On the Determinants of Foreign Direct Investment to Developing Countries: Is Africa Different?

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Summary. — This paper explores whether factors that affect Foreign Direct Investment (FDI) in developing countries affect countries in sub-Saharan Africa (SSA) differently. The results indicate that: (a) a higher return on investment and better infrastructure have a positive impact on FDI to non-SSA countries, but have no significant impact on FDI to SSA; (b) openness to trade promotes FDI to SSA and non-SSA countries; however, the marginal benefit from increased openness is less for SSA. These results imply that Africa is *different*—suggesting that policies that have been successful in other regions may not be equally successful in Africa. © 2001 Elsevier Science Ltd. All rights reserved.

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The African continent did not benefit from the increased investment flows to developing countries as a whole, in spite of the fact that the countries of the region undertook many efforts to attract investment . . . (UNCTAD, 1995, p. iii).

1. INTRODUCTION

The past decade has witnessed a dramatic increase in Foreign Direct Investment (FDI) to developing countries, with FDI increasing from $24 billion (24% of total foreign investment) in 1990 to $178 billion (61% of total foreign investment) in 2000 (World Bank, 2001). This is welcome news, especially for poor countries that do not have access to international capital markets. As suggested by the above quote, however, Africa, the poorest region, did not benefit from the FDI boom despite efforts to attract FDI. [1] For example, over 1980–89 and 1990–98, FDI to sub-Saharan Africa (SSA) grew by 59%. [2] This compares with an increase of 5,200% for Europe and Central Asia, 942% for East Asia and Pacific, 740% for South Asia, 455% for Latin America and Caribbean, and 672% for all developing countries (World Bank, 2000a). Africa's inability to attract FDI is troubling because FDI is crucial to the region. The reason is that FDI provides the needed

capital for investment. In addition, FDI brings with it employment, managerial skills and technology, and therefore it accelerates growth and development. [3] The role of FDI as a source of capital has become increasingly important to SSA. This stems from the fact that income levels and domestic savings in the region are very low. As a result, external capital is needed to supplement domestic savings in order to spur investment and growth. Most countries in SSA, however, do not have access to international capital markets and therefore have to rely on the other two forms of foreign finance: FDI and official loans (e.g., loans from multilateral organizations such as the World Bank). [4] In addition, official lending to the region has declined substantially over the past decade—official finance as a share of GNP has declined from 6% in 1990 to 3.8% in 1998. Furthermore, foreign aid per capita declined from an average of $35 over 1989–92 to about $28 over 1993–97 (World Bank, 2000b). It is therefore imperative for SSA to increase its share of FDI in order to compensate for the decline in official assistance.

Unfortunately, for most countries in the region, efforts to attract FDI have been futile.

One objective of this paper is to examine why SSA has been *relatively* unsuccessful in attracting FDI. I find the determinants of FDI to developing countries and analyze whether these variables have a *differential* impact on FDI flows to SSA. Specifically, I use cross-sectional data on 71 developing countries to answer the following questions: (a) What factors drive FDI to developing countries? (b) Are these factors *equally* relevant for FDI to SSA? (c) Why has SSA attracted so little FDI? (d) Why has SSA been *relatively* unsuccessful in attracting FDI despite policy reform? Is Africa *different*?

As regards question (a), note that, although there is an extensive literature on the determinants of FDI to developing countries, most of the analyses are based on a relatively small number of countries. Furthermore, only a few African countries are included in the samples. For example, Gastanaga, Nugent, and Pashamova (1998) consider 49 countries, six of which are in SSA, while Schneider and Frey (1985) consider 51 countries of which 13 are in SSA. An exception is Edwards (1990), where 25 out of 51 countries are in SSA. My empirical analysis employs a more comprehensive dataset—the dataset includes 71 developing countries about half of which are in SSA (32 SSA countries and 39 non-SSA countries). An advantage of using a dataset that spans a large set of countries is that it increases the degrees of freedom and therefore enhances the credibility of the results. Furthermore, it allows me to test the extent to which the determinants of FDI identified in previous studies explain the variation in FDI for my comprehensive sample. Regarding questions (b), (c) and (d), these issues are yet to be addressed in the literature.

Analyzing FDI flows to Africa is important for several reasons. First, on the subject of FDI, Africa remains underresearched. To the best of my knowledge, there is no published empirical study on FDI that focuses exclusively on Africa. [5] This is surprising since, as pointed out earlier, FDI is crucial to the region. Second, since FDI contributes to growth, it is important to know the factors that affect FDI flows to the slowest growth region, Africa. Third, to the extent that FDI to SSA is driven by different factors, policies that have been successful in other regions may not be equally successful in SSA. Indeed, a number of African policy makers believe that the lessons from non-African countries do not apply to them because the circumstances differ so much. Hence, my analysis will shed light on ways via which policy makers in SSA can attract FDI.

