Foreign Aid, Fiscal Optimality and Economic Growth in Nigeria

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Abstract

The main thrust of this study has been to provide empirical illuminations to the debate on the effectiveness of foreign aid in driving sustainable growth and development. Using an extended Barro style model of aid-augmented government expenditure and economic growth, an analytical model is derived to explain this nexus for Nigeria. To obtain estimates free from endogeneity bias; the methodology adopted for the estimation and empirical analysis is based on the IV-2SLS approach. The result from this exercise well conforms to the argument that foreign aid is indeed instrumental to the growth process of Nigeria. The result for our second objective also validates the conventional debate that the growth effects of foreign aid is in most cases conditional on some "good" macroeconomic policy environment. The implication of our findings is that adequate policy framework and institutional improvement can serve as a veritable path through which foreign aid can most contribute to growth in Nigeria.

Keywords: Foreign Aid, Fiscal Optimality, Economic Growth, IV-2SLS
JEL Classification: F35; H21; O23

1. Introduction

Official development assistance ODA (hereafter foreign aid) represents an important channel through which income and capital is transferred from developed nations to poorer, underdeveloped economies. And indeed both the magnitude and the scope of these international transfers have increased significantly over the last four decades. For example, total flows of foreign aid from members of the OECD countries have increased from about US$3.14 billion in 1961 to over $43 billion in 2015. By that time these funds had come to represent between 5% and 10% of the Gross National Income of the recipient low income countries, and to finance between 20% and 30% of their gross capital formation (WDI, 2016).

However, one of the issues that have captured much of the interest of researchers concerns the role which foreign aid plays in the process of stimulating capital formation and economic growth. This interest and the consequent inquisition to the aid-growth nexus has led to a large but conflicting and inconclusive empirical literature on the link between foreign aid, economic growth, and development (see Easterly 2009). The divergence of the outcome of empirical research in this strand of the literature has been attributed; on the one hand: to the different perceptions and composition of foreign aid, and on the other hand; because of the

methodological difficulties of measuring and identifying the impact of different forms of foreign aid (Puonti, 2010).

One of the first and most influential studies on the aid-growth nexus is that of Burnside and Dollar (2000). The researchers concluded that the divergence of conclusions in the aid-growth nexus can only be explained by the macroeconomic suitability of the recipient country. Thus they concluded that aid only has a positive impact on economic growth in countries with good macro-economic policy. Other researchers have also produced similar findings (for example, Minou and Reddy (2010); Okada & Samreth, 2012).

Hence, despite the disparity in empirical conclusions the growth inducing role of foreign aid; however, there is a general consensus that the potency of the foreign aid in spurring growth is conditioned on some inherent factors of the recipient country, chief among which include the quality and soundness of macroeconomic policy management in the recipient country, institutional quality and the purpose of which the aid is meant for (Arndt, Jones & Tarp 2009).

Sequel to the preceding, this study formalizes these propositions intuitively into twofold objectives; first, the study examines the proposition that foreign aid have significant impacts on economic growth. This proposition has one main corollary: that the impact of foreign aids may vary depending on their objectives and targets. For instance, aids aimed at providing funds for government recurrent expenditure may have immediate felt impact on the economy, while those aimed at providing funds for capital investment are expected to contribute to economic growth, but only in the long term growth trajectory. In this sense, Dijkstra and Kemp (2011) contend that the pitfall of assuming that all aid has the same objective or short-term impact is somewhat questionable and could flaw the outcome of any empirical exercise. Secondly, the proposition that foreign aid works most effectively in a framework optimal fiscal management is investigated.

This paper distinguishes itself from previous studies and thus contributes to the literature as follows; first by examining this nexus for Nigeria in a framework of optimal fiscal management. The intuition for this modeling approach derives from the fact that most aid inflows are often provided for government expenditure, thus an enquiry of this nature is justified. Second, the study proposes an endogenous aid-growth model that follows the calibration of the Barro framework.

In addition to the above contributions, the paper has policy implications in two key areas of interest. First; increasing debate on the conditionalities of foreign aid to developing countries that in most cases hitches on some macroeconomic reforms provides a rationale for this study. Therefore, investigating the effect of aid on investment and growth through fiscal policy channel could provide additional insights into the ongoing debate on policy frameworks needed to maximize the aid-growth linkage. Second, by using comparatively more recent data set (1980-2015) in a single country analysis, we provide an updated account of this nexus in a country specific framework.

