

## Impact of Foreign Aid and Foreign Direct Investment on Economic Growth: Evidence from Sub-Saharan African Countries

*(Kesan Bantuan dan Pelaburan Langsung Asing ke Atas Pertumbuhan Ekonomi:  
Bukti daripada Negara-negara Sub-Sahara Afrika)*

**Masoud Rashid Mohamed**  
Sekolah Pengajian Siswazah  
Universiti Putra Malaysia

**Shivee Ranjane Kaliappan**  
**Normaz Wana Ismail**  
**W. N. W Azman-Saini**  
Fakulti Ekonomi dan Pengurusan  
Universiti Putra Malaysia

### ABSTRACT

*The purpose of this study is to examine the impact of foreign aid and FDI on economic growth of Sub-Saharan African countries. The generalized method of moments is applied on 41 countries covering the period of 1998 to 2010. The results suggest that while foreign aid has negative effect on growth, the impact of FDI is positive but statistically insignificant. Furthermore, we found evidence that foreign aid from different bilateral donors may have different effects on economic growth.*

*Keywords: Foreign aid; foreign direct investment; economic growth; Sub-Saharan Africa; Generalized Method of Moments*

### ABSTRAK

*Tujuan kajian ini adalah untuk menyelidik kesan bantuan asing dan pelaburan langsung asing ke atas pertumbuhan ekonomi negara-negara Sub-Sahara Afrika. Kaedah Momen Teritlak digunakan ke atas 41 buah negara melibatkan tempoh masa dari 1998 hingga 2010. Keputusan kajian menunjukkan bahawa bantuan asing mempunyai impak negatif ke atas pertumbuhan ekonomi, manakala FDI, walaupun memberikan kesan positif tetapi tidak signifikan. Tambahan pula, kajian juga mendapati bantuan asing daripada penderma dua hala yang berlainan mempunyai kesan yang berbeza ke atas pertumbuhan ekonomi.*

*Kata kunci: Bantuan asing; pelaburan langsung asing; pertumbuhan ekonomi; Sub-Sahara Afrika; Kaedah Momen Teritlak*

### INTRODUCTION

For more than four decades, foreign aid has become an integral development aspect of Sub-Saharan African (SSA) countries. According to Burnside and Dollar (2000), foreign aid serves as transfer of income, which may or may not stimulate economic growth. Generally, there are two main objectives of foreign aid; namely, to promote economic development and to improve the welfare of the people in the recipient countries. Apart from foreign aid, foreign direct investments (FDI) have also gained prominence in recent years due to its potential positive impact on economic development of the host countries. Nevertheless, empirical studies have been mixed and ambiguous on the effect of foreign aid and FDI on the growth of developing countries. Judging from a period

of about four to five decades from now, aid has been increasingly flowing to developing countries; however, the issue of aid effectiveness on growth remains unclear (Harrigan and Wang 2011). This is because some pointed out that foreign aid has not increased the growth rates in poor and developing countries (Boone 1995 and 1996).

Because an apparent lower rate of growth in most of the Sub-Saharan African and other developing countries (possibly caused by low levels of savings, shortage of capital and foreign exchange constraints), foreign aid is widely considered and accepted as an important tool for promoting economic growth in the regions. Foreign aid believed to fill the gaps in domestic savings, investments, and fiscal deficits thereby permitting higher rates of economic growth to takeoff. In-depth studies have applied various econometric methodologies to investigate the

effectiveness of foreign aid on growth. The results of these studies are categorized into three main groups. To some, aid has positive effect on growth, to others, aid effect is positive but conditional to certain country-specific factors, and some believe that aid has negative effect on growth of recipient country. On the other hand, FDI also plays an important role in accelerating technology diffusion, introduction of new knowledge, production process, and managerial skills. It also facilitates the expansion of international production networks and provides easy means for domestic firms to access the international markets (Hermes and Lensink 2003; Durham 2004; Barro and Sala-i-Martin 1995). Similar to the case of aid, empirical studies generate mixed results on the way FDI affect growth in developing countries. Some studies suggest a direct positive relationship between FDI and growth; others indicate indirect effects; and some show evidence of negative effects. Against this background, the paper aims to examine the impact of foreign aid and FDI on economic growth of Sub-Saharan African countries. The main contribution of the study is in terms of the measure of foreign aid used. The study differentiated the foreign aid between bilateral aid and multilateral aid. The bilateral aid is further disaggregated based on main individual donor country. Furthermore, the study also examines the influence of institutional quality on the aid-growth nexus by incorporating four measures of institutional quality (i.e. the index of government effectiveness, regulatory quality, control of corruption, and rule of law).

The remainder of the paper is organized as follows: Section 2 presents the trend and performances of economic growth, foreign aid and FDI flows to SSA countries. Section 3 provides review of literature on related issues; Section 4 describes the variables and explains the methodology; Section 5 presents the empirical results and discusses the findings. Section 6 concludes the study.

#### AN ECONOMIC OVERVIEW OF SUB-SAHARAN AFRICAN (SSA)

SSA countries have passed through various episodes of progress and downturn in terms of economic performances. During 1970s and 1980s, SSA countries were growing at the annual average of 3.5 percent and 1.8 percent respectively (UNCTAD 2011). This rate is quite low to combat poverty and other socio-economic problems of the region. The slow and low growth rate was largely contributed by the poor performance of the global economy due to oil shock caused by embargoes imposed by Organization of Petroleum Exporting Countries (OPEC). Moreover, the prices of agricultural commodities and raw materials exported by SSA countries declined sharply but the prices of imported manufactured goods increased substantially. Due to this, many SSA

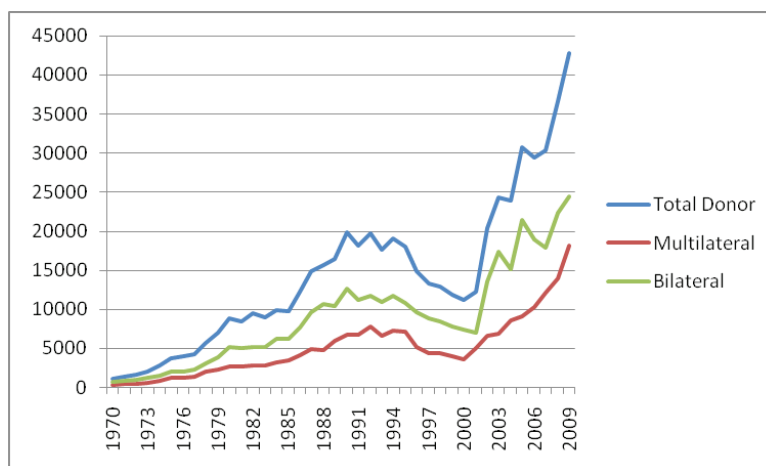
countries also faced balance of payment difficulties in the 1980s. Nevertheless, in 1990s, SSA countries started to recover slowly. The economy could have probably grown very much faster in 1990s if not due to the outbreak of war, political tensions, and HIV/AIDS epidemic in many countries, which weakened the growth.

