, Corr., EXR, INF, Pop and M*Corr. are non-stationary at level and integrated to the same order I(1), we can test for the presence of joint integration which is cointegration.

Table 3. ARDL Bound Test Results

Test Statistic	Value	k
F-statistic	13.63349	7
Critical Value Bounds		
Significance	I0 Bound	I1 Bound
10%	2.03	3.13
5%	2.32	3.5
2.5%	2.6	3.84
1%	2.96	4.26

The ARDL bound test results are reported above. Results indicate that there is a long run relationship between military expenditure, institutional quality and economic growth in Nigeria since the calculated value of the statistics is greater than 5% critical value. The ARDL bound test results for Nigeria (13.63349 is greater than 3.5 at 5%) and statistically significant at $\alpha =$ 1% and 5% respectively. This shows that there is a long-run relationship among the military expenditure, institutional quality and economic growth.

Table 4: ARDL Long Run and Short run results

ARDL Cointegrating And Long Run Form				
Cointegrating Form				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(MILEXP)	6.948147	6.470383	1.073839	0.3040
D(MILEXP(-1))	-3.314363	2.039898	-1.624769	0.1302
D(COR)	11.532598	4.748012	2.428932	0.0318
D(COR(-1))	-8.853740	4.218704	-2.098687	0.0577
D(MIL_COR)	-3.070723	4.151858	-0.739602	0.4738
D(INV)	-0.061709	0.159028	-0.388043	0.7048
D(POP)	112.368705	31.481661	3.569339	0.0039
D(INF)	-0.125908	0.043857	-2.870834	0.0141
D(INF)	0.085201	0.047504	1.793540	0.0981
D(EXR)	0.049165	0.015476	3.176916	0.0080
D(EXR(-1))	0.048165	0.012206	3.945891	0.0019
CointEq(-1)	-1.656648	0.167625	-9.883048	0.0000
Cointeq = GDPGR - (28.4619*MILEXP - 9.5754*COR - 15.8924*MIL_COR + 0.2693*INV + 48.0105*POP - 0.1401*INF + 0.0098*EXR - 143.5437)				
Long Run Coefficients				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
MILEXP	28.461938	4.453885	6.390362	0.0000
COR	-9.575403	3.016661	-3.174172	0.0080
MIL_COR	-15.892363	3.254977	-4.882481	0.0004
INV	0.269294	0.056768	4.743743	0.0005
POP	48.010529	8.055404	5.960040	0.0001
INF	-0.140138	0.044417	-3.155062	0.0083
EXR	0.009805	0.009075	1.080395	0.3012
C	-143.543746	21.958420	-6.537071	0.0000

Considering the individual variable in the context of Nigeria, military expenditure indicates a highly statistically significant positive long run relationship with economic growth. The long run coefficient of military expenditure is 28.461938. The implication of this is that military expenditure rises as economic growth rises in Nigeria. The findings might not be unconnected with the fact that largely during the period under consideration, that is 1984 to 2017, the external threat to Nigeria was not much. Hence, military expenditure is bound to exhibit positive and significant impact on growth. The findings conform to Barro and Sala Martins (1992) and the theoretical postulation of Aizenman and Glick (2006) which is referred to as Aizenman and Glick model of military expnditure and growth.

The long run relationship and impact of institutional quality (proxy by corruption) exhibits a positive long run relationship with economic growth. The long run coefficient of institutional quality (proxy by corruption) is -9.575403 and it is statistically significant at 5% level. The implication of this is that there is inverse relationship between institutional quality (proxy by corruption) and Nigerian economic growth. The implication of the result is that institutional quality, which is measured by corruption index, have been negatively affecting the economic growth of Nigeria. Therefore, corruption is a clog in the wheel of economic growth of Nigeria; this conforms to the findings of Valeriani and Peluso (2011) that concluded that corruption discourages economic growth.

Another variable that has significant impact in the model is military expenditure/institutional quality (institutional quality proxy by corruption) interactive form. The result is an indication that military expenditure-institutional quality interactive form exhibits an inverse long run relationship with economic growth. The long run coefficient of military expenditure/institutional quality is -15.892363. The implication of this is that the joint effect of military expenditure and institutional quality does not stimulate economic growth. Therefore, according to the results, institutional quality, which can be seen in terms of management of military expenditure in Nigeria, has negative impact on the Nigerian economic growth. If we compare this result to the two previous ones discussed, it means that the positive influences of military expenditure is whittled down by poor institutions in Nigeria, which causes their joint effects to be negative on economic growth. This position was equally supported by Aizenman and Glick (2006).

