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## **Curse or Blessing? Multinational Corporations and Labor Supply in Africa**

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Sonno

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## Abstract

Do multinational enterprises create local job opportunities in developing countries? We address this largely unanswered question by combining geolocalised individual-level data with information on domestic and foreign multinationals' affiliates in Sub-Saharan Africa over more than a decade. Having a multinational's affiliate within walking distance correlates with an increase in employment of +4.3% with respect to the sample mean. Multinationals' activity is correlated with higher off-farm and lower on-farm employment (+13% and -7%, respectively), a result driven by affiliates of foreign companies. Female employment and "good jobs" increase around affiliates, but only when they are part of foreign groups.

JEL Classification: F23, F66, F16, O12, J01

Keywords: Multinational Enterprises, Labor Supply, job quality, Africa

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# Curse or Blessing?

## Multinational Corporations and Labor Supply in Africa<sup>\*</sup>

Mariapia Mendola<sup>†</sup>      Giovanni Prarolo<sup>‡</sup>      Tommaso Sonno<sup>§</sup>

January 2022

### Abstract

Do multinational enterprises create local job opportunities in developing countries? We address this largely unanswered question by combining geolocalised individual-level data with information on domestic and foreign multinationals' affiliates in Sub-Saharan Africa over more than a decade. Having a multinational's affiliate within walking distance correlates with an increase in employment of +4.3% with respect to the sample mean. Multinationals' activity is correlated with higher off-farm and lower on-farm employment (+13% and -7%, respectively), a result driven by affiliates of foreign companies. Female employment and "good jobs" increase around affiliates, but only when they are part of foreign groups.

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# 1 Introduction

Job creation is one of the greatest development challenges in Sub-Saharan Africa. A booming population, coupled with sluggish structural transformation, makes productive employment growth the most pressing policy issue if the region is to achieve economic progress and stability (WDR, 2013; Gollin, 2018; Diao et al., 2019; WB, 2017). A weak industrialization process has been hampering Africa’s capacity to increase wage-payment employment and “good jobs” through labor market reform and supply-side labor market policies (Rodrik, 2016; Diao et al., 2021).<sup>1</sup> Thus, attention has shifted to the role of global economic integration and in particular the impact of multinational enterprises (MNEs) in creating (or offsetting) job opportunities in Africa. On the one hand, foreign companies have been criticised for their extractive activities and monopsony power in development settings, which may curb local employment and growth (Aitken and Harrison, 1999; Borensztein and Lee, 1995; Dell and Olken, 2017). On the other hand, the capital injections, international practices and higher productivity associated with these firms can benefit the local economy (Hirschman, 1957; Gorg and Strobl, 2001; Javorcik, 2004). Despite this issue has hit, and sometimes polarized, public opinion, there is no global evidence on the impact of large labor-demand shocks, such as those embodied by the arrival of MNEs, on employment outcomes in Africa. The main reason for this lacuna is the lack of granular geolocalized data on MNEs and individual locations for a sizeable group of countries in a panel setting.

This paper provides new systematic evidence on this controversial topic by employing novel data on the universe of affiliates of multinational firms, both domestic and foreign, in Sub-Saharan Africa. We match this detailed data on MNE affiliates between 2007 and 2018 with geo-located data from the Demographic and Health Surveys (DHS) on individuals living fairly close (at different radii, up to 50 km) to such affiliates.<sup>2</sup> That is, we document the consequences of the MNE presence for labor supply of the working-age population in Africa. Exploiting very granular information, we can see how the local labor market conditions created by the presence of MNEs influence labor market participation on- and off-farm and whether the effect varies depending on the enterprise’s nationality.

Results show that MNEs significantly affect labor market participation (+4.3% with respect to sample mean) and the effect is highly localized, vanishing when distance from the affiliate(s) is

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<sup>1</sup>The majority of African workers are employed in low-productivity jobs, such as subsistence agriculture and low value-added services. Self-employment has continued to be predominant, especially in urban areas (Diao et al., 2019; IMF, 2018).

<sup>2</sup>See for example Mamo et al., 2019 for the use of the geolocalized component of DHS.

greater than 5 km. This result supports the idea that proximity may foster, through local interactions, positive productive spillovers from foreign MNEs on the local economy – while the same does not hold for regions and people located further away.<sup>3</sup>

Interestingly, being close to MNEs significantly increases the average number of off-farm jobs (+13% with respect to sample mean) while decreasing on-farm employment (-7%). Since economic development typically comes when the more productive sectors absorb resources from the less dynamic ones, this result would appear to indicate a positive contribution of MNEs to employment and structural change. Yet, distinguishing between domestic and foreign affiliates (those with headquarters located abroad), we find the effects to be asymmetric: only the foreign affiliates increase off-farm jobs, while reducing employment in agriculture. The domestic affiliates turn out to have a positive effect on agricultural employment but no significant impact on off-farm jobs.

These findings suggest that foreign affiliates may generate positive spillovers in the local economy in a way that is radically different from multinational affiliates with headquarters located in the same country. We go deeper into this issue, which is related to the mechanisms through which MNEs affect the local economy, by distinguishing foreign affiliates between those with headquarters in OECD and non-OECD countries, and between countries with and without a bilateral colonial history. We expect that if spillovers flow through international practices and technology diffusion as well as positive externalities, these will be greater the more advanced and less “extractive” the headquarters country is (Michalopoulos and Papaioannou, 2020; Bruhn and Gallego, 2012). And in fact we do find supportive evidence, in that the positive local employment effect of foreign affiliates is driven entirely by those whose headquarter is in an OECD or non-colonial country.

Our results are obtained at the within-region-and-year level, and are robust to the exclusion of migrants from the sample, which could introduce biased results if people choose to relocate owing to the presence of MNEs. More specifically, we estimate the effect of exposure to MNEs by comparing an individual living nearby an affiliate with others in the same region and year not exposed to any affiliate, conditional on individual controls. Checking heterogeneous effects by workers’ gender and age (youth employment), we find that young and male individuals are more likely to be employed if a domestic affiliate is nearby, while this is true for women if the local affiliate is foreign.

