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Evidence from selected African countries

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Which domestic firms benefit from FDI? Evidence from selected African countries

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Abstract

The existing literature on the effects of FDI inflows on domestic firms' performances offers ambiguous evidences. Macro-level studies suggest that the characteristics of inward FDI and the 'absorptive capacity' of the host economy matter in determining the sign (or the mere existence) of these effects. Studies based on micro-level data have so far mostly focused on finding a nexus between FDI inflows and the productivity of domestic firms, suggesting that the effects might be highly heterogeneous across domestic firms. One of the limits of existing studies in explaining the impact of FDI is the narrow focus on factors' productivity or spillover effects, making it difficult to rigorously disentangle the confounding effects of the multiple channels through which multinational enterprises might affect the host economy.

In this paper, using a recent firm-level survey conducted by UNIDO in 19 Sub-Saharan African countries, we analyse the main characteristics that can make domestic firms in Sub-Saharan Africa (net) 'winners' or 'losers' from the presence of FDI and explore the channels through which the multinational enterprises have an impact on the local firms: products' market, input availability and costs, access to finance, export opportunities. Finally, we analyse the strategic reactions of domestic firms induced by the presence of foreign affiliates.

Keywords: Foreign direct investment, spillovers, forward and backward linkages, Africa
JEL Code: F23, O14, O16, O55

1. Introduction

Inward investments from multinational enterprises (MNEs) might affect the host economy through several channels: (i) direct effects on the endowments and productivity of factors of production; (ii) demonstration effect whereby domestic firms 'learn by imitation' from foreign MNEs; (iii) forward and backward linkages with domestic firms; (iv) more intense competition in host country markets; (v) externalities, in particular spillover effects.

Although the literature on FDI impacts in developing countries has experienced a large acceleration in the last decades, the answers provided by the existing studies are often ambiguous. One of the likely causes of this ambiguity is the "narrow" focus on estimation of proxies related to "factor productivity" and/or "spillover effects". As highlight by critics of this approach (see Driffild and Jidra 2012), these studies often fail to disentangle in a rigorous manner the confounding effects of the multiple channels highlighted above.[1] In addition, although the productivity channel is clearly important, there is no guarantee that a domestic firm experiencing a positive effect on this channel will necessarily be a net winner from FDI (and vice versa, a firm experiencing a negative productivity effect will not necessarily be a net loser).

In this paper, thanks to the availability of a rich firm-level dataset generated by UNIDO on a large sample of firms from 19 Sub-Saharan African (SSA henceforth) countries, we contribute to the existing literature in two distinct ways. First, we are able to shed lights on the characteristics of domestic firms that either gain or lose from the presence of MNEs in their home markets. In contrast to the bulk of existing literature, we choose to exploit firms' self-assessment of the impact of foreign affiliates' presence on their overall business performance.[2] We do so by exploring specific channels through which these effects materialize. Second, we analyse the strategic reactions that domestic firms employ as a consequence of MNEs presence; this second part of the study allows us to search for evidence on the potential dynamic effects induced by the presence of foreign investors in the domestic economy. In fact, although the analysis on winners and losers from FDI is important for an assessment of short- to medium-run

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[1] The standard tool employed by recent empirical studies is the regression of some measures of domestic firms' total factor productivity (TFP) against a proxy which tries to capture the 'potential' externality from FDI as follows: $\ln(TFP_{it}) = a + \sum_{j=1}^{J} b_j X_{it} + c(FDIlink_{it}) + e_{it}$ where X_{ij} is a set of control variable and *FDIlink* is a measure of firm exposure/linkages with foreign affiliates. The main problem with this approach is that the estimated parameter *c* is the result of a "net" effect which includes, among other channels, spillovers and the data required to disentangle the multiple channels are seldom available to the researcher.

[2] To our knowledge the only paper which adopts a similar strategy using self-assessment of domestic firms on the impacts of FDI is Javorcik and Spatareanu (2005) which use survey data on Latvia and Czech Republic in 2003. The authors perform simple correlation analysis and confirm the relevance of an adverse competition effects for some domestic firms and of "knowledge transfer" from MNEs to domestic firms through demonstration effects and labour mobility.

costs and benefits associated with foreign investments, from a policy perspective it is equally (or even more) important to understand how domestic firms react to the presence of MNEs.

This paper is related to recent developments in international trade literature highlighting the differentiated effects of trade on heterogeneous domestic firms (Melitz 2003; Melitz and Redding 2012) and to a new strand of international economics literature which analyses the attitudes/perceptions of economic agents, mainly individuals, on "global interactions" such as trade and international migration and their respective policy preferences toward the regulation of these interactions (Facchini and Mayda 2008, 2011; Mayda 2006; Mayda and Rodrik 2005). This literature investigates the determinants of individuals' attitudes and policy preferences based on economic and non-economic factors that might affects net gains from trade and migration.

We find that larger, newly established and more productive domestic firms are more likely to benefit from interactions with foreign affiliates.[3] Inward FDI in SSA seem also to favour domestic firms with an upstream market orientation (suppliers of intermediate goods and services) rather than suppliers of final consumer goods (downstream market orientation). Direct supplier relationships with foreign affiliates boost the likelihood of domestic firms reporting overall gains from FDI. However, we find that the extent to which they benefit from these interactions depends mainly on the "quality" (as measured by established long-term relationships) instead of the sheer 'quantity' (number of foreign suppliers) of linkages. The net impact of FDI on domestic firms depends also – as emphasized by previous macro-level studies – on the macro-economic environment within which domestic and foreign firms operate. A higher quality of the business environment increases the likelihood of positive effects. A larger size of the manufacturing sector and a larger stock of FDI in the destination country are also associated with positive net gains. Finally, a better access to foreign markets, as proxied by the costs of exports over imports, seems to significantly increase the ability of domestic firms to reap the benefits from FDI inflows.

