The Impact of Foreign Aid on Economic Growth of East African Countries

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Abstract

In this paper, we employ panel data methods, namely Pooled OLS, Random Effects, and Fixed Effects, to examine the impact of foreign aid on economic growth of East African countries over the period of 1985 to 2010. The results suggest that foreign aid has significant negative influence on economic growth for these countries. This calls for further studies to investigate the possible channels through which foreign aid can have positive influence on growth.

Keywords: EAC countries, Foreign aid, Panel data approach

1. Introduction

Foreign aid is believed to directly encourage or at any rate influence economic development of the recipient country. A number of studies to assess the impact of foreign aid in promoting economic growth of recipient countries have been undertaken. The results of these studies are varying broadly across methods and countries and generate mixed results. For example, Hansen and Tap (2001), Karas (2006), Astreriou (2009), Minoiu and Reddy (2010) provide evidence that foreign aid have positive impact on growth. Aitken et al. (1997), Adam and O'Connell (1999), Burke and Ahmadi-Esfahani (2006), and Carden (2009) find evidence for insignificant and even negative role of aid on growth. Burnside and Dollar (2000), Collier and Hoeffler (2004), Easterly et al.(2004) and Alfaro et al.(2004) provide evidence that positive role of aid on growth can be realized only when certain conditions such as good macroeconomic environment, political stability and less corruption exist.

Foreign aid is important for supplementing domestic resources thereby relieving domestic savings and foreign exchange constraints. Ekanayake and Chatrna (2010) indicated that the main role of foreign aid in simulating economic growth is to supplement to domestic finance and thus increasing investment and capital stock.

Theory of gap analysis assumes foreign aid to play complementary role to domestic resources by filling the gap of foreign exchange constraint. This allows them to undertake new investments and ultimately raising the rate of economic growth. From this basis, when developing countries fail to fully utilize their domestic resources due to balance of payment deficits, foreign aid disbursement serves to fill the gap and thus allowing them to fully utilize their resources. Contrary to this view, there are evidence that associate foreign aid flow with negative effects. Some of these evidences reveal that aid can results into crowding-out effect on domestic savings and creating political tumors in recipient countries.

The main beneficiaries of aid are in Africa. Statistics shows that between 2000 and 2008, aid flows to sub-Saharan Africa increased from $12bn to $36bn per year. Some countries in Africa depend heavily on aid (DR Congo 21.3%, Ethiopia 21.7%, Burundi 24.4%, Mauritania 30.6%, Eritrea 30.8%, Sierra Leone 47%, and Mozambique 60.2%). The contribution of aid to their GDP is of such an extent that the countries would be in difficulty situation or even collapse if the foreign the aid to stop.

This paper use panel data from five economies of EAC member countries to examine the impact of foreign aid to these countries. The appropriateness of this analysis lies on the commonality of these countries in terms of their geographical layout, political background and economic structures.

The rest of the paper is organized as follows: section 2 presents the overview of EAC countries economic performance; section 3 presents the review of literature; section 4 describes the methodology for the study and data sources; Section 5 presents the empirical results and finally section 6 presents is the summary and conclusion for the study.
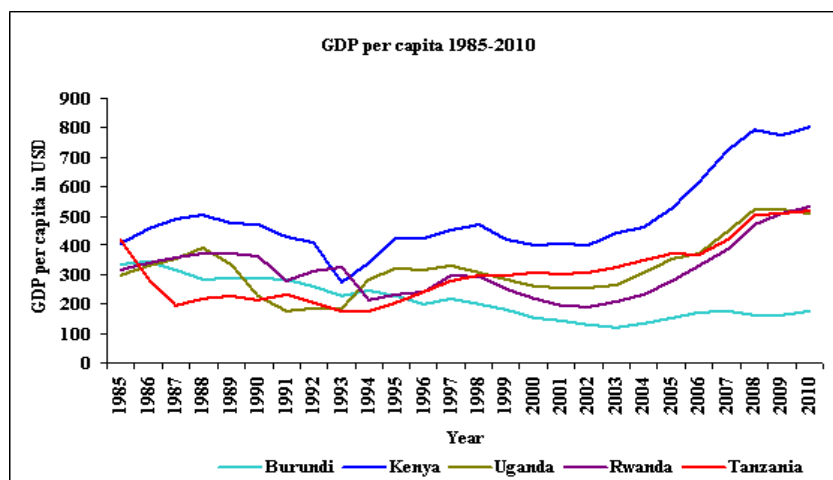
2. Overview of EAC countries

