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Greenfield FDI and job creation in Africa

Tabea Lakemann¹ · Jann Lay¹ · Regina Schnars¹ · Tevin Tafese¹ 

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Abstract

Foreign direct investment (FDI) can potentially contribute to the structural transformation that will create jobs for Africa's young and underemployed workforce. Yet, surprisingly little is known about the direct and indirect employment effects of greenfield investment, the most common form of FDI on the continent. We address this knowledge gap by constructing a comprehensive, Africa-wide project-level dataset on greenfield FDI for the period 2013 to 2020, combining information from the two leading commercial databases of project-level greenfield FDI, fDi Markets and Orbis Cross Border Investment. Based on this novel publicly available dataset, we show that there is little overlap in the projects covered by the two databases, implying that the total number of greenfield FDI projects in Africa is much larger than suggested, for example, by UNCTAD's flagship World Investment Report. Descriptive analyses based on our database and ILO employment data suggest that direct job creation in greenfield projects may be an important driver of formal employment creation in services and manufacturing in selected countries. However, direct greenfield job creation is small relative to total job creation, and indicative correlation regressions even hint at potential crowding-out of formal employment in domestic firms.

JEL Codes F23; J4, L16; N17.

Keywords FDI · Jobs · Structural transformation · Africa

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1 Introduction

It is often taken for granted that foreign direct investment (FDI) creates jobs. The promotion of FDI, in particular greenfield FDI, features prominently on development agendas, including in Africa. On the continent, levels of FDI have long been much lower than in other regions of the world and the creation of productive employment for an increasing and relatively young labour force constitutes one of the key development challenges (Sumberg et al., 2021; UNCTAD, 2020). Yet, the net effect of foreign investment on employment in the host economy can be positive or negative, driven by direct or indirect employment effects. While a new factory built with FDI creates employment, perhaps even more in supplier firms, the same factory may create competitive pressures in domestic labour and product markets that reduce employment elsewhere in the economy. To date, only few studies investigate the employment impacts of greenfield investment in Africa. However, understanding the direct and indirect employment effects of FDI, including on formal and informal employment, and the related sectoral patterns, is a precondition for designing policies that maximise the beneficial development impacts of FDI.

In this paper, we study greenfield FDI in Africa and its direct and indirect employment effects for the period between 2013 and 2020. Our focus is on greenfield FDI, generally defined as the establishment of new facilities or the expansion of existing ones by a foreign investor in a host country (UNCTAD, 2020). In Africa, greenfield investment is the dominant mode of entry for FDI as compared to Mergers and Acquisitions (M&A), where a foreign investor joins or takes over a domestic firm. Our paper makes two contributions.

First, we construct and provide open-access a novel project-level dataset of greenfield FDI in Africa, which we use to provide a more comprehensive and nuanced picture of FDI on the continent and more accurate estimates of the employment effects of greenfield FDI than were previously available. Combining the two most used proprietary project-level FDI databases (Orbis and fDi Markets), we show that more than two thirds of all projects are listed in only one of the two sources, implying that both databases – and consequently the studies using them – understate the true number and investment volume of greenfield FDI projects and, accordingly, jobs created substantially. For example, our findings suggest that announced greenfield FDI in our database in 2016 and 2017 is 20 and 33 per cent higher, respectively, than the total value of announced greenfield investment for the same years as presented in the 2018 World Investment Report using fDi Markets (UNCTAD, 2018). We also demonstrate that using only one of the original databases not only underestimates total greenfield investment activity, but also distorts it in terms of sector, investor origin, and destination country. Our novel comprehensive database on greenfield investment and employment is also freely available for fellow researchers to use for further studies (Tafese et al., 2024).

Second, we add to a nascent but growing literature on the effects of foreign investments on African labour markets. Several factors could lead to less positive employment effects in Africa as compared to other world regions, ranging from lower levels of FDI, higher technological distance and lower linkages between investor firms and local firms, as well as a higher share of resource-seeking FDI in extractive industries.

Recent studies document positive effects of greenfield FDI and the presence of multinationals on employment and structural transformation in several African economies (Hoekman & Sanfilippo, 2023; Mendola et al., 2021), as well as for FDI attracted by resource discoveries in Mozambique (Toews & Vézina, 2022), and manufacturing FDI in Ethiopia (Abebe et al., 2022; Crescenzi & Limodio, 2021). While the cited papers focus on local spillover effects, our descriptive and correlational analyses consider nationally aggregate effects at the sectoral level, thus also capturing the effects of foreign competition or within-sector linkages on domestic firms that may not be located in proximity to the greenfield investment. For these analyses, we link information from our novel FDI database to ILO employment data from 33 African countries at the country-sector level, distinguishing between formal and informal employment. Descriptive analyses at a broad sectoral aggregation suggest that direct job creation in greenfield projects may be an important driver of formal job creation in services and manufacturing in selected African countries. Overall, however, formal job creation is low in most countries, compared to informal job creation, which accounts for the bulk of total job creation. Moreover, econometric correlational analyses for 14 African countries – for which two or more waves of employment data are available – provide indicative evidence that FDI may create few additional formal jobs or even crowd out formal employment in domestic firms, as we find a significant positive but rather low correlation when regressing net employment changes on greenfield job creation at the more fine-grained 2-digit sector level. The effects vary across broad sectors, with the small overall effect of greenfield job creation being driven by formal employment in services, and no significant effect in formal manufacturing. Finally, more greenfield jobs are associated with less informal service employment in the same sector, possibly hinting at crowding-out of informal services jobs.

The paper is structured as follows. We first provide a brief literature review on jobs and FDI in Africa in Sect. 2. We then present our consolidated database of greenfield projects in Africa in Sect. 3, and use it to derive stylised facts on greenfield FDI and direct job creation in Africa in Sect. 4. In Sect. 5, we conduct simple regression analysis on the relationship between greenfield jobs and local employment growth, before concluding in Sect. 6.

2 Literature review: FDI and job creation in Africa

Greenfield FDI can create jobs in the host country directly, i.e., in the foreign-owned firm itself, or indirectly in domestic firms through linkages and spillovers (Lay & Tafese, 2020). Further, the quality of employment in foreign firms tends to be higher than in comparable domestic firms. As we discuss in Sect. 3, there is no single, authoritative data source on the number of jobs created directly by greenfield FDI projects. UNCTAD's 2024 World Investment Report suggests that up to 200,000 additional jobs could be created in Africa through greenfield FDI projects announced in 2023 (UNCTAD, 2024), based on publicly announced projects contained in the fDi Markets database.

Higher efficiency and higher output due to superior access to global markets, better technologies, or more efficient allocation of resources may allow foreign firms to generate additional employment. However, when domestic firms are acquired by foreign firms, the impacts on employment within the firms may not always be positive, as higher labour productivity may be achieved through downsizing. Similarly, the employment spillovers of FDI on domestic firms are also ambiguous. On the one hand, the positive effects of FDI on domestic firm productivity and employment in these firms may result in technological upgrading (Abebe et al., 2022; Görg & Strobl, 2005), or local (backward) linkages (Amendolagine et al., 2013). Mechanisms facilitating these spillovers can be imitation (Abebe et al., 2022), worker mobility (Abebe et al., 2022; Görg & Strobl, 2005), the transfer of knowhow, such as managerial practices (Abebe et al., 2022; Crescenzi & Limodio, 2021), and competition (Abebe et al., 2022). On the other hand, increased competition from foreign firms or from domestic competitors that become more productive may also crowd-out domestic firms and lead to (net) employment losses.

These theoretical ambiguities may explain why the very limited firm-level evidence on job creation through FDI is inconclusive. For Africa in particular there are very few studies, and the limited evidence available comes largely from a single data source, the UNIDO Africa Investor Survey conducted in 2010/2011 for 19 sub-Saharan African countries. This cross-sectional dataset allows for simple comparisons between domestic and foreign-owned firms, usually controlling for additional factors such as sector, investment destination, and investor origin. These data include some firms that have been established as greenfield projects, but this is usually not taken into account in the studies that use them.

One early study based on the UNIDO Africa Investor Survey is Coniglio et al. (2015) who find that foreign-owned firms have, on average, 11.5 to 16.6 more employees than domestic firms operating in the same sector and country (depending on the specification). They also find heterogeneous employment effects with respect to the origin of the investor. Foreign firms from other developing countries employ 15.3 per cent more workers than domestic firms controlling for other (partly endogenous) firm characteristics. This difference is only 4.1 per cent for firms from the global North. Using slightly different specifications,¹ Foster-McGregor et al. (2015) find somewhat smaller overall employment effects of foreign ownership, with about 10 per cent more workers employed in foreign-owned firms. Their study examines industry heterogeneity and distinguishes between blue-collar and white-collar workers. These analyses suggest, for example, that the effect of ownership on employment is driven by higher demand for lower-skilled jobs in foreign-owned manufacturing firms, an effect that is particularly pronounced in Chinese-owned manufacturing firms.² Another aspect considered in this literature is the employment of foreign vis-

¹ Differences include, for example, the use of different independent variables or (Coniglio et al., 2015) an OLS estimation strategy, while Foster-McGregor et al. (2015) use an IV approach and quantile regression.

