Multinationals in sub-Saharan Africa: Domestic linkages and institutional distance

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Acknowledgements

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Abstract

This paper analyses the role of institutional distance in the establishment of domestic linkages by multinational enterprises in a cross- section of 19 sub-Saharan countries. Investors' familiarity with formal and informal procedures in the host country reduces uncertainty and facilitates networking with local firms. A similar degree of institutional development boosts linkages between domestic firms and multinationals. Using a novel dataset from the 2010 Africa Investor Survey published by UNIDO, we find that institutional distance carries more weight for multinationals from the north and is conditional on the degree of attractiveness of local sourcing. The paper contributes to the emerging literature on the role of institutions for the development of inter-firm linkages and to the relatively scarce literature on South-South FDI in least developed countries and thus contributes to the definition of clearer targets for foreign investment policies.

1.   Introduction

The establishment of domestic linkages by multinational enterprises (MNEs) and their relevance in promoting industrial development has been the focus of numerous academic studies and is a common target of investment policies. There is a common consensus that linkages between foreign affiliates and domestic firms can enhance the benefits from FDI (UNCTAD, 2001). In this regard, local sourcing is seen as a mutually beneficial outcome with local firms benefitting from higher demand and employment, as well as potential technology transfers and MNEs from lower costs, specialization gains and better adaptation to the local market. A good understanding of the factors that drive multinationals to source locally is therefore crucial for the design of adequate investment policies. While literature on the subject has traditionally focused on the analysis of foreign investor characteristics that boost local linkages, no study has specifically examined the impact of host country institutions on the domestic linkage. We aim to fill this gap and argue that the relevance of host country's institutions is not necessarily the same for all investors since the *home country's* institutional background plays a crucial role in this regard as well. Building on the literature on South-South[1] FDI flows, we introduce the concept of *institutional distance* between the home and host country as a decisive factor in determining the domestic linkage. Thereby, we also contribute to the fairly scarce literature on South-South FDI which, inspired by the remarkable rise in multinationals from emerging countries (henceforth southern multinationals), looks at the special characteristics and effects of South-South vs. North-South flows.

We further develop these ideas in the following subsections while reviewing the literature on each factor.

1.1   What drives domestic linkages?

Literature on the determinants of backward linkages and FDI has identified a number of drivers behind multinationals' decision to source from local suppliers. One way of approaching this issue is to classify the drivers into two main categories: 1) factors relating to the characteristics of the foreign investor, and 2) those relating to the host country's institutional environment. While the bulk of the literature has thus far focused on the first and second type of drivers, little attention has been paid to the impact of the host country's institutional quality on MNEs' local sourcing decision. However, as has been traditionally reported in the literature on transaction costs, institutions play a key role in shaping inter-firm relationships (North, 1992) and hence,

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[1] "North" refers to industrialized countries and "South" to developing economies as defined in The International Yearbook of Industrial Statistics (UNIDO, 2010).

we argue that they necessarily have an impact on the interactions between MNEs and local suppliers.

Several foreign *investor characteristics* have been identified as determinants of domestic linkages in the economic development and international management literature. In this regard, evidence has been found on the significant role type of investment plays, where market seeking FDI tends to benefit from long-term and more stable relationships with suppliers relative to resource seeking, efficiency seeking or asset seeking FDI (Dunning and Rojec, 1993). MNEs' *ownership structure* is also identified as a linkage determinant, with joint ventures establishing more linkages than fully owned subsidiaries (Belberdos et al., 2001; Kiyota et al., 2007; 2008). The third driver is the *subsidiary's autonomy*, with more independent subsidiaries sourcing more locally (Jindra et al., 2009). An additional linkage driver is the geographical distance between the home and host economy. In other words, the farther the distance, the higher the trade costs and consequently, the more profitable it is for the multinational to source locally (Rodriguez and Clare, 1996). Consistent empirical evidence of these four drivers has been found for sub-Saharan African in Amendolagine et al. (2013), also using the UNIDO Africa Investor dataset.

Next, we turn to the second type of drivers and focus of our analysis, namely the *institutional determinants* of MNEs' local sourcing decision. As stated in the literature on transaction costs (North, 1991; 1992), one key function of governance institutions[2] is to make it possible for economic agents to better cope with the uncertainties involved in economic exchange as "they provide the rules of how exchanges are to be made and the mechanisms enforcing them". When a foreign investor operates in a new country, the investor faces higher transaction costs relative to the home country due to the lack of information about the local market and supplier networks. Furthermore, the investor faces higher uncertainty in terms of local supplier reliability and the quality of inputs. Therefore, a good institutional framework which, for example, guarantees contract enforcement and transparency, reduces foreign investors' perceived risk and facilitates linkages with local suppliers. In developing economies, where relatively weak institutions (as perceived by the foreign investor) might discourage the establishment of domestic linkages (UNCTAD, 2001), this factor assumes a particularly important role. This is the case in sub-Saharan Africa, where corruption and political instability strongly and negatively affect FDI inflows (Asiedu, 2006).

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[2] Strictly speaking, institutions are the instruments of governance and good institutions support and promote good governance. Although the two terms are not exactly the same, they are often used as synonyms.

Although the impact of host country institutions on the size, composition and type of FDI flows has been extensively explored at the macro level[3], their role as a domestic linkage driver has largely been ignored in the empirical literature. To the best of our knowledge, the only study that directly includes an institutional variable as a local linkage determinant is the study by Amendolagine et al. (2013) who found evidence that a host country's ability to guarantee contract enforcement influences the extent of domestic linkages established.

We take the analysis of the impact of host country institutions on domestic linkages one step further and argue that the relevance of the host country's institutional quality for foreign investors' local sourcing decision might not necessarily be the same for all investors, because the *home country's* institutional environment plays a crucial role in this regard as well. That is, institutional proximity makes it easier for the multinational to cope with the new environment by facilitating labour relationships and networking with local firms. Such multinationals will therefore perceive interactions with the local manufacturers as less risky. Putting it in terms of transaction costs, a foreign investor faces lower uncertainty if the procedures and rules governing economic exchange in the home country are similar to those in the host country. In other words, the larger the *institutional distance* between the host and the home country, the higher the transaction costs for the foreign investor and hence, the less likely the interaction with domestic suppliers. This assertion and the notion of *institutional distance* directly relate to the special features of South-South FDI flows and its effects on the host country.

