

# Effect Of Military Expenditure On Human Capital Development In Nigeria

An ARDL Model Approach.

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**Abstract—** *The key responsibilities of any performing government is to ensure safety of lives and properties in any given society through a strong military mechanism, involving strong commitments to military expenditure in order to bolster national security and counter threats. Military expenditure has been recently argued to displace expenditure on human capital development indicators, though no economic theory has a firm backing on the exact relationship between military spending and human capital development spending. Most empirical studies claim the possibility of negative relationship between the two, hence, so it is against this backdrop that this study investigated the effect of Military Expenditure on Human Capital Development in Nigeria. The major focus of the study was to investigate the effect of military expenditure on human capital development in Nigeria covering the period of 1981-2017. On the basis of the facts presented in the literature review, empirical investigations were carried out on the effect of military expenditure on human capital development in Nigeria where Military Expenditure (LMEXP) was found to have a negative relationship with Human Capital Development (HDI) both in the short run and on the long run and was statistically insignificant at 5% level of significance while Government Expenditure on Health (GEXPH) was found to have a positive relationship with Human Capital Development (HDI) in the current year in the long run but statistically insignificant at 5% level of significance. Similarly, Government Expenditure on Education (GEXPE) had a negative relationship with HDI in the short run*

*in the present year and also statistically insignificant at 5% level of significance but was statistically significant in the long run with a positive relationship with HDI. The result from the ARDL Bounds Test for co-integration test indicated evidence of long run relationship among the variables of interest while the result of the Granger causality test showed that Military Expenditure and Human Capital had a uni-directional causality where Military Expenditure granger causes Human Capital Development. Based on the findings, the study recommended that there is need as a matter of deliberate policy initiative by the Government to try to strike a balance between military expenditure and improvement in the human capital sector of the economy by trading some resources off to education and health sector in order to improve the health indices. Besides, Policy makers should encourage budgetary allocation in support of accumulation of capital and human capital development in the years ahead.*

**Keywords—***Military Expenditure, Human Capital Development, Human Development Index*

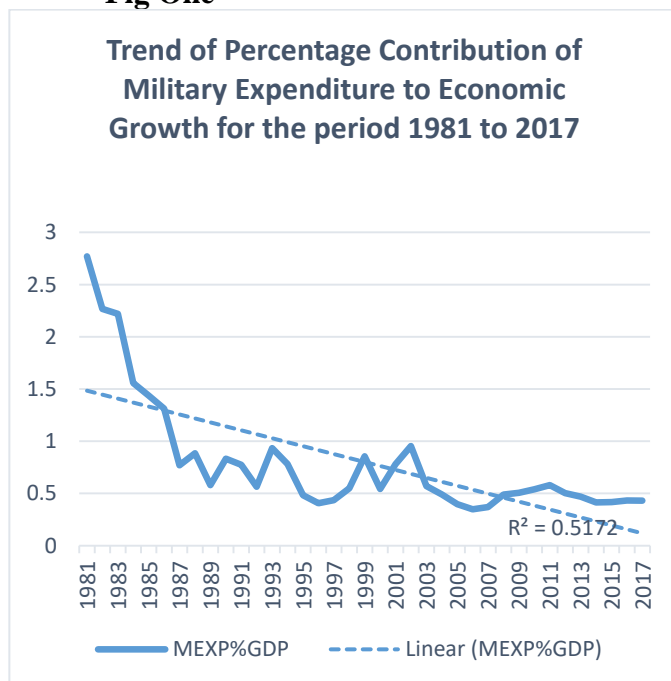
## 1. Background to the study and Statement of the problem

The major duties of any active government is to ensure the safety of lives and property in any given society through a strong military mechanism, involving robust commitments to defense expenditure in order to bolster security and counter threats. Military expenditure is a rough measure of the level of government financial allocations for military purposes. As such, it can measure the priority

given to defense as a means of achieving security as formulated in national security doctrines (Skons, 2005). Strong and efficient armed force, strong enough to guarantee national peace and security is indispensable for the economic progress of a nation. This argument anchors on the premise that defense is a critical sector that contributes to economic development by ensuring internal and external stability (Eme & Anyadike, 2013).

Today, world military expenditure has skyrocketed- much bigger than ever with an estimate of \$1,738 billion per annum, with the United States determining the trend as the biggest spender globally owing to her rapidly increasing military expenditure, as one of the top spenders with about \$711 billion military expenditure, followed by China, Russia, United Kingdom, France, Japan, India, Saudi Arabia, Germany and Brazil at \$143, \$71.9, \$62.7, \$62.5, \$59.3, \$48.9, \$48.5, \$46.7 and \$35.4 billion respectively. The top ten big military spenders take about 74.3% of military expenditure globally, the United States alone accounts for 41%.

**Fig One**



Source: Researchers Compilation from World Bank Data Files 2020

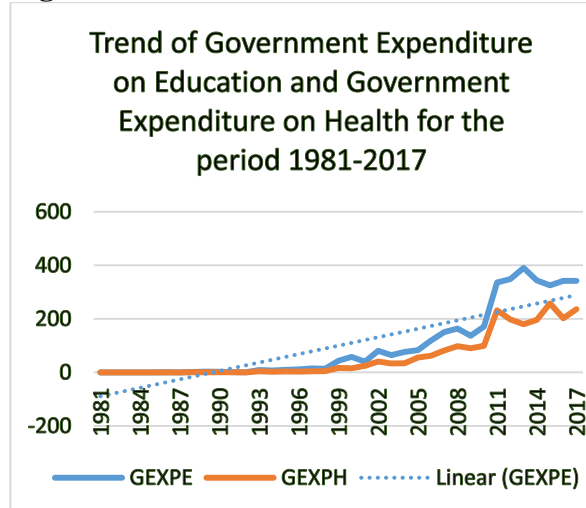
According to World Bank and the Office of Disarmament Affairs (ODA), the amount spent on the defense sector globally is equivalent to \$4.7 billion daily or \$249 per person, and just about 5% of this amount annually is needed to

achieve and sustain the Millennium Development Goals (International Peace Bureau, 2012). Taking a close look at the figure above, it can be clearly seen that upon the huge sums allocated to the defense sector, it has not contributed significantly to the growth of the Nigerian economy since its highest contribution came from the year 1981 to 1983 while in 2017, its contribution to GDP was a mere 0.43% and these calls for a serious review on the part of the monetary authorities and the Government using fiscal instruments.

