Foreign Aid, Domestic Revenue and Economic Growth in Ghana

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Abstract
Various funding sources are available to any government in a developing country. In spite of their availability, each source has its unique way of contributing to economic growth. The objective of this study is to determine the relationship between foreign aid and domestic revenue on one hand and their effect on economic growth in Ghana. Using macroeconomic time series data (for 1970 – 2011) and error correction methodology together with Granger causality tests, the results show that, domestic revenue and foreign aid complement each other for development financing. Moreover, foreign aid cannot be a substitute for domestic revenue generation as domestic revenue is the most important between the two factors. Domestic revenue is the most effective irrespective of the existence of other forms of capital. In addition, the threshold effect of aid becomes non-existent when there is no capital accumulation. There is a positive causal link from both domestic revenue and foreign aid to economic growth. It is recommended that, more attention should be given to the generation of domestic revenue.
Key Words: Foreign Aid, Domestic Revenue, Economic Growth, Error Correction Model, Ghana

1.0   Introduction

Over the years, the quest to improve economic growth and reduce poverty has taken centre stage in most developing countries. This requires massive expenditure, with resources obtained from external loans, grants and domestic resource mobilisation. Available data shows that, the flow of capital in Ghana has continually increased. The expectation is that, the increasing financial resources would translate into enhanced economic growth and poverty reduction. However, this expectation is not met and Ghana has not experience accelerated economic growth. This raises the question of how has external aid, Foreign Direct Investment (FDI) and domestic resources contributed to enhanced economic growth and poverty reduction in Ghana? It is against this background that this study investigates the external aid financing of economic growth in the Ghanaian context.

Despite the improvements in economic performance, Ghana continuous to be confronted with a number of constraints, including levels of savings and investment that are low to fuel the growth needed to raise living standards, reduce poverty and generate sufficient productive employment, in other words, for self-sustained growth. Among the sources of funding available are foreign aid and domestic revenue. An understanding of aid and domestic revenue patterns, and how they are related to economic growth and poverty reduction is thus, one of the key elements of policy that fosters development of low income countries such as Ghana. The broad objective of this study is to empirically estimate the impact of foreign aid and domestic revenue on economic growth in Ghana. Specifically, this is to: identify whether Ghana's receipt of aid has significant effect on economic growth; determine the role of domestic revenue in output enhancement; and determine whether or not the flow of aid influences domestic revenue generation. The rest of the paper is organised as follows. The background of foreign aid, domestic revenue and economic growth are in section two. Section three contains the methodology and model specification. The data analysis and results are in section four while the conclusion is in section five.

2.0   Background Issues

After many years of development assistance to developing countries, there is evidence that millions live on less than US$1 per day as extreme poverty and others on US$2 per day, which is estimated to be about 40% of the world's population (UNDP, 2007). In addition to the inability to reduce poverty, economic growth in Sub-Saharan Africa for instance has not seen much acceleration. The earlier view that low savings or low capital formation is the cause of the start of vicious cycle of poverty and low growth is thus questionable. Given these conditions, how has aid impacted on economic growth in Ghana is vital for domestic revenue mobilisation and growth. The economic growth rate of Ghana since independence has been fluctuating, from 1970 to 1983 (see Figure 1). Basically, this period witnessed negative growth rates over the history of Ghana. Ironically, the negative growth rates coincided with military interventions in governance in the country. From 1979, the growth rate in the country started to decline until the intervention of the SAP. Since the establishment of the SAP, Ghana has recorded positive growth rates till date. However, the positive trend has been relatively stable but not

accelerating, to lead to massive poverty reduction (see Figure 1 below). It is therefore necessary for Ghana to intensify effort to improve upon the fairly stable growth rate.

