

# Remittances and Industrialization in Africa: Evidence from Manufacturing Firms Data

Kabinet KABA\* Mahamat MOUSTAPHA†

*Preliminary version, please do not quote or share*

## Abstract

In this paper, we examine the effect of sub-Saharan Africa's new main source of external finance, namely remittances, on industrialization. Using a fixed-effects instrumental variable approach and firm survey data, we first find that international remittances increase both capital acquisition by nationals in existing manufacturing firms (intensive margin) and the entry of new manufacturing firms into the market (extensive margin). Second, the results show a negative effect of international remittances on the sales of manufacturing firms. Third, a positive effect of international remittances on employment in manufacturing firms is highlighted. Finally, the results are robust to the change of remittances' measure and the exclusion of over-represented and most industrialized countries.

Keywords: Remittances, Industrialization, Manufacturing, Consumption, Investment, Economic Development, Africa.

JEL Classification : E2, F24, F63, L60, N67, O14

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\*Corresponding author: kabinet.kaba@uca.fr; CERDI, University Clermont Auvergne.

†mahamat-abdrmane.moustapha@dauphine.psl.eu; Paris Dauphine University-PSL, CNRS, PSL.

# 1 Introduction

Industrialization, defined as the growth of the manufacturing sector relative to other sectors (Rodrik 2016; Gui-Diby & Renard 2015; Herrendorf et al. 2014), is seen as the natural path to economic development (McMillan & Headey 2014; McMillan & Rodrik 2011; Murphy et al. 1989b; Murphy et al. 1989a; Lewis, 1954). Because it allows a significant improvement in the standard of living since it employs a large number of people and offers very high rates of pay compared to traditional sectors. Over the past 200 years, the vast majority of economies that have experienced significant improvements in living standards have done so through industrialization (Murphy et al. (1989b)). Manufacturing growth has been the key to success for both Western countries (industrial revolution) and Asian dragons (Asian miracle).

Despite the importance of this sector in the fight against poverty and improving living standards, sub-Saharan Africa (SSA) is the least industrialized region in the world.<sup>1</sup> In 2019, manufacturing's share of GDP was only 11% (WDI). Several reasons explain the low level of industrialization. These include the lack of infrastructure, the small size of domestic market and, most importantly, the lack of financing for manufacturing sector. To fill this financing gap, policymakers in SSA have long relied on the financial openness of their economies to attract external resources such as foreign direct investment (FDI). However, according to Asiedu (2006), most FDI in Africa have been directed towards natural resources sector. This has negatively affected African industrialization (deindustrialization), notably through the phenomenon of Dutch disease (Gui-Diby & Renard 2015).

Given the importance of industrialization for SSA countries and the failure of FDI as private financing for manufacturing growth, the question is whether there are other sources of external financing that can support the industrialization process in SSA. This question is especially relevant given that remittances have grown significantly in recent years. Since 2005, they have grown steadily in contrast to FDI and official assistance. From \$20 billion in 2005, remittances to Africa have more than doubled in 2019 to reach over \$40 billion (Figure 2).

There are three main channels through which remittances can affect industrialization. First, remittances can reduce the liquidity constraints of manufacturing firms (investment effect). Thus, they can enable recipients and/or senders to invest in the home country, either by buying shares in existing manufacturing firms (intensive margin) or by creating new firms (extensive margin). Second, remittances can affect industrialization through recipients' expenditures. As a new source of income, they increase the disposable income of recipients. This could expand the size of the local market and increase demand for manufactured goods. If these remittances are used by recipients to request local manufactured goods, the sales of manufacturing companies are expected to increase. This growth should be a source of industrialization because, once it has reached a certain threshold, it will allow an increase in manufacturing production in GDP. If, on the contrary, local consumers have a preference for imported industrial products, this could be a source of competitive pressure on national manufacturing companies and reduce their sales. Moreover, as remittances increase, the marginal propensity to consume should decrease in favor of the marginal propensity to invest, leading to a substitution of the share of remittances allocated to consumption by that allocated to capital accumulation mentioned above. About the third channel, it is a direct result of the previous two. Indeed, the acquisition of capital in existing firms leads to an expansion of their capacity to invest in inputs, including labor. This intensive margin would thus contribute to increasing the demand for labor by manufacturing firms. Likewise, the entry of new firms into the market should be accompanied by investments in inputs such as labor and capital. Similarly, if remittances are used to purchase local manufactured goods, there should be an expansion of manufacturing activity through increased sales, which would ultimately lead to an increase in labor demand.

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<sup>1</sup>The term SSA refers to sub-Saharan Africa, but we sometimes use it to say SSA countries i.e., sub-Saharan African countries.

However, the opposite effect will occur if remittances are used to purchase foreign manufactured goods, so we might expect to see a negative impact of remittances on manufacturing employment.

The objective of this paper is therefore to examine the effects of the recent increase in remittances to SSA on its industrialization. Specifically, how remittances affect capital accumulation, sales, and employment in manufacturing firms located in SSA countries.<sup>2</sup> To the best of our knowledge, there is no article that has studied this issue as we do in the existing literature. Almost all of the existing literature has focused on the effect of remittances on economic growth. This literature can be grouped into two main categories. The first includes studies finding that remittances at best have no significant effect on economic growth, and at worst have negative effect (Rao & Hassan 2011; Chami et al. 2005; Barajas et al. 2009; Feeny et al. 2014; Chami et al. 2003). The absence of significant effect of remittances is mainly explained by the fact that the share of these funds in GDP is still very low in most recipient countries (Barajas et al. 2009). The negative impact is through exchange rate, which represents the main element of Dutch disease phenomenon (Amuedo-Dorantes & Pozo 2004; Lopez et al. 2007). The second wave includes studies showing that remittances have a conditional positive effect on economic growth (Aggarwal et al. 2011; Giuliano & Ruiz-Arranz 2009; Catrinescu et al. 2009; Gupta et al. 2009; Mundaca 2009). This positive effect of remittances on growth is mainly due to financial development, which eases credit constraints (Sobiech, 2019).

The contribution of this paper is twofold. First, we contribute to the above literature by examining one of the channels through which remittances affect economic growth. Indeed, the growth rate aggregates all sectors of activity, so the effect of remittances on this variable does not precisely identify how the economic structure is affected. Given the importance of industrialization in the process of development in SSA countries, this approach helps to give a clear understanding to SSA policymakers of how the impact of remittances on manufacturing can be a source of economic development and growth. Second, this paper is the first to translate a direct relationship between remittances and manufacturing firm data in SSA. This is a relevant approach in the sense that unlike macroeconomic data, which is an aggregation of firms across sectors, it allows for better targeting of economic policies.

Using the fixed-effects instrumental variable approach and a large sample of survey data on firms in 48 African countries between 2006-2019, we study the effect of international remittances on industrialization. Our results show that international remittances positively affect both the share of capital held by nationals and the number of manufacturing firms but negatively affect manufacturing firm sales. More specifically, we find that a 1% increase in remittances per GDP leads to a 0.59% increase in the share of capital held by nationals while that of remittances per capita increases capital held by nationals by 0.44%. In terms of extensive margin, a 1% increase in remittances per GDP contributes to a rise of the number of manufacturing firms in SSA by 1.03 units, while the increase in remittances per capita leads to an additional 0.74 manufacturing firms. Regarding manufacturing firm sales, we find that a 1% increase in remittances per GDP reduces manufacturing firm sales by 2.17% when we use remittances per capita as the variable of interest, this loss is 1.52%. Finally, we find that remittances positively affect manufacturing employment. Specifically, our results show that a 1% increase in remittances per GDP leads to a 2.63% increase in manufacturing jobs, while a 1% increase in remittances per capita increases manufacturing jobs by 2.66%. Our results are robust to sample selection. We obtain similar results when we exclude over-represented countries and the most industrialized countries from the sample.

The remainder of the article is structured as follows : section 2 provides a brief overview of remittances in SSA. Section 3 presents the theoretical framework for understanding the link between remittances and industrialization. Data description and identification strategies are presented in sections 4 and 5 respectively. In Section 6, We present the main results. Section 7 presents some robustness checks and Section 8 concludes.

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<sup>2</sup>The terms firms, enterprises and companies have the same sense in this paper, so they are used alternately.

## 2 Background : Remittances in Sub-Saharan Africa

SSA has become one of the main emigration areas in recent years. The number of migrants from this region has increased steadily over the past 20 years. It has grown from around 20 million in 2000 to 40 million in 2020. In 2020, 14% of international migrant stocks come from SSA (UN DESA, 2020). Migration movements have become an important source of income for the migrants' countries of origin. According to World Bank data, the amount of remittances recorded and received by all SSA countries in 2019 is about US\$47 billion, or 3 percent of the region's GDP. This makes the region one of the largest recipients of remittances relative to GDP. As shown in Figure 1, only South Asia received more remittances relative to GDP than SSA in 2019. Figure 2 and 3 show that remittances to SSA have not only increased significantly in recent years but, more importantly, have surpassed the other two sources of external financing, namely FDI and Official Development Assistance (ODA). Furthermore, it can be noted that unlike FDI, for instance, remittance flows are much more stable.

As the region's main source of external finance, remittances can be invaluable for the development of the manufacturing industry in SSA for at least two reasons. Firstly, remittances can improve financing for the manufacturing sector, which faces enormous constraints in accessing both external and internal finance compared to other sectors. Indeed, as far as external financing is concerned, FDI are mainly focused on the natural resources sector (Gui-Diby & Renard 2015; Asiedu, 2006) while ODA is directed towards non-tradable services such as construction, health care and education (Rajan & Subramanian, 2011). In terms of internal financing, the manufacturing sector in SSA is disadvantaged in favor of import activities. Indeed, national financial institutions have a preference for financing import activities considered to be faster and less risky than manufacturing activities. Secondly, remittances can help increase private spending, which can increase demand for manufactured goods. If this increase in demand is for local manufactured goods and not imported goods, it could help the development of the manufacturing sector.

## 3 Theoretical Framework : How can remittances affect Industrialization?

There are three main transmission channels through which remittances affect industrialization namely investment effect, spending effect and employment effect.

### 3.1 Investment effect of remittances

Remittances affect capital accumulation in manufacturing firms both as an additional source of external financing and by modifying the financing behavior of credit institutions.

Since remittances represent an additional resources for SSA economies, they affect capital accumulation in manufacturing sector through the intensive and extensive margin. By definition, the intensive margin refers to the expansion of existing firms and the extensive margin corresponds to the entry of new manufacturing firms into the market through new investment. Thus, a part of remittances can be used to acquire capital in existing manufacturing firms. If this type of remittances' utilization reaches a significant magnitude, the contribution of manufacturing firms to the national output will increase, triggering an industrialization dynamism. Alternatively, remittances can be invested in the creation of new manufacturing firms, which will increase the number of manufacturing firms and thus the share of manufacturing in the national output. Remittances represent additional liquidity in the recipient economy. Thus, for the entrepreneurs whose entry into the market is hampered by a lack of financing, this new cash

will allow them to invest in their business.<sup>3</sup> The intensive and extensive margins show that remittances are additional resources that increase capital accumulation. In the context of African countries marked by difficulty in accessing investment credit, particularly in industrial activities, this category of external resource can help to overcome these internal credit constraints by improving the credit-worthiness of economic agents.

Moreover, the rise of capital accumulation through migrant remittances in the manufacturing sector will make financial institutions more interested in this sector, for which they provide little financing for investment in SSA. Indeed, given that the industrial base of SSA countries is weak, lending institutions tend to finance investments in the import business rather than the creation of a new manufacturing plant. This can be explained by the fact that the return on investment from import activity appears to be faster than that from setting up a new manufacturing firm, which can sometimes take several years. Also, the risk associated with importing activity is lower than investing in manufacturing.

### **3.2 Spending effect of remittances**

Although migrants are often motivated to invest in their country of origin either to prepare for their come back or to contribute to the development of their country, a significant share of remittances goes to the senders' families. Households mostly use these funds for consumption purposes, including manufactured goods' consumption. If the magnitude of this part of remittances reaches some threshold, the result will be an expansion of domestic demand for industrial goods. The question is therefore to understand how this rise impacts the SSA manufacturing firms. The answer to this question depends fundamentally on what types of manufacturing products are demanded. Indeed, if households buy local industrial goods, the increase in demand will lead to a rise of domestic manufacturing supply. Once it reaches a certain size, the rise of manufacturing output will lead to an increase in the share of industrial production in national output, creating a drive for industrialization. However, in the case of countries with a weak industrial base, a significant share of domestic demand for industrial goods is allocated to imports of manufactured goods, which will fuel competitive pressure on domestic manufacturing firms. At this point, two effects can be identified. First, there may be a substitution between local and foreign manufactured goods with a preference for the last one. Such a substitution could be justified by the fact that imported goods, especially from the main SSA countries trade partners are cheaper due to the availability of technology in these countries. Second, given the weak industrial base of SSA countries, consumers will turn elsewhere in order to satisfy the demand for industrial goods that are not produced in the domestic economy. Other effect concerns the substitution of the share of remittances allocated to final consumption expenditures by that allocated to the acquisition of capital in manufacturing firms. Indeed, as remittances received by a family increase, the marginal propensity to consume should fall in favor of the marginal propensity to invest.