The results can be summarized as follows: (i) Countries in SSA have on the average received less FDI than countries in other regions by virtue of their geographical location; (ii) Higher return on capital and infrastructure development promote FDI to non-SSA countries, but have no significant impact on FDI flows to SSA countries, *ceteris paribus*; (iii) Openness to trade has a positive impact on FDI flows to both SSA and non-SSA countries. However, FDI to SSA is less responsive to changes in openness than FDI to other regions. These results suggest that Africa is *different*!

The remainder of the paper is organized as follows: Section 2 presents some stylized facts about FDI to Africa and Section 3 briefly reviews the empirical literature on the determinants of FDI to developing countries. Section 4 describes the data and the explanatory variables. Section 5 presents the empirical results and Section 6 discusses the results. Section 7 concludes.

2. FOREIGN DIRECT INVESTMENT TO AFRICA: STYLIZED FACTS

In this section, I summarize three stylized facts about FDI that motivate my analysis. The supporting data are presented in Tables 1 and 2.

(a) *SSA has not benefited from the boom in FDI that began in the mid-1980s*

During 1980–84 and 1994–97, the annual average of FDI to developing countries increased by 1,630% while FDI to Africa increased by 496%. As a result, Africa's share in total FDI flows has dropped significantly, from 36% in 1970–74 to 10% in 1980–84 and to 3% in 1995–99 (Table 1). It is important to note that, although the continent as a whole has not fared well in attracting FDI, some countries have been quite successful, especially in recent years. For example, over 1989–93 to 1994–98, average net FDI to Tanzania, Uganda and Zimbabwe increased by 1,610%, 1,140% and 1,093% respectively. This compares to an increase of 240% for all developing countries (World Bank, 2000a).

Table 1. *Annual averages of net FDI inflows to developing countries and selected regions (millions of dollars), 1970–99*

FDI flows	1970–74	1975–79	1980–84	1985–89	1990–94	1995–99
All developing countries	2,058	5,967	8,896	15,222	25,347	153,805
East Asia & Pacific	464	1,034	2,346	5,588	26,352	60,342
Europe & Central Asia	58	65	87	341	4,469	20,784
Latin America & Caribbean	1,500	3,496	5,467	5,960	15,629	59,332
South Asia	50	71	163	350	863	3,693
Sub-Saharan Africa (SSA)	741	803	866	1,337	1,847	5,170
SSA's share (%)	36	13	10	9	4	3

Source: World Bank (2000a).

Table 2. *Rates of return on US FDI in Africa and selected regions, 1991–96*

Region/sector	1991	1992	1993	1994	1995	1996
Africa	30.6	28.4	25.8	24.6	35.3	34.2
Primary	35.4	29.1	26.1	23.9	34.2	36.9
Secondary	16	18.9	30.5	30.0	42.8	21.3
Tertiary	NA	22.2	23.5	21.7	21.6	23.1
Other industries	28.4	40.8	13.5	44.1	35.0	17.4
Asia & Pacific	23.8	22.6	20.7	18.4	20.2	19.3
Latin America & Caribbean	12.1	14.3	14.9	15.3	13.1	12.8
Developing countries	15.9	17.2	16.9	16.5	15.8	15.3
All countries	11.6	10.4	11.1	11.7	13.3	12.5

Source: United Nations Center for Trade and Development (1999).

(b) *FDI has become an important source of finance to SSA*

Since 1990, FDI has outpaced (partially substituted for) official lending (loans from multilateral organizations) in SSA. During 1990–94 and 1995–99, net official flows declined by 24% whereas FDI increased by 180%. As a consequence, FDI's share of total foreign investment has risen substantially—from 7% over 1980–84 to 10% over 1990–94 and 27% over 1995–99 (World Bank, 2000a).

(c) *The return on FDI to Africa is higher than FDI to other regions*

The average return on US investment to Africa over 1991–96 was 30%. This compares with 21% for Asia and Pacific, 14% for Latin America and 16% for all developing countries (Table 2).

3. A BRIEF LITERATURE REVIEW

Most of the empirical analyses on the determinants of FDI use crosscountry regressions to identify country characteristics—such as market size, labor cost and political instabil-ity—that attract or deter FDI. Table 3 presents the effects of six variables that have been widely used in the literature (for an extensive survey see Chakrabarti, 2001, and Gastanaga et al., 1998). Clearly, the results are conflicting. The objective of this paper is not to resolve the conflicting empirical results. [6] Instead, I examine the extent to which the variables included in previous studies explain the variation in FDI for my sample and analyze whether these variables have a different impact on FDI to SSA.