The East African Community (EAC) is a regional inter governmental organization established under Article 2 of the Treaty for the Establishment of the East African Community that entered into force in July 2000. The membership of the community comprises of Burundi, Kenya, Rwanda, Uganda, and Tanzania. The community has made significant progress since its establishment in terms of both economic and social development. However, countries that form the community remains to be are amongst the poorest in the world despite receiving a huge amount of foreign aid to assist their development programs. While all EAC member countries have liberalized their economies, the pursuit of macroeconomic convergence remains a key focus of all the economies. The benchmark indicators of sustained GDP growth rates of 7 percent, inflation rate of 5 percent, single digit interest rates and gross national savings of above 20 percent are yet to be achieved. The limited number of empirical studies to this area makes it difficult to assess the impact of aid to the region. This study intends to evaluate the impact of foreign aid on economic growth of five EAC countries.

The trends are based on data gathered from the UNCTAD statistical database. The figure shows that the average real GDP per capita of all five EAC countries has been growing slowly from USD 354.84 in 1985 to USD 507.27 in 2010. This accounts for about 43.67 percent increase since 1985. That is, in average, over the period of 1985 – 2010, the real per capita GDP of these countries was growing at the average rate of only 1.68 percent per annum, which is far lower than the target benchmark of 7 percent growth per annum for the EAC. This rate is significantly low to rescue these countries from absolute poverty trap. For the case of individual countries, Burundi appears the least in terms of real GDP per capita as compared to other EAC countries. Its real GDP per capita was only USD 176.62 in 2010. This amount is 47.75 percent lower compared to that of 1985, which is USD 338. This implies that for the last 25 years the welfare of Burundi people was devastating with low hope of improvement. This distressing situation is possibly attributable to civil war and conflicts that persisted for almost two decades. Per capital GDP of Kenya, Rwanda, Uganda and Tanzania in general have shown slow pace of growth for the entire study period. See Figure 1 below for details of their trends.
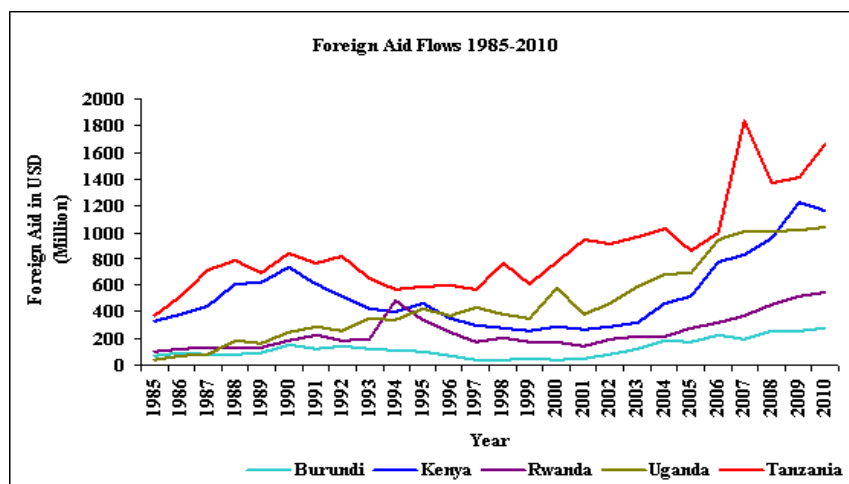
In terms of foreign aid flows, for the entire period, the countries received significantly huge amount of foreign aid funds to support their development process (Figure 2). The inflow of official development assistance (ODA) to these countries has increased from the average of USD 184.852 million in 1985 to USD 935.544 million in 2010 (UNCTAD data). This increase accounts for more than four times. When compared to other EAC countries, Tanzania ranks the first for receiving foreign aid for the whole study period. The slow rate of economic growth and large foreign aid inflows to the countries motivated to undertake empirical study to investigate the linkage between foreign aid and economic growth of these countries. Hence, this study aim at analyzing the relationship between economic growth and foreign aid flows in five EAC member countries.

