Theory and Evidence

The Determinants of FDI in Sub-Saharan Africa

by

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Abstract:

As a potential source of capital, FDI offers an avenue for growth. Few previous studies have examined the determinants of Africa separately from the rest of the world. In this paper, I investigate some of the economic, political and geographic variables that may explain the pattern of FDI growth in Africa. Using panel data from 22 Sub-Saharan African nations, I employ three separate regression processes to explain FDI inflows over the period 1982-2000. Of the three regression analyses, one ignores country heterogeneity, one utilizes regional dummies to correct for country fixed effects, and the last regression uses country dummies. Using such indicators as lag of FDI, GDP, total trade, population, inflation, a political rights index, production of oil, and an infrastructure proxy, my findings suggest that GDP, trade, lag of FDI and crude oil production are statistically important in explaining FDI inflows to the host country.

1. Introduction

A substantial body of literature supports the finding that there is a link between foreign direct investment (FDI) and growth (Hansen and Rand, 2004); Klein et al. 2001). As a potential source of growth, FDI has become increasingly important in developing countries. From 1990 to 2000, for example, FDI to the developing world, as a percentage of total foreign investment, increased from 24% to 61% (Asiedu, 2002). As Asiedu reports, while Europe and Central Asia, East Asia, South Asia, and Latin American experienced increases during this time period of 5,200%, 942%, 740%, and 455%, respectively, Africa's increase during this period was tiny. Specifically, during the period 1980-1998, FDI growth in Africa was a meager 59%, and it showed no increase from the period 1980-1989. More hopefully, Africa did receive a boost in FDI in 2004. This paper seeks to examine the economic, political and geographic variables that may explain the pattern of FDI growth in Africa. Following Asiedu (2002), which found the determinants of FDI to Sub-Saharan Africa (SSA) to differ structurally from other countries, I have chosen to focus only on SSA.

FDI, as a source of external capital to enhance growth, has become extremely important in light of the decreases in official lending to the developing world as a whole, and Africa specifically. With poverty rates rising steadily – reaching 46.5% in SSA based on the $1 a day poverty line as reported by the World Bank Group – economic growth in the region has become a matter of urgency. As the neoclassical growth model shows us, savings increases are essential to realize real growth in this region. However, Africa's domestic savings and income remain extremely low, as income is channeled directly to subsistence expenditures. Given the low domestic savings rate, coupled with the general

lack of access to international capital markets, both official assistance and FDI are of great importance to SSA. FDI also has the added dimensions that it may serve to transfer technology to the host country, as well as to offer avenues for job creation in areas in which unemployment often remains high.

The plan of the paper is as follows. In Section 2, I present a review of the literature. Section 3 contains a discussion of the methodology and data. The empirical analysis follows in Section 4, and is further explained in Section 5. Conclusions are found in Section 6.

2. Literature Review

Using cross-sectional data for 71 developing countries, which includes 32 Sub-Saharan countries, Asiedu (2002) seeks to determine if FDI differs in SSA and non-SSA countries. She explores this by using both an intercept dummy for Africa and interaction terms with the dummy variable and other economic variables—openness, infrastructure, and return on investment. Employing FDI as a percentage of GDP as the dependent variable, she finds that, on average, SSA countries receive a lower level of FDI than other regions. Additionally, higher return to capital has no significant affect on FDI flows, the marginal effect of openness of trade is less for SSA countries, and infrastructure development lacks significance on FDI flows to SSA countries. These results indicate the heterogeneity of FDI determinants, specifically to Africa.

Morisset (1999) uses both a panel and cross-sectional analysis of FDI in Africa, employing two separate dependant variables: FDI inflows and FDI inflows normalized by GDP and total value of natural resources for each country. Morisset finds that economic

growth and trade openness have a large impact on the level of FDI inflows a given country receives.

Asiedu (2003) utilizes the eclectic theory that all else equal, natural resource rich countries should receive more FDI than others. She uses the sum of minerals and oil, an independent variable within the regression analysis, as a proxy for natural resource endowment. Asiedu's natural resource data contrasts Morisset, who subtracts manufacturing from primary and secondary sectors to derive natural resource data.

The three regression analyses focused on FDI in Africa share common findings in the significance of trade openness. While Asiedu (2003) and Morisset both find significance in the role of the country's market size and natural resource endowment, Asiedu finds that the telephones per 1000 people as a proxy for infrastructure is both positive and significant while the Morisset study concludes it is insignificant.

