

# Does Migration Foster Exports?

## Evidence from Africa

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## Abstract

This paper aims at assessing the impact of migration on export performance and more particularly the effect of African migrants on African trade. Relying on a new data set on international bilateral migration recently released by the World Bank spanning from 1980 to 2010, the authors estimate a gravity model that deals satisfactorily with endogeneity. The results first indicate that the pro-trade effect of migration is higher for African countries, a finding that can be partly explained by the substitution between migrants and institutions (the existence of migrant networks compensating for weak contract

enforcement, for instance). This positive association is particularly important for the exports of differentiated products, suggesting that migrants also play an important role in reducing information costs. Moreover, focusing on intra-African trade, the pro-trade effect of African migrants is larger when migrants are established in a more geographically and ethnically distant country. All these findings highlight the ability of African migrants to help overcome some of the main barriers to African trade: the weakness of institutions, information costs, cultural differences, and lack of trust.

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# DOES MIGRATION FOSTER EXPORTS?

## EVIDENCE FROM AFRICA<sup>1</sup>

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## INTRODUCTION

While the neo-classical theory of international trade predicts substitution between international migration and international trade, a growing empirical literature has provided evidence that migrant networks could facilitate bilateral economic transactions. This pro-trade effect could operate through the dissemination of migrants' preferences for goods from their country of origin, the removal of informational and cultural barriers between host and origin countries (Rauch and Casella, 2003) or/and through the facilitation of contract enforcement in weak institutional environments (Greif, 1993). Migration would then reduce transaction costs associated with trade and serve to complement trade.

Although African trade has significantly grown over the last decade, African exports still represent a negligible portion of global exports.<sup>2</sup> African products suffer from significant trade barriers, both formal (time to export, transportation difficulties) and informal stemming from the relatively weak legal institutions present in African countries, as well as from limited information about international trading opportunities in these countries. Meanwhile African migration has increased and one might wonder whether these movements in population, by reducing the main obstacles to African trade, may have stimulated African exports.<sup>3</sup>

While the existing literature examining the pro-trade effect of migration has mainly focused on specific developed countries, the aim of this paper is to investigate the relationship between the population of African migrants and exports from African countries. Moreover, to better understand this relationship in the case of Africa, we examine whether African migrants can help overcome some of the constraints to African trade: the weakness of institutions, information costs, cultural differences and lack of trust.

This paper contributes to the literature on migrant networks in several ways. First, because African countries are particularly affected by institutional weakness, it tests the pro-trade effect of migration, identified mainly in the literature for developed countries, in the case of African countries. Second, an instrumental variable (IV) estimator is used to take explicitly the problem of endogeneity into account (previous empirical research has mostly treated migration as exogenous). The bilateral instruments employed include the existence of a bilateral social security agreement between two countries, the lagged share of migrants from the origin country who live in the host country and the difference in life expectancy between

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<sup>2</sup> According to WTO data, merchandise exports from Africa represented only 3.5 percent of world merchandise exports in 2012.

<sup>3</sup> The number of migrants from Sub-Saharan Africa in the OECD countries increased by nearly 80 percent during the 1990s (Lucas, 2006).

the two countries. Finally, the paper examines the underlying mechanisms for African migration to foster African trade (both international and intraregional trade). To carry out this study, we rely on a new data set on international bilateral migration recently released by the World Bank for the years 1980, 1990, 2000 and 2010. This data set is the first to cover such a long time span and to include every country in the world.

Our findings point first to a substantial positive effect of the African diaspora on African exports that is higher than the average effect of migration on exports at the world level. This could be partly explained by the prevalence of, on average, weaker institutions in Africa, since we also find that the weaker the institutions in the countries of origin, the more migrants contribute to trade. Second, our findings show a stronger effect in the case of differentiated goods, suggesting migrants also play an important role in reducing information costs, which should affect differentiated products more than commodities. Moreover, the positive effect of the African diaspora on intra-African exports appears to be stronger when migrants are established in geographically and ethnically distant countries. The paper would thus suggest that through migration trade barriers hampering African trade could be further reduced, namely that it would help enforce contract, reduce information costs, and lower cultural barriers.