Figure 1: Real GDP Growth Rates of Ghana
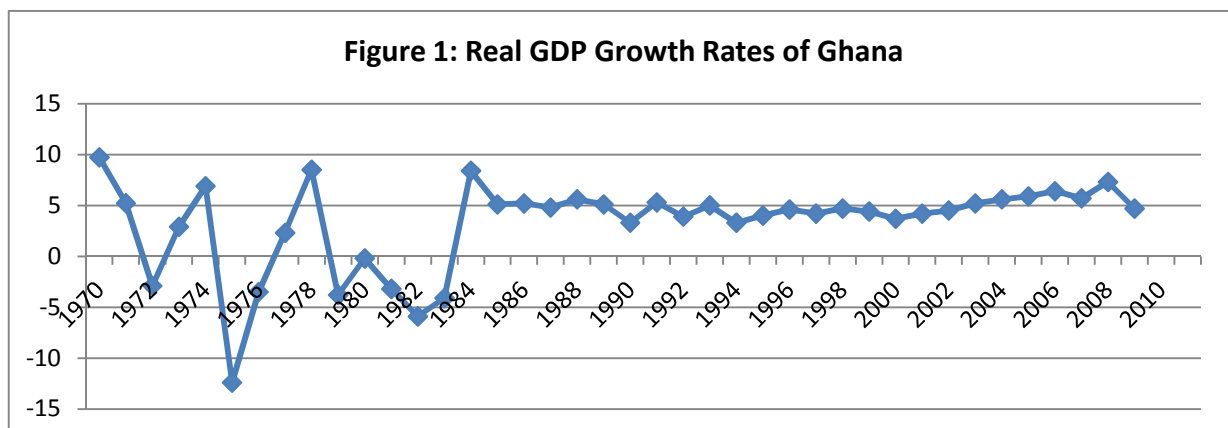
In a similar way, domestic revenue has not seen massive growth, although there is an upward trend. It is observed that, there were large swings in the growth of domestic revenue generation from 1970 to 1980 (see Figure 2). The low revenue resources during the early periods of the 1980s are an indication of the general decline in the Ghanaian economy. At the same period, there were low aid flows to Ghana. With the advent of the SAP, the growth of domestic revenue picked up and the trend has been positive since then. But this needs to accelerate in order to enhance public expenditure. Also, after the SAP, aid has improved in magnitude, but it is below that of domestic revenue. This is expected as aid is supposed to complement domestic resources but not become the main source of a country's financing. Comparatively, the uncertainty about aid flows is clearly seen in Ghana as there are fluctuations even after the SAP. Thus, it is expected that, the larger the gap between domestic revenue and aid, the more the effort required to generate more domestic revenue.

Figure 2: Trend of Aid and Domestic Revenue As Percentage of GDP
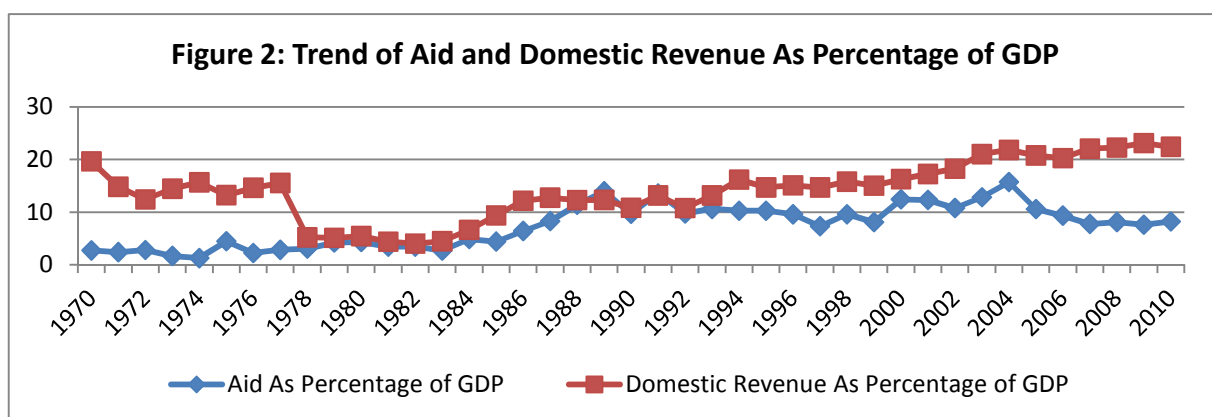
Historically, Ghana has extensively depended on both domestic and foreign financing for her expenditure purposes. The corresponding impact of these elements for achieving accelerated economic growth and poverty reduction is important. Therefore, it is prudent to investigate how financing of public expenditure – foreign aid (grants) and domestic revenue generation could be done optimally to help reduce poverty in Ghana.

