Determinants of Foreign Direct Investments (FDI): Lessons from the African Economies

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The volume of foreign direct investments (FDI) that flows into Africa is relatively very low as a share of the total global FDI flows and as a share of FDI flows into all developing countries. More alarmingly, the African share of FDI inflows is on a steady downward trend for the last three decades. In 2006 however, FDI inflow to Africa rose by 20% to $36 billion, twice that of 2004 level. The aim of this study is to analyze the various potential determinants of FDI for a sample of African economies employing a panel data analysis for the period 1990-2005. Twenty African countries are involved in this study, based on data availability. The Hausman test specification recommends the use of fixed effects model. All the explanatory variables as specified in the econometric functions are found to be significant in attracting FDI in Africa corroborating recent empirical evidences.

INTRODUCTION

The volume of FDI that flows into Africa is not only very low as a share of total global FDI flows or even as a share of FDI flows to developing countries, but also the share is on a steadily declining for several decades in the past. Africa accounts for just 2 to 3 percent of global FDI inflows, down from a peak of 6 percent in the mid-1970s, and less than 9 percent of developing-country flow receipts compared to an earlier peak of 28 percent in 1976 (UNCTAD (2005)). In 2006, FDI inflow to Africa rose by 20% to $36 billion, twice the amount recorded in 2004. Following substantial increases in commodity prices, many transnational corporations (TNCs)

particularly those from developed countries, already operating in the region, significantly expanded their activities in oil, gas, and mining industries (UNCTAD (2007))[1].

The 24 countries in Africa classified by the World Bank as oil- and mineral-dependent, have on average accounted for close to three-quarters of annual FDI inflows over the past two decades. FDI in Africa has tended to concentrate in a few countries. In recent years, just three countries (South Africa, Angola, and Nigeria) accounted for 55 percent of the total. The top fifth (10 out of 48 countries) accounts for 80 percent, and the bottom half accounts for less than 5 percent. This trend has held for at least the last three decades, with the top 10 countries accounting for more than 75 percent of the continent's total FDI inflows. In Sub Saharan Africa, the preferred FDI destinations were: Angola, Equatorial Guinea, Nigeria, and South Africa.

Many studies in literature have dealt with the issues of FDI and their potential benefits for developing countries in terms of employment opportunities, technology transfers, and growth and development. There have also been several studies on the determinants of FDI in developed countries and developing countries, although all developed countries or all developing countries cannot be grouped together given their different economic and socio-political conditions. There are quite a few studies that concentrate on a region, and yet, very few on the African region. To close this gap in existing literature, the aim of this study is to analyse the various potential determinants of FDI for a sample of African economies. The period under consideration here is 1990-2005.

The increasingly significant role of FDI in the growth dynamics of countries has created much research interest among scholars and much research has been focused on the determinants of FDI and has generally identified the following factors namely comparative labour costs, country size, economic openness nature of exchange rate regimes, return on investment, and political factors. Many of the studies include primarily developed countries in their sample and most of those which include substantial number of less developed countries, (e.g. Schneider and Frey, 1985 and Gastanaga and Nugent, 1998) are estimated with pure cross sections. With regard to research on the determinants of FDI inflows to Africa, the state of the current literature is even poorer. (Schoeman et al 2000), (Morisset 2000), and (Asiedu 2002).

The rest of the paper is organised as follows: Section 2 deals with the review of theoretical and empirical literature, Section 3 describes the econometric modeling and discusses the empirical approach and the data used, and Section 4 presents the econometric results and analyses of the findings and finally, the last section concludes the paper.

REVIEW OF LITERATURE

Dunning's (1981, 1988) 'electric theory' provides a flexible and popular framework, where it is argued that foreign direct investment (FDI) is determined by three sets of advantages which direct investment should have over the other institutional mechanisms available for a firm in satisfying the needs of its customers at home and abroad. The first of the advantages is the ownership specific one which includes the advantage that the firm has over its rivals in terms of its brand name, patent, or knowledge of technology and marketing. This allows firms to compete with the other firms in the markets it serves, regardless of the disadvantages of being foreign.