The remainder of the paper is organized as follows. Section 1 describes the patterns of African migration and exports. Section 2 reviews the literature. Section 3 presents the data and the empirical methodology. Results are then discussed in Section 4 and finally some policy conclusions are drawn.

## **1. AFRICAN MIGRATION AND EXPORTS: AN OVERVIEW**

### **1.1 AFRICAN MIGRATION**

Between 1980 and 2010, the population of African migrants in the world has more than doubled and reached about 30.6 million in 2010 (according to the latest available information on bilateral migrants provided by the World Bank).<sup>4</sup> However, despite this sharp increase in migration from African countries, the population of African migrants represented barely 3 percent of Africa's total population in 2010. At the same time, African migrants represented only 17 percent of the total population of migrants from the developing world (by comparison, migrants from Asia represented a third of all migrants from developing

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<sup>4</sup> In this paper we focus on international African migration, namely inter-country movements of people within the continent, as well as movements from the continent towards the rest of the world.

countries). In view of the significance of undocumented migration within Africa and given the lack of official data in many African countries, these figures are likely to be significantly underestimated.<sup>5</sup>

African countries are affected differently by emigration. As evidenced in Ratha et al. (2011), emigration rates are particularly high in countries that have suffered from conflicts, e.g. Eritrea and Liberia, or in countries with a small population, such as Cape Verde, Sao Tome, or Lesotho. Moreover, World Bank's data suggest also that Egypt, Morocco, Burkina Faso, Algeria and Zimbabwe were the top five African emigration countries in 2010, representing 12.4 percent, 10.5 percent, 4.8 percent, 4.2 percent and 3.9 percent of all African emigrants, respectively.

Turning to destination countries of African migrants, two main stylized facts emerge: their destination countries are not very diversified and most African migrants remain on the continent rather than migrating to other regions. France still appears to be the most attractive destination for emigrants from Africa (almost 10 percent of total emigrants from Africa in 2010), ahead of Côte d'Ivoire, Saudi Arabia, South Africa and the United States (see Appendix A, Figure A.1, and Table A.1).

In 2010, about half of international migrants from African countries still lived in Africa. Almost all migrants from Swaziland, Niger and Lesotho have settled in other countries on the continent (97 percent, 97 percent and 99 percent of migrants, respectively). The countries in Africa attracting most migrants in 2010 were Côte d'Ivoire, South Africa and Burkina Faso (Ratha et al., 2011). Their attractiveness might be explained either by higher wages and work opportunities or by their direct access to the sea.

This tendency of African migrants to move within the African continent is verified all along the period studied. We note, however, that the share of African migrants who stay in Africa has decreased steadily over time (from 59 percent in 1980 to 51 percent in 2010), with a slow diversification of African migrant destinations (for example, a growing share of African migrants, mainly from North Africa, going to the Middle East). The attraction exerted by Europe, the second most popular destination for African migrants, has remained stable over the same period (at around 28 percent).

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<sup>5</sup> About half of African migratory flows are intra-continental and most of them are informal and not included in national official statistics (Ratha et al, 2011).

## 1.1. African exports

Easterly and Reshef (2010) documented the recent success of African countries in enhancing remarkably their exporting capacities. Data from the Direction of Trade Statistics (DOTS, IMF) indicate a steady increase in the annual average rate of African export growth, with an acceleration over the last decade. African exports have grown annually on average by 2.6 percent in the 1980s, 8 percent in the 1990s, and 15 percent in the 2000s. Despite this significant increase, African exports (totaling US\$450 billion in 2010) still represent a small share of global exports. Indeed, in 2010, Africa provided only 3.5 percent of global exports.

The destinations of African exports have shifted over time with the share of African exports headed for OECD countries decreasing from 86 percent in the 1980s to 60 percent in 2010 (see Appendix A). In parallel, the share of African exports to emerging countries has risen from about 4 percent in 1980 to 25 percent in 2010. The level of intra-African trade is rather limited but has grown significantly, expanding by 11 percent every year on average over the period 1980-2010. As a result, in 2010, African countries were exporting 11 percent of their products within Africa.