3.0   Literature Review
The relationship between foreign aid and economic growth has been studied for over three decades. These studies have concentrated on micro and macro levels with varying results. While some of the studies have found direct positive relationship, others propose non-linear relationship. In the same vain, the numerous studies have been undertaken with different methods. Also, the studies have generally looked at the effectiveness of aid through its effect on fiscal policy on one hand and the impact of aid on economic growth on the other. These differences warrant country specific study, relatively on macro-level to ascertain the impact of foreign aid on economic growth.
The results of the previous studies have provided varied positive impact. Burnside and Dollar (2000) by

incorporating aid-policy interaction in their model found non-linear relationship. For them, foreign aid contributes to economic growth so long as there is existence of good policy environment while Doucouliagos and Paldam (2008) shows aid has no optimism for growth. In a similar way, Hadjimichael et al. (1995), Durbarry et al. (1998) and Lensink and White (2001) found that there is a threshold effect of aid on growth. In other words, aid exhibits a decreasing returns impact on output growth. Mosley (1987) found positive effect of aid at the micro level but not at the macro, a situation termed as micro-macro paradox. The effectiveness of aid on growth is premised on three main channels: aid increases domestic investment, aid increases aggregate savings in the recipient countries and aid improves growth with some conditions (such as capital accumulation led growth, good policy environment, etc). Earlier studies such as that of Boone (1996) showed that aid has no impact on either investment or growth when viewed from neo-classical growth paradigm. That study was specified as linear. On the other hand, other studies have results which contradict that of Boone. Studies such as Hadjimichael et al. (1995), Burnside and Dollar (2000) and Lensink and White (2001) modeled their growth model as non-linear as well as specifying foreign aid as a fraction of GDP. In spite of these similarities among non-linear specifications, Boone included aid as an interactive term while others incorporated aid and its square as explanatory variables. In addition, there have been criticisms about the methodology used. Bivariate Granger causality tests such as in Dhakel et al. (1996) failed to establish any causal link between the two macroeconomic variables. Contrary to the above studies, those who found positive link of aid to growth include Levy (1988), Murty et al. (1994) and Grounder (2001). There have been issues raised about the endogeneity of aid flows as emanating from good macroeconomic policy of recipient countries, income level of donor countries, etc. But evidence shows that there are uncertainties surrounding aid flows including global financial and oil crisis, economic changes in donor countries, etc. These among others have interrupted a consistent determination of aid flows. Based on these, aid is treated as exogenous in this study.

3.1 Conceptual Framework and Model Specification

Recent aid literature centres on two competing models: a) the Good Policy Model, where the key feature is policy interaction with aid (i.e. conditional on good policy), and b) the Medicine Model, where aid is squared (Jensen and Paldam, 2006). This study is situated within the medicine model, basically because the policy environment does not seems to be a major concern unlike the absorptive capacity of aid as evidenced by Foster and Killick (2006), and Chowdhury and McKinley (2007). The medicine model reflects the fact that, there can be a direct effect from aid to growth as well as acting through capital accumulation (Herzer and Morrissey, 2011), and savings and investment (Hadjimichael et at, 1995; Hansen and Tarp, 2000, 2001). This non-linear theory presents three scenarios:

- The case of positive (increasing) effect of foreign aid on growth;
- The case of maximum effect of foreign aid on output-optimal threshold; and
- The case of decreasing effect of foreign aid on growth.

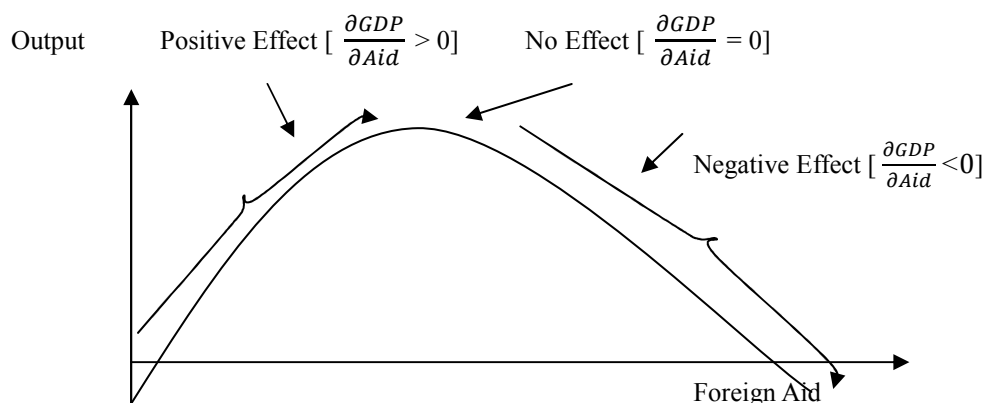These cases present an inverted U-shape curve called Aid Laffer curve (Figure 3).