[1] Figures 1and 2 in appendix show how FDI in the world has been distributed around the major region 1999 to 2003 and 2005-06 respectively.

The second advantage is the location-specific advantages relate to the importance for the firm to operate and invest in the host country and are those advantages that make the chosen foreign country a more attractive site for FDI than the others. For instance, firms may invest in production facilities in foreign markets because transportation costs are too high to serve these markets through exports. This could either be directly related to the actual nature of the good, either being a high bulk item or a service that needs to be provided on site, or due to policy factors such as tariff rates, import restrictions, or issues of market access that makes physical investment advantageous over serving the market through exports. Location advantage also embodies other economic, institutional, and political characteristics such as large domestic markets, availability of natural resources, an educated labor force, low labor cost, good institutions (the clarity of country's law, efficiency of bureaucracy, and the absence of corruption), political stability, corporate and other tax rates, etc. Location-specific determinants are the only ones that governments can influence directly.

The third advantage is the internationalisation advantage, that is why a 'bundled' FDI approach is preferred to 'unbundled' product licensing, capital lending, or technical assistance (Wheeler and Mody, 1992). These refer to the superior commercial benefits for firms resulting from the exploitation of ownership-specific and location-specific advantages by investing in foreign affiliates that they control, rather than through transactions with unrelated firms located abroad.

Bende-Nabende and Slater (1998) investigate both the short-run and long-run locational determinants of FDI under the broad categories of cost-related investment environment improving and other macroeconomic factors. The short-run dynamics indicate that European investment in the Thai manufacturing sector has been more responsive to the macroeconomic factors. The long-run dynamics on the other hand suggest that European investment has been more responsive to the investment environment improving factors. In particular, there is evidence to suggest that the Thai manufacturing sector is losing its cost-related comparative advantage.

Dar, Presley, and Malik (2004) studied the causality and long-term relationship between FDI, economic growth, and other socio-political determinants. Although literature gives the evidence of existing relationship between FDI and economic growth. Their paper considers economic growth, exchange rate, and level of interest rates, unemployment, and political stability as determinants of the level of FDI inflows for Pakistan over the period 1970-2002. Almost all variables are found to have theoretically expected signs with two-way causality relationship.

Nunnenen (2002) argues that there is a significant gap between, allegedly, globalization-induced changes in international competition for FDI and recent empirical evidence on the relative importance of determinants of FDI in developing countries. He shows that surprisingly little has changed since the late 1980s. Traditional market-related determinants are still dominant factors. Among non-traditional FDI determinants, only the availability of local skills has clearly gained importance. As concerns the interface between trade policy and FDI, he finds that the tariff jumping motive for FDI had lost much of its relevance well before globalization became a hotly debated issue.

Artige and Nicolini (2005) analyse the determinants of FDI inflows for a group of European regions. The originality of their approach lies in the use of disaggregated regional data. First, they develop a qualitative description of their database and discuss the importance of the macroeconomic determinants in attracting FDI. Then, they provide an econometric exercise to identify the potential determinants of FDI. In spite of choosing regions presenting economic

similarities, they show that regional FDI inflows rely on a combination of factors that differ from one region to another.

Bénassy-Quéré, Coupet and Mayer (2007) re-examine the role of institutions in the host and in the source country by estimating a gravity equation for bilateral FDI stocks that includes governance indicators for the two countries. Second, they tackle multicollinearity and endogeneity bias by implementing a three-stage procedure for instrumentation and orthogonalisation. Third, they look further into the detail of institutions by using a new database constructed by the French Ministry of Finance network in 52 foreign countries. This database is used to point out in some detail the relevant institutional features. Its country coverage, which focuses on developing countries, is very helpful for studying the impact of the institutional environment of the host country. It does not allow, however, going deeply into the impact of the institutional environment in the source country as well as into the impact of institutional distance. Hence they complement our analysis with estimations based on the Fraser database, which provides fewer details on institutions, albeit on a more balanced country coverage between industrial and developing countries. Finally, they study the impact of institutional distance on bilateral FDI.

