Impact of Official Development Assistance on the Quality of Economic Sectors in Nigeria

*[1]Oladipo, Olajide. S., Ukeje Marie C., Yusuf Wasiu. A.
Department of Economics, Nile University of Nigeria, Abuja FCT

Abstract : Official statistics reveals that large swings have remained a consistent trend in official development Assistance in Nigeria but its influence on economic development is yet to be fully investigated. The study adopted an ex post facto research design, with the data covering all the sectors of the economy and spanning 2000-2020; a period of 21 years. A dynamic Panel ARDL estimation technique is preferred for the analysis given by Pesaran and Shin (2003). The Hausman test indicated preference to Pool Mean Group (PMG) estimator to determine possible homogenous effect. The findings revealed that development assistance improves the overall economic growth by 0.014 percent and 0.076 percent in the long-run and short-run respectively. However, in the health sector, there is an indication of 0.276 percent increase in economic growth as result of official development assistance while the educational sector experienced 0.71percent all things being equal. It is therefore recommended that the health and educational ministries should be transparent enough to boost confidence of donors.

Keywords: Economic growth, Hausman test, Heterogeneous Short-run estimation, Official development assistance, Panel ARDL.

Introduction

Development assistance refers to international development assistance (IDA). IDA monies are awarded to recipient nations based on their income levels, track record of success in managing their economies, and the number of continuing IDA programmes in their respective countries. The loan conditions of the International Development Association (IDA) are very favourable, meaning that IDA credits bear free or very low interest costs. The financing conditions are decided by taking into consideration the risk of debt distress faced by the recipient countries, the level of GNI per capita, and the

creditworthiness of the recipient countries in relation to borrowing from the International Bank for Reconstruction and Development (IBRD). Grants account for 100 percent of the financial support provided to recipients at high risk of debt distress, while grants account for 50 percent of the financial assistance provided to recipients at medium risk of debt distress. Other beneficiaries, such as Nigeria, get IDA credits on regular or mix terms, as well as hard terms, with maturities ranging from 38 years to 25 years, respectively. A total of $16.2 billion (including IDA guarantees) in IDA commitments were made during the fiscal year 2016 (which concluded on June 30, 2016), with 12 percent of the amount being committed on grant conditions. In fiscal year 2016, a total of 161 new operations were committed. Since 1960, the International Development Association (IDA) has donated $328 billion to 112 nations. Annual pledges have climbed significantly over the previous three years, averaging around $19 billion on average.

Consequently, foreign aid, has historically driven economic development in Sub-Saharan Africa (SSA). Official Development Assistance (ODA) is expected to meet the following criteria, according to the Organization for Economic Cooperation and Development (OECD): (a) be sourced from a government agency, (b) have as its major goal the improvement of economic and social well-being, and (c) contain a "grant element" of at least 25%. (Rudel, 2005). As a result, official development assistance has remained an important source of funding for government programs, limiting debt reliance and maintaining fiscal stability. Official Development Assistance (ODA) is a type of assistance provided by the United Nations to countries identified as developing economies in need of assistance in areas such as water supply, education, health, sanitation, security, and transportation, among others, with the goal of improving the recipient countries' human development and enhancing sustainable economic growth (Kolawole, 2013;Fasanya &Onakoya, 2012; Maria &Ezenekwe, 2015;Yiew & Lau, 2018; Fashina, Asalaye, Ogunjobi&Lawal, 2018).

Sub-Saharan African nations got an estimated 40% of worldwide government development assistance in the last thirty years, followed by South and Central Asian countries, which received 20.7 percent (OECD, 2016). Similarly, from 1980 to 1990, 1991 to 2000, and 2001 to 2015, West African countries got 26%, 25%, and 28% of Africa's total government development assistance, respectively (OECD, 2016). It is essential to note that Nigeria dominates the sub-region of the Economic Community of West African States in terms of development assistance receipt. In 1988, net official development assistance was worth US$118.1 million while in 2010, it was worth US$2.1 billion. In 2005 and 2006, the value fluctuated between US$6.4 billion and US$11.4 billion. This is most likely due to the Paris Club of creditors forgiving the country's debt.

Nigeria ranked one among the top ten aid recipients in Africa. On the average, net Official Development Assistance (ODA) from all donors received in Nigeria grew from US$ 301 million in the period 1970-97 to US$ 2162 million in 2010-16. In 48 years, period (1970-2016), 4.5 per cent share of ODA from all donors came to Nigeria. Commitment to the social sector was US$ 1947 million in the period 2016. Using social indicator of education, Nigeria ranked fifth among the top ten ODA recipients in Africa in 2016. The total commitment of US$ 209 million was made to education. In the health sector, the country ranked first, with a total of US$ 935 million received in the same period.Despite this massive aid, there are growing worries about the health and education indices of human capital development. Adult literacy, as a measure of education, revealed a 53.8 percent literacy rate on average from 1991 to 2008. This equates to a staggering illiteracy rate of more than 40% in a country that receives some of Africa's largest education ODA. Similarly, the fact that school enrolment has increased over time, basic enrolment in primary education has a net value of roughly 63 percent, with a record of 10.5 million children out of school. Access to basic health facilities like the Primary Health Care Facilities (PHF) remained a daunting challenge with long-term foreign finance in the country.

A brief examination of Official Development Assistance statistics reveals that large swings have remained a consistent trend in official development Assistance in Nigeria, particularly between 2010 and 2017 (Ayomitunde, Ololade, Moses, and Babatunde (2019)). Despite the huge amount of foreign aid given to Nigeria, research indicated that boosting official development Assistance as a tool for encouraging economic growth and development is still lacking in empirical generality.