Figure 1: The trend of EAC countries' real GDP per capita from year 1985 to 2010

Source: authors' plotting.

Figure 2: The trend of EAC countries' foreign aid flows from year 1985 to 2010

Source: authors' plotting.

3. Literature Review

The role of foreign aid on economic growth is originally described by the theory of "Two Gap" model proposed by Chenery and Stout (1966). The theory argues that the developing countries remain underdeveloped because of foreign exchange and savings constrains. Inadequate savings create the gap that results into low level of capital formation, which in turn leads to low level of domestic investment. Usually, investment creates job opportunities and increase income to the country thereby promoting the growth of overall economy. On the other hand, insufficient foreign exchange earnings create import-export gap that constrains developing countries to import capital goods and advanced technology from developed countries. On the other hand, Bacha (1990) and Taylor (1994) argued that developing countries are also constrained by "fiscal deficit" by which their government additional requires revenue to finance public investments in education, health, infrastructure, and other important social sectors for development. Therefore, the responsibility of foreign aid in this theory is to supply additional funds that will supplement those gaps in order to improve the economic growth in developing countries. Rostow (1960) stages theory of aid did not see the economy as based on questions of output, production and technology that are applicable to all countries regardless of their local conditions. According to the stage theory, the process of economic development enforced through aid passed through five major uneven phases, they are traditional society, pre-conditions for take-off, take-off, drive to maturity and the age of high mass consumption (Ndi, 2010).

In terms of empirical literature, the aid-growth results are mixed. While some studies evidence that aid has positive impact on growth, some studies evidence that the impact of foreign aid is insignificant and it can be negative. The empirical studies attest that positive role of aid on growth is dependent of certain factors such as macroeconomic conditions, political stability, and level of corruptions in the recipient country. Among the studies that found a significant positive role of foreign aid on economy of recipient country, is earlier study conducted by Papanek (1973). In this study, Papanek (1973) distinguished foreign aid flows from other kinds of foreign capital flows to examined the linkage between foreign aid, saving and foreign private investment. His results suggested that foreign aid should be directed to countries that suffer from a balance of payments constraint. Later study by Levy (1988) examined the empirical linkage between foreign aid and economic growth of sub-Saharan Africa countries. The results revealed a significant positive association between aid and investment as well as between aid and economic growth in Sub-Saharan Africa. Similarly, Singh (1985), Hadjimichael et al. (1995) found a positive significant impact of foreign aid on recipient's economic growth. Clemens et al. (2004) distinguish between short-impact aid and long-impact aid and find a strong and positive effect of aid on growth.

On the other hand, there is large number of studies that stress that the positive impact of foreign aid on growth is dependent on certain factors such as sound macroeconomic conditions, quality of institutions and political environments. The pioneer of this group is Burnside and Dollar (2000) who found the evidence that suggest that foreign aid works well in decent macroeconomic environment characterized by low level of inflation, small budget deficits; and open to trade. However, the study conducted by Easterly et al. (2004) used the same