Onyeiwu and Shrestha (2004) argue that despite economic and institutional reform in Africa during the past decade, the flow of FDI to the region continues to be disappointing and uneven. In their study, they use the fixed and random effects models to explore whether the stylized determinants of FDI, affect FDI flows to Africa in conventional ways. Based on a panel dataset for 29 African countries over the period 1975 to 1999, their paper identifies the following factors as significant for FDI flows into Africa: economic growth, inflation, openness of the economy, international reserves, and natural resource availability. Contrary to conventional wisdom, political rights and infrastructures were found to be unimportant for FDI flows to Africa. The significance of a variable for FDI flows to Africa was found to be dependent on whether country- and time-specific effects are fixed or stochastic.

Nakamura and Oyama (1998) studies the macroeconomic determinants of FDI from Japan and the United States into East Asian countries, and the linkage between FDI and trade, and other macroeconomic variables. Their analysis focuses on the structural differences among East Asian counties and classifies them based on statistical tests of fixed effects models using panel data. This examination helps to clarify how Japanese and American multinational firms position their production bases in East Asian countries within their international marketing strategies. In order to avoid the problem of simultaneity among variables, they examine simultaneous equation models to confirm the validity of panel regression results. In their study, they find that East Asian countries can be classified into four groups depending on FDI from Japan and other elasticities to macroeconomic variables, and this grouping almost coincides with their economic development stages. Moreover, they confirm that FDI from Japan into all the groups are strongly affected by changes in real bilateral exchange rates, but this is not always the case for FDI from the United States. Among different country groups, FDI into Group 1 (Taiwan and Korea) responds positively to the Japanese capacity utilization, indicating their industries' integration with the Japanese economy. Group 3 (Indonesia and the Philippines) shows that Japanese FDI is buoyed up by the yen's appreciation against the U.S. dollar. FDI into group 4 (China and Malaysia) and, to a lesser extent, Group 2 (Singapore and Thailand) is oriented more toward capturing local markets compared to the other groups. They also find that Japanese FDI has strong trade expansion effects, which is rarely seen for the U.S. FDI.

METHODOLOGY

The theoretical framework on the determinants of FDI and a discussion of various factors affecting FDI has already been presented in the previous study. In that study, we follow recent empirical work, particularly Adeisu (2002), to investigate the determinants of FDI for a sample African nations. We also improve on Aseidu (2002) work by accounting for the possibility of dynamics in FDI determinants modeling. We adopt the previous work model in writing a reduced form specification of a demand for inward direct investment function with some modifications. It should be pointed out that the selection of explanatory variables was constrained by data availability[2] for the relevant countries.

$$FDI_{it} = f(RES_{it}, SIZE_{it}, WAGE_{it}, XMGDP_{it}, SER_{it}, POL_{it}) \qquad \textbf{(1)}$$

We use *i* to index the countries and t to index time and the rationale for including these variables is explained next. Extrapolation was kept to a minimum.

Natural Resource Intensity (RES): As posited by the eclectic theory, all else equal, countries that are endowed with natural resources would receive more FDI. Very few studies on the determinants of FDI control for natural resource availability (except Gastanaga et al., 1998; Morisset, 2000 and Noorbakhsh et al., 2001). The omission of a measure of natural resources from the estimation, especially for African counties case, may cause the estimates to be biased (Asiedu, 2002). We, therefore, include the share of minerals and oil in total exports to capture the availability of natural resource endowments. This measure of natural resources has been employed in several studies, including Warner and Sachs (1995), Asiedu and Esfahani (2001) and Aseidu (2002) among others.