In the last decade, SSA countries have generally sustained the growth rate of 5.10 percent. This is two times higher than global growth rate and more than three times of developed countries. However, this growth rate is 0.6 percent lower compared to East Asian growth. The higher growth rate of SSA countries during 2000s is due to a sustained rapid economic growth of oil exporting nations such as Angola, Nigeria, and Sudan, which sustained an annual growth of between 8 to 11 percent. The region benefited a lot from favorable external environment that resulted from strong world demand and increased prices for oil, minerals, and some agricultural products. However, the availability of external finance in the form of foreign assistance, political events, weather conditions, and weaker global economic growth (especially their major trade partners) imposed risks for SSA growth prospects (World Bank 2010).

#### THE FLOW OF FOREIGN AID AND FDI

The flow of foreign aid to SSA countries has been generally changing over time. The steady increase of aid flow is observed from the period of 1970 to late 1980s followed by a significant drop in the 1990s. In early 2000s, the flow started to recover gradually and increased substantially in 2005. Figure 1 shows the various categories of foreign aid (total, multilateral and bilateral official development assistance) to SSA which shared similar trend over the period of 1970 to 2009. All types of foreign aid seem to move much closer in the 1970s but a considerable divergence observed since 1980s. The share of bilateral aid seems to decline since 1980s while that of multilateral aid rises. However, bilateral aid remains an important source of foreign financial resources to SSA countries. During 1990s and mid-2000s, the decline of bilateral aid and total aid was noted. The 1990s decline is due to the end of Cold War and possibly contributed by large budget deficits faced by some donors such as Sweden, Italy, Japan, Finland, Ireland and Norway.

On the other hand, SSA countries also have attracted more FDI during the last decade reflecting an improved investment environment in the region. More specifically, during the period of 2000 and 2009, most of these countries attracted between USD 100 and 500 million per annum. This is more than twice of the FDI flows received in the preceding decades. However, when compared to other regions, SSA region receives significantly less amount of FDI. For example, between 2000 and 2009, SSA region received only quarter of the FDI received by Latin America and less than 15 percent of Asian countries



Source: UNCTAD Online Database (2012)

FIGURE 1. The Profile of Aid Flow to SSA from 1970 – 2009 (in million USD)

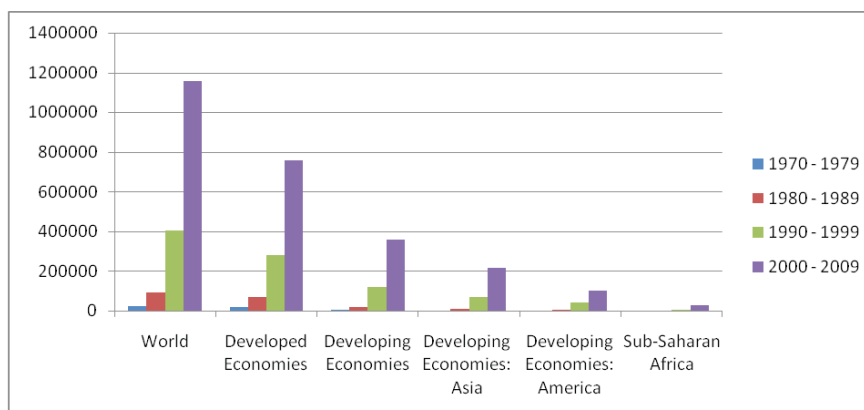
(see Figure 2). Several factors might have contributed to the relatively small flows of FDI in SSA region. These include unreliable political environment, small markets, poor infrastructure, unattractive policies and poor private sector development. In summary, although SSA countries receive huge amount of aid, they still have low rate of economic growth. Low rate of economic growth has resulted into unacceptably high rate of poverty and deprived standard of living. Thus, as mentioned earlier, this paper aims to investigate empirically how foreign aid and FDI affects the economic growth of these countries.

country specific conditions. The evidence that suggests positive role of foreign aid on economic growth is substantially based on earlier growth models, which assumed that physical capital accumulation plays a key role in promoting economic growth of a country. Harrod (1939) and Domar (1946) growth model is amongst the mostly widely used model in determining the aid-growth relationship. Chenery and Strout (1966) later extended the model to be known as Two-Gap model. Chenery and Strout (1966) extensions assert that foreign aid plays an important role of filling saving and foreign exchanges gaps that limit the growth of developing countries. These two gaps are believed to undermine the physical capital accumulation in developing countries. In the pioneering work on foreign aid and economic growth, Papanek (1973) separated aid from other types of foreign capital and examined the empirical nexus between aid, savings and foreign capital investment. He suggested that developed countries should assist developing countries to resolve their balance of payment difficulties through transfer of resources in the form of foreign aid. However, Papanek’s study suffers from major econometric

## REVIEW OF LITERATURE

### AID-GROWTH LINKAGE

Extensive body of literature, both theoretical and empirical, exists on foreign aid and economic growth. The literature can be divided into three groups, namely; positive effects of aid on growth, negative or insignificant effects, and positive effects but conditional to certain



Source: UNCTAD Database (2012)

FIGURE 2. The Average Annual Distribution of World FDI Inflows (million USD)

problems such as simultaneity and measurement defaults and hence his finding was claimed as controversial (Ali and Isse 2005). Nevertheless subsequent studies by Levy (1988), Singh (1985), Dowling and Hiemenz (1983), and Mühleisen et al. (1995) have consistently demonstrated that foreign aid has a positive and significant influence on economic growth of the recipient countries.