Finally, we explore the degree to which MNEs may stimulate the creation of “good jobs”

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<sup>3</sup>Note that, while our analysis focuses on the ability to generate employment opportunities, in this paper we do not distinguish between direct MNEs’ employment from spillover effects in other sectors/industries/firms.

by distinguishing between permanent, temporary and seasonal employment. The stability of jobs is arguably an instance of job quality (Rodrik and Stantcheva, 2021). We find that, on average, MNEs significantly increase permanent jobs, while decreasing both occasional and seasonal employment. The effect on permanent employment is again driven mostly by foreign affiliates, suggesting that local “good jobs” are more likely to be created by foreign MNE affiliates.

Overall, our findings resonate with recent observations of the potential of global integration and exposure to major labor-demand shocks to create jobs and reallocate workers to more productive occupations in Africa. This holds especially for the foreign affiliates of multinational firms. Many developing countries have experienced rapid global integration over the last few years, and in Africa, in particular, the number of multinational affiliates increased by more than 250% from 2007 to 2018.

Substantial literature has shown that foreign MNEs may foster productivity and knowledge spillovers in local firms in the host economy, mainly through ownership advantages and mechanisms of interaction (Blomstrom, 1986; Blomstrom and Wolff, 1989; Xu, 2000; Javorcik, 2015). However, there is less evidence on spillovers *among individuals* in host regions, especially in terms of labor market outcomes and job quality. The extent to which multinational enterprises are a source of growth or instead of “exploitation” of local workers is a contentious question. Study of the issue has suffered a lack of comprehensive data and large-scale geolocalised information, in that the precise location of MNEs’ affiliates is rarely available, especially in developing countries in Africa. A series of recent papers have provided some country-level or cross-regional evidence using FDI aggregates or specific MNE/country settings. In an influential paper Heath and Mobarak (2015) consider the development of the garment sector in Bangladesh as an exogenous intervention across time and villages, and show its impact on women’s wellbeing, in terms of educational attainment, marriage, childbirth and work of young women (see also Jensen, 2012 and Majlesi, 2016 on female employment in India and Mexico respectively). Toews and Vezina (2020), instead, study FDI bonanzas due to giant resource discoveries and focus on the job creation effects triggered by non-extraction FDI in Mozambique. Using both household surveys and firm censuses, they estimate a large local job multiplier effect: every additional FDI job resulted in 4.4 to 6.5 additional local jobs (half in the formal and half in the informal sector).<sup>4</sup>

Our paper advances the state of this literature by leveraging both spatial and temporal location of MNEs throughout all Sub-Saharan Africa over more than a decade to document employ-

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<sup>4</sup>Our analysis is also related to the literature on the effects of the rise of an export-oriented manufacturing sector in developing countries (e.g. Méndez-Chacón and Van Patten, 2019; Atkin and Gonzalez-Navarro, 2018; McCaig and Pavcnik, 2018; Verhoogen, 2008; Atkin, 2016; Atkin and Gonzalez-Navarro, 2018).

ment patterns at the individual level in the host regions. Importantly, our study offers compelling evidence of the potential role of MNEs in job creation in any given location in Africa, by disaggregating according to a number of factors, including firm nationality, distance, job quality and people’s age and gender. The work only constitutes an initial overview on this broad topic. It would certainly be worthwhile establish some systematic evidence on the relationship between MNEs and labor market outcomes with continent-wide panel data. In the last section we describe further analyses that are left to future work.

The rest of the paper is organized as follows. Section 2 presents the data, in particular the DHS and the original data on MNEs, and Section 3 reports the methods used and the results. Section 4 provides ideas for future research and concludes.

## 2 The Data

The setting of the study is Sub-Saharan Africa. We combine two sources of data for the period 2007–2018, namely geolocalized DHS survey data and information about MNEs in the vicinity neighbourhood.

**DHS Data.** The Demographic and Health Surveys are nationally-representative household surveys that gather a wide range of indicators on health, demographics and education. Our data cover Sub-Saharan countries, using DHS survey phases 5 to 7. The timeline runs from 2003 to 2019 with a total of more than 4,4 million observations on households in 32 African countries (i.e. household members interviewed).<sup>5</sup> From DHS, we use individual data for men and women aged 15–64 on labor supply and working conditions.<sup>6</sup> The data gives the geographic coordinates of the households interviewed. Note that DHS always adds some random noise around the precise location of households, to preserve privacy (up to 2 km for urban and 5 km for rural clusters).<sup>7</sup> Our main outcome variables of interest focus on labor market participation and job quality. First, we construct the dummy variable *Job*, equal to 1 if the individual has worked in the past 12 months. Then we study the type of job in greater detail. *On-Farm Job* takes value 1 if the respondent works on farm and 0 otherwise (including not working in the last 12 months); *Off-Farm Job* takes value 1 when the person works in a sector other than agriculture and 0 other-

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<sup>5</sup>See Appendix A for the complete list of country-years covered.

<sup>6</sup>We use DHS Personal Recode (PR) file, which includes all members of the household. While this database gathers information about family characteristics, we have to rely on the Individual Recode (IR) and the Male Recode (MR) for information on working conditions. The IR covers the same women (over 15 years old) as the PR database, but with more information about work. The same goes for MR, which includes the same men (over 15) as the PR, but with more details.

<sup>7</sup>This distance can be extend to 10 kilometers when population density is particularly low.



wise.<sup>8</sup> DHS directly also contains information on one aspect of quality, namely whether the job is *Occasional*, *Permanent*, or *Seasonal*.

**Multinational Enterprises.** For MNEs, we use the database developed in Sonno (2020), which combines information on the ownership of all firms connected through an ownership link (from the Bureau Van Dijk *Historical Ownership Database*), for the entire world. Starting from these data, the procedure elaborates an algorithm that retrieves the network of ownership for each business group, based on the definition of direct or indirect majority of the voting rights ( $\geq 50.01\%$ ).<sup>9</sup> The final dataset maps the hierarchical structure of business groups by ascending the ownership structure, constructing the network of groups for more than 200 countries, from 2007 to 2018, and then geolocates by zipcode. More than 6.3 million business groups, with 12.8 million affiliates for 2007-2018 are covered. For the scope of this paper, we focus on African affiliates of multinational enterprises (i.e. business groups with at least one affiliate located in a country different from the headquarters'). The nationality of affiliates and headquarters is central to our analysis. We distinguish between *Domestic Affiliates*, namely those located in the headquarters' country, and *Foreign Affiliates*, those located in a different country. For this project we use information only on the time-pattern and location of affiliates, together with their domestic or foreign nature, while many other variables (such as financial statements, industry, etc. from the Bureau Van Dijk *Orbis* dataset) will be explored in future research.