Output   Positive Effect [$\frac{\partial GDP}{\partial Aid} > 0$]   No Effect [$\frac{\partial GDP}{\partial Aid} = 0$]

Negative Effect [$\frac{\partial GDP}{\partial Aid} < 0$]

Foreign Aid

Figure 3: Graph of Aid Laffer Curve

There is a general need for an initial foreign capital to supplement domestic savings and revenue. Thus, in theory, below a certain threshold, acquisition of foreign capital is a spur to growth. This is referred to as the Stimulus View. It argues that, with correct levels of aid resources, investment, employment and consumption, economic growth would be stimulated. It is assumed that, this level of accumulation is helpful and serves as a catalyst to growth. This positive relationship between aid and growth is based on the fact that, the new foreign capitals in the form of grants afford the recipient country the ability to import critical capital goods and improve investment to enhance

growth. In the context of the theoretical underpinnings of the non-linear relationship, some reasons have been put forward. For instance, the non-linear impact of aid on growth according to Lensink and White is due to the existence of and inappropriate use of technology with institutional weaknesses. For Durbarry et al. capacity constraints and elements of Dutch disease of aid are reasons while Hadjimichael et al. relate the non-linearity to recipient country's weak absorptive capacity problems.

Theoretically, domestic revenue raised through mainly taxes would have a non-linear relationship with economic growth. The other component of domestic resources mobilisation is non-tax sources. The relative magnitude of these in revenue, the rate of increase of tax rates, the mix of direct and indirect taxes, the size of the tax base and how the tax base is expanding would determine whether non-linear effect of domestic revenue is possible. For this study, the non-linear consideration is ignored based on a number of reasons. Firstly, for Ghana, tax rates are marginally reduced or maintained through annual government budgets statements. Secondly, tax structure and base are continually diversified and thirdly annual targets of revenue generation are exceeded. This to a large extent indicates that, non-linear tax rates can be ignored.

In addition to aid and domestic revenue variables, a number of other variables are included as control variables. The growth model estimated is standard according to literature. The control variables included traditional factors of production: labour force (LF), gross capital formation (GCF) and human capital development (H) expected to be positively related to economic growth; macroeconomic stability captured by inflation (IF) and the external sector represented by openness (trade intensity-OP) indicating trade policy (Javid and Qayyum, 2011). The macroeconomic variables of concern are real GDP growth rate (ẏ), foreign aid (A) and domestic revenue (DR). Using secondary data on Ghana specific case and empirical literature, an econometric model is built to help appreciate foreign aid and domestic revenue interaction and effect on output growth. The empirical model is derived from the theoretical and empirical formulations. The objectives of the study are considered by using least square estimation and Granger causality tests. Thus, the growth model becomes:

$$\dot{y}_t = \alpha_0 + \alpha_1 (LF)_t + \alpha_2 (GCF)_t + \alpha_3 (H)_t + \alpha_4 (A)_t + \alpha_5 (A)^2_t + \alpha_6 (OP)_t + \alpha_7 (IF)_t + \alpha_8 DR_t + \alpha_9 Dum_t + \varepsilon$$

$$\dots (1)$$

where α_i are the coefficients and ε is the error term.

