



Does Corruption Grease or Sands the Wheels of Government Expenditures' Impact on Poverty in Nigeria? ARDL Approach

¹Saad Buba*, ²Saad Mohamed Abdullah Lihniash and ³Abubakar Ahmed Jada

¹Department of Economics, Gombe State University, Nigeria

²Department of Accounting, Murzuq, Fezzan University, Libya

³Department of Accounting, Adamawa State Polytechnic, Yola

*Corresponding Author's E-mail: saadbubadamare12@gsu.edu.ng

Abstract

The government, through its expenditures, provide public goods in order to improve welfare and reduce poverty, but sometimes affected by bureaucratic bottlenecks and corruption. This paper investigated the long-run consequences of corruption in a model of public expenditures and poverty in Nigeria. Poverty is one of the most disturbing features in Nigeria, hence the need for a continued upward review of public expenditure to build the basic infrastructures of the economy that cannot be afforded by the poor. To test the hypothesis of grease or sands the wheels, the study sourced its data from Central Bank of Nigeria, National Bureau Statistics and the World Bank for 21 years (1996-2016). We employed ARDL bounds test approach. Results show no any decrease in poverty in Nigeria despite increase in Consumer Price Index. The index remains below 30, which is still categorised as most corrupt. Hence, making the public expenditure incapable of attacking poverty, which is in tandem with previous studies elsewhere. Institutions and anti-graft agencies be strengthened, increase salaries and award the honest, dedicated and transparent public officers in charge of contract award procurement and supervision of projects.

Keywords: Government expenditure; corruption; grease the wheels; sands the wheels; poverty; Nigeria

JEL Classification: O15, H11, H53

1.0 Introduction

Government expenditure is vital to reducing poverty, especially when made on programmes that target at the poor like, education, health etc., that are sometimes referred to as public goods because allowing market forces to allocate them will leave the poor inconsequential. Edrees, Azali, Azman and Nor (2015) after investigating the impact of public expenditure on poverty reduction, concluded that public spending on health and education has a positive and significant impact on poverty reduction. Ritwik and Joydeb (2016) concurred this after examining the impact of public expenditures, economic growth and poverty alleviation in India, concluded that expenditures on infrastructures like roads, irrigation, power, transport and communication, increase per capita income and incidence of poverty is also lowered.

Poverty has been considered as a real social phenomenon, manifesting more of its consequences in lack of income than the lack of income (Ferragina, Tomlinson & Walker, 2017). In a more simplified term, poverty is the inability to attain a minimal standard of living and is more glaring in the areas where people are benefitting less or even nothing from government spending. Two conceptions of poverty, absolute and relative, reflecting two types of deprivation, have been distinguished in several kinds of literature, but this work will revolve around the absolute poverty that is measured by poverty ratio because it is the type that truly reflects Nigerian situation. According to World Bank (1994), corruption is an abuse of public office for personal benefit, even though; this definition does not discharge and acquit the private sector from been corrupt, especially when it comes to procurement or hiring in large companies, especially multinationals. (Wei, 2001) suggested that corruption tilts the structure of government expenditure away from desired education and healthcare, simply because, the extraction of rents is very difficult. (Del Monte & Papagni, 2007) asserted that public spending on consumable goods and services has the potentiality of causing corruption. Corruption is the process of influencing government policies and decisions for one's benefit (Shleifer & Vishny, 1993). Poor people don't benefit from Nigeria's wealth, due to a high level of corruption. For instance, public office holders stole the sum of \$20 trillion from the government treasury between 1960 and 2005 (Oxfam, 2017).

In Nigeria, corruption is seen as a systematic way of our daily life and even incorporated in our business of life, which is regarded as a respect for our local traditions by multinational corporations (Transparency International, 2017). Corruption in the public sector often exacerbates conditions of poverty (low income, poor healthcare and education status, bad roads, poor agricultural policies and other characteristics) in countries that are already struggling with the strains of economic growth, democratic transition, and political instability like Nigeria. However, countries experiencing chronic poverty are seen as natural breeding grounds for systemic corruption in order to bridge the social and income inequalities.

Poverty in Nigeria has continued to rise; with about 100million people surviving on less than \$1.25 per day, in spite a recorded economic growth (World Development Indicators, 2010). According to National Bureau of Statistics (NBS, 2012b) in 2010, 70% of Nigerians lived in absolute poverty, indicating a rise from 54.7% in 2004. This unfortunate situation is seen in a country that happens to be the largest oil producer in Africa and the seventh in the world, even though the sector has been marred by accusations of corruption. (NBS, 2012a) said, a Nigerian situation is a paradox because as Nigeria is growing from strength to "strength" the citizens are getting poorer. For instance, North-West and North-Eastern part of the country recorded 77.7% and 76.3% poverty rate respectively, while the South-Western part recorded 59.1%, this variation could be attributed to having better access to healthcare facilities, education and so on.

Government expenditures in Nigeria has kept on fluctuating, but it averaged at N892.80 Billion from 1996 to 2016, with the highest expenditure of N1795.78 Billion in 2013 and the lowest of N146 Billion in 1996 (CBN, 2016). For the purpose of this study, we shall consider only the expenditures made on the economic and the social sectors of the economy. This is due to the



fact that it is the only data the authors can obtained. Despite the increased Public expenditure, the proportion of Nigerians living in poverty kept on increasing year by year. This situation is worrisome, no wonder, United Nation's report (United Nations, 2016) on Nigeria's Common Country Analysis (CCA), described it as one of the poorest and unequal countries in the world, with over 80 Million of her population living below poverty line.