### **3.3 Employment effect of remittances**

The employment effect of remittances depends on the two previous effects, namely investment effect and spending effect. Indeed, the acquisition of capital in existing firms leads to an expansion of their capacity to invest in inputs, including labor. The intensive margin would thus contribute to increase demand for labor by manufacturing firms. Moreover, the entry of new firms into the market should be accompanied by investment in factors of production such as labor and capital. The extensive margin should also be a source of manufacturing labor demand. If remittances to families are used to purchase local manufacturing goods, there should be an expansion of manufacturing activity through higher sales,

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<sup>3</sup>See Woodruff & Zenteno (2007) and Woodruff & Zenteno (2001) for the utilization of remittances as investment in business

which would eventually lead to an increase in labor demand. However, the opposite effect will occur if remittances are used to purchase foreign manufacturing goods, so we could expect to see a negative impact of remittances on manufacturing employment. Finally, remittances can also have a positive effect on employment due to their effect on investment in human capital.

## 4 Variables and Data Description

This paper combines both microeconomic data from manufacturing firms in SSA and macroeconomic data. The firms' data come from the World Bank Enterprise Surveys (WBES), which examine selected questions about the business environment and other determinants of firms' performance. The surveys are conducted in each country on formal firms with stratified random sampling. The stratification is based on the sector of firms, their size, and their geographical location. Data are collected by the statistical office of the countries in which enterprises are located. We use the most recent standardized dataset over the period 2006-2019. Macroeconomic data are from the World Development Indicators (WDI) database. Subsection 4.1 describes the main variables used in this article while subsection 4.2 presents some descriptive statistics.

### 4.1 Variables Description

#### 4.1.1 Definition of industrialization

In macroeconomic terms, industrialization is measured by both the production and employment viewpoints (Rodrik, 2016; Gui-Diby & Renard 2015; Herrendorf et al. 2014; Kang & Lee, 2011). Under the employment perspective, it is measured by the share of manufacturing employment in total employment. The production perspective considers the manufacturing value added's share in GDP as measure of industrialization. From these different measures, industrialization can be defined as the expansion of manufacturing sector in the overall level of economic activity relative to other sectors. This means that only manufacturing firms can trigger a process of industrialization from the growth of their employment and production. Based on this definition, we consider four measures of industrialization at the firm level.

The first two concern the acquisition of capital in manufacturing firms and the number of manufacturing firms. Indeed, the acquisition of capital in manufacturing firms is a capital accumulation that provides new financing to enterprises. Thus, a process of capital accumulation over time in these firms will trigger a growth of manufacturing activity that will lead to industrialization. This manufacturing growth is an intensive margin because it shows the expansion of companies already in the manufacturing market. Since we use a variable concerning the acquisition of capital by nationals as industrialization's measure, we consider it to be a measure of endogenous industrialization because its origin is domestic. Moreover, the number of manufacturing firms is measured by a dummy that takes 1 if a firm in the overall sample is manufacturing enterprise and 0 otherwise. In this case, industrialization will take the form of an increase in the number of manufacturing firms that leads to an increase in manufacturing output. This measure represents the extensive margin because it allows us to understand whether or not remittances are used for the creation of new manufacturing firms, i.e., whether they allow new firms to enter into the manufacturing market. It is also our second measure of endogenous industrialization because we assume that the entry of new firms into the market is enabled by the use of remittances by nationals.

The third measure of industrialization is the manufacturing firms' sales. This variable represents our measure of industrialization from the production perspective. In this case, industrialization is shown by the fact that an increase in the manufacturing enterprises' sales indicates a rise of manufacturing

production (all things being equal). Finally, the last measure of industrialization is the employment perspective which is proxied by manufacturing firms' employment.

#### 4.1.2 Firms' Variables

Firm data come from WBES. This database provides information on the characteristics, performance, and constraints of enterprises in developing countries. The enterprise data is described below.

**Capital Share Held by Nationals :** This variable represents the share of firm's capital (in percentage) that is held by economic agents with the nationality of country in which the enterprise is located. It is obtained by asking the manager about the distribution of firm's capital between nationals, foreigners, government and other. We are interested in this variable to understand whether remittances contribute to the acquisition of capital in SSA manufacturing firms. This will allow us to understand if remittances are a source of endogenous industrialization in SSA by highlighting whether or not remittances contribute to capital accumulation in SSA.

**Capital Share Held by Foreigners:** Like the previous variable, this one is obtained by asking the manager the share of the capital that is held by foreigners.

**Number of Firms:** This variable is a dummy taking 1 if one firm is in the manufacturing sector and 0 otherwise. It allows to understand how remittances can have extensive margin effect by increasing the number of manufacturing firms through the arrival of new enterprises.

**Firm's Sales:** This variable represents the company's total annual sales. It is initially recorded in the local currency of the country in which the enterprise is located. However, in order to allow for cross-country comparisons, we convert it to 2015 constant dollar and deflate it for inflation using the GDP deflator. It helps to understand whether remittances contribute to the manufacturing firms' growth through the demand for local manufacturing products. In this case, we would expect a positive impact of remittances on firms' sales. Remittances can therefore be considered as a source of industrialization. However, a negative impact will show that remittances are a source of deindustrialization through the competitive pressure of foreign manufacturing products' demand and the deterioration of local manufacturing firms' competitiveness.

**Firms' Employment:** The total permanent employment is measured by the number of permanent and full-time employees at the end of last fiscal year. This group of workers includes all paid employees who are hired for a period of one or more fiscal years and/or have a guarantee of renewal of their employment and who work up to 8 hours or more per day.

**Sales of Firms Three Years Ago:** This variable is used to control the conditional situation of firms. Indeed, the amount of sales growth three years ago could be used to invest in order to increase the future sales.

#### 4.1.3 Macroeconomics Variables

The macroeconomic variables used in this article are:

**Remittances:** This variable are composed of personal transfers and compensation of workers. The first includes all current transfers in cash or kind made by SSA emigrants to their countries of origin. Compensation of employees represents the wages of seasonal and other short-term SSA workers employed abroad. Remittances are from WDI database and are in current dollars. We consider both remittances per capita and per GDP.

**Remittances Prices:** Originally recorded as average transaction cost of sending to a specific country; this variable represents the average total transaction cost as a percentage of the amount sent for every \$200 sent by each remittance service provider. It comes from the Remittance Prices Worldwide database. This variable is used as instrument in the empirical approach.

**Workers rate:** Originally recorded as the number of migrant workers in the Organization for Economic Cooperation and Development (OECD) countries relative to the population of the countries of origin; this variable represent our second instrument in the empirical approach. It is collected from the OECD database (DIOC).

**Unemployment rate:** Unemployment is defined as the share of the labor force that is without a job but available and looking for work. This variable comes from the WDI database. It is used because a high unemployment rate can be a reason for entrepreneurship. Specifically, a young unemployed will tend to ask for remittances from a family member or friend abroad in order to invest in an entrepreneurial project. This entrepreneurship can be a collaboration between the sender of remittances and the entrepreneurial project initiator.

**Political stability index:** This variable measures the perceived likelihood of political instability and/or violence for the political reasons, including terrorism. The estimation gives the country's score on the overall indicator, in units of a standard normal distribution. More precisely, it is range from about -2.5 to 2.5. The highest level of political instability corresponds to the score (-2.5), while the highest level of political stability is indicated by the score (2.5). The indicator comes from the WDI-FDSD database. This variable allows us to understand the effect of the quality of institutions on our measures of industrialization.

**Control corruption index:** The control of corruption measure perceptions of the extent to which public power is exercised for private purposes, including both small and big forms of corruption, as well as the "capture" of the state by elites and private interests. The estimation gives the country's score on the aggregate indicator, in units of a standard normal distribution. More precisely, it is range from about -2.5 to 2.5. The highest level of corruption corresponds to the score (-2.5), while the lowest level of corruption is indicated by the score (2.5). The indicator comes from the WDI-FDSD database. Similarly to the political stability indicator, it allows to understand the effect of the quality of institutions on our measures industrialization .

**GDP growth rate:** This variable from the WDI database represents the economic growth rate. It reflects the domestic economy's dynamism, which can affect the measures of industrialization. Indeed, if the economic growth is driven by expansion of manufacturing firms' production, investment in these firms will be profitable and so economic agents will acquire capital in these enterprises. Alternatively, if the economic growth is driven by other firms operating outside manufacturing sector, the income from their increased output can be used to consume local manufacturing products, which could boost manufacturing sales.

**GDP per capita:** From also WDI database, the GDP per capita represents here both the income per capita and the size of domestic economic. As income per capita , its growth could increase the demand for local or foreign manufacturing products. As size of the domestic economy, its growth could increase domestic demand providing new opportunities for entrepreneurship and thus investment in either new or existing manufacturing firms through capital acquisition.

**Credit to private:** It represents the domestic credit to the private sector refers to financial resources provided to the private sector by financial institutions in percentage of GDP. These credits include loans, purchases of non-equity securities, trade credits and other accounts receivable, which give rise to a claim for repayment. This variable collected from the WDI database, measures the ease of access to credit, which can have an impact on industrialization in SSA.

**Trade:** The trade openness indicator from the WDI database represents the sum of exports and imports of goods and services as a percentage of GDP. It provides an overview of the way in which trade openness both provides sales opportunities for local firms and imposes competitive pressure on local enterprises through foreign sales in the domestic economy.

**Domestic investment:** Gross fixed capital formation (GFCF) includes land improvements (fences,

ditches, drains, etc.), purchases of plant, machinery and equipment, and the construction of roads, railroads and other facilities, including schools, offices, hospitals, private residential dwellings and commercial and industrial buildings. Since one firm's investment in factor of production represents the final goods sale of other enterprise, an increase in GFCF can lead to a demand expansion for local manufacturing products. In addition, this increase in manufacturing demand can create investment opportunities in this sector. This variable comes from the WDI database.

**Business cost:** It represents the cost that companies support to start a business per capita including costs related to administrative procedures. It comes from the Global Economy and WDI database and allows to identify the effect of the entrepreneurial costs on our variables of interest. This indicator includes all official fees and fees for legal or professional services if such services are required by law. Corporate legislation, the commercial law, specific regulations and fee schedules are used as sources for the calculation of costs. But it excludes bribes.

## 4.2 Data Description

Table A.1 in the Appendix shows the number of manufacturing firms and the share of each country in our total sample. The database contains 15,790 manufacturing firms. Nigerian and Kenyan firms are the most represented with 14.57% and 9.30% of the total sample respectively. The different industries considered in the definition of manufacturing enterprises are presented in Table A.2 on the basis of the International Standard Industrial Classification (ISIC revision 3.1). This table shows that labor-intensive industries like food manufacturing (24.15 %), clothing (13.65 %) and metal products (9.1 %) are the most represented in the database. In contrast, capital-intensive industries such as radio, television and communication equipment and apparatus (0.39%); manufacture of other transport equipment (0.38%); tobacco products (0.31%); manufacture of coke, refined petroleum products and nuclear fuels (0.28%); recycling (0.28%) and manufacturing of office, accounting and computer machinery (0.09%) are the least represented.

Descriptive statistics for the main variables used in the regressions are presented in the Table 1. Overall, we note that manufacturing companies represent 42% (15,790) of the entire sample. These manufacturing companies employ an average of 53 people. In terms of ownership, the average share of capital held by nationals in manufacturing companies is 84.43%, while that held by foreigners is 8.94%. The firms in our sample therefore tend to be, on average, domestic rather than foreign manufacturing enterprises. Compared to their level three years ago, manufacturing companies' sales are down an average of US \$7.2 million, from US \$20 million to US \$13 million. In terms of governance, on average, the countries in our sample have a poor score for political stability (-0.60) and control of corruption (-0.63). In contrast, the countries of SSA have on average a good economic performance with an annual GDP growth rate of 4.12%. The amount of GDP per capita is only \$ 1,736.61 per person. This confirms the low level of economic development in SSA countries. Concerning the remittance variables, the amount of remittances received represents on average 3.23 percent of total GDP. The annual per capita amount is \$ 42.41. Finally, the share of private credit granted by domestic financial institutions represents 23.61% of GDP.