**Descriptive statistics.** Here we provide some essential descriptive statistics on the DHS and MNE data. Our final dataset covers 32 Sub-Saharan countries. Figure 1 shows the DHS interview locations (green) and MNE locations (red). In yellow, we display DHS locations that have at least one MNE within a radius of 50 km.<sup>10</sup> Table A2 in the Appendix reports some descriptive statistics. Panel (a) shows that we have more than 4.7 million individuals interviewed in the period 2003–2018. 51% are female and 35% live in urban locations. The interviews are with people aged 15 and up, younger children are counted as observations without being directly interviewed, and the average age of those interviewed is 22. Around 32% of the individuals had more than five years of schooling (we define them as *Secondary Education*). The average number of children per

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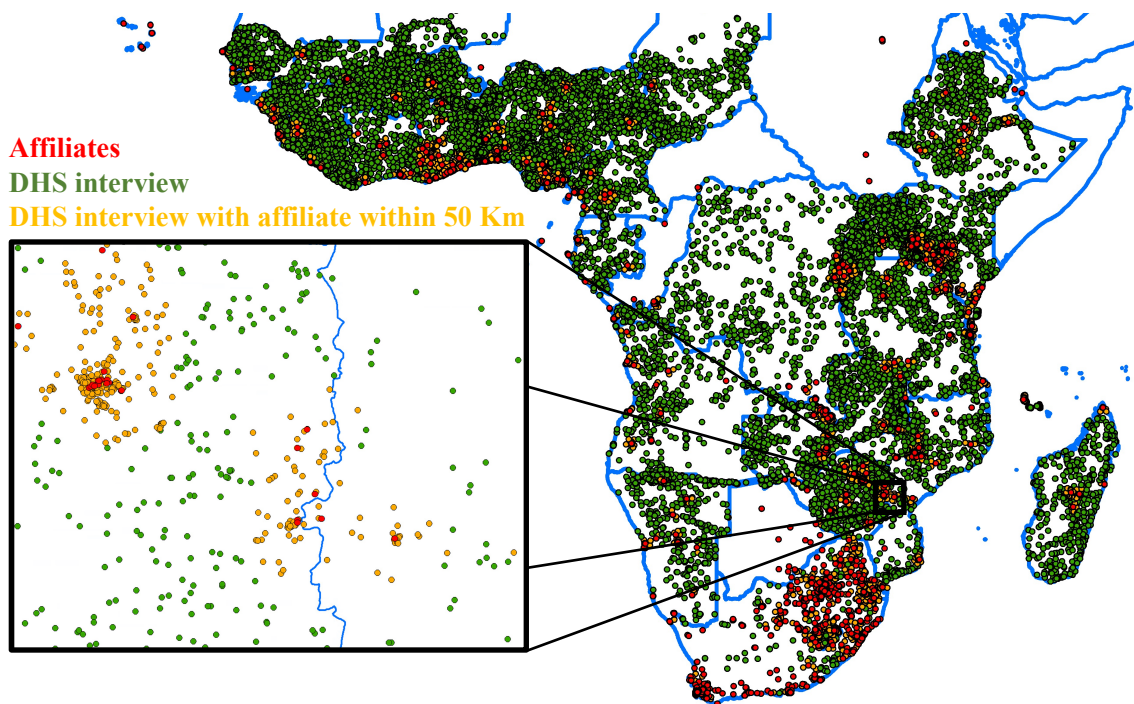
<sup>8</sup>The latter two variables are built from the standardized occupation groups provided by the DHS: not working, professional / technical / managerial, clerical, sales, agriculture-self employed, agriculture-employee, household and domestic, services, skilled manual, unskilled manual, army, agricultural, agriculture / breeding / fishing / forest. *On-Farm Job* is equal to 1 for agricultural jobs (namely, agriculture-self employed, agriculture-employee, agricultural, agriculture / breeding / fishing / forest) and 0 otherwise; conversely for *Off-Farm Job*.

<sup>9</sup>This definition of control follows the international standards for multinational corporations (OECD, 2005; Eurostat, 2007; UNCTAD, 2009).

<sup>10</sup>We vary the size of this radius from 0 to 50 km, by 5-km steps (0-5 km, 0-10 km, . . . , 0-50 km). Figure 1 shows only the largest radius.

household is 1.35. For more than 1.2 million interviewees we have information on labor market participation (*Job*), on the type of job (*On-Farm Job* and *Off-Farm Job*), and on job quality (*Occasional*, *Permanent*, *Seasonal*). In Panel (b) we can see the number of individuals interviewed having at least one MNE within 0-5 km, 5-10 km, and so on up to 25 km in at least one year. In the second row, we show the average number of years of exposure to an MNE affiliate. For instance, there are 301,008 individuals with at least one MNE affiliate within 5 km of their home. And these individuals are exposed on average for 6.1 years (possibly to different affiliates and without continuity) to MNE activity.

Figure 1: DHS and MNE in Sub-Saharan countries



*Notes:* The map shows the locations of affiliates (in red) and of DHS households, in orange those closer than 50 km from the nearest affiliate, in green those further than 50 km away.