Some scholars,Agunbiade and Mohammed (2018) had submitted that the impact of Official Development Assistance on economic growth would be felt at an early stage up to an optimal point, after which any additional aid would only have a negative impact on growth due to overdependence on official development Assistance, poor management of inherited resources, and a disregard for inherent abilities. They then concluded that official development assistance is insufficient to promote economic growth unless it is accompanied with solid policy and effective economic management. Therefore, given the contradictory findings and debates in the literature, it is critical to establish a link between development assistance and economic growth on Nigeria's education and health sectors.

Empirical Literature

A large number of empirical studies on the aid-economic growth nexus have attempted to determine whether aid inflows to developing countries achieve the core objective of

promoting economic development and the welfare of the people living in these countries. The outcomes of these studies show a large disparity in findings; Moreira, (2005) conducted a microeconomic level study, usingcost-benefit analyses, wherein the study concluded that foreign assistance has a growth-enhancing effect. Conversely, another study conducted at macroeconomic level and based on cross-country regressions by Mosley and Abrar (2006) utilized "micro-macro paradox" to describe the seeming conflict in the link between assistance and economic development. It has been suggested that the apparent contradiction in the aid-growth relationship is due to a number of factors, including poor data quality, poor econometric technique, inadequate model specification and, more importantly, relatively short data periods, all of which have an adverse effect on the reliability of the results (Boone, 1996). Consequently, a few of these studies are briefly discussed here.

Ayomitunde, Ololade, Moses and Babatunde (2019), examined the relationship between official development assistance and poverty alleviation in Nigeria. The major findings in this study are as follows. There is a significant negative relationship between official development assistance and household consumption per capita in Nigeria. This implies that official development assistance has no sufficient capacity to alleviate the current worrisome level of poverty in this country. Also, George, Ayomitunde, Grace, and John (2020), examine the long run equilibrium relationship between official development assistance and poverty alleviation in Nigeria over the period of 1981 to 2017, the study utilized data from UNCTAD, World Bank database, CBN Statistical Bulletin, using Cointegration, OLS and Granger Causality approach.The major findingindicates a significant negative relationship between official development assistance and poverty level in Nigeria. Although, FDI which also constitutes a strategic part of foreign capital imported into Nigeria does not contribute to poverty alleviation in Nigeria. However, official development assistance and poverty level have bidirectional feedback. Therefore, Nigerian government should be committed to the provision of a sound environment and good governance that can facilitate prudent usage of inflows of official development assistance especially on projects and programs that have trickle down effects on the poor masses in the country.

N'dri-Kan (2017) examined the nexus between official development assistance and poverty alleviation in ECOWAS countries with the application of panel data between1980 and 2014. The results from the study indicated that that ODA contributed to poverty alleviation in the region. But, its impact on economic growth was inimical. As a result of this, the author submitted that ODA is pro-poor, which is not growth enhancing in ECOWAS sub region. In another perspective, Askarov (2015) employed the technique of

instrumental variables to establish that aid has a direct impact on economic growth in emerging economies.

Arndt, Jones and Tarp. (2011) utilized the LIML point estimates to submit that a sustained inflow of 25 USD aid per capita is supposed to improve growth rate by around 50 percentage point on average, at the same time alleviate poverty by around 6.5 percentage points, gear up investment by around 1.5 percentage points in GDP, increase average schooling by 0.4 years, increase life expectancy by 1.3 years and bring about reduction in infant mortality by 7 in every 1000 births. While examining the effectiveness of aid on poverty reduction. Feeny (2013) elaborated the impact of foreign aid on poverty and human well-being in the Papua New Guinea. He said that the allocation of foreign aid to Papua New Guinea has been broadly consistent with the strategy to effectively reduce poverty and develop human well-being.

Collier and Dollar (2002) used regression analysis to prove that the impact of aid on poverty is a function of its impact on per capita income growth. It was confirmed that the aid leads to economic growth, which eventually reduces poverty. Ali, Nishat and Anwar (2010) utilized the LIML point estimates to submit that a sustained inflow of 25 USD aid per capita is supposed to improve growth rate by around 50 percentage point on average At the same time, it also alleviates poverty by around 6.5 percentage points, gear up investment by around 1.5 percentage points in GDP, increase average schooling by 0.4 years and increase life expectancy by 1.3 years and bring about reduction in infant. However, Jide, Ibietan, Felix and Ese (2014) submitted that despite the high flows of ODA in Nigeria on annual basis yet there is little or no impact on poverty alleviation in Nigeria. Nyirenda and Mbelle (2023) examined the impact of foreign aid on economic growth of Tanzania and their results indicated that foreign aid has not been very much successful in poverty reduction.

Ologbenla (2021) examined the effect of fiscal policy shocks on foreign aids and its overall effect on the economy of Nigeria between 1980 and 2019. The results showed that foreign aids in Nigeria are more responsive to external shocks (oil price and exchange rate) than the fiscal policy shocks. Both oil price shock and government revenue shocks are significant in determining the behaviour of the GDP. However, government revenue and expenditure shocks fail to have a commensurate positive effect that the oil price has on them and the GDP. It was recommended that Nigerian government should embark on more effective utilisation of foreign aid while embracing economic diversification to reduce reliance on oil.

Obiora, Nwanolue,and Okeke. (2022). examine how the policy framework governing foreign aids inflow into Nigeria sustained her poverty alleviation efforts from 2010 to

2020. Anchored on the Aid Conditional Theory, the study found out that the policy framework governing foreign aids' inflow into the country did not sustain poverty alleviation from 2010-2020 as it is not definitive and lacked robust and procedural details relating to tracking and utilization of aids inflow. In view of the finding, the study recommended that there is need to strengthen Nigeria's foreign aids policy framework through appropriate legislation for a better outcome.