data but with expanded time scope concluded that the Burnside and Dollar's results were not robust.   Similarly, Hansen and Tarp (2000) argued that the Burnside and Dollars' results are not robust because they are sensitive to change in model specifications and sample size. Contrary to Burnside and Dollar (2000), Dalgaard et al. (2001) found evidence indicates that foreign aid can promote growth irrespective to quality of macroeconomic conditions but with diminishing marginal returns. Supporting Dalgaard et al. (2001) results, Guillaumont and Chauvet (2001) hold that foreign aid can promote economic growth in hash macroeconomic environment characterized by unstable terms of trade and natural disasters. Although Burnside and Dollar's results were challenged in terms of robustness, a number of studies followed their path.   These studies show that aid-growth linkage is dependent on certain conditions such as vulnerability of recipient country to external shocks (Guillaumont and Chauvet, 2001; Collier and Dehn, 2001); quality of institutions (Burnside and Dollar, 2004); and degree of civil liberty and political stability (Islam, 2003; Chauvet and Guillaumont, 2002).

On the contrary, several studies suggest insignificant effects of foreign aid on recipient country's economic growth. Some of these studies attest that foreign aid has adverse effects on recipient country. For instance, Adam and O'Connell (1999) believe that foreign aid may results into indecent fiscal behavior whereby recipient's government effort to tax raising mechanisms may decline, thus, triggering the need for additional aid while dissipating the short-term beneficial effects of aid and creating a culture of dependency.   Moreover, there is evidence that link foreign aid with the real domestic exchange rate appreciation, which may results into loss of external competitiveness that in turn, may lead to lower long-run economic growth (Van Wijnbergen 1986). There is also evidence that associates foreign aid with direct negative effects on growth.   Djankov et al. (2006) found that foreign aid has a negative impact on the democratic stance of developing countries and on economic growth by reducing investment and increasing government consumption. Therefore, their empirical findings support neither the democratization effect of foreign aid nor the development effect. Mallik (2008) applied the panel data co integration analysis on the panel data from six poorest and highly aid dependent African countries (Central African Republic, Malawi, Mali, Niger, Sierra Leone and Togo) to test the long-run impact of foreign aid on economic growth. The results suggested that, in the end, foreign aid could impose negative effects on economic growth of these countries.

Some scholars argued that development assistance is sometimes harmful to recipient countries' political stability and social development.   Development aid can accelerate conflicts and political tumors especially in the countries where ethnic issues are sensitive (Esman and Herring, 2003). The hypothesis that economic growth theories led to a developmental friction in Africa because the humanitarianism underpinning foreign aid policy was a sign that could easily alienate into new discursive forms of politics of power, bureaucraticism and ideology in the context of Africa (Ndi, 2010). Moyo and Ferguson (2009) and Moyo (2010) cast blame on foreign aid as source of the social stagnation in Africa. The foreign aid did not take African out of poverty but rather entrenched the continent into greater depth of underdevelopment (Ndi, 2010) and millions of peoples in   Africa are poorer and poverty have not ended but increased (Moyo, 2010).

4. Data and Methodology

To analyze the impact of foreign aid in EAC countries, the study applies a panel data approach for the annual data from 1985 to 2010. The Solow growth model has been adopted to estimate the growth effects of foreign aid in EAC. Thus, the general empirical model for this study can presented in the form Cobb-Douglas production function as follows:

$$Y_{it} = A_{it} K_{it}^{\alpha_2} L_{it}^{\alpha_3} \tag{1}$$

In this study, the standard growth accounting model can also be expressed in linear logs:

$$GDP_{it} = \alpha_2 Capital_{it} + \alpha_3 Labor_{it} + A_{it} \tag{2}$$

where *GDP* is economic growth, *Capital* and *Labor* represent the capital and labor, respectively. *A* is the growth rate of total factor productivity which explains the output growth that is caused by other factors of production that are not specified in the above model. Note that α_2 and α_3 are the elasticity of output with respect to *Capital* and Labor respectively.