Market Size: The size of the host market, which also represents the host country's economic conditions and the potential demand for their output as well, is an important element in FDI decision-makings. Moreover Scaperlanda and Mauer (1969) argues that FDI responds positively to the market size 'once it reaches a threshold level that is large enough to allow economies of scale and efficient utilization of resources'. The importance of the market size has been confirmed in many previous empirical studies (Kravis and Lipsey, 1982; Schneider and Frey, 1985; Wheeler and Mody, 1992; Tsai, 1994; Loree and Guisinger, 1995; Lipsey, 1999; Wei, 2000. To proxy for market size *(SIZE)*, we follow the literature and use real GDP per capita. Since this variable is used as an indicator of the market potential for the products of foreign investors, the expected sign is positive. Per capita GDP may also proxy for capital abundance (Edwards, 1990) and investment climate (Wei, 2000; Aseidu, 2002).

Labour cost: Labor cost has always been argued to be a major component of total production cost and of the productivity of firms. Wage variables have thus been often included in the empirical literature and this is particularly true for labor-intensive production activities where a higher wage would deter FDI. However, wages may also be high because of high local inflows of FDI. We use the nominal wage rate (*WAGE*) as a proxy for labor cost. We would generally expect a negative sign on the coefficient (e.g., countries with lower labor costs would attract more FDI).

[2] Though tax incentives are believed to play an important role in FDI, corporate tax rate being not available for most countries of the sample, we had to omit this explanatory variable.

Human Capital: Foreign direct investors are also concerned with the quality of the labour force in addition to its cost. In fact, the cost advantages accrued by lower wages in developing nations can well be mitigated by low skilled workers. A more educated labor force can learn and adopt new technology faster and is generally more productive. Higher level of human capital is a good indicator of the availability of skilled workers, which can significantly boost the locational advantage of a country. Root and Ahmed (1979), Schneider and Frey (1985), Borensztein et al, (1998), Noorbakhsh et al. (2001) and Aseidu (2002) find that the level of human capital is a significant determinant of the locational advantage of a host country and plays a key role in attracting FDI. We control and test for the impact of labor quality, using the general secondary education enrollment rate (*SER*).

The *corporate tax rates* (as measured by *TAX*) of the host country represent another factor which foreign direct investors would consider and higher these tax levels of the host country would be expected to deter potential FDI. However, there seems to be mixed empirical results as for instance Kemsley (1998) and Billington (1999) have found the host country tax rate to be a significant factor in determining FDI inflows. Wheeler and Mody's (1992) have found the tax rate of the host country to be insignificant.

Openness: It is a standard hypothesis that openness promotes FDI (Hufbauer et al. 1994). In literature, the ratio of trade to GDP is often used as a measure of openness of a country and is also often interpreted as a measure of trade restrictions. This proxy is also important for foreign direct investors who are motivated by the export market. Empirical evidences (Jun and Singh, 1996) exist to back up the hypothesis that higher levels of exports lead to higher FDI inflows. We, therefore, include Trade/GDP in the regression to examine the impact of openness on FDI. The dependent variable, *FDI*, is measured as the net foreign direct investment inflow as a percentage of GDP and is a widely used measure (see Adeisu,2002; Quarzi, 2005**;** Goospeed et al, 2006).

We also added *political instability* (*POL*) following works from Schneider and Frey (1985), Edwards (1990), Loree and Guisinger (1995), Hanson (1996), Jaspersen et al. (2000) and Aseidu (2002). In fact political stability, especially for the case of African countries, is a significant factor in the location decision of multinational corporations (MNCs). Political instability and the frequent occurrences of disorder 'create an unfavorable business climate which seriously erodes the risk-averse foreign investors' confidence in the local investment climate and thereby repels FDI away' (Schneider and Frey 1985). We use a political risk rating[6] as provided by the International Country Risk Guide (2006) as a proxy. The rating awards the highest value to the lowest risk and the lowest value to the highest risk and provides a mean of assessing the political and institutional framework of the countries.