Methods

The study employed Panel Data for six different sectors of the Nigeria economy from 2000 to 2020. Data were sourcedfrom World Bank Development Indicators (WDI) and UNCTAD Conference on Trade and Development. It also adopted data from International Financial Reports, the International Monetary Fund (IFS, IMF). The central bank of Nigeria which is the major source of sectorial economic development has categorised the economic sectors into six different sectors, namely; Agriculture, Construction, Industry, Trade, Education and Health. This study containsdata from these sectors in a panel format.

The basic Solow model has been updated in empirical applications such as (Mankiw et al. 1992) to achieve the enhanced Solow growth model, wherein the rate of income growth depends not only on technological transition, labour and capital but also on policy variables such as exchange rates. This study also draws insight from models (Akinloand Odusola2003), (Ogun and Alege 2005) and extended the model to include such vital explanatory variable. As such, the linear model for estimation in this study is as follows;

$$\Delta y_{it} = \theta_0 + \theta_1 DA_t + \theta_1 GCF_t + \theta_2 LFR_t + \theta_3 OPN_t + \mu_{it}3 \quad (1)$$

Δy_{it} stand for the real GDP per capita growth for the country, i at time t.

DA_t represents development assistance for the country, i at time t

GCF_t represents capital stock for the country, i at time t

LFR_t stand for the labour force as a percentage of the population for country i at time t.

OPN_t represents trade openness for country i at time t. Trade openness is taken as $\frac{export+import}{real\ GDP}$

Taking the logarithm of both sides gives the equation below;

$$ln\Delta y_{it} = \theta_0 + \theta_1 DA_t + \theta_1 lnGCF_t + \theta_2 lnLFR_t + \theta_3 lnOPN_t + \mu_{it}3 \quad (2)$$

Equation 2, was therefore estimated with appropriate estimation technique and the choice of technique was logically to avoid biases during estimation.

Real GDP per capita is used to measure the degree of economic success as it provides an indicator of the amount of a citizen's income, which will increase as the economy is doing well. Use real GDP per capita would focus on the actual impact on the wellbeing of the population which is of greater interest to the economist.

Official development assistance as government aid that promotes and specifically targets the economic development and welfare of developing countries. The DAC adopted ODA as the “gold standard” of foreign aid in 1969 and it remains the main source of financing for development aid.

Capital Stock (CS) is a proxy to the formation of gross capita. The higher the domestic investment rate, the faster the rate of economic growth will be given that investment increases capital stock and ultimately boosts aggregate demand. In other words, increased investment will have a positive effect on the nation's economic development and a substantial impact on the citizen's wellbeing by working simultaneously on the commodity market and the capital market.

The Degree of Trade Openness (OPN) is proxy using the ratio of the volume of trade to GDP (Export +Import/GDP). The a priori expectation, ceteris paribus, is that the greater the degree of trade openness, the greater the growth. The nation is exposed to external influence through trade. Trade has been a rationale for contributing to economic growth and improving citizens' welfare. Firstly, exports help generate revenue and increase the nation's foreign reserve which in effect helps to support the country's external debt. Second, the utility of the population could be satisfied by importation which products and services are not produced in the country. The importing country may also import technical know-how which is especially limited in developing nations such as Nigeria.

Throughout the time frame, the Labour Force denoted as (LF) captured the population growth rate. Originally, the labour force is a source of growth in that labour production is counted in the gross domestic product of the country. Labour force is, therefore, an important driver of economic growth, especially with balanced and advantageous demographics. Labour supply has been important and indispensable in developed and developing countries, even as technology is replacing some of the jobs which were initially done manually.

A dynamic estimation technique of panel ARDL was chosen. This technique requires that all variables be stationary at the level or first difference, dependent and independent. As such it adoptedIm, Pesaran and Shin (2003) unit root test choice for panel data, popularly known as Im-Pesaran-Shin (IPS) unit-root test panel. Therefore, this approach calls for all variables to be stationary, contingent and autonomous at the stage or first discrepancy.

The panel ARDL estimation technique is dynamic as it takes into account both the lag of dependent variable and the independent variables. Thus, the panel estimate portrayed the true impact of digitization on economic growth as the digital application requires lagged acclimatization time to acclimatize to new processes, thus it will take some time to replicate its impact on economic improvement.

The application of panel ARDL is however anchored on two separate schools of thought by estimator preference. On the one hand, Pesaran and Smith (1995) suggested using the Mean Group (MG) estimator to eliminate bias due to heterogeneous slopes in dynamic panels while estimating the short- and long-run variables coefficients. The MG estimator offers accurate estimates of the average of the long-term coefficients but with slope homogeneity, it will be inefficient. Pesaran et al. (1999, 2001), on the other hand, endorses a more efficient estimator for long-run coefficients which assumes the homogeneity of and variable in the panel; a Pooled Mean Group (PMG) estimator. This school of thought is of the opinion that the use of PMG estimator will allow the short-run parameters to be heterogeneous while the long-run parameters remain homogenous.

However, the problem of choice between the two estimators is often confronted by researchers. The Hausman (1978) test was performed in this study to determine which estimator is most suitable for the panel. As such, it is determined the null hypothesis (H_o) that the estimates of MG and PMG are not significantly different; therefore, the PMG is more effective. The baseline will be to reject the null hypothesis if the p-value is less than 0.05.

Usually, the panel ARDL (p, q, q..., q) model is demonstrated thus;

$$y_{it} = \sum_{j=1}^{p} \delta_{ij} y_{i,t-j} + \sum_{j=0}^{q} \beta_{ij} X_{i,t-j} + \gamma_i + \varepsilon_{it} \qquad (3)$$

Where y_{it} is the dependent variable, $(X'_{it})'$ is M*1 vector that is stationary at a level or first difference; δ_{ij} represents the coefficient of the lagged dependent variable to be estimated; β_{ij} is M*1 coefficient vectors; γ_i stands for fixed effects such that; i=1,...,N; t=1,2,...,T; p, q are optimal lag orders to be determined by estimating the unrestricted model; ε_{it} represent the white noise.