Athough some disagreement exists between Asiedu's studies and Morisset (1999), the findings of broader studies of FDI determinants are even more contradictory. Gastanaga et al. (1998) examine FDI inflows over the period 1970-1995 to investigate the roll of corporate tax policy, tariff rates, exchange rate, contract guarantee, corruption, black market premiums, and risk of nationalization on FDI. Using several different estimation procedures, they find statistical significance of a number of variables: degree of openness, contract enforcement, corruption, growth, and nationalization risk. Gastanaga et el. fail to find significance in the black market premium. The may be because the parallel market premium and corruption are correlated as Reinhart and Rogoff (2003) find. The descriptive study by Reinhart and Rogoff (2003) examines the nature of price stability, incidence of war, trade, and external economic environment in

relation to FDI. They find that Africa, as a region, is relatively unaffected by fluctuations in the US economy, while world commodity prices have a large impact on the region.

Noorbakhsh et al. (2001) examine human capital and FDI inflows to developing countries using three different measurements of human capital. The variables include secondary school enrollment, accumulated years of secondary schooling, and combined tertiary and secondary education in working population. The study finds all three are significant in a panel analysis using Whites's correction methodology with fixed-effect region-specific dummies as encouraged by Singh and Jun (1995). Additionally, Noorbakhsh et al. conclude that human capital over time have become of greater importance using separate regression for three distinct time periods over the time 1983-1994.

Singh and Jun employ OLS regressions using a time dummy and control for regional differences using regional dummies to develop a broad base study of the determinants of FDI. They find political stability, business conditions, and manufacturing exports are more important for host countries with higher FDI than those with lower FDI. They also conclude that the work days lost, as a variable, holds greater statistical significance in countries with lower FDI.

Harms and Ursprung (2002) examine whether multinational corporations seek civil and politically repressed countries in which to invest, thus boosting FDI to such countries. Using indices created by Raymond Gastil and continually published by Freedom House, they search for a positive relationship between repression and average foreign direct investment per capita using OLS methodology. Harms and Ursprung employ three different indices: political rights, civil liberties, and repression. These

indices are based on a range of one to seven—seven reflecting the greatest degree of repression. They find a negative and significant relationship between the dependant variable and all three indices. Consequently, it appears that political rights within a country result in greater inflows of FDI than otherwise.

Embarking on an investigation into the sensitivity of previous cross-country regression analyses of FDI determinants, Chakrabarti (2001) finds that market size holds the largest and most significant place in such studies. Using an extreme bound analysis, Chakrabarti examines the likelihood of a host of variables—concluding that most are highly subject to conditional variations.

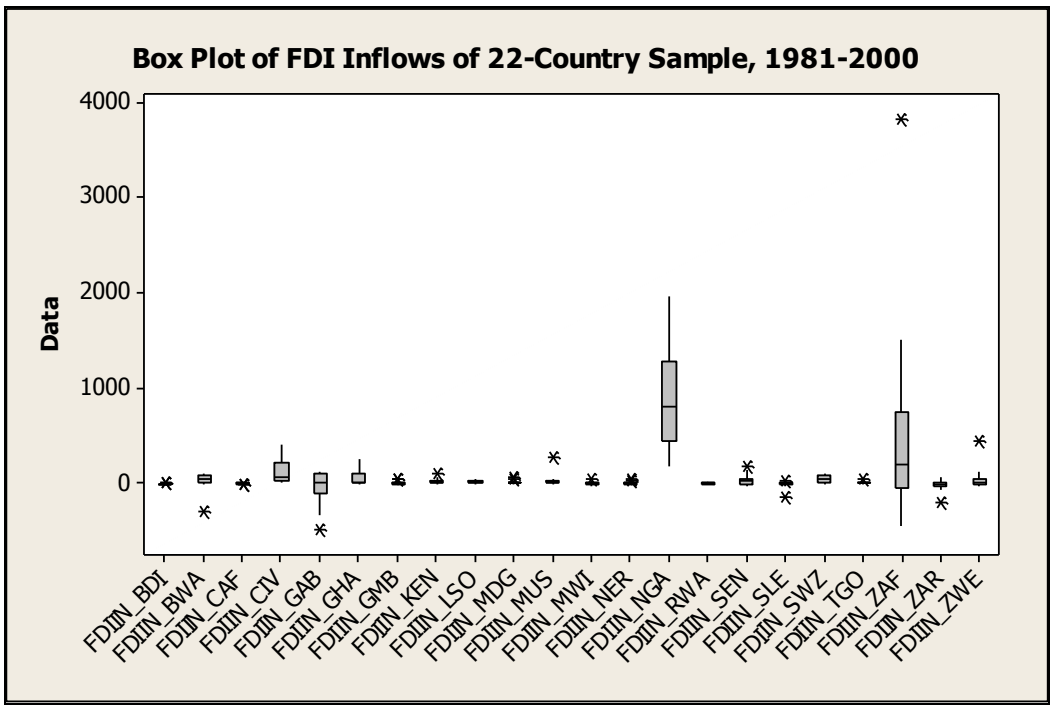
By now, one should note that a large range of studies have presented mixed results. Following Chakrabarti's findings, limiting the scope of the study to Africa should help lower conditional variations evident in large cross-country analyses.