In terms of domestic firms' strategic reactions to the presence of foreign affiliates, we find evidence that a large number of domestic African firms react by "imitating" foreign firms, mainly by producing similar products and/or applying similar marketing strategies. Interestingly, in our study the self-reported "winners" from FDI inflows are more likely to be associated with the adoption of imitation strategies. On the contrary, the (net) losers from FDI

[3] These results are in line with Bekes et al (2006). The authors focus on spillovers from FDI to heterogeneous domestic firms and, using firm-level panel data for Hungary, find that the larger and more productive domestic firms are more able to reap the benefit from interactions with MNEs.

are more likely to remain idle, i.e. report not to react strategically at all, or react to the foreign presence by shifting to different (complementary) products. Although family business and small enterprises, that constitute the backbone of the economy of most African countries, are more likely to be net losers from FDI we find them to be strategically more responsive to foreign firms' entry than larger domestic firms. We also find some evidence that the size, and even more importantly, the 'quality' of linkages between domestic and foreign firms boost the likelihood of "learning by imitation". Our findings therefore suggest that FDI inflows play an important stimulus for structural change in SSA.

The paper is organized as follows. In *Section 2* we briefly summarize some of the existing evidence on FDI flows to SSA and their effects. In *Section 3* we analyse the characteristics of self-declared winners and losers from FDI inflows in a sample of SSA countries. *Section 4* is then devoted to the analysis of the strategic reactions that domestic firm employ due to the presence of foreign firms, while the final section concludes.

2. FDI and domestic firms in Sub-Saharan Africa

The African continent has attracted a modest share of FDI inflows over the last few decades. In 2009, the global share of FDI stock in Africa was a mere 2 percent with a net flow of FDI to the continent amounting to approximately 46 billions of US$ per year over the period 2009 to 2011. Although still of limited size, the inflows are becoming less and less concentrated compared to the recent past, both geographically as well as sectorally. In fact, less than a decade ago the five main receiving countries accounted for approximately 90 percent of total inflows, in 2011 this percentage has fallen to circa 50 percent with rising share of FDI aimed at non-extractive sectors such as light manufacturing and services (UNCTAD 2012).

The increase in the size (and geographical scope) of the flows is also due to a significant expansion of South-South FDI, in particular intra-African FDI flows along with those from emerging economies such as China, India and other Asian countries. In 2011, for the first time greenfield FDI inflows originating from other developing economies were higher than those originating from developed economies (42,6 versus 38,9 billions of US $; UNCTAD 2012).

The existing evidence on FDI effects in Sub-Saharan Africa is still rather limited and mainly confined to country-level analysis (Asiedu 2002 and 2006) or to specific case studies such as those on Chinese and Indian investments (Morrissey 2010).

Two recent papers focus on the linkages between foreign investors and local firms in Africa. Morrissey (2012) emphasizes the limited impact of FDI in Africa in terms of creation of

linkages and spillovers to the domestic economy. These limited effects are generally attributed to (i) a limited 'absorptive capacity' of domestic firms; (ii) a concentration of FDI inflows in the resource sector rather than in manufacturing or services; (iii) the presence of corruption and political instability which limits the inflows of market- and efficiency-seeking FDI. Amendolagine, Boly, Coniglio, Prota and Seric (2012), which use the Africa Investor Survey 2010 (the same database we employ in this paper), analyse the determinant of local linkages developed by MNEs in Sub-Saharan Africa. The authors find evidence of weak linkages between foreign affiliates and domestic firm in SSA which, to a large extent, can be explained by features such as the relatively recent "time of entry"[4] as well as the mode of entry (greenfield investments generate fewer backward linkages) and sectoral composition and motivation of foreign investors (market-oriented companies are more likely to source inputs from local suppliers). The authors also confirm the importance of the origin of FDI in terms of their potential to boost local linkages; in particular, they find statistically significant evidence of the reduced propensity of Chinese investors – which constitute the bulk of recent investment in several African countries - to generate local linkages.

Moreover, a report published by UNIDO in 2012 suggests that FDI inflows in SSA have produced an overall increase in sectoral productivity despite displacing some of the competing domestic firms, evidenced by a reported reduction in employment and wages. These negative first-layer effects on wages and employment are partly (and in some cases, completely) offset by more positive second-layer effects on domestic firms operating in other related sectors via forward and backward linkages.

Looking at the overall impact of FDI inflows in SSA, the effects appear to be heterogeneous across countries based on the UNIDO survey employed in our analysis. In *Table 1*, we report the percentages of firms experiencing positive, negative or no-effects due to the presence of foreign firms in their home markets.

[4] Merlevede *et al*. (2011) find a similar effect of time since entry of the foreign firm on the magnitude of spillovers on domestic firms.

Table 1 The net effects of inward FDI on domestic firm by country of origin in Sub-Saharan Africa

Country	*Positive*	*Negative*	*No effects*	*N. obs.*
Burkina Faso	41,1	26,0	32,9	*73*
Burundi	35,5	27,3	37,2	*121*
Cameroon	37,6	27,8	34,6	*133*
Cape Verde	33,1	31,6	35,3	*272*
Ethiopia	27,4	20,2	52,4	*431*
Ghana	27,7	31,9	40,4	*235*
Kenya	25,9	19,3	54,7	*316*
Lesotho	**7,8**	**39,2**	52,9	*102*
Madagascar	50,0	20,6	29,4	*102*
Malawi	44,0	25,3	30,7	*75*
Mali	25,6	25,1	49,2	*195*
Mozambique	**82,5**	**6,3**	11,1	*189*
Niger	24,6	29,2	46,2	*65*
Nigeria	37,7	23,0	39,3	*387*
Rwanda	27,8	24,1	48,1	*108*
Senegal	42,8	23,0	34,2	*152*
Tanzania	32,4	24,7	42,8	*299*
Uganda	25,8	27,3	46,9	*403*
Zambia	47,3	33,5	19,2	*203*
Sub-Saharan Africa	**34,4**	**24,9**	**40,7**	**3861**