Investment long run coefficient is 0.269294. The result is an indication that investment exhibits a positive long run relationship with economic growth. The implication of this is that more investment stimulates economic growth. Population long run coefficient is 48.010529. The result is an indication that population exhibits a positive long run relationship with economic growth and it is statistically significant at 5%. The implication of this is that as population rises, economic growth of Nigeria also rise significantly. Other macroeconomic variables used in the model such as exchange rate and inflation rate show that while inflation is significant, exchange rate failed to have significant long run relationship with economic growth. Under the short run aspect of the cointegration regression, the results show that unlike the long run results, many of the variables are not statistically significant. However, the error correction term is -1.656648 and it is statistically significant at 1% . This shows that the adjustment to equilibrium economic growth given any changes in the independent variable is in the right direction.

4.3 Hypothesis Testing

Following the results from the estimated model, the following decisions are made concerning the three hypotheses stated in section two of the study:

Hypothesis 1: There is no significant relationship between military expenditure and economic growth.
Based on the results from the estimated model, the probability value of the coefficient of military expenditure at 0.0000 is less than 5% so, the hypothesis is rejected. It is concluded that there is significant and positive relationship between military expenditure and economic growth in Nigeria. However, the reason behind this might not be unconnected with the fact that the external threat levels during 1984 to 2017 is low; hence, expenditure on military will exhibit positive and significant relationship with growth (Aizenman and Glick, 2006). However, from the theory, what really matters is the interaction of military expenditure and institutional quality as measured by corruption and not military expenditure per se. This is because when domestic output is low as shown by the mean value of economic growth which is closer to the minimum, the relationship between military expenditure and growth is not reliable even when military expenditure rises.

Hypothesis 2: There is no significant relationship between institutional quality and economic growth.
Considering the results from the estimated model where the probability value of institutional quality (corruption index) is 0.0080, the hypothesis is rejected and we conclude that there exists a significant but negative relationship between institutional quality and economic growth in Nigeria. It further shows that a rise in corruption level significantly decreases economic growth of Nigeria.

Hypothesis 3: The joint effects of military expenditure and institutional quality is not significant on economic growth.
Again, the hypothesis is rejected because the probability value of the joint effect of the two is 0.0004. The value is less than 5% hence, we also conclude that the joint effects of military expenditure and institutional quality on growth of Nigeria is significant but negative. The theory has emphasised the importance of corruption on the effect of military expenditure on growth. The study found negative relationship between corruption which is a measure of institutional quality and growth

therefore, regardless of the positive and significant relationship between military expenditure and growth, the negative impact of corruption on growth will make their joint effect to be negative. This further strengthens the affirmation of the theory that nature of corruption in the economy is very necessary for military expenditure to be effective in promoting economic growth.

4.4 Post Estimation Tests

Table 5 presents the post estimation diagnostic test for heteroscedasticity. The rationale of the post estimation tests is to ascertain the robustness of the ARDL results.

Table 5: Heteroscedasticity Test: Breusch-Pagan-Godfrey Test

Null Hypothesis : No Heteroscedasticity			
F-statistic	0.367258	Prob. F(16,15)	0.9724
Obs*R-squared	9.007232	Prob. Chi-Square(16)	0.9131
Scaled explained SS	1.647357	Prob. Chi-Square(16)	1.0000

The null hypothesis is that there is no heteroscedasticity. Using the F statistics, it is discovered that the probability of F shows that the null hypothesis is to be accepted. Therefore, it was concluded that the model is not having the problem of heteroscedasticity which may affect the validity of the results.

Table 6: Breusch-Godfrey Serial Correlation LM Test

Null Hypothesis : No Serial-Correlation				
F-statistic	1.336783	Prob. F(2,13)	0.2965	
Obs*R-squared	5.458497	Prob. Chi-Square(2)	0.0653	

The null hypothesis indicates that there is no serial correlation. Since the F-statistic probability is greater than 5%, it is obvious that the null hypothesis is to be accepted while we reject the alternative hypothesis that there is serial correlation. Consequently, the estimates from our model are valid and can be used for forecasting.