The rest of the paper is organized as follows. Section 2 presents a review of the diverging views in the empirical literature. We propose the analytical framework in section 3. The econometric methodology adopted for the empirical analysis is discussed in Section 4. The empirical analysis is covered in Section 5. While section 6 presents the conclusion, implications and caveats derived from the findings.

2. A Review of Literature

The major consensus in the literature is that foreign aid can be a potent instrument through which developed countries can contribute to the development of poor developing countries

(Minou & Reddy, 2010). The flow of foreign aid in the form of financial support, technical support, entrepreneurial training, human capital development and infrastructural development programmes instituted by developed countries in LDCs all support this aim. However, in reality, the actual impact of foreign aid on the progress of developing countries has remained at best questionable. While some studies provide evidence of a positive aid-growth linkage others do not.

Chief among the studies that validate the positive aid-growth linkages include Burnside & Dollar (2000). Burnside & Dollar (2000) which concludes that aid are and even most effective when policies are appealing and conducive. Their study has received abundant credence from latter studies which provide similar findings (for example, Okada & Samreth, 2012). Dalgaard & Erickson (2009) have established robust evidence that aid is beneficial in the short-term; whereas Minou and Reddy (2010) have recently found that the beneficial effect could also be viewed in the long-term especially for aids targeted at capital and infrastructural development. Gong, Zang & Zou (2008) and Asongu & Jellal (2015) have emphasized that development assistance has both a direct effect on welfare and an indirect impact through public spending on social services. The indirect stance has been further consolidated by Upreti (2015) on wellbeing and poverty in recipient countries. Foreign aid has also been found to promote institutions in terms of its role on corruption (Okada & Samreth, 2012) and transition to democracy (Resnick, 2012).

Arndt, Jones and Tarp (2010) examined in detail the above-mentioned methodological problems and devoted a great deal of attention to their solution. Extensive testing led them to conclude that aid has a significant positive impact on economic growth mainly in the *long term*: increasing aid by 10% of the recipient country's GDP results in the economic growth per capita of the population in the long term of more than one percentage point.

While some studies provide enthusiastic empirical evidence for the positive aid-growth linkage, others, have remain largely pessimistic and in most instances at opposing view. Lessmann & Markwardt (2010) found that aid did not have a significant impact on economic growth, but it did have a negative interaction effect: He further argued that fiscal decentralisation has a negative impact on the aid-growth relationship and political decentralisation had no impact. Moyo (2009) also suggested that development aid, and budget support in particular, encourages corruption and has a negative impact on economic development. This conclusion, however, is not based on empirical scrutiny but on a meta-analysis of the available literature. The most poignant argument by this author is an intuitive one, namely that countries should have been much wealthier by now if aid had been used effectively. Dalgaard & Erickson (2009) and Dalgaard & Hansen (2010), similarly, showed that the assumed potential impact of aid is often overestimated and exaggerated. The authors calculated that if all aid in the past 30 years had been used effectively to increase investment, this still would only have led to a per capita increase in income marginally by just 6%-10%.

2.1 A Summary of the Literature

The preceding evidence shows that the analysis in the subject is far from conclusive. We may conclude that there is sufficient empirical evidence for the positive long-term impact of aid on economic growth. It remains difficult to show a positive relationship for the short term, precisely because the correlation between aid and economic growth in the short term seems negative. As pointed out by Roodman (2008) countries receive aid because they are doing poorly economically. Another reason why it is difficult to show an immediate positive impact is that a large share of aid is not aimed at promoting short-term economic growth. In passing, one can inferred that foreign aid transmission is most effective in an environment of fiscal policy optimality and good macroeconomic policy environment.

3. Analytical Framework: Extensions of Barro (1990)

The model adopted for this study is based on an extension of the theoretical proposition developed by the Barro (1990) framework. It is assumed that foreign aid is modeled as an exogenous transfer of income or capital which flows from foreign countries to recipient countries.