Source: Authors' elaboration on UNIDO Africa Investor Survey 2010

The number of domestic firms who benefit from FDI is larger that those that experience negative effects (34,4 percent against 24,9 percent). Only in four countries the situation is reversed: Lesotho, Ghana, Niger and Uganda. In particular in Lesotho only 7,8 percent of the domestic firms surveyed experienced positive effects.[5] On the other side of the spectrum lies Mozambique where 82,5 percent of the firms experienced positive effects from FDI. The large differences across countries are likely to be driven by both domestic firms' characteristics and the different macro-economic environments within which both domestic and foreign firms operate. The aim of the next section is to address more in depth the characteristics of domestic firms who classify themselves as either winners or losers from FDI inflows.

[5] Most of the FDI inflows in Lesotho are concentrated in the textile and apparel sectors and are mainly related to the preferential agreement under the AGOA (Africa Growth and Opportunity Act) which induced a large flow of investments from Taiwan and Mainland China. An interesting paper by Lall (2005) highlights the weak local links created by these investors in the country and discusses the challenges based on the phasing-out of the quota system on Asian exports under the Multi-Fibre Agreement.

3. Who benefits from FDI?

3.1 Data description and empirical methodology

In this study, we employ firm-level data on domestic firms from 19 SSA countries collected by UNIDO through the Africa Investor Survey 2010[6]. The dataset allows us to identify "self-declared" winners and losers from direct or indirect interactions with FDI.[7] One potential drawback of the analysis might be associated with the fact that perceptions might be based on a general attitude toward MNEs rather than on real economic effects experienced by the firms. While this might be true in some cases, we argue that it is unlikely that non-economic / cultural attitude toward FDI might systematically bias firms' perceptions in such a way that economic effects are completely disregarded.

We estimate a probit model on the determinants of domestic firms' self-assessment on net effects stemming from FDI presence in their countries. *Table 2* reports some descriptive statistics on the covariates employed in the analysis including their expected sign on the dependent variable. We consider two sets of characteristics that have been highlighted in the theoretical and empirical literature as important explanatory factors concerning the impact of FDI on domestic firms' performance. The first set of covariates relates to domestic firm's characteristics (*size*, *age*, *market orientation*, *ownership structure*, *sector* and productivity levels) and the degree of direct interactions between foreign and domestic firms. We include these variables since they represent crucial determinants of the firms' ability to reap the potential gains from direct and indirect interactions with foreign multinationals. In particular, firm productivity is a key factor. We employ different proxies of firm productivity: *sales per employee* (log), the *exporter status* and the *multiproduct firm status*. These measures capture different dimensions of firms' 'absorptive capacity'. Given the importance of *direct competitive pressure* that a domestic firm might experience with the entry of foreign affiliates, we also

[6] UNIDO's main aim was to generate a rich information base with the view to assist Sub-Saharan Africa countries in the development of effective foreign investment promotion strategies. The database contains a rich set of information on approximately 7000 foreign and domestic firms operating in SSA. The sample was constructed in order to be representative of public and private for profit firms with 10 or more employees. An oversampling of relatively large firms (> 100 employees) was adopted. The survey covers agriculture, mining, manufacturing, utilities, construction and services. In the present study we exclusively focus on domestic firms.

[7] The questionnaire administered to domestic firms includes the following item: "*How do you rate the effect of the presence of foreign investors in this country on this company overall ability to compete in the market?*". Similar questions are asked for specific channels of potential interactions such as demand for the company's product, cost of labour, availability of inputs of production, access to finance and access to export markets. From these questions we build dummy variables equal to 1 if firms experiment positive or strongly positive effects and 0 for negative/strongly negative effects. We exclude from the analysis those domestic firms that declare "*no effect*", since these are likely to be domestic firms with very marginal interactions with foreign affiliates. Alternative codifications of the dependent variable have been used with no changes in the qualitative results of the analysis.

employ a dummy variable that is equal to 1 if the main competitor of the domestic firm is a foreign subsidiary operating in the country and 0 otherwise.

The second set of covariates includes characteristics of the home country, which might affect both the type of inward FDI (and in turn its effects on the host country economy) and the ability of local economic agents to benefits from foreign MNE presence in the country. In particular we control for the (economic) size of the host economy (as proxied by *GNI*), relative level of development (*GNI per capita*), the *size of the manufacturing sector*, the *size of inward FDI* and *international trade costs* incurred by firms (both domestic and foreign) as proxied by the cost of shipping a container in US$. In addition, we include a set of country-level covariates that capture the quality of the business environment and of the institutional framework (*corruption*, *strength of legal rights*, *time to resolve insolvency*).[8]

3.2 Estimation results

Table 3 reports marginal effects of the probit model for a set of baseline estimations where only firm-level characteristics are included. In columns (1) and (2) we respectively report estimates for domestic manufacturing and services firms by first excluding and then including sectoral- and country-level fixed effects.

[8] A recent study by Buchanan *et al.* (2012) highlights the importance of institutional quality for the level and volatility of FDI inflows.

