

The Puzzling Effects of Foreign Aid (ODA) on FDI: Examining Africa's Experience

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Abstract

The foreign aid -FDI relationship hypothesis is quite recent in the development literature but sparks interesting controversy. Existing results are inconclusive on whether the two capital flows are complementary or substitutes. The argument of this paper is that previous studies' implicit treatment of developing countries as a uniform entity could partly be blamed for the inconclusive results. It therefore attempts a unique study for Africa and further disaggregates the continent into two groups based on natural resource endowment to see if some level of clarity can emerge for better aid allocation and policy targeting. Employing fixed effects estimation model for a balanced panel of 93 countries including 42 African countries on annual data covering 1996-2008, the study finds that total foreign aid to Africa has positive effect on FDI. It also emerged that Production sector aid has no negative effect on FDI in Africa. This type of aid rather has a significant positive effect on resource-seeking FDI in Africa proxy for by FDI in "oil and mineral exporting African countries". There is no evidence of rent seeking and/or MPK reducing effect of aid to Africa as found for developing countries in some earlier studies.

Keywords: Foreign aid, FDI, Effects, Africa, Developing countries

1. Introduction

The relationship between official development assistance (ODA) and foreign direct investment (FDI) in developing countries is a quite recent debate in the development economics literature, but sparks huge controversy. The impending query of whether foreign aid creates positive (negative) effects in recipient country to attract (repel) FDI also underlies the very issue of aid effectiveness and hence a relevant debate in the development literature.

Probing the foreign aid-FDI relationship, Harms and Lutz (2006) stressed aid's role in harnessing infrastructure development in recipient countries who otherwise may not have been able to do, due to governments' budget inadequacy and limited domestic revenue mobilisation. As infrastructure in transport and communication gets developed, cost of doing business reduces drastically. Foreign private investors who would like to take advantage of the market and resource endowment of these developing countries could be enticed to invest in these economies. On this score, aid is said to have a complementary impact by crowding in FDI. This view was echoed in the UN's 2002 Monterrey Report of the International Conference on Financing for Development.

Meanwhile, Caselli and Feyrer (2007) after adjusting for price differences find that the marginal product of capital (MPK) is roughly the same across countries, meaning that increasing aid flows to developing countries will lower the MPK in these economies. The fall in MPK would therefore be offset by outflows of other types of capital investments such as FDI. If this is the case, aid and FDI are clearly closer to being substitutes rather than being complements. This argument forgets that not all countries have reach maximum level of physical capital accumulation and that the investment gap in some countries is so huge that foreign aid inflow will just not be enough to reduce the productivity of physical capital or compete with FDI for investment opportunities. Economic theory from the neoclassical perspective as expressed by the Solow (1956) convergence hypothesis tells us that return on capital (MPK) is higher where accumulated capital stock is lower. Kosack and Tobin (2006) have even argued that, aid and FDI are unrelated. This is because aid is mainly oriented towards public expenditure through budgetary support and investment in human capital, while FDI is a private sector decision relatively more connected to physical capital. Again, one could not easily imagine foreign aid as an economic growth enabler able to create conditions for attracting FDI when aid-growth nexus is still debatable and market distortion externalities of aid such as Dutch disease, corruption, and ruined competition hangs on (Rajan & Subramanian 2007, 2011).

Empirical studies explicit on the effects of foreign aid on FDI present mixed results (see Selaya & Sunesen 2008; Kimura & Todo 2007; Steve *et al.* 2007; Harms &Lutz 2006; Karakaplan *et al.* 2005; Blaise 2005). There is the conclusion that total foreign aid does not have statistically significant positive effect on FDI. Rather, aid for infrastructure (infrastructure aid) is found to be significantly positive for FDI while aid in physical capital (production sector aid) is negative for FDI. Others see aid-FDI relationship to be donor country specific; arguing that aid from a particular donor country does not matter for FDI from a different country. Clearly the debate so far has been inconclusive.

Given the inconclusive results so far, we argue in this article that existing literature implicit treatment

of developing countries as a uniform entity is a strong assumption and if addressed could reveal some systematic differences among the different regions of the developing world in the relationship between foreign aid and FDI. Moreover, little effort has been made to distinguish the relationship with respect to the different categories of foreign aid and the different types of FDI.

Africa is fairly different economically, politically and in terms of the FDI it attracts from other developing regions. The region's economic structure is dominated by the primary sector and contains larger percentage of FDI in comparison to other regions. FDI flow and stock in other regions is mostly concentrated in the manufacturing and service sector (Cantwell 1997). A look at the FDI stock statistics for Africa during the period 1988 and 1997 shows an increase from 51.8 percent to 53.4 percent in the primary sector. Comparing this to the statistics in Asia and Latin America, there was rather a decline from 8.8 percent to 3.4 percent and 5.7 percent respectively for the period under review (UNCTAD 1999a: 424-25). On a whole, figures for developing countries as a cohort shows a marginal increase from 6.7 percent in 1990 to 7 percent in 2002. In addition to the concentration of stock figures in the primary sector, annual flows to Africa between 1996 and 2002 continues to be concentrated in this sector representing an average of 55 percent of total flows (UNCTAD 2002a: 52).

Knowing that FDI in Africa is traditionally resource-seeking in the extractive sectors (UNCTAD 2008), taken on previous studies' recommendation of redirecting more aid to complementary inputs from the production sector (Selaya & Sunesen 2008) tends to be controversial and disadvantageous to African economies. It is therefore the argument of this article that, the relationship between the two capital flows can be better explained when characteristics of destination country are taken into consideration. Africa may present significantly different results from the rest of the developing world. An establishment of this fact is crucial for proper targeting in aid allocation, and to resolving the capital shortage problem of African economies. It is also crucial for contributing to the realization of the millennium development goals (MDGs).

On the basis of these arguments, this article makes the following hypotheses:

Hypothesis 1: Total foreign aid to Africa has a statistically significant positive effect on FDI.

Hypothesis 2: Production sector aid has no negative effect on FDI in Africa. It rather has a significant positive effect on resource-seeking FDI in Africa.