4. DESCRIPTION OF THE DATA AND THE VARIABLES

In determining the factors that affect FDI, it is useful to distinguish between two types of FDI: market-seeking and non-market seeking. The main objective of market-seeking FDI is to serve domestic markets. Here goods are produced in the host country and sold in the local market. As a consequence, this type of FDI is driven by domestic demand such as large markets and high income in the host country—suggesting that FDI in small and poor countries is less likely to be market seeking. For non-market seeking FDI, goods are produced in the host country but sold abroad. [7]

Table 3. *Effect of selected variables on FDI*

Determinants of FDI	Positive	Negative	Insignificant
Real GDP per capita	Schneider and Frey (1985) Tsai (1994) Lipsey (1999)	Edwards (1990) Jaspersen, Aylward, and Knox (2000)	Loree and Guisinger (1995) Wei (2000) Hausmann and Fernandez-Arias (2000)
Infrastructure quality	Wheeler and Mody (1992) Kumar (1994) Loree and Guisinger (1995)		
Labor cost	Wheeler and Mody (1992)	Schneider and Frey (1985)	Tsai (1994) Loree and Guisinger (1995) Lipsey (1999)
Openness	Edwards (1990) Gastanaga *et al.* (1998) Hausmann and Fernandez-Arias (2000)		
Taxes and tariffs		Loree and Guisinger (1995) Gastanaga *et al.* (1998) Wei (2000)	Wheeler and Mody (1992) Lipsey (1999)
Political instability		Schneider and Frey (1985) Edwards (1990)	Loree and Guisinger (1995) Jaspersen *et al.* (2000) Hausmann and Fernandez-Arias (2000)

Hence, demand factors in the host country are less relevant. A more pertinent factor for this type of investment is the ease with which firms can export their products. Nevertheless, factors that increase the productivity of capital are relevant for both types of FDI.

As shown in Table 8 (see Appendix A), the countries included in the analysis are mostly poor and small countries. Furthermore, about half of the countries are in SSA, and FDI to that region is mainly in natural resources, which is non-market seeking. This suggests that FDI to the countries in my sample is less likely to be market-seeking. This conjecture guides my explanation of how various variables affect FDI. [8] All the independent variables employed have been used in previous studies, with differing interpretations for some of the variables. In the discussion below, I point out these differences and also highlight the caveats of the proxy variables used in the empirical analysis.

As is standard in the literature, the dependent variable is the ratio of net FDI flows to GDP. My choice of independent variables was constrained by data availability. For example, data on important factors such as real wages, trade policies, and tax legislation are not readily available for most developing countries,

particularly for countries in SSA. [9] Since my analysis calls for the inclusion of many African countries, I am unable to test the impact of these important variables on FDI. Indeed, this may explain why only a few African countries were included in previous studies. Below I describe the independent variables included in the analysis.

(a) Description of explanatory variables

(i) *Return on investment in the host country*

FDI will go to countries that pay a higher return on capital. But finding an appropriate measure for the return on investment is problematic, especially for developing countries, thereby making testing this hypothesis very difficult. This is because most developing countries do not have well-functioning capital markets, and therefore it is difficult to measure the return on capital. To get around this problem, I assume that the marginal product of capital is equal to the return on capital. This implies that investments in capital-scarce countries will yield a higher return. Since capital-scarce countries tend to be poor, I use the inverse of the real GDP per capita to measure the return on capital. This implies that, all else being equal, investments in coun-

tries with a higher per capita income should yield a lower return and therefore real GDP per capita should be inversely related to FDI. [10] The assumed inverse relationship between income per capita and the return on capital is consistent with empirical facts. According to UNCTAD (1995), the average return on US FDI in developing countries over 1990–93 was about 17%. This compares with 10% return on investment in developed countries.

In the literature, the relationship between real GDP per capita and FDI is far from unanimous (Table 3). Edwards (1990) and Jaspersen *et al.* (2000) use the inverse of income per capita as proxy for the return on capital and conclude that real GDP per capita is inversely related to FDI/GDP. In contrast, Schneider and Frey (1985) and Tsai (1994) find a positive relationship between the two variables. The argument here is that a higher GDP per capita implies better prospects for FDI in the host country. As pointed out earlier, this argument is valid for market-seeking FDI. Hence my analysis is consistent with that of Edwards and Jaspersen *et al.*

(ii) *Infrastructure development*

Good infrastructure increases the productivity of investments and therefore stimulates FDI flows. As is standard in the literature, I use the number of telephones per 1,000 population to measure infrastructure development. A good measure of infrastructure development should take into account both the *availability* and *reliability* of infrastructure. Thus the measure I employ falls short since it captures only the availability aspect of infrastructure. Clearly, infrastructure is of little use if it is not reliable. Hence, one would expect infrastructure reliability (e.g., how often the phone lines are down) to be more important to foreign investors than infrastructure availability (the number of telephones in a country). Since data on the reliability of telecommunication are not available, I use telephones per 1,000 population to measure infrastructure development, albeit imperfectly. [11]