Apart from that, Burnside and Dollar (2000) was the first one to stimulate a debate on positive effect of aid that is conditional to certain country-specific factors. They argued that aid could have positive effect on growth if the macroeconomic environment of a recipient country is good. The implication of this argument is that aid should be allocated according to macroeconomic performance of the recipient countries. However, Easterly et al. (2004) and Hansen and Tarp (2001) stressed that Burnside and Dollar's findings were not robust because the results are sensitive to changes in data and model specifications. The final view is that aid has negative effects on growth. According to this view, foreign aid increases a government's resource envelope, which often leads to a reduced government efforts to revenue collection from taxation. The country's mechanism of raising tax may decline, eliciting the need for additional aid while dissipating the short-term beneficial effects of aid and creating a culture of dependency (Adam and O'Connell 1999). Most economists who disapproved foreign aid as means of promoting economic prosperity in poor countries associate it with reduced government discipline (Levy 1988). Some of the advocates of negative influence of foreign aid to growth attested that a continuous rise in foreign aid inflow could reduce long-run capital accumulation and labor supply of aid recipient countries and by extension may reduce their rate of economic growth.

#### FDI-GROWTH LINKAGE

Similar to the case of aid-growth, the literature of FDI and growth generates mixed and ambiguous results. There are three groups of findings; pro-FDI view, anti-FDI view, positive role of FDI but based on host country's specific characteristics. Theoretically, FDI has a direct effect on growth due to its contribution to capital accumulation and technology diffusion in the host economy. The effect of FDI on growth will be particularly effective if the diffusion of technology leads to acquisition of new stock of knowledge via labor training, new management practices, skills development, and new organizational styles (De Mello 1999). Blomstrom et al. (2000) argues that FDI contribute to the growth of the host economy, both directly and indirectly. FDI contribute directly to economic growth by generating employment opportunities and assisting the process of export promotion, capital formation and technology absorption. The indirect influence of FDI to host economy includes increased productivity of the firms through

demonstration effects and labor mobility. This has been empirically proven in Ramirez's (2000) study, which established a positive impact of FDI on labor productivity. This finding supports the theoretical postulation that FDI has spillover effect on labor productivity, which in turn led to overall economic growth. On the other hand, Hsiao and Hsiao (2006) tested the causality between FDI, exports and growth for eight rapidly growing East and Southeast Asian economies namely China, Malaysia, Korea, Taiwan, Singapore, Hong Kong, Philippines and Thailand. The panel analyses revealed a unidirectional causality from FDI to GDP while the time series results indicate that the results cannot be generalized for all countries because each country produces different causality between the variables.

Nonetheless, a number of empirical studies showed that the effect of FDI on growth is highly dependent on factors such as substitutability between FDI and domestic investments and country-specific characteristics (e.g. level of financial development, economic freedom, openness, etc.). For instance, Buckley et al. (2002) argued that countries with an open trade regime, high savings rate, and high level of technology are likely to benefit more from FDI. Similarly, Hermens and Lensink (2003) found evidence that financial development is an important prerequisite condition for FDI to have a positive impact on economic growth. They asserted that sound financial development contributes positively to the process of technological diffusion. Bengoa and Sanchez-Robles (2003) suggest that in order to benefit from long-term foreign capital inflow, the host country should have sufficient infrastructure, adequate level of human capital development, stable economy and liberalized markets. Furthermore, Azman-Saini et al. (2010) found that the effect of FDI on growth is contingent to host country's level of economic freedom.

Contrary to above views, the anti-FDI view argues that the impact of FDI on the host country is negative. Aitken et al. (1997) argue that despite several benefits from FDI, since foreign firms able to produce at relatively lower marginal cost, this would affect the competitiveness of domestic firms and demand for the products produced by domestic firms. If this effect is sufficiently high, the net effect can be negative thereby resulting in declining productivity of local firms and affecting the overall performance of the economy. While Ndikumana and Verick (2008) suggest that FDI have crowding-in effects on domestic investment for African countries; Borensztein et al. (1998) found evidence that suggest less robust complementary between FDI and domestic investment. A recent study by Adams (2009) also found a negative net crowding-out effect of FDI for African countries. However, Lumbila (2005) attests that foreign direct investment and domestic investment can have positive effect on growth only under a good policy and environment. In summary, the findings on how aid and FDI affect growth are mixed and inconclusive. This provides

an avenue for further explore the issues. In this study, we endeavor to explore this issue by using GMM approach based on data from SSA countries.

## DATA AND METHODOLOGY

To examine the impact of foreign aid and FDI on economic growth of Sub-Saharan African countries, the theoretical growth model is constructed as follows:

$$Y_{it} = A_{i,t} K_{d,i,t}^\alpha K_{f,i,t}^\lambda L_{i,t}^\beta \quad (1)$$

where  $Y$  represents the flow of output,  $A$  is the total factor productivity (explains the contribution of factors that are not included in the model to the output growth),  $K_d$  represents the domestic capital,  $K_f$  is the foreign capital flows,  $L$  is the labor force,  $\lambda$  represents the changes in output to changes in foreign capital stock, and  $\beta$  represents the output changes to labor force changes. The subscript  $i$  and  $t$  represent the cross-sectional members of the family and time respectively. In econometric presentation, we specify the above model as:

$$Growth_{it} = \beta_0 + \beta_1 AID_{i,t} + \beta_2 FDI_{i,t} + \lambda Z_i + \varepsilon_{i,t} \quad (2)$$

where  $Growth$  refers to growth of per capita GDP,  $AID$  is the flow of net official development assistance (ODA);  $FDI$  represents the flow of foreign direct; and  $Z_i$  is the vector of control variables which include the level of human capital (measured by life expectancy at birth), labor force (measured by the total number of people in the country) and technological growth (measured in terms of country's openness to international trade). The model is re-specified based on Generalized Method of Moments (GMM) proposed by Arellano and Bover (1995) and Blundell and Bond (1998). The model is represented as follows:

$$\log y_{i,t} = \beta_0 + \beta_1 \log(y_{i,t-1}) + \beta_2 x_{i,t} + \beta_3 z_{i,t} + \beta_4 \eta^t + \mu_i + \varepsilon_{i,t} \quad (3)$$

