

Does The Inflows Of Foreign Aid Dampen Or Stimulate FDI to EAC Members? Evidence From East African Community Members

Masoud Mohammed Albiman

Department Reseach policy and development, Zanzibar Revenue Board(ZRB) and Zanzibar Insitute of Business Reseach and Technology (ZIBRET) , Tanzania, Zanzibar. Albimani1966@hotmail.com

ABSTRACT

Recently, the World Bank and IMF have been more interested in understanding whether foreign aid inflows from multilateral or bilateral donors have catalyzing effect on the crowd out effect to FDI. From this fact, the paper investigates the causal relationship between foreign aid, both bilateral and multilateral aid with FDI inflows to EAC members. Using time analysis techniques of VECM and Granger causality, the results are mixed. On one hand, foreign aid (bilateral and multilateral) causes FDI in two countries. On the other hand, we found no relationship between foreign aid and FDI in other two countries. The results calls for appropriate policy implementations.

1.0 INTRODUCTIONS

Recently, the World Bank and IMF have been more interested in understanding whether foreign aid inflows from multilateral or bilateral donors have catalyzing effect on the crowd out effect to FDI (Kang et al 2011). Yet, very few studies have empirically examined the impact of foreign aid to FDI to developing countries especially the East African community members (EAC).

For long time foreign aid has become an important source of external finance to the African economics. Foreign aid as an important source of inflows especially in Africa, on average, it accounts for 12.5 percent of total GDP in Africa (Pallage and Robe, 2001). On the other hand, recently due to the more economic integration and promotion of open economic policies, FDI has become a second source of external finance. From this fact it is important to look for the relationship of these two variables.

According to several literatures, foreign aid has different impact of economic growth . Firstly it is argued that, foreign aid can improve the domestic infrastructures to the recipient countries (Harmz and Lutz, 2006). Since the increase in foreign aid would necessitate marginal productivity of domestic capital thus will stimulate more FDI inflows. However, it is also argued that, when foreign aid come in the form of physical capital would increase in capital accumulation in the domestic economy as results crowd out FDI (Changsheng et al , 2011, Gong and Xiaoying, 2007).

Furthermore, foreign aid can be used to finance budget deficits and profit outflows from FDI, as results will attract more FDI (Harmz and Lutz, 2006). On the other hand, the increase in foreign aid can increase the supply of tradable goods and results to lower price of goods in domestic economy. From this fact, the profit of FDI would diminish due to low price of goods thus FDI will decrease or crowded out¹.

The criteria for selecting to study the EAC members are as follows lies in the argument that, the trend of foreign aid, FDI and their ration to GDP are increasing rapidly since late 1990s².Furthermore, the EAC members are still in the process of monetary union and political federations by 2015. From this fact, the clear and appropriate policies are needed on the determinants of macroeconomic performance of these countries. Not only that but also according to millennium development goals (MDGs), EAC members considered as poorest countries in LDCs by the World Banks. In that sense, they receive higher aid inflows in the sense that, would help to reduce levels of poverty, budget deficits and improve the social economic well-being by 2015

On the other hand, due to the small private capital inflows like FDI, especially for the LDCs, for long time foreign aid seems to play important role in supporting FDI inflows. It suggested that, foreign aid can play the important role in mitigating the supply constraints, such as poor infrastructure and communications and low capital available for the development program. For example, the key function of the Multilateral Investment

¹ Some time this act is tremed as “ dutch diseases” .

²See Figure 1.1 and 1.2

Guarantees Agency (MAG) plays an important role to ensure that FDI risks are eliminated (Asiedu and Nandwa, 2009).

For example, MAG, provide insurance to any risk relating to expropriation, currency, profit transfer restrictions, and political risk or any government actions against private sectors. In fact, the main assumptions here is that, the foreign aid programs would help to remove obstacles relating to the inflows and performance of FDI in developing countries especially African countries. For example, Multilateral aid (MAID) helps to reduce expropriation risk of the government. On the other hand, bilateral aid (BAID) said to reduce the risk of FDI since it acts as good signal of the relationship between recipients and host country.

TREND OF FOREIGN AID TO EAC MEMBERS

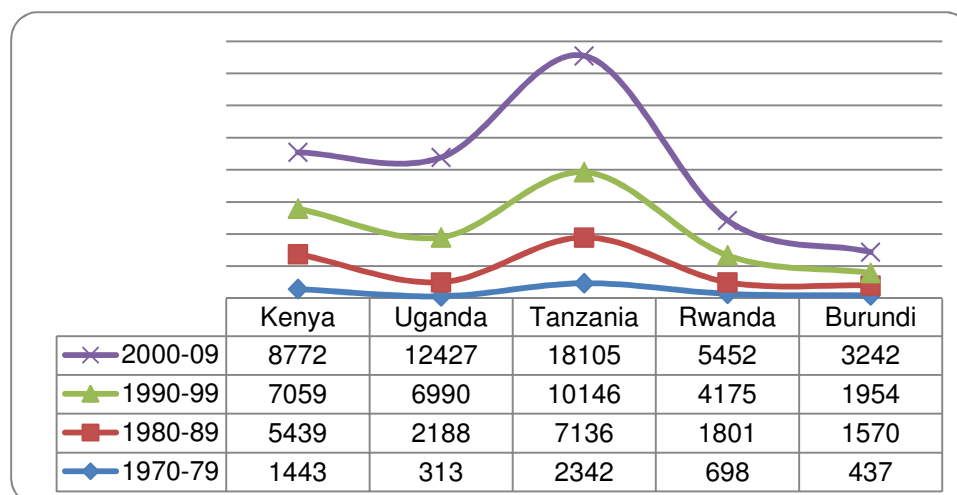


Figure 1.1 The trend of Foreign aid (ODA) inflows to EAC members

(Source: UNCTAD Online database and author's calculation)