## 5 Empirical Specification

To estimate the effect of international remittances on industrialization, the basic econometric model is :

$$Y_{it} = \alpha + \beta R_{it} + \gamma X_{it} + c_i + \mu_{it} \quad (1)$$

Where  $Y_{it}$  represents one of our four measures of industrialization in country  $i$  at time  $t$ .  $R_{it}$  is our variable of interest. It is either the logarithm of the amount of international remittances per capita or the logarithm of the amount of international remittances per GDP.  $X_i$  includes a vector of control variables,  $c_i$  is a country-specific effect and  $\mu_{it}$  is an idiosyncratic error term.

However, estimating this specification an ordinary least squares model could lead to biased coefficients. The main source of this bias would be the endogeneity of remittances. Indeed, remittances can be endogenous for at least two reasons. First, even if the country fixed effect allows for time-invariant heterogeneity, there could still be an unobserved, time-varying omitted variable that affects both remittances and industrialization. The second reason that remittances can be endogenous is the problem of reverse causation. For instance, let's say we regress industrialization on remittances. We argue that increasing remittances could lead to further industrialization by reducing liquidity constraints. But at the same time, industrialization could increase remittances by generating income that facilitates migration. This type of reverse causality problem persists despite the country fixed effect.

To address this endogeneity concern, we use the instrumental variables approach. More precisely, we use the following two instruments : (1) Remittances Prices and (2) Workers rate in OECD countries. Regarding the first instrument, we use, more specifically, the average cost of sending \$ 200 to country  $i$ . The idea behind this choice is that transaction costs, in particular transfer prices, can be a major obstacle to sending money. If it is more expensive to remit to country  $i$ , the volume of remittances sent by migrants to that country may decrease. Therefore, a negative relationship between the average cost of remittances and the amount of remittances received is expected. Many articles have already highlighted the role of remittance prices on the volume of remittances. For instance, [Freund & Spatafora \(2008\)](#) find that remittances depend negatively on transfer costs and exchange rates restrictions [Gibson et al. \(2019\)](#) also show that remittances have negative cost elasticity.

In addition to the prices of remittances, we use the number of workers of country  $i$  in OECD countries divided by the total population of country  $i$  as the second instrument for international remittances. We justify the use of this instrument by the SSA sociological context. Indeed, an important sociological literature has highlighted a strong solidarity which characterizes the migrant communities from a specific country and the importance of social networks in migration. Thus, patterns of migration networks partly determine current migration and remittances. The underlying idea is that migrant networks provide information on the conditions of the domestic environment and the costs of migration. They thus help to reduce the costs of migration and remittances. Thus, the likelihood of migrating and the volume of remittances will be higher in areas with larger and stronger migrant networks. Many studies have already used migrant networks as an instrument for remittances/migration ([McKenzie & Rapoport \(2007\)](#); [Hanson & Woodruff \(2003\)](#)). We therefore expect a positive effect of the number of workers from country  $i$  in OECD countries divided by the total population of country  $i$  on remittances received by that country. We focus on workers in OECD countries, as these countries are the main destinations for international migrants from SSA.

Figures 4 show the relationship between the volume of remittances received and the cost of remittances to a specific country, as well as the number of workers in country  $i$  in the OECD country divided by the total population of the country. As expected, we see in this graph that the amount of transfers received is lower when the cost of sending funds is higher (left chart). Similarly, there is a positive relationship between remittances and the proportion of workers from recipient countries to OECD countries (right chart).

Our claim is that, conditional on the set of control variables included in our specification, the unobserved components of the dependent variables are uncorrelated with these two instruments. Based on the above, we use an instrumental variable fixed effects (IVFE) approach where, as a first step, we estimate

the amount of international remittances as follows :

$$R_i = \alpha + \beta Z_{it} + \gamma X_{it} + c_i + \nu_{it} \quad (2)$$

Where  $R_i$  represents the suspected endogenous variables (the logarithm of the amount of international remittances per capita or the logarithm of the amount of international remittances per GDP).  $X_i$  is a set of control variables.  $Z_i$  is a vector of the instrumental variables described above.

The second step equation of the effect of international remittances on industrialization can be estimated as follows:

$$Y_{it} = \alpha + \beta \widehat{R}_{it} + \gamma X_{it} + c_i + \mu_{it} \quad (3)$$

Where  $\widehat{R}_i$  is the fitted values of  $R_i$  from the first stage.  $Y_{it}$ ,  $X_i$  and  $c_i$  are the same variables described in equation (2). Our coefficient of interest is  $\beta$  and  $\mu_{it}$  the error term.

## 6 Results

In this section, we present the main results of our analysis, starting with the investment effect of remittances, the spending effect, and finally the effect of remittances on employment in the manufacturing sector.

### 6.1 Investment effect

This part allows to understand how remittances can lead investment in existing firms (capital ownership by nationals) and the creation of new firms (The increase in the number of enterprises).

#### 6.1.1 Effect of remittances on capital held by nationals and Foreigners

The results for the effect of remittances on capital acquisition in SSA manufacturing firms by nationals, which is our first measure of industrialization, are presented in Table 2. In the first four columns, we report the results estimated using fixed effects model. We find a positive and negative effect of remittances on the share of capital owned by nationals and the share of capital owned by foreigners, respectively, regardless of the remittance measure used. Specifically, on average, an increase in remittances per GDP of 1% leads to an increase in the capital held by nationals of about 0.38% and a decrease in that held by foreigners of about 0.26%. While remittances per capita increased the share held by nationals by 0.27% and decreased that held by foreigners by 0.16%.

In the following columns, we consider the potential endogeneity of international remittances and use an IVFE model to correct for this potential bias. The results of the first and second steps are presented in the next column. As expected, column 5 shows that the instruments used predict international remittances very well. Indeed, the rate of workers in OECD countries is positively and significantly associated with the probability of receiving international remittances. In contrast, as mentioned above, the cost of remittances is negatively associated with international remittances.

We also notice at the bottom of columns 6, 7, 9 and 10 that the instruments used are also relevant. They pass the weak identification, under-identification tests. Indeed, the Kleibergen-Paap F statistic for weak identification and the Kleibergen-Paap rk LM statistic for under-identification are both higher than the standard value of 10 used in the literature.

The results of the second stage estimate are shown in columns 6, 7, 9 and 10 of Table 2. The positive effect of international remittances on the share of capital held by nationals in the first four columns remains unchanged. However, the effect on the foreigners' share is no longer significant. Specifically, we

find that international remittances increase the share of capital held by nationals by 0.59% when we use remittances per GDP and by 0.44% when we use remittances per capita.

Overall, the results show that remittances allow nationals to participate in the capital of manufacturing firms in SSA. We therefore argue that remittances are a source of endogenous industrialization because, unlike FDI, they enable domestic ownership of manufacturing firms. These results show that remittances contribute to the growth of manufacturing firms - through increased capital - that already exist in the market. The question is therefore whether remittances, in addition to the intensive margin, allow new manufacturing firms to enter the market (extensive margin).

### 6.1.2 Effect of remittances on the number of manufacturing firms

To understand the contribution of remittances on the extensive margin, we study their impact on the number of manufacturing firms. This helps us to understand whether remittances allow new manufacturing firms to enter the market. The entry of firms is measured by a dummy that takes 1 if the firm is in the manufacturing sector and 0 otherwise. Thus, a positive effect of remittances on this dummy would show that remittances lead to an increase in the number of manufacturing firms and hence the entry of new firms into the market. Table 3 reports the results of this analysis using both a fixed-effects model (columns 1 and 2) and a fixed-effect instrumental variable approach (columns 3 and 4). The results of the fixed-effects model show that remittances per capita and per GDP do not increase the probability of being a manufacturing firm. However, in the model with instrumental variables, they have a significant and positive impact on the number of manufacturing firms in the market. Specifically, a 1% increase in remittances per head leads to an additional 0.74 manufacturing firms in the market. On the other hand, a 1% increase in remittances per GDP leads to an increase in the number of manufacturing firms of 1.03 enterprises. As shown in Table 2, the instrumental variables significantly affect remittances with a negative effect for the cost of remittances and a positive one for the workers rate. Our instruments also pass the instrument validity tests.

Overall, the results of this subsection show that in addition to increasing the intensive margin, remittances contribute to the entry of new manufacturing firms into the market and thus to the increase of the extensive margin.

## 6.2 Spending effect : Effect of international remittances on the sales of manufacturing firms

Besides the use of remittances for investment purposes, a significant part of remittances is used for final consumption such as food, education, health, clothing, etc..(Adams Jr & Cuenquecha (2010), Clément (2011), Zhu et al. (2012), Thapa & Acharya (2017)). In this subsection, we examine whether remittances affect the sales of manufacturing firms in SSA through their effect on final consumption.

Table 4 shows that neither remittances per head nor remittances per GDP significantly affect firms' sales in the fixed effects model. However, they negatively and significantly affect annual sales of manufacturing firms. An increase in remittances per head leads to a decrease in manufacturing sales of 1.52% while a rise of remittances per GDP of 1% leads to a decrease in manufacturing sales of 2.17%. This negative impact of remittances can be explained mainly by two substitution effects. The first is the substitution of the local manufacturing products' demand by foreign industrial goods. This effect becomes plausible in the case of SSA countries since they have a weak industrial base. This implies the unavailability of most products demanded by domestic consumers, but also a preference for foreign goods because of their lower price, which is explained by the difference in technology between SSA countries and their main trade partners. The second effect concerns the substitution of the share of remittances

allocated to final consumption expenditures by that allocated to the acquisition of capital in manufacturing firms. Indeed, as remittances received by a family increase, the marginal propensity to consume should fall in favor of the marginal propensity to invest.

### 6.3 Employment effect : Effect of international remittances on number of full time employees

Manufacturing employment is the fourth measure of industrialization. The results of the fixed-effect instrumental variable approach, which is our preferred specification, reported in Table 5 show that remittances per GDP and remittances per capita positively affect the number of permanent full-time employees in manufacturing firms. An increase in remittances per GDP of 1% leads to a 2.63% increase in the number of permanent full-time workers in manufacturing firms. Furthermore, the increase in remittances per head by 1% raises this number of workers to 2.66%. This positive effect can be explained mainly by the intensive and extensive margins. The increase in the capital of existing enterprises boosts the investment capacity of firms, especially investment in inputs (capital and labor). In addition, the entry of new firms into the market is done with new investments in labor and capital.

## 7 Robustness Checks

Although using two different measures of remittances (remittances per GDP and remittances per capita) confirms the robustness of our results to the choice of variable of interest, we perform two alternative robustness tests to test the sensitivity of our results to sample selection bias. First, as we do not have the same number of firms across countries, some countries such as Nigeria and Kenya are over-represented in the total sample. As mentioned above, these two countries account for 14.57% and 9.30% of the total number of firms in the sample respectively. Thus, to ensure that the results are not driven by these two countries, we perform our estimations on a sample excluding these two countries. Second, we examine whether our results depend on the most industrialized countries in the region, such as South Africa, Mauritius, Ethiopia, and Nigeria. To test this concern, we apply the estimates to a sample excluding the above countries. The results of these robustness checks are presented in the subsection 7.1 and 7.2.

### 7.1 Excluding Nigeria and Kenya

The results of the analyses without Nigeria and Kenya are reported in Tables 6, 7, 8 and 9. We only interpret the results for the IVFE model, which is our preferred model.

Regarding the investment effect of remittances, our results show that the exclusion of Nigeria and Kenya does not change our main results. More specifically, Table 6 shows that a 1% increase in remittances per GDP leads to an increase in the share of capital held by nationals of the order of 0.95%. This increase is 0.64% for remittances per capita. However, compared to Table 2, the observed effect of remittances on the share held by nationals when we exclude Nigeria and Kenya is somewhat higher. Similarly, the positive effect of remittances on the number of manufacturing firms shown in the section remains unchanged even if we exclude Nigeria and Kenya (Table 7). We find that a 1% increase in remittances per GDP leads to a 2.22 unit increase in the number of manufacturing firms, while a 1% increase in remittances per capita leads to a 1.73 unit increase in the number of manufacturing firms.

The results of the spending effect (sales of manufacturing firms) of international remittances excluding Nigeria and Kenya are shown in Table 8. As with the investment effect, the exclusion of Nigeria and Kenya does not affect the significance and sign of the effect of remittances on firms' sales. This effect

remains negative with a 1.70% decline in sales following a 1% increase in remittances per capita and a 2.52% decline after a 1% increase in remittances per GDP.

