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## Foreign direct investment in Africa: The role of natural resources, market size, government policy, institutions and political instability

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Research Paper No. 2005/24

## **Foreign Direct Investment in Africa**

The Role of Natural Resources, Market Size,  
Government Policy, Institutions and Political  
Instability

Elizabeth Asiedu\*

June 2005

### **Abstract**

Data from several investor surveys suggest that macroeconomic instability, investment restrictions, corruption and political instability have a negative impact on foreign direct investment (FDI) to Africa. However, the relationship between FDI and these country characteristics has not been studied. This paper uses panel data for 22 countries over the period 1984-2000 to examine the impact of natural resources, market size, government policies, political instability and the quality of the host country's institutions on FDI. It also analyses the importance of natural resources and market size vis-à-vis government policy and the host country's institutions in directing FDI flows. The main result is that natural resources and large markets promote FDI. However, lower inflation, good infrastructure, an educated population, openness to FDI, less corruption, political stability and a reliable legal system have a similar effect. A benchmark specification .../.

Keywords: Africa, corruption, foreign direct investment, institutions, natural resources, political instability

JEL classification: F23, O55

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shows that a decline in the corruption from the level of Nigeria to that of South Africa has the same positive effect on FDI as increasing the share of fuels and minerals in total exports by about 35 per cent. These results suggest that countries that are small or lack natural resources can attract FDI by improving their institutions and policy environment.

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Tables given at the end of the document.

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We [the United Nations General Assembly] resolve to halve, by the year 2015, the proportion of the world's people whose income is less than one dollar a day. We also resolve to take special measures to address the challenges of poverty eradication and sustainable development in Africa, including debt cancellation, improved market access, enhanced Official Development Assistance and increased flows of Foreign Direct Investment, as well as transfers of technology.

United Nations Millennium Declaration, 8 September 2000

## 1 Introduction

When it comes to foreign direct investment (FDI) in Sub-Saharan Africa (SSA), the common perception is that FDI is largely driven by natural resources and market size. This perception seems to be consistent with the data: the three largest recipients of FDI are Angola, Nigeria and South Africa,<sup>1</sup> from 2000 to 2002, these countries absorbed about 65 per cent of FDI flows to the region (World Bank 2004b).<sup>2</sup> Thus, this perception if true is troubling for three reasons. First, it suggests that FDI in the region is largely determined by an *uncontrollable* factor, and that natural resource-poor countries or small countries will attract very little or no FDI, regardless of the policies the country pursues. Second, the countries in SSA are small in terms of income—23 out of the 47 countries in the region have a GDP of less than US\$3 billion. Indeed, in 2002, the total GDP of SSA excluding South Africa was US\$214 billion, which was equal to about a quarter of the GDP of Brazil and about one-half of the GDP of Mexico (World Bank 2004b). Third, FDI in resource-rich countries are concentrated in natural resources and investments in such industries tend not to generate the positive spillovers (e.g., technological transfers, employment creation) that are often associated with FDI (Asiedu 2004).<sup>3</sup>

This paper answers three questions. What are the determinants of FDI to Africa? Can small countries or countries that lack natural resources attract FDI? How important are natural resources and market size vis-à-vis government policy and host country's institutions in directing FDI flows to the region?

The analysis is important for several reasons. First, as indicated by the United Nations Millennium Declaration, an increase in FDI will help the continent achieve its Millennium Development Goal (MDG) of reducing poverty rates by half in 2015.<sup>4</sup> The

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<sup>1</sup> South Africa has a large local market and contributes about 46 per cent of SSA's GDP. The share of GDP for Nigeria and Angola are 8 per cent and 2 per cent respectively. Angola and Nigeria are oil producing countries—oil accounts for over 90 per cent of total exports.

<sup>2</sup> The breakdown of FDI flows is as follows: 36 per cent to South Africa, 16 per cent to Nigeria, 13 per cent to Angola and 19 per cent to the remaining 45 countries in the region.