The study is divided into five sections. Section 2 focuses on presenting the existing empirical discussions concerning the plausible effects of foreign aid on foreign direct investment by first looking briefly at the determinants of the two capital flows. Explicitly, it examines the channels through which aid can have either positive or negative effects on FDI. The section also presents sectoral flows of foreign aid and FDI to Africa in comparison to other developing regions. This is to establish the distinctiveness of the continent and hence the need for contextualised treatment of the debate. Following to some extent, Selaya and Sunesen (2008) model is adopted in this study in Section 3 to establish the study's hypothesis. Here, foreign aid invested in economic and social infrastructure is distinguished from foreign aid allocated to production sectors and for 'other uses' to assess their varying impact on FDI. The econometrics method and data used in the study is discussed extensively in this section. Results from the empirical approach are discussed in Section 4 to provide insightful conclusions. Section 5 presents conclusions from the study. It also highlights some limitations of the study and suggestion for further research.

2. Review of Relevant Literature

Foreign aid allocation and FDI location is discussed in the literature to be influenced by varied factors. Aid allocation is said to be influenced by the locational disadvantages or needs of recipients and interests of donors while FDI is determined by the comparative locational advantages of a host country which suits the benefit seeking interests of investors. How then does the two capital flows relate. To start with, we first looked briefly at the determinants of these two capital flows.

2.1 Determinants of Foreign Aid (ODA)

Informed by the Herrod-Domar gap models, economists and development researchers have postulated foreign aid to stimulate economic growth (Chenery & Strout 1966; Chenery & Bruno 1962). The provision of development assistance (foreign aid) is meant to deal with capital shortage challenges so as to enhance the capacities and abilities of poor countries to develop their economies and lift themselves out of poverty.

Historically, aid allocation has been influenced by not less than six (6) cluster of motives (Riddell, 2007:91): (i) emergency/humanitarian support, (ii) assist recipient achieve growth and poverty reduction goals, (iii) show solidarity, (iv) further donor's political and strategic interest, (v) promote commercial interest of donor, (vi) historical ties such as former colonies. Debate on which of these motives dominate is extensively documented (see Angeles *et al.*, 2008; Berthelemy 2006; Alesina & Dollar 2000; Lumsdaine 1993; Maizels and Nissanke 1984 for example).

Each motive has implication for the aid-FDI relationship debate. For instance, development effects of growth and poverty-reduction motive could have positive impact on FDI in general. Burnside and Dollar (2000),

and Collier and Dollar (2002, 2004) papers on the effectiveness of aid made conclusions which implied aid allocation based on this motive promotes good policies and produce poverty reduction gains. Good macroeconomic and governance policies and improved wealth are found to matter for FDI location decision. In the same way, commercial interest motive may be positive for FDI of that particular aid donor country but not for FDI in general; Blaise (2005) found this to be true for Japanese aid. Aid allocated on the basis of political interest and historical ties is viewed not to produce any development benefits but rather promotes unhealthy behaviours such a corruption (Alesina and Weder 2002; Tavares 2003) which is postulated to be negative for FDI.

2.2 Determinants of FDI

According to UNCTAD (1999a), foreign direct investment (FDI) is a long-term controlling investment in assets of not less than 10 percent by a foreign investor or enterprise in a foreign country. This investment is usually carried out to take advantage of some benefits in the foreign country (Dunning 1993). Therefore any factor that indicates the realisation of this motive derives in FDI and the reverse is also true.

The 'eclectic paradigm' developed by Dunning (1993, 2001) highlights infrastructure development, broad definition of host country risks, the quality of human capital and economic policies as important factors in the location decision of FDI. A number of studies also support the idea that high quality infrastructure is an important determinant of FDI (see Steve *et al.* 2007; Asiedu, 2002, 2006; Wheeler & Mody 1992 for example).

Steve *et al.* (2007) and Asiedu (2002, 2006) also indicated natural resources availability draws in FDI. However, Asiedu (2002, 2006) cautioned that different types of FDI react differently to host country characteristics. Whereas natural resources availability dominates location decision of resource-seeking FDI, host country market size, wealth, property right protection and governance variables greatly matter for other types of FDI. Trade openness and tax incentives are also found to matter for FDI. Azémar & Desbordes (2010) highlighted trade openness to be particular crucial for horizontal FDI.

Factors briefly noted here are not exhaustive of the determinants of FDI but enough to properly situate our discussion on the link between foreign aid and FDI. It provides enough grounds to help us test the hypotheses mentioned earlier.

2.3 Channels of Foreign Aid Effect on FDI

To date, I am not aware of any paper that has analysed the effects of foreign aid on FDI in Africa. Existing papers have analyse the question for broad sample of developing countries (Selaya & Sunesen 2008; Steve *et al.* 2007; Harms & Lutz 2006; Karakaplan *et al.* 2005) and case study of specific donor country aid and FDI (Kimura & Todo 2007; Blaise 2005). The conclusions reached have therefore mainly been for this sample and may not be true for Africa.

The authors researching explicitly on the effects of foreign aid on FDI have identified these four broad possibilities by which aid can have effect on FDI: 1) positive infrastructure effect, 2) positive vanguard/information effect, 3) negative Marginal Product of Capital (MPK) reducing effect, and 4) negative rent seeking effect.

2.3.1 Positive Infrastructure Effect

Harms and Lutz (2006) identified that aid's ability to improve and/or consolidates favourable domestic investment environment is conditional on which activities it financed. The authors found out that two critical aid allocations (namely aid for social and economic infrastructure) – broadly define as "infrastructure aid" - are the ones that reinforce the desirable qualities of recipient countries. It is argued that given its contribution to the development of transport and communication facility, electricity supply, education and the enhancement of human capital; aid invested in socio-economic infrastructure contributes to reducing the cost of doing business and produces the quantity and quality of skills demanded by multinationals, hence creating the favourable environment for attracting FDI. This positive economic effect of aid is dubbed 'infrastructure effect'.

Steve *et al.* (2007) using unbalanced panel of 52 for the period 1982-1995 also found that aid for infrastructure has a statistically significant positive effect on FDI. This type of aid is less likely to be misappropriated or nurture unproductive rent seeking activities. The authors stressed that given its physical nature; aid allocated to infrastructure can easily be monitored by donors and civil society. More importantly, the domestic population shows much optimism and interest in infrastructure projects such that governments stand the chance of losing its credibility and political hold if funds of this nature are misapplied. There is therefore little or no incentive for the public sector to misuse 'infrastructure aid' and hence would make effective and efficient use of it for the purpose for which it was allocated. Selaya & Sunesen (2008) using a panel of 84 developing countries for the period 1970-2001 also supported the idea that infrastructure aid draws in FDI. By implication, aid for infrastructure (complementary inputs as referred to by Selaya & Sunesen 2008) is said to have a significantly positive impact on economic growth leading to the creation of enabling investment environment.