(iii) *Openness of the host country*

In the literature, the ratio of trade (imports + exports) to GDP is often used as a measure of openness of an economy. [12] This ratio is also often interpreted as a measure of trade restrictions. The impact of openness on FDI depends on the type of investment. When investments are market-seeking, trade restrictions (and therefore less openness) can have a positive impact on FDI. The reason stems from the "tariff jumping" hypothesis, which argues that foreign firms that seek to serve local markets may decide to set up subsidiaries in the host country if it is difficult to import their products to the country. In contrast, multinational firms engaged in export-oriented investments may prefer to locate in a more open economy since increased imperfections that accompany trade protection generally imply higher transaction costs associated with exporting. As discussed previously, FDI for my sample is less likely to be market-seeking and therefore I hypothesize a positive relationship between openness and FDI.

The empirical literature has generally focused on the impact of trade openness on FDI. One would, however, expect capital account openness to also affect FDI. For example, restrictions on currency convertibility, such as foreign exchange control laws, are likely to deter FDI. This is particularly true for market-seeking FDI since such laws makes it difficult for foreign firms to repatriate their profits. Unlike trade openness, data for variables that measure capital account openness are not readily available. Hence, I am unable to analyze the empirical link between current account openness and FDI.

(iv) *Political risk*

The empirical relationship between political instability and FDI flows is unclear (Table 3). For example, Jaspersen *et al.* (2000) and Hausmann and Fernandez-Arias (2000) find no relationship between FDI flows and political risk while Schneider and Frey (1985) find an inverse relationship between the two variables. Using data on US FDI for two time periods, Loree and Guisinger (1995) found that political risk had a negative impact on FDI in 1982 but no effect in 1977. Edwards uses two indices to measure political risk—political instability (which measures the probability of a change of government) and political violence (the sum of the frequency of political assassinations, violent riots and politically motivated strikes). The political instability variable was significant but the political violence variable was not. For my analysis, I use the average of the number of assassinations and revolutions, as in Barro and Lee (1993), to measure political instability. The sign of the estimated coefficient is not determined *a priori*.

(v) Other economic variables

I also test the significance of other variables that have been used (most of them sparsely) in previous studies. These include the ratio of liquid liabilities to GDP as a measure of financial depth, the ratio of government consumption to GDP as a measure of the size of government, the inflation rate as a measure of the overall economic stability of the country and the growth rate of GDP as a measure of the attractiveness of the host country's market. The hypothesis is that financial depth, lower inflation, smaller government and higher growth rates foster FDI.

(b) Description of the data

The data were obtained from the World Bank's *World Development Indicators*. Summary statistics of the variables are reported in Table 4. Table 5 compares FDI/GDP, the return on investment, openness and infrastructure development for SSA and non-SSA countries.

According to Table 5, the measures of infrastructure and openness are on the average lower for SSA. [13] Indeed, my dataset is not an anomaly. According to Collier and Gunning (1999), infrastructure is *less available* and *less reliable* in Africa than other regions. The authors document that the number of telephones per capita in SSA is one-tenth that of Asia. Furthermore, the level of faults of Africa's telecommunication system is three times

higher than that of Asia. Table 5 also shows that the return on investment is on the average higher for SSA. This is consistent with the data provided in Table 2.

5. EMPIRICAL RESULTS

I begin my analysis by determining the variables that are relevant in explaining the variation in FDI/GDP for my sample. I use ordinary least square (OLS) for all the estimations. The results are reported in Table 6. Columns (1)–(4) are results from cross-section regressions, where the variables are averaged over the 10-year period, 1988–97. Column (5) reports results for a panel regression. Here, the variables are averaged over three subperiods: 1988–90, 1991–93 and 1994–97.

The results reported in Column 1 of Table 6 indicate that a large share of the variation in FDI rate can be explained by a small number of factors, namely, openness to trade, infrastructure development and the return on investment. As a group, these factors account for about 60% of the variability in FDI/GDP. Indeed, the adjusted R^2 is very high for a crosscountry regression. The results also show that FDI/GDP increases with the degree of openness to international trade, infrastructure development and the return on investment. [14] These results are consistent with previous studies.

