DOES CORRUPTION AFFECT THE EFFECT OF FOREIGN AID ON ECONOMIC GROWTH IN NIGERIA? AN EMPIRICAL INVESTIGATION

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Abstract
The influence of corruption on the effect of foreign aid on economic growth is investigated using Nigeria's data spanning the period from 1994 to 2014. The ordinary least squares (OLS) estimation technique is used to estimate a multiple linear regression model for the investigation. The analysis shows that the effects of official development assistance and aid on real GDP is positive and statistically significant, and that corruption does not affect the effect of aid on growth. The study however finds that government final consumption expenditure and exchange rate are positively related to real GDP, while trade openness is observed to be negatively related to it. In light of the empirical evidence, the paper recommends for policy consideration, effort by the government to enhance the attractiveness of the country to foreign aid especially by intensifying the fight against corruption; increase in government final consumption expenditure; imposition of restriction on importation, especially on those that commodities that can be produced locally; government intervention in the foreign exchange market to avoid harmful appreciation of the currency, etc, to enhance the growth of the nation's economy.

Keywords: Foreign Aid, Economic Growth, Corruption.
JEL Classification Codes: D73, F35, F43

1. Introduction

A theory that relates foreign aid to growth is the two-gap model considered to be an extension of the Harrod-Domar model. The Harrod-Domar model relates growth to national savings rate (or savings-income ratio) and the national capital-output ratio. The implication of the model is that higher rates of savings and investment engender higher rate of economic growth. However, for less developed countries (LDCs), there exists the possibility of a savings-gap arising from low level of savings (attributable to low level of income) which falls short of desired investment needed to accelerate economic growth. There is also the foreign exchange-gap arising from low level of exports and high import demand owing to low level of domestic output. These gaps constitute the focus of the twogap model. The savings-gap can be closed by inflow of foreign direct investment (FDI), while the foreign exchange-gap can be bridged by foreign aid (Akande and Oluyemi, 2010). According to the Transparency International (2007), the goal of development assistance (that is, foreign aid), is to reduce poverty and support countries in their development. Thus the inflows of FDI and foreign aid to an economy are considered key determinants of economic growth, especially for LDCs.

Transparency International (2007) has noted that aid can be corrupted (where it is provided as a resource outside of public scrutiny in the recipient country), and its impact can be dampened by

corruption – which has been defined as the abuse of public office or entrusted power for private gain (Kolstad, Fritz and O'neil (2008) – through inappropriate use or diversion of a portion of it from intended purposes and beneficiaries. Corruption has the potential to undermine aid effectiveness. According to Shah (2014), foreign aid or development assistance extended to corrupt recipient government is often regarded as a waste of resources. This appears to have been the situation in Nigeria which though has received much aid and official development assistance over the last three decades according to official statistics from the World Bank's World Development Indicators (2015), has also seen escalation of its poverty rate and experienced slow growth in the period. Over 70% of the country's population lives below the poverty line of US$1.29 per day (Burleigh, 2013). Poverty in the country has been attributed to corruption (Aina, 2014). The country has consistently been on the list of the most corrupt countries in the world according to the Transparency International. In fact she was rated the most corrupt country in 1996, 1997 and 2000 among the countries surveyed. It has been argued that corruption in the country has tended to reduce the effectiveness of aid she has received over the years. Burleigh (2013) lamented Nigeria's situation and corroborated Shah (2014) by describing the country as a country so corrupt that it would be better to burn aid money extended to it.

The objective of this study is to empirically investigate whether or not corruption matters in the effect of aid on economic growth in Nigeria. In other words, the paper aims at investigating whether corruption significantly affects the effect of foreign aid on economic growth. The specific objective includes investigating the effect of foreign aid on the growth of Nigeria's economy. Though several studies have examined the effect of foreign aid on economic growth in Nigeria, none to our knowledge has empirically investigated the effect of interaction between corruption and aid on economic growth in the country. This paper intends to undertake this task with a view to recommending measure(s) that would help enhance the growth of the nation's economy.

