DOES FOREIGN AID IMPACT ON ECONOMIC GROWTH IN NIGERIA?

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Abstract

This paper examines the aid-growth relationship in Nigeria following the 2007-08 Global Financial Crisis (GFC), using time series data for the period 1970 – 2014, autoregressive distributed lag (ARDL) and dummy variable models. The results indicate that foreign aid impacts positively on economic growth in Nigeria, both in the long- and short-run. This suggests that donor countries should acquaint themselves with the socio-economic and political realities of the domestic economy in Nigeria so that official development assistance offered to Nigeria is shielded from corruption and bad governance. However, the results further show that the GFC significantly altered the aid-growth relationship in Nigeria, such that the results of this study and the bulk of existing empirical studies for Nigeria should be interpreted with care.

Key words: Foreign Aid; Economic Growth; Global Financial Crisis; ARDL Model

JEL Codes: F35; F43; F36; C32

1. Introduction

Foreign aid[1] refers to economic, technical or military aid given by one nation to another for purposes of relief and rehabilitation, economic stabilization and for mutual defense. It includes resource transfers from the highly industrialized economies in the form of grants, loans and concessional financial terms to less developed economies (Hayter, 1999; Abiola and Olofin, 2008). Till date, there is no consensus among economic researchers and policy makers on whether foreign aid is effective in enhancing economic growth in poor countries or otherwise (Edwards, 2014). According to Easterly (2014), Moyo (2010), and Hayter (1999), such official assistance has injured less developed countries over the years. They argue that official aid enriches the elite in poor countries through corruption, creates dependency, promotes currency overvaluation, and perpetuates bad governance, especially as the conditions of aid are usually formulated to serve the interest of the donor country. This means that foreign aid should be drastically reformed to make it more effective or abolished altogether so that poor countries can take advantage of the

[1] In the literature, the terms foreign aid and development aid (or simply aid) are used interchangeably. They generally refer to Official Development Assistance (ODA), and the Development Assistance Committee (DAC) of the OECD collects and publishes the data. See Okon (2012) and the references therein.

opportunities provided by the global economy. However, there are economists, such as Sachs (2009), Karrass (2006) Quartey (2005), Morrisey (2001) and Stiglitz (2002), who believe that such transfers of resources play important role in complementing domestic resources towards achieving growth and development in poor countries. According to these economists, foreign aid eases foreign exchange constraints, transfers modern technological know-how and managerial skills, and hence facilitates economic growth in less developed economies. They however state that such official assistance has been historically too low to impact effectively on growth.

Over the years, Nigeria has been a significant recipient of foreign aid, with net ODA receipts reaching $2.058 billion in 2010. Though it declined to $1.765 billion in 2011, it nonetheless rose gradually to $1.912 billion and $2.515 billion in 2012 and 2013 respectively. By 2014, net ODA receipts by Nigeria stood at $2.476 billion, representing 0.45% of gross national income (GNI)[2]. Given the lack of consensus on whether or not foreign aid enhances economic growth, it is the goal of this study to re-examine the aid-growth relationship in Nigeria. Accordingly, the specific objectives of this study include: (i) to determine if aid impacts positively and significantly on economic growth in Nigeria; and (ii) to determine if the 2007-08 Global Financial Crisis (GFC) altered the aid-growth relationship in Nigeria.

2. Literature Review

Some theories of foreign aid are considered relevant for this study, especially the ones that highlight the importance of foreign aid to the growth and development of an economy[3]. In what follows, the main postulations of these theories are presented. The Chenery and Strout Two-gap model postulates that foreign aid accelerates economic growth by supplementing domestic capital formation (Chenery and Strout, 1966). The intuition behind this postulation is that most developing countries face either shortage of domestic savings to match investment opportunities or shortage of foreign exchange to finance needed imports of capital and intermediate goods. The savings-gap and foreign exchange-gap are therefore two separate and independent constraints to the attainment of a target rate of growth in developing economies. The Three-gap model refers to the saving- investment gap, the trade gap and the fiscal gap. Here, the fiscal gap means the gap between government revenue and expenditure. This gasp is responsible for the inability of government to stimulate private investment when government resources for investment and imports are insufficient due to debt service and other factors. Accordingly, closing the fiscal gap may be achieved if external resources are directed to the government budget (Chenery and Strout, 1966).