TREND OF FDI TO EAC MEMBERS

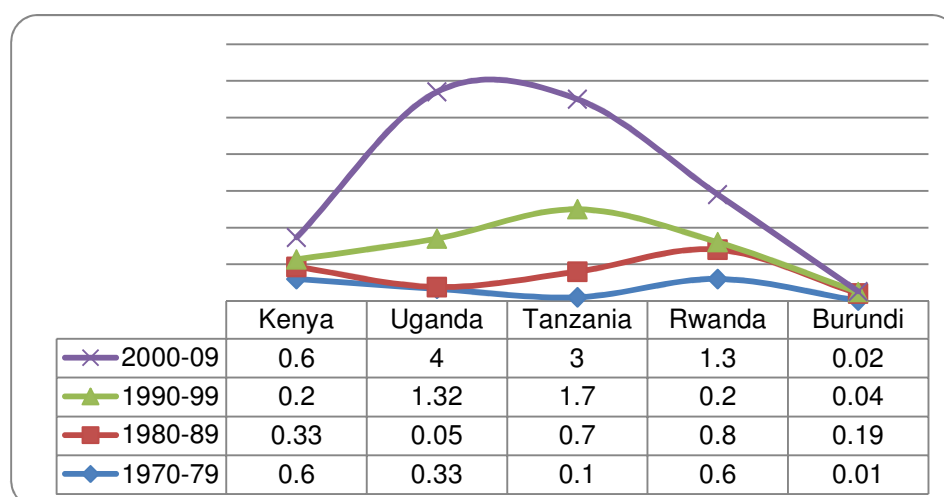


Figure 1.2. FDI percentage in GDP for EAC members

(Source: UNCTAD Online database, 2010 and author's calculations)

2.0 LITERATURE REVIEWS

Very few literatures investigated the impact of foreign aid to FDI. This part presents the discussion of the previous empirical literatures. Karakaplan (2005) argued that, found that foreign aid do not have any impact to FDI instead, financial development and good governance should be promoted to attract more FDI. Furthermore, Harmz and Lutz (2006) supported Karakaplan, by suggesting that foreign aid does not have any impact to economic growth. In contrast, Blaise (2005) found positive impact of aid to FDI in Japan. However, they pointed that aid has significant impact to FDI, when countries have unfavorable environments or when private investors faces heavy regulatory restrictions. All literatures of (Karakaplan, 2005; Blaise, 2005; Harmz and Lutz, 2006) used same proxies of total value of aid and FDI in their analysis.

Furthermore, Kosack and Tobin (2006) supported Karakaplan (2005) and Harmz and Lutz (2006) by suggesting that, foreign aid does not have an impact to marginal productivity in host country since most of aid inflows are in the form of government budget deficits and human support. Simultaneous to that, Caselli and Feyrer (2007) argued that foreign aid in most African countries substitute FDI rather than complement it. In supporting these results, Arellano et al (2009) pointed that, foreign aid substitute FDI in the host country

Moreover, Kimura and To-do (2010) after using a gravity model to investigate the impact of aid to FDI in Japan. He found that foreign aid does not attract FDI. This is indicated major difference with the results of Blaise (2005) who did the same analysis in Japan.

In general, Kimura and Todo (2010) supported the results of Karakaplan (2005), Kosack and Tobin (2006) and Harmz and Lutz (2006). Furthermore, Changsheng Xu et al (2011) suggested that, foreign aid in the form of human capital and infrastructure causes FDI in Bangladesh, India and Sri Lanka. On the other hand, they found that aid in the form of physical capital causes FDI only in India. On the other side, suggested that FDI causes aid of human capital and infrastructure only for Bangladesh. Generally, they found that aid is complement factor for FDI in five Asian countries.

3.0 METHODOLOGICAL ISSUES

The study uses time series data therefore we have to ensure that all time series technique are met before final conclusion. Therefore, the study used three unit roots test to test whether variables are stationary these tests including Augmented Dickey fuller test (ADF) Philips and Perron (1988). The standard test of ADF and PP test both relied on the null hypothesis that there is unit root, and thus they are not powerful for the alternative hypothesis (Kwiatkowski et al 1992). From this fact, we use KPSS test which assumes that the null hypothesis of a series are stationary. Thus the KPSS test is suggested to eliminate near unit root process which cannot be detected in ADF and PP test. The method uses to test for Co integration is a Johansen and Juselius approach (1988, 1990). If variables are cointegrated we use a vector error correction term (VECM) to test for the long run and short run causality. VECM model will be specified in the following form:

$$\begin{aligned} \ln GDP_t = & \varphi_0 + \sum_{i=1}^m \varphi_{1i} \ln FDI_{t-i} + \sum_{i=1}^n \varphi_{2i} \ln BAID_{t-i} + \sum_{i=1}^n \varphi_{3i} \ln MAID_{t-i} + \\ & \sum_{i=1}^n \varphi_{4i} \ln EXP_{t-i} + \sum_{i=1}^n \varphi_{5i} \ln DI_{t-i} + \varphi_6 ECM_{t-1} + \mu_{2t} \dots \dots \dots (1) \end{aligned}$$

$$\begin{aligned} \ln BAID_t = & \varphi_0 + \sum_{i=1}^m \varphi_{1i} \ln GDP_{t-i} + \sum_{i=1}^n \varphi_{2i} \ln BAID_{t-i} + \sum_{i=1}^n \varphi_{3i} \ln MAID_{t-i} + \\ & \sum_{i=1}^n \varphi_{4i} \ln EXP_{t-i} + \sum_{i=1}^n \varphi_{5i} \ln DI_{t-i} + \varphi_6 ECM_{t-1} + \mu_{2t} \dots \dots \dots (2) \end{aligned}$$

$$\begin{aligned}
 InMAID_t = & \varphi_0 + \sum_{i=1}^m \varphi_{1i} InGDP_{t-i} + \sum_{i=1}^n \varphi_{2i} InBAID_{t-i} + \sum_{i=1}^n \varphi_{3i} InMAID_{t-i} + \\
 & \sum_{i=1}^n \varphi_{4i} InEXP_{t-i} + \sum_{i=1}^n \varphi_{5i} InDI_{t-i} + \varphi_6 ECM_{t-1} + \mu_{2t} \dots \dots \dots (3)
 \end{aligned}$$

$$\begin{aligned}
 InZ_t = & \beta_0 + \sum_{i=1}^m \beta_{1i} InZ_{t-i} + \sum_{i=1}^n \beta_{2i} InGDPC_{t-1} + \sum_{i=1}^n \beta_{3i} InAID_{t-i} + \\
 & \sum_{i=1}^n \beta_{4i} InFDI_{t-i} + \sum_{i=1}^n \beta_{5i} InEXP_{t-i} + \beta_6 ECM_{t-1} + \mu_{5t} \dots \dots \dots (4)
 \end{aligned}$$