It is assume as in Barro's theoretical underpinnings, that productive investments may either be private investments or public investment all of which ultimately have positive effects on output expansion and economic growth. This is stated more explicitly below as in equation *(1)*;

$$y = f(k, g)$$
$$f(k, g) = \phi k^\alpha g^{1-\alpha} \tag{1}$$

Where k is private capital, and g is a composite function that encompasses all productive public expenditure in the domestic economy. This public expenditure is financed by government taxes revenue and an allocation of foreign aid. Hence g can be specified thus;

$$g = \rho f(k, g) + d \tag{2}$$

Where d is the amount of foreign aid which is measured as a proportion of national income and it is assumed to be determined in an exogenous manner, while ρ is a non-negative tax rate indicating the proportion of income that is channeled to the government in form of tax collection.

Asongu & Jellal (2015) provide some slight modification for regarding the characteristics of the participating economic agents. Supposing that government's behavior, and the representative agent is postulated to choose their private consumption path, *c*, and private capital accumulation path, *k*, to maximize their discounted utility, namely,

$$\max \int_0^\infty u(c, g)e^{\beta t} dt$$

Subject to $\qquad\qquad\qquad\qquad\qquad\qquad$ (3)

$$\dot{k}(t) = (1 - \rho)f(k, g) - c + d$$
$$\dot{d}(t) = \delta y(t)$$
$$\dot{g}(t) = \rho y + d(t)$$

Given that $k(0) = k_0$

where $\beta > 0$ is the time discounted rate, ρ is the flat income tax rate, $f(k; g)$ is the output, d is the foreign aid to the representative government for some development project, and $u(c; g)$ is the instantaneous utility function, which is defined on per-capita private consumption c and government expenditure g, δ is the indexation rate of foreign aid as a proportion of national income. This rate is exogenous, fixed and considered as 'given' by national economic agents. These kinds of utility functions and production functions are introduced by Arrow and Kurtz (1970) and used in latter studies by Barro (1990) and Turnovsky (2000), among many others.

To solve the optimization problem, the Hamiltonian function is derived from (3), thus:

$$H[u(.), f(.)] = u(c, g)e^\beta - \lambda[(1 - \rho)f(k, g) - c - d] \tag{4}$$

The first other condition for optimization can simply be obtained by partially differentiating the Hamiltonian function above with respect to c and k, thus;

$$H'(c) = u'(c, g)\beta - \lambda = 0 \qquad (5)$$
$$u'(c, g)\beta = \lambda$$
$$H'(k) = \beta\lambda - \lambda(1 - \rho)f'(k, g) = 0 \qquad (6)$$
$$\beta = (1 - \rho)f'(k, g)$$

Equation (5) is the familiar condition, which means that for the optimizing agent to be in equilibrium, the marginal utility of consumption must equate its marginal utility of private wealth. Similarly, equation (6) is the familiar Euler equation describing the motion of the marginal utility of private capital.

In light of findings by previous literature and the empirical conclusions thereof on effectiveness of aid on growth it can be inferred that the objective of aid donor(s) vis-à-vis recipient countries is the development of projects that stimulates efficiency in the private sector thereby leading to increased productivity and growth. In this sense aid is supposed to be entirely and observably allocated directly to the financing of productive public spending, which can have significant expansionary impacts on domestic productivity. Hence, the role of aid is to provide socio-economic infrastructure which improves private sector effectiveness and efficiency. Building on this premise, it can be established that the equation for budget equilibrium which consist of a given tax rate and foreign aid is given this time by equations 7i and 7ii.

In the steady state, we have the following equations determining the equilibrium values of private capital accumulation and government spending:

$$g = \rho f(k, g) + d \qquad (7i)$$
$$\beta = (1 - \rho)f'(k, g) \qquad (7ii)$$

In 7(i), as foreign aid to the government directly increases government revenues, and accordingly raises government investment expenditure outlay, this will lead to a rising marginal productivity of private capital, and hence, more private output and consumption for a given output tax. At the same time, with more aid to the government, the social-welfare maximizing government lowers its tax rate on private production, and creates further incentive for private savings and investment which ultimately leads to growth in per-capita income.

4.0 Model Specification and Empirical Approach

The principal interest of this study is to examine the impact of foreign aid on economic growth conditional in a framework of optimal fiscal policy. The study also seeks to examine other factors that affect growth and aid flows.

