

International Investment Agreements and FDI inflows in Africa*

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Abstract

Using investment-level data, we study the location choice of 8,283 greenfield investments in 44 African countries over the 2003-2017 period, focusing on the role of International Investment Agreements, i.e. Bilateral Investment Treaties (BITs) and Treaties with Investment Provisions (TIPs). We document a positive relation between the existence of BITs and TIPs and the location of FDI into African countries which is most strongly affecting the location of investments in services.

Keywords: Foreign Direct Investment; Location Choice; Africa; Conditional Logit

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1 Introduction

Although Foreign Direct Investments (FDI) have increased by 15 times in Africa from 1990 to 2017, they still account for less than 3% of global flows. The location factors for investment into Africa may be different Asiedu (2002) and investors still perceive Africa as a risky investment destination. FDI into Africa have grown parallel to international agreements covering trade and investment flows. The aim of these agreements is generally to encourage flows of FDI into low-income countries. According to UNCTAD, 520 Bilateral Investment Treaties (BITs) and 47 Treaties with Investment Provisions (TIPs) are in force in Africa. There is still limited evidence about whether the increase in FDI into Africa can be attributed to these agreements.

African countries are involved in about 25% of the 2,649 IIAs in force worldwide. Most IIAs are BITs, legally binding agreements between two sovereign states regarding the promotion and protection of FDI. In developing countries, where scarcely effective institutions cause credibility problems, BITs could act as signals of trustworthiness to foreign investors and protect investors against expropriation and unfair treatment (Kerner, 2009). Along with BITs, a range of economic partnerships, taxation treaties and investment agreements regulates FDI flows into Africa. Along with benefits from the expected increase in FDI flows, IIAs also entail costs from sovereignty loss and onerous dispute settlement procedures. The costs of IIAs may be especially high for African countries, also marked by weaker institutions and business environment.

Evidence on the impact of these agreements on FDI flows is ambiguous. Most studies find a positive relationship between BITs and FDI (e.g. Neumayer and Spess, 2005; Kerner, 2009), while others do not (Hallward-Driemeier, 2003; Tobin and Rose-Ackerman, 2005; Sauvart and Sachs, 2009). Moreover, the majority find that the gains from BITs accrue to countries with stronger institutions (Hallward-Driemeier, 2003; Tobin and Rose-Ackerman, 2005; Lejour and Salfi, 2015). Lejour and Salfi (2015); Sichei and Kinyondo (2012) find no robust effect of BITs on OECD FDI stocks in Africa, while Bankole and Adewuyi (2013) show that BITs have a strongly positive impact on both FDI flows and stock in the ECOWAS region. Reconciling partially divergent results in the literature, Colen et al. (2016) showed that BITs are most effective in attracting FDI in sectors with a larger risk of expropriation and in sectors that are politically sensitive to foreign ownership.

Recognising this important heterogeneity in the effectiveness of BIT, it is crucial to take the sectoral dimensions into consideration when studying the link between BITs

and TIPs and the location choice of FDI into Africa. Even more heterogeneity may arise from FDI functions. Hence, we employ detailed investment-level data from FDI Markets which enable us to disentangle the MNE activity in which the investment is operating. These are merged to UNCTAD data on IIAs to study the role of BITs and TIPs among the determinants of greenfield FDI in 44 African countries. Our results confirm that FDI are significantly more likely to locate into countries with which the investor is tied by an IIA; investments in business services and sales, marketing and support are driving the result.

2 Empirical Application

The availability of investment-level data allows us to study the location choice faced by individual investments and the differences associated with different MNE activities. Previous studies used the amounts of FDI, but the insights may be different considering that the countries receiving the largest numbers of investments are not necessarily those attracting the largest investment projects (Table A.1) and that spillovers may also arise from smaller FDI.