For equation 1 up to 4 , *InBAID* Implies bilateral aid, *InMAID* implies multilateral aid. For other variables and symbols as previously defined. From the equations above ECMs’ is error correction terms lagged one year period This help to differentiate between “short run” and “long run “causality. When ECM is negative and significant we conclude that there is long run causality. This is measured through the significance of the t test of ECM. The significance of the lagged changes of all independent variables ($\alpha' s, \varphi' s, \delta' s, \lambda' s$) implies that there is short run causality. This test is performed through the significance of the F-test. However, if the variables are not Co integrated, then the Granger causality test will be conducted in first difference VAR without including the ECM In the equations.

This study used annual data with the spanning from 1970 until 2010. The data collected is as follows, Uganda (1970-2010), Burundi (1970-2006), Kenya (1970-2010)), Rwanda (1976-2010).The data collected from UNCTAD online database key indicators and World’s Bank indicators (WDI). Table 1 provides the descriptions of the variables and data source.

Table 1.0 Description of Data and Sources

Variable	Measurement	Descriptions	Sources
Economic growth	GDP per capita	Real GDP which includes domestic productions	UNCTAD, World Bank
FDI	FDI-GDP ratio	Foreign direct inflows	UNCTAD, World Bank
Export	Export-GDP ratio	Export of goods and services	UNCTAD ,World Bank
Domestic investment	Capital formation-GDP ratio	Outlays or additions of fixed assets in the economy plus net changes in inventories excludes all form of FDI	World Bank
Foreign aid (multilateral and bilateral aid)	Net ODA –GDP ratio	Disbursement of loans and Grants for development activities	UNCTAD, World Bank

(UNCTAD refers to the United Nations Conference on trade and development

4.0 ANALYSIS AND DISCUSSIONS

4.1 Unit Root Tests

The results of unit root tests are presented in table 1.2, 1.3, 1.4 and 1.5 The results are presented in two different forms, of intercept and trend and intercept. The critical value statistics are given in response of MacKinnon (1999) values. The PP statistics are obtained through Newey West adjustment of Bartlett Kernel On the other hand, the critical values for Kwiatkowski et al is given is given by Kwiatkowski et al (1992). Special attention has been given in the process of lag length selection, so as to ensure the disturbance terms are white noise. In this consideration, we use the Schwarz Criterion method is used to select the appropriate lag length which is selected automatically using Eviews 7.

Each test among these three tests has advantages and disadvantages at different circumstance. For example the standard test of ADF and PP test fails to detect the structural break that is common in time series moving average (Perron, 1989). From this fact, we assume that variables are not stationary at level or $I(0)$, once it is accepted for all three tests in both with intercept and intercept with the trend. Otherwise, for any conflicting results we assume that variables is not stationary at levels $I(0)$, hence we continue with first difference¹. In any conflicting results, we also assume that, variables are not stationary at levels, because most of the macroeconomic variables were found to have a unit root problem at their level form (Nelson and Plosser, 1982). The results in table 1.2 and 1.3 present the results of unit root test in level form. After considering all the three tests, in both conditions of intercept with and without trend, it is concluded

that that, all variables are not stationary in level form. On the other hand, table 1.4 and 1.5 presents results of unit root after first difference .

Table 1.2 Unit Root Test Results in Level Form

COUNTRY/VARIABLES	ADF TEST		PP TEST		KPSS TEST	
	Constant	Constant and trend	Constant	Constant and trend	Constant	Constant and trend
Kenya						
InGDP	-1.731524(1)	-2.451883(1)	-1.674096(1)	-2.065574(1)	0.485651*(4)	0.112937(4)
InFDI	4.491753(0) *	4.531971(0) *	4.621104(4)*	4.620772(3)*	0.255018(4)	0.137697**(4)
InAID	1.906711(0)	1.793426(0)	-1.994703(3)	-1.888663(3)	0.175152(5)	0.141573**(5)
InEXP	2.470181(0)	-2.708465	-2.556325(5)	-2.819109(3)	0.274447(4)	0.104256**(4)
InLDI	1.298025(0)	1.312531(0)	-1.275661(2)	1.3254981(2)	0.413098**(5)	0.168133*(5)
LPOP	1.843587(4)	2.573801(4)	0.597785(4)	-2.062498(4)	0.706347*(5)	0.175043*(5)
Uganda						
InGDP	1.149078(4) *	4.551953(1) *	2.815235(9)*	3.319285(21) *	0.376751**(5)	0.200312*(5)
InFDI	8.391391(0) *	8.369213(0) *	8.747674(3)*	8.726228(3)*	0.551435*(5)	0.155731*(4)
InAID	0.727849(0)	1.019541(0)	-0.727849(0)	1.336052(1)	0.173010(1)	0.170296*(2)
InEXP	6.070900(0) *	5.168852(3) *	6.322324(13) *	14.09970(38) *	0.2509285(4)	0.209309*(4)
InLDI	8.005927(0) *	8.360548(0) *	8.171282(2)*	8.360548(0)*	0.647906*(5)	0.176764(4)
LPOP	1.232883(0)	1.714150(0)	-1.232883(0)	-1.765305(1)	0.639866*(5)	0.126875**(5)

Notes: Asteriks* and ** implies a significant level at five percentage (5%) and ten percentage (10%). Values in () implies the t statistics level. ADF implies Augmented Dickey Fuller (1979, 1981) and Critical values obtained in response of McKinnon(1999). PP implies Philips and Perron (1988). KPSS implies Kwiatkowski et al (1992) test. The critical values of KPSS found in Kwiatkowski et al 1992, table 2

¹The same reasons has been given to justify that variables are stationary after first difference by several studies and used Johansen and Juselius co integration method (See, Das and Choudhary, 2011, Malik, 2008).