Nigeria is known both globally and locally as been one of the corrupt countries and poverty stricken-countries of the World. It has already been established that there is a correlation between corruption and increased level of poverty, (see Chetwynd, Frances & Spector, 2003). Past and present governments in Nigeria have intensified effort in investigating alleged corruption malpractices by former Ministers, Governors and Advisers. Several measures are also taken to incorporate anti-corruption precautions into government's institutional framework, starting with "whistle blower" policy in 2016, aimed at exposing all kinds of corrupt practices and as well joining the Open Government Partnership (OGP) gears toward enhancing transparency and accountability in the affairs of government for comparison with the international best practices. Despite all these efforts, the corruption index remains high at 27 in 2017, which is less than 50 (Transparency International, 2018). Nigeria is poor because of the corrupt attitude of the government and unless the public resources are not stolen through the use of public power, it will continue to remain poor.

The major concern of this research is, funds earmarked for the provision of infrastructural facilities like education, healthcare, roads etc. and projects for the public interest which are being diverted by corrupt officials in-charge of procurement, implementation and supervision which does not only cause poverty but also increased it. This situation should not be in an Oil rich country like Nigeria the seventh largest oil exporter in the World and a blessed country with abundant natural and human resources. All these are happening because of corruption, a cankerworm that has eaten deep into the fabrics and garments of the Nigerian society for many decades, in spite the establishment of all kinds of anti-graft agencies like EFCC, ICPC, and Code of Conduct Bureau.

In most developing countries, Nigeria inclusive, poverty is one of their most disturbing features. Hence the need for a continued upward review of public expenditure to build the basic infrastructures of the economy that cannot be afforded by the poor. The overall objective is to shrink the widely existing income inequality and reduce extreme poverty and as well break the vicious circle of poverty. But without the judicious (zero corruption) use of the funds, it will be in vain to expend such funds. Odior (2014), maintained that Nigeria will find it difficult to achieve the United Nation's (MDGs) target of reducing poverty from 54.4% to 21.45 by the year 2015. Obadan (2001) also said that despite interests shown by previous governments to reduce poverty through various programmes and policies, the rate and menace of poverty have continued to rise over the years. He suggested factors that militated against it as; high rate of corruption, lack of political will, bad governance etc. Furthermore, many studies made some attempts in examining the impact of public spending (education, infrastructure, health, agriculture, roads or even combined) on economic growth and reduction of poverty. Their

outcomes differ significantly in detecting the impact and efficiency of these categories of expenditures as it is restricted by numerous factors and restraints.

However, these constraints need to be clearly understood and their effect, so as to determine whether the government should intervene and how to do it. It is therefore against this backdrop, that after considering the significant increase in public expenditure and the poverty trends in Nigeria, this study focused on the following problems: Many families have lived and are still living in extreme poverty despite increase public expenditure; the most pertinent question is that: can this poverty circle be broken through increase public expenditure? Can corruption “grease or sands the wheels” of public expenditure to reducing poverty? Although a large literature exists to explain reasons behind the continual increase of poverty in Nigeria, little attention has previously been paid to the influence of corruption on poverty reduction through public expenditures. Therefore, this work will try to increase the level of our understanding about the long-run relationship that exists between public expenditure and poverty reduction and as well determine whether corruption “greases” or “sands” the wheels of public expenditure impact on reducing poverty.

This topic is called for, because poverty issue is one of the most important topics, not only in Nigeria but globally. Therefore it is anticipated that this work would generate a great deal of interest and understanding among the academicians, policymakers and the general public, especially on the antagonist role played by corruption in the quest for poverty reduction. For academicians, it serves as a source of reference for further research on the same topic. Policy makers and other agencies saddled with the responsibility of reducing poverty as the findings will help them to understand what is actually happening so they can use it for designing and tracking poverty reduction policies and programmes.

The data will cover the period of 21 years (1996-2016). The justification for using this time frame was predicated on Habibullah, Din, and Hamid (2016), when they carried out a study on good governance and crime in Malaysia using short time-series data on Good governance indicators and crime for the period of 14 years (1996-2009). Moreover, on the Transparency International site, the data available is only from 1996 to date, hence the use of 21 years’ time-frame. The major limitation of this study is the use of short time-series from 1996-2016. This study used poverty rate as a proxy for poverty reduction, which is dependent. While government expenditure (on economic and social sectors) and Corruption are the independent variables, that supposedly impact on the poverty rate. Section 2 of this study reviewed related literature, section 3 is the methodology of the study, and section 4 and 5 are on analysis of results and conclusion and recommendations of the study respectively.

2.0 Literature Review

2.1 Conceptual Review

2.1.1 Poverty

Poverty is lack of means of subsistence (food, clothing, shelter and so on), besides miseries of this kind, poverty also connotes helplessness when faced with the demands of life: ignorance, weakness, bondage, isolation, defencelessness against injustice” (Verhey, 1975). In relation to

this definition, Corbett (2007), defines poverty as a “condition of having insufficient resources or income. Sarwar, Sarwar, and W (2011) see poverty as the major impediment to achieving economic prosperity. This prompted Imaekhai (2009), to observe that “poverty is still very much a problem in Nigeria even on a higher magnitude to the failure of previous attempts made by both civilian and military governments to tackle the problem”. Also various programmes like NAPEP, Operation Feed the Nation (OPN), Live Above Poverty Organisation (LAPO), etc., have been established for the people to be educated on how to find a long-lasting answer to this ‘menace’ called poverty, but most of these programmes did not record any meaningful success as it was basically flawed by corruption. This stimulated Oladipo (1999), to postulate that “Nigeria today is a country in which poverty, human degradation and despondency reign supreme. But this situation needs not to remain so”. Previous records have confirmed this fact as in (Imaekhai, 2009), in 1960, the poverty level in Nigeria was about 15% and after 20 years, that is by 1980 it has grown to 28.0%. By 1985, the poverty level stood at 46.0%, dropping to 43% in 1992. Between 1980 and 1996, the poverty level had hit 66%. He continued by stating that “The federal office of statistics state-by-state poverty level data puts it at 28.1% in 1980, 46.3% in 1985, 42.7% in 1992 and 65.6% in 1996” (Imaekhai, 2009).