A large share of African exports is composed of primary commodities that are homogeneous products. In 2000, according to Rauch's classification (1999), about 60 percent of African exports were goods traded on organized exchanges (classified as homogenous goods), 20 percent were products with reference prices (classified as intermediate), and only 20 percent of exports could be considered as differentiated products. This pattern especially applies to African exports in destination to non-African countries. For intra-African trade, however, the types of traded goods are slightly different, with a smaller share of homogeneous traded goods and about 35 percent of the exports being differentiated products.

## 2. REVIEW OF THE LITERATURE

Results of the empirical literature examining the migration-trade nexus provide strong evidence in support of a pro-trade effect of migration. Most empirical papers testing the relationship between migration and trade have, however, focused on single-anchor developed countries and few considered global bilateral data sets. Few papers have focused on the specific pro-export effect in the context of developing countries.

Among studies assessing the influence of immigration on exports and imports in specific developed countries, Gould (1994) conducted a study on the United States, Head and Ries (1998) on Canada, Murat and Pistorresi (2009) on Italy, Girma and Yu (2002) on the United Kingdom, Peri and Requena-Silvente (2010) on Spain, Briant et al. (2009) on French regions and Bastos and Silva (2012) on Portugal using firm-level data. They have all found a significant positive effect of the population of immigrants on trade performance of these developed host countries. Bacarreza et al. (2006) is one of the few studies examining the trade-migration nexus in the case of a developing country: Bolivia. Their findings provide evidence of a positive and significant effect of Bolivian immigration and emigration on Bolivian trade, with a larger magnitude for Bolivian emigration.

A number of other studies underlined the impact of a specific diaspora on bilateral trade. For example, the Chinese network has been found to increase considerably bilateral trade (Rauch and Trindade, 2002). Conducting the same analysis, Felbermayr et al. (2011) found that the Chinese network leads to a more modest amount of trade creation and that the three most relevant trade creation networks after the Chinese are Moroccan, Polish and Turkish.

Another type of studies makes use of global bilateral migration. Felbermayr and Jung (2009) considered a South-North gravity model and established a positive trade effect between southern and northern countries. Questioning the pro-trade effect of migrants, Parsons (2012) found that migration had a positive effect only on northern exports to the South. Finally, using cross-section data, Tadesse and White (2013) showed that African migrants significantly promoted African trade. However, their empirical approach does not control for the possible endogeneity of migration and they do not analyze the mechanisms through which African migrants could promote African trade.

But why would migration foster trade? A broad strand of literature has emphasized the importance of good institutions, especially in exporter countries, to promote international trade (Anderson and Marcouiller, 2002; Berkowitz et al., 2006). In particular, mechanisms of arbitration are required to settle possible disputes between traders and ensure contract enforcement. Greif (1989, 1993) and Rauch (2001) have demonstrated theoretically that ethnic networks, that could threaten to impose informal sanctions through the community, could promote trade contract enforcement and international trade. Thereby, the presence of migrant networks could compensate for the lack of good institutions.

Few papers have, however, empirically showed that migrants can offset the trade-inhibiting effect of institutional weaknesses. Dunlevy (2006) found, for example, that the higher the



level of corruption in the country of origin, the stronger the positive association between immigrants and bilateral exports of the American States. Similarly, in the case of France, Briant et al. (2009) have confirmed that the pro-trade effect of migrants is more salient when they come from a country endowed with weak institutions.

Another mechanism through which migration could foster international trade is related to access to information. Several studies have provided evidence on the trade-restraining effect of information costs (Harris, 1995; Fink et al. 2005, among others). Rauch and Casella (2003) have emphasized that migrant networks could promote bilateral trade by providing information on market risks or business opportunities and connecting economic agents. As argued by Rauch (2001), migrant networks may, for example “help producers of consumer goods to find appropriate distributors”. Combes et al. (2005), Girma and Yu (2002), Head and Ries (1998), Felbermayr and Toubal (2012) have empirically identified the reduction in information costs as one of the relevant mechanisms through which migration affects trade.<sup>6</sup>

This information channel is facilitated by the migrants’ knowledge of the language, the functioning of institutions and legal framework of both their host and home country. A few studies have provided evidence on the role of migrants in reducing trade costs associated with cultural distance. For example, focusing on the U.S., Dunlevy (2006) showed that the pro-trade effect of immigration increases with the “language distance” between the foreign born and the natives. His results confirmed that, in this specific case, migrants served to bridge cultural gaps between the U.S. and their trading partners. Moreover, using different proxies of cultural distance, Tadesse and White (2010) found that immigrants living in the United States reduced the trade-inhibiting effect of cultural distance with trading partners.