The re-parameterized panel ARDL (p, q, q..., q) error correction model for this paper is represented as follows with all variables are in natural logarithm;

$$\Delta lnGRT_{it} = \theta_i\left[lnGRT_{i,t-1} - \phi'_i(lnDA_t + lnGCF_t + lnLFR_t + lnOPN_t)\right] + \sum_{j=1}^{p-1} \lambda_{ij} \Delta lnGRT_{i,t-j} + \sum_{j=0}^{q-1} \varphi'_{ij} \Delta lnDA_{t-j} + \sum_{j=0}^{q-1} \varphi'_{ij} \Delta lnGCF_{t-j} + \sum_{j=0}^{q-1} \varphi'_{ij} \Delta lnLFR_{t-j} + \sum_{j=0}^{q-1} \varphi'_{ij} \Delta lnOPN_{t-j} + \alpha_i + \varepsilon_{it} \qquad (4)$$

Notes:θ_i = coefficient for speed of adjustment to equilibrium which is expected to be less than 0.

ϕ_i' = Coefficients of long-run relationships

$ECT = \left[lnGRT_{i,t-1} - \phi_i'(lnDA_t + lnGCF_t + lnLFR_t + lnOPN_t)\right]$ represent the error correction term to be estimated.

λ_{ij}, φ_{ij}' represent the short-run dynamic coefficients.

RESULTS

Thestudy implements a panel Autoregressive-Distributed Lag (Panel ARDL) model for co-integration to establish both the short-and long-run effects of the independent variables on the dependent variable (real growth rate).

Summary Statistic and Correlation

Table 1 Summary Statistics and Correlation

Panel A Summary Statistics

Variable	Observation	Mean	Std. Dev.	Min	Max
$GRT_{i,t}$	126	5.854168	7.394634	-9.41915	55.57805
$lnDA_t$	126	10.8293	11.88042	0.00065	36
$lnGCF_t$	126	24.98934	8.583188	14.90391	40.61495
$lnLFR_t$	126	58.1314	2.847654	52.907	60.539
$lnOPN_t$	126	0.33579	0.078408	0.170109	0.4405

Panel B Correlation

Variables	GRT	DA	GCF	LFR	OPN
$GRT_{i,t}$	1				
$lnDA_t$	-0.2321	1			
$lnGCF_t$	-0.0269	-0.4703	1		
$lnLFR_t$	0.2759	-0.5315	0.4467	1	
$lnOPN_t$	0.1683	-0.3911	0.4724	0.4514	1

Source: Author's Computation 2022 using Eviews version 10

From table 1 the mean for economic growth (GRT), development assistance (DA), gross capital formation (GCF), Labour Force Rate (LFR) and trade openness (OPN) are 5.854168, 10.8293, 24.98934, 58.1314 and 0.33579 respectively.Maximum and Minimum is the highest and lowest values of the series for the period under study. The table above indicates that the maximum values for economic growth (GRT), development assistance (DA), gross capital formation (GCF), Labour Force Rate (LFR) and trade openness (OPN) during the period under study are 55.57805, 36, 40.61495, 60.539 and 0.4405 respectively while the minimum values of economic growth (GRT), development assistance (DA),, gross capital formation (GCF), Labour Force Rate (LFR) and trade openness (OPN) are -9.41915, 0.00065, 14.90391, 52.907 and 0.170109 respectively.

Standard Deviation is a measure of spread or dispersion in the series. From the table 4.1, the standard deviation for economic growth (GRT), development assistance (DA), gross capital formation (GCF), Labour Force Rate (LFR) and trade openness (OPN) are 7.394634, 11.88042, 8.583188, 2.847654 and 0.078408 respectively. This shows that the development assistance had a large spread over the period under study while the trade openness has comparatively a minimal spread.

Panel B of Table 4.1 displays the correlation coefficient for the variables used. The estimated correlation coefficient reports that none of the variables is highly correlated with each other, hence, the model is expected to have no multicollinearity issues when estimated. In other words, researchers have reasoned that when variables are correlated and estimated in the same regression there is likely to be multicollinearity issues and as such, to rescue such a situation, it is advisable to independently estimate correlated variables (Azu and Muhammad, 2020). The situation from estimated correlation does not warrant such a scenario rather all the variables can be estimated at once.

Stationarity Test and Lag Selection Criteria

The unit root results presented in Table 2 are the IPS test proposed by Im et al. (2003) for the panel unit root test, it is chosen because of its widely used and its output is robust. It also viewed as most appropriate for both balanced and unbalanced data. The panel stationarity test results show that the variables are stationary at either first difference or level. The real growth and development assistance (DA) are stationary at the level and statistically significant at one percent,while gross capital formation, labour force and trade openness are stationary at the first difference. This attests to the suitability of the variables for estimation with the panel ARDL technique.

Estimating equation with the ARDL model; panel or time series, the lag selection is very critical and indispensable. According to (Bahmani-Oskooee and Nasir, 2004) and (Baek,

2014), the lag selection is very sensitive because the result of the F-statistic could be affected in case of time series which could also affect the outcome of the error correction term (in both time series and panel application). Therefore, the study estimated the unrestricted model for panel ARDL to decide the choice of lags for each sector per variable. As always the casewith lag order selection criteria, the most occurring lags was chosen and used for the estimation. The most common lag reflects that lag selection for all variables is (1, 2, 0, 2, 2) The summary of lag selection is posted in Table 3.