I next include a dummy variable, *AFRICA*, and test whether countries in SSA on the

Table 4. *Summary statistics for the full sample (71 countries)*

Variables	Mean	Standard deviation	Minimum	Maximum
100 * (FDI/GDP)	1.754	2.222	−0.517	11.034
100 * (Imports + Exports)/GDP	69.54	48.97	17.036	360.451
log(Phones per 1,000 population)	2.84	1.524	−0.211	6.078
log[1/(GDP per capita)]	−7.732	0.86	−9.794	−6.106
100 * Government consumption/GDP	13.042	4.118	4.21	25.434
Inflation rate	145.403	549.556	0.955	3367.62
100 * M2/GDP	32.228	18.369	7.31	84.045
GDP growth	3.622	2.538	−4.956	9.755
Political risk	0.22	0.32	0	1.333

Table 5. *Differences between sub-Saharan Africa and other developing countries (mean of selected variables)*

Variables	SSA	Non-SSA
100 * (FDI/GDP)	0.885	2.467
Openness to trade	66.995	71.628
log(Phones per 1,000 population)	1.785	3.706
RETURN = log[1/(GDP per capita)]	−7.178	−8.189

Table 6. *OLS estimation*

Variable	(1)	(2)	(3)	(4)	(5)
Intercept	4.32	6.188***	6.523**	13.098**	12.252***
	(0.146)[a]	(0.000)	(0.047)	(0.013)	(0.002)
$OPEN = 100 * (\text{Imports} + \text{Exports})/GDP$	0.030***	0.032***	0.032***	0.033***	0.035***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
$INFRAC = \log(\text{Phones per } 1,000 \text{ population})$	0.837***	0.574**	0.623**	1.399***	1.345***
	(0.002)	(0.032)	(0.052)	(0.001)	(0.000)
$RETURN = \log[1/GDP \text{ per capita}]$	0.906*	0.997**	1.112**	2.220***	2.107***
	(0.056)	(0.026)	(0.032)	(0.007)	(0.007)
Africa dummy		−1.342***	−1.415***	−1.451***	−1.523***
		(0.002)	(0.001)	(0.001)	(0.000)
GDP growth			0.004		
			(0.966)		
$100 * \text{Government consumption}/GDP$			0.027		
			(0.562)		
Inflation rate			0.000		
			(0.629)		
$100 * M2/GDP$			0.002		
			(0.862)		
Political instability			−0.022		
			(0.972)		
$OPEN * AFRICA$				−0.005	−0.003
				(0.615)	(0.742)
$INFRAC * AFRICA$				−1.374**	1.384***
				(0.014)	(0.001)
$RETURN * AFRICA$				−1.800*	−1.611**
				(0.059)	(0.027)
Adjusted R^2	0.6043	0.6530	0.6244	0.7119	0.5706
Number of observations	71	71	68	71	211

[a] *P*-values are in parentheses.
* Significance at the 0.10 level.
** Significance at the 0.05 level.
*** Significance at the 0.01 level.

average receive less FDI relative to countries in other regions. *AFRICA* equals one if a country is located in SSA. The results reported in Column 2 indicate that the Africa dummy is negative and statistically significant. Furthermore, the adjusted R^2 increases noticeably, indicating the importance of regional effect. The coefficient of the Africa dummy is interesting because it measures the average difference in FDI/GDP between an SSA country and a non-SSA country with the same levels of openness, infrastructure and return on capital. The results indicate that on the average FDI/GDP for a country in sub-Saharan Africa is about 1.3% less than that of a comparable country outside the region.

Using the specification in Column 2 as my basic model, I test for robustness by including economic variables (government consumption, the inflation rate, financial depth and growth rates) and a measure of political risk. The results reported in Column 3 shows that the basic model is robust to changes in specifica-tions. Furthermore, the economic variables and the measure of political risk are not significant. [15] The insignificance of the esti-mated coefficient of the political risk variable agrees with the findings of Edwards (1990), Jaspersen *et al.* (2000) and Hausmann and Fernandez-Arias (2000). Indeed, this result is not surprising. For example, in 1998 and 1999, Angola, a highly unstable country ranked first in FDI flows among SSA countries (UNCTAD, 2000). A plausible explanation is that FDI to Angola (which is mostly in petroleum) is so profitable that the return after adjusting for risk is quite substantial. It is interesting to note that the Africa dummy remains significant after controlling for a wide range of factors. [16] This indicates that there is an unaccounted for ''Africa effect''—suggest-ing that the inability of countries in sub-Saharan Africa to attract FDI may be partly blamed on the fact that these countries are located in a continent that happens to have a bad reputation.