### **3. THE EMPIRICAL ANALYSIS**

#### **3.1. The empirical model**

The empirical exercise will first aim at estimating the association between migration and exports from African countries by properly controlling for endogeneity. We will also examine the role played by the quality of institutions in the diaspora-trade relationship to assess whether it can be an explanation of the pro-trade effect of African migrants (since African countries are generally endowed with weaker institutions). The effects on differentiated products will also be analyzed to assess whether in addition to the contract enforcement

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<sup>6</sup> Note, however, that Felbermayr and Toubal (2012) and Head and Ries (1998) have found that migrants serve more to promote demand for home products than to decrease transaction costs.

argument African migrants could play a role in alleviating information asymmetries. Finally, the association between migration and geographic or ethnic distance will be more closely studied in the context of intra-African trade.

For this purpose, we will start by estimating a log-log gravity model of exports augmented with the logarithm of the population of emigrants from each country of origin as an additional control variable, as expressed below:

$$\ln X_{i,j,t} = \alpha_1 \ln Migr_{i,j,t} + \alpha_2 YPC_{i,t} + \alpha_3 YPC_{j,t} + \alpha_4 D_{i,j} + \alpha_5 CD_{i,j} + \alpha_6 FTA_{i,j,t} + \mu_i + \mu_j + \delta_t + \varepsilon_{i,j,t} \quad (1)$$

where  $X_{i,j,t}$  is exports from origin country  $i$  to host country  $j$  at year  $t$ <sup>7</sup>;  $Migr_{i,j,t}$  represents the number of migrants of country  $i$  living in country  $j$ ;  $D_{i,j}$  is the geographical distance between country  $i$  and  $j$ ;  $CD_{i,j,t}$  is a set of dummies measuring cultural proximity between countries  $i$  and  $j$  (the presence of a common language, a common colonial past, a common border, colonial ties) ;  $FTA_{i,j,t}$  takes into account the existence of trade agreements between countries  $i$  and  $j$ .

To control for unobserved heterogeneity between countries both exporters and importers fixed effects are included ( $\mu_i$  and  $\mu_j$ ) and the vector  $\delta_t$  contains a full set of year-specific dummies. To control for multilateral trade resistance of importing and exporting countries, whose importance has been underlined by Anderson and Van Wincoop (2003), we rely on the method proposed by Baier and Bergstrand (2009). These authors have shown using Monte Carlo simulations that adding theory-consistent simple log-linear terms into the gravity equation can robustly account for multilateral resistance. These multilateral resistance terms are calculated for the usual bilateral trade cost determinants, namely distance, contiguity, colonial ties, common colonial past, common language and free trade agreement.<sup>8</sup> Finally,  $\varepsilon_{i,j,t}$  denotes an i.i.d error term.

### 3.2. Econometric issues

An important econometric issue to deal with in such exercises is the endogeneity bias that may arise from measurement errors, omitted variables or potential reverse causality between the dependent variable, exports from country  $i$  to country  $j$ , and our variable of interest,

<sup>7</sup> For the sake of simplicity, we will omit the  $t$  indices in the remainder of the paper.