Note:

$\dot{y}$: Real GDP growth rate (source-Ghana Statistical Service, 2012)

LF: Labour force growth rate (source-Ghana Statistical Service, 2012); GCF: Gross capital formation as percentage of GDP (World Development Indicators, 2012); A: Foreign Aid as percentage of GDP (source-Bank of Ghana, 2010 and World Development Indicators, 2012); DR: Domestic Revenue as percentage of GDP; H: Public education expenditure as a percentage of GDP (source-ISSER, Ghana Statistical Service, 2012); OP: Level of openness (source- World Development Indicators, 2012); IF: Inflation rate (source-ISSER, various issues and Bank of Ghana, 2012); Dum: Form of governance and institutions. The dummy takes the value of 1 for all years in which there were democratically elected government and the value of zero for any other year.

4.0   Data Analysis and Results

The secondary data for the study is sourced from Bank of Ghana, Ghana Statistical Service and World Development Indicators, covering the period 1970 to 2011. Generally, the time series variables are weighted by GDP. The essence of regression analysis is to estimate short and/or long term economic relationships. Such analyses are to test theoretical economic postulations. But recent developments in econometrics reveal the need to ascertain the stationarity of time series properties. The general view is that, all variables should be stationary

at the same order of integration before estimation is undertaken (Adam, 1992 and Egwaikhide, 1997).

Unit root tests were performed. This was done using two recent improvements in the unit roots tests: Augmented Dickey-Fuller and the Elliott-Rothenberg-Stock DF-GLS tests. The results of these tests are presented in Table 1. Two main approaches are used to ascertain cointegration in the study. These are the two-step Engle-Granger (1987) approach and Johansen method. This allows for a distinction to be made between the short and long runs. If the growth rate, external aid, domestic revenue and other control variables are integrated of order 1, then in order to ensure stationarity, the dependent variable should be expressed as a first difference, Δy_t. When all variables are I(1), and they are co-integrated, then non-stationarity is not an issue (Jenkins, 1998: pp. 42).

Table 1: Unit Root Test Results

	DF-GLS Test		**Augmented Dickey-Fuller Test**	
Variables	**DF-GLS Statistic**	**Comment**	**Augmented DF Statistic**	**Comment**
Δy	3.36	I(0)	-7.27	I(0)
LF	-1.80	I(1)	-2.58	I(1)
ΔLF	-2.24	I(0)	-8.23	I(0)
GCF	-0.48	I(1)	-0.65	I(1)
ΔGCF	-7.19	I(0)	-7.32	I(0)
H	-2.38	I(0)	-2.36	I(1)
ΔH	-5.49	I(0)	-5.59	I(0)
A	-1.58	I(1)	-1.92	I(1)
ΔA	-8.81	I(0)	-8.76	I(0)
DR	-1.11	I(1)	-1.15	I(1)
ΔDR	-2.61	I(0)	-6.39	I(0)
IF	-2.11	I(0)	-2.58	I(1)
ΔIF	-11.07	I(0)	-8.23	I(0)
OP	-0.94	I(1)	-0.94	I(1)
ΔOP	-6.06	I(0)	-6.90	I(0)
	The critical values for the DF-GLS are -2.65 (for 1%), -1.94 (for 5%) and -1.61 (for 10%)		The critical values for the Augmented DF test are -3.60 (for 1%); -2.93 (for 5%) and -2.60 (for 10%)	

It can be noted from Table 1 that, the first difference of the variables are all significant at 1% level implying that they are stationary at first difference. This gives way for cointegration test to be performed, ensuring that there is a long run relationship between the dependent variable on one hand and the independent variables on the other. The cointegration tests were performed using two main approaches: the Engle-Granger and the Johansen cointegration tests. The Engle-Granger cointegration test was based on the error term extracted after estimating the long run static model in equation 1. If the unit root test on the error terms from the static model is stationary, there is cointegration, which indicates that the model can be estimated in first difference.

The Engle-Granger two step cointegration test was applied along side the Johansen cointegration test. From Table 2, the unit root test conducted on the error term extracted from the long run static model shows stationarity, even at conventional levels of 1% and 5%. This indicates that, there is long run relationship among the variables of the economic growth model.