Table 1.3 Unit Root Test Results in Level Form

COUNTRY/VARIABLES	ADF TEST		PP TEST		KPSS TEST	
Rwanda	Constant	Constant and trend	Constant	Constant and trend	Constant	Constant and trend
InGDPC	- 1.944762(0)	- 2.054124(0)	- 1.867600(1)	- 1.979785(1)	0.193793(4)	0.161714*(4)
InFDI	- 4.074611*(0)	- 4.037325*(0)	- 4.200330(3)*	- 4.177382*(3)	0.189170(4)	0.151584*(4)
LBAID	- 2.760526(0) **	- 2.900308(0)	- 2.752944(1)	- 2.911429(1)	0.241348(4)	0.094483(3)
LMAID	- 0.082679(0)	- 1.395741(0)	- 0.082679(0)	- 1.056673(2)	0.521105*(1)	0.113882(1)
InEXP	- 2.264078(0)	- 0.755180(2)	- 3.144161*(2)	- 4.032150*(2)	0.274447(4)	0.104256(4)
InLDI	- 3.142918(0) *	- 3.976006*(0)	- 3.144161(2)*	- 4.032150*(2)	0.166015(4)	0.167591*(4)
Burundi						
InFDIGDP	- 5.162049(0) *	- 5.162049(0) *	- 5.236411(3) *	- 6.179674(3) *	0.513015*(4)	0.132708**(3)
InGDPC	- 0.836574(0)	- 1.465642(0)	- 1.064946(3)	- 1.493653(1)	0.170201*(5)	0.273348(2)
LBAID	- 0.821502(7)	- 1.995938(7)	- 1.276133(3)	- 2.143425(3)	0.497656*(4)	0.061438(4)
LMAID	- 2.254999(1)	- 3.077111(1)	- 1.748873(0)	- 2.276275(0)	0.479080*(4)	0.059486*(4)
InEXP	4.193280(0) *	- 4.781145(0) *	- 4.282792(3) *	- 4.768487(1) *	0.424638**(4)	0.085762(0)
InLDI	- 2.354820(0)	- 2.310767(0)	- 2.154292(1)	- 2.100319(1)	0.146934(4)	0.149821*(4)

Notes: Asteriks* and ** implies a significant level at five percentage (5%) and ten percentage (10%). Values in () implies the t statistics level. ADF implies Augmented Dickey Fuller (1979, 1981) and Critical values obtained in response of McKinnon(1999). PP implies Philips and Perron (1988). KPSS implies Kwiatkowski et al(1992) test. The critical values of KPSS found in Kwiatkowski et al 1992, table 2

Table 1.4 Unit Root Test Results after First Difference

COUNTRY/VARIABLES	ADF TEST		PP TEST		KPSS TEST	
					Constant	Constant and trend
Kenya						
InFDI	- 7.640860(0) *	- 7.539890(1))*	- 11.48543(4) *	- 12.00144(5) *	0.068201(4)	0.044010(2)
InGDP	- 4.116716(0))*	- 4.046209(0))*	- 3.985447(4) *	- 3.901202(4) *	0.148200(0)	0.148200(0)
LBAID	- 3.688012*(1)	- 3.649542*(1)	- 7.456828*(4)	- 7.391203*(4)		
LMAID	- 8.684503*(0)	- 8.623060*(0)	- 8.684503*(0)	- 8.680327*(1)	0.085435(3)	0.060293(3)
InLDI	- 6.543565(0))*	- 5.032387(1))*	- 6.550380(1) *	- 6.793171(4) *	0.163232(0)	0.129231(0)
LEXP						
Uganda						
InFDI	- 8.391391(0))*	- 8.369213(0))*	- 8.747674(3) *	- 8.726228(3) *	0.177549(5)	0.088330(6)
InGDPC	- 1.149078(4))*	- 4.551953(1))*	- 2.815235(9) *	- 3.319285(21))*	0.654680(4)	0.114284(4)
LBAID	- 3.985545*(3)	- 3.953470*(3)	- 5.540887*(3)	- 5.463748*(3)	0.082933(1)	0.084072(1)
LMAID	- 6.956248*(0)	- 6.978830*(0)	- 6.959008*(2)	- 6.982372*(1)	0.168527(2)	0.047265(0)
InEXP	- 6.070900(0))*	- 5.168852(3))*	- 6.322324(13))*	- 14.09970(38))*	0.426540(1 1)	0.500000(3 9)
InLDI	- 8.005927(0))*	- 8.360548(0))*	- 8.171282(2) *	- 8.360548(0) *	0.279799*(1)	0.138764(2)

Notes: Asteriks* and ** implies significant level at five percentage (5%) and ten percentage (10%). Values in () implies the t statistics level. ADF implies Augmented Dickey Fueller (1979, 1981) and Critical values obtained in response of McKinnon(1999). PP implies Philips and Perron (1988). KPSS implies Kwiatkowski et al(1992) test. The critical values of KPSS found in Kwiatkowski et al 1992, table 2

Table 1.5 Unit Root Test Results after First Differences

COUNTRY/VARIABLES	ADF TEST		PP TEST		KPSS TEST	
Rwanda	Constant	Constant and trend	Constant	Constant and trend	Constant	Constant and trend
InFDI	- 10.24709(0))*	- 10.12138(0))*	- 12.50651(5))*	- 14.38733(7))*	0.142941(7)	0.124823(8)
InGDPC	- 7.009409(0))*	- 5.668109(1))*	- 7.381535(7))*	- 7.90344*(1 2)	0.188740(1 0)	0.160761(1 4)
LBAID	- 6.826276*(0)	- 6.718878*(0)	- 7.257424*(5)	- 7.129368*(5)	0.241348(4)	0.094483(3)
LMAID	- 1.542577(0)	- -1.486560(0)	- 1.469814(1)	- 1.357543(1)		
InEXP	- 5.702638(1)*	- 6.525035(1))*	- 7.712599*(0)	- 18.8233*(2 1)	0.054959(2)	0.048817(2)
InLDI	- 9.826658(0)*	- 9.796309(0))*	- 11.72239(5)*	- 14.94311(7)*	0.165855(4)	0.130902(5)
Burundi						
InGDPC	- 5.294493(0)*	- 5.433210(0))*	- 5.318789(2)*	- 5.433210(0)*	0.273348(2)	0.083974(0)
InFDI	- 7.340173(1)*	- 7.280233(1))*	- 18.59025(8)*	- 20.29324(7)*	0.053057(3)	0.053057(3)
LBAID	- 6.083343*(6)	- 5.937659*(6)	- 5.541868*(3)	- 5.515516*(2)	0.091274(4)	0.068571(4)
LMAID	- 4.745933*(1)	- 4.680378*(0)	- 4.645795*(0)	- 4.568240*(0)	0.054166(3)	0.053749(3)
InEXP	- 9.612456*(0)	- 9.459687*(0)	- 12.14575*(6)	- 11.90680*(6)	0.167416(8)	0.147186(9)
InLDI	- 9.543565(0)*	- 9.3211662(0)*	- 0.895686(3)*	- 8.754315(3)*	0.164485(3)	0.145432(3)