Table 2 Unit Root Test (IPS)					
	Level		1st Difference		Remark
Variable	Constant	Trend	Constant	Trend	
$GRT_{i,t}$	-2.3716***	-0.9793	-8.2273***	-7.1067***	I0
$lnDA_t$	-2.5413***	4.7001	-2.8046***	-3.8788***	I0
$lnGCF_t$	0.4301	4.3947	-3.2408***	-2.6069***	I1
$lnLFR_t$	2.5521	0.6509	-3.0077***	-2.1547**	I1
$lnOPN_t$	-0.4636	-1.4572*	-7.9341***	-6.3488***	I1
Note: Numbers in the display are t-statistics generated with lag 1. *** p<0.01, ** p<0.05, * p<0.1; Null hypothesis (H_0): the panel has a unit root. Constant-constant only & Trend-constant and Trend					

Table 3: Table of Lags					
Country/Variables	$GRT_{i,t}$	$lnIPR_t$	$lnGCF_t$	$lnLFR_t$	$lnOPEN_t$
AGRICULTURE	1	1	0	0	0
INDUSTRY	1	0	0	0	1
CONSTRUCTION	1	2	1	2	2
TRADE	1	2	1	2	2
HEALTH	2	1	0	2	1
EDUCATION	2	2	0	1	2
Common Lags	1	2	0	2	2

Cointegration and the Long-Run Relationship

The establishment of a long-run relationship for this study followed the assumptions and criteria of Banerjee et al (1998) which proposed that models must satisfy the long-run relationship with negative and statistically significant error correction terms (ECT). The $ECT_{.}$ fully satisfies the stated criteria with reported negative ECT of -0.938 for overall

model and it's significant at one percent. The coefficient of *ECT* in the model indicates the speed of error correction. The negative value of *ECT* is bonded between -1 and 0. Following Sovbetov (2018) and Sovbetov and Saka (2018), this implies that there is no serial error correction and instability problem caused by a structural break in the data. The magnitude of *ECT* is /0.938/ in the model shows that the previous period's disequilibrium of the models is correct at a speed of 93.8 percent annually. This, indeed, reveals a very high convergence rate which entails a strong cointegration in the panel.

Table 4 Pedroni'sCointegration Tests		
Test Stats.	Panel	Group
V	0.3898	.
Rho	-4.842	-3.731
T	-6.267	-7.756
ADF	-4.593	-5.885
No. of Panel units: 5; Regressors: 4 No. of obs.: 125; Avg obs. per unit: 25 Sources: Author's Computation		

In PMG estimation, short-run results can be estimated for individual sectors of the economy as captured in this study which also determines the coefficient of ECT for these different sectors. The results were consistent with the outcome of the overall estimation. In the Agricultural sector *ECT* is -0.946 while Industry, Construction, Trade, Health and Educational sectors report *ECT* of -0.875, -.996, -0.913, -0.674 and -0.758 respectively. All the results are statistically significant at one percent. As earlier indicated, these *ECT* values represent the speed of error correction which are negative and bonded between -1 and 0. Therefore in line with (Sovbetov, 2018) and (Sovbetov and Saka, 2018), these imply there are no serial error correction and instability problems caused by a structural break in the respective country data. The outcome was reflected when estimating the individual stability tests.

In another attempt to confirm the existence of cointegration in the model, the study also employed Pedroni'scointegration tests which also confirmed the existence of cointegration. First, rho statistics reports negative statistics for both panel (-4.842) and group (-3.731) which is also affirmed by t-statistics which reports negative statistics for both panel (-6.267) and group (-7.756). on the other hand, ADF statistic is also consistent with the other two statistics with negative statistics for both panel (-4.593) and group (-5.885) respectively (See table 4).

Estimated Long-and Short-Run Coefficients

The data is made up of a panel of six sectors on the Nigerian economy and the Hausman test favoured the use of PMG estimator which permits for the homogeneity of the long-run estimation but still allows short-run estimation for respective individual members of the panel. Collectively, real economic growth is positively influenced by the increasing development assistance (DA) in Nigeria, which is in line with expectations. From Table 5, the long-run coefficient for development assistance (DA) is 1.410 which is statistically significant at one per cent. This implies that in the long-run, as development assistance (DA) increases by one per cent, economic growth will tend to increase by 0.014 percent, all things being equal. The short-run result is also consistent with the outcome of the long-run. The estimation reports a homogenous coefficient of 7.619, which is statistically significant at one percent; which implies that in the short run, the overall economic growth of Nigeria is being positively influenced by development assistance (DA) by about 0.076 percent, all thing being equal. In other words, as the development assistance (DA) increases by one percent, economic growth is increasing by 0.076 per cent, ceteris paribus. The closeness of the short-run impact on the long-run impact (positive and statistically significant at one percent) is expected because of the high convergence rate. Thus, the third hypothesisH_{O3}: **There is no significant difference in impact of official development assistance in the educational and health sector of the Nigerian economy** is hereby rejected.

Table 5 PMG Homogeneous Long-and Short Run Estimation			
Long Run		Short Run	
VARIABLES	INC	VARIABLES	INC
		ECT	-0.938***
			(0.165)
$l2.lnDA_t$	1.410***	$D.lnDA_t$	7.619***
	(0.248)		(2.716)
$lnGCF_t$	1.882	$D.lnGCF_t$	3.759
	(2.465)		(3.979)
$l2.lnLFR_t$	62.42***	$D.lnLFR_t$	122.9***
	(13.82)		(44.06)
$l2.lnOPN_t$	6.444***	$D.lnOPN_t$	0.225
	(2.493)		(6.645)
		Constant	-282.6***
			(39.89)
Observations	120		120

Country FE	YES		YES
Year FE	YES		YES
Standard errors in parentheses*** p<0.01, ** p<0.05, * p<0.1 Source: Authors' computation			

Individually, each sector of the Nigerian economy experiences a similar response to the overall effect of the development assistance on economic growth. They are all positive and statistically significant except for industry and construction which reports a positive coefficient but not statistically significant. However, the effect is higher in the Agricultural sector than any other selected sectors of the economy. In the agricultural sector, the coefficient is 16.74 and statistically significant at one per cent which is higher than what is obtainable in the trade, with a coefficient of 9.152 and statistically significant at five per cent. Education has a Coefficient of 7.067 and statistically significant at one per cent while Health has a coefficient of 2.761 and statistically significant at five percent. Industry and construction reported coefficients of 4.892 and 0.251 but are not statistically significant. This implies that development assistance motivates economic growth mostly in the Agricultural sector, trade sector, health and educational sector by 0.167 per cent, 0.092 per cent, 0.276 per cent and 0.071 per cent respectively, all things being equal.