Applying logs on both sides of the Equation 1 (for ease of interpretation) and denoting the lowercase variables as the natural log of the respective uppercase variable and *t* for time result in the econometric version:

$$fdi_{it} = \alpha + \beta_1 res_{it} + \beta_2 size_{it} + \beta_3 wage_{it} + \beta_4 xmgdp_{it} + \beta_5 ser_{it} + \beta_6 pol_{it} + \beta_7 com_{it} + \varepsilon_{it} \quad \textbf{(2)}$$

DATA SOURCE

The main sources of data series are from the International Monetary Fund's International Financial Statistics (IFS) (2006) and World Development Indicators (WDI) (2006). Share of minerals and oil in total exports, nominal wage rate, secondary education enrolment rate, tax

rates and FDI data are all taken from the WDI. Real GDP per capita, exports and GDP are obtained from IFS. Political risk ratings are obtained from internal country Risk Guide (2006).

ANALYSIS

In an attempt to determine the determinants of FDI, in this study, the panel data techniques have been employed. The use of panel data technique allows us to determine the temporal evolution of groups of countries rather than analyzing the temporal behaviour of each of them. This technique takes into account the individual heterogeneity, allows a larger number of data points, and improves the efficiency of the estimates.

Panel data may have group effects, time effects, or both. These effects are either fixed effect or random effect. A fixed effect model assumes differences in intercepts across groups or time periods, whereas a random effect model explores differences in error variances. The Hausman specification test compares the fixed versus random effects under the null hypothesis that the individual effects are uncorrelated with the other regressors in the model (Hausman 1978). If correlated (H0 is rejected), a random effect model produces biased estimators, violating one of the Gauss-Markov assumptions; so a fixed effect model is preferred. Hausman's essential result is that the covariance of an efficient estimator with its difference from an inefficient estimator is zero (Greene 2003). When we perform the Hausman test specification,

Table 1: Panel data estimates : Fixed effects
(20 countries x 16 years (1990-2005))
Dependent variable lnfdigdp = (log of fdigdp)

Independent Variables	***Fixed effect estimates***
Constant	*-3.64*
	*(-1.75)**
Res	*0.063*
	*(2.26)***
size	*0.19*
	*(2.46)***
wage	*-0.086*
	*(-2.13)***
xmgdp	*0.34*
	*(4.13)****
pol	*-0.12*
	*(-2.25)***
Ser	*0.19*
	*(2.22)**
R^2	*0.45*
Number of obs	*320*
Hausman Test	*Prob>chi2=0.052*

*significant at 10%, ** significant at 5%, ***significant at 1%

the test recommends the use of fixed effects model. Table 1 reports the relevant estimates following the analysis. The small letters denote variables in natural logarithmic and t values are in parentheses.

All the explanatory variables as specified in the econometric functions are seen to be significant in attracting FDI in Africa and are in line with recent empirical evidences. For instance the abundance of natural resources as measured by *RES* is seen to be positive and significant confirming the results of Aseidu (2002) for African case and Kinoshita and Campos (2004). This means the presence of resource-seeking FDI, though the elasticity cannot be readily interpreted since it is a qualitative variable.

Openness had a positive impact on FDI as well suggesting that an efficient environment that comes with more openness to trade is likely to attract foreign firms (this conclusion is also supported by Asiedu, 2002; Edwards, 1990), and that countries that embarked on trade liberalization were rewarded with more FDI. In fact, the significance of *xmgdp* even after controlling for natural resource availability suggests that FDI is not only resource seeking and that government can play a major role as well in the FDI equation. FDI is thus, believed to be non extractive to industries (Non-natural resource based FDI) as well. This is particularly important to Africa because such investments, for instance investments in manufacturing and technologically intensive industries, enhance technological spillovers and foster employment.

The size of the domestic market, stock of human capital, though to a large extent as witnessed by the size of their respective coefficients, plays a positive role while political instability and labour cost play a negative role in attracting FDI in the markets and the results are consistent with empirical works in the field.

CONCUSION

This research investigates the factors enhancing the attractiveness of FDI recipient countries and is based on a sample of 20 African countries over the period 1990-2005. The abundance of natural resources is reported to be positive and significant (supporting the presence of resource-seeking FDI) and is line with Aseidu (2002) and Kinoshita and Campos (2004) works. Openness had a positive impact on FDI as well and is in line with the fact that an efficient environment that comes with more openness to trade is likely to attract foreign firms. The size of the domestic market, stock of human capital, though to a large extent as witnessed by the size of their respective coefficients, played a positive role, while political instability and labour cost a negative role in attracting FDI in the markets and the results are consistent with empirical works in the field.