2.1.2 Public Expenditure

Public spending can have an alleviating effect on poverty through the provision of infrastructural facilities and other services to the poor; thereby creating the circumstances that will improve the ability of the poor to accrue assets (education) and reduce the impact of undesirable shocks through the delivery of safety nets. Fan, Hazell and Thorat (2000), opined that rural poverty in India can only be reduced by increasing government expenditure on roads, agricultural research, as it will generate high productivity. In another separate study, Fan, Xiaobo and Neetha (2004), discovered that the same type of expenditure (on education and health) also had a significant impact on reducing rural poverty in Uganda. (Boqiang, 2005) was also in affirmative when he says government spending on infrastructures like roads, electricity, rural education and irrigation has all contributed to rural productivity growth and poverty reduction in China. Mehmood and Sara (2010), had the same view, that there is a short-run as well as the long-run relationship between the government expenditure and poverty. Several studies maintained that public expenditures on education, health, irrigation, power and other development activities have been effective in reducing poverty in India (Jha, Biswal & Biswal, 2000; Edeme, Nkalu, & Ifelunini, 2016)

According to Odior (2014), re-allocation of expenditures to education sector is important in determining economic growth and reduction of poverty in Nigeria. Ogun (2010) carried out a study on infrastructure and poverty reduction, concluded that, huge spending on both social (education and health) and physical infrastructure (roads, transport etc.) leads to poverty reduction in Nigeria. Marisa and Iturbe-Ormaetxe (2018), discovered that expenditure on education has a long-run tendency of reducing the frequency of poverty at a later life, especially for children with the poor family background. Fan and Xiaobo (2008), found that government expenditure on agricultural research and extension had a significant impact on poverty reduction, and on the contrary, expenditure on roads has a marginal effect on poverty reduction. But Sanjaya and Nuriev (2016), had a varying view, that public spending is growth-enhancing

but still not enough to reduce poverty, poverty gap and income distribution. Chemingui (2007), after analysing public spending and poverty reduction in Yemen, concluded that; increasing public expenditure on health and education supposed to create further economic growth and reduce poverty than solely expending on the agricultural sector, but that been an oil country, it will not increase barrels of oil productivity, hence agricultural expenditures is pertinent to reducing poverty achieving economic growth. Treisman (2000), opined that more distribution of public goods like health, education, roads may impact on poverty reduction. (Bakhtiari & Meisami, 2010) asserted that increased health and education status will decrease income inequality and the level of poverty in Islamic countries. Celikay and Sengur (2016) corroborated that, the relationship between education expenditures and GINI coefficient (a measure of inequality in income distribution) exists. Jung and Thorbeck (2003), after appraising the distributional consequences of public expenditure in Tanzania and Zambia with a multi-sector CGE model suggested that education expenditure can raise economic growth and as well be effective for poverty alleviation. Birowo (2011), after studying the relationship between government expenditure and poverty rate in Indonesia, concludes that the government expenditure in overall did not have a negative relationship with poverty rate.

2.1.3 Corruption

Corruption is manifested in budget planning, implementation, monitoring and supervision. Osei-Tutu, Badu, and Owusu-Manu (2010), observed some of the corruption faces as kickbacks, bribery, tender manipulation, embezzlement and conflicts of interest. Tanzi, and Davoodi (1998), maintained that; whenever corruption influences allocation of project and selection of contractors, the result of this is a public expenditure that is highly distorted. “White elephants’ and “cathedrals in the deserts” are produced, i.e. poor quality of projects. Treisman (2000), after studying the causes of corruption concluded, that greater state participation in an economy was significantly related to higher level of corruption, a case of Nigeria. He went further to say that in the early stage of growth, corruption increases and then decreases with economic development. But the relationship between government expenditure and corruption, may be non-linear and also quite complex.

Timofeyev (2011), said there is a correlation between the efficiency of social spending and corruption perception index calculated by Transparency International. Méon and Sekkat (2005), tested the Hypothesis “grease the wheels” against “sand the wheels” and concluded that corruption “sands the wheels” as it impacts negatively on growth separately from its impact on investment, which they said depends on the quality of governance, the situation tend to aggravate when corruption increases. Olarewaju (2016), after using Johansen maximum likelihood procedure, discovered that corruption adversely affects output growth. In the same vein, Aigheyisi (2015), discovered that corruption had no significant impact on the growth of Nigeria economy at both the pre-democratic and democratic period. Ovat and Bassey (2014), reveals an obvious correlation between corruption and public expenditure with an adverse effect on economic growth which is manifest in rising incidence of poverty. On the contrary, Mallik and Saha, (2016), shows that corruption is not always growth-unsupportive; but growth-supportive for some countries, thereby supporting the “greasing the wheels” hypothesis.