Finally, as with the total sample, Table 9 shows that remittances per GDP and remittances per capita have a positive and significant effect on the number of permanent full-time employees in manufacturing firms.

Overall, these analyses show that our results are not influenced by the over representation of countries like Nigeria and Kenya. Our main findings are robust to the exclusion of these two countries.

## 7.2 Excluding the Most Industrialized Countries

The results of the analysis excluding the most industrialized countries from the sample, reported in Tables 10, 11, 12 and 13, highlight three main findings.

First, the exclusion of the most industrialized countries from the sample does not change the sign and significance of the effect of remittances on domestic capital ownership. However, the effect size is much larger when the most industrialized countries are excluded (2.25 for remittances per GDP and 1.74 for remittances per capita) compared to the baseline results (0.37 for remittances per GDP and 0.44 for remittances per capita). Moreover, excluding the most industrialized countries from the sample does not affect the sign and significance of remittances on the number of manufacturing firms (Table 11). Second, we find similar results for the sales of manufacturing firms in Table 12, but again the effect size is larger when we exclude these countries, regardless of the variable of interest (remittances per capita or remittances per GDP). Finally, as shown in Table 13, international remittances have a positive and significant effect on the number of full-time employees, which is consistent with the result in Table 5.

Taken together, these results prove the robustness of our results to the exclusion of the most industrialized SSA countries.

## 8 Concluding Remarks

In this paper, we explored the effect of Sub-Saharan Africa's new main source of external finance, remittances, on industrialization. Specifically, we use a fixed-effect instrumental variable approach and firm survey data to examine how remittances contribute to capital accumulation, manufacturing firm sales, and job creation in this sector. Our results highlight three key findings.

First, we find that international remittances increase capital acquisition by nationals in existing manufacturing firms (intensive margin), and second, they allow new manufacturing firms to enter the market (extensive margin). Specifically, we find that international remittances increase the share of capital held by nationals by 0.59% when we use remittances per GDP and by 0.44% when we use remittances per capita. With respect to the extensive margin, our results show that a 1% increase in per capita remittances leads to 0.74 additional manufacturing firms in the market while a 1% increase in remittances per GDP leads to an increase in the number of manufacturing firms by 1.03 firms. Second, when we examine the effect of international remittances on the sales of manufacturing firms, we find a negative effect. Indeed, we find that an increase in remittances per capita of 1% leads to a decrease in sales of manufactured goods of 1.51% while an increase in remittances per GDP of 1% leads to a decrease in sales of manufactured goods of 2.17%. Third, we observe a positive effect of international remittances on employment in manufacturing firms in Sub-Saharan Africa. Specifically, increasing remittances per capita by 1% increases the number of workers to 2.66%. Finally, we obtained similar results when we performed robustness tests on sample selection by excluding over-represented countries and the most industrialized countries from the sample.

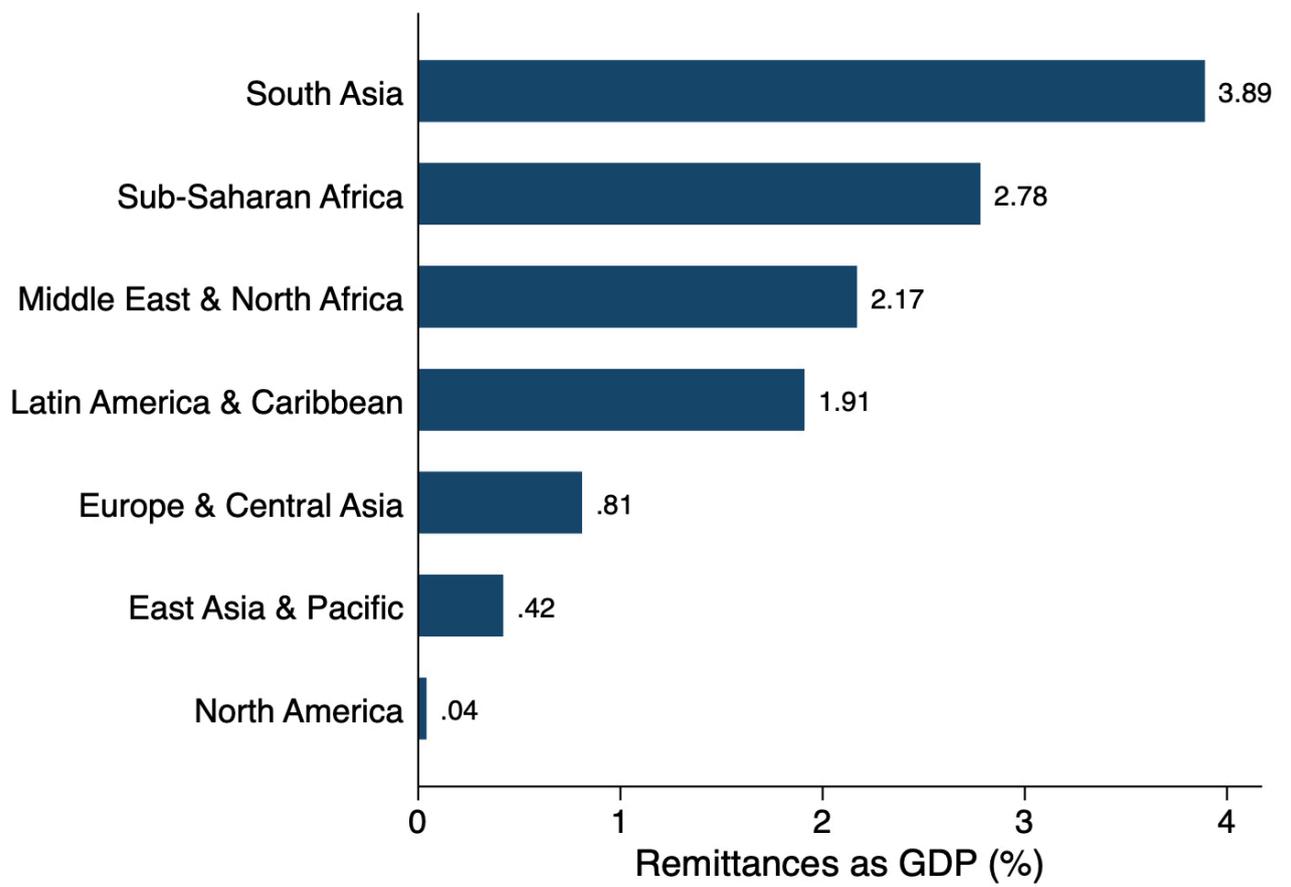
These results have several policy implications. First, the positive effect of remittances on investment in new and existing firms suggests a productive use of remittances. This is evidence that remittances can be a source of finance for the manufacturing sector, which faces huge challenges in accessing finance. However, the magnitude of the effect of remittances on industrialization remains even smaller due to the persistence of other entrepreneurship challenges in this region. These include the profitability of manufacturing companies, weak infrastructure (roads, electricity, etc.), bureaucracy and corruption. If these barriers are removed, the effect of remittances on the industrialization of this region can be substantial. Second, the negative effect of remittances on sales of manufactured goods indicates a substitution of foreign industrial goods for local manufactured goods. Consequently, to improve their sales and take advantage of the effect of remittances on spending, African manufacturing firms need to improve the competitiveness of their products. The improvement in the quality of road and electricity infrastructure services by policymakers discussed above can also improve their competitiveness, since these are inputs for manufacturing production. Policymakers can also help promote local products by subsidizing them.

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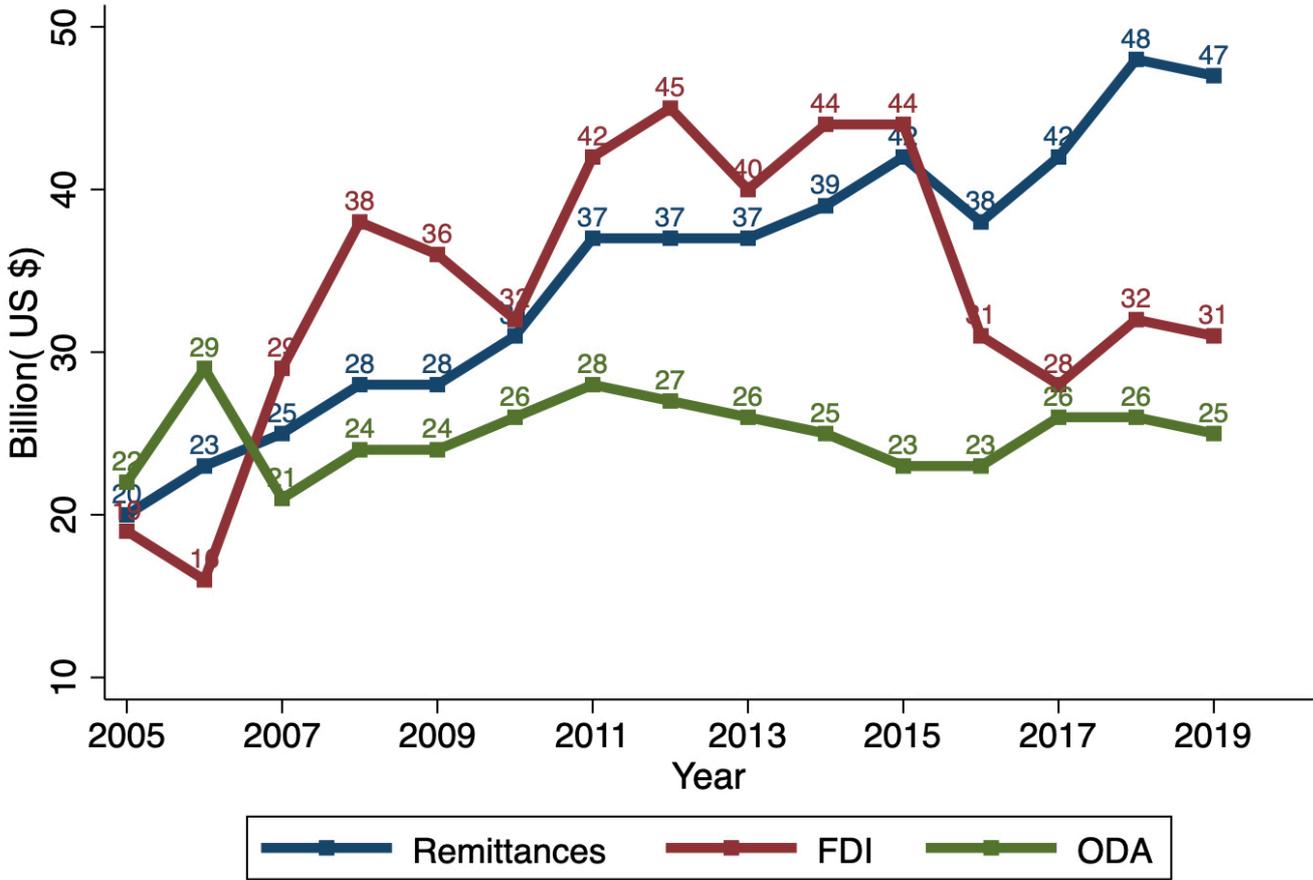
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Figure 1: Remittances per GDP by world bank regions classification



