Development Assistance, Economic Growth Revisited: A Country Specific Analysis

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Abstract: Evidence abound that developing countries are unable to meet the capital investment requirements of their economies and tend to rely on development assistance to fill this deficit. However, the extent to which these augmented funds propel the desired economic growth and development is plagued with both theoretical and empirical uncertainty.

This paper presents a Ghanaian perspective to the long existing development assistance and economic growth argument.

Autoregressive Distributive Lag- ARDL model is used to estimate short and long run impacts of development assistance on economic growth for periods spanning from 1970 to 2014.

The results of which indicates official development has a significant positive effect on economic growth in the short run but an insignificant effect in the long run. The long run impact of official development assistance on economic growth was also found not to experience decreasing returns to scale.

Keywords: Official Development Assistance, Economic Growth, Autoregressive Distributive Lag

I. INTRODUCTION

The effectiveness of development assistance to transit capital scarce economies to sustained levels of needed economic growth is an issue that continues to be contended in the aid-growth nexus. Notable criticism of aid ineffectiveness to propel the intended economic growth, since the inception of aid about some six decades ago are captured in the scholarly works of Mosley et al (1992), Friedman (1958), Collier (2007), Easterly (2003) and Easterly (2006).

The overwhelming arguments from the critics of aid-growth nexus, contend that, recipients of aid mainly countries in Sub-Saharan Africa despite the huge volumes of aid allocated, little economic growth is achieved. Reasons for the dis-link is largely attributed to the fungibility of aid, the use of funds for consumption rather than productive investment ventures, development assistance mainly driven by donors' interest "center, peripheral exploitation" rather than recipient countries' need for development assistance, aid is also said to breed corruptions and fiscal indiscipline and discourages home grown reforms to raise wealth.

Other body of literature notably Malaluan and Guttal, (2003) further the arguments of development assistance beyond its ineffectiveness to achieve growth, as an identified cause of the rising levels of inequality and poverty in recipient countries, given the dependence of capital scarce economies to development assistance and the volatility and unpredictability in the flow of the volumes of assistance to resource scarce economies.

In contrast to the views of the critics of aid-growth arguments, other scholarly studies that analyze the economic growth in resource scarce economies with and without development assistance reveal economic growth in resource scarce economies will have been lower in the absence of development assistance. It attributes the seemingly poor performance of Sub-Saharan countries to bad governance, poor policy regimes, natural and structural problems, and political expediency to allow for market reforms (ECA, 2005).

A. TRENDS AND VOLUME OF DEVELOPMENT ASSISTANCE FLOW TO GHANA

Ghana is taunted as one of the few countries in Africa and Sub-Saharan African countries where development assistance has had a positive impact on.

The flow of development assistance to Ghana generally is classified into; periods preceding Structural Adjustment Programme-SAP, period of Structural Adjustment Programme implementation and period from 2001 to date under Poverty Reduction Strategy Papers - PRSPs programmes.

The volume of official development assistance to the country was at its all-time lowest in the period preceding the SAP- an annual average of about US$ 10 million dollars. This increased by about fivefold in the period of SAP and further increased by about twofold in the period of PRSPs Programme - from an average annual flow of US$ 500 million to US$ 1.2 billion.
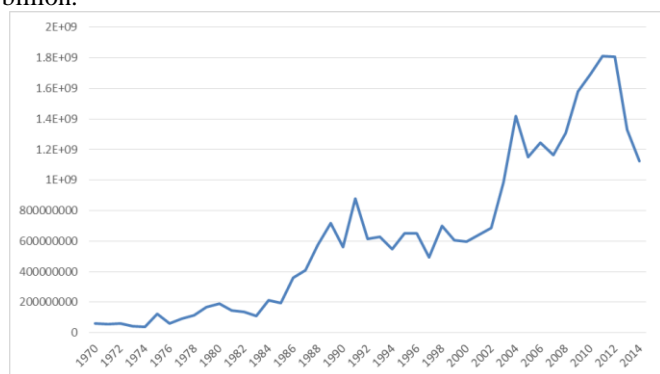
Source: World Economic Indicator, 2017