### 3 Empirical Results

Assessing the impact of MNEs' activities on job-related outcomes poses a series of methodological difficulties, due above all to the fact that both affiliates and individuals may decide where to locate. That is, MNEs may sort into specific locations depending on their local characteristics (infrastructure, access to inputs, labor supply, etc.) so that residence near these large firms is

near-negligible compared with other local factors potentially driving the results. Likewise, people may decide to move close to (or far away from) them for reasons related to employment, so that the correlations we estimate would be spurious. We address both problems in the following way. First, from the DHS data we know when people moved to their current location, so we can directly test whether our results are robust to the exclusion of migrants. The non-migrant sample is used as the benchmark estimation sample throughout.<sup>11</sup> Secondly, all our specifications include region  $\times$  year fixed effects, which control for time-varying locational and socio-economic drivers behind the behavior of both firms and individuals, such as the availability of infrastructures, aggregate wage and employment dynamics, conflicts, weather, and the like. Lastly, we indirectly test whether the arrival of MNEs is responsible for the generation of employment opportunities by checking whether people living different distances away from them experience the same effect. We find that this is not the case; that is, the estimated effects vanish quite quickly and monotonically with distance, suggesting that the presence of multinational affiliates is indeed responsible for a change in employment patterns at the local level. We report empirical models and results below.

### 3.1 MNEs and Local Labor Supply

We model the impact of MNE exposure on job participation. For a generic individual  $i$ , located in region  $r$ , interviewed in year  $t$ , our first regression model is:

$$y_{irt} = \alpha + \beta \text{Affiliates}_{irt} + \gamma X_{irt} + f_{rt} + u_{irt} \quad (1)$$

where  $y_{irt}$  denotes our outcome variable of interest, depending on the specification,  $\text{Affiliates}_{irt}$  is a dummy variable taking value 1 if individual  $i$  in year  $t$  has at least one MNE affiliate active within 5 km of home.  $X_{irt}$  is a set of individual controls standard in the literature, namely whether the respondent lives in an urban area, has completed primary education (proxied by more than 5 years of schooling), gender, age (and age squared), and the number of children (truncated at 5). Importantly,  $f_{rt}$  are region  $\times$  year fixed effects, implying that  $\beta$  estimates the effect of being exposed to an MNE affiliate, comparing an individual near an affiliate with other people in the same region in a given year not exposed to any affiliate, conditional on individual controls.

A second regression model focuses on potential asymmetric effects of being in the neighborhood of a domestic as opposed to a foreign MNE affiliate. This is important, since the two

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<sup>11</sup>In Appendix B we present descriptive statistics for this sample of settled individuals. As we can see from analyzing Tables A2 and A3, the two samples are largely comparable both from a demographic point of view and in terms of employment characteristics.

groups of firms differ significantly. *Domestic Affiliates* are firms located in the same country as their headquarters, *Foreign Affiliates* in a different country from the headquarter.<sup>12</sup> Most importantly, though, most of the headquarters in the latter group are in advanced countries outside Africa, so foreign affiliates may have (innovative) characteristics that are different from domestic affiliates. Specifically, we estimate the following model:

$$y_{irt} = \omega + \delta \text{Domestic Affiliates}_{irt} + \sigma \text{Foreign Affiliates}_{irt} + \tau X_{irt} + f_{rt} + e_{irt} \quad (2)$$

As noted, an important concern with these models is that people may migrate to locations where MNEs open affiliates. In order to tackle this issue, we restrict our analysis to individuals who already lived in the interview location *before* the arrival of MNE affiliates.<sup>13</sup> The results of models (1) and (2) are presented in Table 1, in the odd and even columns, respectively.

In columns 1 and 2 the dependent variable is *Job*, a dummy variable equal to 1 if the individual worked in the previous 12 months. From column 1 we can observe that being located within a radius of 5 km from an MNE affiliate is associated with an increase in the probability of being employed by 3 percentage points (p.p.), or 4.3% of the sample mean (0.0304/0.704), and this effect seems to be driven particularly by domestic affiliates (column 2). Before moving on to the other outcomes, we assess the hypothesis that the effects are localized, i.e. the 0-5 km is a plausible “proximity” radius and longer-distance spillovers (at least in terms of labor supply) are limited. To do this, we simply augment model (2) with a series of dummies indicating whether domestic or foreign affiliates are present within successive bands of 5 km from the DHS location.<sup>14</sup> The results, reported in Figure 2, show that after the first domestic and foreign dummies (the latter borderline significant at 10% level), all remaining longer-distance effects are indistinguishable from zero. This is reassuring with respect to the identification of local spillover effects and their sensitivity to distance.

In the remaining columns of Table 1, we distinguish agricultural from non-agricultural employment (the latter being all sectors other than agriculture, forestry, and fishery), which we define as *On-Farm* and *Off-Farm Jobs*.

Looking at control variables, a clear pattern emerges as expected: people living in urban areas and those who are more educated (with at least 5 years of schooling) are more likely to be employed in off-farm jobs, while the opposite holds for their counterparts living in rural areas

<sup>12</sup>Note that the dummies for Domestic and Foreign Affiliates are not mutually exclusive, as they only indicate the presence of at least one of the specified type of affiliates.

<sup>13</sup>In Appendix B we show that our results are robust to relaxing this restriction.

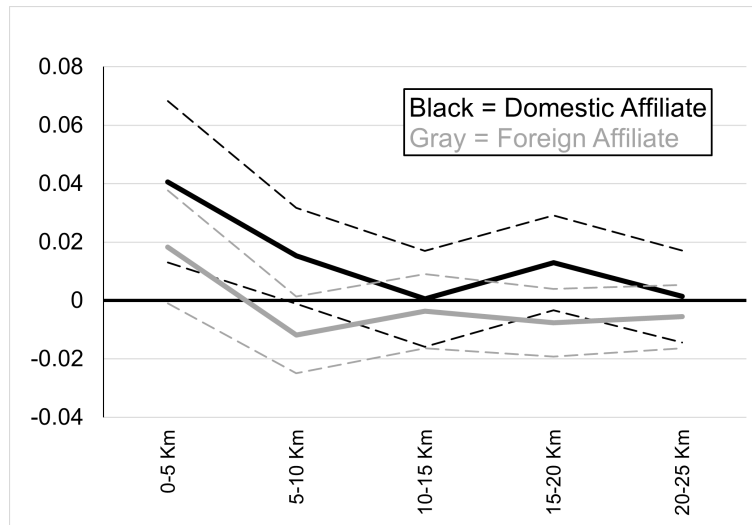
<sup>14</sup>Technically, we rewrite the regression including dummies of the form *Domestic Affiliates* (0 – 5)<sub>irt</sub>, *Foreign Affiliates* (0 – 5)<sub>irt</sub>, . . . , *Domestic Affiliates* (45 – 50)<sub>irt</sub>, *Foreign Affiliates* (45 – 50)<sub>irt</sub>.