The Public Interest theory seems to be the most significant theory towards foreign aid and has existed for the last 50 years. It states that foreign aid is necessary to fill a financing or investment gap and this will in turn lift recipient countries out of poverty trap (Sachs, 2005). It recognizes the

[2] Details of net ODA receipts by country are available at

http://www.oecd.org/dac/stats/statisticsonresourceflowstodevelopingcountries.htm.

[3] For theories of economic growth that are relevant for this study, such as Rostow's growth model, HarrodDomar growth theory, Lewis theory of economic growth and Schumpeter's model of economic growth, the reader is referred to Mbah and Amassoma (2014), Girma (2015) and the references therein.

fact that it is the donor countries politicians that make decision to provide aid to less developed countries (LDCs), which in turn assists the politicians to achieve their own goal of being re-elected. The Public Choice theory explains that foreign aid is ineffective and damaging to the recipient countries (Easterly, 2003, 2007). The bedrock of this theory is the argument that governments cannot do anything right. Hence, the politicians according to this theory use government resources to maintain and consolidate their hold on power. The Modernization theory of foreign aid consists of a changeable set of ideas and strategies that guide policies of foreign aid, trade, nationalism, and counter-insurgency. At the heart of this theory is the realization that the economic and political advancements enjoyed by the highly industrialized nations (like the United States) is normative, so that it is in the overall interest of these highly developed nations that steps should be taken to bring other less developed countries up to a comparable level (Sunkel, 1969). The International dependence theory is considered an extension of Marxist theory, that is, the poor countries are said to be dependent on the developed ones for market and capital, but the poor countries receive only a very small portion of the benefits that the dependent-relation brings about. This is because international dependence is based on an international division of labor which allows industrial development to take place in some countries, while restricting it in others. The theory recognizes that the growth of international capitalism and multinational corporations caused poor countries to be further exploited and to become more dependent on the developed countries (Todaro and Smith, 2014).

The empirical literature shows that while some studies find evidence in support of positive influence of foreign aid on growth in the recipient economy, other studies did not find such evidence. Using time series data for the period 1960-1970 and an underlying vector autoregressive (VAR) model, Chenery and Carter (1973) find that foreign aid accelerated growth in Taiwan, Korea, Iran, Thailand and Kenya, while it retarded growth in India, Colombia, Ghana, Tunisia, Ceylon and Chile. Fasanya and Onakoya (2012) analyzed the impact of foreign aid on economic growth in Nigeria over the period 1970 to 2010. The results are consistent with the growthenhancing hypothesis. Fayissa and El-Kaissy (1999) find that for a sample of 77 countries over sub-periods 1971-1980, 1981-1990 and 1971-1990, foreign aid influenced economic growth positively in developing countries. Other studies that found positive effect of aid on growth are Burnside and Dollar (2000), Gomanne, Girma and Morrissey (2003), Hatemi-J and Irandoust (2005), Karrass (2006), and Sakyi (2011).

Contrary to the above empirical studies, Eregha (2009) examined the relationship between foreign aid, investment and economic growth in Nigeria. The results show that foreign aid has significant negative effect on growth. Bakare (2011) also examined the macroeconomic impact of foreign aid in Sub-Sahara Africa using Nigeria as a case study. Using a vector autoregressive (VAR) model, the study found a negative relationship between foreign aid and output growth. Singh (1985) finds that foreign aid impedes growth among selected LDCs once the index of state intervention is introduced into the model. Mosley, Hudson and Horrell (1987) also find that for 60 LDCs studied over the periods 1960-70, 1970-80, and 1980-83, foreign aid failed to accelerate growth. Other studies that found negative effects of foreign aid on growth include Easterly, Levine and Roodman (2003), Akonor (2008), Okon (2012), Eregha, Sede and Ibidapo (2012), Mbah and Amassoma (2014), and Girma (2015).