Dalgaard, Hansen and Tarp (2003) noted that while policy and aid both have a direct impact on output growth at different time trajectories, they matter in highly nonlinear fashions, and are mutually intertwined. Accordingly, a reduced form long run output growth can be thought of as being a function $\theta(.)$ of foreign aid d, private investment k, policies p, and various other factors, m such that expression as in equation (8) can be stated thus:

$$y = \theta(d, k, p, m) \qquad (8)$$

Equation 8 is simply a hybrid version of the specification in equation 1 that upgrades to capture typical macroeconomic policies and control factors as is typical in empirical growth equations. Equation 8 can be estimated by transforming it to a log-linear version in which all the variables are expressed in the logarithms and their parameters are denoted as elasticities with respect to the regresand. A first order Taylor's approximation of $\theta(.)$ would then yield linearized parameter terms in $d, k,$ and p along with interaction terms involving d and p which is stated in equation 9 below;

$$y_t = \theta + d_t\theta_1 + k_t\theta_2 + p_t\theta_3 + m_t\theta_4 \tag{9}$$

where t indexes time dimension of the variable, y_t is per capita real GDP growth rate, d_t is aid as a proportion of GDP, while k_t is the private capital investment as a percentage of GDP.

Empirical works by Ferede & Dahlby (2012) is built on this premise. The essential finding is that the marginal impact of aid on per capita output growth seems to diminish as the size of the inflow rises. However, the interaction between policies and aid turns out to be indeterminate. Thus re-specifying 9 to capture the preceding notions gives equations 10 below;

$$y_t = \theta + d_t\theta_1 + k_t\theta_2 + \boldsymbol{M_t}\theta_m + \boldsymbol{Z_t}\theta_z + \Pi\theta_\Pi + \varepsilon_t \tag{10}$$

$\boldsymbol{M_t}$ is a $m \times 1$ vector of macroeconomic policy variables that affect economic growth, $\boldsymbol{Z_t}$ is a $z \times 1$ vector of fiscal management and institutional and governance indicators that are capable of affecting growth. The term $\Pi\theta_\Pi$ captures the interaction of aid with some policy measures and institutional factors of which fiscal optimality is included and the resultant effect on economic growth and finally ε_t is the *typical* stochastic error term.

Recent empirical growth literature provides guidance concerning the institutional factors and economic policies that affect growth, and we follow this literature in building up the baseline regression specification. The general strategy is to account for a range of institutional and policy frameworks that can help to explain the growth performance of an aid recipient country like Nigeria as well as to ensure that any inferences drawn about the relationship between foreign aid and growth are robust.

4.1 Econometric Approach

Apparently, equation 10 can be estimated using the ordinary least squares (OLS) method. However, past empirical studies argue that such estimate may likely suffer from the flaws of simultaneity and endogeneity bias[1]. Hence, the study utilizes two separate approaches ranging from the Ordinary Least Squares (OLS) and the Two Stage Least Squares (2SLS). The interpretation and discussion of result is based on the result obtained for the 2SLS.

The study adopts a Two-Stage Least Squares (2SLS) Instrumental Variable (IV) estimation strategy based on twofold justifications: first the empirical strategy is consistent with the problem statement and also addresses the issue of endogeneity that may be inherent in the model. The adopted IV procedure is in accordance with recent foreign aid and development

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[1] Suspicion of the possible correlation between the error term and the coefficient of foreign aid is most justified by the fact the foreign aid often times respond to growth outcomes in developing countries experiencing poor growth. In this sense, economic growth performance influence foreign aid, and then in turn foreign aid influences growth. However, the direction of this correlation is not obvious. The error terms would have a negative correlation to the extent that donors respond to negative growth shocks by providing more assistance. But there are plausible reasons why the errors may have a positive correlation. One conclusion of earlier studies and our own work is that aid is not given only for developmental purposes; it may serve the strategic or commercial interests of donors. In that case a country enjoying a commodity boom, or any positive shock to growth, may receive special favor from some donors, introducing a positive correlation between the error terms (Burnside and Dollar, 2000).

literature. The purpose of adopting an IV approach is to have some bite on endogeneity. Moreover, the line of inquiry is consistent with an IV technique essentially because, the study aims to assess how foreign aid instruments affects growth through mechanisms of fiscal behaviour (see, Asongu & Nwachukwu, 2016; Asongu & Tchamyou, 2015).

4.2 Constructing an Optimal Fiscal Policy Index

The exercise of constructing an optimality fiscal policy management index has been that of intuitive calibration. In a somewhat simplistic though credible fashion it can be thought of as government financing of its spending in the most cost effective manner given its available resource and foreign aid constrain. In this sense, the optimal fiscal policy management problem thus becomes the issue of choosing such a tax rate that balances the received aid and maximizes the representative consumer's utility and private firm return taking into account the government budget constraint.