Table 1: MNE and local labor supply

Estimation Dep. Variable	(1)	(2)	(3)	(4)	(5)	(6)
	LPM					
	Job		On-Farm Job		Off-Farm Job	
Affiliates	0.0303*** (0.00827)		-0.0235*** (0.00815)		0.0526*** (0.00937)	
Domestic Affiliates		0.0396*** (0.0142)		0.0539*** (0.0115)		-0.0217 (0.0136)
Foreign Affiliates		0.0193** (0.00974)		-0.0447*** (0.00931)		0.0667*** (0.0110)
Urban	-0.0458*** (0.00264)	-0.0457*** (0.00264)	-0.268*** (0.00379)	-0.268*** (0.00379)	0.222*** (0.00331)	0.222*** (0.00331)
Secondary Education +	-0.0122*** (0.00179)	-0.0122*** (0.00179)	-0.116*** (0.00222)	-0.115*** (0.00222)	0.0962*** (0.00202)	0.0962*** (0.00202)
Female	-0.192*** (0.00202)	-0.192*** (0.00202)	-0.135*** (0.00258)	-0.135*** (0.00258)	-0.0226*** (0.00250)	-0.0226*** (0.00250)
Age	0.0586*** (0.000412)	0.0586*** (0.000412)	0.0106*** (0.000405)	0.0106*** (0.000405)	0.0468*** (0.000472)	0.0468*** (0.000472)
Age Squared	-0.000720*** (5.74e-06)	-0.000720*** (5.74e-06)	-8.67e-05*** (6.08e-06)	-8.68e-05*** (6.08e-06)	-0.000621*** (6.81e-06)	-0.000621*** (6.81e-06)
Numb. of Children	-0.000691 (0.000651)	-0.000693 (0.000651)	0.0151*** (0.000752)	0.0151*** (0.000751)	-0.0151*** (0.000729)	-0.0151*** (0.000729)
Obs	556,663	556,663	536,790	536,790	536,790	536,790
R2	0.254	0.254	0.298	0.298	0.233	0.233
Region × Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Mean Dep. Variable	0.704	0.704	0.336	0.336	0.388	0.388

Notes: LPM estimations. Dependent variables: *job* (dummy for having worked in the last 12 months), columns 1 and 2; *On-Farm Job* (dummy for working in the farming sector), columns 3 and 4; *Off-Farm Job* (dummy for working in the non-farming sector), columns 5 and 6. \*\*\*, \*\*, \* indicate significance at the 1%, 5%, and 10% level, respectively. Main explanatory variables are: *Affiliates* (odd columns), a dummy flagging those individuals having at least one affiliate within a 5 kilometer radius; *Domestic Affiliates* and *Foreign Affiliates* (even columns), two dummies flagging those individuals having at least one domestic and/or one foreign affiliate within a 5 kilometer radius, respectively. Controls are: dummy for household living in urban area, dummy for education level above 5 years (*Secondary Education*), dummy for female, age and age squared, number of children (capped at 5), region × interview year fixed effects. Errors are clustered at the level of DHS cluster (i.e. the geographic unit for which coordinates have been coded, which can be a village, a neighborhood in urban area, etc). Sample is all those individuals already living in the place before the arrival of the first affiliate.

Figure 2: MNE and Labor Participation: Geographic decay



*Notes:* The plot represents the results of the model 2 augmented with dummies for domestic and foreign affiliates within different radii, from 0-5 km to 45-50 km (only the coefficients up to 25 are shown), as explained in footnote 14. The dependent variable is *Jobs*. Coefficients for domestic (foreign) affiliates are represented in black (grey), together with the 95% confidence interval. See main text and the note of Table 1 for further details.

and with less education. As expected, the influence of age on labor supply is not constant but changes with age. Females are significantly less likely to be employed than males (both on- and off-farm), while the number of children decreases off-farm labor supply (and increases on-farm employment).

Turning to our variables of interest, Column 3 shows that the impact of MNE affiliates is associated with a 2.35 p.p. decrease in the probability of having an on-farm job, a 7% drop with respect to the sample mean (-0.0235/0.336). Distinguishing among types of MNE activities (column 4), we observe that domestic and foreign affiliates have opposite effects. Specifically, being within 5 km of an affiliate of a domestic MNE is associated with an increase of 5.4 p.p in the likelihood of on-farm employment, while the effect is negative in sign and 15% smaller in magnitude (4.5 p.p) if the individual is close to the affiliate of a foreign MNE. Interestingly, these effects are reversed for off-farm jobs. Columns 5 and 6 show that on average being close to an MNE affiliate is positively correlated with an increase of 5.3 p.p (over 13% of the sample mean) in the likelihood of being employed in an off-farm job, and that this effect is driven by foreign affiliates. Indeed, having a foreign affiliate of an MNE nearby increases the likelihood of off-farm employment by 6.7 p.p.. These results point to a significant role of the affiliates of foreign MNEs in generating positive labor demand spillovers in terms of reallocation of local workers from on-farm to off-

farm jobs, which is not the case for domestic MNEs.<sup>15</sup>

We argue that these asymmetric effects between domestic and foreign MNE affiliates offer significant support for the thesis that, unlike domestic (multinational) firms in Africa, foreign ones may boost capital and technology transfers, international business practices and productivity externalities that spill over the local host economy. Spillovers, in particular, may derive from increased competition, productivity and technological change across local firms and activities, which in turn boost labor turnover and employment. In order to double check this mechanism with our data, we distinguish between foreign affiliates where headquarters is located in an OECD country and in former colonial power.<sup>16</sup> Our prior is that the more advanced and “less exploitative” the headquarters’ country is, the greater the scope for positive spillovers in Africa.