Military expenditure is certainly not without effect on resource allocation and economic growth. The effects are multiple and often offset each other. There are considerable literature on the cost of military expenditure, resulting from its adverse effect on economic performance of the overall economy. There is diversion of resources that would have been used for other developmental needs; the resources used for military equipment (either producing or importing) can alternatively be used for building hospitals, schools or for providing civilian goods, showing the extent to which the economy foregoes the opportunity cost to commit these resources for alternative peaceful uses.

In most developing countries (Nigeria inclusive), the percentage of military expenditure as a share of GDP is high contrary to health or education expenditure as a share of GDP. High military expenditure and ongoing conflicts (terrorism, insurgency, political conflict, ethnic conflict, religious crisis and border violent, amongst others) in developing countries have become a major impediment to the growth and development of the system. Public expenditure on health is one of the biggest challenges in West African Sub-region, thus, enhancing the productivity of health expenditure in developing countries has been a controversial debate and a key public policy challenge over the years, as there is very high infant mortality, life expectancy in this region is estimated to be among the lowest in the world.

**Fig. Two.**



Human capital development does not only aid economic growth via good health services, it has been argued that education contributes to skill acquisition through school enrolment; this enables individuals to improve on their productivities. The role of education is pivotal in comprehending, controlling, altering, and recreating of human environment (Central Bank of Nigeria, 2000). According to Anyanwu & Erhijakpor (2007), education improves health, and productivity, which implies that health and education has a link with economic development of a country. In developing countries not only is government allocation to health sector traditionally low (Fosu, 2001), but they are also where the interaction of economic decline and continued high rates of population growth meant that the proportion of the school age population in school declined by 10%. For instance, from the figure two above, from 1981 to 1993, government expenditure on education and health was very small with their values not up to a billion Naira, it was only from 1995 to 2009 when there was a steady fluctuating increase in both education and health sectors respectively where the educational sector expenditure rose to 164 billion Naira while the Health sector was around 98 billion Naira in 2009 respectively where the both had also maintained a volatile increase to present.

Nigeria is a developing economy with expanding financial and social service sectors. According to Worldometers Nigerian Population (2015), Nigeria worth about \$568.51 billion in 2014 GDP and represented about 0.92% of world economy, ranking 26th in the world and 1st in Africa with an estimated population of about 177.8 million in 2014. The country has however

witnessed unusual huge increases in public expenditure in the last few years. For instance, from 1970 to 2012 total recurrent expenditure has increased from ₦716.10 million to ₦3,365,760.00 million respectively. This increase however, has not translated to any significant growth as more Nigerians are poor today as was never before (Nasiru, 2012). Available statistics from Central Bank of Nigeria Statistical Bulletin (2012), showed that military expenditure were ₦444.6 billion, ₦233 billion, ₦264 billion, ₦348 billion, ₦921.91 billion, ₦1,055 trillion and ₦968.127 billion from 2008 to 2014 respectively, showing an upward trend in defense expenditure.

Increase in government expenditure is meant to boost the economy (Jiranyakul, 2012), but despite the continuous rise in government expenditure in Nigeria the economy is still stunted, Nigeria still faces rising incidence of poverty and is ranked among the poorest economy with poor public service delivery (Nurudeen & Abdullahi, 2010). The issue relating to effective and efficient public service delivery are critical for Nigeria because it is a country where the public sector controls enormous wealth coming from oil revenues leading to increase in public expenditure levels in the tune of over 40% of gross domestic product (GDP), yet there is very little to show for this in terms of actual impact on poverty, health and education of the masses, this forms one of the major factors contributing to her low per capita income. Nigeria channels a large part of her revenue to defense sector with less recognition to the important role played by human capital (Adelowokan, 2012).

Military expenditure consistently overshadows both education and health expenditure from 2001-2014 except for 2006, 2007 and 2013 when it was slightly overtaken by education expenditure. This tells us that expenditure in health and education sectors has been fluctuating. Increasing military expenditure in Nigeria will not only divert the resources from other sectors but the adverse effects of raising military expenditure in developing economy like Nigeria is likely to worsen the existing poverty since almost all the military hardwares are imported. The debate on impact of military expenditure on development of human capital in Nigeria in recent times draws attention to these questions. How does military expenditure (increase or decrease) affect human capital

development in Nigeria; most importantly health and education sector which are pointers to human capital development and how this in turn affects the growth of Nigeria's economy? There is the insinuation in literature that successive governments in Nigeria favors the defense sector with high military spending at the expense of other sectors (Alexander, 1990). This by implication is said to impact negatively on Nigeria human capital development. This has given rise to key pertinent question; does military expenditure impact negatively on Nigeria human capital development? Addressing this question will give a new lease to effective policy-making in the country. It will aid to establish the needed link between the current rate of military expenditure and development of human capital in Nigeria. This critical issue forms the focus of this study. By the time the study is completed, the researchers shall be in a position to ascertain the true state of affairs.

## **2. Review of Related Literature**

### **2.1 Conceptual Literature**

#### **2.1.1 Military Expenditure**

According to Wikipedia, military expenditure also known as a defense budget, it is the amount of financial resources dedicated by a state to raising and maintaining an armed forces or other methods essential for defense purposes.