1.2   What is special about southern multinationals?

Outward foreign direct investment (FDI) from developing economies has increased considerably in the last decade. According to UNCTAD (2013), FDI from developing and transition economies accounted for 31 percent of total outflows in 2012. It has also been observed that these new *emerging multinationals* tend to locate their investments in other developing economies, giving rise to the so called South-South FDI flows. The determinants and location patterns of this new form of investment differ from those traditionally identified in the literature on North-South flows. Thus, the effects on the host country might also differ from the usual ones. In fact, cultural and institutional proximity have often been specified as a comparative advantage specific to South-South investors, which can promote linkages and generate positive externalities to the local economy.

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[3] See, for example, Zurawicki and Habib (2010), Cuervo- Cazurra (2006), Asediu (2006), Wei (2000), Javorcik and Wei (2001). Broadly speaking, empirical evidence is consistent in showing that deficient institutions deter FDI inflows, promote joint ventures over fully owned subsidiaries and attract more resource seeking FDI.

When analysing the effects of South-South relative to North-South investment flows, the notion of *institutional distance* has remarkable implications. Despite its relevance, the idea of institutional distance is relatively new and has only been explored at the macroeconomic level. For instance, Cuervo- Cazurra (2006) analyses bilateral FDI flows from 183 origin countries to 106 host economies and finds that corruption reduces FDI inflows but also changes the composition in terms of country of origin. He arrives at two major conclusions: first, there are fewer flows from the countries that have signed the OECD convention against corruption[4] and secondly, there are larger flows from countries with higher levels of corruption. These results imply that not all investors are concerned about corruption in the host country to the same extent and suggests a role for institutional distance, even though the author does not explicitly introduce this concept until a later study (Cuervo-Cazurra and Genc, 2008). The paper focuses on the South-South dimension of FDI and concludes that although emerging MNEs may be disadvantaged in terms of size, technology and management skills relative to more developed MNEs, their ability to cope with poor institutions might actually turn out to be an advantage when the degree of institutional development in the investment destination is similar to that in their home country.

In a similar fashion, Bénassy-Quere et al. (2007) estimate a gravity equation to study the impact of institutional distance on bilateral FDI flow using data from developed and developing countries from 1985-2000. They find that institutions are relevant in determining the size of bilateral FDI flows, independently of the level of GDP per capita. Moreover, they claim that institutional distance is more important than institutional quality in the host country, and point out the relevance of this finding for the rising South-South trend of FDI. Aleksynska and Havrylchyk (2012) analyse the impact of institutional distance and natural resource endowment in South-South FDI flows using data from 60 developing and 22 developed economies between 1996 and 2007. They distinguish between positive and negative institutional distance, i.e. whether the quality of the host country's institutions is better or worse, respectively, than in the origin country. They find that large institutional distance has a negative effect on FDI flows and additionally point out that poor institutions are not deemed problematic with regard to resource-seeking FDI, and might even be considered an advantage for obtaining special privileges over the natural resource.

Earlier literature on international management introduced the concept of *psychic distance* as the greater impediment to international transactions than physical distance. Mostly applied to the

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[4] Organization for Economic Cooperation and Development (OECD) Convention on Combating Bribery of Foreign Public Officials in International Business Transactions.

analysis of trade flows, psychic distance (which comprises aspects from cultural and institutional distance) deters effective firm interactions since different perceptions and relational behaviour hamper the development of trust between the counterparts. Habib and Zurawicki (2002), Beugelsdijk et al. (2004) and Miura and Takechi (2010) provide interesting evidence from this branch of literature. International management literature deals with the concept of liability of foreignness (LOF), which refers to the social costs derived from doing business abroad. For example, Eden and Miller (2004) argue that such social costs are a key strategic issue because they cannot be measured and predicted in contrast to the economic costs. They further claim that LOF is driven by the institutional distance between the host and the home economies. The authors explore three types of institutional distance: cognitive, normative and regulatory. They conclude, consistent with other studies that the greater the institutional distance, the more likely the firms are to choose a local partner and adopt a joint venture strategy.

To summarize, literature on institutional distance has thus far focused on its impact on size, composition or the ownership structure of FDI and trade flows at the aggregate level. We contribute to this branch of literature by arguing that institutional distance has important implications not only in terms of location or ownership structure as determinants of FDI but also as a factor driving domestic linkages by multinationals since, as argued above, the larger the *institutional distance* between host and home country, the higher the transaction costs for the foreign investor and, hence, the less likely the interaction with domestic suppliers.

The contribution of our study is substantial and helps define clearer targets for foreign investment policies. Two features of the study highlight its relevance. First, it contributes to and consolidates insights from the literature on determinants of domestic linkages and analyses host country effects of South-South FDI by examining the impact of institutional distance as a significant determinant of domestic linkages. Secondly, it focuses on sub-Saharan Africa, a region that remains understudied due to the scarcity of quality firm level data and weak institutions which have commonly been pointed out as an obstacle to foreign investments.

The remainder of the paper is organized as follows: section 2 presents our research hypothesis and analyses the mechanism behind the relationship between linkages and institutions. Section 3 describes the dataset and methodology. Section 4 discusses the estimation results and section 5 concludes.

2   Research question: Domestic linkages and institutional distance

We analyse the impact of institutional distance on the size of the domestic linkage of multinationals in 19 sub-Saharan countries. Building on the literature on determinants of

domestic linkages, transaction costs economics and South-South FDI at the macro level, we develop our research hypothesis, namely that, *ceteris paribus*, greater institutional distance represents a deterrence to the creation of domestic linkages, since the foreign investor's unfamiliarity with informal procedures and the way of doing business in the host country may impede an efficient interaction with local suppliers. Therefore, one would expect that institutional distance is negatively related to the domestic linkage. This effect is especially relevant for least developed host countries, as is the case of sub-Saharan Africa, with its relative poor institutional background and the considerable degree of uncertainty faced by foreign investors.