where  $y$  represent the explained variable of the model (growth of per capita GDP),  $y_{i,t-1}$  is the lagged level of the dependent variable,  $x$  represents the vector for explanatory variables (aid and FDI) and  $z$  is the vector for all control variables. The control variables include population growth, gross fixed capital formation, trade openness, and human capital. The symbol  $\eta^t$  and  $\mu_i$  denotes a time-specific effect and the county-specific effect, respectively. The error term,  $\varepsilon$  fulfills all classical assumptions, that is,  $\varepsilon \sim IID(0, \sigma_\varepsilon)$  and  $E(\mu_i \varepsilon_{i,t}) = 0$  where  $i$  and  $t$  refers to cross sectional units and time, respectively. GMM is preferred because of its ability to capture the country specific effects and possible joint endogeneity problem of some independent variables, which is in turn, may lead to simultaneity bias. Although difference GMM proposed by Arellano and Bond (1991) can account for possible simultaneity bias and correlation between lagged dependent variable and error

term by using lagged levels of independent variables as instruments, it still suffers from several econometric problems. In asymptotic samples, the lagged instruments of difference GMM tend to become weak thereby causing biasness in the parameter estimation (Alonso-Burtego and Arrelano 1999; Blundell and Bond 1998). Based on Arellano and Bond (1991) the standard GMM conditions of no second-order autocorrelation for this study can be set as follows:

$$E[y_{i,t-s} (\varepsilon_{i,t} - \varepsilon_{i,t-1})] = 0 \text{ for } s \geq 2 \text{ and } t = 3 \dots T \quad (4)$$

$$E[x_{i,t-s} (\varepsilon_{i,t} - \varepsilon_{i,t-1})] = 0 \text{ for } s \geq 2 \text{ and } t = 3 \dots T \quad (5)$$

$$E[z_{i,t-s} (\varepsilon_{i,t} - \varepsilon_{i,t-1})] = 0 \text{ for } s \geq 2 \text{ and } t = 3 \dots T \quad (6)$$

The solution to the biasness and imprecision caused by difference GMM is by using system GMM as proposed by Arellano and Bover (1995) and Blundell and Bond (1998). This method uses lagged first difference of the variables as instrument in addition to the one presented by equation 4 to 6. However, the additional instrument is only valid under a restriction of initial condition as prescribed by growth theories, which include Solow (1956), and endogenous growth theories. The additional conditions based on Arellano and Bover (1995) and Blundell and Bond (1998) for equation 3 are represented in equation 7 to 9 below:

$$E[(y_{i,t-s} - y_{i,t-1})(\mu_i + \varepsilon_{i,t'})] = 0 \text{ for } s = 1 \quad (7)$$

$$E[(x_{i,t-s} - x_{i,t-1})(\mu_i + \varepsilon_{i,t'})] = 0 \text{ for } s = 1 \quad (8)$$

$$E[(z_{i,t-s} - z_{i,t-1})(\mu_i + \varepsilon_{i,t'})] = 0 \text{ for } s = 1 \quad (9)$$

The above condition implies that even if the lagged country-specific effect does correlate with the levels of explanatory variables, it will not correlate with their differences. Therefore, the system will now result in an efficient estimation. Similarly, even if the initial values of the explanatory variables deviate from their long-run value, they will not systematically correlate with country-specific effect. Nevertheless, System GMM may suffer from problem of optimal instrument identification. GMM instruments tend to be over identified thereby causing the problem of over fitting the estimated model (Roodman 2009). Little guidance is currently available to determine the optimal number of instruments to be used. However, Hansen's (1982)  $J$ -test can be useful in detecting the over-identification problem in system GMM. The test is performed under the hypothesis of the presence of validity for all instruments, with zero expectation of empirical moments. It follows the Chi-square distribution with degree of freedom equal to number of used instruments that over-identifies the restriction. The second problem that is associated with system GMM is the potentiality of second-order serial correlation. However, this can easily be detected through testing the error term of the differenced error term. We used system GMM approach based on the condition presented by equation 2 to 7 in order to minimize

TABLE 1. Data Sources and Descriptions

Variable	Descriptions	Data source	Expected Sign
GDP per capita	Change in GDP per capita. Represent the rate of economic growth of the selected countries	UNCTAD	-
Foreign aid	Measured as net total ODA divided by the country's GDP	UNCTAD	+
FDI	Total FDI inflows over the country's GDP	UNCTAD	+
Bilateral and multilateral aid	The total flows of bilateral ODA, multilateral ODA and individual donor's bilateral ODA. (as a ratio to GDP)	UNCTAD & World Bank	+
Population growth	Change in country's total population	UNCTAD	+
Openness	Sum of export and import trade over the country's GDP	UNCTAD	+
Capital formation	Gross fixed capital formation as percentage of GDP	World Bank	-
Human capital accumulation	Life expectancy at birth	World Bank	+

possibility of biasness in the estimated coefficients. More specifically, we employed the *two-step* GMM (system) instead of *one-step* GMM. This is because *one-step* GMM assumes homoskedasticity of error residuals while *two-step* GMM relaxes this assumption (Arellano and Bond 1991).

#### DATA SOURCES

The data were obtained from the World Bank's World Development Indicator and UNCTAD Online Database. Summary of the variables are reported in Table 1.

#### EMPIRICAL RESULTS AND DISCUSSION

One of the contributions of the present study is that we estimate the impact of foreign aid on growth in a different manner other than that of most typical growth-aid literature. We first estimate the impact of total foreign aid on growth as done by most of the past studies. Then, we estimate based on the disaggregated measure of foreign aid (i.e. bilateral aid (total) and multilateral aid). The bilateral aid is further disaggregated into aid from individual donor country to investigate the effect of aid from each donor to economic growth of SSA countries. The results of the *one-step* and *two-step* GMM estimators for the aggregate aid and FDI flows are presented in Table 2. For each model, Sargan test of overidentifying restrictions and the Arellano-Bond test of autocorrelation are reported.