Table 6 PMG Heterogeneous Short Run Estimation

	(1)	(2)	(3)	(4)	(5)	(5)
VARIABLES	Agriculture	Industry	Construction	Trade	Health	Education
ECT	-0.946***	-0.875***	-.996***	-0.913***	-0.674***	-0.758***
	(0.178)	(0.185)	(0.221)	(0.208)	(0.135)	(0.214)
$\boldsymbol{D.lnDA_t}$	**16.74*** **	**4.892**	**0.251**	**9.152** **	**2.761** **	**7.067*** **
	(5.583)	**(4.002)**	**(2.991)**	**(4.320)**	**(3.221)**	**(1.954)**
$D.lnGCF_t$	-1.195	18.89*	3.839	-3.673	19.09*	0.934
	(16.47)	(10.18)	(8.627)	(12.04)	(11.14)	(5.187)
$D.lnLFR_t$	156.6	20.62	58.06	105.6	47.67	273.7***
	(161.2)	(104.1)	(89.78)	(129.5)	(144.3)	(70.65)
$D.lnOPN_t$	-20.20*	19.84***	-1.463	7.605	16.89***	-4.658
	(10.91)	(6.504)	(6.066)	(7.883)	(4.874)	(3.217)
Constant	-238.4***	-220.3***	-293.6***	-227.0***	-232.6***	-433.6***
	(69.14)	(70.89)	(88.53)	(74.55)	(79.48)	(97.41)

Observations	120	120	120	120	120	120
Country FE	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES
Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1 Source: Authors' computation						

Specifically, in the educational sector, there is an indication that development assistance has a homogenous impact in the long-run which has been determined by long-run results. While also possessing homogenous effect in the short-run, there is also a heterogenous effect which was determined by the estimator. The short-run homogenous effect is reported with a coefficient of 7.619 and statistically significant at one percent. From Table 6, the heterogenous effect is reported with a coefficient of 7.067 and statistically significant at one per cent. In other words, an increase in development assistance will boast the economy of the educational sector by 0.71 per cent all things being equal. Therefore, the first hypothesis H_{O1}: **Official development assistance have no significant effect on the growth of educational sector of the Nigeria Economy** is hereby rejected.

Similarly, in the health sector, the heterogenous effect of development assistance on the economic development of the health sector is reportedly positive with a coefficient of 2.761 and statistically significant at five per cent. In other words, an increase in developmental assistance will increase economic development in the health sector by 0.276 per cent, all things being equal. Therefore, the second hypothesis; H_{O2}: **There is no significant contribution of official development assistance on the growth of the Health Sector of Nigerian economy** is hereby rejected. This implies that increasing development assistance would necessitate to economic growth in Nigeria. Development assistance influences the economy by providing development projects and increasing job opportunities as well as presenting a working tool to approximately every worker in society.

Overall, an increase in labour force seems to have a positive influence on economic growth in Nigeria, in the long run. From table 5 the result posted a long-run coefficient of 62.42which is statistically significant at one per cent. This implies that an increase in the labour force would tend to have a long-run effect on economic growth in Nigeria. The overall short-run result is reportedly consistent with the long-run result. The coefficient of the overall short-run coefficient is 122.9 and statistically significant at one percent. By implication, as labour supply increase by one percent, economic growth in Nigeria rises by 0.62 percent in the long run, all things being equal while the same will manifest to

approximately 1.23 percent in the short-run, all things being equal. The heterogeneous short-run estimation (see table 6) reveals this positive effect are mostly experienced in the education sector. This sector reflects the direction of the labour force efficiency. The education sector reports a coefficient of 5.682, which is statistically significant at one percent while the educations sector reports the coefficient of 273.7, which is statistically significant at one per cent. It shows that increasing labour force participation rate boosts economic growth in the educations sector by approximately 2.74 per cent, all things being equal. In the health sector, the result is positive but not statistically significant.

The estimation of the effect of capital formation on economic growth revealsit's not significant for the overall long-and short-run estimations but individually, the variable is statistically significant for industrial sectors while it is not in others. For instance, the coefficient is reportedly positive and statistically significant at ten percent in the industrial sector. The estimated coefficient is 18.89 for the industrial sector of the economy. This implies that in this sector, as capital formation increases, economic growth increases by approximately 0.19 percent, ceteris paribus. As for trade openness, the overall result reveals that both the short-and long-run reports positive coefficient but only the long-run coefficient is statistically significant at one per cent. The long-run coefficient is 6.444 which implies that as trade openness increases by one per cent, economic growth will increase by rises by 0.064 per cent, ceteris paribus. In the health sector, the effect is positive with a reported coefficient of 19.09 and statistically significant at ten percent. This implies that as capital formation increases by one percent, economic growth in the health sector increases by 0.191 percent, all things being equal.

Stability and Diagnostic Tests

In panel ARDL estimation, stability test is conducted on an individual member of the panel which is also executed herein. Normally, the researcher base on the estimation of the error correction model to determine the stability of the research especially with a large member of panels. In this research, the number of panel members is just five which prompted the decision to conduct stability tests on individual members of the panel. The need for stability tests could not be overemphasized. It of necessity to test for the stability of the model employed to ensure dependency and reliability of the results. These tests are conducted to determine the suitability and stability of the model applied in this project work.