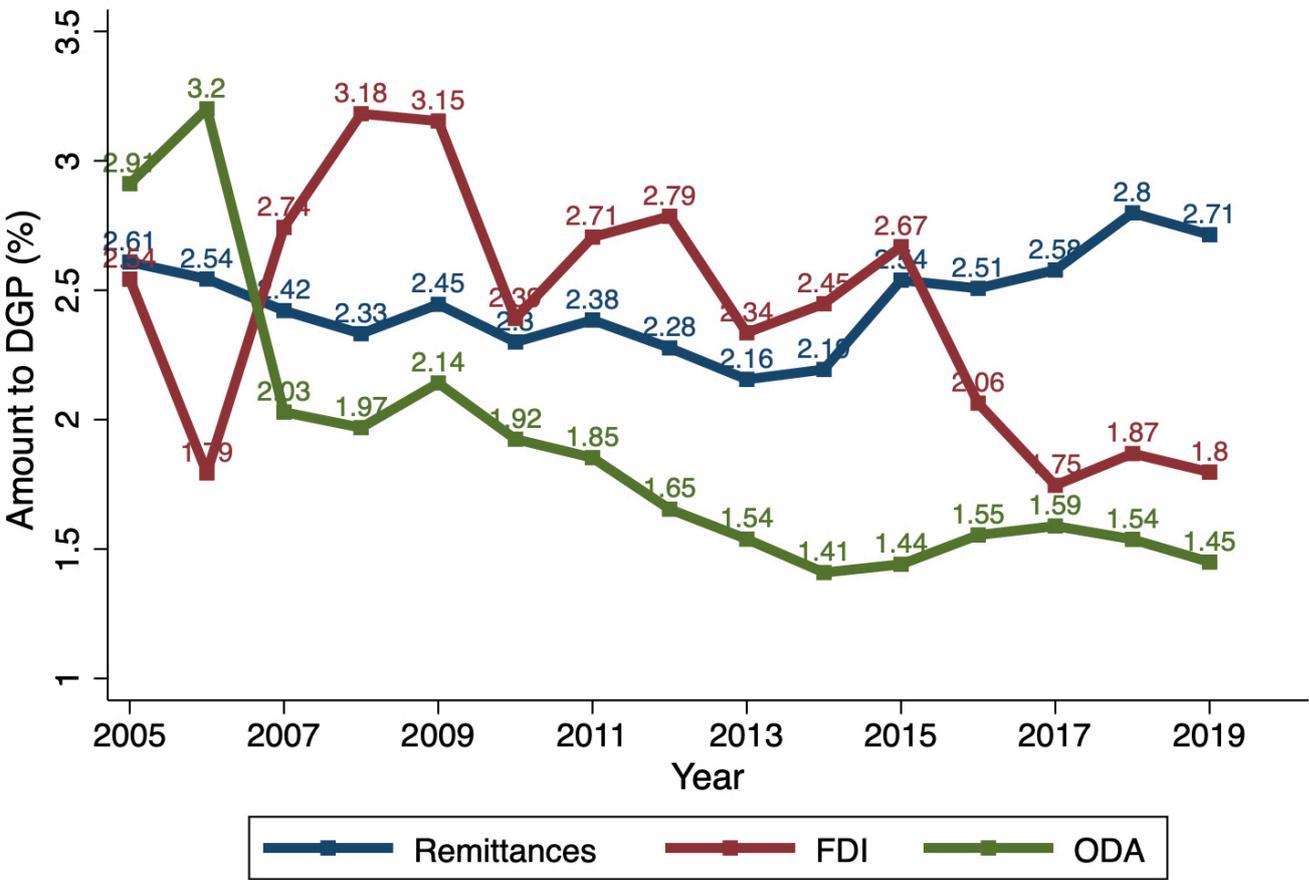
Source : Authors using WDI data

Figure 2: Remittances flows, Foreign Direct Investments and official development assistance to Sub-Saharan Africa



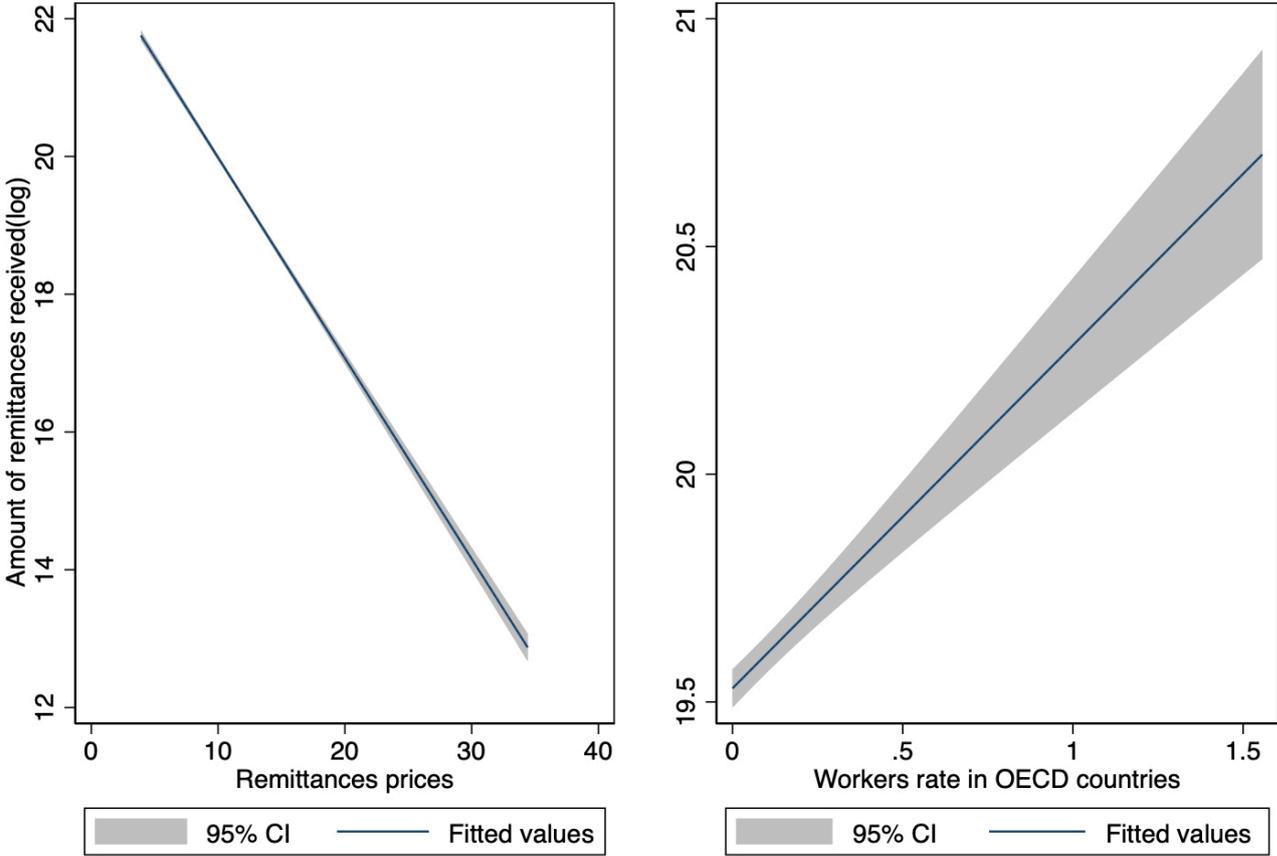
Source : Authors using WDI and OECD data

Figure 3: Remittances, Foreign Direct Investments and Official Development Assistance to GDP in Sub-Saharan Africa



Source : Authors using WDI and OECD data

Figure 4: Remittances flows, remittances prices and workers rate in OECD countries



Source : Authors using WDI and OECD data

Table 1: Descriptive statistics of the main variables

Variables	Mean.	Std. Dev.	Min	Max	Observation
<b>Enterprises variables</b>					
Share owned by Nationals	87.43	30.70	0.00	100.00	15706
Share owned by Foreigners	8.94	26.61	0.00	100.00	15690
Share owned by Government/State	0.93	7.47	0.00	100.00	15695
Share owned by Other	2.68	14.56	0.00	100.00	15691
Total Annual sales of manufacturing firms(in millions of US \$)	13.13	226.13	0.00	22262.30	15970
Total Annual sales of manufacturing firms 3 years ago(in millions of US \$)	20.33	1221.83	0.00	146588.97	15970
Number of full time employees	52.96	280.95	0.00	20000.00	15970
<b>Macroeconomic variables</b>					
Trade	63.11	25.52	16.67	139.37	105
Unemployment rate	7.28	6.74	0.94	28.47	105
Credit to private	23.61	28.07	2.34	149.23	105
Domestic investment	22.08	8.28	6.35	42.21	105
GDP pc(US \$)	1736.61	1965.41	194.69	10809.65	105
Political stability index	-0.60	0.83	-2.36	1.02	100
Control corruption index	-0.63	0.54	-1.49	0.96	100
Business cost	93.22	156.05	0.20	1180.70	103
GDP growth rate	4.12	5.66	-36.39	11.55	105
Amount of international remittances (in millions of US \$)	2068.13	5288.77	0.00	22037.02	99
Amount of international remittances per capita	42.41	59.72	0.00	343.76	99
Amount of international remittances to GDP	3.23	3.91	0.00	20.84	99
Remittances cost of sending 200(US\$)	11.46	5.14	3.91	34.42	103
Workers rate	0.10	0.32	0.00	1.56	105

Table 2: Effect of international remittances on the share of the business owned by nationals and foreigners

	Dependant variable : Share of the business owned by nationals and foreigners(log)									
	Fixed-effects model				Instrumental variables for panel-data models					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Share held by nationals	Share held by foreigners	Share held by nationals	Share held by foreigners	First stage	Share held by nationals	Share held by foreigners	First stage	Share held by nationals	Share held by foreigners
<b>Remittance to gdp(log)</b>	0.377*** (0.068)	-0.258*** (0.073)				0.591** (0.277)	-0.019 (0.299)			
<b>Remittances pc (log)</b>			0.270*** (0.044)	-0.162*** (0.047)					0.443** (0.222)	-0.007 (0.239)
Trade	-0.005 (0.003)	0.011*** (0.003)	-0.005* (0.003)	0.010*** (0.003)	0.018*** (0.000)	-0.012** (0.006)	0.008 (0.006)	0.026*** (0.001)	-0.013** (0.006)	0.008 (0.007)
Unemployment rate	0.021 (0.018)	-0.016 (0.019)	0.019 (0.018)	-0.012 (0.019)	-0.068*** (0.002)	0.038 (0.024)	-0.002 (0.026)	-0.085*** (0.003)	0.035 (0.024)	-0.001 (0.026)
Credit to private	0.008 (0.007)	-0.008 (0.007)	0.009 (0.006)	-0.008 (0.007)	-0.025*** (0.001)	0.024** (0.010)	-0.006 (0.010)	-0.036*** (0.001)	0.025** (0.010)	-0.005 (0.011)
Domestic investment	0.024*** (0.004)	-0.014*** (0.004)	0.024*** (0.004)	-0.014*** (0.004)	-0.011*** (0.001)	0.013** (0.006)	-0.006 (0.006)	-0.019*** (0.001)	0.014** (0.007)	-0.006 (0.007)
GDP pc(log)	0.080 (0.077)	-0.212** (0.083)	-0.193** (0.094)	-0.055 (0.101)	0.126*** (0.011)	-0.105 (0.091)	-0.196** (0.098)	1.165*** (0.017)	-0.542* (0.279)	-0.191 (0.300)
Political stability index	-0.124 (0.107)	0.404*** (0.114)	-0.134 (0.107)	0.403*** (0.114)	0.274*** (0.013)	-0.061 (0.120)	0.321** (0.129)	0.430*** (0.021)	-0.093 (0.130)	0.320** (0.140)
Control corruption index	1.240*** (0.151)	-0.989*** (0.162)	1.338*** (0.148)	-1.064*** (0.158)	0.484*** (0.018)	1.267*** (0.206)	-1.163*** (0.222)	0.354*** (0.028)	1.399*** (0.171)	-1.170*** (0.185)
Business cost	0.239*** (0.037)	-0.217*** (0.039)	0.244*** (0.037)	-0.218*** (0.039)	-0.044*** (0.004)	0.255*** (0.040)	-0.202*** (0.044)	-0.085*** (0.007)	0.266*** (0.044)	-0.201*** (0.047)
GDP growth rate	0.095** (0.045)	-0.055 (0.048)	0.084* (0.045)	-0.046 (0.048)	-0.040*** (0.007)	-0.094 (0.061)	0.048 (0.065)	-0.076*** (0.011)	-0.087 (0.063)	0.049 (0.068)
<b>Instrument</b>										
Remittances prices					-0.021*** (0.001)			-0.025*** (0.002)		
Workers rate					0.166*** (0.010)			0.225*** (0.015)		
Observation	14248	14232	14248.	14232	13970	13986	13970	13970	13986	13970
F-stats	23.693	10.685	24.489	10.636		18.542	9.234		18.474	9.233
R <sup>2</sup>	0.016	0.007	0.017	0.007		0.014	0.007		0.013	0.007
Kleibergen-Paap rk Wald F Stats						443.400	443.113		280.854	280.712
Kleibergen-Paap rk LM Stats						834.411	833.847		540.373	540.088
Chi-sq(2) P-value						0.000	0.000		0.000	0.000
Country fixed effect	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes

Notes: robust standard errors are in parentheses. pc : per capita \*\*\* p < 0.01, \*\* p < 0.05, \* p < 0.1.