Thus the question before us is: what ρ (tax rate) should the government pick? The solution to this question is explicated in equation: the government must pick a ρ that satisfies directly and indirectly (7i) and (7ii) respectively.

5.0 Empirical Results

5.1 Aid Transfers and Growth Regression Results

The key issue in this study focuses on investigating the impact of foreign aid on economic growth with particular interest on the interplay of fiscal optimality. Teko and Nkote (2014) Dalgaard and Hansen (2003) use different estimation method, different specification and different dataset and reported diverging results and hence concluded that the dissimilarity in result in the aid-growth relation may be more of an empirical question.

Table 4 reports the result for the aid-growth equation. Specifications 1 and 2 are the OLS and 2SLS regression for the single variables model without interaction, while specification 3 and 4 include the interaction term of foreign aid with some policy and institutional variables.

The R-squared and the adjusted R-squared for the different specifications indicate that the model is well explained in it's the different versions specified. The F-statistic for the models also shows significant overall impacts of the regressors on the dependent variable. The Durbin-Watson (D-W) statistic reported for the OLS and the 2SLS indicates absence of the serial correlation in the model. This result is supported by the B-G LM test for serial correlation in the model, though the non-interactive 2SLS specification indicates some slight serial correlation.

The test for instrument orthogonality suggests that the instruments are independent of the regressors. While the B-P heteroscedasticity test reports evidence showing that the variance of the estimated errors are constant.

The result that is reported in Table 1 and the accompanying relevant model diagnostic test suggest that the explanatory variables including aid are uncorrelated with the error term in the growth equation. Again testing for the exogeneity of aid using the J-difference statistic in the 2SLS estimators, we obtained a test statistic with a p-value of 0.12. The results from the model diagnostic and evaluation tests provide evidence on the reliability of the estimated parameters and thus we can reasonably rely on this results.

Notice that the regression result for the 2SLS estimates is broadly consistent with its OLS counterpart. In particular the coefficients of the variables in the 2SLS result retain the same magnitudes and sign as that in the OLS result; however they lose significance in the 2SLS regression. One reason for this may be that we have difficulty maintaining instrument

relevance when there are more endogenous variables in the regression equation. The variables in the aid-allocation regression equation are same as that that in the aid-growth equation with some dummy for explaining military regime and democratic era impacts on aid allocation.

Table 1: Aid-Growth Equation

Specifications Regressors	1 OLS	2 2SLS	3 OLS	4 2SLS
Constant	7.5736** (0.0000)	7.7832** (0.0000)	6.0635** (0.0000)	6.8234 (0.0751)
Foreign Aid (AID)	0.0662* (0.0756)	0.0360* (0.0560)	0.0322 (0.3041)	0.0077 (0.9305)
Capital Stock	0.291*** (0.0000)	0.311*** (0.0000)	0.415*** (0.0090)	0.533** (0.0184)
Trade Openness	-0.137** (0.0243)	--0.2246** (0.2395)	-0.228*** (0.0008)	-0.5218 (0.4026)
Govt. Expenditure	0.0722** (0.1279)	0.1842* (0.0967)	0.1821** (0.0128)	0.1979 (0.3793)
Exchange Rate	0.079*** (0.0001)	0.108*** (0.0008)	0.114*** (0.0002)	0.2053 (0.1403)
Fiscal Optimality (FO)	0.162*** (0.0000)	0.135** (0.0399)		
Institutional Qlty. (INS)	0.2325 (0.3642)	0.5652 (0.5378)	0.3210** (0.0240)	0.2079 (0.9349)
AID-squared	0.0026 (0.1157)	0.0016 (0.5762)	0.5249 (0.2989)	0.0842* (0.0502)
AID*FO			-1.6288 (0.2885)	6.0544 (0.7359)
AID*INS			0.9885* (0.0694)	1.4795 (0.9265)
AID-squared*FO			0.4100 (0.0259)	-0.1623 (0.9585)
AID-squared*INS			0.8714 (0.8099)	-0.0890 (0.9557)
R-squared	0.9192	0.8950	0.8714	0.6730
Adj. R-squared	0.8943	0.8615	0.8099	0.5095
F-stats.	36.995*** (0.0000)	28.074*** (0.0000)	14.174*** (0.0000)	5.808*** (0.0002)
D-W Stats.	1.9231	1.6859	1.9082	1.9302
J-stats Orthogonality Test		**(0.1251)**		**(0.0855)***
B-G LM Serial Correlation Test	**(0.4209)**	**(0.0716)***	**(0.2395)**	**(0.0468)****
B-P Heteroscedasticity Test	**(0.1230)**	**(0.2450)**	**(0.6923)**	**(0.1526)**

Note: ***, ** and * denote significance at 1%, 5% and 10% respectively.