2. Brief Review of the Literature

Numerous researches have been conducted to investigate the effect of foreign aid on economic growth in different countries and regions. The results have been mixed. Lew, Mohamed and Mzee (2012) find a significant negative effect of foreign aid on economic growth in a panel data study of East African countries over the period from 1985 to 2010 using the methodologies of pooled OLS, random effect and fixed effect estimations. Abouraia (2014) employs the ordinary least squares (OLS) estimation technique to examine the effect of foreign aid on economic development of the Philippines in the 20092012 period. The results show that foreign aid positively and significantly affects the growth of the country's real GDP.

Minoui and Reddy (2009) employ cross sectional OLS regression technique and the system generalized method of moments (GMM) estimator to analyse the growth impact of official development assistance to developing countries using data that span the period from 1960 to 2000 allowing for two different kinds of aid (development aid and non development aid) to have distinct effects on growth The evidence indicates that development aid as opposed to non development aid has positive and robust effect on subsequent growth.

Girma (2015) employs the autoregressive distributed lag (ARDL) approach to cointegration and error correction analysis to examine the impact of foreign aid on economic growth of Ethiopia

using data that span the period from 1974 to 2011. The analysis indicates that the short-run and long-run effect of foreign aid on economic growth is negative, but the effect of interaction of foreign aid with policy index on economic growth is positive and significant indicating that aid effectiveness is dependent on (favourable) macroeconomic policies.

The ARDL approach to cointegration and error correction analysis is also used in AppiahKonadu et al (2016) to examine the effect of foreign aid on economic growth in Ghana using data that span the period from 1972 to 2012. The empirical evidence shows inter alia that foreign aid has negative effect on the growth of the country's economy.

In Nigeria, Kolawole (2011) examines the effect of foreign aid on real output growth in the period from 1980 to 2011 using Granger causality test and error correction modeling. The study reveals amongst others that foreign aid in the form of official development assistance exacts no significant impact on the growth of Nigeria's economy. The study also finds no evidence of causal relationship between official development assistance and real GDP growth. Similar result is found in Mbah and Amassoma (2014) using same methodology to examine the effect of foreign aid on economic growth of Nigeria. The study by Okon (2012) on the impact of foreign aid on human development in Nigeria in the period from 1960 to 2010 using the two-stage least squares estimation technique shows that foreign aid negatively and significantly affects human development in the country.

The relationship between foreign aid and corruption has attracted considerable attention in recent times. The question has been posed as to whether less corrupt government receive more aids than the more corrupt governments. The study by Alesina and Weder (2002) finds no evidence that less corrupt governments receive more aid. In fact the study finds, using some measures of corruption, that more corrupt governments receive more aid. The study also finds no evidence that foreign aid reduces corruption. Also on the effect of foreign aid on corruption, the study by Okada and Samreth (2012) involving Quantile regression however finds that foreign aid generally reduces corruption, though the reduction effect is greater in less corrupt countries.

The empirical evidence on the effect of corruption on economic growth has been inconclusive. Jain (2011) finds that corruption adversely affects economic growth; Mo (2001) finds that corruption could be beneficial to growth; Aigheyisi (2015) find that corruption exerts no significant effect on economic growth.

3. Methods

To achieve the objective of the study which is to empirically examine whether corruption affects the effect of foreign aid on economic growth in Nigeria, we specify a growth model that relates economic growth (using real GDP per capita as proxy) to official development assistance and aid per capita, corruption, interaction term between these variables and other growth determinants identified in growth literature. The model is specified functionally as:

$$RGDP = f(ODAA, CPI*ODAA, TOPEN, GFCF, GFCE, EXRT) \quad [1]$$

Where RGDPPC = Real gross domestic product,

ODAPC = Official development assistance and aid,

CPI = Corruption perception index,

CPI*ODAA = Interaction term for interaction between ODAPC and CPI
TOPEN = Trade openness measured as trade as percentage of GDP,
GFCF = Gross fixed capital formation
GFCE = Government final consumption expenditure EXRT = Official nominal ₦/$ exchange rate.