3. Methodology and Data

In my study I use balanced panel data from a 22-country sample over the period 1982-2000. While Asiedu seeks to explore more policy-specific determinants of FDI, I intend to explore regional and country grouping affects, along with the impact of political rights on FDI. I use a standard dependent variable, net inflows of FDI, which is obtained from the United Nations Commission on Trade and Development.

The box plot shown in Figure X illustrates the low levels of FDI inflow received by the Sub-Saharan African countries included in the sample. Notable exceptions inlcude South Africa (ZAF) and Nigeria.

Figure 3.1



Independent Variables/Indicators:

(1) Lag of FDI: It is logical to conclude that the level of FDI a host country receives is, in part, determined by the reception of FDI from the year previous. Consequently, I use a one-year lag (distributed lag with an order of one) of FDI. The results should indicate a positive relationship between the lag of FDI and FDI inflows for the current period.

(2) Population: All else equal, greater labor availability should attract FDI, notably, export-oriented FDI. In the case of Africa, abundance of unskilled workers should result in labor-seeking multinationals investing in these countries. Consequently, we should observe a positive relationship between population and FDI. Population data comes from the World Bank's World Development Indicators Online.

(3) Market size of host country: Multinational corporations desire larger host country markets to facilitate greater sale of production. This, study, like others mentioned previously, will employ GDP as a proxy for market attractiveness. However, I use GDP on a purchasing power parity basis to ensure uniformity of figures across countries. We should observe, again, a positive relationship between the dependent variable and GDP PPP. This data comes form WDI Online.

(4) Economic stability and instability: As macroeconomic stability greatly influences annual investment decisions, I employ inflation as a proxy for macroeconomic health. Ceteris paribus, multinational corporations should find countries with higher inflation less attractive, thus invest less within the host country. Consequently, the results should indicate a negative relationship between the dependent and independent variable. This data is collected from WDI Online.

(5) Openness to trade: Multinational corporations often seek to export products to other markets for further manufacturing/assembly or sale. Consequently, a host country's openness to trade will facilitate this export-oriented FDI. With greater openness to trade, host countries should receive greater degrees of FDI. In this study, I utilize trade as a percentage of GDP as a proxy for openness (trade is defined as exports plus imports). This analysis should indicate a positive relationship between openness and FDI inflows.

(6) Political institutions and stability: Greater institutionalized political rights should have an impact on the investment climate in a myriad of ways—greater political stability,

lower corruption, and greater accountability to name a few. For political rights, I use the Raymond Gastil index, which is published by Freedom House, and is the same index used by Harms and Ursprung (2002). This index ranks countries' political rights on a scale of one to seven--one representing greatest political freedom. We should observe a negative relationship. As political rights decrease (rankings will increase toward 7), the investment climate becomes less favorable and multinationals will invest less, all else equal. Table 3.1, containing descriptive statistics of all variables used in this study, indicates that political rights in Africa are on average relatively poor—nearly 1.5 units above the median of possible numerical evaluations under the indices.

(7) Oil: The importance and attractiveness of oil is unparalleled. Consequently, a host country's endowment of oil resources should have positive impact on foreign direct investment as foreign companies seek access and extraction of oil. The regression analysis should indicate a positive relationship between the dependent variable and oil. I use crude oil production in thousands of barrels per day from the US Department of Energy's Energy Information Administration.

(8) Infrastructure: Quality infrastructure such as phones, roads, and electricity provide multinational corporations with a cost-efficient environment in which to operate foreign offices and production centers. I use the log of telephones per 1000 persons, data from WDI Online, as a proxy for overall infrastructure. This data only included lines connecting to an exchange server, which excludes mobile phones. We should observe a positive relationship between the FDI inflows and the proxy variable, LTELE.

(9) Regions: To test whether regional effects occur in Sub-Saharan Africa, I make use of a set of dummy variables, like Singh and Jun (1995), for four distinct economic and monetary regions in Africa. Although these unions evolved over the sample time period, I use the dummy variables solely to test regional differences and not to infer anything about the monetary unions themselves. No inferences of the relationship between the regional dummies and the dependent variable are made a priori.

(a) The Western Africa Economic and Monetary Union (WAEMU) includes Benin, Burkina Faso, Guinea-Bissau, and Senegal, as well as Cote D'Ivoire, Mali, Niger, and Togo, which are included in the 22-country sample.

(b) The Central African Economic and Monetary Community (CAEMC) includes Cameroon, Chad, Equatorial Guinea, Central African Republic and Gabon. The Central African Republic and Gabon are contained with this study's 7sample.