Overall, a clear gap emerges in the empirical literature showing that most of the existing studies were conducted prior to the 2007-08 Global Financial Crisis (GFC). This means that the dynamics of the aid-growth relationship has not been comprehensively investigated following the crisis. For

example, this study will determine if the crisis induced structural change in the presumed relationship. Besides, the lack of consensus on the nature of the foreign aid-economic growth relationship as shown in the empirical studies reviewed above means that further investigation is required to achieve a more comprehensive understanding of this relationship in Nigeria. It is the goal of this study to fill these gaps in the literature.

3. Data and Methodology

The data consists of annual observations for the period 1970 to 2014. The variables of interest include: gross domestic product (GDP), measured in current US$ so that GDP growth rate is the proxy for economic growth; foreign aid (AID) measured as total ODA received (current US$); naira to U.S. dollar exchange rate (EXCH); trade openness (TOP) measured as $(imports + exports)/GDP$; inflation rate (INF); total population (POPG) measured in millions of people, so that the log of POPG captures the annual population growth rate in Nigeria; and foreign direct investment (FDI) net inflows (current US$). To ensure consistency, the entire dataset was taken from World Development Indicators of the World Bank Database. To reduce the effect of noise and ensure that the estimated parameters retain obvious economic interpretations, the entire dataset was logged prior to estimation, except for the inflation rate.

Following Burnside and Dollar (2000) and Mbah and Amassoma (2014), the model that captures the first objective of this study can be specified in its implicit form as follows:

$$GDP = (AID, EXCH, TOP, INF, POPG, FDI) \quad (1)$$

The model in equation (1) can be expressed in its mathematical form as follows:

$$lGDP = \alpha + \beta_1 lAID + \beta_2 lEXCH + \beta_3 lTOP + \beta_4 INF + \beta_5 lPOPG + \beta_6 lFDI \quad (2)$$

Where: l denotes natural logarithm, α is the intercept, and $\beta's$ are parameters to be estimated. Equation (2) can also be specified econometrically by including the error term as follows:

$$lGDP = \alpha + \beta_1 lAID + \beta_2 lEXCH + \beta_3 lTOP + \beta_4 INF + \beta_5 lPOPG + \beta_6 lFDI + \varepsilon \quad (3)$$

Given that the presumed relationship may be dynamic in nature, equation (3) is now specified in its dynamic form as an autoregressive distributed lag model:

$$lGDP_t = \alpha + \sum_{j=0}^{q} \beta_j lAID_{t-j} + \sum_{j=0}^{q} \beta_j lEXCH_{t-j} + \sum_{j=0}^{q} \beta_j lTOP_{t-j} + \sum_{j=0}^{q} \beta_j INF_{t-j} + \sum_{j=0}^{q} \beta_j lPOPG_{t-j} + \sum_{j=0}^{q} \beta_j lFDI_{t-j} + \sum_{j=1}^{q} \beta_j lGDP_{t-j} + \varepsilon_t \quad (4)$$

Where q is the lag length to be determined using the general-to-specific approach. It must be emphasized that the model in equation (4) will be estimated in its error correction form if the preliminary data analysis indicates the existence of an equilibrium relationship among the variables.

The second objective of this study seeks to establish if the GFC altered the aid-growth relationship in Nigeria. If we let $lGDP\ and\ lAID$ be the logged GDP and foreign aid, then the relationship between economic growth and foreign aid can be written as:

$$lGDP_t = \alpha + \theta lAID_t + \varepsilon_t \quad (5)$$

Let D_t be a dummy variable taking a value of 0 for observations in 1970 – 2006 (i.e. before the GFC) and 1 for observations in 2007–2014 (i.e. following the GFC), so that 2007 is our presumed breakpoint. We investigate the existence of structural change in the relationship between the economic growth and foreign aid using the following multiple regression model:

$$lGDP_t = \theta_0 + \theta_1 D_t + \lambda_1 lAID_t + \lambda_2 (D_t lAID_t) + \varepsilon_t \quad (6)$$

where: θ_1 is the differential intercept; and λ_2 is the differential slope coefficient. Obviously, if either the differential intercept or the differential slope coefficient is statistically significant, then we must reject the hypothesis of no structural change. Furthermore, if the differential intercept and the differential slope coefficient are jointly statistically significant, we should also reject the hypothesis of no structural change.