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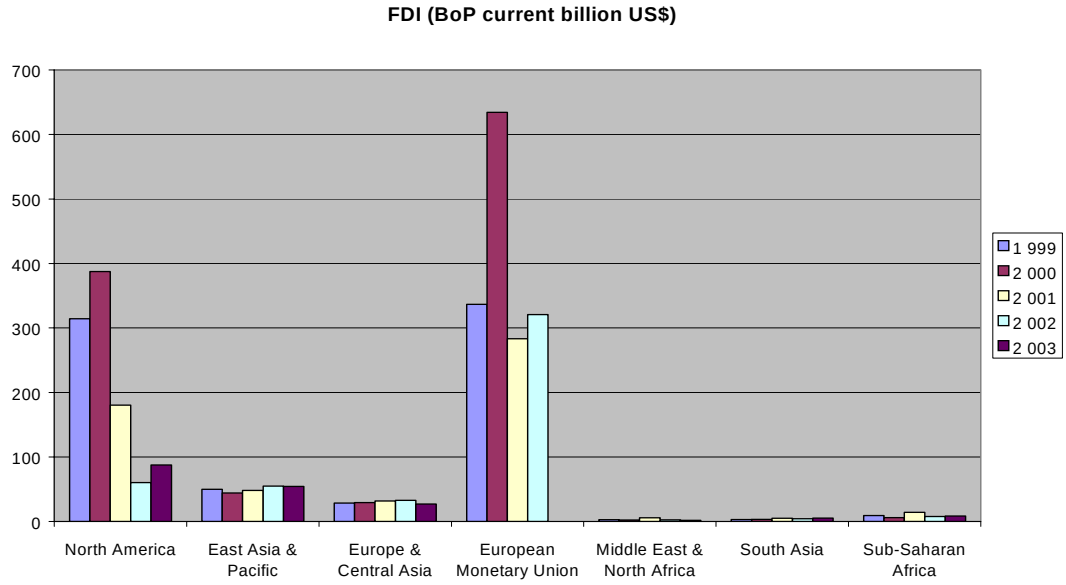
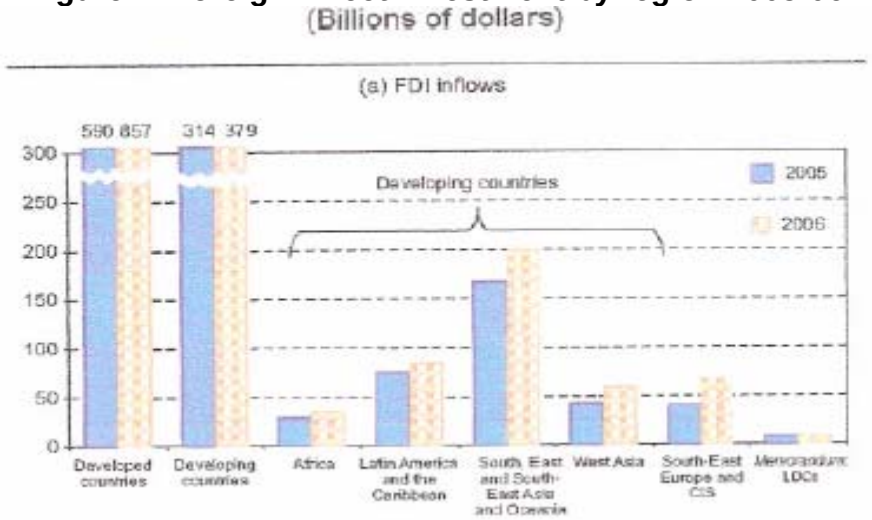
Appendix 1:

Figure 1: Foreign Direct Investment by region 1999-2003



Source: UNCTAD (2006)

Figure 2: Foreign Direct Investment by region 2005-06



Source: UNCTAD (2007)