According to results presented in Table 2, the hypothesis of valid over identifying restrictions and the zero autocorrelation cannot be rejected. This confirms the validity of instruments used and the absence of higher order autocorrelation in the residuals, respectively. The finding shows that except for the coefficient of population, all other coefficients of control variables have signs that are in line with theoretical predictions. However, only the coefficients of openness and human capital appear

to be significant at 1 percent level. The coefficient of lagged dependent variable is positive and statistically significant at 10 percent level implying that the GDP per capita is likely to increase when it has increased in the previous period.

The coefficient of aid (total) is negative and statistically significant (at 1 percent level). This suggests that the hypothesis that aggregate aid has positive effects on growth of GDP per capita is rejected at 1 percent level. This implies that there is an inverse relationship between foreign aid and GDP per capita growth in SSA countries. Moreover, the squared value of aggregate aid is included to determine the non-linearity relationship between aid and growth. The coefficient is statistically insignificant implying the absence of non-linear relationship between aid and growth. On the other hand, the coefficient of FDI is positive but statistically insignificant. The possible explanation for this finding is that FDI flows to SSA is very low compared to other regions, thus, its contribution to growth is also possibly too little to be significant. As noted by Lensink and Morrissey (2001) African countries need to attract more FDI to ensure a substantial contribution to the economic development as a whole.

The findings confirm the view that foreign aid impedes growth instead of promoting it. Specifically, the results support the findings of recent studies such as Liew et al. (2012), Neanidis and Varvarigos (2009), Mallik (2008), Burke et al. (2006), and Rajan and Sumbramanian (2005). Liew et al. (2012) investigated the growth impact of aid on five East African countries (Burundi, Kenya, Tanzania, Rwanda, and Uganda) over the period of 1985 to 2010 using panel data methods namely POLS, fixed effect and random effect methods. The study applied the same measure of aid (ODA/GDP) as applied by this study. After controlling for labor, capital and government, the results indicate that foreign aid has negative and significant effects on economic growth of these countries. Moreover, Mallik (2008) investigate the same issue for the six poorest nations in Africa (Central African Republic, Mali, Malawi, Niger, Sierra Leon, and

TABLE 2. Growth Regressions: Using Aggregate Aid and FDI

	One Step GMM			Two Step GMM		
	Coefficient	Std Error	t-statistic	Coefficient	Std Error	t-statistic
Log GDP per capital <sub>(t-1)</sub>	0.123***	0.037	1.925	0.125***	0.017	7.180
Log Aid (Total)	-0.316***	0.120	-3.809	-0.384**	0.165	-2.323
Log Aid <sup>2</sup>	0.026			-0.010	0.037	-0.283
Log FDI	0.051	0.086	0.914	0.022	0.036	0.604
Log Openness	0.818***	0.203	3.708	0.639***	0.104	6.101
Log Capital Formation	0.036	0.134	0.138	0.076	0.087	0.871
Log Population	-0.023	0.037	-1.041	-0.039	0.026	-1.455
Log Human Capital	3.008***	0.771	3.526	3.030***	0.437	6.923
AR(1) <i>P-value</i>	0.043	–	–	0.056	–	–
AR(2) <i>P-value</i>	0.606	–	–	0.777	–	–
Sargan <i>P-value</i>	0.228	–	–	0.283	–	–

Notes: \*\*\*, \*\*, and \* denote significant at 1%, 5%, and 10% respectively

Togo) using a time series analysis found that aid has long run negative effects on growth.

The important question to be considered here is why foreign aid imposes negative effects on growth of these highly aid-dependent countries. The literature provides US with several situations by which foreign aid can negatively affect growth. One of them is the possibility of causing the real exchange rate appreciation of recipient country's currency (the Dutch Disease effects) thereby affecting the country's competitiveness in the world market and thus hurting the external demands of their products (Quattara and Strobl 2003; Nyoni 1998). This of course will undermine the overall economic performance of the country. Theoretically, foreign aid is expected to supplement the domestic saving constraint and thus supporting the domestic public investment in infrastructure, social services such education and health, and institutional reforms. However, aid may negatively affect domestic savings by substituting it and thus may discourage economic growth and development. These can be the possible reasons for the negative effect of aid on growth of SSA countries.

On the other hand, Table 3 reports the results of growth regressions for bilateral and multilateral aid. The Sargan and autocorrelation tests confirm that the instrument specification is good for both models. As reported in the baseline model, coefficients of all control variables have the expected signs, except for population. The coefficients for openness, human capital, and capital formation are significant in both models (for both bilateral and multilateral aid models). Similar to the case of baseline model, the coefficient of lagged dependent variable, the GDP per capita, is positive and strongly significant implying that an increase in the growth of GDP per capita is positively and significantly associated with its increase in the previous period. Again, the coefficient of FDI has positive sign as stipulated by economic theory.

However, it is not statistically significant implying the absence of any significant relationship between FDI inflow and growth of GDP per capita. Concerning bilateral and multilateral aid, the results from Table 3 reveal that the coefficients of both, bilateral and multilateral aid are negative. Nevertheless, the coefficient of bilateral aid is statistically significant at 1 percent, while the coefficient of multilateral aid is insignificant. Therefore, it can be concluded that, as in the case of total aid, total bilateral aid is associated with lower rate of economic growth while multilateral aid has no significant impact on growth of SSA countries.

#### ACCOUNTING FOR INFLUENCE OF INSTITUTIONAL QUALITY

In this section, we analyze the influence of institutional quality in enhancing the aid-growth linkage. That is, foreign aid (total) is interacted with four institutional variables (i.e. the index of government effectiveness, regulatory quality, control of corruption, and rule of law) to determine the importance of institutional quality in driving the aid-growth relationship. Table 4 presents the results on growth regressions based on both, *one-step* and *two-step* GMM. It is observed that the coefficients of all institutional variables have positive and strong significant signs suggesting the existence of positive relationship between institutional quality and economic growth. This is consistent with theoretical predictions. The coefficients of foreign aid appear to be negative and significant in all four models, as reported previously.