Following the literature on FDI location choice, we employ conditional logit models (Train, 2009) and assume that investment n will locate in African country i if the observed component of the (linear) utility it yields exceeds that of all other African countries $j \neq i$. The resulting choice probability is:

$$P_{ni} = P(\text{Choice}_{ni} = 1|x, y) = \frac{e^{\alpha'x_i + \beta'y_{ni}}}{\sum_j e^{\alpha'x_j + \beta'y_{nj}}}$$

where x_j and y_{nj} are vectors of variables varying by destination and by investment-destination respectively; the model controls for investor fixed effects. α and β are parameter vectors to be estimated. The corresponding elasticities are $\alpha(1 - P_{ni})x_i$ and $\beta(1 - P_{ni})y_{ni}$.

We consider 8,283 greenfield FDI locating into 44 African countries from 116 origin countries worldwide over the 2003-2017 period. Of these, 3,599 investments are in Business Services and Market Access activities, 1833 in Manufacturing, 418 in Extraction and the rest in other activities. Our binary dependent variable *Choice* equals 1 if investment n located in country j and zero otherwise. Our variables of interest are two dummies, *BIT* and *TIP*. *BIT* is equal to 1 if, in year t , a bilateral trade agreement is not only signed but also in force (Siegmann, 2007; UNCTAD, 2014) between country

j and the source country of investment n , and zero otherwise. TIP is equal to 1 if, in year t , a treaty with investment provisions (other than BIT) is in force between the two countries.

We also control for other factors affecting the utility of potential locations (see Table 1 and section A); all regressors are lagged one year to mitigate simultaneity problems.

African countries vary considerably in their participation in BITs and TIPs. Considering all possible partners worldwide, Northern African countries, along with Mauritius, Ethiopia and Mozambique are involved in the largest number of BITs. Sudan, Nigeria, Burkina Faso, Senegal, Cameroon, Mauritania and Gabon rely more on TIPs (cf. Table A.2). In bilateral terms, a 23% of the potential dyads in our sample were tied by a BIT and 64% by at least one TIP (cf. Table A.3).

Overlap between the pairs involved in BITs and in TIPs is limited; the correlation between the two is 0.12 (see Table A.4). Moreover, while there may be some overlap between the determinants of BITs and TIPs and FDI, some important differences are apparent even from the summary statistics. Indeed, while both correlate positively with *Colony* and negatively with *Log Distance*, *BIT* is more strongly correlated with size-related variables (*FDI stock 2002*, *Log Population*) than *TIP*; *BIT* is negatively correlated with *Ores Exports 2002* while *TIP* is not. *Urban Population Shares* correlates positively with *BIT*, but negatively with *TIP*.

3 Results

The “control-only” specification estimates are reported in column (1) of Table 1. For illustration, we compute the approximate elasticities for the average country in the sample. This has a small probability to be chosen, hence $\alpha(1 - P_{ni})x_i \approx \alpha x_i$ and $\beta(1 - P_{ni})y_{ni} \approx \beta y_{ni}$.

Results are largely in line with the expectations. FDI result most responsive to *Urban Population Share*, which is our proxy for low labour costs (estimated approximate elasticity of 2.44, though slightly diminishing), *Institutional Distance* (-1.05), geographic distance (-0.78), and population (0.76). The approximate elasticities for *Trade Openness*, *Primary Enrolment Ratio* and FDI stocks are also relatively high and close to 0.48, 0.41 and 0.40 respectively. FDI are also responsive to GDP growth (0.22) and to natural resources, though to a lesser extent (the approximate elasticity to ores exports is 0.13, the one to fuel export stocks is even negative and approximately -0.15), whose significant