Stability Test

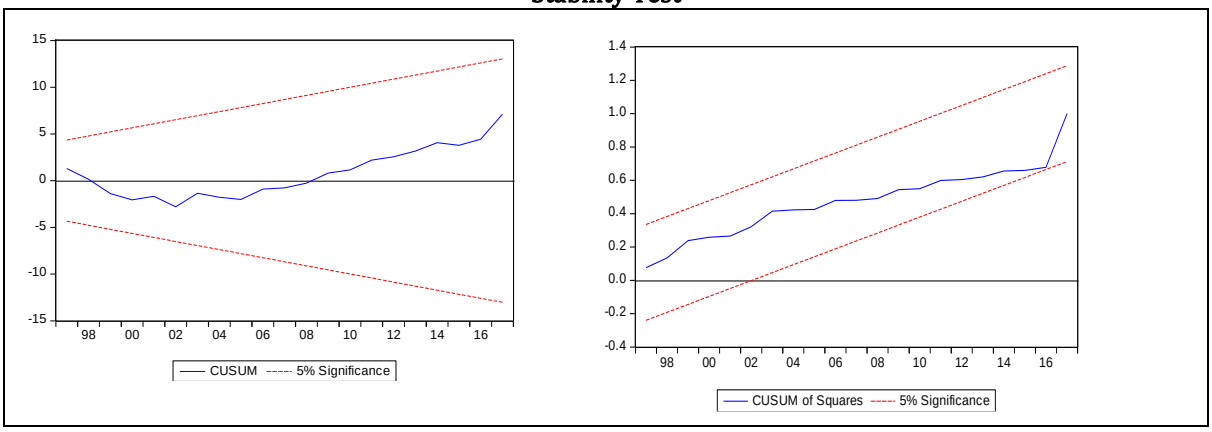

Figure 3: Stability test

The stability test indicates that the model is reliable (that is, the model does fall within the red lines) and does not suffer from any structural break. This is an indication that the estimated model exhibits the stability required for forecasting.

5. Conclusion and Recommendations

The results from the analysis have brought out some findings which will enable this study make some conclusions on the relationship between institutional quality, military expenditure and Nigerian economic growth.

Firstly, the results show that there exists a direct and significant relationship between military expenditure and Nigerian economic growth. This implies that an increase in the government expenditure on the military will lead to a rise in the Nigerian economic growth especially when the external threat level is low during the period under review, that is 1984 to 2017.

Secondly, institutional quality shows a significant negative impact on economic growth of Nigeria. It should be noted that institutional quality is proxy by corruption. This conclusion is also obtained in this study and it is an indication that the

endemic nature of corruption in Nigeria which measures institutional quality is a clog in the wheel of Nigerian economic growth. Furthermore, this conclusion speaks volume about the weakness of government institutions in Nigeria. It implies that a weak government institution in Nigeria is an important factor affecting the country's economic growth as shown in this study. Furthermore, findings have revealed in the study that Nigerian institutional quality have both short and long run significant negative impacts on economic growth of the country. Consequently, it can be concluded from this study that a major challenge that Nigeria faces in terms of economic growth is institutional quality.

Thirdly, the joint effect of military expenditure and institutional quality has also been examined. It should be noted that under the second findings, military expenditure alone is used but this variable combines institutional quality with military expenditure. The results also show that there exists a negative and significant relationship between it and Nigerian economic growth. This result further underscores the negative impact of corruption as a proxy for institutional quality on Nigeria economic growth. This variable shows that the management of military expenditure by government institutions in Nigeria has significant negative impact on the economic growth of the country. Consequently, this study concludes that the joint effect of military expenditure and institutional quality has not promoted the economic growth of Nigeria during the period under study. It further means that the positive impacts that military expenditure supposed to have on the Nigerian economic growth is whittled down by the negative impact of institutional quality.

However, other control variables such as inflation, population and investment have also been identified as drivers of economic growth in Nigeria. These variables were also found to be significant in influencing the economic growth of Nigeria in the studies of Apanisile and Okunola (2014).

Based on the conclusions from the study, it is important that Nigeria tackle the problem of corruption which is used as a measure of institutional quality because it has been revealed that it prevents the joint effect of both institutional quality and military expenditure from having the expected positive impact on economic growth of Nigeria.

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