Table 3: Effect of international remittances on manufacturing firms

	Dependant variable : Manufacturing companies (dummy)					
	Fixed-effects model		Instrumental variables for panel-data models			
	(1)	(2)	(3)	(4)	(5)	(6)
	Model 1	Model 2	First Stage	Model 3	First Stage	Model 4
<b>Remittances pc (log)</b>	-0.000 (0.011)			0.740*** (0.120)		
<b>Remittance to gdp(log)</b>		-0.017 (0.017)				1.033*** (0.138)
Unemployment rate	-0.051*** (0.004)	-0.052*** (0.004)	-0.062*** (0.002)	-0.001 (0.009)	-0.074*** (0.003)	0.008 (0.009)
Credit to private	-0.010*** (0.002)	-0.010*** (0.002)	-0.029*** (0.001)	0.020*** (0.005)	-0.042*** (0.002)	0.019*** (0.004)
Domestic investment	0.002** (0.001)	0.002** (0.001)	-0.007*** (0.001)	0.013*** (0.002)	-0.013*** (0.001)	0.012*** (0.002)
GDP pc(log)	0.029 (0.022)	0.032* (0.018)	0.178*** (0.014)	-0.842*** (0.143)	1.207*** (0.023)	-0.149*** (0.033)
Political stability index	0.115*** (0.025)	0.118*** (0.025)	0.198*** (0.014)	-0.093** (0.045)	0.327*** (0.021)	-0.046 (0.036)
Control corruption index	0.130*** (0.040)	0.136*** (0.040)	0.291*** (0.020)	0.052 (0.047)	0.080*** (0.029)	-0.204*** (0.062)
GDP growth rate	-0.032*** (0.012)	-0.034*** (0.012)	-0.091*** (0.007)	0.128*** (0.028)	-0.157*** (0.010)	0.117*** (0.023)
Trade	0.002** (0.001)	0.002*** (0.001)	0.019*** (0.001)	-0.018*** (0.003)	0.028*** (0.001)	-0.017*** (0.003)
Business cost	0.020** (0.009)	0.019** (0.009)	-0.071*** (0.006)	0.127*** (0.019)	-0.134*** (0.010)	0.106*** (0.015)
<b>Instrument</b>						
Remittances prices			-0.008*** (0.001)		-0.005** (0.002)	
Workers rate			0.151*** (0.008)		0.194*** (0.012)	
Observation	29491	29491	28967	28967	28967	28967
F-stats	29.419	29.519		27.597		30.538
R <sup>2</sup>	0.010	0.010		-0.157		-0.123
Kleibergen-Paap rk Wald F statistic				124.723		180.386
Kleibergen-Paap rk LM statistic				150.671		245.421
Chi-sq(2) P-value				0.000		0.000
Country fixed effect	Yes	Yes		Yes		Yes

Notes: robust standard errors are in parentheses. pc : per capita \*\*\* p < 0.01, \*\* p < 0.05, \* p < 0.1.

Table 4: Effect of international remittances on sales of manufacturing firms

	Dependant variable : Total Annual sales of manufacturing firms(log)					
	Fixed-effects model		Instrumental variables for panel-data models			
	(1)	(2)	(3)	(4)	(5)	(6)
	Model 1	Model 2	First Stage	Model 3	First Stage	Model 4
<b>Remittances pc (log)</b>	0.534 (0.353)			-1.518*** (0.427)		
<b>Remittance to gdp(log)</b>		0.561 (0.542)				-2.171*** (0.549)
Unemployment rate	0.247 (0.188)	0.241 (0.195)	-0.066*** (0.003)	0.100* (0.057)	-0.082*** (0.005)	0.081 (0.058)
Credit to private	0.101 (0.071)	0.094 (0.070)	-0.024*** (0.001)	0.040** (0.019)	-0.034*** (0.002)	0.039** (0.018)
Domestic investment	0.056 (0.034)	0.055 (0.034)	-0.010*** (0.001)	0.000 (0.012)	-0.017*** (0.001)	0.004 (0.011)
GDP pc(log)	-3.084*** (0.803)	-2.498*** (0.625)	0.138*** (0.025)	-0.642 (0.568)	1.194*** (0.040)	-2.131*** (0.217)
Political stability index	-0.481 (0.741)	-0.441 (0.762)	0.256*** (0.026)	0.214 (0.259)	0.393*** (0.038)	0.154 (0.245)
Control corruption index	0.540 (0.925)	0.466 (1.024)	0.536*** (0.023)	1.770*** (0.321)	0.449*** (0.032)	2.272*** (0.389)
GDP growth rate	0.571* (0.320)	0.579* (0.318)	-0.035*** (0.011)	0.048 (0.145)	-0.066*** (0.015)	0.054 (0.140)
Trade	-0.039* (0.023)	-0.036 (0.023)	0.016*** (0.001)	0.003 (0.011)	0.023*** (0.001)	0.004 (0.011)
Sales 3 Years Ago	0.335*** (0.018)	0.335*** (0.017)	-0.000 (0.000)	0.335*** (0.007)	0.000 (0.000)	0.335*** (0.007)
<b>Instrument</b>						
Remittances prices			-0.023*** (0.002)		-0.029*** (0.002)	
Workers rate			0.172*** (0.013)		0.234*** (0.020)	
Observation	14493	14493	14231	14231	14231	14231
F-stats	137.257	147.077		335.069		338.523
R <sup>2</sup>	0.393	0.392		0.366		0.372
Kleibergen-Paap rk Wald F Stats				125.213		136.778
Kleibergen-Paap rk LM Stats				265.753		331.360
Chi-sq(2) P-value				0.000		0.000
Country fixed effect	Yes	Yes		Yes		Yes

Notes: robust standard errors are in parentheses. pc : per capita \*\*\* p < 0.01, \*\* p < 0.05, \* p < 0.1.

Table 5: Effect of international remittances on number of full time employees

	Dependant variable : Number of full-time employees(log)					
	Fixed-effects model		Instrumental variables for panel-data models			
	(1)	(2)	(3)	(4)	(5)	(6)
	Model 1	Model 2	First Stage	Model 3	First Stage	Model 4
<b>Remittance to gdp(log)</b>	0.202*** (0.077)			2.633*** (0.291)		
<b>Remittances pc (log)</b>		0.222*** (0.047)				2.659*** (0.219)
Unemployment rate	0.110*** (0.018)	0.117*** (0.018)	-0.057*** (0.003)	0.208*** (0.021)	-0.081*** (0.004)	0.285*** (0.024)
Trade	-0.017*** (0.003)	-0.018*** (0.003)	0.014*** (0.001)	-0.053*** (0.005)	0.014*** (0.001)	-0.057*** (0.005)
Credit to private	-0.003 (0.005)	-0.002 (0.005)	-0.014*** (0.001)	0.032*** (0.007)	-0.019*** (0.001)	0.048*** (0.008)
Domestic investment	-0.001 (0.004)	-0.002 (0.004)	-0.006*** (0.001)	0.004 (0.006)	-0.003*** (0.001)	-0.002 (0.006)
GDP pc	0.000*** (0.000)	0.000 (0.000)	0.000*** (0.000)	0.000 (0.000)	0.000*** (0.000)	-0.001*** (0.000)
Political stability index	-0.080 (0.119)	-0.129 (0.120)	0.219*** (0.022)	-0.544*** (0.136)	0.444*** (0.040)	-1.042*** (0.168)
Control corruption index	-0.812*** (0.157)	-0.827*** (0.154)	0.460*** (0.019)	-1.937*** (0.222)	0.470*** (0.025)	-2.082*** (0.211)
GDP growth rate	-0.015** (0.007)	-0.011 (0.007)	-0.000 (0.001)	-0.022*** (0.008)	-0.019*** (0.002)	0.031*** (0.010)
Sales 3 Years Ago	0.060*** (0.003)	0.061*** (0.003)	-0.001 (0.000)	0.062*** (0.004)	-0.001 (0.001)	0.066*** (0.004)
Years of education	0.674*** (0.076)	0.647*** (0.077)	-0.008 (0.011)	0.346*** (0.091)	0.059*** (0.016)	0.107 (0.098)
<b>Instrument</b>						
Remittances prices			-0.030*** (0.002)		-0.048*** (0.002)	
Workers rate			0.146*** (0.009)		0.091*** (0.015)	
Observation	15111	15111	14849	14849	14849	14849
F-stats	79.301	80.780		83.776		84.789
R <sup>2</sup>	0.055	0.056		-0.006		-0.115
Kleibergen-Paap rk Wald F Stats				199.814		201.010
Kleibergen-Paap rk LM Stats				513.735		500.624
Chi-sq(2) P-value				0.000		0.000
Country fixed effect	Yes	Yes		Yes		Yes

Notes: robust standard errors are in parentheses \*\*\* p < 0.01, \*\* p < 0.05, \* p < 0.1.

Table 6: Effect of international remittances on the share of the business owned by nationals and foreigners excluding Nigeria and Kenya

	Dependant variable : Share of the business owned by nationals and foreigners(log)									
	Fixed-effects model				Instrumental variables for panel-data models					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Share held by nationals	Share held by foreigners	Share held by nationals	Share held by foreigners	First stage	Share held by nationals	Share held by foreigners	First stage	Share held by nationals	Share held by foreigners
<b>Remittance to gdp(log)</b>	0.269** (0.107)	-0.188 (0.116)				0.948** (0.381)	-0.302 (0.417)			
<b>Remittances pc (log)</b>			0.164** (0.064)	-0.124* (0.070)					0.638*** (0.222)	-0.234 (0.244)
Trade	-0.002 (0.004)	0.011*** (0.004)	-0.001 (0.003)	0.011*** (0.004)	0.026*** (0.000)	-0.028*** (0.010)	0.016 (0.011)	0.035*** (0.000)	-0.026*** (0.008)	0.017* (0.009)
Unemployment rate	0.035* (0.021)	-0.031 (0.023)	0.032 (0.021)	-0.030 (0.022)	-0.087*** (0.002)	0.123*** (0.037)	-0.049 (0.041)	-0.122*** (0.003)	0.119*** (0.033)	-0.051 (0.036)
Credit to private	-0.018 (0.011)	-0.007 (0.012)	-0.016 (0.012)	-0.009 (0.013)	-0.076*** (0.001)	0.087*** (0.032)	-0.030 (0.035)	-0.137*** (0.002)	0.101*** (0.033)	-0.039 (0.036)
Domestic investment	0.040*** (0.005)	-0.023*** (0.006)	0.036*** (0.005)	-0.020*** (0.005)	-0.004*** (0.001)	0.007 (0.008)	-0.014 (0.009)	0.019*** (0.001)	-0.008 (0.009)	-0.009 (0.010)
GDP pc	-0.000*** (0.000)	0.000 (0.000)	-0.000*** (0.000)	0.000 (0.000)	0.001*** (0.000)	-0.000** (0.000)	0.000 (0.000)	0.001*** (0.000)	-0.001*** (0.000)	0.000 (0.000)
Political stability index	-0.205* (0.118)	0.465*** (0.128)	-0.203* (0.118)	0.464*** (0.128)	-0.020* (0.010)	-0.030 (0.121)	0.427*** (0.133)	-0.039** (0.017)	-0.018 (0.122)	0.419*** (0.133)
Control corruption index	0.910*** (0.195)	-0.757*** (0.212)	0.979*** (0.197)	-0.809*** (0.214)	-0.095*** (0.018)	1.401*** (0.212)	-0.877*** (0.232)	-0.597*** (0.030)	1.686*** (0.251)	-0.988*** (0.276)
Business cost	0.138*** (0.044)	-0.177*** (0.047)	0.139*** (0.044)	-0.179*** (0.048)	-0.068*** (0.004)	0.270*** (0.056)	-0.206*** (0.061)	-0.122*** (0.007)	0.286*** (0.057)	-0.216*** (0.062)
GDP growth rate	0.078 (0.051)	-0.065 (0.055)	0.085* (0.050)	-0.069 (0.055)	0.193*** (0.007)	-0.281*** (0.091)	0.022 (0.100)	0.296*** (0.011)	-0.272*** (0.084)	0.026 (0.092)
<b>Instrument</b>										
Remittances prices					-0.011*** (0.001)			-0.024*** (0.002)		
Workers rate					0.192*** (0.009)			0.292*** (0.014)		
Observation	10634	10620	10634	10620	10358	10372	10358	10358	10372	10358
F-stats	13.114	4.953	13.132	5.009		7.191	3.950		7.387	3.990
R <sup>2</sup>	0.012	0.005	0.012	0.005		0.006	0.004		0.005	0.004
Kleibergen-Paap rk Wald F Stats						460.198	458.906		489.407	487.847
Kleibergen-Paap rk LM Stats						845.971	843.699		895.018	892.307
Chi-sq(2) P-value						0.000	0.000		0.000	0.000
Country fixed effect	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes

Notes: robust standard errors are in parentheses \*\*\* p < 0.01, \*\* p < 0.05, \* p < 0.1.