<sup>3</sup> Asiedu (2004) finds that natural resource availability does not have a significant impact on multinational employment in SSA.

<sup>4</sup> One of the main themes of the MDG adopted by the UN General Assembly in September 2000, is to reduce the number of people living on less than a dollar a day by 50 per cent. The MDG is particularly important to Sub-Saharan Africa because the poverty rate for the region is very high. About 48 per cent of the populations live on less than one dollar a day. This compares with 4 per cent for Eastern

importance of FDI in eradicating poverty is also echoed in the New Partnership for Africa's Development (NEPAD) declaration, which stipulates that in order for the continent to achieve the MDG, the region needs to fill an annual resource gap of US\$64 billion, about 12 per cent of GDP.<sup>5</sup> Since income levels and domestic savings in the region are low, a bulk of the finance will have to come from abroad. However, official assistance to the region has been declining.<sup>6</sup> In addition, most of the countries in the region do not have access to international capital markets. As a consequence, the resources needed for poverty alleviation have to come from FDI. From 1995-2001, annual FDI flows to SSA averaged about US\$7 billion. Average annual flows fall to US\$2.9 billion when Angola, Nigeria and South Africa are excluded. Thus, filling the annual resource gap of US\$64 billion needed for poverty alleviation would require a substantial increase in FDI.

Given the importance of FDI to the region, it is surprising that there is a dearth of research on the factors that affect FDI to Africa. A search of the Econlit database using 'foreign direct investment' and 'Africa' as keywords yielded only five journal articles on the determinants of FDI to Africa.<sup>7</sup> The papers have two limitations. First, none of them include minerals and oil as a determinant of FDI. Second, none of the papers examine the effect of corruption, political risk and investment policies on FDI. This is surprising because surveys of multinational corporations operating in Africa (section 2 provides a brief description of four surveys) reveal that these factors are important determinants of FDI to the region.

This paper contributes to the literature by analysing the impact of natural resources, market size, physical infrastructure, human capital, the host country's investment policies, the reliability of the host country's legal system, corruption and political instability on FDI flows. The analysis utilizes panel data for 22 countries in SSA over the period 1984-2000. There are three reasons for limiting the sample to African countries. First, as pointed out earlier, the literature on FDI to Africa is scant. Second, results from several investor surveys indicate that the factors that attract FDI to Africa are different from the factors that drive FDI in other regions (e.g., Batra, Kaufman and Stone 2003; Brunetti, Kisunko and Wider 1997). This observation is also consistent with the empirical results of Asiedu (2002). The third reason for limiting the sample to African countries is the widespread perception that the region is structurally different from the rest of the world. Indeed, many African policymakers believe the lessons from East Asia or Latin America do not apply to them because their situation is different. But African leaders can learn from each other. Hence, an empirical analysis that focuses on

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and Central Europe, 15 per cent for East Asia, 12 per cent for Latin America, 2 per cent for the Middle East and North Africa, 40 per cent for South Asia, and 24 per cent for all developing countries. Furthermore, for several countries in the region, more than half of the populations live in abject poverty. For example the poverty rate for Burkina Faso is 62 per cent, 66 per cent for Central African Republic, 73 per cent for Mali, 70 per cent for Nigeria and 64 per cent for Zambia. See Nunnenkamp (2004) for a discussion of the role of FDI in achieving the MDG.

<sup>5</sup> NEPAD is a development plan put together by African leaders to eradicate poverty and promote growth in the region. For more on this issue see Funke and Nsouli (2003) and Owusu (2003).

<sup>6</sup> For example, net official development assistance to SSA declined from US\$187 billion in 1990 to US\$10 billion in 2001, a decrease of about 41 per cent (World Bank 2003a).

<sup>7</sup> The papers are Lemi and Asefa (2003); Bende-Nabende (2002); Asiedu (2002); Morisset (2000) and Schoeman, Robinson and de Wet (2000).

performance within the continent will have greater credibility among African policymakers.