4. Empirical Results and Discussions

Our empirical analysis began with test for the stationarity of all the variables used in this study, using the ADF unit root test. In other words, we seek to ensure that the variables are either I(0) or I(1) stationary. With the lag length selected automatically by Schwarz Information Criteria (SIC) and including trend and intercept, the results of the ADF tests are shown in Table 4.1. The results indicate that except for population growth and inflation, all the variables are integrated of order one, that is, stationary after first difference. This is consistent with the requirements of the ARDL model specified in equation (4), and also suggests that there may be equilibrium relationship between the variables.

Table 4.1: Summary of ADF Unit root test results

Variables	**Test 5% Critical Values**	**Level ADF Test Stat**	**1st Difference ADF Test Stat**	**Order of Integration**
LAID	-3.5208	-3.3018	-5.9246	I(1)
LEXCH	-3.5181	-1.5962	-5.2258	I(1)
LFDI	-3.5181	-2.2844	-12.8698	I(1)
LGDP	-3.5181	-0.2702	-6.1397	I(1)
LPOP	-3.5236	-6.2275	-	I(0)
LTOP	-3.5181	0.8552	-9.7289	I(1)
INF	-3.5155	-3.7253	-	I(0)

To ascertain if indeed an equilibrium relationship exists between the variables, we conducted the Johansen test for cointegration. The results are shown in Table 4.2. While the trace test shows the existence of at least four cointegrating equations, the max-eigen test indicates the existence of at least two cointegrating equations. Overall, both tests indicate that there exists a stable long-run relationship.

Table 4.2: Johansen Cointegration Test Results

Hypothesized No. of CE(s)	**Trace Statistic**	**5% Critical Value**	**P-Value**	**Hypothesized No. of CE(s)**	**Max-Eigen Statistic**	**5% Critical Value**	**P-Value**
None *	177.7951	125.6154	0.0000	None *	58.6155	46.2314	0.0015
At most 1 *	119.1797	95.7537	0.0005	At most 1 *	41.2638	40.0776	0.0366
At most 2 *	77.9158	69.8189	0.0098	At most 2	28.4430	33.8769	0.1938
At most 3 *	49.4729	47.8561	0.0350	At most 3	20.7338	27.5843	0.2926
At most 4	28.7390	29.7971	0.0658	At most 4	15.6804	21.1316	0.2441
At most 5	13.0586	15.4947	0.1127	At most 5	12.7425	14.2646	0.0858
At most 6	0.3161	3.8415	0.5739	At most 6	0.3161	3.8415	0.5739

To address the first objective of this study, we estimated the long-run model in equation (4) by OLS. The results of the parsimonious model are shown in column 1 of Table 4.3. Further, to enable us capture the short-run dynamics, we estimated the model in its error correction form and the results are shown in column 3 of Table 4.3. However, the pairwise Granger Causality test between foreign aid and economic growth shows that there is a unidirectional causality, which runs from foreign aid to economic growth (see Appendix I). This result is consistent with OECD statistics, which indicates that extremely poor countries tend to receive the highest amount of foreign aid, so that the aid variable in equation (4) may not be exogenous after all. In fact, this finding is also consistent with economic theory which explains that aid flows from advanced countries to poor countries. To account for this possible endogenity, we estimated equation (4) using the instrumental variable (IV) technique. The results are presented in column 2 of Table 4.3.