5.2 Discussion of Results

From the two specification and two estimation methods utilizing for the empirical analysis in this study, some significant evidence on the aid-growth can be inferred. In particular the regressions in the four specifications report a seemingly homogenous and consistently positive aid growth nexus. This result indeed lends credence to that suggested by Puonti (2010) suggesting the positive long-run aid-growth impacts. Specifically, the estimate indicates that raising the aid/GDP ratio by one percentage point raises the real GDP per capita growth rate by a range of positive values as indicated across the four specifications. However, the relative magnitude of the value is statistically insignificant.

Interestingly, the result conforms to the theoretical proposition earlier discussed in section three of this study. Hence, the instrumentality or relevance of foreign aid contributing to the positive growth effects on real GDP per-capita could be explained by the fact that development assistance reduces the tax effort of the government which provides additional incentives for private investment (either in terms of reinvested profits or improvements in the investment climate) and thereby leading to overall growth in the economy. This explanation can also be extended to imply that increased formation of fixed capital provided by aid assistance that leads to increased efficiency in production and expansion in output Asongu and Jellal (2015).

On the overall the parameter estimates for foreign aid which is the variable of utmost interest and the theoretically motivated variables are correctly signed and thus confirming theoretical expectations and empirical regularities from of previous studies.

Expectedly, evidence from the parameter estimate of gross fixed capital formation as a ratio of GDP indicates a positive and significant effect on economic growth in Nigeria. In shows that capital formation in the economy has a positive and statistically significant impact on economic growth. This result conforms to the theorizing of the endogenous growth theory and the Cobb-Douglas formulation linking capital directly with output growth. The result also lends credence to that obtained by Adode, (2011) and Upreti (2015). A comparison between the relative effectiveness of the magnitude of the parameter estimate of GFCF and foreign aid on growth reveals that GFCF has a more robust impact on economic growth and thus contributes more impressively to growth than aid in Nigeria.

The result for trade openness turns out to assume a strong negative value indicating a negative interplay between trade openness and GDP growth. Thus, suggesting that increase in trade openness does not lead to the expected outcome. This result is puzzling and in fact negates the popular proposition of the classical trade theorist. However, recent empirical studies using more realistic dataset have pointed to some of the growth inhibiting features of trade especially for less developing countries (LDCs) with poor industrial capacities.

Interestingly, other variables in the model have the theoretical stipulated and the intuitively expected sign though with varying magnitude and significance. For instance, the result for government expenditure lends credence to the popular theorizing of the growth inducing role of government expenditure on economic growth. Finally, the result for exchange rate

suggests a slightly marginal effect on GDP per capita growth; as shown in the value of the estimated parameter. Similar result is also obtained for exchange rate thus creating room for inference to be drawn as to the channel through which exchange rate may affect growth.

Fiscal optimality has strong positive impact on growth in the non-interactive regression equation. In essence the result points to the fact that proper fiscal management and allocation is indeed growth inducing for the economy. The result obtained for fiscal optimality indicates that optimal fiscal policy contributes positively to economic growth. In fact the result suggests a robust and strong impact of optimal fiscal policy on economic growth. Indeed this gives credence to the fact that given the definition of optimal fiscal policy utilized for this study, economic growth will be most significant at the point at which government expenditure is most efficiently allocate.

It turns out that the significance of the squared-aid term is only significant in the set of interaction regression. Some insight can be gained from this result. Since the aid-squared term retains the positive value as in the non-squared aid variable it can be asserted that foreign aid has a linear and consistently positive effect on growth in Nigeria.