The main result is that countries that are endowed with natural resources or have large markets will attract more FDI. However, good infrastructure, an educated labour force, macroeconomic stability, openness to FDI, an efficient legal system, less corruption and political stability also promote FDI. A benchmark specification shows that a decline in corruption from the level of Nigeria to that of South Africa has the same positive effect on FDI as increasing the share of fuels and minerals in total exports (NATEXP) by about 34.84 per cent. Also, an improvement in the host country's FDI policy from that of Nigeria to that of South Africa has the same positive effect on FDI as increasing NATEXP 23.01 per cent. A similar change in corruption and FDI policy will have the same effect as increasing GDP by 0.37 per cent and 0.25 per cent, respectively. These results suggest that countries that have small markets or countries that lack natural resources can attract FDI by streamlining their investment framework and improving their institutions.

The remainder of the paper is organized as follows: Section 2 provides a summary of the results from four surveys on the factors that constrain FDI to SSA. Section 3 describes the data and the explanatory variables. Section 4 presents the empirical results and section 5 concludes.

## **2 Constraints on FDI to Africa: results from four surveys**

This section describes the factors that constrain FDI to Africa. The discussion focuses on four surveys:

### *i) World Business Environment (WBE) Survey*

The survey was conducted by the World Bank in 1999/2000. It covered about 10,000 firms in 80 countries. The sample for SSA included 413 foreign firms in 16 countries.<sup>8</sup> Respondents were asked to judge on a four point scale the extent to which a particular factor constrained their business operations in a country (1= no constraint to 4= severe constraint).

### *ii) World Development Report (WDR) Survey*

The survey was conducted by the World Bank in 1996/7. It covered 3,600 firms in 69 countries. The sample for SSA included 540 foreign firms in 22 countries.<sup>9</sup> Respondents were asked to judge on a six point scale the extent to which a particular factor constrained their business operations in a country (1= no constraint to 6= severe constraint).

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<sup>8</sup> See Batra, Kaufmann and Stone (2003) for a detailed description of the survey.

<sup>9</sup> For a detailed description of the survey see Brunetti, Kisunko and Wider (1997).

iii) *World Investment Report (WIR) Survey*

The survey was conducted by the United Nations Conference on Trade and Development (UNCTAD) in 1999/2000. It covered 63 large transnational corporations (TNCs) from the database of the top 100 TNCs of UNCTAD.<sup>10</sup> Respondents were asked to cite the factors that deter FDI to SSA.

iv) *The Center for Research into Economics and Finance in Southern Africa (CREFSA) Survey*

The survey covered 81 TNCs in the Southern Africa Development Community (SADC).<sup>11</sup> Respondents were asked to identify the factors that constrain FDI in the SADC.

Table 1 summarizes the results from the WBE and WDR survey and it reports the average score for each constraining factor. Table 2 presents the summary for the WIR and CREFSA surveys and it shows the percentage of firms that identified a particular factor as a constraint to FDI. Two points stand out from the two tables. First, corruption ranks very high on the list of obstacles in all four surveys. Second, FDI regulations, financing constraints, weak infrastructure, macroeconomic instability (which includes inflation and exchange rate risk) and political instability are strong deterrents of FDI to Africa. Section 4 empirically analyses how these factors affect FDI flows to Africa.

### **3 Description of the data and the variables**

The analysis covers 22 countries in SSA over the period 1984-2000. As is standard in the literature, the dependent variable is the ratio of net FDI flows to GDP. Unless otherwise stated, all the data were obtained from World Development Indicators on CD-Rom, published by the World Bank in 2003. The number of countries and the variables included in the regressions were determined by data availability. The summary statistics are in Table 3.