Table 2: Engle – Granger Cointegration Test Results

Lag Length: 5 (Automatic based on SIC, MAXLAG=9)							
Null Hypothesis: ECT has a unit root		**Exogenous Assumptions**					
		Constant		**Constant, Linear Trend**		**None**	
		t-Statistic	**Prob.**	**t-Statistic**	**Prob.**	**t-statistic**	**Prob.**
Augmented Dickey-Fuller test statistic		-3.9645	0.0044	-3.9314	0.0214	-4.0286	0.0002
Test critical values:	1% level	-3.6394		-4.2528		-2.6347	
	5% level	-2.9511		-3.5484		-1.9510	
	10% level	-2.6143		-3.2070		-1.6109	
*MacKinnon (1996) one-sided p-values							

The Johansen cointegration test summary was carried out and the results are presented in the Table 3 below. With various assumptions experimented about the variables, there is at least one cointegration relationship among the variables. It is noted that, with the trace statistics, there is cointegration irrespective of the test type. On the other hand, the Maximum-Eigen Values show cointegration for the variables.

Table 3: Johansen Cointegration Test Results

Selected (0.05 level*) Number of Cointegrating Relations by Model					
Data Trend:	**None**	**None**	**Linear**	**Linear**	**Quadratic**
Test Type	No Intercept	Intercept	Intercept	Intercept	Intercept
	No Trend	No Trend	No Trend	Trend	Trend
Trace	2	3	3	3	4
Max-Eig	2	2	2	1	1
*Critical values based on MacKinnon-Haug-Michelis (1999)					

Having established cointegration[1], the study estimated an encompassing parsimonious model. Given this situation, then a dynamic model of growth can be built by creating an 'error correction' term (ECT) which reflects the convergence of GDP growth on its long run equilibrium path. Along with the contemporaneous values of the explanatory variables, their lagged values were also added as separate variables. Equally, the lagged values of the dependent variable were included. This is based on the fact that, some of the variables have impact both in the current and future periods. Their effects transcend beyond one period. An arbitrary lag length of three was initially used. The insignificant variables were eliminated by using the standard Akaike and Scharwz Information Criteria. This is a "General-to-Specific" approach. The coefficient of ECT measures the speed with which GDP growth converges on its long run equilibrium. It is expected to be a) negative; b) less than unity and c) statistically significant. The other variables in the equation will be those which capture or determine GDP growth in the short run. Changes in GDP growth will thus be a function not only of current changes in the independent variables, but also of the cumulative effect of lagged changes in all the variables and the adjustment of total GDP towards its long-run equilibrium path (indicated by the error correction term). The general form of the error correction model of growth can be given as:

$$\Delta \dot{y}_t = \alpha_0 + \sum_{i=0}^{n-1} \alpha_1 \Delta LF_{t-i} + \sum_{i=0}^{n-1} \alpha_2 \Delta GCF_{t-i} + \sum_{i=0}^{n-1} \alpha_3 \Delta H_{t-i} + \sum_{i=0}^{n-1} \alpha_4 \Delta A_{t-i} + \sum_{i=0}^{n-1} \alpha_5 \Delta A_{t-i}^2$$

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[1] Two series are cointegrated if they never drift apart from each other, that is, they maintain equilibrium. That is a linear function of the two is I(0), stationary

$$+ \sum_{i=0}^{n-1} \alpha_6 \Delta OP_{t-i} + \sum_{i=0}^{n-1} \alpha_7 \Delta IF_{t-i} + \sum_{i=0}^{n-1} \alpha_8 \Delta DR_{t-i} + \alpha_9 Dum_t + \alpha_{10} ECT_{-1} + v_t$$

The error correction model captures the short run dynamic as well as long run properties of the economic growth model. This is because, it includes variables both in levels (i.e., error correction term, dummy) and differences (of all other explanatory variables). Therefore, the model can be estimated with Least Square method since all the variables included in the model are stationary. By applying the general-to-specific methodology, the parsimonious error correction model results are presented in Table 4 below.