(c) The Southern African Development Community (SADC) includes Angola, Mozambique, Namibia, Seychelles, Tanzania, Zambia, as well as several countries included in the test sample. These countries are Botswana, Democratic Republic of Congo, Lesotho, Malawi, Mauritius, South Africa, Swaziland, and Zimbabwe.

(d) The West Africa Monetary Zone (WAMZ) includes Ghana, Nigeria, Sierra Leone, and the Gambia, which are included in the twenty-two-country sample used in this study as well as Guinea and Liberia (both not included in sample)

(10) Fixed effects least squares dummy variables: I employ fixed effects dummies for each country. This control for cross-sectional cross countries assumes that the variation between countries over the time period 1982-2000 is fixed (controlling cross sectional heterogeneity). I assign a dummy variable, λ , to all countries except Burundi to avoid perfect collinearity across the set of country dummies since the intercept, α, is included. Consequently, the coefficients of these terms will represent the marginal impact of the country relative to Burundi.

$$FDIIN_{it} = \alpha + \lambda_i + \beta z_{it} + e_{it}$$

Table 3.2

Variable	N	Mean	St Dev	Minimum	Maximum
FDIIN	418	83.2	307.6	-487	3817.2
POP	418	15.97	23	0.065	126.91
GDPPPP	418	25.18	61.85	0.69	410.01
INFL	418	99.1	1296.2	-20.8	26762
TRADE	418	71.2	37	6.32	178.99
POLRIGHT	418	4.9136	1.7811	1	7
OIL	418	93	371.7	0	2165
LTELE	418	1.7661	1.3195	-1.666	5.461

4. Empirical Analysis

Ignoring potential cross-sectional heterogeneity, I begin with the analysis—omitting potential fixed effects within the OLS panel and including only political and economic variables within the model.

$$FDIIN_{it} = \alpha + \beta_1 FDIINLAG_{it} + \beta_2 POP_{it} + \beta_3 GDPPPP_{it} + \beta_4 INFL_{it} + \beta_5 TRADE_{it} + \beta_6 POLRIGHT_{it} + \beta_7 OIL_{it} + \beta_8 LTEL_{it} + e_{it}$$

The preliminary regression analysis, Table 4.1(1), indicates that with a 10% level of significance, we can reject the null hypothesis that that the coefficients for FDIINLAG,

Table 4.1

OLS Regression, 1982-2000, 22-country Sample in SSA

	(1)		(2)		(3)		(4)	
Constant	28.21		40.09		48.09		50.99	
	49.81		48.49		51.64		32.27	
	0.57		0.83		0.093		1.58	
FDIINLAG	0.20378	***	0.20769	***	0.18869	***	0.20705	***
	0.04839		0.04825		0.04873		0.04819	
	4.21		4.3		3.87		4.3	
POP	0.5447				0.2845			
	0.4917				0.6237			
	1.11				0.46			
GDPPPP	1.8559	***	1.8475	***	1.9706	***	1.5872	***
	0.2374		0.2366		0.2534		0.1949	
	7.82		7.81		7.78		8.14	
INFL	-0.00379				-0.00158			
	0.007991				0.008066			
	-0.47				-0.2			
TRADE	0.7402	*	0.7236	*	1.0023	**		
	0.3809		0.3803		0.4298			
	1.94		1.9		2.33			
POLRIGHTS	-13.645	**	-13.116	*	-14.73	**	-11.83	*
	6.86		6.834		6.931		6.052	
	-1.99		-1.92		-2.13		-1.95	
OIL	0.34766	***	0.34175	***	0.34951	***	0.35881	***
	0.03621		0.03575		0.03953		0.03609	
	9.6		9.56		8.84		9.94	
LTELE	-18.83		-21.3	*	-17.67			
	12.67		12.3		12.81			
	-1.49		-1.73		-1.38			
WAEMUDUM					-0.93		35.96	
					43.93		28.2	
					-0.02		1.28	
CAEMCDUM					-76.92	*	-58.83	
					44.29		37.43	
					-1.74		-1.57	
SADCDUM					-60.01			
					38.72			
					-1.55			
WAFZDUM					-23.2			
					41.5			
					-0.56			
R-Squared values	54.20%		54%		54.80%		54.10%	
N	418		418		418		418	

Estimate coefficient value
Estimate standard error
t-statistic

*10% significance level
**5% significance level
***1% significance level

GDPPPP, TRADE, POLRIGHT, and OIL are zero in favor of the alternative that they are not zero. Additionally, the results indicate POP, INFL, and LTELE coefficients are insignificant within the specified model. The model produces an R-squared value of 54.2%.