Table 1: Estimation results - Conditional Logit

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
					No ZAF	Manuf.	Extraction	Services	Constr. & Electricity
<i>Dep. var.: Choice</i>									
choice									
FDI stock 2002	0.111*** (0.012)	0.105*** (0.013)	0.109*** (0.012)	0.101*** (0.013)	0.086*** (0.013)	0.066** (0.028)	-0.046 (0.046)	0.098*** (0.019)	0.233*** (0.048)
FDI stock 2002 ²	-0.004*** (0.000)	-0.004*** (0.000)	-0.004*** (0.000)	-0.004*** (0.000)	-0.003*** (0.000)	-0.002** (0.001)	0.002 (0.002)	-0.004*** (0.001)	-0.008*** (0.002)
Ores exports 2002	0.013*** (0.003)	0.012*** (0.003)	0.012*** (0.003)	0.011*** (0.003)	0.008** (0.003)	0.005 (0.007)	0.024* (0.013)	0.007 (0.005)	0.061*** (0.013)
Ores exports 2002 ²	-0.0002*** (0.0000)	-0.0002*** (0.0000)	-0.0002*** (0.0000)	-0.0002*** (0.0000)	-0.0002*** (0.0000)	0.000 (0.0001)	-0.000 (0.0001)	-0.0002** (0.0001)	-0.0010*** (0.0002)
Fuel exports 2002	-0.012*** (0.002)	-0.012*** (0.002)	-0.012*** (0.002)	-0.013*** (0.002)	-0.016*** (0.002)	-0.013*** (0.004)	0.022** (0.009)	-0.019*** (0.003)	-0.005 (0.007)
Fuel exports 2002 ²	0.0001*** (0.0000)	0.0001*** (0.0000)	0.0001*** (0.0000)	0.0001*** (0.0000)	0.0001*** (0.0000)	0.0001* (0.0000)	-0.0002* (0.0000)	0.0002*** (0.0001)	0.0001* (0.0001)
Inst. Dist.	-0.705*** (0.041)	-0.700*** (0.041)	-0.721*** (0.042)	-0.714*** (0.042)	-0.669*** (0.042)	-0.545*** (0.095)	-0.740*** (0.145)	-0.745*** (0.063)	-0.607*** (0.146)
GDP growth	0.047*** (0.005)	0.047*** (0.005)	0.048*** (0.005)	0.048*** (0.005)	0.055*** (0.005)	0.060*** (0.011)	0.024 (0.018)	0.045*** (0.008)	0.047** (0.020)
Log population	0.756*** (0.027)	0.755*** (0.027)	0.755*** (0.027)	0.754*** (0.027)	0.752*** (0.027)	1.079*** (0.070)	0.569*** (0.094)	0.746*** (0.040)	0.308*** (0.092)
Urban Pop. Share	0.061*** (0.006)	0.061*** (0.006)	0.062*** (0.006)	0.062*** (0.006)	0.071*** (0.006)	0.041*** (0.012)	0.021 (0.020)	0.074*** (0.009)	0.084*** (0.025)
Urban Pop. Share ²	-0.001*** (0.000)	-0.001*** (0.000)	-0.001*** (0.000)	-0.001*** (0.000)	-0.001*** (0.000)	-0.000* (0.000)	-0.000 (0.000)	-0.001*** (0.000)	-0.001*** (0.000)
Primary Enrolm.	0.004*** (0.001)	0.004*** (0.001)	0.005*** (0.001)	0.005*** (0.001)	0.006*** (0.001)	0.009*** (0.002)	-0.000 (0.004)	0.005*** (0.001)	0.005 (0.004)
Trade openness	0.008*** (0.001)	0.008*** (0.001)	0.008*** (0.001)	0.008*** (0.001)	0.008*** (0.001)	0.015*** (0.002)	0.013*** (0.003)	0.007*** (0.002)	0.001 (0.004)
Log Distance	-0.780*** (0.023)	-0.772*** (0.023)	-0.770*** (0.023)	-0.761*** (0.023)	-0.826*** (0.024)	-0.908*** (0.055)	-0.502*** (0.130)	-0.733*** (0.034)	-0.583*** (0.085)
Common Language	0.730*** (0.034)	0.720*** (0.034)	0.651*** (0.034)	0.639*** (0.035)	0.667*** (0.037)	0.343*** (0.075)	0.341** (0.155)	0.698*** (0.052)	0.569*** (0.126)
Colony	0.837*** (0.057)	0.836*** (0.057)	0.883*** (0.056)	0.884*** (0.056)	0.773*** (0.066)	1.141*** (0.123)	0.169 (0.236)	0.944*** (0.084)	0.552** (0.223)
South Africa	2.820*** (0.273)	2.801*** (0.273)	2.924*** (0.273)	2.896*** (0.274)	0.000 (.)	1.441** (0.596)	-0.097 (0.952)	3.766*** (0.419)	4.059*** (1.049)
BIT		0.098*** (0.033)		0.114*** (0.033)	0.384*** (0.039)	0.041 (0.069)	-0.031 (0.159)	0.197*** (0.050)	0.388*** (0.123)
TIP			0.512*** (0.052)	0.521*** (0.052)	0.345*** (0.056)	0.349*** (0.109)	-0.290 (0.232)	0.518*** (0.080)	0.776*** (0.191)
N	307,058	307,058	307,058	307,058	232,889	68,392	16,432	132,626	22,145

