

Foreign Aid and Economic Growth in the West African States: A Panel Framework

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ABSTRACT: *This paper examines the impact of economic variables namely, foreign direct investment (FDI), investment, export, foreign aid and broad money supply on economic growth, approximated by gross domestic product (GDP) using annual data covering a period 1981-2008 on a group of West African countries. The impact of variables on GDP is estimated using three panel estimation models: pooled model (pooled), fixed effects model (FEM) and random effects model (REM). We explore the hypothesis that foreign aid can promote growth in developing countries. We test this hypothesis using panel data series, while the findings of previous studies are generally mixed, our results indicate that foreign direct investment has purely positive effects on economic growth in West African countries.*

Keywords: *FDI, Economic Growth, West African*

I. Introduction

Official development assistance (ODA), more commonly known as foreign aid consists of resource transfers from the public sector, in the form of grants and loans at concessional financial terms, to developing countries. Many studies in the empirical literature on the effectiveness of foreign aid have tried to assess if aid reaches its main objective, defined as the promotion of economic development and welfare of developing countries. When focusing on the traditional purpose of foreign aid - promotion of the economic growth of developing countries -, one notes that the results obtained differ according to the approach used. Studies at the micro-level, mainly using cost-benefit analyses, support the view of those in favour of the effectiveness of foreign aid. In contrast, the results presented in studies at the macro-level, namely cross-country regression studies, are, to say the least, ambiguous. Mosley (1986) called this contradiction the “micro-macro paradox”.

The role of foreign aid in the growth process of developing countries has been a topic of intense debate. Foreign aid is an important topic given its implications for poverty reduction in developing countries. Previous empirical studies on foreign aid and economic growth generate mixed results. For example, Gomane, et al. (2003) find evidence for positive impact of foreign aid on growth; Burnside and Dollar (2000) and Brautigam and Knack (2004) find evidence for negative impact of foreign aid and growth, while Mosley, et al. (1987), Boone (1996), and Jensen and Paldam (2003) find evidence to suggest that aid has no impact on growth. It should be noted that, although Burnside and Dollar (2000) concluded that foreign aid has positive effects, this conclusion applies only to economies in which it is combined with good fiscal, monetary, and trade policies. A recent study by Doucouliagos and Paldam (2009), using the meta-analysis covering 68 papers containing a total of 543 direct estimates, it is found that the effect of aid on growth estimates scatter considerably and add up to a small positive, but insignificant, effect on growth. The zero correlation result has yet to be overcome.

The main role of foreign aid in stimulating economic growth is to supplement domestic sources of finance such as savings, thus increasing the amount of investment and capital stock. As Morrissey (2001) points out, there are a number of mechanisms through which aid can contribute to economic growth, including (a) aid increases investment, in physical and human capital; (b) aid increases the capacity to import capital goods or technology; (c) aid does not have indirect effects that reduce investment or savings rates; and aid is associated with technology transfer that increases the productivity of capital and promotes endogenous technical change. According to McGillivray, et al. (2006), four main alternative views on the effectiveness of aid have been suggested, namely, (a) aid has decreasing returns, (b) aid effectiveness is influenced by external and climatic conditions, (c) aid effectiveness is influenced by political conditions, and (d) aid effectiveness depends on institutional quality.

It is interesting to note that in recent years there has been a significant increase in aid flows to developing countries although other types of flows such as foreign direct investment and other private flows are declining. For example, according to the Organization for Economic Corporation and Development (OECD, 2009b), foreign direct investment and other private flows are on the decline, and remittances are expected to drop significantly in 2009. Budgets of many developing countries were hit hard by the rises in food and oil prices in the last two years. Many countries are not in a strong fiscal position to address the current financial crisis. According to the OECD (2009b), in 2008, total net official development assistance (ODA) from members of the OECD’s Development Assistance Committee (DAC) rose by 10.2% in real terms to US\$119.8 billion and is

expected to rise to US\$130 billion by 2010. Africa is the largest recipient of foreign aid. For example, net bilateral ODA from DAC donors to Africa in 2008 totaled US\$26 billion, of which US\$22.5 billion went to sub-Saharan Africa. Excluding volatile debt relief grants, bilateral aid to Africa and sub-Saharan Africa rose by 10.6% and 10% respectively in real terms. Given the importance of foreign aid to the economies of developing countries, it is important to understand its contribution to economic growth of developing countries.