I next test whether the impact of openness, return on capital and infrastructure development on FDI/GDP is the same for SSA and non-SSA countries. To carry out the test, I interact each variable with the Africa dummy. The regression results are reported in Column 4. Three facts stand out from Column 4. First, all the three variables remain significant, suggesting that these variables are important in explaining FDI flows to non-SSA countries. Second, the coefficients of all the interactive terms are negative, suggesting that the marginal effect of the variables on FDI/GDP is less for SSA countries compared to non-SSA countries. Third, two of the coefficients of the interactive terms, *AFRICA * RETURN* and *AFRICA * INFRAC*, are significant.

Table 7 reports the estimated partial coefficients (with *P*-values in parentheses) of *OPEN*, *RETURN* and *INFRAC* for SSA countries and non-SSA countries. [17] Table 7 shows that *INFRAC* and *RETURN* do not have a significant impact on FDI/GDP to SSA. The insignificance of *INFRAC* follows from the fact that I cannot reject the hypothesis (based on the *F*-test) that the sum of the coefficients for *INFRAC* and *INFRAC * AFRICA* $(0.025 = 1.399 - 1.374)$ equals zero. A similar analysis holds for *RETURN*. In contrast I reject the hypothesis that the sum of the coefficients for *OPEN* and *OPEN * AFRICA* $(0.028 = 0.033 - 0.005)$ is equal to zero, suggesting that openness to trade has a significant impact on FDI/GDP to SSA. The results also indicate that, although openness promotes FDI in both African and non-African countries, the marginal benefit from improved openness is somewhat less for countries in SSA. Specifically, a 1% increase in openness leads to a 0.033% increase in FDI/GDP for a non-SSA country. This compares with a 0.028% increase for a comparable country in SSA.

As discussed earlier, the measures of openness and infrastructure development are on the average lower for countries in SSA (Table 4). It

is therefore possible that the differential impact of these variables can be explained by a "threshold effect" and not a "regional effect." [18] I tested this hypothesis by including quadratic terms for *INFRAC* and *OPEN* in the regressions. The estimated coefficients for the quadratic terms were not significant, suggesting that there is no second-order effect (the results are not reported). Finally, I checked the robustness of the results by examining whether the results hold when panel data is used. The results reported in Column 5 indicate that the results are robust.

6. DISCUSSION OF RESULTS

The significance of the Africa dummy and the differential impact of openness, return on investment and infrastructure development on FDI to SSA suggests that Africa is *different*. In this section I summarize the empirical results and provide explanations for each result.

(a) *Result 1*

Countries in SSA have on the average received less FDI than countries in other regions by virtue of their geographical location—there is a negative effect on FDI for being an African country.

The negative and significant estimated coefficient of the Africa dummy suggests that there may be an adverse regional effect for SSA. There are two plausible explanations for this. First, the continent is perceived as being *inherently* risky. This perception of Africa is supported by the empirical evidence of Haque, Nelson, and Mathieson (2000), who find that commercial risk-rating agencies often rate African countries as riskier than warranted by the fundamentals. Second, due to lack of knowledge about the countries in the continent, investment decisions are often not guided by country-specific conditions but rather based on inferences from the environment of neighboring countries. Thus, to some extent, foreign investors evaluate African countries as if the countries in the continent constitute "one big country."

(b) *Result 2*

Higher return on capital promotes FDI to non-SSA countries, but has no significant impact on FDI flows to SSA countries, ceteris paribus.

Table 7. *Partial effect of selected variables*

Variable	SSA	Non-SSA
OPEN	0.028***	0.033***
	(0.002)	(0.000)
INFRAC	0.025	1.399***
	(0.642)	(0.001)
RETURN	0.419	2.220***
	(0.401)	(0.007)

*** Significant at the 0.01 level.

In a risky environment, higher returns may not induce more investments. The reason is that the risk-adjusted return may be low—too low, so that it may deter investment. As discussed earlier, Africa is perceived as being inherently risky. One factor that seems to aggravate the risk environment in SSA is the uncertainty of government policy. For example, the risk of policy reversal was chosen as the most important risk factor by 150 foreign investors in East Africa (World Bank, 1994). Not surprisingly, policy uncertainty has a negative impact on private investment. But the risk of policy reversal has a more profound impact on FDI than other types of investments. The reason is that FDI is partially irreversible—much of the costs associated with FDI are sunk and therefore not retrievable if disinvestment occurs. [19] Thus, policy uncertainty coupled with the irreversible nature of FDI makes Africa overly risky for FDI. In the midst of excessive policy risk, higher returns may not be sufficient to compensate for the possibility of a costly mistake should policy be reversed. As a consequence, we would expect foreign investment to be less responsive to an increase in the return on capital. [20] This seems to be the case for Africa. Thus investment risk, in particular the risk of policy reversal, may explain why higher returns do not translate into increased FDI in SSA.