The model is specified in the form in which it could be estimated, that is econometrically as:

$$RGDPPC = \beta_0 + \beta_1 ODAPC_t + \beta_2 CPI_t * ODAA_t + \beta_3 TOPEN_t + \beta_4 GFCF_t + \beta_5 GFCE_t + \beta_6 EXRT_t + \varepsilon_t \quad [2]$$

The variables are as previously defined. ε_t is the residual term The *a priori* expectations are: $\beta_1 > 0$, $\beta_2 > 0$, $\beta_3 > 0$, $\beta_4 > 0$, $\beta_5 > 0$, $\beta_6 > 0$.

The expected positive sign on the ODAPC variable is justified by the two-gap theory. Foreign aid positively affects economic growth, all things being equal. Corruption is generally believed to hurt economic growth and reduce aid effectiveness. On a scale of 10, the corruption perception index takes up values from 0 to 10, with 0 indicating highly corrupt and 10 indicating very clean. Less corruption indicated by increase in the CPI is therefore expected to be favourable to economic growth. The coefficient of the interaction term for ODAA and CPI is therefore expected to be positive. Positive and statistically significant coefficient implies that increase in CPI (that is reduction in corruption) increases the positive effect of ODAA on real GDP; or that more corruption (decrease in CPI) adversely affect (or reduce) the positive effect of ODAA on the real GDP. If the coefficient of the interaction term is not statistically significant, this is an indication that corruption does not influence, or affect the effect of aid on growth.

International trade theories predict positive effect of trade openness on economic growth. Growth theories such as the neoclassical growth theories predict positive effect of investment on economic growth. Keynesian expenditure theory and Ram's (1986) growth accounting model predict positive effect of government expenditure on economic growth. International trade theory predicts positive effect of currency depreciation on economic growth as it boost a country's export and curb imports. High lending interest rate discourages investment and hence, adversely affects economic growth.

Equation [2] shall be estimated using the ordinary least squares (OLS) estimation technique adjudged to yield estimates that are best, linear and unbiased (BLU). The estimation shall be performed with the aid of EVIEWS 8 computer software.

Data used for the analysis are annual time series data covering the period from 1994 to 2005. Data on corruption perception index was obtained from the transparency international, while data on the other variables were obtained from the World Bank's world development indicators. The choice of the sample period was dictated by Nigeria's data on corruption perception index which starts from 1994. The model shall be estimated using logarithm of the variables except the corruption perception index.

4. Results and Discussion

The result of estimation of equation [2] is presented in Table 1.

Table 1. Estimation Result

Dependent Variable: LOG(RGDP)
Method: Least Squares
Sample (adjusted): 1 21
Included observations: 21 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	18.07413	0.835020	21.64516	0.0000
LOG(ODAA)	0.051024	0.016338	3.122967	0.0075
CPI*LOG(ODAA)	0.000761	0.002167	0.351148	0.7307
LOG(TOPEN)	-0.108146	0.061428	-1.760525	0.1001
LOG(GFCF)	0.040583	0.049391	0.821664	0.4250
LOG(GFCE)	0.223482	0.064102	3.486323	0.0036
LOG(EXRT)	0.126788	0.027764	4.566580	0.0004

R-squared	0.989643	Mean dependent var	25.32694
Adjusted R-squared	0.985204	S.D. dependent var	0.438222
S.E. of regression	0.053306	Akaike info criterion	-2.764351
Sum squared resid	0.039781	Schwarz criterion	-2.416176
Log likelihood	36.02568	Hannan-Quinn criter.	-2.688788
F-statistic	222.9468	Durbin-Watson stat	1.892901
Prob(F-statistic)	0.000000		

Table 2. Test for Multicollinearity

Variable	Centered VIF
C	NA
LOG(ODAA)	3.450697
CPI*LOG(ODAA)	7.919990
LOG(TOPEN)	1.924293
LOG(GFCF)	30.56410
LOG(GFCE)	30.05426
LOG(EXRT)	3.408032

We observe that the signs on the coefficient of all the variables except the trade openness variable conform to a priori expectations. Official development assistance and aid positively and significantly affects economic growth. The effect is highly significant even at the 1% level. A 10%| increase in the amount of official development assistance and aid was associated with 0.5% increase in the real GDP. This validates the proposition of the two gap model and suggests that for Nigeria's economy, foreign aid positively affects growth and corroborates previous findings such as those of Abouraia (2014) and Minoui and Reddy (2009).