Table 4: Results of the Short Run Models of Economic Growth

Variables	Coefficients of Short Run Models			
	General Model	Model Without Foreign Aid	Model Without Domestic Revenue	Model Without Both Domestic Revenue and Foreign Aid
	(i)	(ii)	(iii)	(iv)
Constant	0.10 (1.14)	0.63 (1.71)	0.10 (1.19)	0.510 (2.56)
Foreign Aid	0.57 (2.40)b		0.59 (2.23)b	
Foreign Aid Square	-0.007 (-2.16)		-0.007 (-1.40)	
Domestic Revenue	0.65 (3.05)b	0.39 (2.41)b		
Inflation	0.03 (2.23)b	0.036 (199)a	0.03 (1.92)a	0.03 (1.86)a
Gross Capital Formation	0.57 (3.70)c	0.45 (2.27)c	0.40 (1.96)c	0.50 (2.52)c
Human Capital Development	0.58 (4.73)c	0.42 (2.97)c	0.70 (1.85)a	0.13 (2.66)c
Labour Force	0.35 (1.39)c	0.23 (1.18)b	0.20 (1.54)a	0.29 (1.37)a
Openness	0.14 (2.73)c	0.09 (1.37)c	0.07 (1.88)	0.11 (1.71)c
Dummy	0.45 (1.48)	0.33 (1.10)	0.56 (1.4)	0.21 (1.99)
Error Correction Term	-0.23 (-6.71)a	-0.54 (-3.09)	-0.59 (1.5)a	-0.59 (-3.39)
Adjusted R-Sq.	0.74	0.64	0.63	0.61
Prob (F-Statistic)	0.00	0.00	0.00	0.00

Note: t-statistics in parenthesis; a, b, and c are lags 1, 2 and 3 respectively

The general model demonstrates the impact of foreign grants and domestic revenue as postulated by theory. Foreign grants show a nonlinear effect on economic growth. The level variable is positive while its square gives a negative effect (equation i). This shows that, GDP growth initially increases as aid increases but falls after some point. The combined effect indicates that, increasing acquisition of foreign aid has a threshold in its contribution to output growth. Thus, given the results, aid threshold is estimated to be 40.7% of GDP. This is attested to by other studies such as Chowdhury and McKinley (2007). Domestic revenue also has a positive relationship with output growth. When the marginal diminishing effect of aid is dropped, the level variables indicate that, domestic revenue contribution to output growth far outweighs the contribution of foreign grants.

When domestic revenue alone is excluded from the model, the impact of aid is marginally increased (see equation iii) compared with the general model. This is because government investment largely depends on domestic revenue. In spite of the fact that government of Ghana receives about 25% of budget support through grants, domestic revenue while directly contributing to GDP also indirectly enhances the effect of money received from abroad. Without the support of domestic revenue, grants may not be enough to undertake major development activities. Also, without the inclusion of domestic revenue, the diminishing effect of aid becomes non-existent over the study period. In addition, there is marginal change in the coefficient of aid when domestic revenue is excluded (and when the level variable of aid alone is used), indicating that without domestic revenue, there will be no problem with large amount of aid coming into the country. Thus, controlling for domestic revenue, the diminishing effect of aid does not apply in Ghana over the study period (as it is insignificant). Without the inclusion of foreign aid, domestic revenue still maintained a positive effect on growth. The coefficient of domestic revenue reduced from 0.65 to 0.39 in the case where there is aid and where there is no aid respectively. This implies that, the two financing components of government funding are complementary to each

other. This together with earlier results shows that, domestic revenue is a necessary source of funding for public investment and development. At the extreme, domestic revenue could be substituted for aid but not vice versa over an extended period.

The behaviour of the control variables are discussed via the inclusion and exclusion of the two main sources of funding-grants and domestic revenue (equations ii and iii). The effect of inflation on growth was positive in all the different versions of the model. Ironically, there was no much difference in the magnitude of the coefficients but was relatively significant in the general model. These results show that, the price levels have not reached a point that would hamper economic growth. Gross capital formation produced marked difference in the results in the two cases. In the presence of the two funding sources, the coefficient was 0.57 but reduced to 0.13 when the two variables of concern were excluded. This is indicative of the fact that, it serves as one of the major sources of capital accumulation when there is no domestic revenue and foreign grants. Human capital development also maintained positive relationship in the models as expected. Unlike inflation, its impact reduced from the case where aid and revenue were included to the case where they were excluded (i.e. from 0.58 to 0.13). In this situation, it can be deduced that, domestic revenue and aid help to improve human capital development in the form of accessible quality education and providing health care services on affordable basis. Notably, Ghana spends quite an amount of resources on human capital development subsector.