Not to say the least, the 'eclectic paradigm' developed by Dunning (1993, 2001) highlights infrastructure development, broad definition of host country risks, and the quality of human capital and economic policies as important factors in the location decision of multinationals' FDI. Beyond doubt, the main objective of foreign investors is the realization of profits and the security of their investment; hence anything that keeps cost down and assures the safety of their investment is most likely to draw in FDI. There are countless empirically evidence (see Steve *et al.* 2007; Asiedu 2002, 2006; Wheeler & Mody 1992 for example) which points out that the quality of a country's infrastructure is an important determinant of FDI. Therefore, foreign aid has positive effect on FDI through its allocation for infrastructure development.

2.3.2 Positive Vanguard/Information Effect

Traditionally, aid-tying has been one of major routes by which the business community in a donor country gets involve in the economy of recipient countries. The rendering of services through undertaking contracts linked to aid creates an automatic flow of foreign businesses from a particular donor country to recipients of its aid.

Apart from the above, businesses in a donor country take up investment opportunities in recipient countries through other various means. Kimura & Todo (2007) postulated that in as much as aid causes trade dependency by changing preferences and introducing donors' practices and processes into a recipient country, so does aid affect the business system and environment of recipients by introducing donors' business practices, procedures and systems. This effect is said to lead to selective flow of FDI due to the introduction of particular donor systems. Aid from a particular donor may therefore lead to FDI from that donor's country while inhibiting potential FDI from other countries. This is christened 'vanguard effect' (Kimura & Todo 2007).

In an empirical analysis of donor-recipient pair of 80 observations for Japanese aid for the period 1995-2002, Kimura & Todo (2007) found this effect to be true for Japanese aid and FDI but not so for aid in general. The authors explained that aid from a particular donor had no impact on FDI from other donor countries. Blaise (2005) also argued that aid may not lead to FDI only via trade dependency or change in business practice but also through induced selective favourable treatment of FDI from major aid donors by recipients of their aid. In this respect, aid giving is postulated to create a good rapport between donors and recipient governments which consequently leads to the granting of privileged considerations (such as fiscal incentives, reduced entry barriers and other investment bottlenecks face by foreign investors) to businesses from the donor country. Such a relationship generated through foreign aid would therefore reduce entry barriers, expropriation risks and general cost of doing business thereby crowding in FDI. Using province level data for China from 1980 to 1999, Blaise found that Japanese foreign aid to China have a positive impact on crowding in foreign investments from Japan.

The arguments put forward have some empirical support from the FDI literature as well. Mody *et al.* (2003) have noted that in addition to the other determinants of FDI mentioned earlier, well structured information and knowledge about potential host country influences significantly the investment decision of foreign investors. The authors mentioned further that for a riskier venture such as FDI, the importance of first hand information to risk and cost reduction cannot be overemphasised. By affording investor community in the donor country the opportunity to access privilege information on its aid recipient countries, aid is postulated to draw in FDI.

2.3.3 Negative Rent Seeking Effects

In their study, Alesina & Dollar (2000) showed that being a former colony and political ally of a donor guarantees more aid to a recipient than being a non-colony irrespective of the superiority of the non-colony's economic policies and institutions. This suggests that neither do donors put much premium on recipients' needs; quality policies and institutions nor commercial interest, but, their strategic political interest dominates. This behaviour tends to support ineffective governments and enhances corruption in recipient countries.

Tavares (2003) highlighted that, foreign aid is probably one of the most fertile grounds for corruption. In a somewhat strong criticism of donors practice, Alesina & Weder (2002) argued that the pursuit of their political interest have intensified corruption in recipient countries because there is no evidence that corrupt governments receive less aid. The literature on foreign aid and corruption is vast and as usual produces contrasting results (see Knack & Rahman 2007; Dunning 2004; Knack 2001; Goldsmith 2001; Svensson 2000). Aid category linked to the promulgation of rent seeking behaviour is 'food aid, emergency aid and general budget/programme support'. Kimura & Todo (2007) argued that 'general programme support aid' by definition relates to disbursements not directed to specific sectors while at the same time 'humanitarian aid' by implication is assistance during and after emergencies; the difficulty in monitoring and the unorganised environment in which these aid is used may create fertile condition for unproductive activities. Food aid on other hand stifles local agriculture capability, encourages dependency and promotes petty corruption among public officials.

Aid's impact on rent seeking and corruption goes beyond the weakening of recipient's institutions and economic growth to affecting its attractiveness to foreign investors. World Bank (1998) observed that corruption exercises depressing impact on investment and productivity by increasing the cost of doing business and eroding social capital. This corroborates Acemoglu & Verdier (1998) assertion that corruption affects the protection of

property rights and hence turns out to be inimical to capital accumulation and institutional efficiency. Property right protection in a country is noted to have a significant impact on drawing in FDI (see Bénassy-Quéré *et al.* 2007; Asiedu 2006; Jutting 2003; Lehman 1999). Therefore if aid promotes rent seeking behaviour and corruption in a recipient country, it will most likely deter investors and hence crowd out FDI. However, given Egger & Winner (2006) assertion that corruption does not seem to matter for FDI to developing countries, the negative rent seeking effect of aid insinuated above remains debatable.

2.3.4 Negative Marginal Product of Capital (MPK) Reducing effect

Selaya & Sunesen (2008) have argued strongly that aid invested in physical capital (aid to production sector) crowds out FDI. Their theoretical model showed that aid invested in physical capital competes directly with other types of capital. Again in the spirit of the exogenous growth model of Solow (1956) which postulates a negative relationship between capital accumulation and the marginal product of capital (MPK), Selaya & Sunesen (2008) concluded that increasing aid flows directly to the production sector increases physical capital accumulation and hence reduces MPK thereby crowding out FDI. This assertion is reinforced by Caselli & Feyrer (2007) finding that MPK is roughly the same across countries. It means therefore that increasing aid flows to developing countries will lower the MPK in these economies. Given the mobility of capital and rate-of-return equalisation across countries, a fall in MPK occasioned by “production sector aid” would be offset by outflows of other types of capital such as FDI.