Turning to the institutional quality as shown in the result offers some pattern of relationship that is theoretically expected. The outcome of the estimation for institutional quality as entered in the regression equation clearly affirms the Burnside and Dollar (2002) conclusion. However, the result only connotes a weak linkage between institutional quality and economic growth. The evidence for this institutional factor is not surprising given the fact that similar conclusion has been made in the literature. For instance, Dalgaard and Hansen (2003)) explains that institutional quality provides a sound environment for economic activities to thrive. These authors posit that the absence of strong institutions to effectively manage government affairs and curtail rent seeking is crucial for long-term sustainable growth and development.

5.3 Foreign Aid Interaction with Optimal Fiscal Policy and Institutional Variables

The regression of the interaction of foreign aid and squared aid with optimal fiscal policy, corruption, institutional quality is presented in models 3 and 4 respectively. The regression result shows that the growth outcome of the interaction between foreign aid and fiscal optimality is positive but insignificant. This result well supports the evidence put forward by Burnside and Dollar, (2000). Similar result is also obtained for the interaction between foreign aid and optimal fiscal policy, hence, it can asserted that the plausibility of the aid-growth nexus is most pronounced and robust in an environment where aid is administered with optimal fiscal policy. The interaction of the squared-aid term also turns out to be positive and significant. The non-significance of the parameter estimates confirms the fact that the fiscal process in Nigeria is still sub-optimal and thus the full impact from its interaction with foreign aid may be is low. Similarly, the fact aid inflow makes up a negligible proportion of the Nigerian GDP also supports the result in this study.

The interactive term of foreign aid and institutional quality as well as that for the aid-squared and institutional quality are both positive however, their significance is only evincing for the parameter estimate of the aid-squared term.

5.4 Explaining the Determinants of Foreign Aid

A major aspect that has received considerable attention in the aid-growth literature has been on explaining the factors that encourages aid allocation and inflow to developing countries. This in particular concerns the conditionalities that are often tied to aid by donor countries and agencies. In the sense that the allocation or provision of aid may be conditioned on the fulfillment of some institutional and policy criteria Eubank (2012). This has led most empirical studies to almost always estimate an aid allocation equation where some theoretically conceived or intuitively justified variables are included (Teko and Nkote 2014). In line with this popular practice, this study also estimates an aid-allocation equation for Nigeria using the OLS and 2SLS.

The result of the aid allocation regression provides some informative evidences that are sufficient for drawing implications for this study. The result depicts a negative but non-significant interplay between aid and government expenditure. It shows that the provision of foreign aid responds only weakly to government fiscal expenditure in Nigeria. Thus it can be stated that the inflow of aid is independent of the fiscal policy outlook of the country.

Puonti (2010) and Abbott and Rwirahira (2012) have posited that the provision of foreign to developing countries is in most cases less responsive to fiscal shocks, but more on the fulfillment of prescribed pre-requisites. Hence, though fluctuations in government fiscal expenditure may inhibit aid allocation to Nigeria, its potency in affecting aid is weak and not of significant magnitude.

As expected exchange rate and trade openness have positive parameter estimates in the aid equation. The implication of this result strongly points to the aid-conditionality argument posited by Puonti (2015). Thus it can be inferred that aid inflow to Nigeria, is quite dependent on trade reforms that are pro-liberalization.

A key question that has formed the central focus of aid is "does aid allocation and inflow favour good policies". The next set of explanatory variables explicates the explanation for this question for Nigeria. Beginning with fiscal optimality, we find evidence indicating a positive impact of optimal fiscal policy on aid inflow. The results for institutional quality for the OLS and 2SLS report consistently positive parameter estimates. While the OLS reports some negative result the 2SLS offers result negative effects. The result for corruption well conforms to the intuitive assertion that foreign aid is firmly conditional on some threshold level of accountability. The parameter estimate for corruption index indicates that reducing corruption by significantly increases the allocation of foreign aid to Nigeria.