II. Literature Review

The results of macroeconomic studies on FDI and growth have generally been mixed. Though most studies find some positive correlation between FDI and growth, these results are not always significant. Carkovic and Levine, (2005) attempt to estimate the impact of FDI on growth using data from seventy-two developing and developed countries. Their paper uses two related samples to test the hypothesis that FDI inflows affect growth. Firstly, the authors use cross-sectional data by averaging the data for each country over the full time frame under consideration, and then modify the data by averaging over five-year intervals to exploit time variation. After controlling for variables such as existing economic conditions, the level of human capital and financial development, the authors find that FDI does not exert an independent, positive effect on growth. A different sample specification (developing countries only) and a different dependent variable (the log level of GDP) also yield unchanged results, leading the authors to conclude that inward FDI inflows have no robust effect on host country economic growth.

Borensztein et al (1998) examine the effect of foreign direct investment on economic growth in sixty-nine developing countries, finding that while FDI is positively correlated with real per capita GDP growth, the relationship is modified when levels of human capital are taken into account. In particular, the coefficient of FDI is larger when countries have higher levels of human capital (measured as the average years of secondary schooling for each country's male population), leading the authors to conclude that countries with more educated workforces are better equipped to take advantage of the advanced technologies that might be gained as a result of FDI.

Nunnenkamp and Spatz (2003) suggest that efficiency-seeking FDI is most likely to lead to economic growth due to the spillover of technology and know-how. By contrast, resource-seeking FDI in the primary sector tends to be concentrated in "enclaves dominated by foreign affiliates with few linkages to the local product and labor markets", and thus might not lead to economic growth, despite the "large up-front transfer of capital, technology and know-how, and... high foreign exchange earnings" involved. Market-seeking FDI is projected to have a similar effect, since it might benefit local markets by "introducing new products and services, by modernizing local production and marketing and by increasing the level of competition in the host economies" on one hand, but might crowd out local competitors. Due to these possibilities, it is possible that empirical studies that use only aggregated figures in their analysis might be misstating the effect of FDI on growth, external competitiveness will increase growth rates.

Mandilaras and Popper (2009) investigate international capital flows in seven East Asian countries. The purpose was to determine the indicators of net outflows. The study also evaluates the effect of openness in financial markets on international capital flows, including the link between domestic capital flows and international capital flows in the East Asian countries. The findings show that domestic capital markets is a good indicator in explaining the changes in total capital flows in the seven East Asian countries. Furthermore, openness in capital markets is also important in influencing total capital flows in the economy. The US macroeconomic variables are significant in determining the growth of GDP.

Adhikary (2011) reports that based on theoretical linkage, the relationship between economic growth, trade openness, foreign direct investment (FDI) and capital formation tends to be positive.

Alfaro (2003) partially reaffirms the impact of FDI on growth in Sub-Saharan African countries. While the study covers a range of developing and developed countries, Nigeria is the only Sub-Saharan African country that appears in the forty-seven country sample. Though the exclusion of other Sub-Saharan African countries might have been due to lack of data availability for the variables which the author sought to emphasize, it still highlights the gap in research on FDI in Sub-Saharan African countries. On a more important note, the study's results indicate that it is important to account for the fact that many countries in the Sub-Saharan African region might attract FDI flows focused in the primary sector, due to their abundance of mineral and natural resources.

Hoang et al. (2010)) suggest that FDI only has a positive effect when the stock of human capital reached a certain threshold. Only at this threshold can a country exploit the technology absorbed from FDI. The determinants of FDI in Canada had been examined by Leitao (2010). The study examines the determinants of FDI in Brazil, Japan and the EU-15. Using GMM system estimator and Fixed Effects estimators, the findings show that trade openness and market size were the significant factors that influence the total inflows of FDI in Canada. North American Free Trade Agreement (NAFTA) and Free Trade Agreements (FTA) are the policies that attracted inward FDI to Canada. Tax and wages also had significant influences in determining total FDI in Canada. The stability of macroeconomic policies attracts foreign investors to invest in the country.

III. Methodology And Data

This study is an empirical study using secondary data. Annual data of the whole Sub-Sahara Africa were collected from various conventional sources.

Data Sources

This study is an empirical study using secondary data. Annual data from 1981 to 2008 of West African countries were fitted to Panel framework for the countries and were collected from World Development Indicator (WDI) published by the World Bank. Data for total GDP, FDI, export, import and gross fixed capital formation for 1981 to 2005 were obtained from the World Development Indicator (WDI) 2007 CD-ROM. For years 2006 to 2008, data were extracted from the World Development Indicator (WDI) website.