Notes: Asteriks* and ** implies significant level at five percentage (5%) and ten percentage (10%). Values in () implies the t statistics level. ADF implies Augmented Dickey Fueller (1979, 1981) and Critical values obtained in response of McKinnon(1999). PP implies Philips and Perron (1988). KPSS implies Kwiatkowski et al(1992) test. The critical values of KPSS found in Kwiatkowski et al 1992, table 2

4.2 MULTIVARIATE COINTEGRATION ANALYSIS

Before, estimating the long run relationship between Foreign aid and FDI we have to ensure that all variables in the system have Co movement towards long run equilibrium. The optimal lags selected we rely on two information criteria Akaikes and Schwarz criteria. The lag selected for each country are in brackets, Rwanda (2), Uganda(1), Burundi(2) and Kenya (1). The Co integration test was estimated in the system of six variables, namely, FDI (LFDI), economic growth (LGDP), bilateral aid (LBAID), Multilateral aid (LMAID). For six variables included, the maximum Co integrating relationship is utmost five.

From table 1.6 (Rwanda), the results show that there are, one Co integrates vectors in case of maximum Eigen test ($n-r$) =1, whilst Trace test indicates two Co integrating vectors ($n-r$) =2. On the other hand, from tables 1.7 (Uganda) both tests show four Co integrating vectors ($n-r$) =4). Furthermore, from tables 1.8 (Burundi) and 1.9 (Kenya) both tests of max Eigenvalue and Trace test suggest one Co integrating vectors ($n-r$) =1. In general both tests suggest that there is a long run relationship for all variables in FDI model. This shows that, all variables included in the model are important determinants of FDI inflows in the long run. On the other hand, data indicate that, the models are far from spurious regression.

Table 1.6 Johansen Multivariate Cointegration Test Results

Rwanda (2)				
Variables: LFDI LGDP LBAID LMAID LEXP LDI				
Ho:	Maximum Eigen value	95% critical value	Trace test	95%critical value
$r=0$	57.91033*	40.07757	132.5956*	95.75366
$r \leq 1$	30.86456	33.87687	74.68530*	69.81889
$r \leq 2$	23.95607	27.58434	43.82074	47.85613
$r \leq 3$	10.88805	21.13162	19.86467	29.79707
$r \leq 4$	6.846837	14.26460	8.976625	15.49471
$r \leq 5$	2.129788	3.841466	2.129788	3.841466

Table 1.7 : Johansen Multivariate Cointegration Test Results

Uganda (3)				
Variables: LFDI LGDP LBAID LMAID LEXP LDI				
Ho:	Maximum Eigen value	95% critical value	Trace test	95%critical value
$r=0$	114.6813*	40.07757	256.1311*	95.75366
$r \leq 1$	57.87435*	33.87687	141.4498*	69.81889
$r \leq 2$	36.28126*	27.58434	83.57546*	47.85613
$r \leq 3$	33.77517*	21.13162	47.29420*	29.79707
$r \leq 4$	13.48425	14.26460	13.51903	15.49471
$r \leq 5$	0.034784	3.841466	0.034784	3.8414661)

Notes: LGDP (economic growth), LFDI(FDI), LBAID (bilateral aid), LMAID (multilateral aid), LEXP (export), LDI(Domestic investment), LPOP (labor force). * and ** refers to significant at 5 and 10 percent level respectively. Number in () implies the optimum lag selected by both AIC and Schwarz Criterion

Table 1.8 : Johansen Multivariate Cointegration Test Results

Burundi (2)				
Variables: LFDI LGDP LBAID LMAID LEXP LDI				
Ho:	Maximum Eigen value	95% critical value	Trace test	95%critical value
$r=0$	113.6289*	40.07757	182.1067*	95.75366
$r \leq 1$	25.62332	33.87687	68.47783	69.81889
$r \leq 2$	19.34886	27.58434	42.85451	47.85613
$r \leq 3$	14.65725	21.13162	23.50564	29.79707
$r \leq 4$	8.835404	14.26460	8.848396	15.49471
$r \leq 5$	0.012992	3.841466	0.012992	3.841466

Notes: LGDP (economic growth), LFDI(FDI), LBAID (bilateral aid), LMAID (multilateral aid), LEXP (export), LDI(Domestic investment), LPOP (labor force). * and ** refers to significant at 5 and 10 percent level respectively. Number in () implies the optimum lag selected by both AIC and Schwarz Criterion

Table 1.9 : Johansen Multivariate Cointegration Test Results

KENYA (1)				
Variables: LFDI LGDP LBAID LMAID LEXP LDI				
Ho:	Maximum Eigen value	95% critical value	Trace test	95%critical value
$r=0$	30.40181	40.07757	93.82097**	95.75366
$r \leq 1$	25.34509	33.87687	63.41916	69.81889
$r \leq 2$	20.11653	27.58434	38.07407	47.85613
$r \leq 3$	8.738821	21.13162	17.95754	29.79707
$r \leq 4$	7.248945	14.26460	9.218719	15.49471
$r \leq 5$	1.969774	3.841466	1.969774	3.841466

Notes: LGDP (economic growth), LFDI(FDI), LBAID (bilateral aid), LMAID (multilateral aid), LEXP (export), LDI(Domestic investment), LPOP (labor force). * and ** refers to significant at 5 and 10 percent level respectively. Number in () implies the optimum lag selected by both AIC and Schwarz Criterion.