Table 2 Which domestic firms benefit from FDI? Summary statistics

Variable	Description	Source (*)	Mean	St Dev	Expected sign
Net Positive Effects from FDI	Dummy variable = 1 if the company declares to experience positive effects from foreign firms operating in its country.	AIS 2010	0,58	0,49	*Dependent variable*
Firm size (employees)	Number of full-time employees	AIS 2010	33	1,6	+
Family business	Dummy variable = 1 if the company is owned by individuals or family	AIS 2010	0,45	0,5	-
Company age	Number of years of operation of the firm	AIS 2010	18,1	13,8	+/-
Productivity	Sales per employee, thousand US$	AIS 2010	3,41	5,01	+
Exporter	Dummy variable = 1 if the company is exporting	AIS 2010	0,18	0,38	+
Multiproduct firm	Dummy variable = 1 if the company offers multiple product/services	AIS 2010	0,68	0,47	+
Main competitors: FDI	Dummy variable = 1 if for the main product/service sold in the domestic market the main competitor is a foreign-owned firm based in the country	AIS 2010	0,17	0,37	-
Downstream market orientation	Dummy variable = 1 if the company is selling to the final consumer	AIS 2010	0,21	0,41	+/-
Foreign suppliers within the country (% share)	Share of foreign suppliers based in the country	AIS 2010	9,1	18,4	+
Foreign suppliers within the country (nr)	Number of foreign suppliers within the country	AIS 2010	1,5	6,7	+
Long-term foreign suppliers in the country (% share)	Foreign suppliers with long-term arrangements (% share of total)	AIS 2010	6,9	18,5	+
Foreign buyers within the country (% share)	Share of foreign buyers within the country	AIS 2010	9,0	17,1	+
Long-term foreign buyers in the country (% share)	Foreign buyers with long-term arrangements (% share of total)	AIS 2010	8,4	19,0	+
Self-financed	Dummy variable = 1 if the company initial investment was mainly financed by means of own funding	AIS 2010	0,62	0,48	-
GNI	GNI (current US$; 2008)	WDI - GDF	35,14	57,04	+
GNI per capita (PPP)	GNI per capita, PPP (current international $; 2008)	WDI - GDF	1,44	0,69	+/-
Manufacturing (value added share; %)	Manufacturing, value added (% of GDP); latest 2005-2008; Cape Verde 1999M Niger 2003	WDI - GDF	8,7	4,13	+
FDI inflows (last 5 years; % of GDP)	Foreign direct investment, net inflows (% of GDP); average 2004-2008	WDI - GDF	3,63	2,67	+
FDI stock (% of GDP)	Stock of inward FDI at current value (US $; millions)	WDI - GDF	24,16	16,74	+
Export costs	Cost to export (US$ per container); 2008	WDI - GDF	1822,7	742,5	-
Business environment quality	CPIA business regulatory environment rating (1=low to 6=high)	WDI - GDF	3,49	0,4	+
Time to resolve insolvency (years)	Time to resolve insolvency (years); 2008	WDI - GDF	2,99	0,92	-
Strength of legal rights index (0=weak to 10=strong)	Strength of legal rights index (0=weak to 10=strong); 2008	WDI - GDF	5,6	2,8	+
Corruption Index	CPIA transparency, accountability, and corruption in the public sector rating (1=low to 6=high); 2008	WDI - GDF	3,1	0,54	-
Access to bank credit	Firms using banks to finance investment (% of firms); 2007-2009	WDI - GDF	14,4	9,4	+

(*) AIS 2010 = Africa Investor Survey (UNIDO) / WDI – GDF = World Development Indicators – Global Development Finance (World Bank)

Table 3 Net effect of FDI presence on domestic firms: Winner or losers? A probit model

Dependent variable: Net effects from FDI in the country (1 = positive; 0= negative);	(1)	(2)	(3)	(4)	(5)	(6)
Firm size (employees)	0.0277***	0.0201**	0.0306**	0.0233*	0.0227	0.0366**
	(0.00887)	(0.00943)	(0.0143)	(0.0140)	(0.0139)	(0.0152)
Family business	-0.0937***	-0.0626***	-0.109***	-0.122***	-0.115***	-0.122***
	(0.0217)	(0.0218)	(0.0304)	(0.0298)	(0.0295)	(0.0321)
Company age	-0.00768**	-0.00987***	-0.00963**	-0.00726*	-0.0082**	-0.0095**
	(0.00302)	(0.00300)	(0.00428)	(0.00424)	(0.00417)	(0.00458)
Company age (squared)	0.000133**	0.000180***	0.000166**	0.000129	0.000141*	0.000156*
	(5.96e-05)	(5.89e-05)	(8.15e-05)	(8.08e-05)	(7.96e-05)	(8.72e-05)
Productivity (sales per employee, log)	0.00629***	0.00350*	0.00230	0.00164	-0.000781	0.00103
	(0.00187)	(0.00194)	(0.00333)	(0.00329)	(0.00356)	(0.00367)
Exporter	-0.0192	0.0600**	0.0877**	0.0953***	0.0873***	0.0976***
	(0.0281)	(0.0295)	(0.0343)	(0.0340)	(0.0337)	(0.0363)
Multiproduct firm	0.0266	0.0431*	0.0695**	0.0760**	0.0695**	0.0730**
	(0.0234)	(0.0234)	(0.0340)	(0.0335)	(0.0330)	(0.0361)
Main competitors: FDI	-0.0574**	-0.0680**	-0.0541	-0.0532	-0.0507	-0.0632
	(0.0260)	(0.0267)	(0.0412)	(0.0401)	(0.0396)	(0.0428)
Downstream market orientation	-0.0730***	-0.0480*	-0.0310	-0.0319	-0.0330	-0.0424
	(0.0259)	(0.0262)	(0.0340)	(0.0335)	(0.0331)	(0.0365)
Foreign suppliers within the country (% share)			0.00123			
			(0.000817)			
Long-term foreign suppliers in the country (% share)				0.00165**		
				(0.000780)		
Foreign suppliers within the country (nr)					0.000422	
					(0.00395)	
*Foreign suppliers * productivity*					0.00283*	
					(0.00166)	

Foreign Buyers within the country (% share)						0.000154
						(0.000945)
Sector dummy	*no*	*yes*	*yes*	*yes*	*yes*	*yes*
Country dummy	*no*	*yes*	*yes*	*yes*	*yes*	*yes*
Manufacturing only	no	no	yes	yes	yes	yes
Observations	2,128	2,054	1,039	1,065	1,087	906
Pseudo R-square	0,03	0,09	0,11	0,11	0,11	0,12