We specify the total factor productivity for this study as:

$$A_{it} = \alpha_1 + \alpha_4 AID_{it} + \alpha_5 GOV_{it} + \varepsilon_{it} \tag{3}$$

where GOV_{it} is government consumption as share of GDP and AID_{it} is the foreign aid flows as a share of GDP. Note that α_1 is a constant, and α_4, α_5 are the elasticity of output with respect to GOV_{it} and AID_{it}. ε_{it} is the error term.

We assume that growth of foreign aid inflows increases the total factor productivity growth, which in turn

raises the rate of overall economic growth of aid. Morrissey (2001) has pointed that foreign aid can contribute to economic growth through increases in physical and human capital investment, increases the capital to import capital goods or technology, and is associates with technology transfer. Besides, foreign aid also does not have indirect effects that reduce investment or savings rates. Hence, foreign aid increases will increase economic growth through productivity and efficiency gains by host countries.

Thus, by substituting (3) to (2), we will get:

$$GDP_{it} = \alpha_1 + \alpha_2 Capital_{it} + \alpha_3 Labour_{it} + \alpha_4 AID_{it} + \alpha_5 GOV_{it} + \varepsilon_{it} \qquad (4)$$

Total official development assistance inflows as share of GDP are proxy to AID_{it}. $Labour_{it}$ is growth rate of country total labor force. GDP_{it} represents the real GDP of EAC countries. The data were gathered from UNCTAD database. $Capital_{it}$ stands for capital stock measured by investment as share of GDP. GOV_{it} is government consumption as share of GDP. The data for these two variables were collected from Summer-Heston Penn World Table database. All variables are expressed in natural logarithm.

To estimate the results, we applied the advanced panel data methods. There are several types of panel analytic models; with the most commonly, estimated models are probably pooled OLS (POLS), fixed effects (FE) and random effects (RE). To select the right estimator for the model, various tests had been performed to check whether classical OLS assumptions hold for the model and remedies are suggested. Then the growth – foreign aid nexus model has been estimated using appropriate method(s).

In the random effects model, the changes in unit and/or time are defined as a component of error terms in the model. The random effects model defined as:

$$y_{it} = \beta' x_{it} + a_i + u_{it} \quad \text{with} \quad v_{it} = a_i + u_{it} \qquad (5)$$

where y_{it} is the dependent variable; x_{it} is the vector of regressors; β is the vector of coefficients; and u_{it} is the error term with normal distribution with mean zero and a constant variance allowing to estimate v_{it} for the standard error; $i = 1, ..., N$ and $t = 1, ..., T$. The individual effect a_i is regarded to be constant over time and specific to the individual cross-sectional unit. a_i is presumed to capture the unobservable and non measurable characteristics that differentiate individual countries.

Fixed effects model control for, or partial out, the effects of time-invariant variables with time-invariant effects. For a model with a single explanatory variable,

$$y_{it} = \beta_1 x_{it} + a_i + u_{it} \qquad (6)$$

Then, averaging this equation over time for each unit i, we have

$$\bar{y}_{it} = \beta_1 \bar{x}_{it} + \bar{a}_i + \bar{u}_{it} \qquad (7)$$

By subtracting equation (11) from equation (10), we have

$$y_{it} - \bar{y}_{it} = \beta_1 (x_{it} - \bar{x}_{it}) + (u_{it} - \bar{u}_{it}) \qquad (8)$$

Defining the demeaned data on (y, x) as the observations of each panel with their mean values per individual removed. This algebra is known as the within transformation, and the estimator derived is known as the within estimator. The within estimator will be unbiased and consistent if the explanatory variables are strictly exogenous: independent of the distribution of u. In the Fixed Effect formulation, a_i is treated as an unknown "*nuisance parameter*", which, if ignored, will cause biasness and inconsistency of the estimator; because it is correlated with one or more regressors. Correlation with a_i can be allowed since it will finally be removed by within transformation.