Figure 1.1: Net Volume of ODA and Aid Flow to Ghana (Current US$)

Source: World Economic Indicator, 2017

Figure 1.2: Share of ODA to Capital Formation and Gross National Income

Unlike the volume of development assistance to the economy that increased on average of a fivefold from periods preceding SAP and further increased by a twofold from period of SAP to PRSPs, the share volume of development assistance as a percentage of capital formation in the economy increased on average by a one and half fold. Thus from 43.20% to

60.98% during periods preceding SAP and periods of SAP. The share of development assistance to capital formation declined significantly by a twofold in the PRSPs from the SAP periods- from 60.98 percent during SAP to 30.43 percent under PRSPs.

The share of development assistance to gross national income increased from an annual average of 2.99 percent during periods preceding SAP to 9.07 percent during SAP- representing about a threefold and declined to 7.59 percent during PRSPs.

The overarching impact of the volume of development assistance on capital formation and gross national income follows a different trend from the volume of development assistance flow to the country.

II. SELECTED THEORIES OF DEVELOPMENT ASSISTANCE GROWTH NEXUS

A. TWO GAP THEORY

Theoretical advancement for the disbursement of development assistance to resource scarce countries is to help fill savings and trade gap- Chenry and Strout (1966) describe this phenomenon as the "two gap theory".

The latter gap is considered as more constraining than the former gap, in that an unequal availability of capital for imports- for domestic production and exchange earnings constrains both imports (trade) and the levels of savings that will otherwise be realized which inhibits economic growth.

Resource scarce economies therefore require development assistance to improve exchange earnings and savings to propel growth.

The dual gaps are derived using Keynesian model of injections and leakages approach to national income accounting.

The dual gap framework is an expansion of the earlier works of Harrod-Domar's economic theory, which posits that the spur of economic growth or otherwise in resource scarce economies depend largely on the level of accumulated domestic capital stock and the productivity of capital investment- incremental capital output ratio (ICOR).

The two-gap model has suffered severe criticism from scholarly works of Easterly as being too simplistic to represent the growth process, and dwells on capital accumulation as the surest means to economic growth and development.

B. THE "BIG-PUSH" MODEL ON FOREIGN AID EFFECTIVENESS

The "Big-push" model as postulated earlier by Rosenstein- Rodan and recently by Jeffery Sachs. The theory like the two gap theory assumes resource scarce economies persistent stagnation in poverty and low economic prospects is because of the inability of such economies to raise sufficient savings to propel both micro and macroeconomic level growth- poverty trap and financing gap.

Proponents of the theory argue that economic growth is driven by investment and investment only suffices in an

economy where economic agents have incomes beyond their survival. However, this is not the case in resource scarce economies, economic agents in such countries commit almost all of their income for survival to the neglect of pursuance of growth. Additional inflow such as development assistance is required to bridge the large financing gap between capital investment needed and actual capital provided to ultimately propel economic growth (Sachs, 2005).

C. DEVELOPMENT ASSISTANCE FUNGIBILITY AND DISPLACEMENT HYPOTHESIS MODEL

Growing literature both theoretically and empirically on why development assistance have not yielded the intended economic growth largely points to the fact that, recipient countries appropriate and displace aid funds to areas and projects unintended by donors.

Development assistance fungibility and displacement hypothesis is estimated using three systems of equations propounded by Borcherding and Deacon, (1972) and Bergstrom and Goodman (1973).

The model comprises; non-development current expenditures, development expenditures, and revenues.