Investors' familiarity with the way of doing business in the host country at both the formal and informal level reduces the perceived transaction costs and increases the investor's ability to establish contacts with local suppliers. Indeed, when governance is poor, knowledge of informal procedures is crucial. Institutional homogeneity facilitates networking with local firms and reduces concerns about the reliability of local suppliers.

However, there is an additional factor that needs to be taken into account when analysing the impact of institutional distance on the domestic linkage, namely the growing significance of supply chain management to the competitiveness of firms. According to UNCTAD (2001), a manufacturing firm expends more than half its revenues on purchased inputs, therefore, access to cheaper intermediates becomes a key strategic issue. This fact directly relates with the concept of institutional distance since industrialized countries generally have better institutions and the production costs of intermediates also happen to be higher. Therefore, northern firms with better institutions have an incentive to source locally. The domestic linkage might be boosted if the multinational firm seeks access to cheaper intermediates, the domestic linkage might be boosted, causing institutional distance and the linkage to move into the same direction. Additionally, northern countries in our sample are, on average, geographically further away from the host countries. Consequently, trade costs can also move into the same direction, as institutional distance makes local sourcing more attractive for northern multinationals.

In other words, two forces are operating in opposite directions: on the one hand, institutional distance deters the domestic linkage via higher transaction costs and perceived risk. On the other hand, as far as institutional distance is associated with differentials in intermediates, costs and greater geographical distance might be positively correlated with the domestic linkage via enhanced local sourcing attractiveness.

We account for this potential offsetting effect by including the variable *local sourcing attractiveness* in our analysis and by linking it with the variable *institutional distance*. Note that this variable should not be equated with a specific type of investment since it represents a broader concept: it records an advantage to source from local suppliers which could be based on a number of factors such as cheaper raw materials (resource seeking), lower labour costs (efficiency seeking), access to specific inputs (asset seeking), the appeal of forming stable supplier relationships in the country (market seeking) or avoidance of trade costs.

To recapitulate, we explore the relationship between institutional distance and domestic linkages aiming to answer the following questions: Does institutional distance deter the domestic linkage? Does the degree of local supplying attractiveness compensate for the expected negative effect of institutional distance on the linkage? Do southern and northern firms have a different attitude towards local sourcing?

3   Data and methodology

We analyse the impact of institutional distance on the size of the domestic linkage of MNEs and control for a number of other possible linkage determinants including multinational firm characteristics (size, time since the investment was made, input intensity and ownership structure) and gravity factors (geographical distance, common language or colonial past). Our baseline equation is as follows:

$$LINK_{if(d)} = \alpha + \beta 1\ ID_{f(d)} + \beta 2\ GRAV_{f(d)} + \beta 3\ FIRM_i, + Origin_i + Sector_i + e_i \quad (1)$$

Our dependent variable ($LINK_{if(d)}$) is the **size of domestic backward linkages** defined as the share of domestic inputs over total inputs purchased by the foreign firm. We source from the Africa Investor Survey conducted by UNIDO for the year 2010. The survey provides detailed cross-country firm level data on a number of characteristics of foreign firms (organizational structure, country of origin, market orientation, relationship with local producers, output and production factor prices and quantities, etc.). The survey also covers questions related to firms' international trade activities and to linkages to domestic and foreign producers. Following the data cleaning and outlier removal, we use data of 959 foreign companies from 78 different source economies investing in 19 sub-Saharan African countries.

Table 1 presents summary statistics for the domestic linkage by investor origin and host country. On average, MNEs purchase around 22 percent of their intermediate inputs from the host country. However, average linkages vary considerably across countries. Kenya stands out as the

host country with the highest average local linkage of 42 percent while Rwanda registers the lowest at 0.5 percent.

Our main explanatory variable is the **institutional distance** (IDf(d)) between the origin country of foreign investor f and the host country d. We define this variable as the absolute difference between institutional quality in the host and in the home economy[5] taken from the Worldwide Governance Indicators of the World Bank defined by Kaufmann et al. (2010). This database has the double advantage of including a large number of countries and summarized data from 30 other international and regional sources. Worldwide governance indicators capture data of six areas of governance: voice and accountability, political stability and non-violence, government effectiveness, regulatory quality, rule of law and control of corruption. The indicators are composite measures of governance generated by an unobserved components model that constructs a weighted average of the individual indicators for each source. The average measures are in units of a standard normal distribution with a mean of zero, standard deviation of one and running from approximately -2.5 to 2.5, with higher values representing better governance. Following the literature (e.g. Aleksynska and Havrylchyk, 2012), we define the institutional quality variable as a simple average of the indicators. Descriptive statistics of the institutional quality levels are shown in Table 2. Table 3 presents descriptives of our institutional distance measure by host country.

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[5] Given the relative low level of institutional quality of host countries in our sample, there are just a few cases in which institutional quality is better in the host country – meaning institutional distance is negative – and all of them refer to southern multinationals. Therefore, we consider absolute distance in the main analysis, without distinguishing between negative (positive) distance, i.e. better (worse) institutions at home than in the host country. However, we address this issue in a later step.

Table 1. Summary Statistics: Domestic Linkage

	no. firms	Mean	Std. Dev.	Min	Max
By investor's origin					
South	559	20	31	0	100
North	456	24	33	0	100
By host country					
Burkina Faso	7	4.000	9.327	0	25
Burundi	10	2.000	6.325	0	20
Cameroon	33	20.500	28.936	0	100
Cape Verde	19	13.550	27.984	0	100
Ethiopia	74	22.558	34.275	0	100
Ghana	91	8.901	22.847	0	100
Kenya	201	42.809	36.284	0	100
Lesotho	48	6.500	20.225	0	100
Madagascar	46	16.667	27.227	0	100
Malawi	15	15.467	27.987	0	100
Mali	27	7.444	20.741	0	100
Mozambique	63	11.984	20.762	0	80
Niger	6	10.000	24.495	0	60
Nigeria	76	22.390	32.578	0	100
Rwanda	19	0.516	1.545	0	5
Senegal	21	10.619	20.672	0	80
Tanzania	88	23.506	29.836	0	100
Uganda	135	21.156	31.620	0	100
Zambia	36	21.750	34.363	0	100
All countries	1015	21.695	31.890	0	100