Following this regression, I employ MINITAB statistical software (Release 14) to examine all combinations of regressions with these variables using the "Best Subsets Regression" function. This function produces the optimal regression analysis with the least number of predictors using the Mallows C-p statistic. The C-p statistic is (SSE_p/s^2)-(N-2p), where SSE is the sum of squared errors, s^2 is the mean squared error term for the specified reduced model, N is the number of observations, and p is the number of estimators in the reduced model plus one. The model that corresponds to the lowest C-p value nearest to p is the best model of the possible subsets examined. This statistic serves as a more robust measurement than a simple, rough, R-squared assessment of models as it allows for comparison models of varying numbers of regressors and is adjusted for adverse multicollinearity effects included with a greater number of independent variables.

The Best Subset Regression is run with the above political and economic set, Figure 4.1. The lowest C-p value, 6.4 with a p of 7, corresponds to a model with FDIINLAG, GDPPPP, TRADE, POLRIGHT, OIL, and LTELE as determinants of FDIIN.

$$FDIIN_{it} = \alpha + \beta_1 FDIINLAG_{it} + \beta_2 GDPPPP_{it} + \beta_3 TRADE_{it} + \beta_4 POLRIGHT_{it} + \beta_5 OIL_{it} + \beta_7 LTEL_{it} + e_{it}$$

Figure 4.1

Vars	R-Sq	R-Sq(adj)	Mallows C-p	S	FDIINLAG	GDPPPP	TRADE	POLRIGHT	OIL	LTELE
1	37.6	37.5	142.9	248.68	X					
1	34.4	34.3	171.3	254.94					X	
2	50.6	50.3	29.2	221.61		X			X	
2	45.4	45.1	75.7	233.00	X				X	
3	53.2	52.8	7.9	215.94	X	X			X	
3	51.2	50.8	25.8	220.52		X		X	X	
4	53.5	53.1	6.6	215.35	X	X		X	X	
4	53.5	53.0	7.3	215.53	X	X	X		X	
5	53.7	53.1	7.1	215.22	X	X	X	X	X	
5	53.7	53.1	7.4	215.30	X	X	X	X	X	
6	54.0	53.3	6.4	214.78	X	X	X	X	X	X
6	53.9	53.2	7.3	215.02	X	X	X	X	X	
7	54.1	53.4	7.2	214.73	X	X	X	X	X	X
7	54.0	53.3	8.2	214.99	X	X	X	X	X	X
8	54.2	53.3	9.0	214.93	X	X	X	X	X	X

I run the above-specified model and find that all terms are statistically significant, including LTELE, which in the previous model was not significant. The results are reported in Table 4.1(2).

Next, I move to include all variables in addition to regional dummies. The inclusion of regional dummies, as explained by Singh and Jun (1995), offers an alternative to fixed effect dummies to correct for cross-sectional heterogeneity—maintaining greater degrees of freedom.

$$FDIIN_{it} = \alpha + \beta_1 FDIINLAG_{it} + \beta_2 POP_{it} + \beta_3 GDPPPP_{it} + \beta_4 INFL_{it} + \beta_5 TRADE_{it} + \beta_6 POLRIGHT_{it} + \beta_7 OIL_{it} + \beta_8 LTEL_{it} + \beta_9 WAEMUDUMi + \beta_{10} CAEMCDUMi + \beta_{11} SADCDUMi + \beta_{12} WAFZi + e_{it}$$

The results of this regression are reported in Table 4.1(3). These results are consistent with the original model excluding regional effects: determinants FDIINLAG, GDPPP,

TRADE, POLRIGHTS, OIL, LTELE are again significant within a 10% significance level. The CAEMCDUM is also significant within this specified model.

I again make use of the Best Subset Regression for this set of variables, as demonstrated in Figure 4.2—indicating that FDIINLAG, GDPPPP, POLRIGHTS, OIL, WAEMUDUM, and CAEMCDUM are appropriate predictors of FDIIN (C-p of 7.3 and p of 7). Following these results, I run this regression to attain the relevant parameter estimates, Table 4.1(4).

$$FDIIN_{it} = \alpha + \beta_1 FDIINLAG_{it} + \beta_2 GDPPPP_{it} + \beta_3 POLRIGHT_{it} + \beta_4 OIL_{it} + \beta_9 WAEMUDUMi + \beta_{10} CAEMCDUMi + e_{it}$$

The results indicate significance at 10% specification level with the coefficients of FDIINLAG, GDPPPP, POLRIGHT, and OIL variables.

Last, I employ all economic and political indicators used within this study in addition to employing all fixed effect country dummies, leaving out Burundi.

$$FDIIN_{it} = \alpha + \lambda_i + \beta_1 FDIINLAG_{it} + \beta_2 POP_{it} + \beta_3 GDPPPP_{it} + \beta_4 INFL_{it} + \beta_5 TRADE_{it} + \beta_6 POLRIGHT_{it} + \beta_7 OIL_{it} + \beta_8 LTEL_{it} + e_{it}$$

Table 4.2 (1) displays this regression estimate. The specified model indicates that—with all variables included—only the coefficients of GDPPPP, OIL, DemRepubCongoDUM, and S.AfricaDUM are statistically significant at a 10% level. Since Best Subsets is not available when employing this number of right-hand, independent, variables, we are left to use more conventional methods.