The non-development current account expenditure equation is expressed as;

$$CE_t = f(GDP_t,\ \text{ODA}_t) \qquad (a)$$

Where;

CE_t is per capita non-development current expenditure, in year t

GDP_t is per capita gross domestic product, in year t

ODA_t is all categorical development (project) assistance per capita

Positive and significant coefficient in the value of ODA depicts a diversion of development assistance to non-development expenditure. This will be in line with the negative evaluation of categorical or project development assistance prevalent in the literature (Singer, 1965)

Under development expenditures, spending in each category are determined by;

$$D_{i,t} = g(GDP_t,\ \text{ODA}_{i,t},\ \text{OODA}_{j,t},\ T) \qquad (b)$$

Where;

$D_{i,t}$ is the current expenditure per capita category i in year t

$\text{ODA}_{i,t}$ is development assistance per capita designated for expenditure category i

$\text{OODA}_{j,t}$ is all other categorical development assistance to sectors other than i, i.e., total development assistance minus ODA_i

T indicates the year. Time is included to capture the possibility that development expenditure may benefit from scale economies or learning by doing, resulting in smaller nominal expenditures for a given quantity of real services.

A significant positive coefficient in ODA_i shows that own development assistance utilized in i has a significant impact on expenditure category i. Also a significant positive coefficient in ODA_j indicates diversion from other development assistance categories. The fungibility of development assistance depends on both the effect of own development assistance and other development assistance on each of the expenditure categories.

The last equation- government revenue equation is given as;

$$R_t = h(Oil_t,\ Non-oil_t,\ \text{ODA}_t) \qquad (c)$$

Where;

R_t is revenue, excluding development assistance

Oil and Non-oil levels of gross product accounted for by these productive sectors

When development assistance declines domestic mobilized revenue, the coefficient of ODA will be negative. This undermines the purpose of categorical development assistance, demonstrating a reduction in local effort to collect revenue and hence incapacity to fund government projects and programmmes in a non-inflationary way.

Combining the three equations provides the given government constraint function;

$$CE_t + D_t = R_{t+}\text{ODA}_t \qquad (d)$$

The budget constraint function in (d) above indicates the three equations from the two proponents are non-exclusive, which also implies that the error terms are also non-exclusive.

III. STUDY METHODOLOGY

Autoregressive Distributed Lag- ARDL model is employed to assess the impact official development assistance on economic growth on an annual basis for periods spanning from 1970 to 2014. Both short and long terms of the impact of development assistance are measured.

Empirical and theoretical assertion that an increase in the volume of development assistance causes economic growth to decrease return to scale is tested for.

A. MODEL SPECIFICATION FOR TEST OF STATIONARITY

The dataset was tested for existence of stationarity or non-existence of unit root for each of the study variables using Augmented Dicky-Fuller and Phillips Perron test. Both methods are selected to complement each other due to the seemingly inherent weakness associated with each of them.

The null hypothesis to be tested is "there exist unit root (non-stationarity)" against the alternative "there exist no unit root (stationarity)" expressed mathematically as;

$$H_0 : \beta = 0$$

$$H_1 : \beta \neq 0$$

If the t-statistic value in absolute terms is greater than the critical value, the null hypothesis is rejected and the alternative hypothesis is failed to be rejected that the data series therefore is said to be stationary. Conversely, when the computed t-statistics is less than the t-critical value in absolute terms, the null hypothesis is failed to be rejected that the data series is non-stationary.

The rule of thumb is that none of the data series should be stationary beyond first difference I(1), which implies all data series should be either stationary at level- I(0) or at first difference I(1).

Augmented Dicky-Fuller model of unit test is specified mathematically

as; $\quad \Delta Z_t = \beta + \delta_t + \phi Z_{t-1} + \sum_{i=1}^{s} \varpi \Delta Z_{t-1} + \varepsilon_t - - - - - (1)$

Where Z_t represents the data series at period t, Δ is the first difference variable, β, δ, ϕ and ϖ are parameters to be estimated and ε is the error term.