Note: Marginal effects are reported in the table (Baseline model prob: .575) Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

The results indicate that newly established and larger domestic firms have a higher probability of experiencing positive effects from FDI interactions. We find evidence of a non-linear effect of firm age. Family business are more likely to be net loser from FDI although the magnitude of the effect is not large (6,3 percent at mean values). As expected, when domestic firms directly compete with foreign firms the likelihood of positive effect from FDI is lower. We find that domestic firms with an upstream market orientation are more likely to experience gains from FDI compared to domestic firms which serve the final consumers. This effect becomes insignificant once we control for the existence of linkages with foreign firms (columns 3-5). Backward linkages, i.e. the purchase of intermediate inputs from foreign firms operating in the country, are associated with net positive gains from FDI only in the case of long-term supply relationship. This evidence seems to suggest that the existence of mere linkages is not a sufficient condition for gains; instead, it is the "quality" of linkages, proxied by the existence of a long-term relationship, that matters. Finally, we find evidence that more productive domestic firms are more likely to be 'winners' from FDI inflows. In particular, domestic firms with exporter status have a higher likelihood of experiencing positive effects from FDI.

In *Table 4* we include in the regressions host-country level characteristics. It follows that firms located in relatively larger SSA economies, featuring a larger manufacturing base, are more likely to experience positive net effects from FDI. Interestingly we find that domestic firms in relatively poor countries are more likely to gain from interaction with foreign firms. This effect might be due to the fact that the larger is the "technology gap", the higher is the marginal return to interactions with foreign firms. In this respect Blalock and Gertler (2009) find that

Indonesian manufacturing domestic firms with a larger "technology gap" – i.e. firms that are more far away from the international best-technological frontier – benefits more from FDI.[9]

The size of FDI inflows is also associated with a higher probability for domestic firm to benefit from foreign presence. A better access to foreign markets, proxied by the value of export costs, is also associated with an increase in the likelihood of net gains for domestic firms.

Table 4 Net effect of FDI presence on domestic firms: the role of host-country characteristics

Dependent variable: Net effects from FDI in the country (1 = positive; 0= negative)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
				Firm level covariates			
Firm size (employees)	0.0262***	0.0264***	0.0241***	0.0223**	0.0189**	0.0219**	0.0204**
	(0.00915)	(0.00915)	(0,00912)	(0.00917)	(0.00950)	(0.00916)	(0.00921)
Family business	-0.0742***	-0.0750***	-0.0746***	-0.0748***	-0.0750***	-0.0728***	-0.0728***
	(0.0219)	(0.0220)	(0,0218)	(0.0218)	(0.0230)	(0.0218)	(0.0218)
Company age	-0.00959***	-0.00950***	-0.00913***	-0.00933***	-0.00892***	-0.00944***	-0.00900***
	(0.00302)	(0.00302)	(0,00301)	(0.00301)	(0.00317)	(0.00301)	(0.00301)
Company age (squared)	0.000174***	0.000172***	0.000166***	0.000168***	0.000166***	0.000172***	0.000162***
	(5.95e-05)	(5.94e-05)	(0,0000592)	(5.92e-05)	(6.21e-05)	(5.91e-05)	(5.92e-05)
Productivity	0.00561***	0.00563***	0.00551***	0.00548***	0.00486**	0.00524***	0.00510***
	(0.00195)	(0.00195)	(0,00194)	(0.00194)	(0.00212)	(0.00194)	(0.00195)
Exporter	0.0392	0.0390	0,0418	0.0395	0.0426	0.0399	0.0415
	(0.0300)	(0.0300)	(0,0298)	(0.0298)	(0.0302)	(0.0298)	(0.0298)
Multiproduct firm	0.0410*	0.0412*	0.0389*	0.0363	0.0417*	0.0408*	0.0368
	(0.0236)	(0.0236)	(0,0236)	(0.0236)	(0.0247)	(0.0236)	(0.0235)
Main competitors: FDI	-0.0752***	-0.0762***	-0.0771***	-0.0741***	-0.0648**	-0.0759***	-0.0728***
	(0.0265)	(0.0265)	(0,0264)	(0.0264)	(0.0279)	(0.0264)	(0.0264)
Downstream market orientation	-0.0566**	-0.0552**	-0.0606**	-0.0621**	-0.0696**	-0.0630**	-0.0615**
	(0.0263)	(0.0262)	(0,0262)	(0.0262)	(0.0274)	(0.0262)	(0.0262)
				Destination country covariates			
GNI	0.00205***	0.00195***	0.00161***	0.00227***	0.00195***	0.00272***	0.00255***
	(0.000300)	(0.000299)	(0.000323)	(0.000468)	(0.000520)	(0.000493)	(0.000485)

[9] Note that existing evidences suggests that the larger the technological gap between foreign affiliates and domestic firms the lower is the likelihood of linkages between them. This finding hold also for SSA as showed in a recent paper by Amendolagine et al (2012). It is important to notice that domestic firms might learn from foreign affiliates, and hence experience positive effects from FDI, even in the absence of linkages; the learning potential will be higher the larger is the technology gap. In our estimates we explicitly control for the linkages of domestic firms with foreign affiliates.