The results, reported in Table 2, are in line with the thesis just set out. Column 1 shows that the positive effect of foreign affiliates on local labor supply is driven entirely by those affiliates whose headquarters is located in a former *non-colonial* country, while the opposite holds for affiliates with headquarters in the former colonial power. In particular, columns 3 and 5 indicate that non-colonial countries having MNE affiliates in Africa seem to boost off-farm jobs in particular (+5.9 p.p.), while foreign affiliates with headquarters in the former colonial power contribute more to the decline in on-farm jobs (-10.4 p.p.). A similar pattern emerges when foreign affiliates are broken down according to headquarters located in OECD vs non-OECD countries (even columns in the same table). MNE affiliates whose headquarters are in OECD countries are the only ones that contribute significantly to a rise in off-farm labor supply and a decline in on-farm employment. Taken together, these results seem to indicate a positive role of international productive linkages with advanced countries, especially when these are not tied to colonial legacy – i.e. those more likely to generate technology and production spillovers other than “extractive” investments – in increasing local (off-farm) employment and structural change in Africa.

In the next subsection, we investigate the quality of the jobs created or fostered by global business groups and test for heterogeneous effects across different individual sub-samples.

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<sup>15</sup>One may argue that this may be the result of an industry composition effect in the two groups of affiliates, i.e. domestic and foreign. However, this does not seem to be the case: in our MNE data (around 103 thousand affiliate-year observations), 1.74% of observations are *Domestic Affiliates* active in *On-Farm* Industries, and this number is highly comparable with the 1.76% of *Foreign Affiliates* active in *On-Farm* Industries.

<sup>16</sup>Like the Domestic vs Foreign Affiliate dummies, the OECD vs Non-OECD and Colonial vs Non-Colonial dummies are not mutually exclusive. Colonial linkages come from the widely used CEPII data (Head et al., 2010).

Table 2: Colonial and OECD affiliates

Estimation Dep. Variable	(1)	(2)	(3)	(4)	(5)	(6)
	LPM					
	Job		On-Farm Job		Off-Farm Job	
Domestic Affiliates	0.0431*** (0.0147)	0.0414*** (0.0143)	0.0612*** (0.0118)	0.0545*** (0.0119)	-0.0247* (0.0138)	-0.0207 (0.0136)
Foreign Colonial Affiliates			-0.104*** (0.0197)		0.0484** (0.0222)	
Foreign Non-Colonial Affiliates	0.0401*** (0.00993)		-0.0153 (0.00947)		0.0589*** (0.0118)	
Foreign OECD Affiliates		0.0109 (0.0115)		-0.0574*** (0.0105)		0.0710*** (0.0124)
Foreign Non-OECD Affiliates		0.0112 (0.0146)		-0.0111 (0.0148)		0.0239 (0.0183)
Obs	556,663	556,663	536,790	536,790	536,790	536,790
R2	0.254	0.254	0.298	0.298	0.233	0.233
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Region $\times$ Year FE	Yes	Yes	Yes	Yes	Yes	Yes

Notes: LPM estimations. Dependent variables: *Job* (dummy for having worked in the last 12 months), columns 1 and 2; *On-Farm Job* (dummy for working in the farming sector), columns 3 and 4; *Off-Farm Job* (dummy for working in the non-farming sector), columns 5 and 6. \*\*\*, \*\*, \* = indicate significance at the 1%, 5%, and 10% level, respectively. Main explanatory variables are: *Domestic Affiliates*, a dummy flagging those individuals having at least one domestic affiliate within a 5 kilometer radius; *Foreign Colonial Affiliates* and *Foreign Non-Colonial Affiliates* (odd columns), two dummies flagging those individuals having at least one foreign affiliate from a former colonial power and non-colonial country within a 5 kilometer radius, respectively; *Foreign OECD Affiliates* and *Foreign Non-OECD Affiliates* (even columns), two dummies flagging those individuals having at least one foreign affiliate from an OECD and a non-OECD country within a 5 kilometer radius, respectively. Controls are those reported in the note to Table 1. Sample is all those individuals already living in the place before the arrival of the first affiliate.

## 3.2 Job Quality and Heterogeneous Effects

This section takes two departures from the main analysis: (i) examining a sub-samples of population and (ii) exploring information about “job quality”. With respect to the former, we focus on three sub-samples of settled individuals, namely Youth only (18-25 years), Men only, and Women only, replicating specifications 1 and 2 in Table 1. The results are reported in Table 3, Panel (a). Domestic affiliates are the only responsible for a significant increase in youth employment, according to columns 1 and 2. With respect to the gender sub-samples (columns 3 to 6), the overall effect of affiliates is positive on both, but whereas domestic affiliates significantly increase male employment especially, foreign affiliates play the key role in boosting female employment.

In Panel (b) of Table 3 we return to the full sample of settled population, going further into the quality of the jobs obtained by individuals. While domestic affiliates are associated with employment in occasional jobs (columns 1 and 2), the contribution of MNEs to permanent employment is driven entirely by foreign affiliates (columns 3 and 4). And the small overall negative effect on seasonal jobs (column 5) stems from opposite effects due to domestic affiliates (significantly positive) and foreign affiliates (strongly negative) (column 6).

All in all, by leveraging granular data on both domestic and foreign MNE affiliates in Africa,



Table 3: Job Quality

Estimation	LPM					
<i>Panel (a): Heterogeneity</i>	(1)	(2)	(3)	(4)	(5)	(6)
Dep. Variable	Job					
Sample	Youth		Men		Women	
Affiliates	0.0198 (0.0142)		0.0245*** (0.00844)		0.0307*** (0.0114)	
Domestic Affiliates		0.0636*** (0.0218)		0.0358** (0.0177)		0.0218 (0.0196)
Foreign Affiliates		-0.00588 (0.0169)		0.0162* (0.00927)		0.0321** (0.0133)
Obs	189,418	189,418	106,832	106,832	210,347	210,347
R2	0.195	0.195	0.134	0.135	0.203	0.203
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Region × Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Mean Dep. Variable	0.599	0.599	0.953	0.953	0.747	0.747
<i>Panel (b): Job Quality</i>	(1)	(2)	(3)	(4)	(5)	(6)
Dep. Variable	Occasional Job		Permanent Job		Seasonal Job	
Affiliates	-0.0001 (0.00456)		0.0443*** (0.00849)		-0.0138* (0.00708)	
Domestic Affiliates		0.0167** (0.00686)		-0.0266* (0.0143)		0.0497*** (0.00830)
Foreign Affiliates		-0.00885* (0.00537)		0.0620*** (0.00954)		-0.0339*** (0.00846)
Obs	552,677	552,677	552,677	552,677	552,677	552,677
R2	0.044	0.044	0.196	0.196	0.137	0.137
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Region × Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Mean Dep. Variable	0.068	0.068	0.409	0.409	0.226	0.226