Table 2. Summary Statistics: Institutional Quality

	Mean	Std. Dev.	Min	Max
Host country	-0.5268	0.3700	-1.1642	0.4803
Origin country	0.3549	0.8974	-2.3294	1.8492
Europe+NA	1.2525	0.3306	-0.7414	1.8492
China	0.0195	0.7803	-0.5729	1.4297
Other Asia	-0.3374	0.3216	-1.1944	1.4693
Mena	-0.4235	0.4974	-1.6269	1.1059
SSA	-0.2630	0.6707	-2.3294	0.7449
South	-0.2885	0.5661	-2.3294	1.4297
North	1.2430	0.3368	-0.7414	1.8492

Table 3. Summary Statistics: Institutional Distance by Host Country

	Mean	Std. Dev.	Min	Max
Burkina Faso	0.7643	0.5835	0.1471	1.6612
Burundi	1.9288	0.9175	0.5035	2.8696
Cameroon	1.9958	0.6333	0	2.5885
Cape Verde	0.4052	0.2255	0	1.0532
Ethiopia	1.0896	0.8365	0	2.6027
Ghana	0.8323	0.3897	0.1515	1.6042
Kenya	1.3411	0.8129	0.0604	2.5085
Lesotho	0.6951	0.4101	0.3721	1.7688
Madagascar	1.6395	0.5738	0	2.4547
Malawi	1.0108	0.7115	0.0235	1.9948
Mali	0.7148	0.7396	0.0176	2.1491
Mozambique	0.9325	0.4480	0.0320	1.9067
Niger	1.2716	0.8395	0.4028	2.3870
Nigeria	1.3760	0.8742	0	2.9872
Rwanda	0.8132	0.6558	0.0614	1.9009
Senegal	1.2421	0.6133	0.1132	2.1315
Tanzania	0.7036	0.7154	0	2.2040
Uganda	0.6321	0.7597	0.0150	2.4220
Zambia	0.8849	0.6393	0.0387	1.9791
All countries	1.0473	0.7880	0	2.9872

We additionally include a set of control variables that are likely to affect the size of the linkages referring to **characteristics of the multinational firm** i (FIRMi), and host-home **bilateral variables** (GRAVf(d)). Multinational firm characteristics include ownership structure, time since the initial investment was made, input intensity measured as the total input purchased over total sales, and size of the company measured as the number of employees. We also include origin dummies for the origin of the multinational (north or south). Table A1 in Appendix A presents summary statistics for these variables. The bilateral variables included are geographical distance, common language, common border and common colonial history. These variables are taken from the Gravity database of CEPII.

A detailed description of each variable included in the analysis is available in Table A4 in Appendix A.

4   Results

4.1   Institutional distance and investor's origin

Estimation results are shown in Table 4. Model (1) presents the baseline linear model. Models (2) and (3) are extensions and include an interaction term with the investor's origin (North - South) dummy and quadratic terms of the institutional distance measure, respectively. All

models include industry dummies to control for sector-specific effects. The estimation equations are as follows:

Model (1): LINKif(d) = α+ β1 Instit. Distance f(d) + β2 GRAV(CommonLang, Contiguity, Colony, CommonCol,

$\qquad$ Dist)fd + β3 FIRMi(TimeInvest, TimeInvest^2, InputInt) +Origini +Sectori +ei

Model (2): LINKif(d) = α+ β1 Instit. Distance f(d) + β2 Instit. Distancef(d)* Origini   + β3 GRAV(CommonLang,

$\qquad$ Contiguity, Colony, CommonCol, Dist)fd + β4 FIRMi (TimeInvest, TimeInvest^2, InputInt)

$\qquad$ +Origini +Sectori +ei

Model (3): LINKif(d) = α+ β1 Instit. Distance f(d) + β2 Instit. Distancef(d)* Origini   + β3 Instit. Distance^2 f(d) + β4

$\qquad$ Instit. Distancef(d) ^2 * Origini   + β5 GRAV(CommonLang, Contiguity, Colony, CommonCol,

$\qquad$ Dist)fd + β6 FIRMi (TimeInvest, TimeInvest^2, InputInt) +Origini +Sectori +ei

Robust to the specification model and the estimation technique used, we arrive at interesting and intuitive results for the bilateral variables and the foreign firm characteristics. Multinationals from countries that had a common colonial past with the host country establish around 10 percent more linkages with domestic firms, on average. Geographical distance has an expected negative impact on the domestic linkage since the closer the countries are to each other, the lower the transport costs are presumed to be and, hence, sourcing at home becomes more attractive. With regard to the foreign firm characteristics, ownership structure plays a role for the generation of linkages, and multinationals engaged in joint ventures source 8 percent more, on average, from domestic firms. The time since the investment was made presents an inverted U-shape relationship with the domestic linkage, which is positive until a certain inflection point after which it becomes negative. This result is consistent with other examples in the literature such as Amendolagine et al (2013) and Melverde et al. (2011) who find a similar non-linear

effect. According to the Tobit estimation (Table A2), input intensity has a negative effect, albeit fairly small but statistically significant on the domestic linkage. An interpretation for these counterintuitive results could be that firms that have been in the market for a very long time as well as firms with a very high input intensity internalize part of the input production and source less from local manufacturing firms.

Regarding our *institutional distance* measure, the analysis requires a more detailed discussion. We present the results from the OLS estimation as well as the results of the Tobit estimation in Table A2 in Appendix A. Model (1) corresponds to the baseline linear equation. Differences in the average governance seem to have a significant positive effect on the creation of linkages. To better understand this initially puzzling relationship, we interact the institutional distance measure with an origin dummy variable, in Model (2), which takes the value one if the foreign investor originates from a low income country (South) and zero otherwise (North). Thereby, we can test whether the effect of institutional distance on linkages is conditional on the origin of the firm. Results are reported in column 2. According to this specification, southern multinationals source around 14 percent more of their inputs from domestic firms, on average, relative to investors from industrialized countries. With regard to the interaction terms, we also observe a difference in behaviour by firms depending on their origin. The positive effect of institutional distance on linkages is attributable to multinationals from the North while for firms from the South, the institutional distance effect on linkages remains negative and very minor. Specifically, when institutional distance increases by one unit, linkages with domestic firms by firms from the North establish around 10 percent more linkages with local firms. For firms from the South, the effect of an increase in institutional distance on linkages is around -0,2 percent. All results are robust to Tobit estimation (see Table A2 in Appendix A).