Specification of Model

From the list of cross-country regression studies supplied by Hansen and Tarp (2000), It will be apt to focus on single-equation growth regressions, since it is the most common practice found in the literature. Within this regression subset, model specification suggested by Dowling and Hiemenz (1982) and Mosley et al. (1987, 1992) can be chosen. Despite the unsophisticated empirical growth equations mostly considered, the model specification of each study has been remarked for the inclusion of relevant control variables (e.g., White (1992); Durbarry et al. (1998); Hansen et al. (1998)).

The use of GMM-type estimator is proposed assuming that foreign aid is an endogenous variable and this would be examined in the context of panel data. The empirical model that would be estimated is of the following form:

$$gdp = f(fdi, inv, exp, aid, m2)$$

$$gdp_{it} = \beta_0 + \beta_1 (fdi_{it}) + \beta_2 (inv_{it}) + \beta_3 (exp_{it}) + \beta_4 (aid_{it}) + \beta_5 (m2_{it}) + \tau_i \dots (1)$$

Where, gdp is Gross Domestic Product, fdi, Foreign Direct Investment, aid, Foreign Aid, exp, Export and m2, broad money supply.

IV. Analysis And Presentation Of Results

4.1 Descriptive Statistics

Table 1 summarizes the basic statistical features of the data under consideration including the mean, standard deviation, kurtosis, skewness, and the Jarque-Bera test for the data in their first differences. As *Table 1* show, estimates of the standard deviation for the variables under study indicate that Real GDP, Foreign Direct Investment, Export, AID and broad money supply are more volatile compared to the Investment. Furthermore, standard deviation estimates indicate that the Real GDP, Foreign Direct Investment, Export, AID are less volatile compared to the broad money supply. A test for departure from normality, show that all the variables under study deviates normal distribution. The non-normality of the variables is supported by their skewness and kurtosis (see appendix)

Table 1: Summary Statistics

Variable	Mean	Median	Minimum	Maximum
1_RGDP	21.7656	21.8455	19.2197	25.2446
1_FDI	18.0069	18.1768	12.8882	20.6783
1_INV	1.91054	2.00567	0.0524990	3.81298
1_XPORT	20.7843	20.6798	17.9593	25.2191
1_AID	19.3587	19.5130	16.5329	23.1184
1_M2	20.7018	22.3559	3.11577	25.2000
Variable	Std. Dev.	C.V.	Skewness	Ex. kurtosis
1_RGDP	1.31616	0.0604700	0.463111	0.550593
1_FDI	1.49317	0.0829221	-0.675835	0.498006
1_INV	0.703557	0.368250	-0.120334	0.221647
1_XPORT	1.60027	0.0769940	0.627754	0.0822702
1_AID	1.10084	0.0568653	-0.300797	0.707925
1_M2	5.08493	0.245627	-2.84967	7.10191
Variable	5% Perc.	95% Perc.	IQ range	Missing obs.
1_RGDP	19.3810	24.8094	1.63813	0.000000
1_FDI	15.0255	20.2312	1.81157	0.000000
1_INV	0.730958	3.09009	0.834442	0.000000
1_XPORT	18.4701	24.0042	2.07134	0.000000
1_AID	17.2551	20.7018	1.27373	0.000000
1_M2	3.29167	24.2132	2.30201	0.000000

4.2 Correlation across growth measures

The simple correlations between different measures of openness used in this study are reported in Table 2. The results show that there is generally a statistically significant correlation among the growth measures. More importantly, all of the correlation coefficients have the correct signs except for the correlation coefficients of investment and broad money supply which have incorrect signs but are insignificant. As expected, Real GDP, Foreign Direct Investment, Export, AID and broad money supply, are correlated significantly and positively with each other. Although the relationships between growth measures within each group are generally statistically significant with the correct signs, the relationships between the indicators across the groups tend to be weak. For example, while the investment, export, FDI and AID broad money supply and investment are negatively and significantly correlated with real GDP, their relationships with the broad money supply show weak correlation. Given the strong and positive relationship FDI and growth, the existence of a significant correlation between growth and other variables except broad money supply indicates that trade FDI plays a pivotal role in the growth model of West African countries.