Standard errors in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

quadratic terms indicate small non-linearities in the effects. The odds ratios obtained by exponentiating the coefficients of *Common Language* and *Colony* imply that the choice of a destination country gets 2.08 times more likely if the countries share a language; and 2.31 times more likely by a colonial tie. The dummy for South Africa results as expected positive, significant and large in magnitude.

In columns (2)-(4), we add the our variables of interest, *BIT* and *TIP*, first individually and then jointly. Their coefficients result positive and significant, implying that the choice of a destination country is 1.10 times ($e^{0.098}$) more likely if the countries are involved in a BIT and 1.66 times ($e^{0.512}$) more likely by a TIP. When included jointly, the two coefficients remain significant and even slightly increase. These results support the argument that BITs and TIPs promote the choice of participating countries as destination for investments. Results are robust to removing South Africa from the choice set (Column (5)).

In Columns (6-9), we study the location choices of specific FDI functions: Manufacturing, Extraction, Services (i.e. Business Services and Market-Seeking), and Construction and Electricity. Interestingly, involvement in BIT only seems to promote the location choice for Services FDI (making the choice of the location 1.21 times more likely), and for Construction and Electricity, while it is insignificant for the other kinds of investments. Involvement in FTA matters for Services and Manufacturing investments, but not for Extraction investments. Indeed, our results suggest that Extraction investments respond mainly to natural resources endowment—in this case, fuel exports turn positive and significant—and less to other location factors such as investment agreements. Indeed, human capital variables are insignificant (insignificant effects of Urban Population share and Primary Enrolment) and demand seems to matter less (the coefficient of GDP growth is smaller and insignificant, the one of the log population is much smaller than for Manufacturing and Services). The effect of distance is also smaller and the one of variables proxying or the access to information (FDI stocks and Colonial ties) is insignificant. These results confirm the heterogeneity in the determinants of the location choice for specific MNE activities and extraction investments in particular. Moreover, our results are only confirming the previous findings by (Colen et al., 2016) with an important specification. Indeed, in line with their results, we find that the location choice is promoted by BIT mainly in business services and market-access FDI, which include real estate and financial services, i.e. sectors that are highly politically sensitive. We also find that FDI in Construction and Electricity respond positively, though weakly significantly, to the presence of BITs, in line with the interpretation that

BIT facilitate the location of FDI with a high risk of expropriation and high sunk costs. The categorization of FDI into MNE activities, however, allows for an important specification. Indeed, while extraction FDI can be expected to be characterised by high sunk costs and, potentially, by a high risk of expropriation, they do not seem to be responding to any kind of IIA but rather, and to the largest extent, to natural resources endowment in the destination. This seems rather obvious considering that FDI in extraction are bound to the availability of natural resources in the destination, which IIA cannot substitute for.