However, Kosack and Tobin (2006) conclusion that aid and FDI are unrelated challenges the claim above. Kosack and Tobin’s conclusion is not without problem though. Their argument somehow overlooks a situation where the public sector have large investments in the service and manufacturing sectors such that increased capital flows in the form of aid can be invested in these sectors thereby narrowing opportunities for private investment or crowding out existing ones. For this reason, I argue that the effect that aid invested in the production sector can have on FDI may depend on the type of FDI a country attracts. Service and manufacturing FDI could respond negatively to increased foreign aid investment in production sectors whereas resource-seeking FDI might have positive or no relationship with aid invested in physical capital.

Existing studies suffer two main deficiencies: first there has not been a distinction of the effects on the different types of FDI, and secondly the different types of FDI places different premium on the existing conditions in a host country but this has not been considered.

From the FDI literature, Asiedu (2002, 2006) showed that FDI in different sectors behave somehow differently to the characteristics of a host country. In her study, natural resource availability is found to be significantly positive and dominates other variables in the investment location decision of resource-seeking FDI. The author further explained that the decision to invest in a country by a foreign investor interested in natural resources is almost solely determined by the availability of such resources in the host country. Taking this into consideration, the negative MPK reducing effect argument put forward by Selaya & Sunesen (2008) would be highly insignificant for resource-seeking FDI; given that MPK of a host country does not matter for the profitability of this type FDI. The implication of this is that, the disproportionate location of natural resource among regions of the developing world can overshadow the possible negative profitability effects of aid invested in production sector and draw in more FDI to resource rich countries, thereby invalidating existing conclusions. In view of this and contrary to previous conclusions, this study argues that aid invested in physical capital would not necessarily substitute FDI in natural resource-rich regions such as Africa.

2.4 Differences in FDI flows: Africa and other developing regions

In spite of the marginal role of Africa in FDI, the region has attracted increasing amounts of inward FDI in the past two decades. Inward flows increased from \$2.4 billion in 1985 to \$36 billion in 2006 with FDI stock rising from \$40 billion in 1980 to \$315 billion in 2006 (UNCTAD 2007a). This improvement is quite impressive but still lags behind Asia and the Americas.

The ratio of Africa’s FDI stock to the World’s total increased marginally from 2.4 percent in 1996 to 2.7 percent in 2008. The marginal increase is been attributed to the region’s natural resource potentials and the upsurge of emerging economies’ crave for these natural resources. In spite of this, the region’s share in global FDI compared to other developing regions is still meager.

To highlight the importance of natural resources availability for FDI flows to Africa, it is crucial to note that more than three quarters of FDI to the region goes to the largest natural resource producers –Angola, Algeria, Libya, Mozambique, Nigeria and South Africa (UNCTAD 2008). Data from World Bank’s Africa database revealed that 65 percent of FDI to the region between the periods 2000-2002 went to only three countries: South Africa-36%; Nigeria-16%; and Angola-13% (World Bank 2004b). A look at the FDI stock statistics for Africa during the period 1988-1997 shows an increase from 51.8 percent to 53.4 percent in the primary sector. Comparing this to the statistics for Asia and Latin America, there was rather a decline from 8.8 percent to 3.4 percent and 5.7 percent respectively for the period under review (UNCTAD 1999a: 424-25). On a whole, figures for developing countries as a cohort shows a marginal increase from 6.7 percent in 1990 to 7

percent in 2002. In addition to the concentration of stock figures in the primary sector, annual flows to Africa between 1996 and 2002 continued to be concentrated in this sector representing an average of 55 percent of total flows (UNCTAD 2002a: 52).

Incidentally the perception that FDI to Africa is driven by the region's natural resources endowment seems to be validated by the available data. Extra capital flows in the form of foreign aid to the region can hardly marshal and nurture strong competitive indigenous capitalists to stand head-on with foreign investors to the degree of substitution. Foreign aid in this region could rather engineer simple and imitative technology which would strengthen the productive capabilities of indigenous firms for production and employment expansion. The resultant effect of this process in increased incomes and economic growth will ultimately lead to large market size for increased investment opportunities in other sectors of the economy for both domestic and foreign investors.

If resource-seeking FDI dominant in the Africa region does place high premium on the availability of natural resources relative to institutional, governance and host country productivity, then, the existing one size-fits-all recommendation risks not appreciating the fundamental differences among the different regions of the developing world and the importance of these fundamentals in attracting FDI. It is of utmost importance to sketch out Africa and assess the aid-FDI nexus for this region.

3. Methodology and Data

In view of the literature review and the discussion so far, the study proposes a basic model where net stock FDI is regressed on foreign aid, governance, trade openness level of infrastructure development, population size, and GDP. An Africa dummy is included to control for individual-specific time invariant factors that cannot be easily proxy; example is natural resource endowment.

Given endogeneity problem and unchanging trend of some variables especially that of governance, fixed effects estimation method is adopted for a balanced panel of 93 developing countries including 42 Africa countries for the period 1996-2008 of the form;

$$\ln FDI_{it} = \beta_1 \ln Pop_{it} + \beta_2 \ln GDP_{it} + \beta_3 \ln ODA_{it} + \beta_4 \ln Wgov_{it} + \beta_5 \ln ODA_{it} * \ln Wgov_{it} + \beta_6 \ln xt_{it} + \beta_7 \ln Infra_{it} + \alpha_i + \alpha_t + u_{it} \dots \dots (1)$$

Model (1) would be estimated for all 93 developing countries as a cohort and re-estimated separately for the 42 Africa countries as a cohort; here, the Africa dummy will be removed. The dependent variable FDI_{it} is the net stock of inward FDI in country i at time t , with data taken from the UNCTADstat *International Direct Investment database*. This measure of FDI was similarly used by Kimura & Todo (2007) in their study. Pop_{it} is the population size of country i at time t , and GDP_{it} is Gross domestic product in current US dollars with both data taken from the World Development Indicators (WDI) of the World Bank (2010). Population is included to control for country size. GDP is a measure of market size which reflects the potential domestic demand of multinationals goods and services. The inclusion of these variables is to account for the effect of host country wealth on FDI (Azémar & Desbordes 2010). ODA_{it} is foreign aid disbursement to country i at time t with data taken from the OECD's *Creditor Reporting System (CRS)*. $Wgov_{it}$ is a vector of governance variables constructed from Worldwide Governance Indicators (Kaufmann *et al.* 2009). The variables are voice and accountability, political stability and absence of violence/terrorism, government effectiveness, regulatory quality, rule of law, and control of corruption. Here the scale of measurement is normalised by changing it from the range of -2.5 to +2.5 to the range of 5 to 10 and in both cases indicating worst to best. The Worldwide Governance Indicators (WGI) dataset do not report data for the years 1997, 1999, and 2001; these were therefore interpolated. Consistent with FDI literature, including measures of quality of governance and institutions is indispensable in FDI regressions. $ODA_{it} * Wgov_{it}$ is an interaction term of foreign aid and governance to test for Karakaplan *et al.* (2005) assertion that aid only has a positive impact on FDI in an environment of good governance.