Military budgets often reflect 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. Factors that determine a defense budget include the size of that country's economy, other financial demands on that entity, and the willingness of that entity's government or people to fund such military activity. Generally excluded from military expenditures is spending on internal law enforcement and disabled veteran rehabilitation. The effects of military expenditure on a nation's economy and society, and what determines military expenditure, are notable issues in political science and economics (Hicks, Louis; Curt Raney, 2003). There are controversial findings and theories regarding these topics. Generally, some suggest military expenditure is a boost to local economies. Still, others maintain

military expenditure is a drag on development (Nef, 1950).

Every year in April is the Global Day of Action on Military Spending (GDAMS), which aims to gather people and create a global movement that persuades governments to reallocate their military spending to essential human needs such as food, education, health care, social services and environmental concerns (Global Campaign on Military Spending, 2017).

There are three basic definitions of military expenditure serving as standards for the different international institutions that publish data on military expenditure: that of the North Atlantic Treaty Organization (NATO), the United Nations Organization and the International Monetary Fund (IMF). Only the first two are discussed here. According NATO, established in 1950, military expenditure comprises; "all current and capital expenditures on the armed forces, in the running of defence departments and other government agencies engaged in defence projects as well as space projects; the cost of paramilitary forces and the police when judged to be trained and equipped for military operations; military R & D, tests and evaluation costs, and costs of retirement pensions of service personnel, including pensions of civilian employees. Military aid is included in the expenditures of the donor countries. Excluded are items of civil defence, interest on war debts and veterans payments" (NATO, 2010).

The UN definition is based on Stockholm International Peace Research Institute (SIPRI) definition. In the view of SIPRI (2010), defence expenditures include all current and capital expenditures on the armed forces, including peace keeping forces; defence ministries and other governmental agencies engaged in defence projects; paramilitary forces when judged to be trained, equipped and available for military operations, and military space activities. Such expenditures should include: personnel—all expenditures on current personnel, military and civil retirements, pensions of military personnel and social services for personnel and their families; operations and maintenance; procurement; military research and development; military construction; and military aid (in the military expenditures of the donor country). Excluded military related expenditures are: civil defence; current expenditure for previous military



activities such as veteran benefits, demobilization, and conversion of arm production facilities and destruction of weapon (www.sipri.org). According to the UN group of military experts, there is a lack of detailed data on military spending and that makes it hard to apply a common definition worldwide.

Thus, the same definition as given by SIPRI which is based on the NATO definition given above serves as a guideline for the UN definition (www.mtholyoke.edu).

Indexmundi gives a comprehensive explanation about defense expenditure that it includes all current and capital expenditures on the armed forces, including peacekeeping forces; defense ministries and other government agencies engaged in defense projects; paramilitary forces, if these are judged to be trained and equipped for military operations; and military space activities. Such expenditures include military and civil personnel, including retirement pensions of military personnel and social services for personnel; operation and maintenance; procurement; military research and development; and military aid (in the military expenditures of the donor country). Excluded are civil defense and current expenditures for previous military activities, such as for veterans' benefits, demobilization, conversion, and destruction of weapons, (www.sipri.org).. This definition cannot be applied for all countries, however, since that would require much more detailed information than it is available about what is included in military budgets and off-budget military expenditure items. (For example, military budgets might or might not cover civil defense, reserves and auxiliary forces, police and paramilitary forces, dual-purpose forces such as military and civilian police, military grants in kind, pensions for military personnel, and social security contributions paid by one part of government to another.)

Among the countries maintaining some of the world's largest military budgets include China, France, Germany, Japan, Russia, the United Kingdom and the United States which are frequently recognized to be great powers (Baron, et. al, 2014).

The core work of the military expenditure project is to collect, analyse, process and publish data on military expenditure worldwide, and to monitor and analyse trends in military

expenditure over time, looking at their economic, political and security drivers and their implications for global peace, security and development (SIPRI, 2010).

A second key aspect of the work of the military expenditure project is to study issues relating to transparency and accountability in military budgeting, spending and procurement. Such transparency is often quite weak, which can affect the reliability of data, but which more seriously can lead to wasteful and excessive spending, often unconnected to genuine security needs, and to widespread corruption (SIPRI, 2010).

Conceptually, it is believed that reduction in defense spending to fund essential human needs such as food, education, health care, social service and environmental concerns would make human capital development of a nation to rise. However, such a thing should not lose sight of the fact that insecurity which high military spending targets to combat guarantees a stable political and economic environment on which economic growth thrives. Hence, while pursuing a policy of a moderate military budget targeted at increased spending to raise human capital development which has to be done in a such a way as to balance the two, Therefore, the present study shall be based on the fact that while governments try to reallocate their military expenditure to essential human needs with the aim of improving the human capital factor of a country, it has to be done in such a manner as not to make either of the two suffer disproportionately since security guarantees a stable political and economic climate that engenders growth of the domestic economy so to speak. It is based on this line of conceptual framework that this study is hinged. By the time it is completed, it shall be seen the way forward for the Nigerian economy.

### **2.1.2 Human Capital Development**

Human capital is strategic to the development of any nation; this includes education, health, labour and employment. Human capital, according to, World Bank cited in Igun (2006), is the total stock of knowledge, skills, competencies and innovative abilities possessed by the population. Among the most important changes that characterize the 21st century is the increasing importance of knowledge of economic growth and the advent of

the world wide labour market and the global social and political transformation. Obisi & Anyim (2012), also noted that human capital development are talents, skills, competencies and other advantages which people possess, and could be put to better use to give organisation and nations more benefits. Nigerian Economic Summit Group (2000) and Obisi (2003), further posited that human capital could be understood from the perspective of the masses that have acquired the relevant education and skills that could be put to positive use toward development of the nation. Apparently, human capital represents the fundamental infrastructures from technological development and by extension economic development (Obisi, 2002).