4.3 VECTOR ERROR CORRECTION MODEL (VECM) AND GRANGER CAUSALITY

As we have said earlier within VECM model we can estimate the long run and short run relationship among the variables. After having found the long run relationship between FDI and Foreign aid now, here again we consider the short run interaction among the bilateral aid, multilateral and FDI inflows.

However, we include other important variables like economic growth, domestic investment and human capital. The lag was selected using AIC and Schwarz Criterion. The results are presented in table 1.10, 1.11, 1.12 and 1.13. The results of error correction terms (ECTs) shown by the t statistics value whilst Granger causality is shown by Chi square statistics. For the diagnostic test most of the results show that our models are free from serial correlation and normally distributed.

In the case of Kenya, in table 1.10 results show that, error correction term of bilateral aid (LBAID) and economic growth (LGDP) are significant at the five percent level of significance. This implies that, they make the adjustment towards long run equilibrium, after any short run deviations. For remaining variables do not make adjustment for any shock in the model. The results show that, at the five percent level of significance, bilateral aid (LBAID) Granger cause exports (LEXP). On the other hand, bilateral aid (LBAID) causes multilateral aid (LMAID) at ten percent level of significance. We also found that, economic growth granger causes exports.

Table 1.10 : Results of Vector Error Correction Model (VECM) (Kenya)

Dependent variables	Independent variables						ECT _{t-1} [t-ratio]
	X^2 statistics of lagged first differenced term (p values)						
	Δ LFDI	Δ LGDP	Δ LBAID	Δ LMAID	Δ LEXP	Δ LDI	
Δ LFDI	-	0.37(0.53)	0.22(0.63)	0.60(0.43)	0.86(0.35)	0.68(0.40)	0.05 (0.36)
Δ LGDP	0.28(0.59)	-	0.90(0.34)	0.11(0.73)	6.25*(0.01)	0.40(0.52)	0.00* (3.6)
Δ LBAID	0.21(0.64)	1.95(0.16)	-	3.39**(0.06)	1.38(0.23)	0.07(0.78)	-0.05* (-2.33)
Δ LMAID	2.55(0.10)	6.64*(0.00)	0.34(0.55)	-	0.54(0.45)	0.30(0.58)	0.01 (0.16)
Δ LEXP	0.45(0.49)	6.36*(0.01)	0.06* (0.80)	0.02(0.86)	-	1.19(0.27)	-0.02 (-1.59)
Δ LDI	1.94(0.16)	1.81(0.17)	0.00*(0.98)	0.02(0.86)	0.17(0.67)	-	-0.05 (-1.80)

GDP MODEL, AR(1)=86.84, JB=13, FDI MODEL, AR(1)= 86.84, JB=14, EXP MODEL, AR(1)=86.84, JB=19, AIDMODEL, AR(1)=86.84, JB =12.44, LPOP MODEL, AR(1)=86.84, JB =12.44, LDI MODEL, AR(1)=86.84, JB=83.30

Notes: Asteriks * and ** refer to significant levels at five (5) and ten (10) significant level. Numbers in () and [] refers to the chi square value and t statistics respectively. AR(1) refers to autocorrelation test at order one. JB refers to Jaque Berra normality test.

In the case of Rwanda (table 1.11) the error correction term of multilateral aid (LMAID) and domestic investment (LDI) and export are significant at the five percent level of significance. Any short run deviations from the long run, those variables which are significant will make a correction in the next period and the model will return to the equilibrium. In this model, we found that, all variables including bilateral and multilateral aid granger cause FDI. Multilateral aid (LMAID) Granger causes export and economic growth. We also found that, domestic investment (LDI) granger cause bilateral id (LBAID)

Table 1.11 : Results of Vector Error Correction Model (VECM) (Rwanda)

Dependent variables	Independent variables						ECT _{t-1} [t-ratio]
	X^2 statistics of lagged first differenced term (p values)						
	Δ LFDI	Δ LGDP	Δ LBAID	Δ LMAID	Δ LEXP	Δ LDI	
Δ LFDI	-	0.80 (0.66)	2.44 (0.29)	1.79 (0.40)	0.10 (0.40)	3.85 (0.14)	0.88 (1.05)
Δ LGDP	11.27 (0.00)*	-	3.11 (0.21)	5.2 (0.07)	0.01 (0.99)	5.88 (0.05)**	0.09 (1.61)
Δ LBAID	6.93 (0.03)*	0.96 (0.61)	-	2.89 (0.23)	1.14 (0.56)	5.07 (0.07)**	-0.36 (-1.68)
Δ LMAID	7.96 (0.01)*	4.92 (0.08)**	1.49 (0.47)	-	5.51 (0.00)*	1.86 (0.39)	4.97* (3.11)
Δ LEXP	4.57 (0.10)*	0.17 (0.91)	0.66 (0.71)	3.38 (0.18)	-	1.86 (0.39)	-0.23 (-1.79)
Δ LDI	7.87 (0.01)*	6.09 (0.04)	9.69 (0.00)*	3.04 (0.21)	1.43 (0.4)	-	0.33* (2.47)
GDP MODEL, AR(1)=75.84, JB=13, FDI MODEL, AR(1)= 75.84, JB=19, EXP MODEL, AR(1)=75.84, JB=29, AIDMODEL, AR(1)=75.84, JB =22.44, LPOP MODEL, AR(1)=75.84, JB =22.44, LDI MODEL, AR(1)=75.84, JB=43.30							

Notes: Asteriks * and ** refers to significant level at five(5) and ten(10) significant level. Numbers in () and [] refers to chi square value and t statistics respectively. AR(1) refers to autocorrelation test at order one. JB refers to Jaque bera normality test.

On top of that, Uganda (table 1.12) economic model shows that, error correction terms of the normalized variables (LFDI) are significant implies the presence of long run causality from all variables in the system including bilateral (LBAID) and multilateral aid (LMAID). Furthermore, the error correction term of economic growth (LGDP) and bilateral aid (LBAID) are significant at five and ten percent level of significance level. This implies that, all variables make adjustment to the long run, for any shocks in the short run. The results show that, only bilateral aid (LBAID) causes economic growth (LGDP).