2.2 Theoretical framework

The underpinning theory of this study is the John Maynard Keynes theory of government participation in an economy, opposing to the principles of invisible hands. With the experience of the great depression of the 1930s, Keynes concluded that the invisible hands have failed, and so the government must intervene in order to bring out countries from the economic quagmire the economies of the world have fallen into (Ahuja, 2012). Also, Vedder and Gallaway (1998) supported Keynes view when they said; Government is a necessary, though not a sufficient means or condition for prosperity (absence or low poverty). Another theory is in line with the studies conducted by Méon and Sekkat (2005), which tested the Hypothesis “grease the wheels” against “sand the wheels” and concluded that corruption “sands the wheels” as it impacts negatively on both investment and growth. This study shall apply the same theory to Nigeria situation to ascertain whether corruption “greases the wheels” or “sands the wheels” of public expenditures on poverty reduction in Nigeria.

2.3 Empirical Review

In this section, selected foreign and domestic studies on government spending. Nan (2022), found that corruption affects government expenditure. Del Monte and Pennachio (2020), revealed that corruption increases public debt in OECD countries. Andretsch et al. (2021) in their study have concluded that corruption affects the range of government expenditure. Chandran and Govindaraju (2011), carried a study the effect of government expenditure on economic growth of Malaysia. The research covered a period from 1970-2006 but considered two scenarios where the impact of aggregate government expenditure on RGDP was examined and on the other hand, where the public spending on education alone was used to assess the impact of government expenditure on RGDP. The study found support for Wagner’s law by establishing that aggregate government expenditure had significant positive relationship with RGDP while the use of single predictor variable (education) had a result that agreed with Keynesian hypothesis.

Hasnul (2015) used Ordinary Least Squares (OLS) method to elongate the study on the effect of government expenditure on economic growth in Malaysia from 1970-2014. The study found negative relationship between government expenditure and economic growth in Malaysia. The findings further revealed that education, defense, healthcare and other operating expenditures had insignificant impact on economic growth. Al-Bataineh (2012), examined the impact of government expenditures on economic growth in Jordan from 1990-2010. The study found that total government expenditure had a positive impact on GDP growth. Al-Shatti (2014), focused on public spending on education in Jordan from a period covering 1993-2013 and found that current and capital government expenditures on education could not improve economic growth due to high cost of education provided by the private sectors and increasing level of unemployment in Jordan. Torki (2016), employed OLS to extend the study in Jordan from 1980 to 2013. The findings revealed that total government expenditure and the operating public spending had positive impacts on economic growth.

Gangal and Gupta (2013), examined the influence of government spending on economic growth of India using time series data from 1998 to 2012. The study employed co-integration

and granger causality tests method for evaluation. The result indicated a stable long run relationship between public expenditure and economic growth while establishing that public spending influenced economic growth positively and significantly.

Lahirushan and Gunsekara (2015), employed panel data of Asian countries spanning from 1970-2013 to investigate the impact of government expenditure on economic growth. The countries include: Bhutan, China, India, Japan, Malaysia, Singapore, Sri Lanka, South Korea and Thailand. The random effects panel OLS model was applied and the result indicated a long run relationship and a significant positive impact of government expenditure on economic growth in Asian region.

Kwendo and Muturi (2015), used panel data from 1995 to 2010 and Hausman test to examine the effect of public spending on economic growth in Burundi, Kenya, Rwanda, Tanzania and Uganda. The study target was to establish the effect of government spending components of agriculture, consumption, defense and health on economic growth. The findings revealed that agriculture and defense exerted a negative influence on growth while consumption and health had positive effect on economic growth.

Jelilov and Musa (2016), employed OLS technique to examine the impact of government expenditure on economic growth in Nigeria from 1981-2012. The study established evidence that government expenditure influences economic growth significantly and positively. Omodero (2018), elongated the study in Nigeria from 1999 to 2016 but concentrated on the effect of selected non-development government expenses (which include: education, healthcare, defense & security, agriculture and public debt servicing) on GDP. The findings revealed among others that government spending on public debt servicing, defense and security had significant positive influence on GDP while the other predictor variables had negative impacts on GDP. Based on the outcome, the study suggested a redirection of government resources to agriculture, education and healthcare which can really help to boost economic growth of the country if applied.

Farooq (2016), studied public expenditures and economic growth in Pakistan using three staged least squares method. The study covered a period from 1971 to 2014 and the findings revealed that both developed and non-developed government expenditures had a strong positive impact on economic activity measured by GDP.

Kyissima, Pacific and Ramadha (2017), assessed the long and short run impact of government expenditure in Tanzania using time series data covering a period from 1996-2014. The findings revealed that in the long-run, government expenditure had significant positive correlation with economic growth, but in the short run, there was no significant relationship established. The study suggested improvement in distribution of resources and private sector involvement to boost economic growth in Tanzania.

Muguro (2017) investigated the impact of public expenditure on economic growth in Kenya for a period covering 1963 to 2015. The two types of government spending which are capital and recurrent government expenditure were used as the predictor variables while economic



growth was measured by real GDP. The regression results among others revealed that all components of government spending had no significant impact on economic growth in Kenya.

Considering the multifaceted nature of poverty, this work shall take into cognizance a wider perception of it that includes the accessibility and availability of facilities like healthcare, education, housing, electricity etc. in an effort of reducing it. These facilities could only be provided through public spending (especially in Nigeria, due to its public sector dominance). Bigsten, and Levin (2010), opined that the components of government spending are very crucial to determining economic growth, poverty reduction and human development. They went further to say that public expenditures on education and health simultaneously can impact on the household's economic and social well-being. These are the important components of human capital formation (Besley, 1997), that can aid in reducing the rate of poverty.