To justify which model is more suitable to explain the results of this study, it is necessary to evaluate the appropriateness of these models by comparing the coefficient vectors estimated from these three methods. To evaluate the estimators of POLS and RE, we will apply Breusch-Pagan LM (BPLM) test. Rejection of the null hypothesis favors the Random Effect. On the other hand, Hausman specification test was used to decide whether RE and FE should be used. Rejection of the null hypothesis favored the choice of FE.

5. The Empirical Results

As noted earlier, we applied three panel methods namely POLS model, RE and FE and then used Breusch-Pagan LM test (POLS model vs. RE) and Hausman test (RE vs. FE) to determine which model is best for final estimation of the aid-growth relationship. Table 1 shows the summary of regression results for Pooled OLS, RE and FE models. To test the presence of individual effects the unrestricted specification of the model in equation (4) was estimated separately using POLS, RE and FE. All results from the regressions are found to be significant supporting the negative impact of foreign aid on economic growth in EAC countries.

Table 2 summarizes the BPLM test and Hausman test results. From the results, we found that the BPLM test rejects the POLS model. This means POLS model does not seem to be the appropriate model to estimate the relationship between growth and foreign aid in this study. Next, we applied the Hausman test to determine whether RE or FE model should be used for final estimation. Hausman test suggested the FE method as more appropriate estimator for this study.

Table 1: Summary of Pooled OLS model, Random Effects model and Fixed Effects model   regression results

	Pooled OLS	Random Effect	Fixed Effect	Fixed Effect Cross-section and Year
Constant	31.9432***	31.9432***	-5.6654	22.6198***
	[6.3517]	[8.6220]	[-0.7167]	[5.1682]
Capital	1.1042***	1.1042***	-0.6594**	-0.08489
	[3.6780]	[4.993]	[-2.1507]	[-0.4514]
Labor	-2.7813*	-2.7813**	8.6560***	0.7602
	[-1.8083]	[-2.4547]	[3.9765]	[0.6254]
Government	0.3026	0.3026	-0.3477	-0.4334**
	[1.0666]	[1.4479]	[-0.9651]	[-2.2881]
ODA	-1.0304***	-1.0304***	-0.7855***	-0.5444***
	[-5.4372]	[-7.3807]	[-5.4126]	[-6.2588]
Observation	130	130	130	130
R2	0.3646	0.3646	0.6662	0.9340

Notes: * denotes significant as 10% confidence level; ** denotes significant as 5% confidence level; *** denotes significant as 1% confidence level.

Table 2: Summary of BPLM Test and Hausman Test

Breusch-Pagan LM Test (Pooled OLS vs. Random Effect	85.0082***
Hausman Test (Random Effect vs. Fixed Effect)	109.3304***

Notes: * denotes significant as 10% confidence level; ** denotes significant as 5% confidence level; *** denotes significant as 1% confidence level.

The likelihood ratio test for individual effects is performed to decide whether individual effects are treated as country-specific or period specific. The unrestricted specification of the model in equation (4) needs to be first estimated using a two-way fixed effects estimator in order to test for the presence of individual effects. The two-way fixed effects estimation results are reported in column 5 of Table 1. The estimated coefficient for foreign aid also suggests the existence of significant negative impact relationship between foreign aid and economic growth in EAC countries.

The joint significance of all effects as well as the joint significance of the cross-section effects (means the country-specific effects) and the period effects (means the year-specific effects) are tested separately. Results for the joint significance of all these tests using sums-of-squares (*F*-test) and the likelihood function (Chi-square test) are presents in Table 3. The two statistic values strongly reject the null hypothesis that the effects are redundant.

This indicates the presence of strong country-specific effects in the first case, year-specific effects in the second case and joint significance of all of the effects in the third case. This implies the presence of both country- and year-specific effects in our framework.

Table 3: Summary of Redundant Fixed Effect Test

Redundant Fixed Effect Test	
Cross-section F	64.6957***
Cross-section Chi-square	169.9304***
Period F	15.5757***
Period Chi-square	210.6796***
Cross-Section/ Period F	28.5508***
Cross-Section/Period Chi-square	294.3637***

Notes: * denotes significant as 10% confidence level; ** denotes significant as 5% confidence level; *** denotes significant as 1% confidence level.