Other control variables are xt_{it} representing a measure of trade openness which is the share of trade in GDP in line with Karakaplan *et al.* (2005) and $Infra_{it}$ is a measure of the level of infrastructure development. Infrastructure is proxy for by the per-capita stock of fixed telephone mainlines in line with Azémar & Desbordes (2010). Data on the two variables is taken from the World Development Indicators of the World Bank (2010).

Africa dummy (α_i) and time dummies (α_t) are included. Africa dummy takes the value of 1 for Africa countries in the sample and 0 otherwise. The time dummies are included to control for unobserved time-specific factors common to all countries. A test for the inclusion of time dummies confirms its need. u_{it} is the error term.

From model (1), β_1 (coefficient of population size) is indeterminate; it could be positive, negative or insignificant. The net effect of population would depend on the relevance of local demand to FDI location decision and the externalities either positive or negative that growing population creates. Plausible externalities such as wide spread poverty and public health concerns could be detrimental to the attraction and sustainability of FDI (Azémar & Desbordes 2009).

β_2 (GDP) is expected to be positive since high GDP creates market for investment and market size is

found to be one of the most robust and significant determinants of FDI. β_3 (ODA) is expected to be insignificant in developing countries cohorts in line with existing conclusions but significantly positive for the Africa cohort in line with this article's hypothesis 1. Since β_4 (six governance indicators) is a mixture of variables for governance, we expect varied results. For instance, whereas rule of law; political stability and control of violence/terrorism; government effectiveness; regulatory quality; and control of corruption are expected to have positive effect; voice and accountability is expected not to matter for FDI. It is expected that the premium placed on rule of law and political stability for FDI to Africa will be high. Since majority of the governance variables is expected to be positive, the composite governance variable is therefore expected to have positive effect on FDI. Results for each of the governance variables will be presented. B_5 (ODA*Composite Governance) is expected to be positive in all the two cohorts in line with existing conclusions. B_6 (trade openness), and β_7 (level of infrastructure development) are expected to be significantly positive since openness and improved infrastructure have a desirable effect on FDI. However, the significance of trade openness for FDI to Africa is not expected to be high due to the type of FDI Africa attracts.

The different classifications of foreign aid are said to impact on FDI in different ways. Positive effect of infrastructure aid (aid disbursed for social and economic infrastructure), negative MPK reducing effect of production sector aid (aid disbursed to sectors such as agriculture, manufacturing, trade, banking and tourism), and rent seeking effect of ODA-other (food, emergency/humanitarian, general budget support aid) have been postulated in the literature. We have argued in this article that, the conclusions may not apply for all developing regions. Existing recommendation that aid should disproportionately be allocated for complementary inputs (socio-economic infrastructure) is deemed to be detrimental for the economies of aid recipients with low physical capital accumulation, and skewed resource seeking FDI. To establish this argument, we estimate a fixed effects model with the three classifications of aid in the form;

$$\ln FDI_{it} = \beta_1 \ln Pop_{it} + \beta_2 \ln GDP_{it} + \beta_3 \ln ODA(I)_{it} + \beta_4 \ln ODA(I)^2_{it} + \beta_5 \ln ODA(k)_{it} + \beta_6 ODA-other_{it} + \beta_7 \ln W gov_{it} + \beta_8 \ln x_{it} + \beta_9 \ln infra_{it} + \alpha_t + u_{it} \dots \dots \dots (2)$$

Here ODA (I)_{it}, ODA(k)_{it}, ODA-other_{it} are infrastructure aid, production sector aid, and ODA-other respectively defined above. Data on the three defined foreign aid is obtained from the OECD's *Creditor Reporting System (CRS)*. ODA (I)²_{it} is included to account for the non-linearity of infrastructure aid - that is to say the positive effect of infrastructure aid is subject to diminishing marginal returns (Selaya & Sunesen 2008). All other variables are as defined in model (1) and taken from sources already mentioned.

It is expected that all three categories of aid will have positive effect on FDI to Africa (that is to say β_3 , β_5 , β_6 will be positive). However, we cannot make a definite statement on the significance of β_5 , and β_6 because the various categories of FDI may react to these aid categories differently. The FDI variable in model (2) is a composite one.

β_4 (squared term of infrastructure aid) is indeterminate, depending on whether the anticipated positive productivity effect exerts negative impact on FDI or reinforces the desirable features of a potential location for FDI. In this article we argue that the total factor productivity (TFP) effect of this type of aid would not exert negative effect on FDI as put forward by Selaya & Sunesen (2008), and therefore expect β_4 to be positive in all two cohorts. The expected effect of all other variables is same as discussed in model (1).

The next step in this article is to ascertain if the sector biasness of FDI could account for any observed difference in the aid-FDI relationship between the developing countries' cohort and the Africa cohort. We argue that for a resource seeking FDI, production sector aid will have significantly positive effect. We test this hypothesis for aid-FDI relationship in Africa. Due to unavailability of continuous disaggregate FDI data for Africa, an approach is adopted by splitting the Africa sample into 'oil and mineral exporting countries' and 'non-oil/mineral exporting countries' as categorised by World Bank. The assumption here is that, oil and mineral exporting countries attract mostly resource-seeking FDI relative to other sectors whereas the opposite is true for non-oil and mineral exporters. The study acknowledges the limitation of such simplification but argue given the present condition of data constraint, this approach would provide us some insights into the issue under research. Model (2) is re-estimated for these two subsamples.

It is expected that, in the oil and mineral exporting Africa countries cohort, aid invested in the production sector has a significantly positive effect on FDI for reasons stated earlier. The relationship in non-oil and mineral endowed countries is expected not to be significant due to the extraction of resource seeking FDI from total FDI in the Africa cohort. Countries included in the study are listed in *Appendix*.