Table 2: Correlation coefficients

1_RGDP	1_FDI	1_INV	1_XPORT	1_AID	1_M2
1.0000	0.5455	0.2846	0.9322	0.6403	-0.2713
	1.0000	-0.0475	0.5755	0.4488	-0.2775
		1.0000	0.1925	0.2688	0.3447
			1.0000	0.6414	-0.3599
				1.0000	-0.0357
					1.0000

The GMM results using equation (1) are displayed in Table 3. Regression (1) presents the estimated results of pooled regression. The high correlation between FDI and growth (correlation coefficient equal to 0.54- see table 2) suggests that multicollinearity is a problem. Fixed effects model is used to identify the different impact of the independent variables on the dependent variable. In our case, the fixed effects model is used to determine whether FDI, Export, investment, aid and broad money supply have different impact on GDP. The third column presents the results of pooled estimation based on random effects model. The coefficients value of FDI, Export, investment, aid and broad money supply are 0.02, 0.17, 0.03, 0.63 and 0.01 respectively which show that there is a positive relationship between the dependent variable (GDP) and the independent variables.

It is evident that the results of the F test is significant at 1% level of significance in all panel data models therefore we can conclude that we cannot reject the null hypothesis that the explanatory variables do not explain (taken as a whole) GDP per capita, and hence the determinants selected in this study can be considered to be enough explanatory of the economic growth determinant. Though, in case of the Hausman test we reject the null hypothesis of correlation between countries' unobservable individual effects and economic growth determinants. This implies that for our analysis a random effect model is more appropriate. However, if we compare the sign and significance of coefficients associated with the respective variables we find that results reported in 1 and 2 are same. Both effects (1 and 2) show that all the growth variables in the model have positive and significant impact on the economic growth of the panel countries. However, Hausman test in this case also suggests that the random effect model is preferred way of analysis. So, from the results obtained, we can say that FDI and its higher inflow in the group of panel countries contribute to higher growth.

The model reports that exports and high level of FDI will increase the growth otherwise FDI decreases growth of the panel countries. FDI, exports and investment are found to be having positive impact on the economic growth in panel of countries. This also suggests the preference of export-led growth hypothesis against FDI-led growth hypothesis, a long debated topic in our panel countries.

Table 3: Growth regressions using panel data

Dependent Variable	Regression		
1_RGDP	1 (Pooled)	2 (Fixed Effect)	3 (Random Effect)
const		16.8249 *** (39.55)	16.1149*** (29.18)
1_AID	0.187572** (2.209)	0.0613515*** (3.801)	0.637304*** (3.062)
1_INV	0.0974198 (1.092)	0.0582348** (2.336)	0.0319976* (1.659)
1_FDI	0.0733354 (1.008)	0.00895086** (2.416)	0.0212145* (1.834)
1_XPORT	0.769928*** (12.15)	0.0207741*** (6.009)	0.175472*** (6.723)

L_M2	0.0296152*** (2.624)	0.00976500*** (3.254)	0.0138364 (1.217)
Number of Observation	154	154	154
Breusch-Pagan test			141.724
Hausman test			113.789
Durbin-Watson	0.493302	0.797526	
R-squared	0.999449	0.993847	
Adjusted R-squared	0.999434	0.993027	
F-test	54067.68	1211.441	

Notes : a) *, ** and *** indicate that the estimated parameter is statistically significant at the 10%, 5% and 1% level, respectively.

b) t-values are shown in parenthesis. Heteroskedasticity-consistent standard deviations.

V. Discussion Of Results And Recommendation

In this study, five variables were employed to determine their relationship to economic growth. Using panel estimation in fixed and random effects, the result confirms that all variables play a role as determinant of economic growth in the West African countries. Governments need to play important roles in promoting economic growth since they have the power to shape policies. Governments in the countries should create policies that encourage FDI, openness and investment. The government can reduce tax on imports of goods and services within the countries. This move will reduce the prices of imports; thus will help in increasing trade openness between these countries. Agbetsiafa (2010) in a study of causality evidence between regional integration, trade openness and economic growth proposed that an increase in the number of exports in intermediate goods will improve facilities and human capital, subsequently leading to higher per capita real GDP and avoid deficits in the country.

FDI plays the most important role in determining growth as indicated by the fixed effect model in panel estimation. Via FDI, advanced technologies can be absorbed by the countries. These technologies can lead to product innovations in the countries. In order to achieve this, the governments in these countries have to assure economic, social, and political stability in the countries. These three aspects can attract foreign investors to invest in the domestic economy. The resulting increase in FDI will spur economic growth. Investment in the domestic countries will add to gross fixed capital formation and lead to more growth in the economy. Azam (2010) in a study about the impact of export and FDI on economic growth in South Asia, suggests that the governments of South Asia countries should increase total FDI inflows into the countries.

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Appendix