GNI per capita (PPP)	-0.455***	-0.450***	-0.409***	-0.581***	-1.213***	-0.481***	-0.587***
	(0.0875)	(0.0885)	(0.0884)	(0.125)	(0.320)	(0.130)	(0.125)
GNI per capita (PPP) squared	0.0868***	0.0886***	0.0661***	0.108***	0.352***	0.0777**	0.112***
	(0.0219)	(0.0217)	(0.0225)	(0.0310)	(0.117)	(0.0328)	(0.0309)
Manufacturing base	0.0205***	0.0187***	0.0154***	0.0205***	0.0109*	0.0215***	0.0231***
	(0.00353)	(0.00362)	(0.00381)	(0.00461)	(0.00625)	(0.00462)	(0.00476)
FDI inflows (last 5 years; % of GDP)	0.0110**		0.0167***	0.0147**	0.0352***	0.0193***	0.00775
	(0.00546)		(0.00562)	(0.00571)	(0.0117)	(0.00593)	(0.00664)
FDI stock (% of GDP)		0.00143*					
		(0.000765)					
Export costs			-0.0676***				
			(0.0179)				
Business environment quality				0.0826*	0.155***	0.113**	0.108**
				(0.0427)	(0.0582)	(0.0441)	(0.0444)
Time to resolve insolvency (years)					0.0689***		
					(0.0227)		
Strength of legal rights index						-0.0161***	
						(0.00587)	
Corruption							-0.00146**
							(0.000709)
Observations	2,054	2,054	2,054	2,054	1,833	2,054	2,054
Pseudo R-square	0,06	0,06	0,08	0,06	0,08	0,07	0,07

Note: Marginal effects are reported (Baseline model prob: .575); sector dummies and constant included; Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

It is interesting to note that, although a better business environment is associated with a higher likelihood of gains from FDI, other variables measuring the quality of institutions seems to play in a different direction. We find evidence that the more inefficient is the judicial and legal system (proxied by the number of years needed to solve insolvency and an index of the strength of legal rights) and more widespread is the corruption the more likely is that domestic firms benefit from FDI. Two possible interpretations of this effect might co-exist. On the one side, in a macro-economic context where contracts are weakly enforceable interactions with foreign firms might be seen as more reliable and in turn more profitable for domestic enterprises. On the other side, in weak institutional environment the benefits from FDI for domestic firms might be due to a more 'extractive' behaviour of domestic firms at the expenses of foreign ones due to a lower probability of punishment.

Some interesting additional results emerge by looking at more specific channels of interactions between foreign and domestic firms through which gains or losses might materialize. In *Table 5*, we look at the probability for a domestic firm either to benefit or lose from FDI by focusing on four different channels of interaction rather than at net overall effects, namely: (i) market demand; (ii) availability of inputs and raw materials; (iii) access to capital; (iv) access to export markets. We find that the firm- and host country- level covariates highlighted above seem to be strongly relevant only for some specific channels. One exception is domestic firm productivity which positively affects the probability of experiencing gains for most channels of interactions.

Table 5 Net effect of FDI presence on domestic firms: the role of host-country characteristics

Dependent variable: effects from FDI in the country on specific channels reported at the top of each column (1 = positive; 0= negative)

	Market demand	Availability of inputs and raw materials	Access to finance	Access to export markets	
	(1)	(2)	(3)	(4)	(5)
		Firm level covariates			
Firm size (employees)	0.0296**	0.0140	0.0429***	0.0332***	0.0258*
	(0.0140)	(0.0157)	(0.0117)	(0.0116)	(0.0154)
Family business	-0.0490	-0.0909***	0.0222	-0.00140	0.0133
	(0.0303)	(0.0345)	(0.0277)	(0.0279)	(0.0358)
Company age	-0.0129***	-0.00113	-0.0105***	-0.0102***	-0.00588
	(0.00418)	(0.00486)	(0.00378)	(0.00372)	(0.00485)
Company age (squared)	0.000236***	7.24e-05	0.000201***	0.000186***	0.000101
	(7.95e-05)	(9.36e-05)	(7.44e-05)	(7.22e-05)	(9.25e-05)
Productivity	0.00923**	0.00756*	0.00474**	0.00665***	0.00853**
	(0.00374)	(0.00413)	(0.00215)	(0.00232)	(0.00355)
Exporter	0.00151	0.0127	-0.00366		
	(0.0342)	(0.0393)	(0.0366)		
Multiproduct firm	0.0870***	0.0397	-0.0258	0.0389	0.0496
	(0.0328)	(0.0384)	(0.0286)	(0.0285)	(0.0378)
Main competitors: FDI	-0.0393	-0.0482	-0.0415	0.0309	0.0463
	(0.0414)	(0.0470)	(0.0336)	(0.0345)	(0.0482)
Downstream market orientation	0.0196	0.00824	-0.0385	-0.0843**	-0.0862**
	(0.0328)	(0.0387)	(0.0331)	(0.0337)	(0.0395)
Long-Term Foreign buyers (% share)	0.00190**				
	(0.000786)				
Foreign Suppliers within the country (% share)		0.0020**			

		(0.00091)			
Self-financed firm (financial source for initial investment)			-0.0495*	-0.0644**	
			(0.0278)	(0.0274)	
Long-Term Foreign suppliers in the country (% share)					0.00159*
					(0.000864)
Destination country covariates	Market demand	Availability of inputs and raw materials	Access to finance	Access to export markets	
	(1)	(2)	(3)	(4)	(5)
GNI	0.00274***	-0.000205	0.000372	-0.000115	-4.34e-05
	(0.000710)	(0.000790)	(0.000617)	(0.000615)	(0.000795)
GNI per capita (PPP)	-0.938***	-0.0445	0.0168	-0.0890	-0.0732
	(0.233)	(0.264)	(0.180)	(0.195)	(0.288)
GNI per capita (PPP) squared	0.237***	0.0272	-0.0424	0.0244	0.0104
	(0.0655)	(0.0751)	(0.0515)	(0.0565)	(0.0831)
Export costs	9.02e-06	2.05e-05	-3.86e-05	-6.93e-05***	-5.70e-05*
	(2.71e-05)	(3.20e-05)	(2.63e-05)	(2.43e-05)	(3.06e-05)
Manufacturing (value added share; %)	0.0472***	0.00143	-0.0385***	-0.0367***	-0.0450***
	(0.00922)	(0.0102)	(0.00835)	(0.00779)	(0.00996)
FDI inflows (last 5 years; % of GDP)	-0.0301**	-0.00787	0.0169	0.0102	0.00439
	(0.0136)	(0.0156)	(0.0124)	(0.0121)	(0.0167)
Business environment quality	0.137*	-0.0310	0.146**	0.275***	0.245***
	(0.0737)	(0.0866)	(0.0599)	(0.0625)	(0.0849)
Strength of legal rights index (0=weak to 10=strong)	-0.0147	-0.0162	-0.00493	-0.0136*	-0.0116
	(0.00966)	(0.0112)	(0.00765)	(0.00737)	(0.0110)
Corruption (informal payments to public officials; % of firms)	0.130***	-0.00966	-0.205***	-0.283***	-0.225***
	(0.0447)	(0.0520)	(0.0468)	(0.0414)	(0.0524)
Access to bank credit	-0.0195***	-0.00605	0.0208***	0.00692	0.00996
	(0.00501)	(0.00589)	(0.00482)	(0.00483)	(0.00632)
Sector dummy	*yes*	*yes*	*yes*	*yes*	*yes*
Manufacturing only	yes	yes	yes	no	yes
Observations	1,062	838	1,359	1,350	795
Pseudo R-square	0,08	0,05	0,07	0,10	0,12