2.4 Research gap

This study is a major diversion from the studies of other scholars reviewed above. The study goes further to examine the role of corruption in influencing government expenditure on alleviating poverty in Nigeria due to its inherent predominant effect on economic growth and national development. Other scholars mentioned above used different parameters to measure government expenditure and economic growth, however, this study considers poverty reduction as the major element of national development and the ultimate reason why government incurs expenditure. Without this primary aim as a focus, public sector spending for economic growth may be a misdirection of resources.

3.0 Methodology

3.1 The Data

The types of data required in this study are basically time-series and secondary in nature, which are readily free and available to access. The relevant figures and statistics on public expenditure (on education and social sectors) can be sourced from Central Bank of Nigeria (CBN) statistical bulletin, while poverty rate (head count ratio) will be extracted from National Bureau of Statistic (NBS) publications, Nigeria and Worldwide Development Indicators (WDI) by the World Bank, while Corruption perception index (0- highly corrupt and 100-clean) will be sourced from Transparency International database.

3.2 The Method and Modelling

In order to estimate the impact of public expenditure and corruption on poverty reduction in Nigeria, the researcher used a linear model which is in tandem with the Keynesian model that agrees increase government expenditure will spur economic growth, *ceteris paribus*, increase income that will translate into poverty reduction.

The study will, first, specify the model, secondly, do a cointegration test and lastly run the regression. The essence of cointegration test is to ascertain whether or not a long-run relationship exists between public expenditure and poverty reduction, not only that but to also find out if public expenditure affects poverty rate in the long-run.

The model specification of the long-run relationship between public expenditure, corruption, and poverty reduction is given below;

$$\text{Poverty rate} = \text{public expenditure} + \text{corruption}$$

$$\text{Pov}_t = f(\text{Gex}, \text{Cor}) \quad (1)$$

The above equation (2) shows that poverty reduction is the function of Government expenditure and corruption, which can be explicitly described as; a change in poverty rate is brought about by a change in Government expenditure (on economic services (*Ees*) and social services (*Ess*)) and corruption (*Cor*).

From the neoclassical growth model by Solow (1956), extended by Feder (1982) and Mankiw et al. (1992) equation 1 can thus be transformed into a regression function as given below:

$$\ln \text{Pov}_t = \beta_0 + \beta_1 \ln \text{Ees}_t + \beta_2 \ln \text{Ess}_t + \beta_3 \ln \text{Cor}_t + \varepsilon_t \quad (2)$$

Where *Pov* is the poverty rate as the percentage of population below the official poverty line i.e. poverty ratio, β_0 is the constant term, *Ees* is government expenditures on the Economic sector (Agriculture, Construction, Transport & Communication, Other economic services) and *Ess* is government expenditure on social services sector (education, health and other social and community services), *Cor* is corruption perception index and ε_t is Error term

, β_1, β_2 and β_3 , are the coefficients of the explanatory variables

The expectation of this study is that public expenditure, corruption perception index will have negative impact on poverty rate. That is, an increase in government expenditure and corruption perception index will lead to a decline in poverty rate.

We shall use bounds test suggested by Pesaran *et al* (2001), the ARDL considering the time frame and the estimators from ARDL of the long-run coefficient are reliable even in small sample size. (Narayan, 2005) also provided some critical values of F-test for cointegration for samples of 30-80 observations. This was also adopted by (Habibullah, Din & Hamid, 2016), when they conducted a study on “Good governance and crime rates in Malaysia” when they used a short-time series of 13years from 1996-2009. Therefore, this study shall follow suit, since the data is also a short time-series of 21 annual observations from 1996-2016. To determine the long-run relationship between Public expenditure and Poverty reduction using ARDL Bound Tests.

Thus, the ARDL long-run equation model of poverty reduction as the dependent variable and public expenditure and corruption as independent variables is given below;

$$\Delta \ln Pov_t + \alpha_0 + \sum_{i=1}^p \alpha_1 \Delta \ln Pov_{t-1} + \sum_{i=0}^q \alpha_2 \Delta \ln Ees_{t-1} + \sum_{i=0}^q \alpha_3 \Delta \ln Ess_{t-1} + \sum_{i=0}^q \alpha_4 \Delta \ln Cor_{t-1} + \beta_1 \ln Pov_{t-1} + \beta_2 \ln Ees_{t-1} + \beta_3 \ln Ess_{t-1} + \beta_4 \ln Cor_{t-1} + \varepsilon_t \quad (3)$$

In equation 3 above, Δ is the difference operator, p and q are optimal lag length chosen, α_0 is constant term and ε_t is disturbance term. At that point we employ the method suggested by Pesaran et al. (2001), to test for bounds cointegration, which means testing for the existence of long run relationships amongst variables of interest. An F -test, which can be denoted as $F_{Pov}(Pov/Ees, Ess, Cor)$ is proposed. The null hypothesis for non-cointegration is $H_0: \beta_1 = \beta_2 = \beta_3 = \beta_4 = 0$ against the alternative hypothesis $H_a: \beta_1 \neq \beta_2 \neq \beta_3 \neq \beta_4 \neq 0$ which is rejection of the null hypothesis that cointegration between variables exists. Hence independent variables affect poverty.

The Value of F -statistics is compared with upper and lower critical values provided by Narayan (2005). If the F -statistics exceeds the upper critical value, we reject the null hypothesis and conclude that a long run relationships exists. If the F -statistics fall below the lower critical value, we fail to reject the null hypothesis of no cointegration and then we continue the estimation under the assumption that no log run relationship. The result is inconclusive if the F -statistics fall between the two bounds.