² For Chinese-owned firms, the authors also detect a large effect (of 31 per cent) on white-collar employment. This is at odds with the generally lower skill intensity in foreign firms with an origin in other developing countries (including China), observed by Coniglio et al. (2015). The evidence is thus not entirely conclusive in this regard.

à-vis local workers. Coniglio et al. (2017) find that the share of foreign workers in foreign firms is on average 7.6 per cent higher than in domestic firms. Looking at investor origin, foreign firms from the Global South employ 11.5 per cent more foreign workers than domestic firms, while firms from the Global North employ only 7 per cent more foreign workers. Blanas et al. (2019) confirm that foreign firms use significantly less local labour than domestic firms.

The above studies using the UNIDO data consistently document a positive effect of foreign ownership on the quality of employment. Foreign-owned firms have a higher training intensity, with the ratio of training expenditure to full-time employees being 10.9 per cent higher in foreign-owned firms than in domestic firms. Foreign-owned firms also offer better, more stable, and more secure jobs. For example, they have a two per centage points higher share of permanent workers, a two per centage points lower share of temporary workers, and a 3 per cent lower probability than domestic firms to offer unpaid work (Blanas et al., 2019). Coniglio et al. (2015), Foster-McGregor et al. (2015), and Blanas et al. (2019) confirm the findings of te Velde and Morrissey (2003)³ on the existence and magnitude of wage premia of foreign firms in Africa. Coniglio et al. (2015) find a wage premium of 16.9 per cent for foreign firms (compared to domestic firms) that is even higher for firms from the Global North (up to about 30 per cent).⁴

Methodologically more rigorous approaches that attempt to estimate the causal effect of FDI by focusing on changes in foreign ownership overall also document employment and wage gains as well as improvements in working conditions in domestic firms that are taken over by foreign investors, but such evidence is not available for sub-Saharan Africa. Lipsey et al. (2013) examine job creation in Indonesian manufacturing firms. They find that employment grows 9 and 11 per centage points faster in foreign-acquired firms compared to domestic firms and pre-acquisition firms, respectively. Hijzen et al. (2013) investigate employment and wage effects as a result of foreign ownership changes in Indonesia, Brazil, and three developed countries. Wage effects are positive and large, particularly for Brazil and Indonesia, while there is evidence of (large) employment effects only in Indonesia and Portugal when considering ownership changes. These various firm-level studies offer important insights into the employment and wage effects of FDI. Yet, they tend to ignore – or at least not explicitly account for – greenfield investment. This is also because a meaningful “domestic counterfactual” cannot be established at the firm level. Given the importance of greenfield investment in FDI to Africa, other approaches are needed to investigate the employment and labour market implications of FDI. Previous evidence suggests that greenfield projects are by far the dominant mode of entry in Africa, accounting for about 90 per cent of foreign firm activity (Amendolagine et al., 2013, 2019).⁵ Reasons for the preference for greenfield projects in an African

³ te Velde and Morrissey (2003) had actually been the first to establish a wage premium between 8 and 23 per cent in foreign firms in Africa.

⁴ The wage premium varies considerably across foreign firms from different developing countries, and it is higher for higher-skilled workers than for lower-skilled workers and higher for services than for manufacturing. See also Foster-McGregor et al. (2015) and Blanas et al. (2019).

⁵ Comparing greenfield investment from our consolidated greenfield database with M&A investment from Orbis Crossborder Investment, we estimate that around 87 per cent of the total investment volume

context may include high costs for transferring know-how (Mattoo et al., 2004) or the limited possibilities to acquire established domestic formal firms.

Very recent research has taken a different approach towards examining the labour market impact of – mainly greenfield – FDI in Africa, combining geo-localised, project-level or affiliate-level FDI data with data on local firms and labour markets. Hoekman et al. (2023) use micro data on more than 40 million individuals, which they match with fDi Markets data on the presence of greenfield projects in about 2500 subnational geographical units over the period 1987–2019. They find that the presence of projects correlates with employment growth and a shift of workers into modern industries and higher-skilled occupations. Additional geospatial analyses by Hoekman et al. (2023) linking the presence of greenfield projects to changes in domestic firm performance – using World Bank Enterprise Survey data – suggest positive horizontal spillovers and inter-industry linkages. Using a very similar approach and Demographic and Health Surveys (DHS) data, Mendola et al. (2021) find a 6.7 per centage point increase in off-farm employment in households in close geographical proximity to a foreign multinational enterprise affiliate in sub-Saharan Africa.

These studies point towards a non-negligible impact of greenfield investment on local labour markets. As indicated above, these effects work through both direct and indirect channels and an increasing number of studies on individual countries indicate a possibly large potential for job creation in domestic firms. For example, Toews and Vézina (2022) find positive employment effects of FDI inflows related to oil and gas discoveries in Mozambique. According to the fDi Markets data that they use, about 125 000 jobs were created directly through greenfield projects following the resource discoveries (out of a total of about 9 million jobs in the country). Using household and firm census data they further estimate that for each direct job created in a foreign firm, an additional 2.1 formal jobs and 2.3 informal jobs are created in local firms.

In addition, two recent studies examine the employment effect of greenfield FDI in Ethiopia. Abebe et al. (2022) examine the impact of large greenfield projects in Ethiopia's manufacturing sector using firm census data on employment and administrative data on greenfield projects. Applying a difference-in-differences approach, with control districts defined as those where a project has been licensed but the firm is not yet operational, they find an increase in employment in domestic firms in districts with large greenfield investments. These firms increase employment by 24 per cent, corresponding to roughly 20 employees per firm on average. In addition, in districts with newly opened greenfield projects, 47 per cent more local plants are established. Crescenzi and Limodio (2021) also examine the effects of FDI in Ethiopian districts, but with a focus on Chinese FDI. Moreover, the authors distinguish between effects on domestic firms in the same and upstream and downstream industries. They find positive effects on employment in domestic firms in supplier and buyer industries, on

by foreign investors in Africa were made through greenfield projects between 2013 and 2020, confirming previous evidence. While this is arguably an upper bound, as the M&A data from Orbis Crossborder Investment are also likely to be incomplete, using only greenfield investment from the same database suggests that greenfield investment accounts for 70% of total investment volume.

the one hand, and negative effects on employment in domestic firms in the same sector, on the other. After 6–12 years, positive net effects on local growth are observed.

A related strand of the literature looks at the employment effects of Special Economic Zones (SEZs), which are often populated via greenfield investment. For an overview, see Lay and Tafese (2020). In a cross-country study, Farole (2011) finds huge differences across countries in employment generation. Studies for India (Hyun & Ravi, 2018), China (Lu et al., 2019), and Vietnam (Tafese et al., 2023) find significant positive effects of the presence of SEZs on (formal) employment. It should be noted that employment creation in SEZ can also stem from domestic firms producing for the international market.

Overall, the evidence, although patchy, suggests positive and potentially large employment effects of greenfield investment through the creation of jobs in both foreign and domestic firms. Direct employment effects can therefore be important, but so can positive spillover effects. Recent evidence using geospatial information and micro data points to non-negligible local labour market effects. Our study complements the recent insights on these impacts by (1) improving and expanding the data on greenfield investment with a novel, comprehensive database on greenfield FDI and (2) providing an analysis of the employment effects at the sectoral level using the variation in “exposure to greenfield investment” across countries, sectors, and time.

3 Constructing a consolidated database on greenfield FDI projects in Africa

FDI is generally defined as an investment involving a lasting interest and control⁶ by a foreign investor from one (home) economy in a foreign affiliate in another (host) economy (UNCTAD, 2019). While FDI flows are recorded in the balance of payments (BoP)⁷ of the national central banks of home and host economies, BoP records do not identify greenfield investments, nor do they provide project-level details, such as the amount of jobs created in greenfield investment projects.⁸ Commercial data providers fill the data gap with proprietary databases on greenfield investment projects. These databases are based on public greenfield announcements and are widely used by analysts, researchers, and other professionals. However, their coverage is limited as only publicly announced projects are included and search strategies differ.

We combine information from the two main commercial providers of project-level data on greenfield FDI to construct, to our knowledge, the most comprehensive database of greenfield FDI projects in Africa.⁹ The first and more established database we use is fDi Markets, a Financial Times service that has been collecting data on

⁶ Typically, an investment is considered as reflecting lasting interest and control when the foreign investor owns an equity stake of at least 10 per cent in the foreign affiliate.

⁷ More specifically, BoP records typically include three components of FDI: equity capital, reinvested earnings and intra-firm loans.