However, it is important to note that the higher human capital of a society is the higher would be the potentials for economic development. For example, Korea has no outstanding material resources except her human capital which has been supremely important for the growth of the Korean economy. This means that her human capital is a catalyst to economic development (Obisi, 2003; Nigerian Economic Summit Group, 2000 & Young-lee, 1996). The concept of human capital formulation, according to, Adawo (2011) refers to a conscious and continuous process of acquiring and increasing the number of people with requisite knowledge, education, skills, and experience that are crucial for the economic development of a country. Burneth as cited in Adawo (2011) postulated that investing in education raises per capita GNP, reduces poverty and supports the expansion of knowledge. From their views, it means that for any nation to be fully developed, it must give priority to human capital development. This will impact positively on all sectors of a nation's economy, education, and even the social strata.

Human capital development is something that must exist or happen for national development to take place. In addition, human capital development teaches people how to utilise the power of diverse thinking styles (analytical and intuitive) so that they would achieve holistic best practical solution. Human capital development, training and development are basically the same. This is about development that supports investment in human capital, coaching, training, internship and human capital management (Enyekit, Amachule & Teera, 2011).

Human capital development is about investments, activities, and processes that produce knowledge, health and skills. It means building the balanced human resources base and providing an enabling environment for all individuals to fully engage and contribute to the achievement of the goals of an organization or nation. It is an effort to increase human knowledge, enhance skills, productivity and stimulate resourcefulness of individuals (Erhurua, 2007; Enyekit, Amachule & Teera 2011).

## **2.2 Theoretical framework**

The theoretical framework for the analysis of economic growth is usually evolved from the classic works of Solow (1956). This framework, which is referred to as "neoclassical", generally focuses on the concept of the capacity or potential output of an economy, defined as the output level that is consistent with full employment of capital and labour. One of the functions of the government is stabilization, to encourage a steady rate of economic growth with full employment and stable prices. Stabilization is primarily a macroeconomic function. However, the ways in which government goes about stabilizing also have microeconomic effects on the mix of goods produced (allocation) and the distribution of costs and benefits (redistribution). Stabilization of the economy is attempted by increasing spending or cutting taxes during periods of depression to increase output and employment, or by cutting spending and increasing taxes during boom periods to control inflation. When spending and taxes are used to stabilize the economy, budget deficits and surpluses become inevitable. For this reasons, stabilization policy is mainly a responsibility of the federal government. Most states and local governments try to stay within a balanced budget on a yearly basis. The federal government, however, has greater borrowing power and can let consideration of price stability and full-employment dictates whether or not the budget is balanced. Economists disagree about how stable the state economy would be if, it were left alone. Even in the 1980s when government taxed and spent a much smaller share of the state income, there were still cycles in economic activity. Periods of deflation (falling prices) and unemployment alternated with periods of inflation and rapid growth. But we cannot say for sure that the state economy would have been more stable with government intervention than

without. Public expenditure is important in the economic development of the country. Through public expenditures, most government objectives are achieved such as long-term growth; economic efficiency and poverty alleviation are achieved. Public expenditure is therefore seen as a means of executing government policies and programmes. In spite of its obvious importance, the study of the actual behaviour of public expenditure appears to have received little attention among economists throughout the first half of the 20th century. However, there are two important and well – known theories of public expenditure. Wagner formulated the first one and the other is Peacock and Wiseman (1961). The determinants of public expenditure vary between developed and developing countries as well as among individual countries over time. It is assumed that as government continues to expand its activities to improve the quality of life of the people, public spending is bound to increase. Hence, public expenditure theories provide analytical economic framework under which changes in government spending are viewed. This study is therefore hinged on the theory of defense spending and government expenditure on human capital development (education and health), debt service obligation and economic growth in Nigeria.

### 2.3 Empirical Evidence

The argument about military expenditure began when Benoit (1978), showed empirical evidence that defense burden has advantages on economic growth. Benoit using the Keynesian theory found that in developing countries that there was a positive relationship between military expenditure and economic growth. According to Benoit, military expenditure stimulated rather than depressed the economy. Subsequently, studies sprang up after Benoit's work to challenge his findings; however, so far no results or findings had emerged to show a clear-cut evidence on the nature and extent of effects of military expenditure on economic growth. Following the study of Benoit, some of the studies were of the view that military expenditure should be increased (Odusola FA 1996, Omojomite 2012, Oriavwote & Eshenake 2013, Masoud AK, Munadhil AJ. 2015); some of the studies were of the view that human capital should be increased while some are of the view that either of the variables can be increased as they are both relevant to economic growth

(Smaldone (2005), Hirnissa MT, Muzafa SH, Baharom AH. (2009), Mohammadi T, Maleki B. Gashti HP (2012).

Olabode (2012), examined the relationship between the components of military expenditure and poverty reduction in Nigeria between 1990 and 2010. Using Dynamic Ordinary Least Square (DOLS) method, four models were estimated, two in which poverty index constructed from human development indicators served as dependent variable and the others in which infant mortality rate served as dependent variable. The study showed that military expenditure per soldier, military participation rate, trade, population and output per capita square were positively related to poverty indicator and that military expenditure, secondary school enrolment and output per capita were negatively related to poverty level. This finding confirmed the trade-off between the well-being and capital intensiveness of the military in Nigeria, showing the vulnerability of the poor among the Nigerian people

Masoud & Munadhil (2015), carried out a research on the relationship between military expenditure and economic growth in United States of America using the Autoregressive Distributive Lag (ARDL) bounds testing approach to cointegration tests for the period 1970-2011. The results showed a negative relationship between military expenditure and economic growth.

Abdul, Mohd & Dewi (2015), attempted to examine the effect of conflict and military expenditure on three levels of school performance, namely, school enrolment rate, school completion rate and children out of school rate, in five major countries in South Asia over the period from 1980 to 2013 using panel regression methods. The findings of this study are that conflict and military expenditure created an obvious threat to children's education in South Asia. Therefore, the government, policy-makers and international educational organizations should take effective measures to increase educational opportunities in conflict affected areas through affirmative ways to minimize conflict which could subsequently decrease military budget.

Phiri (2017) investigated the case study for South Africa and confirms that initially, Military expenditure supports to country's

economic growth while at the later stages its largely decreases.