Table 4.3: Parsimonious Estimation Results for Equation (4)

	1	2		3	
	OLS	**IV**		**ECM**	
	Dependent Variable LGDP	Dependent Variable LGDP		Dependent Variable D(LGDP)	
Variable	**Coefficient**	**Coefficient**	**Variable**	**Coefficient**	
Constant	8.4999*** (0.0008)	8.4159*** (0.0011)	Constant -0.0034 (0.7891)		
LAID	0.0109 (0.4522)	0.0082 (0.6818)		D(LAID) 0.0016 (0.9350)	
LAID(-2)	0.0311** (0.0405)	0.0314** (0.0399)		D(LAID(-2))	0.0189 (0.2893)

LEXCH(-2)	0.0327*** (0.0045)	0.0335*** (0.0063)		D(LEXCH(-2))	0.0277 (0.4297)
LTOP	-0.1053*** (0.0020)	-0.1047*** (0.0022)		D(LTOP)	-0.1308*** (0.0002)
INF	-0.0004 (0.5432)	-0.0004 (0.5731)		D(INF)	-0.0001 (0.8026)
LGDP(-1)	0.5383*** (0.0001)	0.5439*** (0.0002)		D(LGDP(-1))	0.6572*** (0.0069)
				ECM(-1)	-0.9678*** (0.0016)
Diagnostic Checks					
R-squared	0.98	0.98			0.44
Adjusted R-squared	0.98	0.98			0.33
F-statistic	406.37	405.91			3.85
Prob (F-stat)	0.00	0.00			0.00
Durbin-Watson Stat	1.68	1.67			2.02
Jarque-Bera Stat	5.8490* (0.0537)	5.54799*(0.06241)			3.0195 (0.2209)
BreuschGodfrey Test [Prob. Chi-Square]	0.4812	0.4684			0.4908
BreuschPagan-Godfrey Test [Prob. Chi-Square]	0.7739	0.7827			0.7592

Notes: The vector of instruments for the IV estimation, Z = [C, LAID(-1), LAID(-2), INF, LTOP, LEXCH(2), LGDP(-1)]. The correlogram in Appendix III indicate that the lags of LAID should be included in the list of instruments. All the values in parenthesis are p-values. * denotes significance at 10% level; ** denotes significance at 5% level; *** denotes significance at 1% level. Breusch-Godfrey Test and Breusch-PaganGodfrey Test are the standard tests for autocorrelation and heteroscedasticity.

The OLS and IV estimation results are qualitatively the same. This shows that the LAID variable is sufficiently exogenous, so that the OLS results should be preferred to the IV results because OLS is more efficient when the regressors are exogenous. Nonetheless, both results agree that foreign aid impacts positively on economic growth in Nigeria. However, the impact becomes significant only at lag 2. The ECM results indicate that even though foreign aid impacts positively on economic growth in the short-run, such impact is not statistically significant even at lag 2. Overall, this study finds that foreign aid impacts positively on economic growth in Nigeria, which

is consistent with Fasanya and Onakoya (2012) and Karrass (2006). However, this finding is contrary to the bulk of existing studies for Nigeria such as Eregha (2009), Bakare (2011), Akonor (2008), Okon (2012), Eregha, Sede and Ibidapo (2012), Mbah and Amassoma (2014), and Girma (2015).

Other variables that impact significantly on economic growth in Nigeria are trade openness and the output growth at lag 1. However, while output growth at lag 1 is growth-enhancing, trade openness is growth-retarding. Exchange rate impacts significantly on growth only at lag 2, while inflation did not show any significant impact on growth, both in the long-run and in the short-run. The ECM coefficient of -0.97 is significant at 1% level, which is consistent with theoretical expectations. The diagnostic checks indicate that the underlying assumptions of all the models reported have been adequately satisfied. The models are free from the problems of residual serial correlation and heteroscedasticity. At the 5% level, the error terms are normally distributed. The p-value of the Fstatistic is 0.00 in all cases, indicating that the estimated parameters are jointly significant at the 1% level in all the models. Overall, the models are well behaved.