This result calls for further analysis. The fact that absolute institutional distance is less important for southern than for northern multinationals could be attributable to the heterogeneity of the *institutional distance* variable across our sample. In this regard, average institutional distance for southern MNEs is generally lower than for northern ones. Moreover, *institutional distance* for the subsample of southern MNEs is in some cases positive (institutions are better in the host country than at home) and in some negative (institutions are better at home than in the host country), which might be causing an outweighing effect. However, the result might also infer a different degree of risk aversion for southern and northern firms: with similar levels of institutional distance, firms from the South would be less risk averse and more willing to engage in relationships with local firms, regardless of the level of governance, even if it is relatively worse than in the home country. To address this issue, we repeat our analysis only for the

subsample of southern firms and distinguish between negative and positive institutional distance. We find some weak but intuitive evidence of positive (negative) institutional distance being positively (negatively) correlated with the domestic linkage. However, these results are not robust to the estimation method[6] suggesting that southern firms do in fact care less about institutional distance or are less risk averse than northern firms. Results for these regressions of the southern subsample are reported in Table B1 in Appendix B.

In a further step, we expand our analysis to test the existence of quadratic relationships between institutional distance and linkage generation. This type of relationship has been identified in a number of papers that study the impact of institutional distance on FDI flows at the macro level; see, for example, Beugelsdijk et al (2004). Results of Model (3) are shown in the third column of Table 4. In this specification, we account for both origin implications and non-linearities by including interaction and quadratic terms. Again, as found in Model (2), it is evident that firms from the North establish substantially fewer linkages than firms from lower income countries. Additionally, emerging multinationals seem to have a very different attitude towards institutional distance relative to northern investors. The effect of institutional distance on linkages by southern multinationals is positive (turning negative with Tobit estimation) and fairly close to zero. Also, we do not find evidence of a quadratic relationship for emerging multinationals. By contrast, the relationship between institutional distance and domestic linkages follows an inverted U-shape relationship. Firms from industrialized countries establish more linkages with local firms at first as institutional distance increases until reaching a certain threshold after which the relationship turns negative.

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[6] Statistically insignificant by OLS but significant at the 5% level by Tobit estimation.

Table 4. Estimation Results: OLS

Dependent variable: local linkage	Model 1	Model 2	Model 3
Institutional Distance	6.407***	9.975***	33.94***
	(2.127)	(2.618)	(11.52)
Low income dummy(=1)	4.356	13.86**	29.19***
	(3.613)	(5.449)	(9.314)
Low income#Instit. Distance		-10.17**	-32.50**
		(-4.628)	(-15.79)
Institutional Distance^2			-7.604**
			(-3.616)
Low income#Instit. Distance^2			6.299
			(7.817)
Firm size	-0.418	-0.534	-0.653
	(-0.873)	(-0.87)	(-0.868)
Joint Venture d.	8.808***	8.769***	8.880***
	(2.369)	(2.363)	(2.357)
Common lang. d.	1.043	0.627	0.582
	(2.629)	(2.659)	(2.681)
Contiguity d.	-2.216	-4.27	-4.968
	(-3.536)	(-3.643)	(-3.678)
Colony d.	4.851	4.839	3.805
	(3.732)	(3.733)	(3.765)
Common colony d.	10.87***	10.34***	10.39***
	(2.886)	(2.895)	(2.916)
Time invest	0.477***	0.481***	0.470***
	(0.149)	(0.149)	(0.15)
Time invest^2	-0.00710***	-0.00723***	-0.00698***
	(-0.00167)	(-0.00167)	(-0.00168)
Input Intensity	-0.0196**	-0.0180**	-0.0180**
	(-0.00922)	(-0.00795)	(-0.0078)
Distance	0.000382	0.000173	0.0000209
	(0.00038)	(0.000391)	(0.000404)
Constant	4.304	0.391	-13.58
	(6.739)	(6.646)	(-8.698)
Observations	996	996	996
R-squared	0.11	0.114	0.118

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
Industry dummies are included

4.2 The role of local supplier attractiveness

A plausible explanation for the puzzling positive coefficient of the institutional distance measure for northern firms might be derived from the fact that, as pointed out above, institutional differences are very often associated with differences in production costs. Hence, if the multinational considers it important to have access to cheaper specific intermediates, it will source locally without caring much about poor institutional quality. In addition, higher trade costs are likely to play a role in explaining this positive sign since in the case of our sample, geographical distances are also linked to institutional distance when looking at industrialized countries.

To address this issue, we explore whether the effect of institutional distance on local linkages is conditional on the degree of local sourcing attractiveness. Due to the wealth of the UNIDO survey data, we are able to construct a variable that proxies for the significance domestically purchased inputs represent for the multinational.

The survey examines the importance of several location factors in the company's investment decision and respondents are asked to rate them on a scale from 1 (not important) to 5 (crucial). Based on this question, we define a dummy variable that takes the value 1 if the firm rates "availability of local suppliers" to be a very important or crucial factor to invest in the country. This variable records the extent to which purchases of locally manufactured intermediate inputs are advantageous for the multinational. Reasons behind this fact could, for example, be lower production costs or higher trade costs. In the same fashion, we also define location factor dummies for "cost of raw materials" and "labour costs" to control for their potential impact on linkages via production factor prices. However, we consider "availability of local suppliers" for the interaction with institutional distance, as it is a more comprehensive variable that accounts for any advantage (lower price, intermediate specificity, prevention of trade costs, etc.) of domestically produced intermediates over imported inputs. Table 5a shows the correlations between the institutional distance measure and the above mentioned location factors. It is evident that the positive and relatively strong relationship between the "local supplier availability" factor and institutional distance present only for northern firms.