⁸ The same applies to cross-border M&A deals. However, we focus on greenfield FDI because it is the dominant mode of entry for foreign investors in Africa.

⁹ For some countries, more comprehensive data are available from their investment promotion agencies (IPA). Although IPA data can provide a more systematic account of greenfield investment in sub-Saharan

greenfield investment projects since 2003. This database is used, for example, by UNCTAD to compile statistics on greenfield projects for its annual flagship World Investment Report¹⁰ as well as by researchers publishing in renowned economics journals.¹¹ The second and more recent database is Orbis Cross Border Investment, which contains data on greenfield projects since 2013. Orbis Cross Border Investment is less well known, although it offers the added benefits of also providing data on cross border M&A deals as well and being part of Bureau van Dijk's larger universe of datasets, which allows users to link the project-level data to firm-level information. Both databases use various sources of information to collect and validate information on greenfield projects, including company press releases, news wires, media sources, industry organisations, investment agencies, and data purchased from market research and publishing companies. fDi Markets reports on its website that the project data are cross-referenced against multiple sources and that over 90 per cent of it is validated against company sources. Orbis states that where no official documentation on greenfield projects is available, employees ensure that at least two news articles are used to create an entry in the database.

3.1 Matching procedure

To combine the greenfield projects recorded in the two databases into a single consolidated dataset, we need to ensure not to double count projects that appear in both databases. We follow a multi-step matching procedure that combines algorithmic matching with manual filtering and cleaning, as shown in Fig. 1). We outline the main steps here, with detailed procedures available in the online appendix.

Africa, it is often not accessible to researchers, or only at an aggregated level, which does not allow for systematic cross-country industry, let alone project-level, analyses.

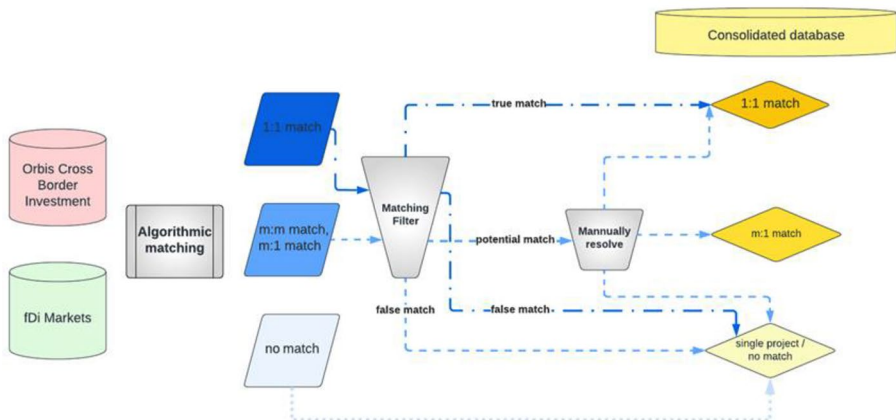


Fig. 1 Overview of the matching procedure

¹⁰ See for example the most recent report (UNCTAD, 2023).

¹¹ See for example Davies et al. (2018), Toews and Vézina (2022), and (Hoekman & Sanfilippo, 2023).

First, based on the name of the investing company, we algorithmically match greenfield projects that are established in the same host country and year. We use *fuzzy matching* algorithms based on a similarity score between the names of the investing companies in the two databases, as *exact matching* is not possible due to differences in the spelling of the names of the investing companies.¹² Applying algorithmic fuzzy matching results in projects of fDi markets and Orbis that are (a) matched with each other once ('1:1 match'), (b) matched with multiple projects in the other database ('m: m match' or 'm:1' match'), or (c) not matched with any project in the other database.

Second, we apply manual filtering and cleaning routines to our matched projects to determine whether the identified matches should be treated as true matches or different projects. For once-matched projects, this mainly involves a manual check of the names of the investing companies and the location of the matched greenfield projects within the host country. For multiple-matched projects, we additionally need to check the status, type, activity, and description of the projects as reported in the two databases in order to identify and resolve the reason behind the multiple matches.

Third, we harmonise key project-level variables across both databases.¹³ On the one hand, these are variables that provide detailed information on the investing company (i.e. foreign affiliate) and its global ultimate owner (GUO, i.e. foreign investor), such as their name as well as the country and region of origin. On the other hand, these are variables that provide detailed information on the greenfield project itself, such as its location in the host country, status, type, and sector. Importantly, both datasets include information on a project's investment amount and job creation, collected either from company sources or estimated by fDi Markets and Orbis using proprietary estimation methods.¹⁴

3.2 Comparison of consolidated database with fDi markets and Orbis databases

The consolidated greenfield database contains 11,233 observations, i.e., individual greenfield projects, for 54 African countries between 2013 and 2020. This compares with 6,193 observations in fDi Markets and 7,607 observations in Orbis over the same period. Decomposing the projects in our consolidated database into matched and unmatched projects shows that just under 25 per cent of the projects were part

¹² We implement the *fuzzy matching* using the 'matchit' command in Stata, applying vectorial token decomposition and phonetic soundex algorithms that have shown to maximise the number of true matches while minimising the number of false matches (see Appendix X for details).

¹³ As fDi Markets and Orbis use different categories for some variables, we have to make some assumptions to harmonise them. Details on the harmonisation procedures can be found in the Online Appendix "Matching Procedure".

¹⁴ The investment amount and job creation figures are estimated for 91 per cent and 86 per cent of the projects in our consolidated database, respectively. To assess the accuracy of the estimates, we compare the median *estimated* investment amount and job creation with the median *reported* investment amount and job creation at the project level. It turns out that, on average, the investment amount and job creation estimates are lower than the reported figures: median official investment at project level of 11 million vs. median estimated investment of 34 million; median estimated job creation at project level of 47 vs. reported job creation of 120. This is also the case, albeit to a lesser extent, when comparing median estimated and reported figures for projects in the same sector.

of both the original fDi Markets and the original Orbis databases (left panel, Fig. 2). Most projects are only listed in either fDi Markets (31.9 per cent) or Orbis (43.6 per cent). These shares highlight the complementary nature of the original fDi Markets and Orbis databases, which also implies that neither was complete to begin with.¹⁵ Importantly, the divergence of the fDi Market and Orbis database appears to increase over time, with the number of matched projects falling sharply from almost 50 per cent in 2013 to just over 10 per cent in 2020 (right panel, Fig. 2).

One reason for the growing divergence over time appear to be differences between fDi Markets and Orbis in the representation of sectors and regional origins. Orbis lists more projects with investors from Latin America and the Caribbean, and especially North America, than fDi Markets. fDi Markets contains more projects originating in the Middle East than Orbis (Figure A2). In terms of the sectoral dimension, Orbis projects dominate in the wholesale and retail sector and the hotel industry, while fDi Markets lists more projects in the construction sector (Figure A3). Although systematic differences are not as pronounced and patterns not as clear for destination countries, Figure A1 in the appendix shows large differences in the number of projects reported in the two databases for individual countries. For example, a high number of unmatched Orbis projects come from investment projects in Morocco; with Orbis reporting almost 300 more projects than fDi Markets in the period 2017 to 2020. Over the same period, Orbis also reports more projects in Kenya, South Africa, and Tunisia. Hence, using only one of the databases not only underestimate overall greenfield investment activity, but also distorts it in terms of sector, investor origin, and destination country.

In line with these differences in coverage, trends in the number of greenfield projects differ significantly between our consolidated database and the fDi Markets and Orbis databases (left panel, Fig. 3). While the number of projects in the fDi Markets database declines or stagnates, the number of projects in Orbis slowly increases until 2018. In contrast, the consolidated database containing all Orbis and fDi Markets projects shows a clear upward trend for greenfield projects in Africa between 2014

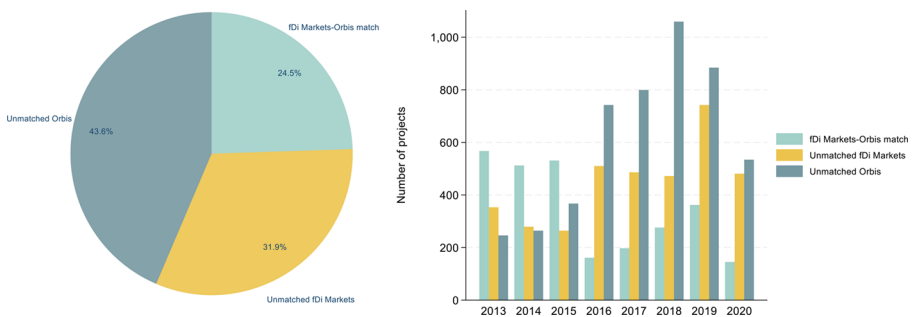


Fig. 2 Decomposing the consolidated database. Note: Authors' calculation based on fDi Markets and Orbis

¹⁵ The consolidated database also lists more greenfield jobs than either fDi Markets or Orbis, but the differences in reported jobs are less pronounced than for the number of projects and project investment, and do not increase over time. This may indicate that projects with large numbers of jobs created are better captured by both fDi Markets and Orbis.