Table 2: Aid Allocation Regression Results

Regressors	Model 1 OLS	Model 2 2SLS	Model 3 OLS	Model 4 2SLS
Constant	-3.6585*** [0.0066]	-4.3400 [0.2967]	-2.7307** [0.0375]	-3.2280 [0.4714]
Govt. Expenditure	-0.2139 [0.2249]	-0.3908 [0.3570]	-0.2139 [0.2249]	-0.3983 [0.3500]
Exchange Rate	0.2849** [0.016]	0.0513* [0.7690]	0.2849*** [0.0000]	0.0524 [0.7810]
Trade Openness	0.3393 [0.1278]	1.5303 [0.2174]	0.3393 [0.1278]	1.5355 [0.2438]
Fiscal Optimality (FO)	0.0803 [0.4757]	0.5808 [0.3711]	0.0803 (0.4757)	0.5878 (0.3833)
Institutional Quality	-0.8109 (0.4060)	0.1301 (0.9806)	-0.8109 [0.4060]	0.1364 (0.9805)
Corruption Index (CO)	-0.3663*** (0.0000)	-0.2873 (0.3461)	-0.3663*** (0.0000)	-0.2812 (0.3636)
Military Regime	0.6873*** (0.0000)	0.7011*** (0.0076)		
Democratic Era			-0.9277*** (0.0000)	-0.8067*** (0.0064)
R-squared	**0.9331**	**0.8299**	**0.9331**	**0.8272**
Adj. R-squared	**0.9158**	**0.7842**	**0.9158**	**0.7807**
Durbin Watson Test	**1.7268**	**2.1026**	**1.7268**	**2.0946**
B-G Autocorrelation Test	**0.4643 (0.6339)**	**5.1364 (0.0767)**	**0.4643 (0.621)**	**5.3444 (0.0691)**
EC-Heteroscedasticity Test	**0.8476 (0.5586)**	**0.8464 (0.5599)**	**0.8476 (0.5586)**	**0.8164 (0.5821)**

Note: ***, ** and * denote significance at 1%, 5% and 10% respectively.

Finally, the study prods further to examine if the allocation of aid to Nigeria has favoured either the military regime or the democratic dispensation in Nigeria using dummy proxies. The result provides some rather surprising evidence that contrast sharply with the generally intuitive view. The result shows that military regime attracted significantly positive aid inflow while the reverse is the case for the democratic dispensation. This result is very intriguing, however the credibility of the result can be explained by the fact that aid inflow to Nigeria has traditionally favoured regimes that pursue liberalization policies. And this was the case during the implementation of the Structural Adjustment Program (SAP) in the military regime of 1986 to the early and mid-1990s.

6. Conclusion, Implications and Caveats

The quest for rapid and sustainable growth and development remains at the top agenda of governments of developing and developed countries as well as international development organizations. Hence, several development assistance and palliatives has become a key conduit through which developed countries and international development agencies provided development assistance to developing countries. The main thrust of this paper has been two fold; first, to empirically investigate the contribution of foreign aid to economic growth in Nigeria; second to examine policy and institutional factors conducive for the growth inducing role of aid with particular emphasis on fiscal optimality.

In an attempt to provide some illuminating insights on the aid-growth literature, the fundamental question addressed in this research concerns first on the effect of foreign aid on growth and second on the outcome of the interaction between foreign aid and fiscal optimality on economic growth. In addition, the study also examines the interaction between foreign aid and some institutional factors. In passing, to avoid the pitfall of model misspecification bias some of the variables that conventionally enter growth equations such as that utilized for this study are included. Similarly, to avoid endogeneity which have been well discussed in the literature, the estimation is done primarily with the aid of an IV-2SLS framework.

On the overall, the result from the estimations and empirical analysis lends credence to the theoretical stipulations and the general empirical regularities and conclusions in the literature. In particular, the study finds that foreign aid impacts economic growth positively though negligibly. We also find that the interaction between foreign aid with our fiscal optimality measure and other factors results in positive but weak linkage with growth. This latter result indicates that the impact of foreign aid on economic growth in Nigeria is systematically conditioned on some factors among which include the quality of policies, the policy climate and even more so on the quality of institutions.

The implication of our findings is that adequate policy framework and institutional improvement can serve as a veritable path through which foreign aid can most contribute to growth in Nigeria. It can also be inferred that foreign aid from donor countries should also insist on some basic key policy reform requirements and compliance for Nigeria to meet in order to access foreign aid. Again, the proper utilization and allocation of aid receipt for developmental projects can indeed be of immense benefit to Nigeria.

Finally, as a caveat, it is pertinent to note that the marginal growth effects of foreign aid may intuitively be attributed to the fact that foreign aid in Nigeria constitutes less than 10 per cent of the real GDP and as such may not have a telling impact on growth. This result should not blur the already agnostic conclusions in the literature; but should be explained by the fact that foreign aid will more robustly impact GDP growth rate in countries with more foreign aid as a proportion of their GDP. However, disentangling the channels through which aid matters seems to be a crucial research topic that can generate some insightful information in the future.

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