Note: marginal effects are reported; sector dummies and constant included;
Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

It is worth noticing that interactions with foreign affiliates seem to boost the ability of firms to access foreign markets. This is particularly the case for large domestic firms with an upstream market orientation, i.e. intermediate goods suppliers, which are less credit constrained (proxied

by the main source of initial investment) and that operate in countries characterized by a good business environment and relatively large manufacturing base. This finding suggests that foreign firms in SSA might play an important role as facilitators of the often prohibitively costly access to foreign markets.

Domestic suppliers of foreign firms, as expected, are more likely to be associated with a higher probability of benefitting from an expansion in demand (column 1). Forward linkages, defined as relationships between domestic buyers and foreign suppliers, increase the availability of inputs and raw materials (column 2) along with the likelihood of domestic firms gaining access to opportunities in foreign markets (column 5). To proxy for the existence of credit constraints, in column 4 we introduce a dummy which is equal to 1 if self-financing is the main source for initial investment of the domestic firms and 0 otherwise. We find that this co-variate is associated with a negative effect on the probability of benefiting from FDI in terms of better access to finance and export markets.

Overall the results suggest a strongly heterogeneous effect of foreign presence on domestic firms; both the characteristics of firms and of the macroeconomic environment of the host country matter in explaining the likelihood of observing "winners" or "losers" from FDI inflows. In addition, from a policy perspective, they lend support to policies aimed at boosting the ability of domestic firms to create linkages with foreign multinationals and, more generally, to policies which favour the development of a good and well-functioning business environment.

4. Winners versus losers: the strategic reactions of domestic firms

In this section we explore the strategic reactions of domestic firms to the presence of MNEs. The dynamic effects induced by the presence of foreign MNEs - most of whom may be at the same time competitors, buyers and suppliers to the domestic firms - are crucial for understanding the structural change engineered by FDI inflows. In particular, it is important to understand which firm characteristics are more likely to be associated with alternative reaction strategies and, in addition, whether self-declared winner and losers from FDI inflows differ in terms of the type of strategies that they put in place.

A first look at the strategic reactions of domestic firm in SSA is reported in *Table 6*.[10] A rather large percentage of domestic firms adopts an 'imitation' strategy such as the production of

[10] Note that the number of observations in the second column, all firms, is larger than the sum of winners and losers since it also includes those domestic firms which have declared themselves to experience no effects from the presence of foreign firms.

similar products (29,5 percent), of similar marketing strategies and methods (28,1%) or similar production technologies (15,5 percent). Winners from FDI, that is firms experiencing positive net effects from the presence of foreign firms in their home countries, are generally more likely to 'imitate' than losers. In the case of SSA countries it is, therefore, the concept of imitation, whether actively supported or not by foreign entrants, that creates the main channel through which technology transfers take place.

Table 6. **How do domestic firm react to the presence of foreign affiliates in their countries?**

Type of strategy	**All firms [(1)]**	**Winners**	**Losers**
Production of similar products	29,5%	37,9%	31,2%
Adopt similar production technologies	15,5%	17,7%	19,6%
Adopt similar marketing strategies and methods	28,1%	35,7%	30,9%
Recruit key employees from foreign investors	6,4%	9,2%	6,7%
Buy licence or patents from the foreign firm	3,9%	5,0%	3,0%
Produce different products to avoid competition	22,8%	25,2%	27,5%
Produce complementary products	21,2%	25,3%	21,9%
No strategic reactions	38,8%	24,7%	33,9%
Observations	*3723*	*1260*	*899*

Source: authors' elaboration on UNIDO Africa Investor Survey 2009

Note: [(1)] Includes domestic firms which experience no effects from the presence of foreign firms.

A significant number of domestic firms (circa 23 percent) have adopted strategies aimed at 'avoiding competition' by shifting production towards different market segments. We find that those firms who experience net negative effects from FDI are more likely to adopt what we call '*fly-away*' strategy. At the same time, the presence of foreign firm is leading a considerable number of domestic firms to embrace a '*fly-closer*' strategy with a shift of the core business toward the production of complementary products (circa 21 percent of firms). Even though both strategies contribute to structural change of the domestic economy, it is expected that the more defensive '*fly-away*' strategy is less likely to bring substantial benefit to the domestic economy. On the contrary, an active effort to contract with the foreign firms as anticipated under the '*fly closer*' strategy might allow domestic firms to tap into the global value chains developed by the foreign MNEs.

Finally, a large share of domestic firms reports not to have any strategic reaction to foreign firms' entry (39 percent). As expected, the percentage of 'passive' firms is significantly smaller for 'winners' (25 percent). From a policy perspective the absence of any reaction from 'losers' is an aspect that should be taken into consideration.