#### **3.1 Description of explanatory variables**

##### *Policy variables*

These are variables that can be directly altered by policymakers. I include four policy variables in my regressions to measure macroeconomic stability, infrastructure development, human capital and openness to FDI. As is standard in the literature I use the inflation rate as a measure of macroeconomic instability (INFLATION), the percentage of adults who are literate to measure human capital (LITERACY), and the

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<sup>10</sup> See UNCTAD (2000) for a detailed description of the survey.

<sup>11</sup> The countries included in the SADC are Angola, Botswana, Congo Dem Rep, Lesotho, Malawi, Mauritius, Mozambique, Namibia, Seychelles, South Africa, Swaziland, Tanzania, Zambia and Zimbabwe. See Jenkins and Thomas (2002) for a detailed description of the survey.

number of telephone main lines per 1000 population to measure infrastructure development, (INFRAC).<sup>12</sup>

In the FDI literature, the most widely used measure of openness is the share of trade in GDP. Thus, the positive relationship between trade volumes and FDI implies that countries that wish to attract more FDI should increase trade. However, as pointed out by Rodriguez and Rodrik (2000), this type of policy recommendation is not constructive. The reason is that policymakers do not directly control the volume of trade. Since one of the objectives of this paper is to prescribe policies that will enhance FDI flows to Africa, I consider a measure of openness that can be directly influenced by policymakers. I use data from the *International Country Risk Guide* (ICRG) that measures the host country's attitude towards inward investment.<sup>13</sup> The index ranges from 0 to 12 (a higher score implies more openness) and is determined by four components: risk to operations, taxation, repatriation of profits and labour costs.

The hypothesis is that the estimated coefficients of LITERACY, INFRAC and the FDI policy index should be positive and the estimated coefficient of INFLATION should be negative.

#### *Institutional variables*

As pointed out earlier, several investor surveys suggest that one of most important deterrents of FDI to Africa is corruption. Several papers have also shown that inefficient institutions as measured by corruption and weak enforcement of contracts deter foreign investment (Asiedu and Villamil 2000; Wei 2000; Gastanaga, Nugent and Pashamova 1998; Campos, Lien and Pradhan 1999). For my analysis, I employ two measures of institutional quality: corruption and the extent to which the rule of law is enforced. The corruption variable measures the degree of corruption within the political system. It covers actual or potential corruption in the form of nepotism, excessive patronage and bribery. The ratings range from 0 to 6, a high rating indicates that corruption is more prevalent. The rule of law variable measures the impartiality of the legal system and the extent to which the rule of law is enforced. The ratings range from 0 to 6, a high rating implies a more impartial court system. Both variables are from ICRG.

#### *Political risk variables*

The hypothesis is that political instability deters FDI. I employ three measures of political instability: (i) Coups; the number of forced changes in the top government; (ii) Assassinations; include any politically motivated murder or attempted murder of a high government official; (iii) Revolutions; include any illegal or forced change in the ruling government. The data were obtained from the *Cross-National Time Series Data Archive*.<sup>14</sup>

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<sup>12</sup> See Asiedu (2002) for a discussion on the caveats of using telephone per capita as a measure of infrastructure development.

<sup>13</sup> The ICRG is published by Political Risk Services, available at: [www.prsgroup.com/](http://www.prsgroup.com/).

<sup>14</sup> More information is available: [www.databanks.sitehosting.net/www/main.htm](http://www.databanks.sitehosting.net/www/main.htm).



### *Other variables*

I use the share of minerals and oil in total exports (NATEXP) as a measure of natural resource availability and GDP to measure the size of the host country's domestic market. The estimated coefficients of NATEXP and GDP are expected to be positive.