Notes: LPM estimations. Dependent variable of panel (a) is *Job* (dummy for having worked in the last 12 months), dependent variables of panel (b) are *Occasional Job* (dummy for having an occasional job), columns 1 and 2; *Permanent Job* (dummy for having a permanent job), columns 3 and 4; *Seasonal Job* (dummy for having a seasonal job), columns 5 and 6. \*\*\*, \*\*, \* indicate significance at the 1%, 5%, and 10% level, respectively. Main explanatory variables in both panels are: *Affiliates* (odd columns), a dummy flagging those individuals having at least one affiliate within a 5 kilometer radius; *Domestic Affiliates* and *Foreign Affiliates* (odd columns), two dummies flagging those individuals having at least one domestic and/or foreign affiliate within a 5 kilometer radius, respectively. Controls are those reported in the note to Table 1. Sample is all those individuals already living in the place before the arrival of the first affiliate for panel (b). In panel (a) the sample is these are restricted to individuals aged 18-25 (columns 1 and 2), men above 25 (columns 3 and 4) and women above 25 (columns 5 and 6).

we find strong and significant evidence that living close to a foreign multinational firm (especially those of advanced and non-colonial countries) generates positive spillovers on local employment, especially for women and particularly permanent jobs (one aspect of good quality).

## **4 Conclusion and Future Research**

Our research provides novel results on the relationship between the presence of multinational enterprises and labor market outcomes in Sub-Saharan Africa, exploiting the universe of domestic and foreign MNE affiliates and multiple country-level representative samples of individuals. Living in the vicinity of a multinational affiliate turns out to generate positive effects in terms of job creation, and the effect is very localized, since it fades away to zero beyond 5 kilometers' distance.

Importantly, the presence of MNE affiliates, specifically foreign ones (with their headquarters abroad), is associated with more off-farm and fewer on-farm jobs. This is true especially for those headquarters located in an OECD country or not the former colonial power. This seems to suggest that foreign affiliates, through technology and knowledge transfers that do not stem from colonial linkages, are likely to spur positive spillovers on the local economy and accelerate the transition from agricultural to off-farm employment. The positive employment effects of the foreign MNE affiliates are particularly significant for women and for permanent employment, and hence of higher quality than seasonal or temporary jobs.

While this first set of results is certainly significant, we consider even more important to investigate this empirical setting further in future research, exploiting in more detailed fashion the time structure of the two main datasets, the industry characteristics of the affiliates (hence, for example, their differentiating capital intensity), and interactions with local socio-economic conditions (cultural, institutional, and political).

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# Appendix

## A DHS Coverage

Table A1 present the country-year coverage of DHS data, specifying for each country the specific DHS survey(s) used and the total number of interviews.

Table A1: African Countries Descriptive Statistics

Country	Survey	Year of the survey	Number of clusters	Number of observations
Angola	7	2015, 2016	627	74.902
Burkina Faso	6	2010	574	82.095
Benin	6	2011, 2012	750	88.174
	7	2017, 2018	555	74.673
Burundi	6	2010, 2011	376	4.242
	7	2016, 2017	554	78.367
Congo	5	2007	300	48.291
	6	2013, 2014	540	95.949
Cote d'Ivoire	6	2011, 2012	352	51.187
	6	2011	580	72.622
Cameroon	7	2018, 2019	469	60.699
	5	2005, 2008	2.626	20.483
Egypt	6	2014	884	120.276
	6	2003	650	77.744
Ethiopia	7	2008	645	75.224
Gabon	6	2012	336	41.675
Ghana	5	2008	412	46.536
	7	2014	427	43.945
	5	2005	297	38.182
Guinea	6	2012	300	45.049
	7	2018	401	49.543
	5	2008, 2009	400	38.515
Kenya	7	2014	1.594	15.384
Comoros	6	2012	252	24.499
	6	2009, 2010	400	44.546
Lesotho	7	2014	400	40.197
Madagascar	5	2008, 2009	600	85.858
	5	2006	408	73.685
Mali	6	2012, 2013	585	5.833
	7	2018	379	54.571
Malawi	6	2010	849	11.885
	7	2015, 2016	850	120.492
Mozambique	6	2011	611	6.275
	5	2008	888	156.809
Nigeria	6	2013	904	178.894
	7	2018	1.389	18.801
	5	2006, 2007	500	42.633
Botswana	6	2013	554	41.646
	5	2005, 2007, 2008	712	80.476
Rwanda	6	2010, 2011	492	56.505
	7	2014, 2015	492	54.905
Sierra Leone	5	2008	353	41.985
	6	2013	435	75.299
	6	2010, 2011, 2012, 2013	792	159.585
Senegal	7	2014, 2015, 2016	628	124.257
Swaziland	5	2006, 2007	275	22.143
Tchad	7	2014, 2015	626	9.962
Togo	6	2013, 2014	330	46.577
	6	2009, 2010	608	6.488
Tanzania	7	2015, 2016	475	50.414
	5	2006	368	45.439
Uganda	6	2011	712	44.977
	7	2016	697	91.167
South Africa	7	2016	750	3.885
	5	2007	320	35.562
Zambia	6	2013, 2014	722	83.058
	7	2018, 2019	545	65.454
	5	2005, 2006	398	42.698
Zimbabwe	6	2010, 2011	406	41.946
	7	2015	400	43.706
Total		2003-2019		4,745,539

*Notes:* Coverage of DHS by countries and years, indicating the wave number.