Table 7: Effect of international remittances on manufacturing firms excluding Nigeria and Kenya

	Dependant variable : Manufacturing companies (dummy)					
	Fixed-effects model		Instrumental variables for panel-data models			
	(1)	(2)	(3)	(4)	(5)	(6)
	Model 1	Model 2	First Stage	Model 3	First Stage	Model 4
<b>Remittances pc (log)</b>	0.049*** (0.013)			1.731*** (0.365)		
<b>Remittance to gdp(log)</b>		0.075*** (0.021)				2.218*** (0.403)
Unemployment rate	-0.049*** (0.004)	-0.049*** (0.005)	-0.083*** (0.002)	0.138*** (0.042)	-0.114*** (0.004)	0.126*** (0.034)
Credit to private	0.001 (0.003)	0.000 (0.003)	-0.084*** (0.004)	0.227*** (0.050)	-0.137*** (0.006)	0.175*** (0.034)
Domestic investment	0.003** (0.001)	0.004*** (0.001)	0.014*** (0.002)	-0.044*** (0.011)	0.030*** (0.003)	-0.019*** (0.006)
GDP pc(log)	-0.116*** (0.028)	-0.079*** (0.024)	0.172*** (0.017)	-1.917*** (0.396)	1.062*** (0.025)	-0.516*** (0.094)
Political stability index	0.117*** (0.026)	0.119*** (0.026)	0.060*** (0.013)	-0.074 (0.064)	0.133*** (0.021)	0.026 (0.044)
Control corruption index	0.388*** (0.049)	0.367*** (0.048)	-0.498*** (0.031)	2.324*** (0.439)	-1.159*** (0.048)	1.382*** (0.211)
GDP growth rate	-0.047*** (0.013)	-0.047*** (0.013)	0.123*** (0.011)	-0.275*** (0.060)	0.158*** (0.017)	-0.240*** (0.046)
Trade	0.001 (0.001)	0.001 (0.001)	0.026*** (0.001)	-0.065*** (0.014)	0.039*** (0.001)	-0.054*** (0.011)
Business cost	0.055*** (0.009)	0.054*** (0.009)	-0.165*** (0.008)	0.546*** (0.105)	-0.287*** (0.011)	0.423*** (0.069)
<b>Instrument</b>						
Remittances prices			-0.008*** (0.002)		-0.003 (0.003)	
Workers rate			0.063*** (0.009)		0.106*** (0.013)	
Observation	22818	22818	22294	22294	22294	22294
F-stats	34.043	33.839		20.230		26.883
R <sup>2</sup>	0.015	0.015		-0.713		-0.417
Kleibergen-Paap rk Wald F Stats				32.916		30.430
Kleibergen-Paap rk LM Stats				47.030		61.979
Chi-sq(2) P-value				0.000		0.000
Country fixed effect	Yes	Yes		Yes		Yes

Notes: robust standard errors are in parentheses. pc : per capita \*\*\* p < 0.01, \*\* p < 0.05, \* p < 0.1.

Table 8: Effect of international remittances on sales of manufacturing firms excluding Nigeria and Kenya

	Dependant variable : Total Annual sales of manufacturing firms(log)					
	Fixed-effects model		Instrumental variables for panel-data models			
	(1)	(2)	(3)	(4)	(5)	(6)
	Model 1	Model 2	First Stage	Model 3	First Stage	Model 4
<b>Remittances pc (log)</b>	0.401 (0.593)			-1.703*** (0.571)		
<b>Remittance to gdp(log)</b>		0.502 (0.920)				-2.520*** (0.759)
Unemployment rate	0.227 (0.189)	0.226 (0.193)	-0.068*** (0.003)	-0.006 (0.074)	-0.090*** (0.006)	-0.023 (0.073)
Credit to private	-0.023 (0.079)	-0.031 (0.076)	-0.069*** (0.005)	-0.318*** (0.061)	-0.109*** (0.007)	-0.302*** (0.052)
Domestic investment	0.133*** (0.038)	0.135*** (0.040)	0.007*** (0.003)	0.206*** (0.019)	0.018*** (0.004)	0.191*** (0.019)
GDP pc(log)	-3.910** (1.739)	-3.539** (1.323)	0.264*** (0.032)	-1.121 (0.807)	1.248*** (0.051)	-2.540*** (0.360)
Political stability index	-0.513 (0.695)	-0.506 (0.707)	-0.047*** (0.018)	-0.948*** (0.233)	-0.040 (0.030)	-1.006*** (0.232)
Control corruption index	-0.159 (1.119)	-0.321 (1.106)	-0.097*** (0.029)	-1.587*** (0.444)	-0.535*** (0.043)	-0.898*** (0.330)
GDP growth rate	0.305 (0.370)	0.314 (0.362)	0.220*** (0.021)	1.190*** (0.174)	0.314*** (0.030)	1.178*** (0.165)
Trade	-0.039 (0.032)	-0.038 (0.032)	0.020*** (0.001)	0.035** (0.018)	0.030*** (0.001)	0.036** (0.016)
Sales 3 Years Ago	0.335*** (0.021)	0.335*** (0.021)	0.000 (0.000)	0.337*** (0.009)	0.000 (0.000)	0.336*** (0.009)
<b>Instrument</b>						
Remittances prices			-0.027*** (0.003)		-0.035*** (0.004)	
Workers rate			0.078*** (0.009)		0.118*** (0.014)	
Observation	10791	10791	10529	10529	10529	10529
F-stats	84.764	85.558		201.210		203.012
R <sup>2</sup>	0.379	0.379		0.356		0.361
Kleibergen-Paap rk Wald F Stats				72.254		71.359
Kleibergen-Paap rk LM Stats				162.804		195.653
Chi-sq(2) P-value				0.000		0.000
Country fixed effect	Yes	Yes		Yes		Yes

Notes: robust standard errors are in parentheses. pc : per capita \*\*\* p < 0.01, \*\* p < 0.05, \* p < 0.1.

Table 9: Effect of international remittances on number of full time employees excluding Nigeria and Kenya

	Dependant variable : Number of full-time employees(log)					
	Fixed-effects model		Instrumental variables for panel-data models			
	(1)	(2)	(3)	(4)	(5)	(6)
	Model 1	Model 2	First Stage	Model 3	First Stage	Model 4
<b>Remittance to gdp(log)</b>	-0.140			1.329**		
	(0.108)			(0.652)		
<b>Remittances pc (log)</b>		-0.033				1.241**
		(0.066)				(0.601)
Unemployment rate	0.064**	0.067***	-0.038***	0.124***	-0.038***	0.121***
	(0.025)	(0.025)	(0.003)	(0.030)	(0.005)	(0.029)
Trade	-0.009**	-0.010***	0.020***	-0.043***	0.029***	-0.053***
	(0.004)	(0.004)	(0.001)	(0.014)	(0.001)	(0.018)
Credit to private	-0.009	-0.005	-0.068***	0.116***	-0.109***	0.159**
	(0.012)	(0.012)	(0.004)	(0.044)	(0.007)	(0.064)
Domestic investment	0.004	0.005	0.014***	-0.033***	0.030***	-0.050***
	(0.007)	(0.006)	(0.003)	(0.012)	(0.004)	(0.018)
GDP pc	-0.518***	-0.507***	0.016	-0.496***	0.825***	-1.501***
	(0.159)	(0.172)	(0.027)	(0.168)	(0.046)	(0.545)
Political stability index	-0.214	-0.224	0.077***	-0.294*	0.171***	-0.405**
	(0.147)	(0.147)	(0.025)	(0.150)	(0.043)	(0.180)
Control corruption index	-0.924***	-0.925***	-0.318***	-0.258	-0.912***	0.450
	(0.221)	(0.224)	(0.035)	(0.310)	(0.055)	(0.593)
GDP growth rate	0.029	0.020	0.291***	-0.521***	0.436***	-0.673***
	(0.064)	(0.064)	(0.020)	(0.184)	(0.030)	(0.246)
Sales 3 Years Ago	0.076***	0.076***	-0.000	0.076***	0.000	0.076***
	(0.004)	(0.004)	(0.000)	(0.005)	(0.001)	(0.005)
Years of education	0.285**	0.257**	0.343***	-0.382	0.586***	-0.657
	(0.130)	(0.130)	(0.018)	(0.292)	(0.029)	(0.413)
<b>Instrument</b>						
Remittances prices			-0.020***		-0.022***	
			(0.003)		(0.004)	
Workers rate			0.022**		0.022	
			(0.011)		(0.017)	
Observation	10791	10791	10529	10529	10529	10529
F-stats	38.602	38.467		29.081		28.821
R <sup>2</sup>	0.038	0.038		0.025		0.009
Kleibergen-Paap rk Wald F Stats				23.580		16.727
Kleibergen-Paap rk LM Stats				69.199		42.478
Chi-sq(2) P-value				0.000		0.000
Country fixed effect	Yes	Yes		Yes		Yes

Notes: robust standard errors are in parentheses \*\*\* p < 0.01, \*\* p < 0.05, \* p < 0.1.

Table 10: Effect of international remittances on the share of the business owned by nationals and foreigners excluding the most industrialized countries

	Dependant variable : Share of the business owned by nationals and foreigners(log)									
	Fixed-effects model				Instrumental variables for panel-data models					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Share held by nationals	Share held by foreigners	Share held by nationals	Share held by foreigners	First stage	Share held by nationals	Share held by foreigners	First stage	Share held by nationals	Share held by foreigners
<b>Remittance to gdp(log)</b>	0.381*** (0.106)	-0.062 (0.116)				2.250*** (0.532)	-0.659 (0.580)			
<b>Remittances pc (log)</b>			0.306*** (0.065)	-0.051 (0.071)					1.736*** (0.439)	-0.341 (0.475)
Trade	-0.006 (0.004)	0.005 (0.005)	-0.008** (0.004)	0.005 (0.005)	0.028*** (0.000)	-0.071*** (0.015)	0.026 (0.017)	0.041*** (0.001)	-0.081*** (0.019)	0.022 (0.020)
Unemployment rate	0.035 (0.023)	0.000 (0.025)	0.041* (0.023)	-0.001 (0.025)	-0.094*** (0.002)	0.273*** (0.055)	-0.079 (0.060)	-0.128*** (0.003)	0.287*** (0.061)	-0.062 (0.066)
Credit to private	0.012 (0.010)	-0.011 (0.011)	0.019* (0.010)	-0.013 (0.011)	-0.049*** (0.001)	0.138*** (0.027)	-0.053* (0.029)	-0.078*** (0.001)	0.164*** (0.035)	-0.048 (0.038)
Domestic investment	0.026*** (0.006)	-0.005 (0.006)	0.027*** (0.005)	-0.005 (0.006)	-0.025*** (0.001)	0.061*** (0.017)	-0.015 (0.018)	-0.038*** (0.001)	0.069*** (0.020)	-0.010 (0.022)
GDP pc(log)	-0.016 (0.164)	-0.478*** (0.178)	-0.419** (0.209)	-0.409* (0.228)	1.026*** (0.012)	-2.549*** (0.596)	0.358 (0.651)	2.559*** (0.020)	-4.667*** (1.165)	0.537 (1.261)
Political stability index	-0.138 (0.120)	0.357*** (0.131)	-0.175 (0.121)	0.363*** (0.131)	0.244*** (0.011)	-0.537*** (0.167)	0.486*** (0.182)	0.428*** (0.017)	-0.742*** (0.214)	0.479** (0.231)
Control corruption index	1.204*** (0.177)	-1.023*** (0.194)	1.289*** (0.177)	-1.037*** (0.193)	0.078*** (0.016)	1.167*** (0.188)	-1.022*** (0.205)	-0.142*** (0.027)	1.621*** (0.186)	-1.136*** (0.201)
Business cost	0.188*** (0.042)	-0.195*** (0.045)	0.190*** (0.042)	-0.196*** (0.045)	-0.020*** (0.004)	0.235*** (0.046)	-0.209*** (0.050)	-0.033*** (0.006)	0.247*** (0.048)	-0.203*** (0.052)
GDP growth rate	0.098* (0.050)	-0.110** (0.055)	0.085* (0.050)	-0.108** (0.055)	0.149*** (0.006)	-0.447*** (0.082)	0.084 (0.089)	0.184*** (0.011)	-0.450*** (0.085)	0.064 (0.091)
<b>Instrument</b>										
Remittances prices					-0.019*** (0.001)			-0.021*** (0.002)		
Workers rate					0.040*** (0.013)			0.094*** (0.022)		
Observation	11145	11130	11145	11130	10868	10883	10868	10868	10883.000	10868
F-stats	12.354	8.381	13.267	8.404		12.045	8.544		11.643	8.472
R <sup>2</sup>	0.011	0.008	0.012	0.008		-0.016	0.006		-0.034	0.006
Kleibergen-Paap rk Wald F Stats						225.606	225.502		125.520	125.295
Kleibergen-Paap rk LM Stats						433.619	433.404		245.607	245.169
Chi-sq(2) P-value						0.000	0.000		0.000	0.000
Country fixed effect	Yes	Yes	Yes	Yes		Yes	Yes		Yes	Yes

Notes: robust standard errors are in parentheses. \*\*\* p < 0.01, \*\* p < 0.05, \* p < 0.1. The most industrialized countries are : South Africa, Ethiopia, Nigeria and Mauritius.