In the event that Poverty and government expenditure and other independent variables are cointegrated after estimating equation (3), the following ARDL equation will be estimated and modified to account for spurious effects as the ARDL-ECM:

$$\ln Pov_t = \theta_0 + \sum_{i=1}^p \theta_{1i} \ln Pov_{t-1} + \sum_{i=0}^q \theta_{2i} \ln Ees_{t-1} + \sum_{i=0}^q \theta_{3i} \ln Ess_{t-1} + \sum_{i=0}^q \theta_{31} \ln Cor_{t-1} + \varepsilon_t \quad (4)$$

The optimal lag length in equation (3) is selected based on Schwartz Bayesian Criterion (SBC) as suggested by Pesaran *et al.* (1996). If cointegration exists, we then specify an ARDL-ECM equation as follows:

$$\Delta \ln Pov_t = \gamma_0 + \sum_{i=1}^p \gamma_{1i} \Delta \ln Pov_{t-1} + \sum_{i=0}^q \gamma_{2i} \Delta \ln Ees_{t-1} + \sum_{i=0}^q \gamma_{3i} \Delta \ln Ess_{t-1} + \sum_{i=0}^q \gamma_{4i} \Delta \ln Cort - 1 + \lambda ECM_{t-1} + \mu_t \quad (5)$$

Where ECM_t is the error correction term define as

$$ECM_t = \ln Pov_t - \left[\theta_0 + \sum_{i=1}^p \theta_{1i} \ln Pov_{t-1} + \sum_{i=0}^q \theta_{2i} \ln Ees_{t-1} + \sum_{i=0}^q \theta_{3i} \ln Ess_{t-1} + \sum_{i=0}^q \theta_{4i} \ln Cor_{t-1} \right] \quad (6)$$

From equation (5), $\gamma_1, \gamma_2, \gamma_3, \gamma_4$ and γ_5 are short run dynamic coefficients of the model's convergence to equilibrium, λ is the speed of adjustment parameter and ECM is error correction term.

The short-run coefficients, $\alpha_1, \alpha_2, \alpha_3$, and α_4 denotes the ARDL long-run coefficients, while ε_t is an error term (pure white noise). ARDL models and its related ECM can be estimated by OLS method. This will also provide the basis for measuring the behaviour at the short-run and the speed at which it can be adjusted back to the steady position. It also tells us the percentage of any instability in the long-run relationship that can be corrected in the current period of time and whether or not and the extent of availability of in-built mechanisms in a system that return it to an equilibrium after a shock. Finally, robustness check shall be conducted to enable us to have a support for our conclusion.

4.0 Results and Findings

In this section, we shall present the result of the study. We shall start by describing the relationship between poverty, public expenditures and corruption in Nigeria for the period 1996 to 2016. Public expenditures are the expenditure on economic and social sectors, poverty is measured by poverty rate while corruption by corruption perception index.

Table 1: Descriptive Statistics of the Variables under study

	Poverty rate	Exp. On Economic Sector	Exp. On Social Sector	Corruption Perception index
1996	63.50	122.58	24.25	6.00
2016	70	519.01	861.12	25
Mean	64.20	488.49	424.31	20.12
Maximum	71.60	974.95	998.78	28
Minimum	53.46	122.58	24.25	6
Std. Dev	5.61	268.55	353.52	6.28
Skewness	-0.49	0.42	0.41	-0.58
Kurtosis	2.45	1.93	1.51	2.38
Jacque- Bera	1.13	1.61	2.47	1.54
P-value	0.56	0.44	0.29	0.46
%Δ bet 1996 and 2016	10.23	323.40	3451.01	316.67
Ave % Δ from 1996-2016	0.06	19.82	47.25	0.88

Source: Author's Computation from E-Views 10, 2018

The data presented in Table IV , shows that , poverty in Nigeria continued to increase between 1996 to 2016, reaching a high of 71.60% in 2009 and falling drastically to 52.46 in 2010, but averagely remaining at 64.20%. Expenditure on economic sector reached N998.78M in 2010 from N122.58M in 1996, but averagely stood at N488.49M. Expenditure on social sector reached its highest of N974.95M in 2013 from N24.25M in 1996, whereas corruption perception index reached its highest level of 28% in 2009 from 6% in 1996, but averaged at 20.12%. The table suggests that poverty was high in 2009 at 71.60% when corruption was also high at 28%, indicating a causal relationship as confirmed by the result of Pairwise Granger Causality tests that showed a bi-directional causality with the prob-value of 0.3824 and 0.6477

for the Null hypothesis: *Cor* does not granger cause *Pov* and *Pov* does not granger cause *Cor* respectively.

The Table 2. Correlational relationship among the variables

	<i>Pov</i>	<i>Ees</i>	<i>Ess</i>	<i>Cor</i>
<i>Pov</i>	1	0.21	0.25	0.34
<i>Ees</i>	0.21	1	0.77	0.81
<i>Ess</i>	0.25	0.77	1	0.86
<i>Cor</i>	0.34	0.81	0.86	1

Author's Computation from E-Views 10, 2018

Another interesting relationship shown in the above table is the high positive correlation that exists between *Ess* and *Ees*, which shows 81% and 86% percent relationship. More so, all other correlation values between poverty, *Ees* and *Ess* are positive, signifying that poverty increases even as public expenditure increases the correlation found between corruption and public expenditures is in tandem with (Ovat & Bassey, 2014) that established a positive relationship between corruption and public expenditure. In this case through bribing for budget to be passed by the executives and padding by the legislative arm.