<sup>8</sup> The multilateral resistance terms defined by Baier and Bergstrand (2009) take the form:  $MR_{ijt}^V = (\sum_{k=1}^N \theta_{kt} V_{ikt}) + (\sum_{m=1}^N \theta_{mt} V_{mjt}) - (\sum_{k=1}^N \sum_{m=1}^N \theta_{kt} \theta_{mt} V_{kmt})$  where  $\theta_{kt}$  is country  $k$ 's share in the world GDP in year  $t$ . The multilateral resistance corrected terms correspond to each variable  $V$  minus  $MR_{ijt}^V$ .

emigration from country  $i$  to country  $j$ .<sup>9</sup> Indeed, migration is mostly driven by differences in opportunities and living condition between countries. Since trade influences these differences, it is also likely to affect migratory flows. Markusen and Zahniser (1999) showed that increasing trade can promote economic growth and job creation in the countries involved and thereby diminish the economic reasons for people to migrate. However, introducing migration costs to the Heckscher-Ohlin-Samuelson model, Lopez and Schiff (1998) demonstrated that trade could also help people afford migration costs and thereby favor migratory flows.

In order to identify the causal effects of migration on trade, we need to find good instruments for bilateral migration (variables influencing bilateral migration but not bilateral trade, except through bilateral migration). They should vary both in time and by country pairs in order to be strongly related to bilateral migration and so as not to be dropped after the inclusion of either time or country-fixed effects.

The instrumental variable approach has been rarely used in the large migration-trade literature. Briant et al. (2009) and Combes et al. (2005) stand as exceptions in this regard. These authors have used as instrument the lagged stocks of migrants. In the literature related to the effect of migrant networks on foreign direct investments, Javorcik et al. (2011) proposed an original set of instruments, but most of them do not change over time and are specific only to the migrant's country of origin.<sup>10</sup> Their only time-varying instrument is a measure of the importance of the existing network of migrants.

Our first instrument measures the existence of a network by the share of migrants from  $i$  living in country  $j$  with respect to the total of migrants from  $i$  in the whole world 10 years earlier.<sup>11</sup> Indeed, a large literature has provided evidence that community networks, by reducing migration costs, positively influence the decision to migrate (Winters et al. 2001; Munshi 2003; Beine et al. 2011). We called this first instrumental variable  $Network_{ij}$ .

Our second instrument,  $BSSA_{ij}$ , is a dummy equal to one if a bilateral social security agreement exists between the two countries. Bilateral social security agreements provide the

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<sup>9</sup> Parsons (2012) underlined the potential endogeneity bias arising from omitted bilateral variables that explain both trade and migration and include country pair fixed effects as an attempt to control for it.

<sup>10</sup> Their instruments are the costs of acquiring a national passport in the migrants' country of origin, distance to the European Union, presence of a US military base in the migrant's country of origin 20 years earlier, a dummy indicating whether the migrant's country of origin allows its citizens to hold dual citizenship. The inclusion of origin-country fixed effects in the estimation would therefore make impossible the use of these variables as instruments.

<sup>11</sup> We resort to migration stocks of the year 1970 from the World Bank database to construct the instrumental variable for the stock of migrants in year 1980.

portability of social security entitlements for migrants residing in the partner country. The total number of bilateral social security agreements has significantly increased worldwide: in our whole database, the total number of bilateral social security agreements has grown from 369 in 1980 (counting only one agreement by pair of countries) to 710 in 2010. In 1980, 36 of total bilateral social security agreements signed worldwide included at least an African country. In 2010, 275 of them have been concluded with an African country (whose 111 have been signed between two African countries). The access of migrants to social protection in the host country and the portability of social security entitlements provided by these agreements may promote bilateral migratory flows and influence the migrants' willingness to return home (thereby affecting the stock of migrants).

Third, Borjas (1999) showed that the importance of welfare benefits in the destination country significantly influenced location decisions made by migrants. Because of the weakness of data on public expenditures in Africa, we used as a third instrument the difference in life expectancy between country  $i$  and country  $j$ ,  $LifeDiff_{ij}$ , considering that it can approximate the “welfare magnet effect” evidenced by Borjas (1999).<sup>12</sup>

Another econometric difficulty relates to the treatment of zero trade flows which are undefined when converted into logarithms. Given the large prevalence of such observations in our data set, we use the Poisson estimator to take into account the information provided by the zero trade flows. The Poisson Pseudo Maximum Likelihood estimator was identified by Santos Silva and Tenreyro (2006) as an efficient way to deal with the zero trade flows in gravity models. Results of Poisson estimates are presented as robustness checks.