Table 11: Effect of international remittances on manufacturing firms excluding the most industrialized countries

	Dependant variable : Manufacturing companies (dummy)					
	Fixed-effects model		Instrumental variables for panel-data models			
	(1)	(2)	(3)	(4)	(5)	(6)
	Model 1	Model 2	First Stage	Model 3	First Stage	Model 4
<b>Remittances pc (log)</b>	0.044*** (0.012)			0.595*** (0.093)		
<b>Remittance to gdp(log)</b>		0.054*** (0.021)				1.524*** (0.205)
Unemployment rate	-0.064*** (0.004)	-0.064*** (0.004)	-0.042*** (0.002)	-0.047*** (0.006)	-0.039*** (0.003)	-0.007 (0.010)
Credit to private	-0.001 (0.001)	-0.001 (0.001)	-0.021*** (0.001)	0.016*** (0.003)	-0.032*** (0.001)	0.030*** (0.005)
Domestic investment	-0.002** (0.001)	-0.002** (0.001)	-0.015*** (0.001)	0.014*** (0.003)	-0.024*** (0.001)	0.025*** (0.004)
GDP pc(log)	-0.060 (0.038)	-0.007 (0.032)	0.692*** (0.018)	-1.198*** (0.198)	2.032*** (0.028)	-1.094*** (0.159)
Political stability index	0.199*** (0.023)	0.203*** (0.023)	0.087*** (0.009)	0.150*** (0.028)	0.157*** (0.016)	0.148*** (0.029)
Control corruption index	0.206*** (0.039)	0.197*** (0.040)	0.188*** (0.022)	0.149*** (0.045)	0.136*** (0.033)	-0.121* (0.071)
GDP growth rate	0.003 (0.002)	0.002 (0.002)	-0.011*** (0.001)	0.017*** (0.003)	-0.028*** (0.002)	0.022*** (0.003)
Trade	0.003*** (0.001)	0.003*** (0.001)	0.017*** (0.000)	-0.010*** (0.002)	0.025*** (0.001)	-0.023*** (0.004)
Business cost	0.025*** (0.009)	0.026*** (0.009)	-0.001 (0.006)	0.036*** (0.011)	0.002 (0.009)	0.056*** (0.013)
<b>Instrument</b>						
Remittances prices			-0.013*** (0.001)		-0.007*** (0.002)	
Workers rate			0.059*** (0.012)		0.273*** (0.015)	
Observation	24029	24029	23505	23505.000	23505	23505
F-stats	38.713	38.140		38.846		35.861
R <sup>2</sup>	0.016	0.016		-0.062		-0.193
Kleibergen-Paap rk Wald F Stats				208.876		66.416
Kleibergen-Paap rk LM Stats				249.562		162.944
Chi-sq(2) P-value				0.000		0.000
Country fixed effect	Yes	Yes		Yes		Yes

Notes: robust standard errors are in parentheses. pc : per capita. \*\*\* p < 0.01, \*\* p < 0.05, \* p < 0.1. The most industrialized countries are : South Africa, Ethiopia, Nigeria and Mauritius.

Table 12: Effect of international remittances on sales of manufacturing firms excluding the most industrialized countries

	Dependant variable : Total Annual sales of manufacturing firms(log)					
	Fixed-effects model		Instrumental variables for panel-data models			
	(1)	(2)	(3)	(4)	(5)	(6)
	Model 1	Model 2	First Stage	Model 3	First Stage	Model 4
<b>Remittances pc (log)</b>	0.692 (0.561)			-3.406*** (0.666)		
<b>Remittance to gdp(log)</b>		0.732 (0.806)				-7.736*** (1.075)
Unemployment rate	0.095 (0.169)	0.091 (0.168)	-0.037*** (0.003)	-0.006 (0.052)	-0.030*** (0.005)	-0.168*** (0.063)
Credit to private	0.014 (0.029)	0.007 (0.030)	-0.019*** (0.002)	-0.103*** (0.022)	-0.030*** (0.002)	-0.152*** (0.024)
Domestic investment	0.080** (0.032)	0.076** (0.034)	-0.019*** (0.001)	-0.071*** (0.025)	-0.031*** (0.001)	-0.131*** (0.028)
GDP pc(log)	-3.172* (1.803)	-2.270 (1.361)	0.603*** (0.028)	5.127*** (1.356)	1.892*** (0.043)	3.779*** (0.820)
Political stability index	0.501 (0.610)	0.548 (0.624)	0.061*** (0.014)	0.655*** (0.209)	0.112*** (0.023)	0.444** (0.218)
Control corruption index	0.707 (0.940)	0.625 (1.048)	0.304*** (0.027)	1.830*** (0.335)	0.274*** (0.040)	3.524*** (0.496)
GDP growth rate	0.029 (0.046)	0.027 (0.048)	0.001 (0.001)	-0.013 (0.016)	-0.010*** (0.002)	0.005 (0.016)
Trade	-0.026 (0.026)	-0.020 (0.028)	0.016*** (0.001)	0.071*** (0.017)	0.023*** (0.001)	0.122*** (0.020)
Sales 3 Years Ago	0.345*** (0.021)	0.346*** (0.021)	0.002*** (0.000)	0.358*** (0.009)	0.003*** (0.000)	0.360*** (0.009)
<b>Instrument</b>						
Remittances prices			-0.020*** (0.002)		-0.019*** (0.003)	
Workers rate			0.046** (0.019)		0.224*** (0.024)	
Observation	11732	11732	11470	11470	11470	11470
F-stats	109.101	122.313		228.700		220.161
R <sup>2</sup>	0.402	0.401		0.320		0.265
Kleibergen-Paap rk Wald F Stats				70.302		59.285
Kleibergen-Paap rk LM Stats				118.438		139.294
Chi-sq(2) P-value				0.000		0.000
Country fixed effect	Yes	Yes		Yes		Yes

Notes: robust standard errors are in parentheses. pc : per capita. \*\*\* p < 0.01, \*\* p < 0.05, \* p < 0.1. The most industrialized countries are : South Africa, Ethiopia, Nigeria and Mauritius.

Table 13: Effect of international remittances on number of full time employees excluding the most industrialized countries

	Dependant variable : Number of full-time employees					
	Fixed-effects model		Instrumental variables for panel-data models			
	(1)	(2)	(3)	(4)	(5)	(6)
	Model 1	Model 2	First Stage	Model 3	First Stage	Model 4
<b>Remittance to gdp(log)</b>	-0.004			1.449**		
	(0.128)			(0.729)		
<b>Remittances pc (log)</b>		0.148*				1.077*
		(0.079)				(0.603)
Unemployment rate	-0.025	-0.012	-0.075***	0.181***	-0.096***	0.178***
	(0.031)	(0.030)	(0.004)	(0.060)	(0.006)	(0.064)
Trade	0.008*	0.003	0.026***	-0.055***	0.039***	-0.059**
	(0.005)	(0.005)	(0.001)	(0.020)	(0.001)	(0.024)
Credit to private	0.092***	0.103***	-0.048***	0.228***	-0.076***	0.241***
	(0.011)	(0.012)	(0.002)	(0.036)	(0.003)	(0.047)
Domestic investment	-0.081***	-0.075***	-0.022***	-0.083***	-0.033***	-0.081***
	(0.007)	(0.007)	(0.001)	(0.020)	(0.002)	(0.024)
GDP pc	1.939***	1.579***	0.920***	-0.271	2.388***	-1.501
	(0.212)	(0.259)	(0.028)	(0.729)	(0.045)	(1.484)
Political stability index	0.433***	0.363**	0.279***	-0.013	0.485***	-0.138
	(0.150)	(0.151)	(0.022)	(0.243)	(0.037)	(0.322)
Control corruption index	-0.438**	-0.412**	0.038	-0.130	-0.204***	0.165
	(0.207)	(0.208)	(0.037)	(0.224)	(0.054)	(0.243)
GDP growth rate	0.178***	0.150**	0.179***	-0.737***	0.233***	-0.741***
	(0.065)	(0.065)	(0.017)	(0.130)	(0.025)	(0.140)
Sales 3 Years Ago	0.076***	0.076***	0.002***	0.075***	0.004***	0.073***
	(0.004)	(0.004)	(0.000)	(0.005)	(0.001)	(0.005)
Years of education	0.027	-0.022	0.153***	-0.369*	0.249***	-0.410*
	(0.132)	(0.132)	(0.015)	(0.193)	(0.023)	(0.226)
<b>Instrument</b>						
Remittances prices			-0.019***		-0.021***	
			(0.003)		(0.004)	
Workers rate			0.015		0.053*	
			(0.023)		(0.031)	
Observation	11308	11308	11046	11046	11046	11046
F-stats	81.023	81.364		194.699		193.995
R <sup>2</sup>	0.073	0.074		0.083		0.080
Kleibergen-Paap rk Wald F Stats				28.460		24.585
Kleibergen-Paap rk LM Stats				64.441		48.697
Chi-sq(2) P-value				0.000		0.000
Country fixed effect	Yes	Yes		Yes		Yes

Notes: robust standard errors are in parentheses \*\*\* p < 0.01, \*\* p < 0.05, \* p < 0.1.

## A Appendix

Table A.1: Number of manufacturing firms and share of each country in the total sample

Countries	Number of firms	Percent
Angola	291	1.82
Benin	160	1.00
Botswana	208	1.30
Burkina Faso	143	0.90
Burundi	193	1.21
Cameroon	187	1.17
Central african republic	6	0.04
Chad	114	0.71
Congo	116	0.73
Democratic Republic of the Congo	555	3.48
Eritrea	114	0.71
Eswatini	273	1.71
Ethiopia	515	3.22
Gabon	89	0.56
Gambia	154	0.96
Ghana	406	2.54
Guinea	227	1.42
Guinea-Bissau	97	0.61
Ivory Coast	349	2.19
Kenya	1,485	9.30
Lesotho	103	0.64
Liberia	129	0.81
Madagascar	339	2.12
Malawi	218	1.37
Mali	492	3.08
Mauritania	245	1.53
Mauritius	232	1.45
Mozambique	477	2.99
Namibia	489	3.06
Niger	158	0.99
Nigeria	2,327	14.57
Rwanda	252	1.58
Senegal	676	4.23
Sierra Leone	126	0.79
South Africa	305	1.91
Sudan	438	2.74
Tanzania	378	2.37
Togo	103	0.64
Uganda	1,051	6.58
Zambia	1,091	6.83
Zimbabwe	659	4.13
Total	15970	100.00

Table A.2: Number of firms and share of each manufacturing industry in the total sample

Industries	Code	Number of firms	Percent
Manufacture of food products and beverages	15	3,856	24.15
Manufacture of tobacco products	16	50	0.31
Manufacture of textiles	17	803	5.03
Manufacture of wearing apparel; dressing and dyeing of fur	18	2,18	13.65
Tanning and dressing of leather; manufacture of luggage, handbags, saddlery, harness and footwear	19	264	1.65
Manufacture of wood and of products of wood and cork, except furniture	20	681	4.26
Manufacture of paper and paper products	21	183	1.15
Publishing, printing and reproduction of recorded media	22	723	4.53
Manufacture of coke, refined petroleum products and nuclear fuel	23	44	0.28
Manufacture of chemicals and chemical products	24	846	5.30
Manufacture of rubber and plastics products	25	700	4.38
Manufacture of basic metals	26	1,319	8.26
Manufacture of other non-metallic mineral products	27	314	1.97
Manufacture of fabricated metal products, except machinery and equipment	28	1,455	9.11
Manufacture of machinery and equipment n.e.c.	29	771	4.83
Manufacture of office, accounting and computing machinery	30	15	0.09
Manufacture of electrical machinery and apparatus n.e.c.	31	320	2.00
Manufacture of radio, television and communication equipment and apparatus	32	62	0.39
Manufacture of medical, precision and optical instruments, watches and clocks	33	104	0.65
Manufacture of motor vehicles, trailers and semi-trailers	34	134	0.84
Manufacture of other transport equipment	35	61	0.38
Manufacture of furniture; manufacturing n.e.c	36	1,041	6.52
Recycling	37	44	0.28