For us to determine the long-run relationship, we employed ARDL Bound tests. It is applied where variables are stationary at $I(0)$ or $I(1)$ and none is $I(2)$. Though, the test for stationarity is not a necessary and sufficient condition for its use, but to avoid the inclusion of $I(2)$ in the model. However, Ouattara (2004), documents that ARDL estimators may not be valid for any data series generated by $I(2)$, because Pesaran et al. (2001) ARDL bounds tests is based on the assumption that variables are integrated of order (0) or (1). Thence, testing the level of stationarity is still necessary. For this purpose we employ the Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) unit root test to check the stationary process of the data series. ADF and PP tests results are presented in Table 3 below.

Table 3. Results of the Unit root test

Variable & Trend	ADF			PP
	Constant	Constant & Trend	Constant	Constant
Levels $I(0)$				
<i>Pov</i>	-3.919***	-4.088	-2.641	-2.705**
<i>Ees</i>	-1.652	-1.674	-1.652	-1.739
<i>Ess_t</i>	-3.142**	-1.652	-0.404	-1.849
<i>Cor</i>	-2.241	-3.245**	-2.254	-3.534*
First Difference $I(1)$				
<i>Pov</i>	-4.440**	-4.267**	-6.087**	-6.013**
<i>Ees</i>	-4.437**	-4.430**	-4.437**	-4.430**
<i>Ess</i>	-3.536**	-3.383*	-3.522**	-3.366*
<i>Cor</i>	-6.030**	-5.679**	-6.199**	-6.001***

Note: ***, ** and * denotes significant at 1%, 5% and 10% significance level, respectively. It is therefore obvious that all the variables are stationary at 5% levels and with restricted constant for both the ADF and PP unit root test.

It is evident from the above, that both the ADF and PP test results, agrees, all the data series are stationary at first difference and at 5 percent level of significance, more so with restricted constant and no trend. Importantly, none of the data series are I(2) or above. Therefore, we are justified for using the ARDL estimators, been that all the variables are integrated. Therefore, we may apply ARDL bounds testing procedures for establishing the long-run relationship between poverty, public expenditures and Corruption.

4.1 ARDL Bounds Test

In Table 4 below, it reveals the value of computed F-statistics as 4.6065, which is more than the upper bound value of Narayan (2005) critical value at 5 percent level of significance; this shows that there is a long-run cointegration relationship among Poverty and its determinants- *Ees*, *Ess* and *Cor*. Hence, we can reject the null hypothesis of No levels relationship and then proceed to estimate the long-run coefficients and short-run model.

Table 4. F-Statistics for testing presence of long-run cointegration

Model F-statistic

$$Pov = f(Ees, Ess, Cor) \quad 4.6065^{**}$$

(n= 21, k=3)

<u>Narayan (2005)</u>	<u>Critical Value</u>	<u>Lower Bound I(0)</u>	<u>Upper Bound I(10)</u>
	1%	4.614	5.966
	5%	3.272	4.306
	10%	2.676	3.586

Note: *, **, *** depicts 10%, 5% and 1% levels of significant, respectively. Critical values are extracted from Narayan (2005) (Table of Case II: restricted intercept and no trend at 5% level; pg. 27).

4.2 Determination of Lag Structure

In the table 5 below, lag 1 was selected by the entire selection criterion at 5% level of significance. This selection is done automatically which included 20 observations after adjustments. This gives us the ARDL (1, 1, 0, 1). Thus;

Table 5. Lag Order selection criteria

Lag	LR	FPE	AIC	SC	HQ
1	80.640*	1.66e+10*	34.843*	35.838*	35.037*
2	20.193	1.86e+10*	34.669*	36.459	34.972*
3	23.699	4.02e+09	31.944*	34.516*	32.299*
4	0.000	NA	-185.015	181.682	-184.683

Note: * indicates the lag structure selected by the criterion and each test at 5% level.

4.3 Long-run Coefficient

Table 6. Results for long-run coefficient

Dependent Variable: *lnPov*

Independent Variable	Coefficient	T-ratio [Prob]
C	12.80	0.660(0.520)
<i>Ees</i> (-1)	-0.036	-2.832(0.014)
<i>Ess</i>	-0.004	-0.559(0.585)
<i>Cor</i> (-1)	2.094	2.983 (0.010)

The above Table 6 explains the coefficients of long-run relationship between poverty rate, public expenditures and corruption. Our result shows that expenditures on the economic sector in the previous year and corruption in the previous year have significant impact on poverty, whereas, expenditure on social sector has no significant impact on poverty. This means that a 1 percent increase in expenditure on economic sector the previous year will bring about decrease in poverty by 0.03% in the current year. This is because spending on agriculture, construction, transport and communication in the current year only affect the poverty rate of the preceding year. Because the agricultural produce must be harvested, constructions, transportation and communication projects must be executed before it can impact on poverty through reduction in cost of farming, transportation of produce and as well participation in the construction work, which is in line (Fan, Hazell & Thorat, 2000), (Chemingui, 2007), (Fan & Xiaobo, 2008) Another reason is that, budget in Nigeria are always implemented late, in fact budget implementation always spills into the preceding financial year, hence the shift in the impact. On the other hand, expenditure on social sector-education and health does not impact on poverty reduction in Nigeria, which is contrary to the studies of (Fan, Xiaobo & Neetha, 2004), (Jha, Biswal, & Biswal, 2000) , (Ritwik & Joydeb, 2016), (Edeme,Nkalu, & Ifelunini, 2016) and (Marisa & Iturbe-Ormaetxe, 2018) .