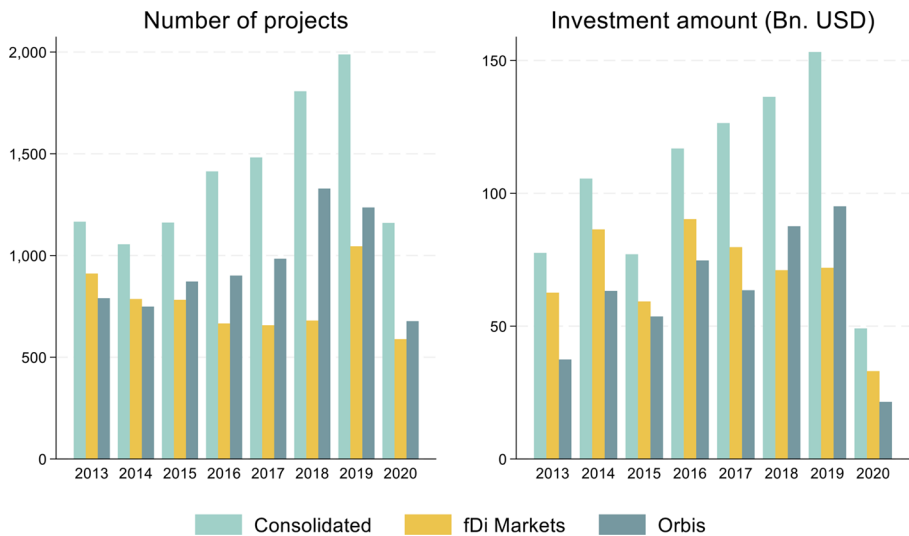


Fig. 3 Number of projects and investment amount by database over time. Note: Authors' calculation based on fDi Markets and Orbis

and 2019. There is also a consistent upward trend in investment amount from 2015 to 2019 (right panel, Fig. 3), while Orbis shows only a slight increase and fDi Markets even shows a noticeable decrease. The reason for the different trends in the number of projects and investment amount is the previously documented decline in the number of matched projects over time, which means that our consolidated database captures more projects over time that were included in either the fDi Markets or Orbis database but missed by the other. In general, our consolidated database is much more comprehensive – especially over time – in terms of the number projects and investment it covers than either of the two individual commercial databases. It should be noted, however, that it still represents a conservative estimate of greenfield investment in Africa, as it may be incomplete in its coverage of projects from certain countries or sectors where public announcements of greenfield projects are either not common or do not appear in the sources used by fDi Markets and Orbis.

4 Stylised facts on greenfield FDI and direct job creation in Africa

Using our consolidated database, we now present three stylized facts about greenfield FDI projects in Africa and their contribution to direct job creation in Africa between 2013 and 2020. The following figures and facts are based on all greenfield projects in the database irrespective of status, i.e., announced and operational projects are included.

4.1 Fact 1: services projects (in economic centres) are the dominant type of greenfield FDI projects in Africa

Figure 4 shows the distribution of greenfield projects in Africa between 2013 and 2020, distinguishing between projects in four aggregate economic activities, namely mining, construction & utilities, manufacturing, and services.¹⁶ Projects are geolocated at the first administrative level, i.e. the state level, with the size of the circles increasing proportionally to the number of projects in a sector in a state.¹⁷ Figure 4 shows that services projects clearly dominate in terms of the number of projects, accounting for around 73 per cent of all greenfield projects in Africa between 2013 and 2020. Within services, wholesale and retail trade projects (30 per cent), finance

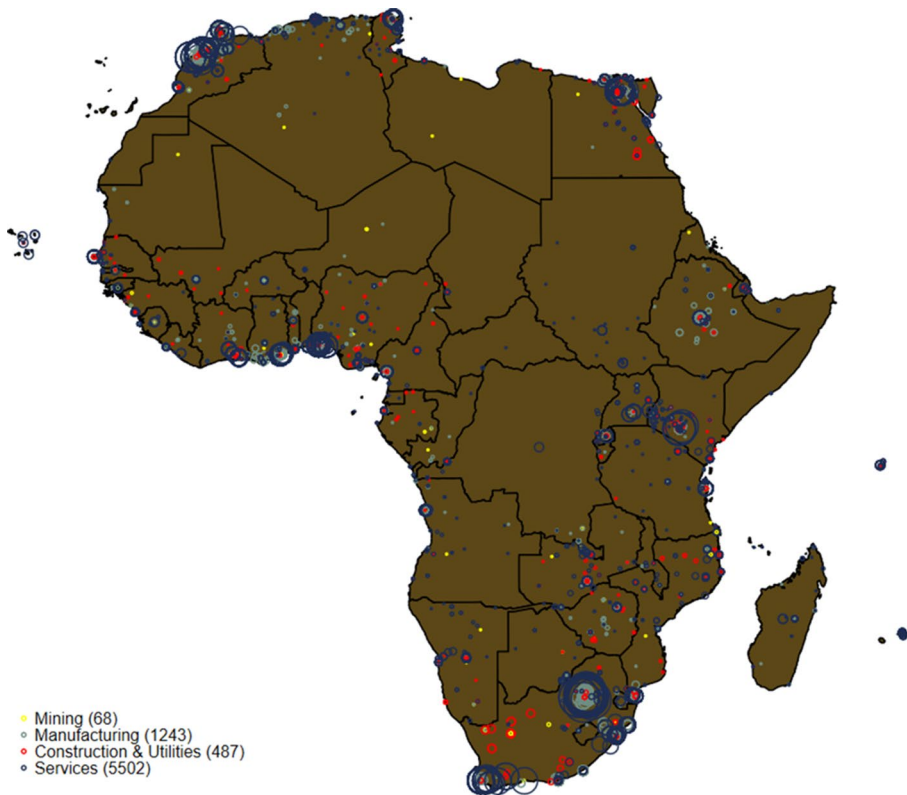


Fig. 4 Geographical distribution of greenfield projects in Africa by sector (2013–2020). Note: Authors' calculation based on the consolidated database

¹⁶ The four economic activities are (i) Mining (ISIC Section B) (ii) Manufacturing (ISIC Section C) (iii) Construction & Utilities (ISIC Section D, E and F) (iv) Services (ISIC Section G–U). We have excluded agriculture from the descriptive and empirical analysis as there are very few (57) agricultural greenfield projects.

¹⁷ About 35 per cent of all projects are excluded from Fig. 4 because there is no information on their location at the state level.

and insurance projects (14 per cent), and information and communication projects (14 per cent) account for more than half of all services projects.

In terms of geolocation, greenfield projects in services tend to be concentrated in the economic centres of countries, especially when compared with greenfield projects in manufacturing, construction & utilities or mining. Whereas 39% of all services projects are located in their countries' capitals, this is the case for only 23 per cent and 21 per cent of projects in construction and utilities and manufacturing, respectively, and only 8% of projects in mining. And while the top destinations for greenfield projects in services and manufacturing are generally the largest African economies, notably Morocco, Egypt, South Africa, Nigeria, and Kenya, the top destinations for mining projects include smaller economies such as Mozambique, Zimbabwe, Angola, Guinea, Namibia, and Zambia.¹⁸

4.2 Fact 2: Greenfield projects in the manufacturing sector are the most job intensive

Figure 5 shows the average job creation per greenfield project in Africa between 2013 and 2020 by the same four aggregate economic activities. With an average of 634 new jobs per project and 249 new jobs per \$10 million investment, manufacturing greenfield projects are the most job intensive in terms of both the number of jobs per project and the number of jobs per invested \$10 million. In fact, while manufacturing projects accounted for only about 19% of all greenfield project announcements between 2013 and 2020, 54% of all greenfield jobs (1.4 million jobs) were created through manufacturing projects. Mining projects create the highest number of jobs per project with an average of 645, but the lowest number of jobs per \$ 10 million. Service projects make up 33% of total greenfield jobs (870,000 jobs) and come close in number to jobs created in manufacturing per invested \$ 10 million with 240 jobs.