The positive coefficient of the interaction term suggests that less corruption enhances the effect of official development assistance and aid on economic growth and by implication, more corruption adversely affects the effect of official development assistance and aid on economic growth. However, for Nigeria the effect of interaction between official development assistance and aid and corruption on real GDP has not been statistically significant, as indicated by the t-ratio and associated p-value of the variable. This signifies that corruption did not affect the effect of official development assistance and aid on the real GDP significantly within the period under review.

Furthermore, the result also shows that trade openness, gross fixed capital formation, government final consumption expenditure and nominal exchange rate significantly contribute to explaining Nigeria's real GDP. Trade openness is observed to have adversely affected real GDP per capita within the study period. The effect is significant at the 10% level. A 10% increase in the degree of trade openness is associated with 1.1% decrease in the real GDP. This effect could be attributed to the precarious dependence of the country on imports which tended to adversely affect her local industries (and hence domestic production and employment) and trade balance (particularly the non-oil balance of trade) and also engendered depletion of her foreign exchange reserves.

Gross fixed capital formation, government expenditure and exchange rate are observed to have positively affected real GDP. The effect of gross fixed capita formation on real GDP per capita is not statistically significant. This could be attributed to the low level of domestic investment in the country engendered by the high cost of doing business therein (high lending interest rate, persistent power outages, unfavourable tax regimes, dilapidated infrastructure, insecurity in parts of the country in recent times etc). The effect of government spending on final consumption on the real

GDP is highly significant even at the 1% level. A 10% increase in government final consumption expenditure as a percentage of GDP was associated with 2.2% increase in real GDP per capita. This suggests that government consumption expenditure in the period under review was able to stimulate economic activities which contributed to the growth of the real GDP per capita. It also suggests that growth within the period was significantly spurred by government consumption spending.

The positive sign on the exchange rate variable conforms to *a priori* expectation. The effect of currency depreciation on real GDP per capita is highly significant even at the 1% level. A 10% increase in the official nominal ₦/$exchange rate was associated with 1.3% increase in real GDP. This could be attributed to the positive effect of currency depreciation on export according to international trade theory, and the expansion in export earnings engendered by currency depreciation may have positively affected economic growth according to the export-led growth hypothesis attributed to Findley (1984) and Krueger (1985).

An examination of the diagnostic statistic reveals that the model has a high goodness of fit as indicated by the coefficient of determination (R-squared) which shows that 99% of the systematic variation in the dependent variable is explained by the regressors. The F-statistic of 222.9 which is highly significant indicates that the explanatory variables are jointly significant in explaining changes in the real GDP. The Durbin-Watson Statistic of approximately 1.9 indicates absence of first order autocorrelation problem.

The interaction term included in the model raises the possibility of the problem of multicollinearity which undermines the reliability of the parameter estimates as it inflates the variances (and hence the standard errors) of the estimates thereby reducing the computed t-ratios leading to erroneous inference on the statistical significance of the affected variables. The estimated model was tested for multicollinearity using the variance inflation factor (VIF) test. The VIF test result is presented in Table 2. The VIFs for log(GFCF) and log(GFCE) are very high, suggestive of problem of multicollinearity. We drop one of these variables – log(GFCF) since it is statistically not significant, and reestimate the model. The result of the estimation is presented in Table 3.

Table 3. Re-estimated Model

Dependent Variable: LOG(RGDP)
Method: Least Squares
Sample (adjusted): 1 21
Included observations: 21 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	18.02291	0.823622	21.88249	0.0000
LOG(ODAA)	0.048454	0.015861	3.054813	0.0080

CPI*LOG(ODAA)	0.000592	0.002134	0.277608	0.7851
LOG(TOPEN)	-0.128564	0.055566	-2.313719	0.0353
LOG(GFCE)	0.269552	0.030731	8.771332	0.0000
LOG(EXRT)	0.142115	0.020340	6.986825	0.0000