## **4 Empirical analysis**

The equation to be estimated is:

$$(FDI/GDP)_{it} = \alpha + \beta_1 NATEXP_{it} + \beta_2 GDP_{it} + \theta (Policy\ Variables)_{it} + \gamma (Institutional\ Variables)_{it} + \mu (Political\ Risk\ Variables)_{it} + \varepsilon_{it}$$

I use a fixed-effects panel estimation for my analysis. The analysis employs an unbalanced panel data for 22 countries over the period 1984-2000.<sup>15</sup> The infrastructure variable (INFRAC) and the human capital variable (LITERACY) are highly correlated. Thus, to avoid multicollinearity, I considered two specifications. Table 4 presents the results when LITERACY is included and Table 5 reports the results using INFRAC. I also consider three measures of political instability. For each specification, column (1) reports the results using the number of coups (COUPS) as a proxy for political risk, and columns (2) and (3) report the results for the number of riots and the number of assassinations, respectively. The results are qualitatively similar for all the specifications. To facilitate the discussion, I will focus on the estimation results reported for the benchmark case, where I include LITERACY and COUPS (column 1 of Table 4).

All the variables have the predicted signs and are highly significant: large markets, natural resources, a good policy environment, good institutions and political stability promote FDI. The regression for the benchmark specification shows that a standard deviation of one increase in NATEXP results in a 0.65 per cent increase in FDI/GDP.<sup>16</sup> Also, a standard deviation of one increase in GDP results in a 2.61 per cent increase in FDI/GDP.

In analysing the relative impact of natural resources and market size vis-à-vis the policy and institutional variables on FDI, I use Nigeria, the most corrupt country in my sample, and South Africa, the least corrupt country as benchmarks. Columns 1 and 2 of Table 6 report the average values of the policy and institutional variables for the two countries over the period 1984-2000. Column 3 reports the estimated coefficients for the benchmark specification (see column 1 of Table 4). Column 4 shows the equivalent effect of a change in the policy and institutional variables for NATEXP and column 5 reports a similar result for GDP. Table 7 reports similar information using the specification for the infrastructure variable and COUPS (column 1 of Table 5).

Table 6 shows that a decrease in corruption from the level of Nigeria to that of South Africa has the same positive effect as increasing NATEXP by 34.84 per cent.<sup>17</sup> An

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<sup>15</sup> The unbalanced panel causes no problem if the missing data is not correlated with the idiosyncratic errors (Woodridge 2002).

<sup>16</sup> The standard deviation for NATEXP is 26.087 (Table 3).

<sup>17</sup> The change in corruption is equal to about 2.6 times the standard deviation (Table 3). The equivalent effect for a change in corruption is computed as follows:  $(4-1.56)*0.357/0.025$ . Note that the

improvement in the reliability of the legal system from the level of Nigeria to that of South Africa has the same positive effect as increasing NATEXP 32.14 per cent. A similar change in corruption and the rule of law will have the same effect as increasing GDP by 0.37 per cent and 0.34 per cent, respectively.<sup>18</sup> For the policy variables, an improvement in the host country's FDI policy from the level of Nigeria to that of South Africa will have the same positive effect on FDI as raising NATEXP by 23.01 per cent.

An increase in the literacy rate from the level of Nigeria to that of South Africa will have the same positive effect on FDI as raising NATEXP by 91.8 per cent. A similar change in FDI policy and the literacy rate will have the same effect as increasing GDP by 0.25 per cent and 0.98 per cent, respectively. The results for the specification using INFRAC and COUP are qualitatively similar (Table 7).

## 5 Conclusion and policy implications

This paper has examined the determinants of FDI to Africa. The results indicate that large local markets, natural resource endowments, good infrastructure, low inflation, an efficient legal system and a good investment framework promote FDI. In contrast, corruption and political instability have the opposite effect. These findings are consistent with the reports of multinational companies that operate in the region.