4. Analysis of the Empirical Results

4.1 Descriptive Statistics

A drawn distribution curve shows that most of the variables are not normally distributed. This is not unlikely given the variability in the sample which also confirms the intrinsic differences among countries in the developing world. A Breusch-Pagan/Cook-Weisberg test confirms the presence of heteroskedasticity; hence all the empirical results are based on robust standard errors corrected for heteroskedasticity.

Table 1 presents summary statistics of the dependent and independent variables used in the study. It can be seen that the individual distribution of the variables does not deviate much away from their means. On average, the highest standard deviation was recorded for ODA-Other (commodity aid, humanitarian aid, and general programme support) and FDI, which is a little over 2 points above their means. The recorded deviation in FDI can be so considering the apparent difference in FDI flows among developing countries.

Table 1: Summary Statistics-Developing Countries

<i>Variable</i>	<i>Mean</i>	<i>Std.Dev.</i>	<i>Min</i>	<i>Max</i>
FDI Stock	7.76	2.08	1.74	12.84
Composite ODA	5.26	1.34	0.94	9.35
ODA-Infrastructure	4.60	1.39	-0.30	8.20
ODA-Production Sector	2.51	1.52	-3.91	7.00
ODA-Other	2.74	2.25	-4.60	7.31
Composite Governance Indicator	1.95	0.08	1.66	2.17
Regulation Quality	1.96	0.09	1.60	2.21
Political Stability	1.94	0.12	1.49	2.15
Voice & Accountability	1.95	0.11	1.71	2.16
Government effectiveness	1.95	0.09	1.73	2.18
Control of Corruption	1.94	0.08	1.61	2.20
Rule of Law	1.92	0.10	1.37	2.15
Openness	4.22	0.48	2.70	5.61
Infrastructure per capita	3.49	1.61	-9.79	-0.86

Note: All variables are in logarithms.

Compare to the *table 1*, we could see that individual countries in the African region as presented in *table 2* do not deviate much from the average value of FDI and ODA recorded in the region for the period under review. The recorded deviations for FDI and ODA are 16.2% and 7.2% lower than what was recorded for all developing countries. This shows that there is some degree of homogeneity among Africa countries with respect to FDI and foreign aid. One could also observe that the average value of ODA-other (commodity aid; humanitarian aid; and general programme support) is some 0.31 points higher than that of all developing countries in the sample. This means that, if this type of aid has any negative effect on FDI as argued by some authors and for which *table 3* depicts negative correlation coefficient; then the crowding out effect of this category of aid on FDI in Africa could be more significant than for other developing countries.

Table 2: Summary Statistics-Africa

<i>Variable</i>	<i>Mean</i>	<i>Std.Dev.</i>	<i>Min</i>	<i>Max</i>
FDI Stock	6.98	1.79	2.76	11.61
ODA	5.27	1.25	1.77	9.35
ODA-Infrastructure	4.47	1.28	1.13	7.48
ODA-Production Sector	2.32	1.58	-3.91	6.31
ODA-Other	3.05	2.03	-4.61	7.19
Regulation Quality	1.93	0.09	1.60	2.13
Political Stability	1.93	0.14	1.49	2.15
Voice & Accountability	1.93	0.10	1.71	2.14
Government effectiveness	1.93	0.09	1.73	2.12
Control of Corruption	1.94	0.09	1.61	2.15
Rule of Law	1.92	0.10	1.37	2.15
Openness	4.22	0.45	2.88	5.62
Infrastructure per capita	11.50	1.70	8.16	16.29

Table 3 depicts a positive correlation between total foreign aid (ODA) and FDI in both the Developing Countries and Africa cohorts. The positive infrastructure aid effect is evident in all two cohorts but slightly more pronounced in the Africa cohort. Governance variables such as regulation quality, political stability, voice and accountability, and control of corruption react with FDI differently in the two cohorts. There is evidence of negative rent seeking and MPK reducing effect of 'ODA-other' and 'aid for production sector' respectively in all the two cohorts. However, since correlation does not mean causality, we turn to the results from fixed effects regressions in section 4.2.

Table 3: Partial Correlation between FDI and the Dependent variables

Variable	Developing Countries	Africa
ODA	0.18	0.12
ODA-Infrastructure	0.07	0.08
ODA-Production Sector	-0.02	-0.09
ODA-Other	-0.27	-0.04
Composite Governance Indicator	0.08	0.08
Regulation Quality	0.12	-0.06
Political Stability	-0.004	0.03
Voice & Accountability	0.03	-0.18
Government effectiveness	0.16	0.03
Control of Corruption	0.008	-0.07
Rule of Law	0.01	0.06
Openness	0.07	0.55
Infrastructure per capita	0.43	0.26

4.2 Estimation Results and Discussion

Both Pooled OLS (POLS) and fixed effects estimations were computed, however discussions are centred on fixed effects results. Errors of measurement concerning governance variables raised by Arndt & Oman (2006) and as noted by Wooldridge (2002) have significant impact on POLS leading to biased and inefficient results. Employing fixed effects helps to deal with the measurement and endogeneity problems. Hausmann test confirms fixed effects estimation is more efficient than random effects estimation.

Table 4: Total ODA's impact on FDI

Variables	Developing Countries		Africa	
	POLS	Fixed Effects	POLS	Fixed Effects
Population	-0.21*** (0.78)	-2.63*** (0.40)	0.01 (0.07)	-0.26 (0.76)
GDP	1.21*** (0.59)	1.59*** (0.09)	0.71*** (0.06)	0.67*** (0.14)
ODA	-0.37 (0.44)	0.04 (0.02)	0.53 (0.53)	2.94** (1.43)
ODA*Wgov _{it}	0.47* (0.44)	0.06** (0.03)	7.22*** (3.01)	7.29*** (3.56)
Composite Governance(lnWgov _{it})	0.78* (0.45)	1.20* (0.64)	0.53* (0.10)	7.07* (9.35)
Openness	1.09*** (0.07)	0.52** (0.09)	1.49*** (0.09)	0.60*** (0.12)
Infrastructure	0.08* (0.04)	0.06 (0.05)	4.69** (0.65)	0.13* (0.07)
Control of Corruption	-2.34** (0.74)	0.34 (0.51)	-1.32 (0.95)	-0.63 (0.65)
Government Effectiveness	0.65 (0.66)	0.10 (0.63)	0.66 (0.76)	0.368 (0.79)
Political Stability	0.22 (0.34)	-0.17 (0.32)	0.48 (0.47)	0.68* (0.40)
Regulation Quality	2.58*** (0.57)	0.08 (0.43)	1.27 (0.64)	3.03** (1.39)
Voice and Accountability	1.03** (0.35)	-0.54 (0.57)	-2.60** (0.51)	-3.02*** (0.69)
Rule of Law	-0.27** (0.09)	-0.004 (0.08)	0.76 (0.61)	-0.22 (0.62)
Africa Dummy	0.44*** (0.07)	-	-	-
Constant	-23.97*** (1.17)	-36.32*** (4.7)	-10.28*** (3.19)	-18.84*** (11.41)
Observation	1208	1208	517	517
R-squared	0.78		0.81	
Adjusted R-Squared	0.77		0.77	
Overall R-Square		0.71		0.70
Hausman test P-value		0.00		0.00