B. ARDL MODEL SPECIFICATION

An estimation model of long run relationship - co-integration between development assistance and economic growth is specified in equation (1) below. The null hypothesis there is no long-run relationship (that is no co-integration) is tested against the alternative hypothesis there exist long-run relationship (co-integration). The hypothesis to be tested is specified as;

$H_0 : \beta_i = \beta_{i+1} = \beta_{i+2} = \beta_{i+3} = 0$ (no long-run relationship)

Against the alternative hypothesis

$H_1 : \beta_i = \beta_{i+1} = \beta_{i+2} = \beta_{i+3} \neq 0$ (a long-run relationship exist)

$\Delta \ln GDPGI_t = \alpha_0 + \sum_{i=1}^{p} \delta_i \Delta \ln GDPG_{t-i} + \sum_{j=1}^{q} \Omega_j \Delta \ln ODA_{t-j} + \sum_{k=1}^{r} \square_k \Delta \ln CF_{t-k} + \sum_{m=1}^{s} \vartheta_m \Delta \ln ODA_{t-m}^2$
$+ \delta_i \ln GDPG_{t-1} + \Omega_j \ln ODA_{t-1} + \square_k \ln CF_{t-1} + \vartheta_m \ln ODA_{t-1}^2$
$- (2)$

The ARDL short run and speed of adjustment (Vector Error Correction Model) is specified mathematically as;

$\Delta \ln GDPGI_t = \alpha_0 + \sum_{i=1}^{p} \delta_i \Delta \ln GDPG_{t-i} + \sum_{j=1}^{q} \Omega_j \Delta \ln ODA_{t-j} + \sum_{k=1}^{r} \square_k \Delta \ln CF_{t-k} + \sum_{m=1}^{s} \vartheta_m \Delta \ln ODA_{t-m}^2$
$+ \sigma_z ECT_{(-1)} + \varepsilon_t - - - - (3)$

The long run ARDL is specified as follows;

$GDPGI_t = \beta_0 + \beta_1 \ln GDPG_t + \beta_2 \ln ODA_t + \beta_3 \ln CF + \beta_4 \ln ODA_t^2 + \varepsilon_t - - (4)$

Where $\ln$ denotes the natural logarithm, *GDPG* Real GDP per capita, ODA net official development assistance, ODA^2 is decreasing returns to scale of official development assistance, CF is capital formation and.

IV. ANALYSES AND RESULTS

The test of stationarity in table 1 below shows none of the study variables is at second difference- I(2), all of the variables are stationary at first difference at 1% and 5% significance level in both Augmented Dick-Fuller and Phillip's Perron unit root test .

Hypothesis 1: *HO: non-stationary (unit root)*

Variable	ADF test statistics with Intercept				P-P test statistics with Intercept			
	Level		1ST Difference		Level		1ST Difference	
	t-stats	P-value	t-stats	P-value	t-stats	P-value	t-stats	P-value
LN_GDPI	-0.06	0.9477	-6.97***	0.0000**	0.24	0.9721	-7.06**	0.0000*
LN_ODA	-1.45	0.5496	-9.39***	0.0000**	-1.40	0.5761	-9.42**	0.0000*
LN_CF	0.07	0.9601	-6.88***	0.0000**	0.36	0.9790	-6.93**	0.0000*
LN_ODA^2	-2.59	0.1024	-9.39***	0.0000**	-2.07	0.2551	-9.47**	0.0000*

Source: Student Computation, E-views 9

Table 1: Unit Root Test of Research Variables

Having determined from table 4 above that at most each of the variables of study is at first difference, the paper proceeds to estimate in table 2 below whether variables measuring the impact of official development on economic growth are cointegrated.

Test Statistic	Value	Df	P-value	Lower Bound	Upper Bound
F-Statistic	4.543042	(5, 26)	0.0041	2.649	3.805
Chi-Square	22.71521	5	0.0004		

Source: Student Computation, E-views 9

Table 2: Results of Bound Test of Cointegration for Impact of ODA on Economic Growth

The results from table 2 above, reveals a long- run relationship (co-integration) exists between development assistance and economic growth. Since the F—value of 4.543 is greater the upper bound value of 3.805. The results therefore allows for the estimation of long-run and short-run vector error correction model for the impact of official development assistance on economic growth.