The results have several policy implications. First, it suggests that FDI in SSA is not solely driven by some exogenous factors, and that small countries and/or countries that lack natural resources can obtain FDI by improving their institutions and policy environment. Second, multilateral organizations such as the IMF and the World Bank can play an important role in facilitating FDI by promoting good institutions in countries in SSA.<sup>19</sup>

The results also suggest that regional economic cooperation may enhance FDI to the region.<sup>20</sup> There are three reasons for this. First, regionalism can promote political stability by restricting membership to democratically elected governments. Second, regionalism permits countries to coordinate their policies. For example, members of a regional bloc may require all participating countries to curb corruption, implement sound and stable macroeconomic policies, and adopt an 'investor friendly' regulatory framework (such as removing restrictions on profit repatriation). Errant countries may face costly sanctions or be barred from membership. Here, the threat of sanctions or losing access to the benefits that accrue from regionalism serves as an incentive for countries to implement 'good' policies. Another advantage of regionalism is that it expands the size of the market, and therefore makes the region more attractive for

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estimated coefficient of NATEXP and the corruption variable are 0.025 and 0.357, respectively (column 1 of Table 4).

<sup>18</sup> The estimated coefficient of GDP is 2.335 (column 1 of Table 4).

<sup>19</sup> There has been increased discussion about the role of multilateral organizations in promoting good institutions in developing countries (Asiedu and Villamil (2003); Frankel (2003); and Hakura and Nsouli (2003).

<sup>20</sup> An example of a regional bloc in SSA is the Southern African Development Community (SADC). Elbadawi and Mwega (1997) find evidence that after controlling for relevant country conditions, countries in the SADC region receive more FDI than other countries in Africa.

FDI.<sup>21</sup> The market size advantage of regionalism is particularly important for Africa because countries in the region are small, both in terms of population and income. The caveat is that the small size of the countries may require that many countries be included in the coalition in order to achieve a market size that will be large enough to attract foreign investors. Policy coordination becomes difficult as the number of countries in the bloc increases. Indeed, the difficulty of coordinating and enforcing policies across many countries may be too costly in terms of time and resources—such that regionalism may be an infeasible option.

Finally, it is important to note that increased FDI does not necessarily imply higher economic growth. Indeed, the empirical relationship between FDI and growth is unclear.<sup>22</sup> Some studies have found a positive relationship between FDI and growth (De Gregorio 1992; Oliva and Rivera-Batiz 2002). Other studies conclude that FDI enhances growth only under certain conditions—when the host country's education exceeds a certain threshold (Borenstein, Gregorio and Lee 1998); when domestic and foreign capital are complements (De Mello 1999); when the country has achieved a certain level of income (Blomstrom, Lipsey and Zegan 1994); when the country is open (Balasubramanyam, Salisu and Sapsford 1996) and when the host country has a well developed financial sector (Alfaro *et al.* 2004). In contrast, Carkovic and Levine (2002) conclude that the relationship between FDI and growth is not robust. These studies seem to suggest that for countries in SSA, reaping the benefits that accrue from FDI, if any, may be more difficult than attracting FDI. However, there is room for optimism. The policies that promote FDI to Africa also have a direct impact on long term economic growth. As a consequence, African countries cannot go wrong implementing such policies.

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<sup>21</sup> The importance of large markets for FDI in Africa is documented in several surveys of MNEs. For example, 'narrow and missing markets' was cited as the main factor preventing French companies from investing in Africa.

<sup>22</sup> See De Gregorio (2003) and Durham (2000) for a review of the literature on the effect of FDI on growth.

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Table 1  
Constraints on FDI to Sub-Saharan Africa,  
Average rating for each constraining factor

WBE (1=no constraint, 4=severe constraint)		WDR (1=no constraint, 6=severe constraint)	
Corruption	2.80	Taxes & regulations	4.50
Weak infrastructure	2.75	Corruption	4.47
Street crime	2.70	Weak infrastructure	4.28
Inflation	2.67	Crime	4.25
Financing	2.64	Inflation	4.11
Organized crime	2.57	Lack of access to finance	3.95
Political instability	2.43	Policy uncertainty	3.88
Taxes and regulation	2.24	Cost uncertainty	3.75
Exchange rate	2.15	Regulations on foreign trade	3.64

Table 2  
Constraints on FDI to Sub-Saharan Africa  
Percentage of firms identifying a factor as a constraint