Figure 4.2

Vars	R-Sq	R-Sq(adj)	Mallows C-p	S	FDIINLAG	POP	GDPPP	INFL	TRADE	POLRIGHT	OIL	LTELE	WAEMUDUM	CAEMCDUM	SADCDUM	WAMZDUM
1	37.6	37.5	144.9	248.68	X											
1	34.4	34.3	173.5	254.94							X					
2	50.6	50.3	30.8	221.61			X				X					
2	45.4	45.1	77.5	233.00	X						X					
3	53.2	52.8	9.4	215.94	X		X				X					
3	51.2	50.8	27.4	220.52			X			X	X					
4	53.5	53.1	8.1	215.35	X		X			X	X					
4	53.5	53.1	8.2	215.36	X		X				X			X		
5	53.9	53.3	6.9	214.77	X		X			X	X			X		
5	53.8	53.2	7.8	214.99	X		X			X	X		X			
6	54.2	53.5	6.6	214.43	X		X		X		X			X	X	
6	54.1	53.4	7.3	214.61	X		X			X	X		X	X		
7	54.4	53.7	6.0	214.02	X		X		X	X	X			X	X	
7	54.3	53.5	7.4	214.39	X		X		X	X	X	X	X			
8	54.7	53.8	5.8	213.68	X		X		X	X	X	X		X	X	
8	54.5	53.6	7.4	214.12	X	X	X		X	X	X			X	X	
9	54.8	53.8	7.3	213.83	X		X		X	X	X	X		X	X	X
9	54.7	53.7	7.4	213.86	X		X		X	X	X	X	X	X	X	
10	54.8	53.7	9.0	214.02	X	X	X		X	X	X	X		X	X	X
10	54.8	53.6	9.2	214.07	X		X		X	X	X	X	X	X	X	X
11	54.8	53.6	11.0	214.27	X	X	X	X	X	X	X	X		X	X	X
11	54.8	53.6	11.0	214.28	X	X	X		X	X	X	X	X	X	X	X
12	54.8	53.4	13.0	214.54	X	X	X	X	X	X	X	X	X	X	X	X

Table 4.2

OLS Regression, 1982-2000, 22/20-country Sample in SSA, Fixed Effects

	(1)		(2)			(1 cont.)		(2 cont.)			(1 cont.)		(2 cont.)	
Constant	-44.44		-45.73	*	**CentralARepDUM**	-5.12		0.28	***	**NIgerDUM**	-129.7		-133.33	**
	84.37		23.97			67.48		18.07			234		63.86	
	-0.53		-1.91			-0.08		0.02			-0.55		-2.09	
FDIINLAG	0.00155		0.26302	***	**DemRepCongoDUM**	-406.1	***	-144.22		**NigeriaDUM**	-240.3			
	0.0504		0.05147			115.9		48.85			270.5			
	0.03		5.11			-3.5		-2.95			-0.89			
POP	1.109		1.3776		**CoteDIvoireDUM**	-45.8		-22.63	***	**RwandaDUM**	-17.29		-2.38	
	2.377		0.6545			127.2		33.97			65.52		17.73	
	0.047		2.1			-0.36		-0.67			-0.26		-0.13	
GDPPPP	8.3576	***	3.225	***	**GabonDUM**	-140.2		209.5	***	**SenegalDUM**	-18.51		-12.54	
	0.8587		1.079			106.3		50.1			83.74		22.71	
	9.73		2.99			-1.32		4.18			-0.22		-0.55	
INFL	0.001762		0.000302		**GambiaDUM**	-38.1		-54.72	**	**SierraLioneDUM**	-25.65		-51.66	*
	0.00781		0.002071			102.6		34.09			96.05		27.28	
	0.23		0.15			-0.37		-1.61			-0.27		-1.89	
TRADE	1.0693		0.5647	**	**GhanaDUM**	-121.25		-50.96	**	**S.AfricaDUM**	-1871.7	***		
	0.8189		0.2535			79.5		24.3			245.3			
	1.31		2.23			-1.53		-2.1			-7.63			
POLRIGHTS	-2.299		0.745		**KenyaDUM**	-114.8		-56.6	*	**SwazilandDUM**	-30.4		-47.63	
	8.839		2.551			79.38		23.67			135.3		43.92	
	-0.26		0.29			-1.45		-2.39			-0.22		-1.08	
OIL	0.3171	**	-1.1168	***	**LesothoDUM**	-63.8		-59.29		**Togo DUM**	-48.73		-46.72	*
	0.1601		0.1664			110.5		35.77			82.31		24.18	
	1.98		-6.71			-0.58		-1.66			-0.59		-1.93	
LTELE	-21.25		7.33		**MadagascarDUM**	-40.98		-16.67		**ZimbabweDUM**	-109.97		-65.24	**
	24.4		7.703			70.78		19.14			84.45		24.29	
	-0.87		0.95			-0.58		-0.87			-1.3		-2.69	
BotswanaDUM	-17.1		-36.04		**MalawiDUM**	-6.18		-5.64						
	116.1		34.88			73.21		20.08						
	-0.15		-1.03			-0.08		-0.28						
BurundiDUM	- - - - - -				**MauritiusDUM**	-16.8		-57.81						
	- - - - - -					137.3		43.62		**R-Squared**	62.20 %		51.40%	
	- - - - - -					-0.12		-1.33		**N**	418		380	