Note: The asterisks ***, **, and * represents significance at 1% 5% and 10% respectively. Standard errors are in parenthesis in all tables.

From table 4 GDP, openness, regulatory quality, government effectiveness, and infrastructure have the expected signs. However significant difference between the two cohorts appears: while regulatory quality and infrastructure is insignificant in the developing countries cohort, they are significantly positive determinants of

FDI to the Africa cohort. Political stability is also found to be relevant for attracting FDI to Africa but seems not to matter for FDI to other developing regions.

It can be seen that while foreign aid alone is not effective in attracting FDI to developing countries as a cohort, it has a significantly positive impact on FDI to Africa. This gives credence to the assertion that the development gap in Africa is so huge that massive capital injection is needed to create conducive conditions; hence foreign aid in all forms could be beneficial to improving Africa's attractiveness. In testing Karakaplan *et al.* (2005) finding, an interaction term between foreign aid and composite governance variable is included in the estimation and this turned out to be positive and significant in all the two cohorts in support of existing hypothesis. This means that foreign aid allocation based on quality of governance can improve the attractiveness of recipients to foreign private investors. Possibly, in a well governed country, foreign aid is put into proper use to improve the economic conditions of the country in comparison to poorly governed country.

Even though we have made some progress towards establishing Africa's distinctiveness, there still exists the question of whether production sector aid impacts negatively on FDI. On this question, I attempt an answer by estimating the effects of the three types of foreign aid on FDI. The results are depicted in *table 5*.

Table 5: Channels of Aid's effect on FDI

Variables	Developing Countries		Africa	
	POLS	Fixed Effects	POLS	Fixed Effects
Population	-0.06 (0.08)	-3.07** (0.42)	0.01 (0.07)	-0.06 (0.82)
GPD	1.11*** (0.07)	0.77*** (0.13)	0.68*** (0.07)	0.76*** (0.16)
Infrastructure Aid	0.04 (0.03)	0.06** (0.03)	0.25*** (0.05)	0.07* (0.04)
Infrastructure Aid ²	0.004 (0.02)	0.05*** (0.01)	0.13*** (0.02)	0.04* (0.02)
Production Sector Aid	-0.02 (0.03)	0.02 (0.02)	-0.06 * (0.03)	0.02 (0.02)
ODA-Other	-0.006	0.01 (0.01)	-0.008 (0.02)	0.007 (0.02)
Openness	1.14*** (0.07)	0.26*** (0.09)	1.47*** (0.09)	0.57*** (0.12)
Infrastructure	0.16** (0.04)	-0.04 (0.05)	0.26*** (0.04)	0.13* (0.07)
Control of Corruption	-2.33*** (0.77)	0.10 (0.51)	-1.37 (0.97)	-0.42 (0.65)
Government Effectiveness	0.43 (0.68)	-0.31 (0.62)	0.36 (0.77)	0.35 (0.78)
Political Stability	0.13 (0.36)	-0.03 (0.30)	0.12 (0.47)	0.34 (0.39)
Regulation Quality	2.46*** (0.58)	1.72*** (0.44)	1.09* (0.63)	0.07 (0.58)
Voice and Accountability	1.08*** (0.39)	-0.72 (0.55)	-2.4** (0.55)	-3.17*** (0.69)
Rule of Law	-0.21** (0.09)	0.04 (0.08)	0.79 (0.70)	-0.20 (0.62)
Africa Dummy	0.44*** (0.07)	-	-	-
Constant	-23.97*** (1.17)	-32.73*** (4.88)	12.43*** (1.94)	-8.44 (12.04)
Observation	1208	1132	491	491
R-squared	0.81		0.81	
Overall R-Square		0.73		0.77
Hausman test P-value		0.00		0.00

Note: The asterisks ***, **, and * represents significance at 1% 5% and 10% respectively.

Expectedly, infrastructure aid has significantly positive effect on FDI to both the "developing countries" and "Africa" cohorts. There is no evidence of negative production sector aid effect on FDI. It turns out to be insignificant consistent with the findings of Kimuara & Todo (2007).

In this article, it has been argued that Africa attracts disproportionately high levels of primary sector

resource seeking FDI than as it is the case in other developing regions. It is further argued that, for a destination of predominantly resource seeking FDI, production sector aid produces a significantly positive effect. The results so far have not supported this hypothesis; mainly because we have not been able to access disaggregate FDI data. We go around this problem by disaggregating the Africa sample into (a) oil & mineral exporting countries, and (b) non-oil & mineral exporting countries; with the assumption that cohort (a) attracts primary sector resource seeking FDI. Hence FDI data in this cohort is used to represent primary sector resource seeking FDI and the estimation result is depicted in *table 6* below.