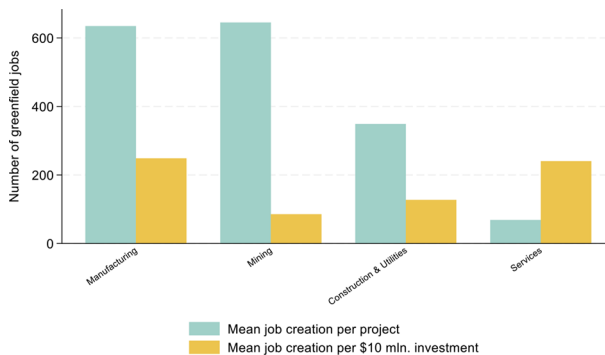


Fig. 5 Job creation of greenfield FDI in Africa. Note: Authors' calculation based on our consolidated database

¹⁸ The different destinations of services and industry projects compared to mining projects can be explained by their motives; greenfield services and industry projects tend to be established by foreign investors in large economies because they can serve as a new market for their products or services (market-seeking) or as a pool of cheap labour (efficiency-seeking), whereas mining projects are also established in smaller economies if they are rich in natural resources that can be exploited.

Within the service sector, high numbers of jobs per \$10 million greenfield investment are created particularly in projects in accommodation and food services (1876 jobs per \$10 mln.), administrative and support services (279 jobs per \$10 mln.), and education (221 jobs per \$10 mln.). Projects in construction & utilities are much less job-intensive.¹⁹

4.3 Fact 3: Greenfield projects contribute directly to formal job creation in manufacturing and services

To assess – and put into perspective – the employment effects of greenfield investment, we now combine the consolidated database on greenfield investment with sectoral employment data. The sectoral employment data from ILOSTAT are derived from national surveys.²⁰ The ILOSTAT dataset contains 74 country-year sets of observations with 19 countries with only one survey, 5 countries with two surveys, and 9 countries with more than two surveys (Table A 1). The ILO provides data on informal and formal employment. The former includes own-account workers, contributing family workers, and employees holding informal jobs²¹ in formal or informal sector enterprises or households. Formal employment, in turn, includes all employees who are not in informal employment according to the above criteria.

Figure 6 shows the number of created greenfield jobs in relation to formal and total employment creation by economic activity,²² i.e., how many jobs are directly created²³ by greenfield investment relative to formal and total job creation for the four aggregate economic activities.²⁴ Since Fig. 6 includes employment generation, the sample is limited to 14 African countries for which we have two or more survey waves to calculate employment generation. Overall, we see a moderate contribution of formal employment creation to total employment creation which varies by country and sector (Figure A 4). We even see a reduction in the number of formal jobs in some

¹⁹ Looking at median job creation rather than average job creation per project, a similar picture emerges, with job intensity being by far the highest in mining and manufacturing, although somewhat lower at 478 and 410, respectively, for job creation per project. Median job creation per \$10 million investment is smaller, but still the highest for manufacturing with 82 jobs created and for services with 43 jobs created.

²⁰ The main data source the ILO uses to compile this database are national labour force surveys, but other sources such as population censuses, establishment surveys, and administrative records are also used.

²¹ According to ILO methodology, jobs are informal if they are not subject to national labour legislation, income taxation, social protection or employment benefits (paid annual or sick leave, etc.).

²² One limitation of the ILO data is missing information on formal and informal employment in certain two-digit sectors due to low numbers of observations in the microdata. When aggregating microdata, the ILO only provides a value if the sector has more than five observations. To deal with these missing observations, we extrapolate formal or informal employment by calculating the difference between total and formal or informal employment.

²³ It should be noted that the data on job creation through greenfield FDI rely on announcements and estimates, as described in Sect. 3. Our stylised representation aims to show the relative importance of FDI job creation in total job creation rather than make a claim to causal identification.

²⁴ In Fig. 6, we average annualized employment growth for each economic activity in one country to give the same weight to each country irrespective of the number of surveys. In a second step we then average over countries.

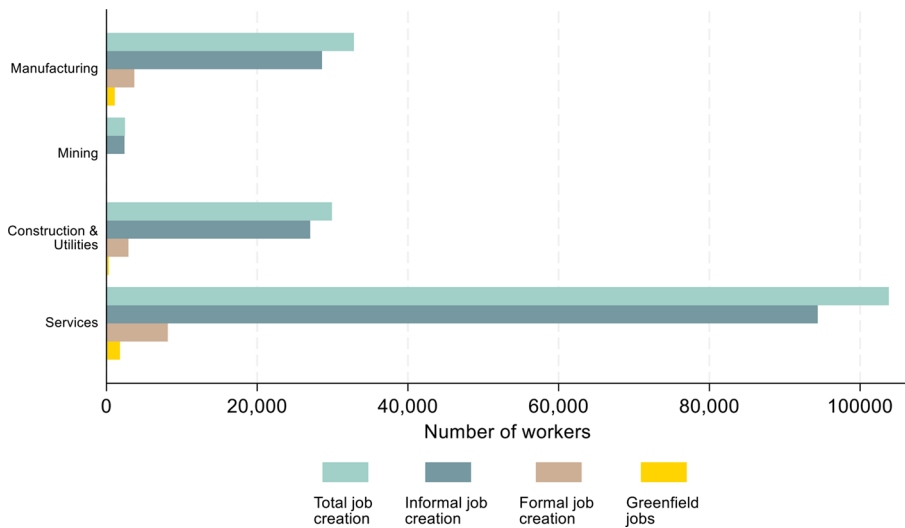


Fig. 6 Annual contribution of greenfield jobs to total employment generation by economic activity, 2013–2020. Note: Authors' calculation based on our consolidated database and ILOSTAT for 14 African countries. Employment generation is annualized and averaged by country to assign an equal weight to each country in the sample

instances, for example in services in Botswana, Egypt, and Tanzania or in manufacturing in Egypt and South Africa.

Regarding the relevance of greenfield jobs in formal job creation, manufacturing and services stand out as economic activities where formal employment creation seems to partly stem from jobs created directly through greenfield investment. In manufacturing, greenfield jobs account for 30% of formal created jobs, mainly driven by larger economies such as Egypt and South Africa. However, greenfield jobs also contribute strongly to formal employment creation in economies in Sub-Saharan Africa with a smaller manufacturing sector, such as Rwanda (35%) or Côte d'Ivoire (21%). In services, 21% of created formal employment is greenfield employment. The strong contribution of greenfield jobs to formal job creation in manufacturing and services is in line with the large number of jobs created for each \$10 million invested in these two activities (as seen in Fig. 5). Greenfield jobs in mining are too small in absolute numbers to be visible in Fig. 6, although the average share of jobs created through greenfield FDI is high in the sector. The contribution of greenfield investments to employment creation in construction and utilities seems to be lower than in the other economic activities.²⁵

Overall, the contribution to job creation is moderate, with greenfield jobs accounting for an average of about 1.9 per cent of total annual job creation between 2013

²⁵ This is not representative of the entire greenfield FDI database but only includes data for sectors, years and countries for which we also have ILOSTAT data.

and 2020. However, the aggregate contribution to total formal job creation is not negligible at over 20 per cent, driven by manufacturing and services.²⁶

5 Net employment effects of greenfield job creation: Econometric analysis

The preceding analysis has descriptively established that the contribution of greenfield jobs to total and formal employment is moderate at the aggregate level of economic activities, although it can be important in selected countries and sectors. Computing and comparing averages, however, may be misleading, which is why we now turn to regression analyses. Specifically, we combine our comprehensive greenfield investment database with the ILO employment data on total, formal, and informal employment at the two-digit level, i.e. 62 sectors.²⁷ We regress changes in total, formal and informal employment in a specific sector and country on the number of jobs created in greenfield projects in the same sector and the same country; thus making use of a unique feature of our data. We expect this regression to provide insights into the “net employment” effect of FDI in the same sector, thus accounting for potential crowding-out or crowding-in of employment in domestic firms. Specifically, we estimate the following OLS model:

$$\frac{E_{cst} - E_{cst-n}}{n} = \beta_0 + \beta_1 \frac{\sum_{t-n}^t \text{Greenfield Jobs}_{cs}}{n} + \beta_c + \beta_s + \beta_t + \epsilon_{cst} \quad (1)$$

Where n is the number of years between two surveys. $\frac{\ln E_{cst} - \ln E_{cst-n}}{n}$ is annual increase or decrease in employment between t and $t-n$, on $\frac{\sum_{t-n}^t \text{Greenfield Jobs}_{cs}}{n}$

, annual greenfield jobs created, again calculated as the annual average over the respective period. We estimate the model with country (β_c), (2-digit) sector (β_s), and period (β_t) fixed effects, with the error term ϵ_{cst} clustered at the sector level.²⁸ We are aware that assuming fixed country, sector, and period effects is a fairly restrictive specification, but we see value in exploiting the within-country and between-

²⁶ These estimates are probably estimated with quite some error as project-level employment generation comes from an estimation model whose validity remains unknown. Finally, there may well be important employment effects coming from indirect effects, i.e., spillovers to domestic firms and their workers. These effects will be accounted for in the subsequent econometric analysis.