Table 5a. Institutional Distance and Location Factors . Correlations

Reference Variable: Institutional Distance				
	North	South	d=1-N*	d=1-S*
LocFac. Availabillity Local Suppliers	**0.1897**	-0.0472	222	252
LocFac. Labor Cost	-0.0224	-0.0136	246	291
LocFac. Raw Material Cost	0.0159	0.0481	309	351

*Number of (North- South) firms for which the location factor dummies take the value one

Additionally, we estimate a simple Probit model to explore how institutional distance affects the probability of the multinational to consider the *availability of local suppliers* as a very important or crucial location factor. Results are shown in Table 5b. Again we find evidence that when institutional distance increases in one unit, the probability of *availability of local suppliers* being a very important or crucial location factor increases by 12%. Southern firms are more likely to find local supplying attractive (8%), but this probability is not related to institutional distance (i.e. a very small negative coefficient of -0.1). In contrast, the probability of northern firms finding *availability of local suppliers* to be a very important or crucial factor is 40% higher when institutional distance increases by one unit. Summing up, there is a positive relationship

between institutional distance and "local supplier attractiveness" which is stronger for northern firms. It therefore seems reasonable to consider that this variable influences, to some extent, the way institutional distance affects domestic linkages.

Table 5b: Local Suppliers and ID. Probit Estimation

Dependent variable: Prob. Loc. Suppliers		
	Model 1	Model 2
Institutional Distance	0.117**	0.465***
	(0.0511)	(0.110)
Low income dummy(=1)		0.826***
		(0.219)
Low.Inc#Instit. Dist.		-0.627***
		(0.180)
Constant	-0.0574	-0.710***
	(0.107)	(0.216)
Observations	1032	1032
Robust standard errors in parentheses		
*** p<0.01, ** p<0.05, * p<0.1		
Industry dummies are included		

In the next step, we run separate regressions for southern and northern firms including the *local supplier attractiveness* dummy among the variables affecting the impact of institutional distance on local linkages. Additionally, we include raw materials and labour cost dummies as control variables to control for potential indirect effects on the production costs of intermediates and yields the following estimation equation:

Model (4): LINKif(d) = α+ β1 Instit. Distance f(d) + β2 Instit. Distancef(d)* LocalSuppi + β3 Instit. Distance^2 f(d)

        + β4 Instit. Distancef(d) ^2 * LocalSuppi + β5 GRAV(CommonLang, Contiguity, Colony, CommonCol,

        Dist)fd + β6 FIRMi (TimeInvest, TimeInvest^2, InputInt, RawMatCost, LabCost) +Sectori +ei

The regression results are reported in Table 6 (OLS) and Table A3 in Appendix A (Tobit). Results show that the extent to which northern multinationals find local sourcing attractive plays a key role in determining the way institutional distance affects the domestic linkage. For southern firms, we find weaker evidence of this interaction which is statistically insignificant in the Tobit estimation.

Results from Model (4) confirm that the positive relationship between the domestic linkage and institutional distance is attributable to firms from industrialized countries and is dependent on

the location factor. If it is important or crucial for the northern multinational to have access to local suppliers, institutional distance is, at first, positively related with the domestic linkage. However, when institutional distance is too large, the relationship turns negative after reaching a certain threshold. In other words, the convenience (production costs, trade costs, etc.) of purchasing local goods offsets the effect of negative institutional distance on domestic linkages when it is moderate. When industrialized countries invest in countries with much more deficient institutions, the effect turns negative as the advantages of local inputs do not compensate for the perceived too high risk. Approximately 9% of the firms in the sample lie above the threshold and some examples of institutional differences range from the level of Germany to Burundi, Finland to Kenya or United Kingdom to Nigeria. For northern firms for which availability of local suppliers was not that important, institutional distance does not play any role in determining the domestic linkage. Similarly, local sourcing attractiveness is not relevant in explaining the way institutional distance affects southern firms. Additionally, firms from the North for which labour costs were a crucial or very important factor with regard to investing in the country, source around 9% more from local suppliers, on average, than multinationals for which labour costs were not crucial.

Summarizing, our main results are the following: first, we find that emerging multinationals generate more linkages with domestic firms, on average, relative to northern multinationals, independent of institutional distance. Factors like being engaged in a joint venture or sharing a common colonial past seem to matter more for the linkage generation of southern multinationals. Second, northern multinationals care more about institutional distance relative to southern firms. Additional analysis reveals that this result is not only attributable to the smaller institutional distance of southern firms in our sample, but also indicates a lower degree of risk aversion for southern firms relative to northern ones. Finally, institutional distance plays a significant role in the generation of linkages by northern multinationals, but only for firms for which access to local suppliers is important. In this case, we find an inverted U-shape relationship between linkages and institutional differences, with the attractiveness of local supplying offsetting the negative effect of institutional distance until a threshold after which institutional distance is too large and the impact on the domestic linkage turns negative.

These results suggest interesting industrial and investment policy implications that we discuss in the following section.

5   Conclusion and policy implications

We study to what extent differences in the institutional environment between the host and source country, i.e institutional distance, influence the domestic linkage by multinationals operating in sub-Saharan Africa. When governance is poor, knowledge of informal procedures becomes crucial. Institutional homogeneity facilitates networking with local firms and might therefore generate positive externalities to the domestic economy. Focusing on a cross-section of manufacturing firms from 19 sub-Saharan countries, we define the domestic linkage as the share of domestically purchased inputs over total inputs and relate it with a measure of institutional distance defined as the absolute difference between the average governance level in the host and in the MNE's country of origin.

Our main findings are the following: first, we find that emerging multinationals generate more linkages with domestic firms, on average, relative to northern multinationals, independently of institutional distance. Second, northern multinationals care more about institutional distance relative to southern firms. Additional analysis reveals that this result is not only attributable to the smaller institutional distance of southern firms in our sample, but indicates a lower degree of risk aversion for southern firms relative to northern ones. Finally, institutional distance plays a significant role in the generation of linkages by northern multinationals but only for firms for which access to local suppliers is very important or crucial. In this case, we find an inverted U-shape relationship between linkages and institutional differences, with the attractiveness of local supplying offsetting the negative effect of institutional distance until reaching a threshold after which institutional distance is too large and the impact on the domestic linkage turns negative.