(c) Result 3

—*Openness to trade promotes FDI to both SSA and non-SSA countries, however, the marginal benefit from increased openness is less for SSA—suggesting that trade liberalization will generate more FDI to non-SSA countries than SSA countries.*
—*Sub-Saharan Africa has received less FDI than other regions because openness is globally important for FDI and countries in SSA are less open than countries in other regions.*

One way by which a country can increase its degree of openness is by liberalizing trade. Thus Result 3 suggests that, all else being equal, trade liberalization is less effective in promoting FDI to Africa compared to other regions. A plausible explanation for the subdued response of FDI to trade liberalization is that foreign investors do not perceive reform as credible—liberalization moves by the government are perceived as transitory and therefore subject to reversal. The risk resulting from the lack of credibility of reform is higher

in Africa for two reasons. First, for many years, African governments have used their trade policy as a macroeconomic instrument to manage their balance of payments. [21] Hence when the terms of trade deteriorated, trade restrictions were tightened, and slackened again when the terms of trade improved. Second, a number of countries embark on reform as part of aid conditionality, where a donor, such as the World Bank, offers temporary aid during reform. Once aid ends, there is little incentive for the country to continue reform, and most countries do abandon reform. In summary, trade reform is sustainable only if it is consistent with macroeconomic equilibrium. Africa's trade reform has in the past been *ad hoc* and therefore not sustainable. Foreign investors anticipate this and therefore do not increase investments when liberalization occurs.

(d) Result 4

Infrastructure development promotes FDI to non-SSA countries, but has no significant impact on FDI flows to SSA countries, ceteris paribus.

Result 4 may be explained by two facts. First, FDI to SSA tends to be natural resource based, mainly in extractive industries. For example, in 1993, petroleum alone accounted for about 66% of FDI from the United States to SSA (UNCTAD, 1995). Second, infrastructure development, in particular, the availability of telephones, is not very relevant for natural resource-based investments. Indeed, foreign firms in extractive industries often locate in remote areas, which typically lack access to basic amenities such as electricity and water. For example, Nigeria, an oil exporting country, receives substantial amounts of FDI (e.g., in 1994 Nigeria ranked seventh among developing countries in receiving FDI) despite its weak infrastructure. According to Collier and Gunning (1999) about 78% of firms in Nigeria use private generators because electricity supply is unreliable.

7. CONCLUSION

This paper has analyzed the determinants of Foreign Direct Investment (FDI) to developing countries and examined why sub-Saharan Africa (SSA) has been *relatively* unsuccessful in attracting FDI despite policy reform. The results indicate that the factors that drive FDI

to developing countries have a different impact on FDI to SSA. Specifically, infrastructure development and a higher return on capital promote FDI to non-SSA countries. In contrast these factors have no effect on FDI to SSA. Openness to trade promotes FDI to both SSA and non-SSA countries; however, the marginal benefit from increased openness is less for SSA—suggesting that trade liberalization will generate more FDI to non-SSA countries than SSA countries. Another important finding is that, all else being equal, FDI is uniformly lower in SSA. This indicates that there is an "adverse regional effect" for SSA: a country in SSA will receive less FDI by virtue of its geographical location. These results suggest that Africa is different.

The results have three policy implications. First, to enhance FDI flows, African countries need to liberalize their trade regimes. Further-more, the full benefits of trade liberalization will be realized only if investors perceive reform as credible and not subject to reversal. As a consequence, African governments should develop mechanisms to enhance the credibility of the reform process. [22] Second, policies that have been successful in other regions should not be blindly replicated in Africa since these policies may have a differential impact on Africa. Finally, the results suggest that Africa is perceived as overly risky and therefore a country in the region will receive less FDI by virtue of its geographical location. This perception may be partly attributed to ignorance about countries in the continent. One way to dispel this myth is for governments to disseminate information about their countries. International organizations such as the World Bank can play an important role in this regard.

NOTES

1. All references to Africa refer to sub-Saharan Africa. A number of African countries have liberalized their invest-ment framework. This includes removing trade restric-tions such as minimum export requirements and limits on imports. See UNCTAD (1999) for a discussion of the liberation measures undertaken by some African coun-tries.

2. This excludes South Africa. There are no data available on FDI to South Africa for the 1980s.

3. See De Mello (1997) for a survey of the literature on FDI and economic growth. For recent surveys on FDI and technology spillover to host countries, see Pack and Saggi (1997) and Blomstrom and Kokko (1998).

4. Foreign Investment generally takes three forms: Foreign Direct Investment (FDI), Indirect Foreign Investment (which includes commercial bank lending and bond finance) and official loans. Official loans are loans from bilateral organizations (mainly governments of developed countries) and multilateral organizations (mainly the World Bank and IMF).