²⁷ While our Greenfield database also includes sectoral information at the 4-digit level, we perform our econometric analyses at the 2-digit level because employment data from ILOSTAT are only available at this level of aggregation. Furthermore, for two countries, Côte d'Ivoire and South Africa, employment data are collected based on ISIC Revision 3.1, while employment indicators for all other African countries are based on 2-digit ISIC Revision 4 sector codes. As a result, some 2-digit sector codes had to be combined in order to achieve concordance between the 2-digit ISIC Revisions 3.1 and 4 sector codes, reducing the total number of 2-digit ISIC sectors in our econometric analyses from 88 to 62.

²⁸ We only cluster on the sectoral level since in a large number of estimations the number of observations does not suffice to calculate robust standard errors. We choose to cluster conservatively on the more restrictive sector level which has higher t-statistics and higher standard errors in most cases and since we expect the sector to determine the outcome variable employment rather than country.

sector variation in the dataset. Unfortunately, we cannot include country-sector fixed effects since this would exclude all countries with only two survey waves and reduce our sample to 9 countries only.

It should be noted that greenfield jobs take the value of zero in 75 per cent of the 1882 unique country-sector-year combinations included in the estimation. Furthermore, while we used all 33 countries in the descriptive statistics on greenfield FDI and its contribution to total employment generation above, the regression analysis is based on only 14 countries due to limitations of the ILO STAT employment data, particularly due to the many countries with only one survey for which we cannot calculate any changes in employment. On the greenfield data side, we only include projects in this analysis that have been confirmed operational as we would expect direct employment effects and spillovers to be only present after a project becomes operational.

Table 1 reports the main results from the baseline estimation of Eq. (1). We find a significant positive correlation²⁹ between additional greenfield jobs and the change in total and formal employment while there is no significant effect of FDI jobs on informal employment. Note again that these coefficients reflect the net employment effect of jobs created in a greenfield project on employment within the same sector (in the same country). Effect sizes are rather small: One additional job in a greenfield project in a certain sector is associated with about 0.315 (0.383) more (formal) jobs in that sector. As both employment changes and FDI jobs are expressed in absolute numbers the coefficient should be 1 if FDI jobs simply add to job growth as explained by the various included fixed effects. If this coefficient was taken at face value, this would mean that some FDI crowds out some formal employment in domestic firms.

We now estimate Eq. (1) separately for mining, construction & utilities, manufacturing, and services sectors (see Table 2). The results suggest that the associa-

²⁹ We also run specifications with other fixed-effects confirming that within-country and between-sector

Table 1 Greenfield jobs and total, formal, and informal employment growth in operational projects (2013–2020), OLS estimation

Employment Change	(1) Total	(2) formal	(3) informal
Greenfield jobs	0.315*** (0.100)	0.383*** (0.0265)	-0.0623 (0.0961)
Constant	4,261*** (15.07)	-281.3*** (3.989)	4,516*** (14.45)
Observations	1,882	1,882	1,882
R-squared	0.055	0.040	0.055
Period FE	Yes	Yes	Yes
Country FE	Yes	Yes	Yes
Sector FE	Yes	Yes	Yes

Note: Robust standard errors in parentheses are clustered by sector. Greenfield jobs are measured as the average annual number of greenfield jobs between t-1 and t. *** stands for significance at the 1% level, ** for significance at the 5% level, and * for significance at the 10% level

variation drives this correlation. Our estimate is robust to the inclusion of year-country and sector fixed effects as well as year-sector and country fixed effects.

Table 2 Greenfield jobs and total, formal, and informal employment growth by economic activity in operational projects (2013–2020), OLS estimation

Employment change	Mining			Construction & Utilities			Manufacturing			Services		
	(1) total	(2) formal	(3) Informal	(4) total	(5) formal	(6) informal	(7) total	(8) formal	(9) informal	(10) total	(11) formal	(12) informal
Gf jobs	3.047 (2.105)	3.644 (3.378)	-0.486 (1.242)	3.538 (7.709)	1.392 (1.398)	2.156 (7.300)	0.733 (1.123)	-0.122 (0.635)	0.867 (0.775)	0.257*** (0.0348)	0.402*** (0.0272)	-0.139*** (0.0255)
Constant	620.4*** (95.63)	-170.0 (153.4)	781.0*** (56.42)	10,347** (1,511)	132.9 (274.0)	10,280** (1,431)	1,430*** (171.7)	-320.1*** (97.02)	1,723*** (118.4)	3,675*** (6.047)	-501.7*** (4.738)	4,138*** (4.428)
Observations	87	87	87	106	106	106	606	606	606	949	949	949
R-squared	0.197	0.089	0.219	0.214	0.118	0.252	0.120	0.101	0.128	0.171	0.064	0.190
Period FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sector FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: Robust standard errors in parentheses are clustered by sector. Greenfield jobs are measured as the average annual number of greenfield jobs between t-1 and t. *** stands for significance at the 1% level, ** for significance at the 5% level, and * for significance at the 10% level

tion between FDI jobs and employment creation differs considerably between the broad sectors. In fact, it is only among service sectors that we can detect a significant effect of FDI jobs on employment. The coefficient is positive for total employment resulting from a (higher) positive effect on formal employment and significant negative effect on informal employment. So direct job creation in service greenfield jobs appears to be associated with more formal and fewer informal jobs in the respective sector suggesting that crowding-out of informal jobs or formalization are at work.

The results of this correlational analysis should be treated and interpreted with caution, in particular the size of the coefficients. First, the coefficients are not causally identified. We are well aware of the potential endogeneity issues; most importantly omitted factors that drive both sectoral employment growth and FDI.³⁰ Using our dataset for rigorous causal analysis is clearly an avenue for future research that we encourage. Second, measurement error is also likely to cause problems in the above analysis. For example, FDI jobs often come from an unknown estimation model (see above) and the ILO employment data relies on multiple data sources that may not measure employment changes in a consistent manner across sectors and countries. Third, the empirical literature on FDI and employment shows that there is very considerable heterogeneity in the relationship between the two variables that is very difficult to accommodate in the type of aggregate regression analysis applied here. This is already evident when we split the sample into broad sectors.

6 Conclusion

Greenfield FDI may contribute to generating the millions of productive jobs that Africa needs for its relatively young labour force. Yet, there is a considerable knowledge gap on the employment effects of greenfield FDI on the continent. This also has to do with data constraints on greenfield investment as well as labour market data that might be associated with the former. We add to and complement recent work on greenfield FDI and employment in Africa and make two specific contributions.

First, we construct a consolidated dataset for greenfield investment in Africa by combining project-level greenfield investment data from fDi Markets and Orbis Cross Border Investment. We show that there is only partial overlap between these commercial databases. Only about 20 per cent of the projects in the consolidated database are matched, i.e., present in both original datasets. Thus, using only one commercial database, as is often done by researchers and international organisations, severely underestimates greenfield investment in Africa. Accordingly, the (potential) job creation associated with FDI may also be underestimated. The databases differ significantly regarding trends over time. We find a clear positive pre-pandemic trend for greenfield investment – both in terms of volume and number – in Africa as a whole. This is despite the fact that both indicators (the number of projects and investment volume) increase only slightly in Orbis and even stagnate in fDi Markets –

³⁰ Various attempts to find a relevant instrument for FDI at the country-sector level, such as total FDI in that sector, failed because the instruments would often only correlate with the extensive margin (whether a country received FDI) but not explain the intensive margin (how much FDI a country received).

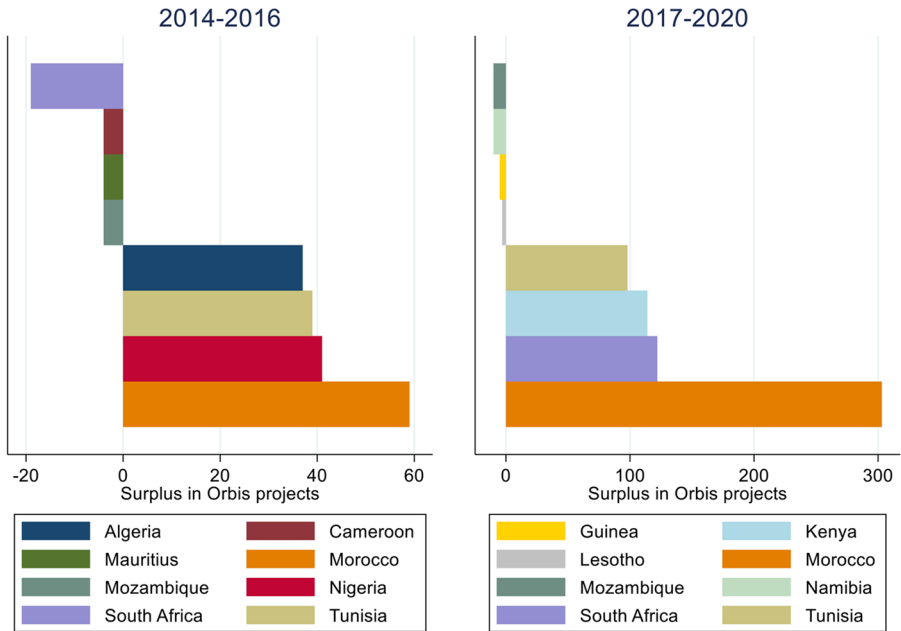


Figure A1 Destination differences: largest and smallest difference in number of projects in fDi Markets and Orbis by destination country (2014–2016 and 2017–2020) Note: Authors’ calculation based on fDi Markets and Orbis

over the same period. Such discrepancies are due to a decreasing number of projects that are listed in both databases over time. One reason for this seems to be differing regional and sectoral foci, i.e., searching algorithms of both commercial databases seem to specialise in finding projects in certain origin regions and sectors. Hence, using only one commercial database not only underestimates greenfield investment activity, but also suggests false patterns and trends.