In order to ensure valid statistical inference, it is important to check for the robustness of the reported regression results. Our test relies on the robust standard errors of the estimated coefficients. One of the more popular of these alternative covariance matrix estimators has been developed by White (1980); the estimation uses White's heteroscedasticity-corrected covariance matrix estimator, focused on improving the estimation of the standard errors without changing the estimates of the slope coefficients (Khan and Hossain, 2010). If the residuals are independently distributed, mean the standard errors that are obtained by aid of this estimator are consistent even if the residuals are heteroscedastic. Table 4 presents the results for robustness check. The results suggest that in exception to the robust estimation with year-specific effects, all other values are significant. The results further suggest that the negative influence of foreign aid on growth is robust.

The results of this study support some previous studies that condemned foreign aid to be associated poor economic performance of recipient countries. These studies argued that foreign aid inflows reduce the long-term capital accumulation and labor supply of recipient country. This affects the countries' potential to generate higher rates of economic growth (Levy, 1988). There is also another argument that justifies the negative linkage between foreign aid and economic growth in recipient countries. This argument suggests that foreign aid may results into appreciation of real exchange rate in the recipient country. This affects the balance of trade position and imposes the long run risk to overall economic performance (Elbadawi, 1999). Indeed, several factors have been identified to be the pre-requisite conditions for aid to have positive influence on growth. These include sound macroeconomic environment, good institutional quality, and low level of corruption. The underperformance of aid could be resulted from failure of aid recipient governments to appropriately management and allocate aid funds in their most productive projects. We advice further studies to be conducted to evaluate the possible channels through which foreign aid can generate desired impact on economic growth of these countries.

Table 4: Robust Estimation

	Pooled OLS Robust	Fixed Effect Cross-section Robust	Fixed Effect Year Robust	Fixed Effect Cross-section and Year Robust
Constant	31.9432*** [6.6822]	-5.6654 [-0.6530]	44.7524*** [14.5083]	22.6198*** [4.5121]
Capital	1.1042** [3.3546]	-0.6594* [-1.7681]	1.8210*** [5.9204]	-0.0849 [-0.1986]
Labor	-2.7813* [-1.6830]	8.6560*** [3.4990]	-7.0769*** [-6.6494]	0.7602 [0.4617]
Government	0.3026 [1.3548]	-0.3477 [-1.0764]	0.5420*** [3.7565]	-0.4334*** [-3.0108]
ODA	-1.0304*** [-3.1177]	-0.7855*** [-3.6966]	-0.4981 [-1.5865]	-0.5444*** [-3.1698]
Observation	130	130	130	130
R2	0.3646	0.6662	0.7560	0.9340

Notes:

Estimations with White cross-section standard errors & covariance;

* denotes significant as 10% confidence level; ** denotes significant as 5% confidence level; *** denotes significant as 1% confidence level.

6. Conclusion

Foreign aid is important capital resources and is deeming to directly or at any rate influence economic development of the recipient country. A number of studies have been undertaken to assess the impact of foreign aid on the economic growth. The results of these studies are varying broadly across methods and countries and generate mixed results. This study analyzed the relationship between economic growth and foreign aid flows in five EAC member countries for the period of 1985 to 2010. The panel data approach based on POLS, RE, and FE methods were used to evaluate the impact of aid on economic growth of these countries. .

Our results suggest that for EAC countries, foreign aid is found to have significant negative influence on economic growth. This implies that the hypothesis that foreign aid led growth is rejected. As proposed in Ndi (2010) for African countries, instead of depending on foreign aid to gather development capital, the EAC countries can increase the development capital through creation of new bond market, micro-financing, revised property laws and enhance political stability to attract foreign commercial investments. We suggest further studies to be conducted to evaluate the channels through which foreign aid can generate positive impact on economic growth of these countries.

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