Kollias and Paleologou (2019) employs a panel vector autoregression (PVAR) to investigate the nexus between military expenditure, investment spending and growth rates with 65 countries covering the period 1971–2014. Findings from the study show that differences between the three income groups were unearthed by the empirical tests conducted.

Zaman (2019) examines the nexus among military spending, business regulatory and growth. The results confirm the bidirectional causality between (i) income growth and military factors, and (ii) military growth and business factors. While it further validates that (i) business led Military Expenditure, (ii) income led Military Expenditure, and (iii) military led trade openness in a panel of G-7 countries.

Churchill and Yew (2018) also examines the relationship between military expenditure and economic growth using a sample of 272 meta observations of studies drawn from 48 primary studies. Their study finds that existing studies indicate growth-retarding effects of MILEX and that it is more pronounced in less developed countries than in developed countries.

### 3. Research Methodology

#### 3.1 Research Design

Macro-economic modeling is generally motivated by two objectives: forecasting and more significantly, policy analysis. In pursuit of these objectives, every model should ideally satisfy four (4) criteria. First, it must fit into a theoretical framework, second, the specification of the model must reflect a clear understanding of the conceptual framework within which policies are formulated and executed along with an envisaged process of adjustment. Third, it is essential that the model is built on a firm and rich data base and finally, the estimated structural model must adequately utilize the rigors and sophistication of econometric methodology (Pandit, 2000). Dwelling on the theme of macro-economic modeling, Klein (1986) asserted that: *“Econometric models are based on theories and estimates of the way people behave, not on the way they ought to behave under some hypothesized decision making rules ... statistical evidence on expected prices contradict the hypothesis of rationality as one might expect”*.

For the purpose of this study, the multiple regression analysis would be employed which will express a linear relationship between the dependent variable, Y and K explanatory variables, where ‘k’ could be any numerical value ranging from 1, 2, 3, ... 200, etc (Egbulonu, 2005).

This research study would bring out one model. The model was built to capture effect of Military Expenditure on Human Capital Development in Nigeria. Based on the nature of this research study, secondary data would be used and the design analysis adopted would be is the ex-post facto. Ex-post facto is a research after the factor has been known and it applies to secondary data (Anyanwu, 2000).

#### 3.2. Model Specification

The military expenditure-economic growth model regression employed by Masoud & Munadhil (2015) in the United States of America was adopted and modified in this study. The study modelled an ARDL version of the Keynesian framework to show that GDP comprises consumption ( $C_t$ ) of the household sector, investment ( $I_t$ ) of the firms, government expenditures which could be split into non-military ( $GE_t$ ) and military ( $ME_t$ ) sector and the international sector ( $X_t$ ) as follows; expenditure affects school enrolment rate Pieroni (2009) while some  $GDP = C + I + GE + ME + X$

The Model below is specified to address the key objective of the present study;

$$\Delta HDI_t = \alpha_1 + \pi_1 HDI_{t-1} + \pi_2 MEXP_{t-1} + \pi_3 GEXPE_{t-1} + \pi_4 GEXPH_{t-1} + \pi_5 TOTOP_{t-1} + \pi_6 GFCF_{t-1} + \mu_t$$

.....Eqn (3.1)

Where:  $\alpha_i$  = Parameters to be estimated;  
 $\mu_t$  = Error Term;  $HDI_t$  = Human Capital Development (Proxy for Human Capital Development)  $MEXP$  = Military Expenditure;  $GEXPE$  = Government Expenditure on Education;  $GEXPH$  = Government Expenditure on Health;  $TOPOP$  = Total Population;  $GFCF$  = Gross Fixed Capital Formation;  $t$  = trend variable

To address the main objective, the paper utilised the Auto-Regressive Distributed Lag



(ARDL) bounds test approach developed by Pesaran *et al.* (2001) to investigate impact of Military Expenditure on Human Capital Development in Nigeria. The procedure for the ARDL bounds testing approach has two steps. The first step is testing for long-run relationship using OLS and the next step is the estimation of short-run parameters by using the unrestricted error correction model (UECM). A dynamic unrestricted error correction model (UECM) could be derived from the ARDL bounds testing by way of a simple linear transformation. The UECM integrates the short-run dynamics with the long-run equilibrium without losing any long-run information. Therefore, equation 3.2 is the ARDL-UECM specification.

$$\Delta \text{HDI}_t = \alpha_1 + \pi_1 \text{HDI}_{t-1} + \pi_2 \text{MEXP}_{t-1} + \pi_3 \text{GEXPE}_{t-1} + \pi_4 \text{GEXPH}_{t-1} + \pi_5 \text{TOTOP}_{t-1} + \pi_6 \text{GFCF}_{t-1} + \sum_{i=1}^k \phi_i \text{HDI}_{t-i} + \sum_{j=1}^k \phi_j \Delta \text{GEXPE}_{t-j} + \sum_{r=1}^k \phi_r \Delta \text{MEXP}_{t-r} + \sum_{m=1}^k \phi_m \Delta \text{GEXPH}_{t-m} + \sum_{r=1}^k \phi_r \Delta \text{TOTOP}_{t-r} + \sum_{d=1}^k \phi_d \Delta \text{GFCF}_{t-d} + \mu_t \dots \dots \dots \text{Eqn (3.2)}$$

Where: Where:  $\phi$  = coefficients of the short-run parameters (where  $j = 1, 2, 3, \dots, n$ )  
 $\pi_1$  to  $\pi_6$  = coefficients of the long-run parameters  
 $\Delta$  = first difference operator  
 $K$  = lag order selected by Akaike's Information Criterion (AIC)

#### 4. Data Presentation and Analysis. Pre-Estimation Test

##### 4.1.1 Descriptive statistics

Preliminary analysis was conducted with the aim to determine the normality of the data, measures of central tendency and measures of dispersion. The mean and median are measures of central tendency and they indicate the average value of the sample. Standard deviation is the positive square root of variance. It is a measure of dispersion, that is, it shows the extent of the deviation from the mean. The null hypothesis of the Jarque-Bera test showed that the distribution is a normal one. Therefore if the probability is less than 0.05, we reject the null.