In order to go beyond this simple cross-tabulation of strategies, we investigate, using a bivariate probit model,[11] which characteristics both at firm- (including the winner/loser status) and at country-level are more likely to be associated with the set of strategic reactions described above.[12]

In *Table 7* we report a summary of the effects of some selected covariates on the probability of adopting the alternative strategies[13]. The adoption of 'copying' strategies is more likely to be observed among those firms which declare to have experienced positive effects from FDI, although we are not able to clearly disentangle the determinants of causality. It is interesting to notice that, conditional on the status being either self-declared winner or loser, smaller and family owned domestic firms, which constitute the backbone of the African economy, seem to be more likely to adopt imitation strategies: a change in firm size from 1 standard deviation above to 1 standard deviation below the mean is associated with, *ceteris paribus*, a 10 percent increase in the probability of domestic firms' adopting an imitation strategy. Both, the quantity and quality of linkages with foreign suppliers are positively associated with a higher probability of imitation. On the contrary, only consolidated long-term linkages with foreign buyers seem to promote this imitation strategy by domestic firms. Among country-level covariates only the host-country relative level of development seems to be significantly associated with the implementation of imitation strategies. Although firm productivity significantly affects the likelihood of being a 'winner', we find no evidence of direct effects on the probability of copying products or production and organizational processes from foreign firms.

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[11] Given the lack of information on the temporal dimension of interactions with foreign firms and on the timing of the strategies implemented by domestic firms we are not able to infer causal effects in this analysis. The reaction strategies adopted by domestic firms depend on the effective (or perceived) impact of foreign subsidiaries. At the same time, the kind of strategies adopted will determine whether a firm is a winner or a loser from FDI (endogeneity of the winner/loser status). We adopt a bivariate probit of the following equations: $Y_i = 1\left[\left(W_i d + X_i b\right) > \upsilon_i\right]; W_i = 1\left[\left(Z_i g\right) > \varepsilon_i\right]$ where $(\upsilon, \varepsilon) \sim N(0, \Sigma)$ and Y_i is the strategy j adopted by firm i and $W_i = 1$ if firm i experiences positive effects from FDI (winner status).

[12] In what follows we merge in a single category, called "copying strategy" the three different forms of imitation of foreign firms listed in *Table 6* (production of similar products, adoption of similar production technology and adoption of similar marketing strategies and methods).

[13] The bivariate probit estimates and marginal effects are available upon request from the authors.

Table 7 FDI inflows: Strategic reactions of domestic firms(1)

	Imitation strategy	**Produce different products**	**Produce complementary products**	**No strategic reactions**
Positive effects from FDI (**winner**)	+	–	–	–
Firm Size	–	+	ns	+
Family Business	+	–	–	ns
Productivity	ns	ns	ns	ns
Interactions with foreign buyers	– (size) + (quality)	ns	+ (quality)	– (quality)
Interactions with foreign suppliers	+ (size) + (quality)	+ (quality)	ns	– (size) – (quality)
Firm age	+	ns	ns	–
Destination country level of development	+	–	ns	–
Baseline probability (bivariate probit)	*.54*	*.34*	*.29*	*.20*
FDI winner = 1	*.77*	*.16*	*.15*	*.10*
GNI pc PPP = Burundi (390 US$)	*.36*	*.44*	..	*.30*
GNI pc = Cape Verde (3410 US$)	*.53*	*.37*	..	*.35*

(1) Summary table on the sign of selected firm-level and country level characteristics on the probability of adopting alternative strategies based on bivariate probit estimates (see footnote 10).

It is important to notice that self-declared 'losers' from FDI are more likely to be 'passive' (that is adopt no strategic reactions at all) or to shift production toward more markets that are less contested by foreign competitors. The analysis suggests that these more passive and defensive attitudes are more likely to be observed in relatively poorer countries. Note also that linkages with foreign firms are negatively associated with the 'no strategic reaction' option. The latter finding in particular seems to lend support to policy measures aimed at boosting linkages between foreign and domestic firms.

5. Concluding remarks

Foreign Direct Investments are widely considered as a fundament ingredient for growth and structural change in poor developing economies. So far the empirical literature has mainly focussed on finding support to the existence of spillovers from foreign affiliates to domestic firms. The quest for finding FDI spillovers in developing countries, and particularly in Africa, has so far been rather unsatisfactory. Acknowledging the fact that FDI inflows produce

important effects which go beyond spillovers or externalities, in this paper we focus on examining the net effects that the presence of foreign investors generate in the domestic economy by enlarging the analysis to the multiple ways by which the presence of foreign affiliates might affect domestic firms.

Our results indicate that the effects of FDI inflows on domestic firms in Sub-Saharan Africa are strongly heterogeneous across countries and that the large observed differences are determined by both domestic firms characteristics and the different macroeconomic environment within which domestic and foreign firms operate. In particular, large, newly established and highly productive domestic firms are those more likely to benefit from interactions with foreign affiliates ('winners').

In addition, FDI inflows in Africa are contributing to structural change by modifying the behaviours of domestic economic agents. Indeed, as a consequence of the presence of foreign investors, domestic firms put in place alternative strategic reactions: the status of 'winners' from FDI inflow is more likely to be associated with the adoption of imitation strategies, while domestic 'losers' from FDI are more likely to employ no strategies or react to the foreign presence by shifting to different (or complementary) products.

From a policy perspective, our results suggest that in designing attraction policies policy-makers in developing countries should consider not only the short-run costs and benefits of foreign investments (including distributional effects on domestic firms) but also their medium to long term dynamic consequences. Our results lend also support to policies aimed at boosting the ability of domestic firms to create linkages with foreign multinationals and, more generally, to policies which favour the development of a good and well-functioning business environment.

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