Estimate coefficient value
Estimate standard error
t-statistic

*10% significance level
**5% significance level
***1% significance level

Table 4.3 displays correlation coefficients with corresponding p-values for the independent variables. As a result of a few significant and relatively large correlations between the fixed effects dummies and economic variables (S.AfricaDUM and GDPPPP, and NigeriaDUM and OIL), the standard errors are misestimated. Correlations of S.AfricaDUM and NigeriaDUM with GDPPPP and OIL are .937 and .972 respectively, both statistically significant. This results in incorrect conclusions regarding the statistical significance of various terms within the model. As a result of such correlation, South Africa and Nigeria are removed from the sample and the regression is rerun. Figure 3.1 offers additional justification for the removal of these countries as the mean of FDIIN for both countries greatly exceeds other SSA countries.

As a result of this process, very different findings arise as many more variables are significant. The fixed effect country dummies appear much more robust as whole. Dummies for the Democratic Republic of Congo, Gabon, Ghana, Kenya, Lesotho, Niger, Sierra Lione, Togo, and Zimbabwe all appear significant with the dummy for the Gambia sitting on the cusp of the 10% significance level. Additionally, several economic variables become relevant: FDIINLAG, POP, GDPPPP, TRADE, and OIL. This new model produces an R-squared value at 51.4%.

Table 4.3

	POP	GDPPPP	INFL	TRADE	POLRIGHT	OIL	LTELE
GDPPPP	-0.121 0.011						
INFL	0.075 0.115	0.015 0.753					
TRADE	-0.211 0	-0.172 0	-0.055 0.252				
POLRIGHT	0.23 0	-0.142 0.003	0.071 0.138	-0.289 0			
OIL	-0.102 0.032	0.16 0.001	-0.01 0.831	-0.016 0.74	0.078 0.103		
LTELE	-0.346 0	0.393 0	-0.1 0.035	0.498 0	-0.495 0	-0.072 0.132	
WAEMUDUM	0.533 0	-0.122 0.01	-0.034 0.473	-0.065 0.174	0.126 0.008	-0.114 0.017	-0.135 0.005
CAEMCDUM	-0.192 0	-0.108 0.023	-0.023 0.634	-0.028 0.553	0.051 0.287	0.029 0.543	0.014 0.777
SADCDUM	-0.215 0	0.265 0	0.087 0.069	0.415 0	-0.293 0	-0.182 0	0.422 0
WAMZDUM	0.089 0.062	-0.011 0.825	-0.025 0.598	-0.053 0.267	0.02 0.682	0.437 0	-0.105 0.027
BotswanaDumm	-0.139 0.003	-0.067 0.161	-0.015 0.755	0.2 0	-0.382 0	-0.055 0.252	0.226 0
BurundiDummy	-0.099 0.037	-0.077 0.108	-0.015 0.748	-0.222 0	0.207 0	-0.055 0.252	-0.219 0
CentrealAfri	-0.123 0.01	-0.078 0.102	-0.016 0.743	-0.156 0.001	0.023 0.633	-0.055 0.252	-0.197 0
DemRepubCong	0.215 0	0.054 0.262	0.301 0	-0.145 0.002	0.201 0	-0.038 0.421	-0.367 0
CoteDIvoireD	0.334 0	-0.027 0.575	-0.016 0.741	-0.011 0.811	0.115 0.016	-0.047 0.321	0.039 0.414
GabonDummy	-0.143 0.003	-0.071 0.135	-0.016 0.742	0.117 0.014	0.047 0.321	0.095 0.047	0.216 0
GambiaDummy	-0.006 0.906	-0.084 0.078	-0.015 0.754	0.257 0	-0.1 0.036	-0.055 0.252	0.068 0.157
GhanaDummy	0.073 0.127	-0.012 0.807	-0.011 0.822	-0.13 0.006	0.029 0.544	-0.053 0.264	-0.073 0.124
KenyaDummy	-0.137 0.004	-0.015 0.759	-0.015 0.757	-0.074 0.12	0.109 0.023	-0.055 0.252	0.045 0.344
LesothoDummy	-0.038 0.424	-0.082 0.088	-0.015 0.756	0.38 0	-0.014 0.771	-0.055 0.252	0.017 0.719
MadagascarDu	-0.072 0.132	-0.058 0.225	-0.014 0.774	-0.167 0	-0.155 0.001	-0.055 0.252	-0.129 0.007
MalawiDummy	-0.141 0.003	-0.075 0.115	-0.013 0.79	-0.071 0.137	-0.008 0.87	-0.055 0.252	-0.1 0.036
MauritiusDum	-0.076 0.111	-0.067 0.161	-0.015 0.748	0.287 0	-0.413 0	-0.055 0.252	0.418 0
NigerDummy	0.786 0	-0.069 0.15	-0.016 0.737	-0.165 0.001	0.121 0.011	-0.055 0.252	-0.243 0
NigeriaDummy	-0.09 0.059	0.156 0.001	-0.013 0.792	-0.05 0.294	0.06 0.212	0.972 0	-0.11 0.021
RwandaDummy	-0.081 0.091	-0.068 0.157	-0.015 0.751	-0.237 0	0.176 0	-0.055 0.252	-0.244 0
SenegalDummy	-0.151 0.001	-0.058 0.222	-0.016 0.74	-0.021 0.657	-0.149 0.002	-0.055 0.252	0.02 0.67
SierraLoneDu	0.188 0	-0.079 0.096	-0.008 0.861	-0.175 0	0.047 0.321	-0.055 0.252	-0.08 0.094
SouthAfricaD	-0.144 0.002	0.937 0	-0.015 0.76	-0.139 0.004	-0.149 0.002	-0.053 0.27	0.447 0
SwazilandDum	-0.118 0.013	-0.079 0.096	-0.015 0.758	0.524 0	0.084 0.078	-0.055 0.252	0.185 0
TogoDummy	0.017 0.719	-0.072 0.13	-0.016 0.742	0.077 0.106	0.146 0.002	-0.055 0.252	-0.066 0.164
ZimbabweDumm	-0.055 0.251	-0.008 0.862	-0.013 0.784	-0.079 0.099	0.004 0.926	-0.055 0.252	0.148 0.002