**Table 4.1**

	HDI	LMEXP	LGFCF	LTOPOP	GEXPH	GEXPE
Mean	0.43	10.3	10.4	8.07	58.8	99.7
Median	0.41	10.5	10.2	8.07	15.2	39.8
Max	0.53	11.6	10.8	8.28	257	390
Min	0.38	8.90	9.98	7.87	0.04	0.16
Std.Dv.	0.05	0.98	0.28	0.12	82.5	131
Skewness	0.57	-0.17	0.43	0.01	1.26	1.15
Kurtosis	1.82	1.53	1.71	1.82	3.09	2.76
JB	4.21	3.512	3.717	2.151	9.785	8.213
Prob.	0.12	0.172	0.155	0.341	0.007	0.016
Sum	16.2	382.3	385.5	298.8	2177	3690
Obs	37	37	37	37	37	37

From table 4.1 it could be seen that the variables GEXPH, GEXPE all have P-values less than 0.05, indicating that they were not normally distributed, while the variables, MEXP, GFCF, HDI and TOPOP all had p values greater than 0.05 signifying that they were normally distributed. However, the number of observations is greater than 30 (37 observations) therefore the study would rely on the law of large numbers and central limit theory to proceed with the estimation.

##### 4.1.2 Unit Root Test

**Table 4.2**

VARAIBLE	ADF stat. (levels)	5% critical value	ADF STAT. (1st Difference)	5% Value	REMARK
HDI	1.1569	-2.945	-5.38634*	2.948	I(1)
LMEXP	1.1551	-1.952	-3.16930*	1.950	I(1)
GEXPE	1.2484	-1.950	-5.020427*	-1.950	I(1)
GEXPH	2.8130	-1.951	-7.334882*	-1.950	I(1)
LGFCF	1.4818	-1.951	-3.70210*	-1.950	I(1)
LTOPOP	6.6755*	3.5529			1(0)

Source: Researcher's Compilation from Eviews 10  
Regression Output

The asterisks(\*) sign is used to indicate stationarity at the 5% significance level

From the stationarity test result table 4.2 above, showed that HDI, GEXPE, GEXPH, LGFCF and LMEXP were all stationary at first difference since their ADF TEST STATISTIC were greater than their tabulated ADF values at 5% level of significance. Only LTOPOP achieved stationarity at level at 5% level of significance.

The application of unit root tests in autoregressive distributed lag (ARDL) technique is necessary in order to ensure that the variables are integrated of order one and none of the variables is integrated of order 2 because the computed F-statistic provided by Pesaran & Shin (2001) are valid for only variables that are I(0) or I(1) and a combination of both. The outcome of the unit root test in Table 4.2 above indicated that the logged series for all the variables were integrated of order 1 except total population (LTOPOP) which was integrated of order zero. Therefore, the variables under study are of mixed integration order and this justified the use of ARDL bounds test approach to co-integration over other conventional approaches that require the variables to be integrated of the same order.

#### 4.1.3 Vector Autoregressive Lag Length Criteria

Table 4.3

La g	LogL	LR	FPE	AIC	SC	HQ
0	-159.0	NA	0.00	9.70	9.9773	9.7998
1	134.2	465.83	1.83	-5.42	-3.5419	-4.7844
2	234.8	124.23	5.07	-9.22	-5.7240	-8.0314
3	330.3	84.305	2.13	-12.8*	-7.83*	-10.6*
8		*	*			

Source: Researchers Extract from Eviews 10 Output (2019).

Using the Vector Autoregressive Lag Length Criteria, it enabled the researchers to determine the appropriate lag periods in evaluating and estimating the required test for the model. Observing the lag length criteria above, it was obvious that the dominating and appropriate lag for the model was lag period 3. The study would make use of the AIC i.e Akaike Information Criterion for estimation.

#### 4.2 Autoregressive Distributed Lag Bounds Test for Co-Integration

Table 4.4

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
		Asymptotic: n=1000		
F-statistic	10.27418	10%	2.26	3.35
k	5	5%	2.62	3.79
		2.5%	2.96	4.18

Source: Researcher's Compilation from Eviews 10.

From the ARDL Bounds Test and going by the decision rule of the Bounds Test, the study could not accept the null hypothesis of no cointegration since the F-Bounds Statistic was greater than the I (0) and I (1) bounds at 10%, 5% and 1% respectively, therefore the researchers concluded that there existed a long run relationship among the variables.

#### 4.2.1 Dynamic Short Run Error Correction Model

The Distributive lag and Short Run Estimates of the Model are summarized below

Table 4.5

ARDL ECM REGRESSION				
Variable	Coefficient	Std. Error	t-Stat	Prob.
C	-3.414086	0.388915	-8.77847	0.0000*
D(LMEXP)	-0.002243	0.003022	-0.74240	0.4665
D(GEXPE)	-1.98E-05	1.94E-05	-1.02108	0.3194
D(LGFCF)	-0.014917	0.006922	-2.15501	0.0435*
D(LGFCF(1))	0.023279	0.006455	3.60646	0.0018*
D(LTOPOP)	201.9313	25.46626	7.92936	0.0000*
D(LTOPOP(-1))	-323.7827	42.12961	-7.68539	0.0000*
D(LTOPOP(-2))	162.9726	21.65034	7.52748	0.0000*
CointEq(1)	-0.823271	0.093786	-8.77817	0.0000*

Source: Researcher's Extract from Eviews 10 Package 2019

Key: \*Significant at 1% and \*\* significant at 5% level.

From the regression result above, the coefficient of the constant term was negative and significant and did not conform to a-priori expectation. The value of the constant term was -3.414086 and this showed that when other explanatory variables were held constant, HDI will decrease by -3.414086 units.