WIR Survey		CREFSA Survey	
Corruption	49	Policy uncertainty	47
Lack of access to global market	38	Macroeconomic instability	42
Political and economic outlook	28	Crime	35
Cost of doing business	28	Corruption	35
Lack of access to finance	28	Policy uncertainty	34
Weak infrastructure	27	Weak infrastructure	30
Tax regulation	24	FDI regulations	24
Unskilled labour	23	War	19
FDI regulatory framework	21	Labour unrest	17

Table 3  
Summary statistics, 1984-2000 (22 countries)

Variables	Mean	Std Dev	Min	Max
Dependent variable= 100*(FDI/GDP)	0.926	1.638	-8.52	9.587
Market size = Log (GDP)	22.312	1.118	19.761	25.832
Natural resources = Share of fuel and minerals in exports (%)	24.011	26.087	0.025	95.592
Policy variables				
Infrastructure = Log (phones per 1000 population)	2.009	0.849	0.916	4.856
Human capital = Literacy rate (%)	56.449	18.935	13.512	87.88
Macroeconomic instability = Inflation rate	15.6	24.155	-4.141	188.05
FDI policy: Openness to FDI	5.886	1.639	2	10
Institutional variables				
Corruption	3.105	0.94	1	6
Effectiveness of the rule of law	2.996	0.909	1	5
Political risk variables				
No. of assassinations	0.061	0.321	0	3
No. of coups	0.015	0.123	0	1
No. of riots	0.273	0.792	0	6

Note: Countries in the sample are Cameroon, Congo Rep., Côte d'Ivoire, Ethiopia, Gabon, Gambia, Ghana, Kenya, Madagascar, Malawi, Mali, Mozambique, Niger, Nigeria, Senegal, South Africa, Sudan, Tanzania, Togo, Uganda, Zambia and Zimbabwe.

Table 4  
Fixed effects estimation:  
Results using the human capital variable (LITERACY)

The dependent variable is 100\*FDI/GDP

Variables	(1)	(2)	(3)
Intercept	-56.472** (0.010)	-66.890*** (0.003)	-59.686*** (0.006)
Market size =Lag of [ Log (GDP)]	2.335** (0.024)	2.821*** (0.007)	2.484** (0.017)
Natural resources = Share of fuel & minerals in exports (%)	0.025** (0.049)	0.027** (0.032)	0.027** (0.031)
Policy variables:			
Human capital = Literacy rate (%)	0.064*** (0.009)	0.060** (0.014)	0.061** (0.012)
Macroeconomic instability = Lag (inflation rate)	-0.013** (0.011)	-0.012** (0.014)	-0.012** (0.019)
FDI policy = Lag (Openness to FDI )	0.197** (0.015)	0.169** (0.035)	0.173** (0.031)
Institutional variables:			
Lag (Corruption)	-0.357** (0.037)	-0.384** (0.024)	-0.338** (0.048)
Effectiveness of the rule of law	0.499*** (0.000)	0.497*** (0.000)	0.513*** (0.000)
Political risk variables			
Lag (No. of coups )	-1.201*** (0.009)		
No. of riots		-0.231** (0.010)	
No. of assassinations			-0.626*** (0.008)
R <sup>2</sup>	0.492	0.491	0.494
No. of countries	21	21	21
No. of observations	137	137	137

Notes: P-values are in parenthesis and \*\*\*, \*\*, and \* denote significance at 0.01, 0.05 and 0.10 levels respectively.