Table 1.12 :Results of Vector Error Correction Model (VECM) (Uganda)

Dependent variables	Independent variables						ECT _{t-1} [t-ratio]
	X^2 statistics of lagged first differenced term (p values)						
	Δ LFDI	Δ LGDP	Δ LBAID	Δ LMAID	Δ LEXP	Δ LDI	
Δ LFDI	-	1.10 (0.77)	7.66* (0.05)	5.56 (0.13)	6.59** (0.08)	16.5* (0.0)	0.09 (0.69)
Δ LGDP	0.15 (0.98)	-	5.20 (0.15)	3.65 (0.30)	0.71 (0.86)	19.2 (0.00)	0.01* (1.29)
Δ LBAID	2.28 (0.51)	6.34** (0.09)	-	14.7* (0.00)	0.11 (0.98)	7.13* (0.06)	0.37* (3.37)
Δ LMAID	2.73 (0.43)	4.68 (0.19)	8.15* (0.04)	-	2.48 (0.47)	10.1* (0.01)	-0.10 (-0.91)
Δ LEXP	1.47 (0.68)	1.79 (0.61)	6.19 (0.10)	2.29 (0.51)	-	1.79 (0.61)	-0.07 (-0.07)
Δ LDI	1.02 (0.79)	1.32 (0.73)	3.20 (0.36)	5.79 (0.12)	2.57 (0.46)	-	-0.00 (-0.19)
GDP MODEL, AR(1)=65.94, JB=14, FDI MODEL, AR(1)= 65.94, JB=39, EXP MODEL, AR(1)=65.84, JB=39, AIDMODEL, AR(1)=65.94, JB =22.44, LPOP MODEL, AR(1)=65.94, JB =22.22, LDI MODEL, AR(1)=65.84, JB=53.30							

Asteriks.* and ** implies five(5) and ten(10) significant level. Numbers in () and [] refers to chi square value and t statistics respectively. AR(1) refers to autocorrelation test at order one.JB refers to Jaque bera normality test.

On the other hand, we found that, multilateral aid (LMAID), foreign direct investment (LFDI) both Granger cause bilateral aid (LBAID). In turn, multilateral aid (LMAID) Granger causes bilateral aid (LBAID). This indicates that, both bilateral and multilateral aid, in the short run; they are dependent on their performance. On the other hand, the results show that FDI (LFDI) causes export growth in the short run.

Table 1.13 :Results of Vector Error Correction Model (VECM) (Burundi)

Dependent variables	Independent variables						ECT _{t-1} [t-ratio]
	X^2 statistics of lagged first differenced term (p values)						
	Δ LFDI	Δ LGDP	Δ LBAID	Δ LMAID	Δ LEXP	Δ LDI	
Δ LFDI	-	0.30(0.85)	3.17(0.20)	0.01(0.99)	0.77(0.67)	14.0*(0.0)	-0.48* [-2.52]
Δ LGDP	3.49(0.17)	-	7.68*(0.02)	1.38(0.49)	6.06*(0.04)	32.4*(0.0)	0.00 [0.35]
Δ LBAID	0.80(0.66)	0.19(0.90)	-	3.95(0.13)	8.65*(0.01)	6.0*(0.04)	0.15* [2.26]
Δ LMAID	3.28(0.19)	1.36(0.50)	1.63(0.44)	-	3.80(0.14)	14.8*(0.0)	-0.12 [-1.06]
Δ LEXP	0.33(0.84)	0.10(0.94)	3.03(0.21)	0.77(0.67)	-	4.49(0.10)	-0.03 [-0.55]
Δ LDI	0.33(0.84)	1.69(0.42)	3.86(0.14)	0.39(0.82)	6.01*(0.04)	-	0.29* [5.57]
GDP MODEL, AR(1)=75.84, JB=33, FDI MODEL, AR(1)= 75.84, JB=79, EXP MODEL, AR(1)=75.84, JB=29, AIDMODEL, AR(1)=75.84, JB =42.55, LPOP MODEL, AR(1)=75.84, JB =72.44, LDI MODEL, AR(1)=75.84, JB=7.30							

Notes: Asteriks * and ** refer to significant levels at five (5) and ten (10) significant level. Numbers in () and [] refers to the chi square value and t statistics respectively. AR(1) refers to autocorrelation test at order one. JB refers to Jaque bera normality test.

On the other hand, in Burundi, the results of error correction term show that, FDI (LFDI), bilateral aid (LBAID) and domestic investment (LDI) significantly make adjustments in equilibrium for any short run deviations. On the other hand, in the short run we found that, economic growth (LGDP), Granger cause bilateral aid (LBAID). Moreover, economic growth (LGDP), bilateral aid (LBAID), domestic investment (LDI) Granger causes exports.

Furthermore, in the short run FDI, export, bilateral and multilateral aid Granger causes domestic investment (LDI).

Generally, for all countries we found that bilateral aid and multilateral aid cause FDI in two countries out of four namely Burundi and Rwanda. These results are supported by Changsheng Xu et al (2010) and Blaise (2005). This implies that the increase in foreign aid would stimulate more FDI through alleviating the constraints of FDI such as poor infrastructures and increasing more access of finance. On the other hand we found that, FDI granger cause bilateral aid in Rwanda which implies that the increase in FDI would stimulate more familiarity between host countries and donors which results to more FDI inflows (Billet, 1993)

On the other hand we found that foreign aid both bilateral and multilateral aid do not support FDI in Kenya and Uganda. These results conform to the results of Karakaplan (2005), Harmz and Lutz (2006) and Kimura and Todo (2010). This implies that, the increase in foreign aid in these countries would not support FDI inflows; instead the government has to rely on alternative factors to increase FDI. In general the results are summarized in table 1.14

Table 1.14 SUMMARY OF CAUSALITY RESULTS

COUNTRY	FDI	BILATERAL AID	MULTILATERAL AID	CONTROL VARIABLES
FOREIGN DIRECT INVESTMENT MODEL (FDI)				
Kenya	No causality	Cause multilateral aid and export	No causality	GDP causes export
Burundi	Cause LDI	Cause LFDI, LDI	Cause LFDI, LDI	Export, LDI cause FDI
Rwanda	Cause bilateral aid	Cause FDI	Cause FDI, Export and economic growth(LGDP)	LDI cause LBAID
Uganda	Cause export	Cause multilateral aid	Cause bilateral aid	LGDP cause LBAID

5.0 CONCLUSION

. Recently, the World Bank and IMF have been more interested in understanding whether foreign aid inflows from multilateral or bilateral donors have catalyzing effect on the crowd out effect to FDI (Kang et al, 2011). Yet, very few studies have empirically examined the impact of foreign aid to FDI to developing countries especially the East African community members (EAC). From this fact, the main intention of this research is to analyze the role of foreign aid to FDI inflows in EAC members.