Pearson's correlation coefficient
P-value

5. Empirical Results Explained

In all models employed in this study, GDPPPP is positive and statistically significant. This finding parallels Chakrabarti's aggregate evaluation of previous studies on FDI. Other important findings include the significance of FDIINLAG, TRADE, and OIL in predicting FDI inflows. The predicted signs of the significant variables appear as hypothesized above, with the exception of the LTELE and OIL (see Tables 4.1(2) and Table 4.2(2) respectively.

In reference to LTELE, this indicates that, according to the regression, the infrastructure proxy has a negative impact on the inflows of FDI to the host country. Collier and Gunning (1999) finds that, while Africa has lower degree of infrastructure, it is also less reliable, which could largely impact the negative relationship observed in this model. This contrasts with the Asiedu (2003) findings of a statistically significant and positive relationship between FDI and the infrastructure proxy, but complements Morisset (1999) who finds no statistical significance in the estimated parameter for telephones. Other models that include this variable find no significance in the estimated parameter (see Table 4.1, Table 4.2). The inconsistent sign of OIL between different models and within the Table 4.1(1)(2) results from the exclusion of Nigeria from the second model. Table 3.3 shows that the NigeriaDUM highly correlates with OIL.

5. Conclusions

The significance of a one-year lag of FDI indicates that the level of FDI inflows received by host country persists over time. A system of incentives to promote FDI inflows may prove to be beneficial in overcoming this trend. The significance of other

indicators, however, brings hope to the prospect of attracting greater inflows of FDI. The significance of political rights indicates that domestic repression negatively impacts investors' likelihood of investing. Consequently, host countries that pursue broader political participation and freedoms will appear more attractive to multinational corporations. The significance and positive sign associated with the TRADE variable, a proxy for openness, implies that policy shifts toward liberalization will promote investment. Lastly, the consistent significance of GDPPPP throughout all regressions underscores the importance of growth within these economies—implying that a dynamic relationship exists between the size of the market, and thus growth, and FDI.

This finding emphasizes the fact that FDI is not the magic cure for Africa. However, with longer-term investments from multinational corporations, FDI offers an avenue to access capital where access is limited, transfer of skills such as trade-specific and managerial skills, as well as transfers of technology.

Schooling levels and literacy rates were not included within this study because of a lack of data. Future studies might employ period averages of other relevant data along with current schooling data to develop some inference regarding the importance of schooling in attracting FDI to Africa. Last, while a few papers have explored this topic, there appears to be a scarcity of literature exploring the roles of FDI in economic growth specific to Sub-Saharan Africa. Further studies may also seek to explore this area.

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