Table 4.4: Estimation Results for Equation (6)

	Dependent Variable LGDP			
Variable	**Coefficient**	**Std Error**	**t-Statistic**	**P-value**
Constant	22.1475	0.5785	38.2852	0.0000
DUM	-6.0636	1.9714	-3.0758	0.0037
LAID	0.1416	0.0311	4.5477	0.0000
DUM*LAID	0.3130	0.0952	3.2870	0.0021
	R-squared = 0.88 Adjusted R-squared = 0.87 F-statistic = 101.8801 Prob (F-stat) = 0.000000 Jarque-Bera = 0.1428 (p-value = 0.9311) **Note:** The Standard Errors are Newey-West HAC standard errors			

Recall that the second goal of this paper is to determine if the GFC altered the aid-growth relationship in Nigeria. To achieve this objective, we estimated equation (6), and the results are shown in Table 4.4. The results indicate that the differential intercept (DUM) and the differential slope coefficient (DUM*LAID) are individually statistically significant at the 1% level. The standard Wald coefficient restriction test also indicates that these two coefficients are jointly statistically significant (see Appendix II). This means that the GFC altered the aid-growth relationship in Nigeria. It also means that all the results reported in Table 4.3 above as well the bulk of the studies in the literature should be interpreted with caution. Ideally, based on this result, we should have re-estimated the models in Table 4.3 separately for pre- and post-GFC periods. Unfortunately, our time series data is not long enough to achieve any meaningful analysis in this direction. Hence, we can only advise that our results and the results of the existing studies should be approached with care.

5. Concluding Remarks and Recommendations

This study examined the aid-growth relationship in Nigeria following the GFC. The results indicate that foreign aid impacts positively on economic growth in Nigeria. This impact, however, becomes significant at lag 2 only in the long-run. Furthermore, the results show that the GFC significantly altered the aid-growth relationship in Nigeria, such that the results of this study and the bulk of the existing empirical studies for Nigeria should be interpreted with care. All in all, this study recommends that donor countries should acquaint themselves with the socio-economic and political realities of the domestic economy in Nigeria so that official development assistance offered to Nigeria is not wasted through corruption and bad governance. By so doing, foreign aid can then remain as a veritable means of complementing domestic resources towards achieving economic growth and development in Nigeria.

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Appendix I: Granger Causality Test between Economic Growth and Foreign Aid

Null Hypothesis:	Obs	F-Statistic	Prob.
LGDP does not Granger Cause LAID	43	9.32646	0.0005
LAID does not Granger Cause LGDP		2.31529	0.1125

Appendix II: Testing Joint Significance of Differential Intercept and Differential Slope Coefficient

Wald Test:
Equation: EQ1

Test Statistic	Value	df	Probability
F-statistic	14.55786	(2, 41)	0.0000
Chi-square	29.11571	2	0.0000

Null Hypothesis:
C(2)=C(4)=0 Null
Hypothesis Summary:

Normalized Restriction (= 0)	Value	Std. Err.
C(2)	-6.063600	1.971375
C(4)	0.312999	0.095224

Restrictions are linear in coefficients.

Appendix III: Correlogram of LAID (Included lags = 10)

Autocorrelation	Partial Correlation	AC	PAC	Q-Stat	Prob
. |*******	. |*******	1 0.908	0.908	39.600	0.000

. |******	.*| . |	2	0.790	-0.195	70.260	0.000
. |***** |	. |*. |	3	0.713	0.199	95.868	0.000
. |***** |	.*| . |	4	0.639	-0.112	116.94	0.000
. |**** |	. | . |	5	0.556	-0.034	133.28	0.000
. |**** |	. | . |	6	0.484	0.015	146.00	0.000
. |*** |	. | . |	7	0.426	-0.006	156.09	0.000
. |*** |	.*| . |	8	0.359	-0.082	163.46	0.000
. |** |	**| . |	9	0.240	-0.334	166.85	0.000
. |*. |	. | . |	10	0.131	0.066	167.90	0.000