## B Additional Tables

In Tables A2 and A3 we present descriptive statistics for the full and the estimation samples, respectively. The latter is restricted to those who lived in the interview's location *before* the arrival of MNEs. Table A4 presents the results of our models 1 and 2 considering also non-settled individuals.

Table A2: Descriptive Statistic

<i>Panel (a): Individual level data</i>	<i>Obs.</i>	<i>Mean</i>	<i>St. Dev</i>	<i>Min</i>	<i>Max</i>
Female	4,745,503	0.512	0.500	0	1
Urban	4,745,539	0.351	0.477	0	1
Number of Kids	4,745,539	1,358	1,391	0	24
Secondary Education +	4,745,539	0.324	0.468	0	1
Age	4,742,205	22.58	19.18	0	97
Job	1,238,433	0.678	0.467	0	1
On Farm Job	1,211,847	0.310	0.462	0	1
Off Farm Job	1,211,847	0.371	0.483	0	1
Permanent Job	1,220,342	0.400	0.490	0	1
Occasional Job	1,220,342	0.200	0.400	0	1
Seasonal Job	1,220,342	0.0730	0.260	0	1
<i>Panel (b): Exposure to MNE</i>	<i>0-5 km</i>	<i>5-10 km</i>	<i>10-15 km</i>	<i>15-20 km</i>	<i>20-25 km</i>
Number of individuals	301,008	298,081	226,345	198,502	210,522
Average years of MNE exposure	6.1	6.2	5.9	5.8	5.8

*Notes:* Authors' computation from DHS and the multinational enterprises (MNE) datasets, all available observations. Additional information on the coverage of DHS dataset can be found in Appendix A.

Table A3: Descriptive Statistic - Settled

<i>Panel (a): Individual level data</i>	<i>Obs.</i>	<i>Mean</i>	<i>St. Dev</i>	<i>Min</i>	<i>Max</i>
Female	556,879	0.676	0.468	0	1
Urban	556,879	0.318	0.465	0	1
Numb. Kids	556,879	1.186	1.170	0	16
Secondary Education +	556,879	0.574	0.494	0	1
Age	556,879	29.31	10.35	15	64
Job	556,663	0.704	0.456	0	1
On Farm Job	536,790	0.336	0.472	0	1
Off Farm Job	536,790	0.388	0.487	0	1
Permanent Job	552,677	0.409	0.492	0	1
Occasional Job	552,677	0.226	0.418	0	1
Seasonal Job	552,677	0.0678	0.251	0	1
<i>Panel (b): Exposure to MNE</i>	<i>0-5 km</i>	<i>5-10 km</i>	<i>10-15 km</i>	<i>15-20 km</i>	<i>20-25 km</i>
Number of individuals	48,857	50,987	36,793	32,328	34,278
Average years of MNE exposure	6.7	6.8	6.3	6.2	6.2

*Notes:* Sample used in the main regressions. Authors' computation from DHS datasets, all available observations for individuals settled at the time of the arrival of the affiliate(s).



Table A4: MNE and Local Labor Supply - Settled and Non-Settled

Estimation Dep. Variable	(1)	(2)	(3)	(4)	(5)	(6)
	LPM					
	Job		On Farm Job		Off Farm Job	
Affiliates	0.0150*** (0.00300)		-0.0276*** (0.00309)		0.0343*** (0.00342)	
Domestic Affiliates		0.0267*** (0.00475)		0.0246*** (0.00460)		-0.00433 (0.00529)
Foreign Affiliates		0.00400 (0.00352)		-0.0377*** (0.00358)		0.0359*** (0.00406)
Urban	-0.0416*** (0.00186)	-0.0416*** (0.00185)	-0.263*** (0.00266)	-0.263*** (0.00266)	0.218*** (0.00237)	0.218*** (0.00236)
Secondary Education +	-0.0261*** (0.00123)	-0.0261*** (0.00123)	-0.113*** (0.00145)	-0.113*** (0.00145)	0.0774*** (0.00143)	0.0774*** (0.00143)
Female	-0.192*** (0.00147)	-0.192*** (0.00147)	-0.127*** (0.00178)	-0.127*** (0.00178)	-0.0438*** (0.00162)	-0.0438*** (0.00162)
Age	0.0581*** (0.000288)	0.0581*** (0.000288)	0.0108*** (0.000270)	0.0108*** (0.000270)	0.0471*** (0.000324)	0.0471*** (0.000324)
Age Squared	-0.000717*** (4.02e-06)	-0.000717*** (4.02e-06)	-9.21e-05*** (4.03e-06)	-9.20e-05*** (4.03e-06)	-0.000623*** (4.63e-06)	-0.000623*** (4.63e-06)
Numb. Kids	-0.00179*** (0.000430)	-0.00180*** (0.000430)	0.0134*** (0.000480)	0.0134*** (0.000480)	-0.0141*** (0.000480)	-0.0141*** (0.000480)
Obs	1,238,432	1,238,432	1,211,846	1,211,846	1,211,846	1,211,846
R2	0.271	0.271	0.330	0.330	0.220	0.220
Region × Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Mean Dep. Variable	0.678	0.678	0.310	0.310	0.371	0.371

Notes: LPM estimations. Dependent variables: "Job" (dummy for having worked in the last 12 months), columns 1 and 2; "On-Farm Jobs" (dummy for working in the farming sector), columns 3 and 4; "Off-Farm Job" (dummy for working in the non-farming sector), columns 5 and 6. \*\*\*, \*\*, \* indicate significance at the 1%, 5%, and 10% level, respectively. Main explanatory variables are: "Affiliates" (odd columns), a dummy flagging those individuals having at least one affiliate within a 5 kilometer radius; "Domestic Affiliates" and "Foreign Affiliates" (odd columns), two dummies flagging those individuals having at least one domestic and foreign affiliate within a 5 kilometer radius, respectively. Controls are: dummy for household living in urban area, dummy for education level above 5 years ("Secondary Education"), dummy for female, age and age squared, number of children (capped at 5), region × interview year fixed effects. Errors are clustered at the level of DHS cluster (i.e. the geographic unit for which coordinates have been coded, that can be a village, a neighborhood in urban area, etc). Sample is all geolocated individuals.