Table 6. Separate regressions. Inst. Distance and Local Suppliying (OLS)

Dependent variable: local linkage

	North	South
Institutional Distance	7.874	13.39
	(13.11)	(10.60)
Local Supplier dummy (=1)	-54.63***	19.47***
	(17.79)	(6.420)
Local Sup#Instit. Distance	73.19***	-33.61*
	(23.08)	(19.68)
Institutional Distance^2	-1.387	-10.04
	(4.163)	(6.292)
Local Sup#Instit. Distance^2	-17.44**	23.17*
	(7.188)	(12.51)
Raw Mat. Cost dummy (=1)	-2.840	3.232
	(3.577)	(2.816)
Labor costs dummy(=1)	6.787**	0.330
	(3.273)	(2.694)
Firm size	-1.502	-0.857
	(1.339)	(1.225)
Joint Venture d.	1.983	11.03***
	(3.133)	(3.377)
Common lang. d.	1.991	-0.0738
	(5.027)	(3.612)
Colony d.	3.268	-
	(5.233)	-
Contiguity d.	-	-7.060*
	-	(4.216)
Common colony d.	-0.555	8.886***
	(19.23)	(3.082)
Time invest	0.402**	0.531
	(0.190)	(0.330)
Time invest^2	-0.00623***	-0.00625
	(0.00198)	(0.00574)
Input Intensity	0.00101	-0.000605
	(0.000712)	(0.000562)
Distance	-0.308*	-0.0212***
	(0.163)	(0.00666)
Constant	3.574	5.808
	(10.08)	(8.641)
Observations	440	538
R-squared	0.23	0.183

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
Industry dummies are included

Our results suggest that there is scope for industrial policy to encourage the domestic linkage. In this regard, the paper points out that foreign investors can also benefit from local sourcing in

countries with relatively weak institutions. Therefore, policies that link up local suppliers with multinationals, such as matchmaking strategies or the provision of information as well as upgrading programmes, will allow multinationals to take advantage of the benefits of also sourcing locally in countries with poor institutions. Additionally, industrial policies that reduce investors' perceived risk and that familiarize them with the formal as well as informal ways of doing business in the country might also encourage the domestic linkage. In other words, industrial policies should aim to reduce the transaction costs perceived by the foreign investor and enhance the benefits of local sourcing and multinational awareness in this respect. Of course these linkage-enabling policies should be combined with broader policies aiming to improve the institutional background of the host country, such as anti-corruption measures or policies aiming to guarantee contract enforcement, which is, however, a slower process that often overcomes the means of industrial policy itself.

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Appendix A

Table A1: Summary Statistics of firm level variables

Burkina Faso	Mean	Std. Dev.	Min	Max
employees	132.875	113.971	33	367
inputint	0.73049	0.15605	0.52862	0.9291583
time invest	19	12.4442	8	43
Burundi				
employees	113.909	167.325	13	559
inputint	0.50987	0.40677	0.00059	1.456948
time invest	28.9167	19.5888	2	58
Cameroon	Mean	Std. Dev.	Min	Max
employees	364.029	1029.45	12	6036
inputint	0.57086	0.35054	0.01201	1.585833
time invest	25.6765	18.3083	3	61
Cape Verde	Mean	Std. Dev.	Min	Max
employees	75.3333	131.04	6	560
inputint	1.97672	5.04507	0.25497	21.52593
time invest	9.66667	8.98517	0	41
Ethiopia	Mean	Std. Dev.	Min	Max
employees	247.551	398.705	7	2500
inputint	1.04059	1.99371	0.0131	16.15694
time invest	8.29487	9.39482	0	54
Ghana	Mean	Std. Dev.	Min	Max
employees	175.581	245.772	9	1673
inputint	1.49445	4.46557	0	39
time invest	16.5625	14.217	1	56
Kenya	Mean	Std. Dev.	Min	Max
employees	472.129	1296.23	10	15887
inputint	1.21325	4.70391	0.00015	51.88586
time invest	24.2772	19.223	0	110
Lesotho	Mean	Std. Dev.	Min	Max
employees	740.735	889.102	12	4585
inputint	0.60512	0.46201	0.01606	1.679197
time invest	9.22449	7.90639	0	38
Madagascar	Mean	Std. Dev.	Min	Max
employees	493.8	824.922	22	4000
inputint	0.55081	0.31127	0.01165	1.089942
time invest	16.1	14.0962	2	63
Malawi	Mean	Std. Dev.	Min	Max
employees	103.5	95.3051	6	400
inputint	0.43743	0.35759	0.0104	1.041314
time invest	18.5	15.7776	3	46

Table A1 (cont.): Summary Statistics of firm level variables

Mali	Mean	Std. Dev.	Min	Max
employees	112.37	112.297	4	400
inputint	0.55552	0.29662	0.0067	1.00637
time invest	11.8571	9.02143	2	41
Mozambique	Mean	Std. Dev.	Min	Max
employees	86.2857	80.121	15	409
inputint	0.69396	0.24665	0.2408	1.89303
time invest	18.3968	17.5164	1	102
Niger	Mean	Std. Dev.	Min	Max
employees	85.5714	60.1134	8	161
inputint	0.77067	0.1869	0.49133	0.99616
time invest	17.4286	14.718	4	45
Nigeria	Mean	Std. Dev.	Min	Max
employees	397.588	620.42	10	3720
inputint	25.8252	202.745	0	1660.35
time invest	27.7294	19.9532	1	111
Rwanda	Mean	Std. Dev.	Min	Max
employees	279.2	486.872	9	2002
inputint	2.12955	5.18728	0.55685	22.2007
time invest	12.1905	13.7682	0	48
Senegal	Mean	Std. Dev.	Min	Max
employees	163.636	178.913	18	600
inputint	0.57442	0.25946	0.10266	1.01368
time invest	33.1818	21.8624	1	81
Tanzania	Mean	Std. Dev.	Min	Max
employees	257.978	777.332	3	7190
inputint	0.63833	0.44407	0.00099	2.83079
time invest	12.6	8.73942	1	47
Uganda	Mean	Std. Dev.	Min	Max
employees	241.898	891.399	6	7500
inputint	7.67228	80.9779	0.00064	944.988
time invest	15.8686	13.6499	2	86
Zambia	Mean	Std. Dev.	Min	Max
employees	189.75	320.063	11	1500
inputint	0.78681	0.50738	0.13	3.119
time invest	13.9211	10.3959	1	47