Analysis of the short run coefficients showed that LMEXP was negative for the current year and one year lag period decreasing Human Development Index by 0.002243 units. This means that a unit increase in Military Expenditure would lead to a decrease in Human Development Index by 0.002243 units. Similarly, Government Expenditure on Education (GEXPE) had a negative coefficient and was negative for the current year decreasing HDI by 0.00198 units which implies that if Government Expenditure on Education increases by 0.00198 units, Human Development Index would significantly decrease by 0.00198 units.

Furthermore, LGFCF was negative for the current year and one year lag period decreasing HDI significantly by 0.014917 units even though it contributed to the growth in HDI in the previous lag and this implies that for every increase in LGFCF, HDI significantly decreases by 0.014917 units, respectively.

LTOPOP was positively impacted on HDI by increasing HDI by 201.9313 units significantly in the current year even though it negatively impacted on HDI in the previous year lag one but significantly impacted on HDI in previous year lag 2.

Finally, the error correction mechanism met the required conditions. The significance and rule of ECM holds that negative and statistical significant error correction coefficients are necessary conditions for any disequilibrium to be corrected. In the light of this, the coefficient of CointEq(-1) was -0.823271. The above result showed that the ECM (-1) value was -0.82% implying that there is convergence of the equilibrium should there be system disequilibrium. The negative sign of the

coefficient satisfied one condition while the fact that its P-value [0.0000] was less than 5% [0.05] level of significance satisfied the second condition of statistical significance. The coefficient indicates that the speed of adjustment between the short run dynamics and the long run equilibrium is 82%. Thus, ECM would adequately act to correct any deviations of the short run dynamics to its long-run equilibrium by 82% annually. This means that if Human Capital Development is at disequilibrium, it converges back to equilibrium at an average speed of about 82%  $(-0.823271 \times 100)$  every year in Nigeria. We can also say that about 82% of disequilibrium from shocks of previous years in Human Capital Development converges back to long run equilibrium every year in Nigeria. Hence, the whole system will get back to equilibrium, long run equilibrium at the speed of about 82% yearly.

#### 4.3 Static Long Run Estimates of Military Expenditure on Human Capital Development in Nigeria

Table 4.6

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LMEXP	-0.020091	0.007873	-2.552027	0.0190
GEXPH	7.55E-06	5.63E-05	0.134054	0.8947
GEXPE	9.58E-05	3.80E-05	2.520360	0.0203
LGFCF	-0.054315	0.021513	-2.524682	0.0201
LTOPOP	0.593111	0.079187	7.489983	0.0000

		Durbin-Watson stat =		
R-squared	0.769625	2.376689		
AdjustedR <sup>2</sup>	0.695905			
F-statistic	10.43985			
Prob	0.000003			

Source: Researcher's Extract from Eviews 10 Output Package 2019. Key: \* Significant at 1% level; \*\* Significant at 5% level

**MILITARY EXPENDITURE(LMEXP):** The long run estimates of Military Expenditure on Human Capital Development in Nigeria showed that Military Expenditure (LMEXP) had a negative relationship with Human development Index in the long run decreasing it significantly

by 0.020091 units but shows to be a significant contributor to Human capital development at 5% level of significance and this finding conforms with the work of Olabode (2012), who examined the relationship between the components of military expenditure and poverty reduction in Nigeria between 1990 and 2010. Using Dynamic Ordinary Least Square (DOLS) method, his study showed that military expenditure per soldier, military participation rate, trade, population and output per capita square were positively related to poverty indicator and, military expenditure, secondary school enrolment and output per capita were negatively related to poverty level. This discovered the trade-off between the people's well-being and capital intensiveness of the military in Nigeria, showing the vulnerability of the poor among the Nigerians.

**GOVERNMENT EXPENDITURE ON HEALTH (GEXPH):** Government Expenditure on Health, on the other hand, had a positive relationship with HDI in the long run increasing HDI by 0.00000755 units but insignificant at 5% level of significance since its co-efficient was almost zero and this has proved that lack of proper and adequate funding and management of funds in the health sector hence the almost zero co-efficient.

**GOVERNMENT EXPENDITURE ON EDUCATION (GEXPE):** Government Expenditure on Education showed a positive relationship with HDI in the long run increasing HDI by 0.0000958 units and also statistically significant at 5% of significance. The significance of government expenditure on education was not surprising since education in every sense has been one of the fundamental factors of development (Todaro & Smith, 2011). No country can achieve sustainable economic development without substantial investment in human capital. Education enriches people's understanding of themselves and the world. It improves the quality of their lives thereby leading to broad social benefits to individuals and society.

**GROSS FIXED CAPITAL FORMATION (LGFCF):** Gross Fixed Capital Formation had negative relationship with Human Development Index decreasing HDI by 0.054315 units significantly in the long run implying that for

every increase GFCF, HDI would decrease by - 0.054315 units in the long run and this findings is line with the work of Ezekwesili (2012), who was of the opinion that Nigeria's poor capital formation came from low education development of the people. She reiterated that, the resurgence of entrepreneurial spirit based on hard work and sound education were the panacea or critical factors to changing Nigerian situation for good.

**TOTAL POPULATION (LTOPOP):** Total Population shows a positive relationship with Human Development Index in the long run, increasing HDI by 0.593111 units implying that increase in Total population would increase HDI by 0.593111 units and this was because Nigeria has been the most populous country in Africa, and the 7th in the world, with approximately 193 million people (Peter, 1987). With such a large population, the Nigerian economy should be resting on a gold mine of human capital, viewed as a significant asset to a developing nation's growth. However, this potential has remained relatively untapped owing to lack of adequate investment and policy avoidance of past and present government in Nigeria.

Finally, R-Square indicated that 77% of the total variation in Human Development Index was accounted for by Military Expenditure (MEXP) Government Expenditure in Education (GEXPE), Government Expenditure on Health (GEXPH), Gross Fixed Capital Formation (GFCF) and Total Population (TOPOP), however, the total variation of 23% in the dependent variable could be attributable to the influence of other factors not included in the regression model.