Table 5  
Fixed effects estimation results using the infrastructure variable (INFRAC)

The dependent variable is 100\*FDI/GDP

Variable	(1)	(2)	(3)
Intercept	-44.881** (0.039)	-58.408*** (0.009)	-48.567** (0.026)
Market size =Lag of [Log (GDP)]	1.830* (0.070)	2.462** (0.017)	1.998** (0.048)
Natural resources = Share of fuel and minerals in exports (%)	0.035** (0.015)	0.036** (0.011)	0.037*** (0.009)
Policy variables:			
Infrastructure = Lag of (log [phones per 1000 population])	1.526*** (0.002)	1.325*** (0.006)	1.469*** (0.002)
Macroeconomic instability = Lag (inflation rate)	-0.013** (0.016)	-0.013** (0.024)	-0.012** (0.03)
FDI policy: Lag (openness to FDI )	0.225** (0.011)	0.191** (0.030)	0.197** (0.024)
Institutional variables:			
Lag (corruption)	-0.474** (0.015)	-0.486** (0.014)	-0.45** (0.021)
Effectiveness of the rule of law	0.528*** (0.000)	0.533*** (0.000)	0.545*** (0.000)
Political risk variables			
Lag (no. of coups )	-1.380*** (0.008)		
No. of riots		-0.215** (0.034)	
No. of assassinations			-0.688** (0.010)
R <sup>2</sup>	0.453	0.439	0.451
No. of countries	22	22	22
No. of observations	140	140	140

Notes: P-values are in parenthesis and \*\*\*, \*\*, and \* denote significance at 0.01, 0.05 and 0.10 levels respectively.

Table 6  
Estimated equivalent effect of a change in the policy and institutional variables vis-à-vis NATEXP and GDP for the regressions using LITERACY and COUPS (column 1 of Table 4)

	Nigeria	South Africa	Estimated coefficient <sup>a</sup>	Equivalent effect on	
				NATEXP (%) <sup>b</sup>	GDP (%) <sup>c</sup>
<b>Institutional variables</b>					
Corruption	4	1.56	0.357	34.84	0.37
Rule of law	1.67	3.28	0.499	32.14	0.34
<b>Policy variables</b>					
Openness to FDI	4.69	7.61	0.197	23.01	0.25
Literacy rate (%)	48.04	83.90	0.064	91.80	0.98
Inflation rate	15.44	7.61	0.013	4.07	0.04

Notes: <sup>a</sup> These are the absolute values of the estimated coefficients from Column 1 of Table 4.  
<sup>b</sup> The equivalent effect of a change in corruption from the level of Nigeria to that of South Africa is given by  $(4-1.56) \cdot 0.357 / 0.025$ , where 0.025 is the estimated coefficient of NATEXP (column 1 of Table 4).  
<sup>c</sup> The equivalent effect of a change in corruption from the level of Nigeria to that of South Africa is given by  $(4-1.56) \cdot 0.357 / 2.335$ , where 2.335 is the estimated coefficient of GDP (column 1 of Table 4).

Table 7  
Estimated equivalent effect of a change in the policy and institutional variables vis-à-vis NATEXP and GDP for the regressions using INFRAC and COUPS (column 1 of Table 5)

	Nigeria	South Africa	Estimated Coefficient <sup>a</sup>	Equivalent effect on	
				NATEXP (%) <sup>b</sup>	GDP (%) <sup>c</sup>
<b>Institutional variables</b>					
Corruption	4	1.56	0.474	33.04	0.63
Rule of Law	1.67	3.28	0.528	24.30	0.46
<b>Policy variables</b>					
Openness to FDI	4.69	7.61	0.225	18.77	0.36
Log (phones per 1000)	1.36	4.71	1.526	146.06	2.79
Inflation rate	15.44	7.61	0.013	2.91	0.06

Notes: <sup>a</sup> These are the absolute values of the estimated coefficients from column 1 of Table 5.  
<sup>b</sup> The equivalent effect of a change in corruption from the level of Nigeria to that of South Africa is given by  $(4-1.56) \cdot 0.474 / 0.035$ , where 0.035 is the estimated coefficient of NATEXP (column 1 of Table 5).  
<sup>c</sup> The equivalent effect of a change in corruption from the level of Nigeria to that of South Africa is given by  $(4-1.56) \cdot 0.474 / 1.83$ , where 1.83 is the estimated coefficient of GDP (column 1 of Table 4).