5. There are a number of studies on FDI flows to other regions. Recent regional studies include those of Stone and Jeon (2000), who analyze FDI flows to Asia, Barrel and Holland (2000), who focus on Central Europe, and Tuman and Emmert (2000), who examine FDI flows to Latin America.

6. Chakrabarti (2001) analyzes the robustness of the various variables.

7. Non-market seeking FDI includes natural resource based investments and other export-oriented invest-ments such as auto assembly plants.

8. To the extent that different factors influence different types of FDI, an ideal approach will be to analyze the determinants of each type of FDI. Unfortunately, disaggregate FDI data are not available for most developing countries.

9. The World Bank's *World Development Indicators* has data on wages and taxes in host countries; however, the data are not available for most of the countries in my sample.

10. The inverse relationship may also reflect a perception that investment risk rises as per capita GDP declines. As a consequence investors may require higher returns to offset the perceived greater risk.

11. Another measure of infrastructure quality is the frequency of power outages. The data although published in *World Development Indicators* are not available for most of the countries in my sample.

12. Gastanaga *et al.* (1998) use a different measure to capture the degree of openness. They compute two indices: one measures "the degree of openness to inward FDI" and the other measures "the general openness to capital flows."

13. See Easterly and Levine (1997) and Collier and Gunning (1999) for a discussion on why these indicators are lower for Africa. In contrast with my data, Rodrik (1998) finds that the degree of openness for sub-Saharan Africa is comparable to that of other regions.

14. I also run regressions using the LIBOR spread, defined by the domestic interest rate minus LIBOR, as a proxy for the return on investment. All else equal, a larger spread implies higher risk and therefore a lower risk-adjusted return. Hence the LIBOR spread should be inversely related to FDI. This variable was not significant for my sample.

15. I experimented with two other measures of financial depth—M1/GDP and M3/GDP—both were not significant. I also experimented with an alternative measure of country risk, expropriation risk. Like the political risk variable, it was not significant. The variable is a survey-based indicator that measures the risk of confiscation and forced nationalization of foreign enterprises. Data on expropriation risk were obtained from the *International Country Risk Guide*, published by Political Risk Services.

16. Jaspersen *et al.* (2000) also find that the Africa dummy persists in all their regressions.

17. This is how the partial coefficients were computed. The estimated coefficient for non-SSA is equal to the estimated coefficient of the generic term. The estimated coefficient for SSA is equal to the sum of the estimated coefficient of the generic term and the estimated coefficient of the respective interaction term. For example, the estimated partial coefficient of *RETURN* is 2.22 for non-SSA and $0.419 = 2.22 - 1.8$ for SSA.

18. For example suppose it is the case that infrastructure promotes FDI only if it exceeds a certain threshold (e.g., $INFRAC > b$, say). Then changes in *INFRAC* may not have a significant impact on FDI to SSA since *INFRAC* for SSA is too low and does not achieve the threshold, b. Here, the unresponsiveness of FDI to changes in *INFRAC* may be attributed to SSA's weak infrastructure.

19. For example, a multinational corporation that abandons its operation in a foreign country is less likely to completely recover the costs associated with setting up the foreign subsidiary.

20. Rodrik (1991) constructs a model that links policy uncertainty to private investor response and shows that even moderate amounts of policy uncertainty may require large increases in the return on capital in order to induce investment.

21. This suggests that trade policy is endogenously determined. See Asiedu and Esfahani (2001) for a discussion on endogenizing FDI and trade policies.

22. See Collier and Pattillo (2000) for a discussion on how governments can increase the credibility of reform.

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APPENDIX A

Table 8. *Countries grouped by region*

Sub-Saharan Africa (SSA)	Latin America & Caribbean	Asia	Other
Benin	Argentina	Bangladesh	Algeria
Botswana	Bolivia	China	Egypt
Burkina Faso	Brazil	India	Morocco
Cameroon	Chile	Indonesia	Papua New Guinea
Cape Verde	Colombia	Malaysia	Tunisia
Central Africa	Costa Rica	Nepal	
Congo Dem. Rep.	Ecuador	Pakistan	
Congo Rep.	El Salvador	Philippines	
Côte d'Ivoire	Grenada	Singapore	
Gabon	Guatemala	South Korea	
Gambia	Guyana	Sri Lanka	
Ghana	Haiti	Thailand	
Guinea	Honduras		
Guinea Bissau	Jamaica		
Kenya	Mexico		
Madagascar	Nicaragua		
Malawi	Panama		
Mali	Paraguay		
Mauritania	Peru		
Mauritius	Trinidad and Tobago		
Mozambique	Uruguay		
Niger	Venezuela		
Nigeria			
Senegal			
Sierra Leone			
South Africa			
Swaziland			
Tanzania			
Togo			
Uganda			
Zambia			
Zimbabwe			