4 Conclusions

Using investment-level data, we address the hitherto relatively unexplored issue of the location determinants of FDI into Africa, allowing for heterogeneous effects by FDI function. We document a positive role of BIT and TIPs in promoting the location of FDI into African countries which is heterogeneous by FDI function. BIT and FTA appear very effective in promoting the location choice of FDI in Services and in Construction and Electricity, in line with previous literature arguing that FDI that are more subject to expropriation risk respond more to Bilateral Investment Treaties. Extraction FDI, instead, seem to be driven mainly by resource endowment considerations. Manufacturing investments significantly respond to FTA but not to BIT but their location determinants are aligned with the aggregate picture. A potential concern to our results is posed by endogeneity, and specifically by the risk of reverse causality. Further research should more directly address this issue.

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A Data Appendix

Data on the investments and their characteristics originate from *fDI Markets*¹, a comprehensive database of crossborder greenfield investments constructed by the Financial Times Intelligence Unit.

Data on BITs and TIPs are drawn from the UNCTAD Investment Policy Hub dataset, investmentpolicyhub.unctad.org.

With 44 countries and 8,283 investments, the potential choice set amounts to 381,018 ($8,283 \times 46$) observations. Missing data issues affecting some control variables (*Ores exports stock*, *GDP growth*, *Log Population*, *Urban Population Shares*, *Primary Enrolment*, *Trade Openness*) reduce the estimation sample to a maximum numerosity of 320,457.

We proxy for market size in the destination country by the *Log Population* and its growth potential by *GDP growth* (e.g. Morisset, 2000; Fiodendji and Evlo, 2015). On the side of costs, we include the share of mineral and metal exports on all merchandise exports at the beginning of the period (*Ores exports 2002*) to proxy for the availability of natural resources, (e.g. Asiedu, 2006; Ndikumana and Verick, 2008), the *Urban population share* in year t to proxy for labour force availability (Morisset, 2000; Lederman et al., 2010) and the *Primary Enrolment Ratio* in year t approximating the quality of the human capital (Suliman and Mollick, 2009)². As regards the fixed entry costs for a foreign investor, we include a measure of *Trade Openness* (constructed as the ratio of the sum of merchandise imports and exports to GDP) (e.g. Asiedu, 2002; Bartels et al., 2009). These variables are drawn from the World Development Indicators Database of the World Bank³. Furthermore, as a measure of the costs of doing business in the country, we draw from the UNCTAD 2018 World Investment Report⁴ the stock of inward FDI in country j in 2002 (*FDI stock 2002*), measured in billion US dollars; to proxy for institutional distance, we add the difference between the countries' *Rule of Law index* for year t drawn from the World Governance Indicators⁵. Finally, to account for preferential ties between country dyads, we include bilateral variables routinely included in the gravity literature (Head and Mayer, 2014), drawn from the CEPII dataset⁶: the *Log*

¹<https://app.fdimarkets.com/library/index.cfm>

²The ratio is calculated by dividing the number of students enrolled in primary education regardless of age by the population of the age group which officially corresponds to primary education, and multiplying by 100. Therefore, it can exceed 100 if students who are older than the standard age for primary education enrol in primary education.

³<https://datacatalog.worldbank.org/dataset/world-development-indicators>

⁴<https://unctad.org/en/Pages/DIAE/World%20Investment%20Report/Annex-Tables.aspx>

⁵<https://info.worldbank.org/governance/wgi/#home>

⁶www.cepii.fr

Table A.1: Destination countries of FDI

Country	FDI count	%*	Capital invest.**	Jobs created**
South Africa	1,843	22.25	51.69	128.12
Morocco	978	11.81	69.854	269.58
Egypt	780	9.42	206.03	277.50
Nigeria	579	6.99	181.30	230.11
Tunisia	428	5.17	65.68	228.81
Algeria	421	5.08	158.32	255.74
Kenya	414	5.00	33.17	106.40
Ghana	388	4.68	97.35	190.00
Mozambique	288	3.48	203.54	254.00
Tanzania	284	3.43	69.14	137.48
Uganda	222	2.68	70.80	112.01
Zambia	178	2.15	98.98	295.95
Ivory Coast	159	1.92	58.65	146.54
Ethiopia	146	1.76	128.76	416.01
Rwanda	140	1.69	53.32	89.71
Senegal	112	1.35	97.94	198.27
Mauritius	105	1.27	43.71	133.38
Namibia	99	1.19	82.26	213.85
Botswana	83	1.00	68.11	238.42
Cameroon	80	0.97	223.06	338.25
<i>Other</i>	<i>556</i>	<i>6.71</i>	<i>152.70</i>	<i>268.04</i>
Total	8,283	100.00	103.19	206.74