As for the interaction terms, the coefficients are negative which is inconsistent with our expectations (refer to Table 4). All these coefficients are statistically significant in all four models. However, these coefficients

TABLE 3. Growth Regressions: Bilateral Versus Multilateral Aid

	One Step GMM		Two Step GMM	
	(1)	(2)	(1)	(2)
	Coefficient	Coefficient	Coefficient	Coefficient
Log GDP per capital <sub>(t-1)</sub>	0.060* [0.037]	0.097** [0.041]	0.085*** [0.020]	0.090*** [0.021]
Log Bilateral Aid (Total)	-0.347* [0.199]	–	-0.338*** [0.104]	–
Log Bilateral Aid <sup>2</sup>	0.006 [0.035]	–	-0.005 [0.017]	–
Log Multilateral Aid	–	-0.073 [0.097]	–	-0.043 [0.034]
Log Multilateral Aid <sup>2</sup>	–	-0.005 [0.013]	–	-0.001 [0.004]
Log FDI	0.0005 [0.095]	-0.114 [0.101]	-0.028 [0.065]	-0.126 [0.059]
Log Openness	0.688*** [0.178]	0.881*** [0.233]	0.645*** [0.105]	0.616*** [0.146]
Log Capital Formation	0.022 [0.107]	-0.083 [0.133]	0.068 [0.073]	0.011 [0.078]
Log Population	-1.830* [1.010]	-1.470 [1.480]	-1.870** [9.220]	-2.240** [8.640]
Log Human Capital	3.113*** [0.683]	3.442*** [0.745]	3.487*** [0.491]	2.955*** [0.661]
AR(1) <i>P</i> -value	0.020	0.041	0.012	0.043
AR(2) <i>P</i> -value	0.901	0.610	0.126	0.822
Sargan <i>P</i> -value	0.788	0.555	0.731	0.573

Note: \*\*\*, \*\*, and \* denote to significant at 1%, 5%, and 10% respectively. Standard errors are reported in parenthesis.

tend to converge towards positive implying that substantial improvement in the quality of institutions may lead to positive of aid coefficient in the long run. For example, the coefficient of aid\*government effectiveness is -0.128, which is higher than the aid coefficient of -0.389. The coefficient of aid\*regulatory quality is -0.035, which is also higher compared to aid coefficient of -0.29. However, this coefficient is not statistically significant. Moreover, the coefficient of aid\*corruption control is -0.248, higher than aid coefficient (-0.409) but this also insignificant. The coefficient of aid\*rule of law is -0.298, also higher than aid coefficient (-0.496). The coefficient is statistically significant at 1 percent level. Therefore, it can be concluded that improvement in the quality of institutions can possibly help reduce the adverse impact of aid on growth and even turn it to positive in the long run.

Our results are contrary to Burnside and Dollar (2004) who clearly found that aid effectiveness is conditional to quality of institutions. It is worth noting that the sizes of coefficients of all four interaction terms are sufficiently lower compared to that of aid. That is, they seem to be likely moving towards positive signs. This may imply that if quality of institutions is substantially improved, aid may have positive effect on growth in the

long run. Thus, the results somehow support Burnside and Dollar's (2004) findings. In addition, Carden (2009) also asserted that institutions promote growth and not the flow of aid. Hence, based on these findings, it would be recommendable that aid should be directly targeted towards improving the quality of institutions in order to generate the desired results on growth.

#### BILATERAL DONORS ANALYSIS

In this section, we analyse the effect of aid on growth by using the data from six major bilateral donors to Africa. These are Canada, France, Germany, Japan, UK, and US. The purpose of this analysis is to identify whether aid from different bilateral donors may have different effects on the growth of SSA countries. Table 5 presents the estimated results. The results passed the Arellano-Bond test of autocorrelation and Sargan test of instruments validity. Coefficients of control variables have positive signs but the coefficient of population growth is not statistically significant in both estimators. The results further reveal that there are differences on the way aid from different donors affect the growth of SSA countries.



TABLE 4. Growth Regressions: Accounting for the Influence of Institutional Quality

Variable	One Step GMM				Two Step GMM			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient
Log GDP per capital <sub>(t-1)</sub>	0.088*** [0.026]	0.075*** [0.027]	0.113*** [0.037]	0.095*** [0.027]	0.090*** [0.015]	0.071*** [0.017]	0.118*** [0.016]	0.080*** [0.012]
Log Aid (Total)	-0.483*** [-0.483]	-0.429*** [0.158]	-0.509*** [0.114]	-0.552*** [0.123]	-0.389*** [0.070]	-0.290*** [0.097]	-0.409*** [0.076]	-0.496*** [0.067]
Log FDI	0.112 [0.112]	0.117 [0.083]	0.071 [0.059]	0.052 [0.069]	0.121** [0.052]	0.117** [0.057]	0.081* [0.043]	0.057 [0.037]
Log Openness	0.639*** [0.639]	0.668*** [0.203]	0.575 [0.166]	0.561 [0.199]	0.464*** [0.105]	0.520*** [0.106]	0.394*** [0.085]	0.463*** [0.080]
Log Capital Formation	-0.096 [-0.096]	-0.040 [0.132]	-0.037 [0.109]	0.034 [0.110]	-0.042 [0.105]	-0.058 [0.105]	0.039 [0.088]	-0.049 [0.074]
Log Population	-0.026 [-0.026]	-0.019 [0.025]	-0.001 [0.025]	-0.016 [0.022]	-0.036 [0.023]	-0.020 [0.021]	-0.016 [0.020]	-0.018 [0.017]
Log Human Capital	2.022 [2.022]	2.252*** [0.636]	2.397*** [0.579]	1.968*** [0.613]	2.011*** [0.341]	1.953*** [0.514]	2.007*** [0.480]	1.617*** [0.365]
Government Effectiveness	0.628*** [0.628]	-	-	-	0.672 [0.136]	-	-	-
Aid*Government Effectiveness	-0.152 [-0.152]	-	-	-	-0.128** [0.062]	-	-	-
Regulatory Quality	-	0.511** [0.245]	-	-	-	0.726*** [0.136]	-	-
Aid*Regulatory Quality	-	-0.099 [0.117]	-	-	-	-0.035 [0.061]	-	-
Corruption control	-	-	0.570*** [0.154]	-	-	-	0.591*** [0.073]	-
Aid*Corruption control	-	-	-0.286*** [0.085]	-	-	-	-0.248 [0.073]	-
Rule of Law	-	-	-	0.396** [0.189]	-	-	-	0.547*** [0.074]
Aid*Rule of Law	-	-	-	-0.354*** [0.109]	-	-	-	-0.298*** [0.056]
AR(1) P - value	0.60	0.129	0.152	0.181	0.225	0.119	0.174	0.260
AR(2) P - value	0.953	0.701	0.625	0.803	0.747	0.628	0.741	0.796
Sargan P-value	0.256	0.369	0.436	0.290	0.541	0.862	0.605	0.694

Notes: \*\*\*, \*\*, and \* denotes significant at 1%, 5%, and 10% respectively. Standard errors are reported in parenthesis.