Table 7: Diagnostic Test						
	Agriculture	Industry	Construction	Trade	Health	Educations
R-Square	0.657987	0.957987	0.77546	0.898712	0.78756	0.79124
Adjusted R-square	0.520917	0.920917	0.63724	0.790134	0.65374	0.62011
Normality Test	0.87392 (0.6344)	0.078992 (0.96124)	0.86543 (0.12544)	0.272761 (0.27455)	0.88532 (0.14454)	0.07456 (0.9712)
Serial Correlation	1.36677 (0.3432)	1.639766 (0.2422)	1.39112 (0.4454)	1.53663 (0.5212)	1.39342 (0.4546)	1.63988 (0.2456)
Heteroscedasticity Test	0.17880 (0.1743)	0.378780 (0.9734)	0.22581 (0.70541)	0.23076 (0.8745)	0.23562 (0.7553)	0.37843 (0.78774)
Heteroscedasticity Test II	1.50061 (0.2146)	1.015511 (0.5056)	1.16213 (0.4467)	1.21563 (0.6231)	1.17253 (0.4698)	1.35533 (0.5236)
Note: Numbers in parentheses are probabilities, JarqueBera Normality Test was utilized, Serial correlation is with Breusch-Godfrey serial correlation Lagrange Statistics, Heteroscedasticity test is with Breusch-Pagan-Godfrey test and Heteroscedasticity test II is with Harvey test. All were done using E-views 10 version.						

Square Sum (CUSUM). In Brown, Durbin and Evans (1975) the test statistics were interpreted and modified on the basis of the CUSUM for recursive residuals. In a simulation analysis, Ploberger and Kramer (1992) illustrate that the persistent residual CUSUM test has greater strength than the OLS test to identify the parameter instability early in the sample. Both the Square Test CUSUM and CUSUM could be depicted graphically to demonstrate such required model stability. In the model herein, there is an indication of perfect stability with no specification errors since the plotted lines are within the region of stability. Adrift from this region of stability will mean an error in the model specification but the result has stated otherwise, hence this report could be relied upon up for further reference. The CUSUM and CUSUM of Square stability tests have also

revealed why the PMG estimator was chosen in the first place. The shape of the graphs looks similar which indicate the homogeneity of the slope of the panel.

This thesis work also did some diagnostic tests to ascertain the extent of the dependability of the model applied in the project work. It has absorbed the use of the Jarque-Bera test for Normality test, Breusch-Godfrey test for serial correlation Lagrange Multiplier statistics. Two different Heteroscedasticity tests were also conducted, first with Breusch-Pagan-Godfrey and another with Harvey Heteroscedasticity test. All these tests further indicated that the model is normal with no sign of serial correlation and heteroscedasticity. The R-square and Adjusted R-Square are high enough which means the independent variables have a high degree of influence over the dependent variable. The null hypothesis for the normality test, serial correlation test, and heteroscedasticity test could not be rejected since their probabilities are very high. Generally, this implies that the short-run co-efficient in the *ECM* model is stable and therefore dependable.

Conclusion and Recommendations

Conclusion

A brief examination of Official Development Assistance statistics reveals that large swings have remained a consistent trend in official development Assistance in Nigeria, particularly between 2010 and 2017 (Ayomitunde, Ololade, Moses, and Babatunde (2020)). Despite the huge amount of foreign aid given to Nigeria, the study has indicated that boosting official development Assistance as a tool for encouraging economic growth and development is still lacking in empirical generality. The estimation established a long-run relationship between the dependent and independent variables that are robust and consistent in all the individual sectors that make up the panel. This was demonstrated from the outcome of the error correction coefficient which was similar in homogenous and heterogeneous estimation for individual sectors of the economy. Those coefficients reflect the speed of adjustment from short-run to long-run and in line with (Sovbetov,2018) and (Sovbetov and Saka, 2018), these imply there are no serial error correction and instability problem caused by a structural break in the respective country data. Pedroni'sCointegration Tests further affirms the existence of a long-run relationship between the dependent variables and independent variables.

This means that development assistance motivates economic growth mostly in the Agricultural sector, trade sector and education sector by 0.167 per cent, 0.092 per cent and 0.071 per cent respectively, all things being equal. It implies that increasing development assistance would necessitate to economic growth in Nigeria. Development

assistance influences the economy by providing development projects and increasing job opportunities as well as presenting a working tool to approximately every worker in society.

Recommendations

Since the result consolidate the need for more inclusive growth, the results of this investigation suggest that Official Development Assistance is important for economic gains. The governments of Nigeria should devise and enforce policies that, could attract more ODA in Nigeria.

Besides, we have found the ODA variables exerts a significant effect on the educational sector. This signifies the need for special attention on the education sector. All stakeholders should undertake full commitment to the implementation of development assistance on education.

JEL Classification:F35, F41, F43, F62

References

1. Agunbiade, O., & Mohammed, S. S. (2018). Impact of foreign aid on the economic development of Nigeria: 1986-2016. Journal of Economics and Sustainable Development, 9(18), 69-80.
2. Akinlo, A. E., &Odusola, A. F. (2003). Assessing the impact of Nigeria's naira depreciation on output and inflation. *Applied Economics*, 35(6), 691-703.
3. Ali, M., Nishat, M. & Anwar, T. (2010). Do foreign inflows benefit Pakistan poor? The Pakistan Development Review, Vol. 48, No. 4, PP.43-57
4. Arndt, C.; Jones, S. & Tarp, F. (2011). Aid, growth, and development: have we come full circle? Journal of Globalization and Development Vol.1 No. 2, pp. 15-27.
5. Askarov (2015). Development Aid and Growth in Transition Countries. World Development, Vol. 66, PP. 383-399.
6. Ayomitunde A.T, Ololade Y.M, Moses S.G, and Babatunde A.I (2019). Official Development Assistance and Poverty Alleviation in Nigeria: An Error Correction Model Approach. Indian Journal of Commerce & Management Studies ISSN: 2249-0310 EISSN: 2229-5674
7. Azu N. P. and Muhammad, Y. M. (2020) Does political regime influence bilateral trade in West Africa. *Transnational Corporations Review*, 12(3), 293-303