R-squared	0.989143	Mean dependent var	25.32694
Adjusted R-squared	0.985524	S.D. dependent var	0.438222
S.E. of regression	0.052725	Akaike info criterion	-2.812492
Sum squared resid	0.041699	Schwarz criterion	-2.514057
Log likelihood	35.53116	Hannan-Quinn criter.	-2.747724
F-statistic	273.3207	Durbin-Watson stat	1.862075
Prob(F-statistic)	0.000000		

Table 4. Multicolinearity Test for Re-Estimated Model

Variable	Centered VIF
C	NA
LOG(ODAA)	3.324219
CPI*LOG(ODAA)	7.848990
LOG(TOPEN)	1.609392
LOG(GFCE)	7.060267
LOG(EXRT)	1.869648

Table 5. Omitted Variables Test

Specification: LOG(RGDP) C LOG(ODAA) CPI*LOG(ODAA) LOG(TOPEN) LOG(GFCE) LOG(EXRT)

Omitted Variables: LOG(GFCF)

	Value	Df		Probability	
t-statistic	0.821664	14	0.4250	F-statistic	0.675131 (1, 14) 0.4250
Likelihood ratio	0.989036	1	0.3200		

We observe that apart from the interaction term, all other variables pass the test of statistical significance. While trade openness variable passes the test at the 5% level, other variables pass the test even at the 1% level. The signs and coefficients of the explanatory variables in the model are similar to those of the explanatory variables in the initial model. Official development assistance and aid positively and significantly affects real GDP. The interaction term for the interaction between corruption and official development assistance and aid is also not significant. Trade openness adversely affects real GDP and its statistical significance in the new model is enhanced as it is now significant at the 5% level. Increases in government consumption expenditure and the exchange rate positively and significantly affect real GDP.

The explanatory power of the model is quite high as nearly 99% of the systematic variation in real GDP is explained by the regressors. The F-statistic of 273.3 indicates that the explanatory variables are jointly significant in the determination of real GDP. The DurbinWatson statistic clearly indicates absence of the problem of positive autocorrelation in the model. The multicollinearity test result shown in Table 4 shows that the there is no problem of serious multicollinearity as all the VIFs are less than 10 (Mela and Kopalle, 2002; Williams, 2015). This is buttressed by the fact that the coefficients of the estimated model (excluding gross fixed capital formation) do not deviate sharply from those of the model including gross fixed capital formation. Moreover, the result of the likelihood ratio (LR) test for omitted variables shown in Table 5 suggests that gross fixed capital formation did not actually make significant contribution to explaining variation in the real GDP within the sample period as indicated by the p-value of the likelihood ratio (LR) which is greater than 0.05. Omitting it from the model does not affect the specification of the model. Thus the result presented in Table is quite reliable and could be deployed for policy purposes.

5. Conclusion and Recommendations

The objective of the paper was to empirically investigate whether corruption affects aid effectiveness (with respect to economic growth) in Nigeria in the period from 1994 to 2014. The ordinary least squares (OLS) estimation technique was used to estimate a linear regression model specified for the purpose. The analysis showed that the effect of official development assistance and aid on real GDP was and statistically significant in tune with the prediction of the two-gap model. It also finds that corruption does not influence the effect of official development assistance and aid on real GDP, hence suggesting as an answer to the question posed in the title of the paper, that corruption does not affect the effect of foreign aid on economic growth. The study found that trade openness adversely affected real GDP. This was attributed to the precarious dependence of Nigeria's economy on imports which have tended to adversely affect the development of the country's industrial and agricultural sectors and employment. Government final consumption expenditure and currency depreciation were positively related to Nigeria's real GDP in the sample period.

In view of the foregoing, we recommend as measures to enhance the growth of Nigeria's economy, intensification of the fight against corruption to ensure that foreign aid is not misappropriated, import control, by restricting imports of commodities that can be sourced or produced locally (a precursor for this would be creating the enabling environment that would encourage local

production); increase in government final consumption expenditure to stimulate economic activities; prevention of unwarranted appreciation of the national currency by government intervention (through the monetary authority) in the foreign exchange market to boost export and curb imports.

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