*Of total inward FDI into Africa, 2003-2017; **Average by country, 2003-2017. Source: FDI markets

distance, calculated as the great circle distance between the two countries' capitals, a *Contiguity* dummy equal to 1 if the countries share a common border and zero otherwise, a *Common Language* dummy equal to 1 if the two countries share a common language that is spoken by at least 9% of the population, and a *Colony* dummy equal to 1 if the two countries ever shared a colonial tie.

Table A.2: Number of IIA by location (first 20 countries)

FDI destination country (1)	BITs		TIPs	
	(2) Average number*	(3) % change 2003-2015	(4) Average number*	(5) % change 2003-2015
Egypt	68.53	0.16	107.13	0.39
Morocco	43.87	0.42	60.80	0.02
Tunisia	38.33	0.21	107.60	0.03
Algeria	27.07	0.76	101.27	0.36
Mauritius	20.67	1.15	78.00	0.00
Lybia	20.60	4.20	80.00	0.00
Ethiopia	18.80	2.00	78.00	0.00
Mozambique	17.60	1.63	105.87	0.01
Senegal	13.47	1.00	108.00	0.00
Sudan	13.27	0.17	107.00	0.00
Nigeria	13.20	1.14	108.00	0.00
Burkina Faso	13.07	1.00	108.00	0.00
South Africa	11.93	0.30	79.00	0.04
Cameroon	9.33	0.38	105.00	0.00
Ghana	9.00	0.00	79.00	0.00
Namibia	8.00	2.00	78.67	0.05
Zimbabwe	7.67	0.67	78.00	0.00
Tanzania	7.53	1.50	76.67	0.01
Mauritania	7.47	1.00	105.00	0.00
Gabon	7.07	3.50	106.00	0.00
<i>Whole sample**</i>	<i>10.50</i>	<i>103.71</i>	<i>89.10</i>	<i>2.40</i>

* Average number of dyads including the destination country that are tied by a BIT (column 2) or a TIP (column 4) over the 2003-2015 period. In the case of multilateral TIPs, one tie is counted for each couple in the group of the participating countries.

** Average ties over the 2003-2015 period, calculated on all countries in our sample.

Table A.3: Summary Statistics

Variable	Mean	Std. Dev.	Min	Max
Choice	0.03	0.16	0.00	1.00
BIT	0.23	0.42	0.00	1.00
TIP	0.64	0.48	0.00	1.00
TIP count	0.81	0.75	0.00	5.00
FDI stock	3.70	7.73	-0.28	35.88
FDI stock ²	73.45	238.78	0.00	1 287.73
Ores Export stock	10.83	18.73	0.00	73.87
Ores Export stock ²	468.28	1 243.90	0.00	5 456.90
Fuel Export stock	12.78	26.05	0.00	97.30
Fuel Export stock ²	842.10	2 391.52	0.00	9 467.47
Institutional Distance	1.48	1.05	-2.80	3.85
GDP Growth (%)	4.75	3.33	-17.00	18.87
Log Population	15.96	1.67	11.32	19.04
Urban Population Share	40.78	15.90	14.79	86.09
Urban Population Share ²	1 916.14	1 373.24	218.63	7 411.83
Primary Enrolment Ratio	101.60	19.55	39.51	149.31
Trade Openness	58.00	27.20	11.94	156.83
Log Distance	8.69	0.60	2.35	9.85
Common Language	0.29	0.45	0.00	1.00
Colony	0.09	0.29	0.00	1.00
South Africa	0.03	0.16	0.00	1.00

Observations: 307,058.