The expected positive impact of labour force on output growth was revealed. The impact reduced from the case where the two variables were included to where they were not included. This may be due to the condition that, labour becomes useful when capital accumulation constraints are non existent. In addition, there were marginal changes in the contribution of trade intensity from 0.14 to 0.11. This may be due to the fact that, there is limited link between trade openness on one hand and the receipt of foreign grants and domestic revenue generation on the other. The objective of the study was also analysed from the perspective of Granger causality tests. The unconditional pair-wise Granger causality tests results among foreign aid, domestic revenue and economic growth are given in Table 5 below.

Table 5: Pairwise Granger Causality Tests

Null Hypothesis, Ho	F-Statistics	Probability	Decision
A does not Granger Cause GDP	3.4077	0.017	Reject Ho
GDP does not Granger Cause A	1.009	0.432	Accept Ho
DR does not Granger Cause GDP	4.543	0.004	Reject Ho
GDP does not Granger Cause DR	2.741	0.041	Reject Ho
DR does not Granger Cause A	0.546	0.739	Accept Ho
A does not Granger Cause DR	2.006	0.112	Accept Ho

It is observed that, foreign aid Granger causes GDP growth. This shows that at 5% significant level, aid helps GDP to grow. On the other hand, the hypothesis that GDP growth does not Granger cause A is accepted. These show and confirm that, aid is given to recipient countries to help enhance GDP growth. Aid is given to improve capital accumulation, complement human capacity, etc. In addition, there is a positive correlation between GDP growth and foreign aid, of a value of 0.36.   The causal link between domestic revenue and GDP is intuitive. It is noted that, there is bi-causality between the two variables. At 1% significant level, domestic revenue Granger causes GDP, while at 5%, GDP growth Granger causes domestic revenue. Thus, there is a stronger causal link from domestic revenue to GDP growth. As more revenue is raised, government obtains more resources which can enhance GDP growth. It also becomes advantageous to raise more revenue when GDP growth is increasing.

Theoretically, domestic revenue generation is not supposed to influence the flow of foreign aid (except under conditions of matching funds). This is confirmed in the Granger causality test. It is noted that, both hypothesis are accepted: domestic revenue does not Granger causes foreign aid flow and vice versa. In Ghana's case, foreign aid has mostly come to complement government budget. According to MOFEP (2009), annual foreign aid budget support to Ghana in the 2000s has been around 25%. Even in the case of matching funds, domestic revenue has to be raised. Domestic revenue seems more significant in determining the growth of GDP in Ghana relative to foreign grants. In the context of magnitude, in the budget, the proportion of external funding in the annual budget average 25%, indicating the remaining 75% of the funding is generated domestically. In this case, assuming that each unit of foreign and domestic funding yields the same impact on output, then domestic revenue would generate much larger contribution to GDP growth over time.

5.0   Conclusion

Various funding sources are available to any government in a developing country. In spite of their availability, each source has its unique way of contributing to economic growth. External debt accumulation has over the

years been problematic for developing countries. On the other hand, domestic revenue and foreign grants seem to be funding sources that do not have immediate negative effect on output growth. This formed the basis for this study. The results show that, domestic revenue and grants complement each other for development financing. Moreover, grants cannot be a substitute for domestic revenue generation as domestic revenue is the most important between the two factors. It was also noted that, when there are various forms of capital accumulation, the threshold level of aid is pushed higher but aid becomes very effective in the absence of capital accumulation. In addition, the threshold effect of aid becomes non-existent when there is no capital accumulation. Domestic revenue on the other hand is effective irrespective of whether there is capital accumulation or not.

Also, it is noted that, domestic revenue and foreign aid are not well related over the study period. In other words, the flow of foreign aid does not depend on whether there is enough domestic revenue or not. Contrary to this, there is a causal link from both domestic revenue and foreign aid to economic growth. Moreover, both domestic revenue and foreign aid have positive impact on economic growth. Given institutions and absorptive capacity, there seem to be a threshold effect of aid on economic growth in Ghana. It is concluded that, both domestic revenue and foreign aid are important for enhancing economic growth, but more attention should be given to the generation of domestic revenue. However, these results should be taken with caution as issues of corruption and mismanagement of fund are critical in the use of funds.

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