Several literatures found mixed results concerning the impact of foreign aid to FDI. However at large extent, they found that, foreign aid does not have any impact to economic growth. Given that, FDI and foreign aid inflows are the large external source of EAC members it is worthwhile to determine their relationship especially in terms of causality. Using the time series techniques of vector error correction term (ECM) and Granger causality test we found mixed results for all EAC members.

Generally, for all countries we found that bilateral aid and multilateral aid cause FDI in two countries out of four namely Burundi and Rwanda. This implies that the future FDI inflows in Burundi and Rwanda largely depend on foreign aid inflows. On the other hand we found that, FDI granger cause bilateral aid in Rwanda which implies that the increase in FDI would stimulate more familiarity between host countries and donors which

results to more FDI inflows. On the other hand we found that foreign aid both bilateral and multilateral aid do not support FDI in Kenya and Uganda. This implies that, the increase in foreign aid in Kenya and Uganda would not support FDI inflows; instead the government has to rely on alternative factors to increase FDI.

In the future studies, it will be important for the researchers to analyze the relationship between foreign aid and FDI in different branches such as looking the impact of human support aid and physical capital aid to FDI.

REFERENCES

- Arellano, C., Bulir, A., Lane, T., and Lipschitz, L. 2009. The dynamic implications of foreign aid and its variability. *Journal of Development Economics*, Vol . 88 : 87 -102.
- Asiedu, E., Jin Y., and Nandwa, B. (2009) .Does the foreign aid mitigate adverse effects of approximation risk on foreign direct investment?. *Journal of International Economics*, vol. 78: 268-275.
- Blaise, S., (2005) On the link between Japan ODA and FDI in China .Evaluation using conditional logit analysis. *Applied Economics*, vol . 37: 51-55.
- Billet, B. (1993). *Modernization Theory and Economic Development: Discontent in the Developing World*. Westport, Conn. USA: Praeger Publisher
- Changsheng, X., Bhavan, T. C., and Zhong, C. (2011). The Relationship between foreign aid and FDI in South Asian economies. *International Journal of Economics and Finance*, vol. 3 : :142-149
- Caselli, F., and Feyrer, J. (2007). The marginal productivity of capital. *Quarterly Journal of Economics*: vol 122: 535-68
- Dickey, D., and Fuller, W. (1981). Likelihood ratio statistics for autoregressive time series with a Unit Root. *Econometrica*. vol : 49, 1057-1072.
- Gong, L., and Xiaoying, C. (2007). Foreign aid, domestic capital accumulation and foreign borrowing . *Journal of Macroeconomics*, 30, 1269-1284
- Harms, P. and Lutz, M. 2006. Aid, governance and private foreign investment: Some puzzling findings in the 1990s. *Economic Journal* vol. 116:773-90
- Johansen, S. (1988) *Statistical Analysis of Co integrating Vectors*. *Journal of Economic Dynamics and Control*. Vol. 12: 231–254.
- Johansen, S. and K. Juselius 1990. Maximum likelihood estimation and inference on cointegration with applications to the demand for money. *Oxford Bulletin of Statistics*. Vol. 52: 169-210.
- Kang, S. J., Lee, H., & Park, B. 2011. Does Korea follow Japan in foreign aid? Relationships between aid and foreign investment. *Japan and the World Econom*. Vol . 23(1): 19-27.
- Karakaplan, M.U., Neyapti and Sayek, S. 2005. Aid and foreign direct investment: International evidence. *JEL* (Discussion paper no 5).Ankara, Turkey. Bilkent University, [Online] Available: [3Hhttp://ideas.repec.org/p/bil/bilpap/0505.html](http://ideas.repec.org/p/bil/bilpap/0505.html)
- Kimura, H. and Todo. 2010. Is foreign aid a vanguard of foreign direct investment? A gravity-equation approach. *World development*. Vol. 38: 482-497.
- Kosack, S. and Tobin, J. (2006). Funding self sustaining development. The role of foreign aid, FDI and government in economic success. *International organization*. Vol. 60: 205-43.
- Kwiatkowski, D., Phillips, P. C. B., Schmidt, P. and Shin, Y. (1992). Testing the null hypothesis of stationarity against the alternative of a unit root: How sure are we that economic time series have a unit root? *Journal of Econometrics*. Vol. 54: 159–178.
- Pallage, S., and Robe M.A (2001). Foreign aid and the business cycles. *Review of International Economics*. Vol. 9: 641-672.

The IISTE is a pioneer in the Open-Access hosting service and academic event management. The aim of the firm is Accelerating Global Knowledge Sharing.

More information about the firm can be found on the homepage:

<http://www.iiste.org>

CALL FOR JOURNAL PAPERS

There are more than 30 peer-reviewed academic journals hosted under the hosting platform.

Prospective authors of journals can find the submission instruction on the following page: <http://www.iiste.org/journals/> All the journals articles are available online to the readers all over the world without financial, legal, or technical barriers other than those inseparable from gaining access to the internet itself. Paper version of the journals is also available upon request of readers and authors.

MORE RESOURCES

Book publication information: <http://www.iiste.org/book/>

Academic conference: <http://www.iiste.org/conference/upcoming-conferences-call-for-paper/>

IISTE Knowledge Sharing Partners

EBSCO, Index Copernicus, Ulrich's Periodicals Directory, JournalTOCS, PKP Open Archives Harvester, Bielefeld Academic Search Engine, Elektronische Zeitschriftenbibliothek EZB, Open J-Gate, OCLC WorldCat, Universe Digital Library, NewJour, Google Scholar