Second, our descriptive and correlational analyses of greenfield investment and employment at the sector and country-sector level, based on our FDI database combined with ILO employment data, complements recent research that finds a positive impact of FDI on local labour markets (e.g. Hoekman et al., 2023). The simple comparison of direct greenfield job creation from our database with total formal employment growth shows a moderate average “contribution” of FDI to (formal) job creation. However, job creation in greenfield projects can be substantial relative to formal employment growth in selected cases, either because of substantial greenfield job creation (e.g., Egypt and South Africa) or because of low formal employment growth (e.g., Mali and Zambia). An important reason for the heterogeneity of FDI’s employment effects is the large variation in the employment intensity of greenfield FDI across sectors and projects. We confirm that, on average, manufacturing does indeed create the most jobs per dollar invested, but we also show that some greenfield projects in services can create a significant number of jobs. Just over half of the jobs created by greenfield projects in Africa between 2013 and 2020 are in manufacturing, but 33 per cent are in services. Overall, however, both formal and greenfield job

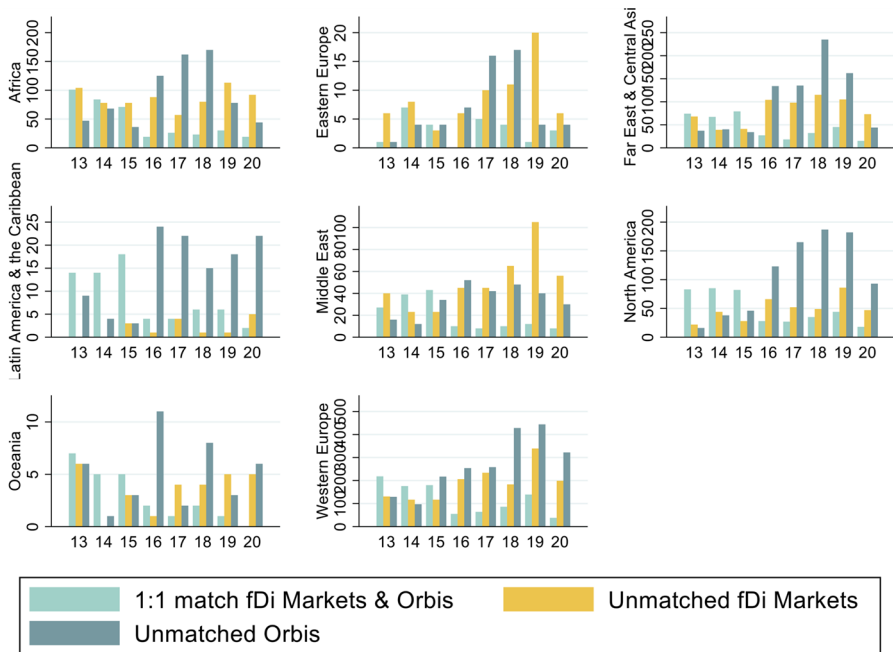


Figure A2 Matched and unmatched fDi Markets and Orbis projects by source region over time. Note: Authors' calculation based on fDi Markets and Orbis

creation are insufficient to absorb Africa's growing labour force, with informal job creation accounting for the bulk of total job creation in most countries. Our exploratory correlational analysis not only confirms small to moderate employment effects, but also points to a crowding out of formal employment in domestic firms. As we explain above, several caveats of our empirical approach lead us to interpret these results with caution, in particular the small size of the coefficient. However, the analysis certainly illustrates, again, the large heterogeneity in the employment effects of greenfield FDI, here specifically across broad sectors.

These interesting findings on the relationship between FDI and employment and its heterogeneity call for further analysis. Such future inquiries may make use of our novel database, which we have already made publicly available. In our view, several potential avenues for future research stand out. First, some of the previous analyses of local labour market effects in Africa could be replicated or extended using our more comprehensive data on FDI projects. Second, more attention needs to be paid to FDI in services. Our results suggest either competitive pressure on informal services or FDI-induced formalization within the same sector; effects that deserve further investigation. Third, and relatedly, we have paid little attention to cross-sectoral linkages and employment effects. Such linkages may be explored by augmenting our data with input-output tables.

We do not want to formulate specific policy recommendations based on our more exploratory findings. Yet, they do have broad implications for development strategies. First, many of our findings caution against seeing FDI as a panacea for solving

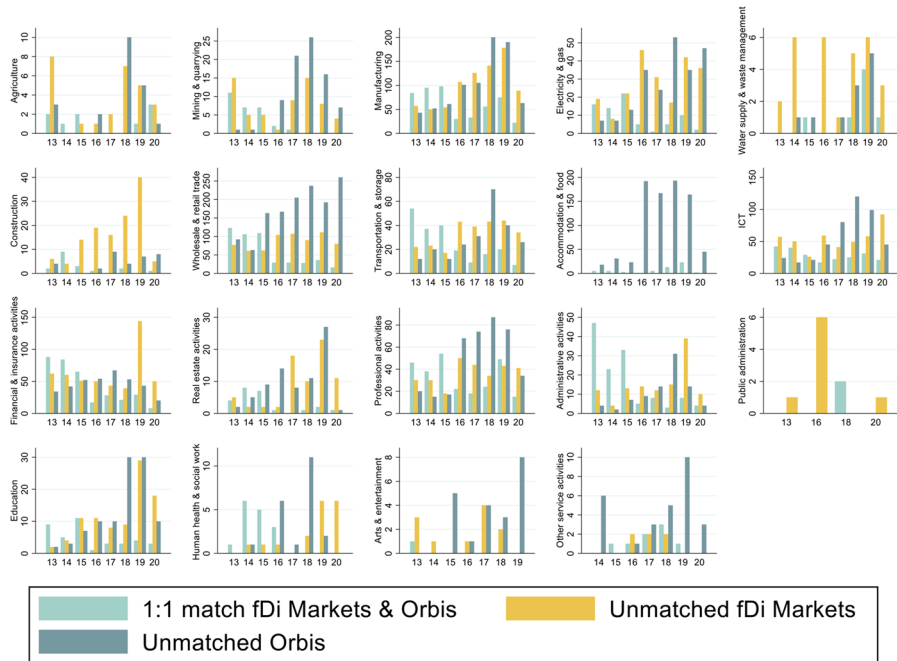


Figure A 3 Matched and unmatched fDi Markets and Orbis projects by ISIC section over time. Note: Authors' calculation based on fDi Markets and Orbis

Africa's employment problem. Its direct contribution to employment creation will be limited and spillovers – at least within the same sector – on employment in domestic firms may be negative. Nevertheless, FDI certainly has a role to play in supporting and accelerating the much-needed structural transformation of African economies. Second, a focus on manufacturing FDI alone, motivated by the desire for direct job creation, is likely to be misguided. Our analysis clearly shows the importance of FDI in services, and policymakers should focus on leveraging the potential of this sector to (a) raise overall productivity (especially in agriculture and manufacturing) and (b) promote the integration of African firms into global and regional value chains through improved trade, transport, and logistics. Third, we urge international organizations, in particular UNCTAD, to step up their efforts to systematically collect data on FDI activities. Our analyses of the consolidated database clearly illustrate that using a partial sample of FDI projects yields biased FDI statistics, which may lead to misguided policy decisions.