Table 6: Aid's impact on FDI in the two African Sub-samples

<i>Variables</i>	<i>Fixed Effects Estimation 'Oil & Mineral exporting'</i>	<i>Fixed Effects Estimation 'Non-Oil & Mineral exporting'</i>
Population	-0.56 (2.04)	-0.20 (1.93)
GPD	1.07 (0.63)	0.62*** (0.21)
ODA for Infrastructure	0.15* (0.10)	0.20*** (0.07)
ODA for Production Sector	0.04* (0.03)	-0.02 (0.02)
ODA-Other	0.04* (0.02)	-0.007 (0.02)
Openness	0.86*** (0.25)	0.36*** (0.27)
Infrastructure	5.95** (2.32)	0.95 (1.18)
Control of Corruption	-2.32 (1.87)	1.52 (1.18)
Government Effectiveness	1.65 (1.34)	1.07 (1.33)
Political Stability	0.15 (0.60)	1.72* (0.89)
Regulation Quality	0.70 (1.70)	-0.79 (0.80)
Voice and Accountability	-6.52** (1.77)	-2.81** (1.23)
Rule of Law	1.01** (0.48)	-2.02 (1.88)
Constant	-15.65** (4.11)	-18.05** (3.97)
Observation	248	243
Overall R-Square	0.75	0.72

The asterisks ***, **, and * represents significance at 1% 5% and 10% respectively.

The result as depicted in *table 6* supports the second hypothesis of this article and indeed shows that aid invested in the production sector have a positive effect on FDI at a 10% significance level in an oil and mineral exporting African country. Another significant result is the positive effect of rule of law in oil and mineral exporting Africa cohort. In all three regression results discussed, it only in this cohort that rule of law has a significantly positive effect on FDI in support of Bénassy-Quéré *et al.* (2007) and Globerman & Shapiro (2002) assertion. The explanation is that given the technology and capital intensive nature of resource seeking FDI, strong impartial judiciary and effective laws that ensure property right protection and contract enforcement is absolutely one of the fundamental conditions investors would expect to be in place.

At this point, it can be said that we have make a successful journey towards understanding the complexity surrounding foreign aid's impact on FDI to some extent. However, further studies would be require in understanding what impact the three classification of aid have on each sector of FDI when disaggregate FDI data for Africa becomes available.

5. Conclusion

Due to its potential benefits of technology transfer, productivity improvement and job creation among others, FDI is deem to be essential for accelerating the growth of developing economies. In view of this, the attraction of FDI becomes a major policy issue in the growth strategies of governments. The marginal role of the developing

world, Africa in particular is worrying however. Noting this, development partners and the international community are making concerted effort to support such economies to engineer favourable environment attractive to private investors home and abroad. Given the implied use of foreign aid as a catalyst for creating the favourable investment environment demanded by the private sector, assessing its impact on FDI is not only relevant in its own right but also legitimate in the aid effectiveness debate.

Notwithstanding the implied positive effect of aid, it has been argued by some that foreign aid encourages unproductive rent seeking activities inimical to the growth of private sector investment (Bauer 1991, p. 45). To a certain level and for production sector, aid reduces returns on capital due to physical capital accumulation thereby discouraging FDI (Selaya & Sunesen 2008). Others have even argued the two capital flows (foreign aid and FDI) are unrelated (Kosack & Tobin 2006). There is therefore a huge controversy on whether foreign aid has a positive or negative effect on FDI.

This article argues that the inconclusiveness of existing results can be attributed to the omission of contextual effects and the implicit treatment of developing countries as a uniform cohort. FDI attraction dynamics is quite varied among the developing regions; such that Africa may present a different result from the rest of the developing world. Given Africa's huge development and capital gap, all the three classifications of foreign aid will be positive for creating conducive investment environment to attract FDI; contrary to existing conclusions that production sector aid and other foreign aid (food, humanitarian/emergency, and general programme support) are inimical to FDI.

True to the hypothesis of this article, empirical results from the study total foreign aid have significantly positive effect on FDI in Africa. The effect of aid is significantly positive in an environment of good governance. Production sector aid has no negative effect on FDI in Africa. This type of aid rather has a significantly positive effect on resource-seeking FDI in Africa proxy for by FDI in "oil and mineral exporting African countries". There is no evidence of rent seeking and/or MPK reducing effect of aid to Africa as found for developing countries in some earlier studies. It also emerged that rule of law has significant effect on drawing in resource-seeking FDI. This means that, to take full advantage of the nature blessings on their countries, natural resource-rich regions such as Africa should strengthen their institutions particularly the judiciary, ensure property right protection, enhance contract enforcement and give the necessary indication of no expropriation risks. These actions if taken would entice private foreign investors with the necessary technological and financial capability to invest and increase their stakes in the region so that countries can reap the benefits associate with FDI for accelerated economic development. To some level of surprise, one governance variable which was not found in all specifications to have any significant positive impact on FDI is the 'control of corruption'. However as noted by Egger & Winner (2006), corruption seems not to matter for FDI to developing countries.

Notwithstanding the thorough research conducted by this study, some issues are worth taking note of when making inference from the results of the study. It is important to note that the omission of other variables such as level of financial development, exchange rate, inflation and taxation which have been identify to be relevant determinants of FDI could generate some bias in the results.

Again, the FDI literature reports lag reaction of FDI to policy variables and other determinants. For instance, investors might want to adopt 'wait and see' attitude to the impact of governments' macroeconomic policies and institutional reforms. In such circumstance FDI will flow to and investors will increase their stakes when the implementation of such policies proves successful and beneficial. The application of foreign aid to create the favourable economic and institution environment also takes time. In view of all these, empirical literature suggests lagging all variables and using system GMM estimator of Arellano & Bover (1995) and Blundell & Bond (1998) to obtain efficient results.

Finally the assumption that 'oil and mineral exporting countries' attracts mainly resource-seeking FDI and the application of that to make deterministic statement about the relationship between resource-seeking FDI and the three classifications of foreign aid could be problematic. Even though in the absence of continuous disaggregate FDI data for Africa, this approach gives some suggestive results, it will be recommended that future studies take this issue up when disaggregate data is available to find out how the different types of FDI react to aid flows. This is particularly crucial in Africa where most countries receive disproportionate sectoral flow of FDI. By this attempt, policy makers and donors alike will be able to know which type of FDI is incompatible with which category of foreign aid and why, so that the appropriate strategies could be adopted to maximise the benefits of aid.

It must however be stated that in spite of these limitations the study presents systematic and interesting results and almost all the specifications produce an R-square of 75% on the average. This means that on average the explanatory variables and the methodology adopted in this study could explain about 75% of the variations in the dependent variable, FDI.

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Appendix

Table 4: List of Countries included in the Sample

Africa Countries		Other Developing Countries	
Algeria	Lesotho	Albania	Iran
Angola	Madagascar	Armenia	Jamaica
Benin	Malawi	Argentina	Jordan
Botswana	Mali	Bangladesh	Kazakhstan
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