Dependent variable: Δ (LN_GDPG)				
Variables	**Coefficients**	**Standard Error**	**t-statistic**	**P-Value**
Constant	0.007119	0.002739	2.598760	0.0144
D(LN_GDPG(-1))	5.123308	2.291391	2.235894	0.0329*
D(LN_GDPG(-2))	0.140512	2.395674	0.058652	0.9536
D(LN_ODA(-1))	0.005666	0.006068	0.933706	0.3579
D(LN_ODA(-2))	0.014757	0.005975	2.469676	0.0194**
D(LN_ODA^2(-1))	-0.392263	0.077319	-5.073326	0.0000**
D(LN_ODA^2(-2))	-0.118789	0.090773	-1.308632	0.2006
D(LN_CF(-1))	-0.257226	0.114910	-2.238504	0.0328*
D(LN_CF(-2))	-0.019313	0.119502	-0.161613	0.8727
ECT(-1)	-3.873714	1.320180	-2.934231	0.0064**
	R-squared	0.698009	Mean dependent var	0.004842
	Adj. R-squared	0.550613	S.D. dependent var	0.013512
	S.E. of regression	0.010016	Akaike info criterion	-6.134407
	Log likelihood	140.8226	Hannan-Quinn criter.	-5.952429
	F-statistic	4.057144	Durbin-Watson stat	1.623387
	Prob(F-statistic)	0.001100		

Source: Eviews 9.0 Computation

*** and * represent 1%, and 5% level of significance, respectively*

Table 3: Vector Error Correction Model Estimate

The results of the Vector Error Correction Model in table 3 above reveals that in the short run, official development assistance impacts on economic growth in the second period at a 1% level of significance. A percentage increase in official development assistance results in an increase in economic growth by 5.60% in the second period. Capital formation was found to have a negative impact on economic growth in the first period lag at 5% significance level. A percentage increase in capital formation in the short run first lag results in a decline in economic growth by 25.72%

The Error Correction Term (ECT) was found from the estimation to be negative statistically. The negative sign of the ECT confirms further the existence of long run relationship between the variables of study. The coefficient of ECT which denotes the speed of adjustment back to equilibrium in the successive year upon a distortion in equilibrium economic growth rate is by 387.37%. This signifies a high speed of adjustment.

Dependent variable: Δ (LN_GDPG)				
Variables	Coefficients	Std. Error	t-statistic	P-Value
Constant	2.048257	0.021473	95.38907	0.0000
LN_ODA	0.000986	0.001066	0.924394	0.3608
LN_ODA^2	-0.001001	0.005587	-0.179134	0.8587

LN_CF	0.046365	0.000817	56.75437	0.0000*
R-squared	0.999226	Mean dependent var		3.029527
Adjusted R-squared	0.999148	S.D. dependent var		0.063249
S.E. of regression	0.001846	Akaike info criterion		-9.647050
Sum squared resid	0.000136	Schwarz criterion		-9.446310
Log likelihood	222.0586	Hannan-Quinn criter.		-9.572216
F-statistic	12902.10	Durbin-Watson stat		0.594840
		Prob(F-statistic)		0.000000

Source: Eviews 9.0 Computation
*** and * represent 1%, and 5% level of significance, respectively*
Table 4: Estimated Long- run Coefficients from ARDL Model

The results of the long run ARDL estimation in table found an insignificant impact of official development assistance on economic growth at both 1% and 5% significant levels. The relationship between official development assistance on economic growth in the ARDL long run estimation was found not to exhibit a decreasing return to scale. However, capital formation was found to have a positive significant impact on economic growth in the long run. A percentage increase in capital formation leads to a 43.75% increase in economic growth.

V. CONCLUSION

The impact of official development assistance on economic growth in a country specific analysis-Ghana, the results of which suggest development assistance is growth promoting in the short run but insignificant in the long run. Assertions in development assistance economic growth nexus that economic growth decreases to return to scale when the volume of development assistance increases could not be ascertained in the long run estimations.

Though the long run impact of development assistance on economic growth was found to be insignificant, the non-exhibition of decreasing to scale impact of development assistance on economic growth suggest a greater potential for a long run significant economic growth given an increase in the quantum of development assistance.

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