Table A2: Estimation Results: Tobit Model

Dependent variable: local linkage	Model 1	Model 2	Model 3
Institutional Distance	13.87***	20.76***	87.85***
	(5.143)	(6.373)	(30.14)
Low income dummy(=1)	1.223	19.92	70.09***
	(9.048)	(13.58)	(25.00)
Low income#Instit. Distance		-19.66*	-105.1***
		(10.64)	(38.37)
Institutional Distance^2			-21.03**
			(9.182)
Low income#Instit. Distance^2			32.81*
			(17.28)
Firm size	-0.100	-0.278	-0.541
	(2.013)	(2.010)	(2.009)
Joint Venture d.	20.13***	20.09***	20.69***
	(4.900)	(4.887)	(4.888)
Common lang. d.	-0.0651	-0.675	-1.411
	(6.489)	(6.477)	(6.490)
Contiguity d.	-7.192	-11.14	-14.43
	(8.998)	(9.235)	(9.370)
Colony d.	8.759	8.433	5.562
	(8.015)	(7.993)	(8.097)
Common colony d.	31.48***	30.12***	29.26***
	(7.303)	(7.308)	(7.346)
Time invest	1.085***	1.097***	1.074***
	(0.395)	(0.395)	(0.394)
Time invest^2	-0.0174***	-0.0178***	-0.0171***
	(0.00573)	(0.00573)	(0.00572)
Input Intensity	-3.075*	-3.096*	-3.084*
	(1.711)	(1.701)	(1.713)
Distance	0.000589	0.000202	-0.000197
	(0.000935)	(0.000958)	(0.000974)
Constant	-38.04**	-45.98***	-86.71***
	(15.76)	(16.40)	(24.60)
Observations	996	996	996

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
Industry dummies are included

Table A3. Separate regressions. Inst. Distance and local suppliers (Tobit)

Dependent variable: local linkage

	North	South
Institutional Distance	7.720	4.676
	(31.51)	(33.04)
Local Supplier dummy (=1)	-115.7**	36.97***
	(49.33)	(14.11)
Local Sup#Instit. Distance	163.7***	-63.89
	(60.23)	(46.88)
Institutional Distance^2	2.003	-4.079
	(10.28)	(20.06)
Local Sup#Instit. Distance^2	-44.37**	39.59
	(17.93)	(30.58)
Raw Mat. Cost dummy (=1)	-0.763	7.383
	(7.215)	(7.748)
Labor costs dummy(=1)	12.43*	-1.001
	(6.421)	(6.941)
Firm size	-2.119	-1.435
	(2.494)	(2.983)
Joint Venture d.	5.114	27.96***
	(5.971)	(7.429)
Common lang. d.	-0.658	-7.431
	(9.852)	(9.672)
Colony d.	6.496	-
	(9.726)	-
Contiguity d.	-	29.50***
	-	(8.875)
Common colony d.	-11.39	27.05***
	(33.93)	(8.543)
Time invest	0.681	0.93
	(0.462)	(0.765)
Time invest^2	-0.0137**	-0.00679
	(-0.0063)	(0.014)
Input Intensity	0.00275*	-0.00203
	(0.00153)	(0.00151)
Distance	-2.14	-4.029
	(-1.745)	(2.707)
Constant	-38.75	51.44***
	(24.36)	(2.855)
Observations	413	574

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
Industry dummies are included

Table A4. Variable Description

Variable	Definition	Source
Dependent Variable		
LINK	Share of locally manufactured inputs over total inputs	AIS 2010
Independent Variables		
Institutional Distance	Absolute difference between host and origin country of average governance indicators	Worldwide Governance Indicators. Kaufmann et. al (2010)
Foreign firm characteristics		
Local Supplier dummy	1 for crucial o very important location factor	AIS 2010
Raw Mat. Cost dummy	1 for crucial o very important location factor	AIS 2010
Labor costs dummy	1 for crucial o very important location factor	AIS 2010
Firm size	Natural logarithm of number or full time employees	AIS 2010
Joint Venture d.	1 if domestic ownership share is >10%	AIS 2010
Time invest	Years since the investment took place	AIS 2010
Input Intensity	Input cost over total turnover	AIS 2010
Gravity variables		
Contiguity d.	1 for contiguity	GeoDist database CEPII
Common col. d.	1 for countries with a common colonizer	GeoDist database CEPII
Colony d.	1 for pair of countries ever in colonial relationship	GeoDist database CEPII
Common lang. d.	1 for common ofical language	GeoDist database CEPII
Distance	kms between most important cities/agglomerations (in terms of population)	GeoDist database CEPII

Appendix B

Table B1. Southern firms subsample

Dependent variable: local linkage

	OLS	Tobit
Institutional Distance	-6.119	-31.59**
	(7.325)	(15.79)
Positive ID(=1)	2.570	-5.760
	(4.615)	(10.88)
PositiveID #Instit. Distance	6.061	40.83**
	(8.435)	(19.18)
Firm size	-0.937	-1.401
	(1.219)	(3.043)
Joint Venture d.	12.10***	30.15***
	(3.392)	(7.449)
Common lang. d.	-3.550	-12.98
	(3.550)	(9.716)
Colony d.	-5.886	-17.65
	(4.228)	(11.85)
Common colony d.	11.62***	38.45***
	(3.099)	(8.946)
Time invest	0.444	0.663
	(0.322)	(0.783)
Time invest^2	-0.00504	-0.00307
	(0.00569)	(0.0144)
Input Intensity	-0.0210**	-3.647
	(0.00914)	(2.642)
Distance	-0.000438	-0.00160
	(0.000564)	(0.00155)
Constant	17.05*	-7.653
	(9.200)	(21.99)
Observations	413	574

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
Industry dummies are included

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