8. Baek, J. (2014). Exchange Rate Effects on Korea-U.S. Bilateral Trade: A new Look. *Research in Economics,* 68(3), 214-221.
9. Bahmani-Oskooee, M., & Nasir, A. B. M. (2004). ARDL Approach to Test the Productivity Bias Hypothesis. *Review of Development Economics*, 8(3), 483-488.
10. Banerjee, A., Dolado, J., &Mestre, R. (1998). Error Correction Mechanism Tests for Cointegration in A Single-Equation Framework. *Journal Time Series Analysis*, 19(3), 267-283.
11. Boone, P. (1996). Politics and the effectiveness of foreign aid. *European economic review*, *40*(2), 289-329.
12. Brown, R. L., Durbin, J., & Evans, J. M. (1975). Techniques for testing the constancy of regression relationships over time. *Journal of the Royal Statistical Society Series B: Statistical Methodology*, *37*(2), 149-163.
13. Collier, P., & Dollar, D. (2002). Aid allocation and poverty reduction. *European economic review*, *46*(8), 1475-1500.
14. Fasanya, I. O., &Onakoya, A. B (2012). Does foreign aid accelerate economic growth? An empirical analysis for Nigeria. International Journal of Economics and Financial Issues, 2 (4), 423-431.
15. Fashina, O. A., Asaleye, A. J., Ogunjobi, J. O., &Lawal, A. I. (2018). Foreign aid, human capital and economic growth nexus: Evidence from Nigeria. Journal of International Studies, 11(2), 104-117
16. Feeny, C. (2013) Aid, policies and poverty in Papua, New guinea. American Economic Review, 90(4), 847–868
17. George O.A, Ayomitunde A.T, Grace K.T, and John N.C (2020). Official Development Assistance and Poverty Alleviation in Nigeria. ActaUniversitatisDanubius Vol 16, No 1
18. Hausman, J. A. (1978). Specification tests in econometrics. *Econometrica: Journal of the econometric society*, 1251-1271.
19. Im, K. S., Pesaran, M. H., & Shin, Y. (2003). Testing for unit roots in heterogeneous panels. *Journal of econometrics*, *115*(1), 53-74.
20. Kolawole, B. O. (2013). Foreign assistance and economic growth in Nigeria: The two-gap modelframework. American International Journal of Contemporary Research, 3(10),
21. Maria, C. U., &Ezenekwe, R. U (2015). Impact of foreign aid on capital generation in Nigeria. International Journal of Economics, Commerce and Management, 1(9), 876-889.
22. Mankiw, N. G., Romer, D., & Weil, D. N. (1992). A contribution to the empirics of economic growth. *The quarterly journal of economics*, *107*(2), 407-437.

23. Moreira, S. B. (2005). Evaluating the impact of foreign aid on economic growth: A cross-country study. *Journal of Economic Development*, *30*(2), 25-48.
24. Mosley, P., &Abrar, S. (2006). Trust, conditionality, and aid effectiveness. *Budget support as more effective aid?*, 311.
25. N'driKan David (2017). Contribution of Official Development Assistance to Poverty Alleviation in the Ecowas. IOSR Journal of Economics and Finance (IOSR-JEF), Vol. 8, No. 2, pp. 37-49.
26. Nyirenda, C., &Mbelle, F. (2023). Why Foreign Aid Fails to Deliver Development in African Rural Settings: The Case of Korean Aid in Tanzania. *International Diplomatic Review Journal*, *2*(1), 93-115.
27. Obiora, C. A., Nwanolue, B. O. G., &Okeke, C. C. (2022). Sectoral Allocation of Foreign Aids and Poverty Alleviation in Nigeria, 2010-2020. *International Journal of Culture and History*, *9*(1), 1-25.
28. Ogun, T. P., &Alege, P. O. (2005). An Econometric Investigation of the Determinants of Food Shortage in Developing Countries: A Case of Nigeria. *Journal of Economics and Management Sciences*, *1*, 18.
29. Ologbenla, P, (2021). Impact of Foreign Aid and Fiscal Policy on the Nigerian Economic Growth. SAU Journal of Management and Social Sciences ISSN: 2550-7302), Vol. 6, Number 1
30. Onakoya, A. B. &Ogunade, A. O (2016). Foreign aid and economic growth nexus in Nigeria: A Johansen Co-Integration Approach. Nigerian Inquiry in the Humanities, 2(1), 52-73.
31. Pesaran, M. H., & Smith, R. (1995). Estimating long-run relationships from dynamic heterogeneous panels. *Journal of econometrics*, *68*(1), 79-113.
32. Pesaran, M. H., Shin, Y., & Smith, R. J. (2001). Bounds testing approaches to the analysis of level relationships. *Journal of applied econometrics*, *16*(3), 289-326.
33. Ploberger, W., &Krämer, W. (1992). The CUSUM test with OLS residuals. *Econometrica: Journal of the Econometric Society*, 271-285.
34. Rudel, L. U. (2005). Official Development Assistance. Headline Series, (327), pp. 7-12,2
35. Sovbetov, Y. (2018). Factors influencing cryptocurrency prices: Evidence from bitcoin, ethereum, dash, litcoin, and monero. *Journal of Economics and Financial Analysis*, *2*(2), 1-27.
36. Sovbetov, Y., & Saka, H. (2018). Does it take two to tango: Interaction between credit default swaps and national stock indices. *Journal of Economics and Financial Analysis*, *2*(1), 129-149.
37. Yiew, T. H., & Lau, E. (2018). Does foreign aid contribute to or impeded economic growth. Journal of International Studies,11(3), 21-30.