7 Appendix A

Matching procedure and harmonization In a first step, we compare the names of the investing company in Orbis and fDi Markets to ensure that matched projects are indeed established by the same company. In a second step, we assign a score to the matched projects based on four criteria that are comparable across the two databases:

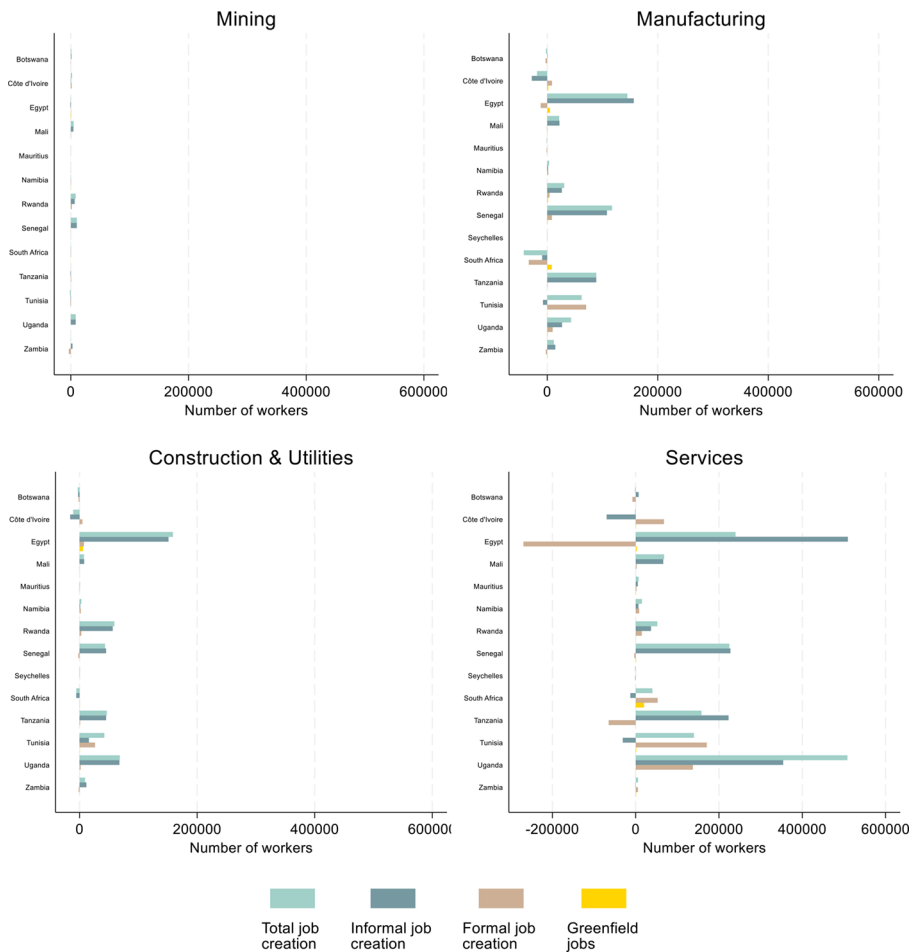


Figure A 4 Contribution of greenfield jobs to total employment generation by economic activity and country between 2013 and 2020. Note: Authors' calculation based on fDi Markets, Orbis, and ILO-STAT. Employment generation is annualized and averaged by country to assign an equal weight to each country in the sample

project location, status, type, and activity. At this point, algorithmically matched projects at different locations are treated as different projects and therefore assigned a score of 0. For the 'matched 1:1' projects, we decide whether projects are treated as true matches or not, based on the score. For 'matched m: m' projects, the generated score is not sufficient as it does not yield clear results. Hence, in a third step for 'matched m: m' projects, we compare the multiple projects within one database that are matched to a single project in the other database. In most cases, the 'matched m: m' projects are co-located projects³¹, i.e., repeated entries of the same project. For the

³¹ Co-located projects are projects that were started at the same time as separate elements of one larger investment project, e.g., a manufacturing plant and a sales office. In some cases, one project in one initial

co-located projects all information is maintained, while for repeated entries, only the most recent observation is kept.

Yet, despite these measures, applying our matching procedure, we noticed that the two databases themselves are not always consistent. Specifically, in harmonising the two databases we notice that the process of recording the information from the original press release on an investment project into the respective databases may involve subjectivity and is therefore error prone.³²

Harmonised variables As fDi Markets and Orbis use different values for some of the variables of interest, harmonising key variables is a necessary step. Here is a brief characterisation of the harmonised key variables.³³ *Global ultimate owner* and *subsidiary* are the variables indicating the “parent” company of the investment, i.e., the entity usually at the top of the ownership chain (‘owner’), and the company actually investing (‘subsidiary’). These investor-level variables provide not only information on the number of firms investing in Africa, but also concrete names and facilitate the tracing of ownership structures. In addition, for greenfield projects originating from the initial Orbis database, the *global ultimate owner ID* and *subsidiary ID* allow observations to be linked to broad firm-level data. *Destination country*, *state* and *city* variables provide information on the location of the project. Sector information follows the ISIC Revision 4 for all projects. For most observations, the *ISIC 4-digit business sector* variable provides a detailed sectoral classification, for the few missing observations, the *ISIC 2-digit business sector* is available. As fDi Markets does not follow a standardised sectoral classification system, we use the business subsector and business activity listed by fDi Markets to approximate and manually assign the ISIC class (4-digit) for projects listed in fDi Markets. Orbis classifies sectoral information within the NACE Revision 2 framework, and we apply a standardised concordance table to convert sectoral data to ISIC classes.

The variable *investment amount* provides information on the capital expenditure of each greenfield project, while *investment amount estimated* indicates whether the capital expenditure information was collected from an official source or estimated by the commercial database provider. Similarly, *jobs created* contains information on the number of jobs created within the project and *jobs created estimated* identifies whether the number was estimated. To estimate investment amounts and job creation for projects where no information is available, fDi Markets and Orbis use a priori-

database shows up as multiple separate projects in the other database. In this case, the multiple observations remain in the consolidated database and are treated as single greenfield projects.

³² For example, both databases infer the status of recorded greenfield projects from the wording of the original press releases. However, when reviewing the original press releases for some selective projects, it is sometimes not clear from the wording why a project is classified as “Announced” or “Opened (Orbis)/ Completed (fDi Markets)”. Another example would be the subjective decision of sectoral assignment, for example, whether a service office of a predominantly manufacturing firm is being allocated to a manufacturing or service sector. In addition, in a few cases, the same project appears more than once with a different project ID.

³³ Detailed information on all harmonised variables, initial variables in fDi Markets and Orbis and the harmonisation process can be found in the auxiliary codebook.

etary estimation method. The number of jobs created is estimated for 91 per cent of projects and the investment amount is estimated for 86 per cent of projects.

The variable *project status* distinguishes between the different stages of a green-field investment process. Projects are classified as “rumour”, “announced”, and “operational”. Orbis attempts to capture not only the formation of projects but also projects that do not take up operations. However, the 0.02 per cent of projects that are “cancelled” or “postponed” is likely to grossly underestimate the number of green-field projects that do not become operational. The Orbis database not only provides the project status, but also distinguishes between the year in which the project was announced, *year announced*, and the year the project became operational, *year operational*. Using the year of project announcement allows for a more forward-looking perspective on FDI and an assessment of “investor interest” in the country, while information on the starting point of operations allows for a more traditional approach by taking stock of actual FDI flows.

Technical note ILO data Currently, the ILO provides the best available data on harmonized cross-country employment and particularly informal employment. The data is based on labor force surveys, household income and expenditure surveys and household surveys. To improve consistency, we only use one data source per country and keep the data source with the most information. Hence, we have removed surveys for Ghana in 2015, Côte d’Ivoire 2017, and for Mauritania in 2019 from the dataset. Comparing the ILO data to underlying individual national surveys, it seems that the ILO does not report statistics if the number of observations in the household or labor force survey in a two-digit ISIC sector is below 5 and deems the estimates unreliable if the number of observations is between 5 and 10. This leads to 950 missing values for formal employment and 402 missing values for informal employment. The comparison to individual national surveys also confirms our assumption that informal employment is the sum of formal and informal employment. Thus, we fill the missing observations in the dataset by deducting informal or formal employment from total employment, if either total employment and either formal or informal employment is known. We also do not have information for every country-sector-year observation. Based on the information mentioned above, we assume that there are less than 5 observations in this sector and the ILO then treats these numbers as missing.

Table A 1: Data availability for ILO employment data by countries and survey years

Country	Year	Country	Year
Angola	2019	Mauritius	2013, 2014, 2015, 2016, 2017, 2018, 2019
Botswana	2019, 2020	Mozambique	2015
Burkina Faso	2018	Namibia	2013, 2014, 2016, 2018
Burundi	2014	Niger	2017
Chad	2018	Rwanda	2017, 2018, 2020
Comoros	2014	South Africa	2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020
Côte d’Ivoire	2013, 2016, 2019	Senegal	2016, 2019

Country	Year	Country	Year
Egypt	2013, 2015, 2016, 2017, 2018, 2019	Seychelles	2019, 2020
Eswatini	2016	Sierra Leone	2018
Ghana	2013	Somalia	2019
Guinea Bissau	2018	Togo	2017
Kenya	2019	Tunisia	2014, 2019
Lesotho	2019	Uganda	2014, 2017, 2019
Liberia	2017	Tanzania	2014, 2020
Madagascar	2015	Zambia	2017, 2018, 2019, 2020
Mali	2013, 2014, 2015, 2016, 2017, 2018, 2020	Zimbabwe	2019
Mauritania	2017		

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