The coefficient of aid from UK and Germany are positive. However, only the coefficient of UK is statistically significant at 10 percent. The coefficients of aid from other bilateral donors (US, France, Japan and Canada) have negative and significant effect on the growth of SSA countries. The results suggest that, when everything else is kept constant, one percentage increase in the aid flow from UK leads to increase in GDP per capita growth by 0.02 percent. For the donor countries by which their aid imposes negative effects on growth, the interpretation of results can be as follows: the coefficient attached with US means that when everything else is constant, a percentage point increase in the aid flow from US is associated with 0.10 percentage decrease

in the GDP per capita growth. Similarly, a percentage increase in the flow of aid from Japan leads to decline in growth by 0.13, when everything else is held constant. Furthermore, a percentage increase in the flow of aid from Canada leads to slowdown of per capita GDP growth by 0.07 percent, keeping other factors constant.

## CONCLUSION

This paper has analyzed the link between foreign aid, FDI and economic growth in SSA countries and examined whether different measures of foreign aid

TABLE 5. Growth Regressions: Bilateral Aid – Donor by Donor Results

Variable	One Step GM			Two Step GMM		
	Coefficient	Std. Error	t-Statistic	Coefficient	Std. Error	t-Statistic
LPGDP <sub>(t-1)</sub>	0.099**	0.044	2.266	0.081***	0.018	4.491
UK	0.012	0.019	0.631	0.017*	0.009	1.905
US	-0.086	0.083	-1.043	-0.103**	0.041	-2.500
France	-0.029*	0.016	-1.805	-0.025***	0.005	-4.302
Japan	-0.138**	0.067	-2.065	-0.132***	0.026	-5.038
Canada	-0.106*	0.057	-1.858	-0.067***	0.020	-3.268
Germany	0.028	0.078	0.365	0.055	0.038	1.424
Log FDI	-0.018	0.091	-0.207	-0.081**	0.039	-2.066
Log Openness	0.746***	0.160	4.649	0.597***	0.088	6.732
Log Capital Formation	0.158	0.122	1.291	0.198***	0.072	2.741
Log Population	0.010	0.037	0.285	-0.006	0.022	-0.290
Log Human Capital	2.447**	0.984	2.484	2.440***	0.462	5.282
AR(1) P-value	0.492	-	-	0.640	-	-
AR(2) P-value	0.870	-	-	0.716	-	-
Sargan P-value	0.271	-	-	0.729	-	-

Notes: \*\*\*, \*\*, and \* denotes significant at 1%, 5%, and 10% respectively.

and institutional quality affect the relationships between the variables. The nexus between aid and growth is extensively debated in academic discussions and policy arenas. The results indicate that foreign aid negatively affects the economic growth of SSA countries. At disaggregated measures of foreign aid, similar result was found for total bilateral aid; however, multilateral aid has no significant impact on growth of SSA countries. Another important finding is that, the influence of institutional quality on stimulating aid-growth nexus is negative. In addition, FDI also seems to have no influence on the growth of SSA countries. This is due to that fact that SSA countries are receiving small amount of FDI compared to other countries in the developing region. Based on the findings, it is suggested that aid should be targeted on improving institutional quality and governance besides economic development in the SSA countries. Since the bilateral sources from different donors has different effect on growth, this call for more cooperation between donor countries to come up with an effective way to allocate the aid to the potential recipient countries. Furthermore, SSA countries need to implement policies that will attract more foreign capital in order to realize the economic benefits of FDI.

#### REFERENCES

- Adam, C., & O'Connell, S. A. 1999. Aid, taxation and development in Sub-Saharan Africa. *Economics and Politics* 11(3): 225-53.
- Adams. 2009. FDI, domestic investment, and economic Growth in Sub-Saharan Africa. *Journal of Policy Modeling* 31(9): 939-949.
- Aitken, B., Hanson, G.H., & Harrison, A. 1997. Spillovers, foreign investments, and export behavior. *Journal of International Economics* 43(2): 103-132.
- Ali, M., & Isse, H. S. 2005. An empirical analysis of the effect of aid on growth. *International Advances in Economic Research* 11(1): 1-11.
- Alonso-Burrogo, C., & Arrelano, M. 1999. Symmetrically normalized instrumental-variable estimation using panel data. *Journal of Business and Economic Statistics* 17(1): 36-49.
- Arellano, M., & Bond, S. 1991. Some test of specification for panel data: Monte Carlo evidence and an application to employment equation. *Review of Economic Studies* 58(2): 277-297.
- Arellano, M., & Bover, O. 1995. Another look at the instrumental-variable of error-components models. *Journal of Econometrics* 68(1): 29-51.
- Azman-Saini, W. N. W., Law, S. H. & Ahmad Abd Halim. 2010. FDI and economic growth: New evidence on the role of financial markets. *Economics Letters* 107(2): 211-213.
- Barro, R. J., & Sala-I-Martin, X. 1995. *Economic Growth*. New York: McGraw-Hill, New York.
- Bengoa, M. & Sanchez-Robles, B. 2003. Foreign direct investment, economic freedom and growth. *European Journal of Political Economy* 19(3): 529-545.
- Blomström, M., Kokko, A., & Zejan, M. 2000. *Foreign Direct Investment. Firm and Host Country Strategies*. London: Macmillan.
- Blundell, R. and Bond, S. 1998. Initial conditions and moment restrictions in dynamic panel data models. *Journal of Econometrics* 87(1): 115-143.
- Boone, P. 1995. The impact of foreign aid on savings and growth. Working paper London School of Economics.
- Boone, P. 1996. Politics and the effectiveness of foreign aid. *European Economic Review* 40(2): 289-329.