#### 4.4 Diagnostic Test/Post Estimation Test≈

##### 4.4.1 Test for autocorrelation

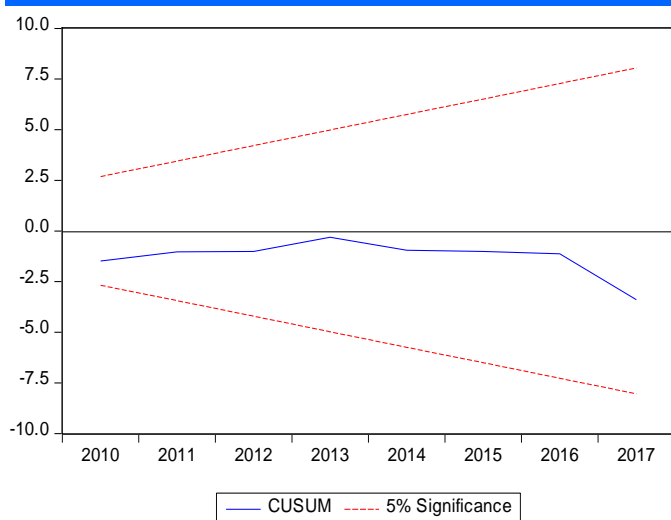
Durbin Watson (DW) = 2.376689

**Decision:** Since the value of Durbin Watson = 2.376689 and clearly above to 2, the study therefore concluded and accepted  $H_0$  that there was no autocorrelation present in the Model.

##### 4.4.2 Stability Test

The cusum test for model stability was employed to check for the stability of the parameters in the model. The result of the stability test is shown below:





The diagram showed that the model was stable as the cusum line lied in between the 5% boundary.

#### 4.4.3 Pairwise Granger Causality Test for Objective Six

To answer the question of the objective six in this study, the study used the Pairwise Granger Causality Test below:

Null Hypothesis:	Obs	F-Statistic	Prob.
LMEXP does not Granger Cause HDI	34	3.27878	0.0361
HDI does not Granger Cause LMEXP		1.43383	0.2547

Source: Researchers Extract from Eviews 10 Output Package 2019

Since focus of the work is on whether Military Expenditure in Nigeria Granger Causes Human Development Index, the study could conclude that Military Expenditure granger caused Human Development Index since it had a prob value of  $0.0361 < 0.05$  level of significance while, on the other hand, Human Development Index does not granger cause Military Expenditure in Nigeria.

## 5. Summary of Findings, Conclusion & Recommendations

### 5.1 Summary of Findings

The study investigated the impact of military expenditure on human capital development in Nigeria covering the period of 1981-2017 with specific objectives namely; to determine the impact of Government Expenditure on Health on Human Capital Development in Nigeria, to examine the impact of Population Growth Rate on Human Capital Development in Nigeria, to determine the impact of Gross Fixed Capital Formation on Human Capital

Development in Nigeria and to know the direction of causality between Military Expenditure and Human Capital Development in Nigeria. The specified model was estimated using the Autoregressive Distributive lag Model and Granger Causality test which were used to determine the level of impact that one variable has on the other as well as the direction causality between them. While E-views 10 statistical software was employed in computing the result, time series data were obtained from the CBN Bulletin for 2018, Nigeria Bureau of Statistics, Knoema and World Bank Statistical Publications and the study establishes as follows:

The study establishes for the period under review, Military Expenditure (LMEXP) was found to have a negative relationship with Human Capital Development (HDI) both in the short run and on the long run and was statistically insignificant at 5% level of significance.

- Government Expenditure on Health has a positive relationship with Human Capital Development (HDI) in the current year in the long run but statistically insignificant at 5% level of significance.
- Government Expenditure on Education (GEXPE) has a negative relationship with HDI in the short run in the present year and also statistically insignificant at 5% level of significance but was statistically significant in the long run with a positive relationship with HDI.
- Gross Fixed Capital Formation has a negative relationship with Human Capital Development in the short run and statistically insignificant at 5% level of significance. While government expenditure on education showed a negative relationship with Human Capital Development in the short run but strongly significant in the long run with a positive coefficient.
- Total Population showed to have a positive relationship with Human Development Index in the current year but insignificant in the previous year while

showing a strong positive relationship with HDI in the 3 years lag period.

- All the variables represented in the model were statistically significant in the short run and long run period except Military Expenditure and Government Expenditure on Health.
- The result from the ARDL Bounds Test for co-integration test conducted earlier shows an evidence of long run relationship.
- The result of the Granger causality test indicates that Military Expenditure granger causes Human Development Index since while on the other hand, Human Development Index does not granger cause Military Expenditure in Nigeria.

## 5.2 Conclusion

This study used the ARDL Model to estimate the effect of Military Expenditure on Human Capital Development in Nigeria for the period 1981-2017. From our findings, Government Expenditure on Health, Government Expenditure on Education and Total Population contributes more significantly than Military Expenditure and Gross Fixed Capital Formation to Human Capital Development in Nigeria.

The conclusion to be drawn from this study is that Military Expenditure has an insignificant economic impact on Human Capital Development growth in the presence of other internal and external macro-economic shocks. Nevertheless, to achieve a high and sustainable growth, we proffer some policy recommendation which when properly implemented will surely stimulate greater growth of output.

## 5.3 Recommendation for Policy Implementation

- There is need as a matter of deliberate policy initiative by the Government to try to strike a balance between military expenditure and improvement in the human capital sector by trading some resources off to education and health

sector to improve the health indices or status of the populace.

- Policy makers should encourage budgetary allocation in support of accumulation of capital and human capital development as they would not only grow the economy but they would also help create new jobs in the entrepreneurship strides of the country.
- There should be a reduced spending on the provision of the public goods (security) but rather increase its spending on human capital development and accumulation of capital since these are the major drivers of economic growth. However, this should be done with an eye on maintaining a stable political and economic climate for business to strive in a bid to raise growth in real terms.

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