The relationship between corruption and poverty is positive and highly significant than the impact of public expenditures on poverty which by implication means an increase in corruption perception index increases. Our result shows a negative relationship between poverty and public expenditure, but it is only the aspect of expenditure on economic sector -Agriculture, construction, transport and communication- in the previous year that has a significant impact on poverty reduction. This is because spending on agriculture, construction, transport and communication in the current year only affect the poverty rate of the preceding year. Because the agricultural produce must be harvested, constructions, transportation and communication projects must be executed before it can impact on poverty through reduction in cost of farming, transportation of produce and as well participation in the construction work, which is in line (Fan, Hazell & Thorat, 2000), (Chemingui, 2007), (Fan & Xiaobo, 2008). Another reason is that, budget in Nigeria are always implemented late, in fact budget implementation always spills into the preceding financial year, hence the shift in the impact. On the other hand, expenditure on social sector-education and health does not impact on poverty reduction in

Nigeria, which contrary to the studies of (Fan, Xiaobo & Neetha, 2004), (Jha, Biswal, & Biswal, 2000), (Ritwik & Joydeb, 2016), (Edeme, Nkalu, & Ifelunini, 2016) and (Marisa & Iturbe-Ormaetxe, 2018). The relationship between corruption and poverty is positive and highly significant, which by implication means an increase in corruption perception index leads to increase in poverty. This means that a 1 percent increase in CPI (decrease in corruption) will lead to fall in poverty rate by 209 percent (Note: increase CPI, means reduction in corruption, because of the scaling; 0-most corrupt and 100-most clean).

Short-run Coefficient

Table 7: Results for short-run coefficient and Error correction model

Dependent Variable: $\ln Pov$

Independent Variable	Coefficient	T-ratio [Prob]
C	12.801	0.660(0.520)
$\ln Ees$	-0.085	-2.739(0.016) **
$\ln Cor$	1275	4.570(0.000) ***
ECM_{t-1}	-0.564	-5.488 (0.000) ***

Note: ***, ** depicts 1% and 5% level of significance respectively.

Table 7 above reports the short-run relationship between poverty, public expenditure and corruption with their error correction adjustment. It revealed that expenditure on economic sector has a negatively significant relationship with poverty at 5%, while a positively significant relationship with corruption at short run, which is the same to the long-run impact as revealed above. One of the important outcomes of this short run dynamics is the lagged error correction coefficients, ECM_{t-1} which is correct in sign and as well significant at 1 percent, confirming the established co-integration among the variables. The coefficient of ECM_{t-1} shows the speed of adjustment back to the long-run equilibrium after a short run shock. In this case ECM_{t-1} is -0.564. This implies, the disequilibria of the previous year's shock will adjust back to the long run equilibrium in the current year at the speed of 56 percent.

Diagnostic test

Table 8. Results of the Diagnostic test

Test statistics	T-ratio [Prob]
Serial Correlation	0.6975 (0.3245)
Heteroskedasticity	2.172 (0.124)
Normality	(0.578)
Functional form	
CUSUM SQ Test	Stable

The LM test result of serial correlation, indicate that the residuals are not serially correlated, since the p-values (0.324) is greater than 0.05. While the test of Heteroskedasticity, also shows that the residuals are Homoscedastic, because the p-value (0.124) is also more than 0.05. The



variables are also normally distributed, as confirmed by the p-value (0.578) which is greater than 0.05. All these tests are done at 5% level of significance.

5.0 Conclusion

This study investigated the existence of long-run relationship between public expenditure and poverty in Nigeria at the same time ascertains whether corruption “greases or sands the wheels” of public expenditure to reduce poverty. We considered public expenditures-on economic sector and social sector; and poverty rate as a measure of poverty and corruption perception index as a measure of corruption. ARDL approach was employed to examine this relationship, which is more appropriate for studies with small sample size. Based on the findings, we may be tempted to draw an inference that corruption is highly significant in determining the rate of poverty in Nigeria. With the high rate of poverty in the country, it is obvious that corruption was responsible for that through; embezzlement and diversion of funds meant for pro-poor programmes, awarding contract to unqualified companies because of nepotism, collecting kickbacks and percentage of the sum to compromise standard. These findings therefore revealed corruption to have “sands the wheels of public expenditure on reducing poverty” as the expenditures made does not impact on reducing poverty. This is in line with findings of (Méon & Sekkat, 2005).

We recommend for the strengthening of institutions and anti-graft agencies; increase public/civil servants' salaries; present positive award to the honest, dedicated, transparent and accountable public officers in charge of contract award, public procurement, implementation and supervision of projects, while negative rewards be giving to the defaulters.

It's clear from the table and figure above, that from when transparency international came into existence, the index has been increasing from 6 in 1996 to 25 in 2016 (still below 30), an indication of corruption persistence due inconsistency fighting the menace, which translates into a deprivation of the citizenry from having public facilities, by and large, increased the level of poverty. Some studies conducted in this area ((Aluko, 2009); (Ikubaje, 2014); (Duru, 2012); (Dukku, 2012)) examined the role played by domestically designed policies by the government to curb this menace of corruption, especially the successes and failures recorded. Concluded that, all efforts made by the government has failed as it did not address the issue of corruption that affects lives of the general public, one of which is poverty.

It has, therefore, become a matter of necessity for the government to increase its expenditures on education, health, institutions (for fighting corruption and ensuring political instability) etc., to ensure a successful reduction in poverty.

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