- Borensztein, E., De Gregorio, J., & Lee W. 1998. How does foreign direct investment affects economic growth? *Journal of International Economics* 45(1): 105-135.
- Buckley, J. P., Clegg, J. and Chengqi Wang. 2002. The impact of inward FDI on the performance of China's manufacturing firms. *Journal of International Business Studies* 33(4): 637-655.
- Burke, P. J., Ahmadi-Esfahani, & Fredoun, Z. 2006. Aid and growth: A study of South East Asia. *Journal of Asian Economics* 17(2): 350-362.
- Burnside, C., & Dollar, D. 2000. Aid, policies and growth. *American Economic Review* 90(4): 847-868.
- Burnside, C., & Dollar, D. 2004. Aid, policies and growth: revisiting the evidence. *World Bank Policy Research Working Paper* No. 3251. Washington: World Bank, Washington.
- Carden, A. 2009. Can't buy me growth: On foreign aid and economic change. *The Journal of Private Enterprise* 25(1): 105-123.
- Chenery, H., & Strout, M. 1966. Foreign assistance and economic development. *The American Economic Review* 66(4): 679-773.
- De Mello, L. R. 1999. Foreign direct investment in developing countries and growth: a selected survey. *Journal of Development Studies* 34(1): 1-34.
- Domar, E. 1946. Capital expansion, rate of growth, and employment. *Econometrica* 14(2): 137-147.
- Dowling, J. M., & Hiemenz, U. 1983. Aid, savings, and growth in the Asian region. *Developing Economies* 21(1): 4-13.
- Durham, J. B. 2004. Absorptive capacity and the effects of foreign direct investment and equity foreign portfolio investment on economic growth. *European Economic Review* 48(2): 285-306.
- Easterly, W., Levine, R., & Roodman, D. 2004. New data, new doubts: A comment on burnside and dollar's "aid, policies, and growth" (2000). *The American Economic Review* 94(3): 774-780.
- Hansen, H., & Tarp, F. 2001. Aid and growth regressions. *Journal of Development Economics* 64(2): 547-570.
- Hansen, L. P. 1982. Large sample properties of generalized method of moments estimators. *Econometrica* 50(4): 1029-1054.
- Harrigan, J. & Wang, C. 2011. A new approach to the allocation of aid among developing countries: Is the USA different from the rest? *World Development* 39(8): 1281-1293.
- Harrod, R. F. 1939. An eSSAy in dynamic theory. *The Economic Journal* 49(193): 14-33.
- Hermes, N., & Lensink, R. 2003. Foreign direct investment, financial development and economic growth. *Journal of Development Studies* 40(1): 142-163.
- Hsiao, Frank S. T., & Hsiao, Mei-Chu W. 2006. FDI, exports, and GDP in East and Southeast Asia - Panel data versus time-series causality analyses. *Journal of Asian Economics* 17(6): 1082-1106.
- Lensink, R. & Morrissey, O. 2001. Foreign direct investment: Flows, volatility and growth in developing countries. University of Nottingham, CREDIT Research Paper.
- Levy, V. 1988. Aid and growth in Sub-Saharan Africa: the recent experience. *European Economic Review* 32(9): 1777-1795.
- Liew, Chung-Yee, Mohamed, Masoud R., and Mzee, Said Seif. 2012. The impact of foreign aid and economic growth in East African countries. *Journal of Economics and Sustainable Development* 3(12): 129-188.
- Lumbila, K. N. (2005). What makes FDI work? A panel analysis of the growth effect of FDI in Africa. Africa Region Working Paper Series, No.80.
- Mallik, G. 2008. Foreign aid and economic growth: A cointegration analysis of the six poorest African countries. *Economic Analysis & Policy* 38(2): 251-260.
- Mühleisen, M., Ghura, D., Nord, R., Hadjimichael, M. & Ucer, E. 1995. Sub-Saharan African growth, savings and investment. International Monetary Fund Occasion Paper 1986-1993, No.118, Washington D.C
- Ndikumana, L. & Verick, S. (2008). The linkages between FDI and domestic investment: Unraveling the developmental impact of foreign investment in Sub-Saharan Africa. Germany. Institute for the Study of Labor (IZA), Working Paper No. IZA DP No. 3296.
- Neanidis, K. C. & Varvarigos, D. 2009. The allocation of volatile aid and economic growth: Theory and evidence. *European Journal of Political Economy* 25(4): 447-462.
- Nyoni, T. S. 1998. Foreign aid and economic performance in Tanzania. *World Development* 26(7): 1235-40.
- Ouattara, B., & Strobl, E. 2003. Do aid inflows cause Dutch disease? A case study of the CFA franc countries. Economic Department Working Paper, University of Manchester, Manchester.
- Papanek, G. 1973. Aid, private foreign investment, savings and growth in less developed countries. *Journal of Political Economy* 81(1): 120-130.
- Rajan, R. G., & Subramanian, A. 2005. What undermines aid's impact on growth? IMF Working Paper 05/127.
- Ramírez, M. 2000. Foreign direct investment in Mexico: A cointegration analysis. *The Journal of Development Studies* 37(1): 138-162.
- Roodman, D. 2009. A note on the theme of too many instruments. *Oxford Bulletin of Economics and Statistics* 71(1): 135-158.
- Singh, R. D. 1985. State intervention, foreign economic aid, savings and growth in LDCs: Some recent evidence. *KYKLOS* 38: 216-232.
- Solow, R. M. 1956. A contribution to the theory of economic growth. *The Quarterly Journal of Economics* 70(1): 65-94.
- United Nations Conference on Trade and Development (UNCTAD). 2012. *Online Statistical Database*. Available at [unctad.org/en/pages/Statistics.aspx](http://unctad.org/en/pages/Statistics.aspx).

Masoud Rashid Mohamed  
Sekolah Pengajian Siswazah  
Universiti Putra Malaysia  
43400 Serdang, Selangor  
MALAYSIA  
rashid\_masoud@hotmail.com

Shivee Ranjane Kaliappan\*\*  
Normaz Wana Ismail\*  
W.N.W Azman-Saini\*\*\*  
Fakulti Ekonomi dan Pengurusan  
Universiti Putra Malaysia  
43400 UPM Serdang, Selangor  
MALAYSIA  
\*\*shivee@putra.upm.edu.my  
\*drnormazismail@gmail.com  
\*\*\*wazman@upm.edu.my

\*Corresponding Author