### 3.3. Variables and data

The data on migrant populations, our variable of interest, have been obtained from the newly released global bilateral migration data set of the World Bank. This database is described in Özden et al. (2011) and is the most comprehensive database on bilateral migration available at present. In this database, the World Bank relies on the foreign-born condition to define an international migrant. Bilateral exports data were drawn from the Direction of Trade Statistics (DOTS) of the International Monetary Fund.

As control variables we include traditional variables of distance and cultural proximity coming from the CEPII distance database. In addition, we add a dummy equal to one if there

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<sup>12</sup> Several studies suggest however that this welfare magnet effect might not be the principal determinant of immigrants' location choices (see for instance Zavodny, 1999 or Kaushal, 2005)

is a trade agreement between the two countries (a bilateral agreement or a belonging to a common regional trade agreement). The variable comes from the CEPII Gravity data set that we have updated until the year 2010. Data on the existence of a bilateral social security agreement has been drawn from *Natlex*, the database of national labor, social security and related human rights legislation published by the ILO's International Labor Standards Department. Finally, data on life expectancy difference between countries has been built from the World Development Indicators (2012). Appendix B presents the definition of variables and their source, and descriptive statistics are summarized in Appendix C. Our sample includes 195 countries, 52 of which are in Africa, and as many trading partners over the years 1980, 1990, 2000 and 2010.

## 4. RESULTS

### 4.1. World versus Africa: Migrants as a substitute for weak institutions

We begin our analysis by estimating equation (1) for the entire world. To assess the distinctive effect of African migrants, we add an interaction term indicating whether migrants originated from the African continent or not ( $Migrants_{ij} * Africa_i$ ). If the trade creation effect is more important for African countries, we expect the coefficient associated with the interaction term  $Migrants_{ij} * Africa_i$  to be positive and statistically significant. The corresponding results are presented in Table 1.

The first column suggests, with the OLS estimator, a mean positive and statistically significant effect of the diaspora from country  $i$  established in country  $j$  ( $Migrants_{ij}$ ) on exports from  $i$  to  $j$ , all over the world. This effect appears even larger in the case of migrants originating from Africa since the coefficient of the interaction term for migrants coming from Africa is significantly positive.

Furthermore, all the control variables exhibit the expected sign. The level of GDP of both the source and the origin markets are positively linked with exports. A large distance between country-pairs is associated with a significantly lower value of trade. The contiguity between countries, the share of a common language, the existence of former colonial ties and the existence of free trade agreements are all positively related to trade.

**Table 1: Impact of Diaspora on Exports**

| VARIABLES  | (1)                        | (2)                        | (3)                           | (4)                           |
|--|----------------------------|----------------------------|-------------------------------|-------------------------------|
|  | Ln(Exports)                | Ln(Exports)                | Ln(Exports)                   | Ln(Exports)                   |
|  | OLS                        | IV-OLS                     | OLS                           | IV-OLS                        |
| <b>Migrants_ij (log)</b>                             | <b>0.155***</b><br>(21.65) | <b>0.0513*</b><br>(1.692)  | <b>0.214***</b><br>(15.05)    | <b>0.455***</b><br>(5.725)    |
| <b>Migrants_ij (log)*Africa_i</b>                    | <b>0.0244*</b><br>(1.953)  | <b>0.125***</b><br>(4.904) |                               |                               |
| <b>Migrants_ij (log)*Institutions</b>                |                            |                            | <b>-0.0138***</b><br>(-4.641) | <b>-0.0506***</b><br>(-7.951) |
| Institutions   |                            |                            | 0.126***<br>(4.872)           | 0.321***<br>(8.281)           |
| GDP_i (log)  | 0.913***<br>(23.94)        | 0.927***<br>(24.41)        | 0.949***<br>(18.37)           | 0.919***<br>(17.20)           |
| GDP_j (log)  | 0.483***<br>(13.99)        | 0.522***<br>(14.55)        | 0.581***<br>(12.12)           | 0.587***<br>(11.72)           |
| FTA  | 0.239***<br>(5.794)        | 0.247***<br>(5.871)        | 0.200***<br>(4.541)           | 0.214***<br>(4.500)           |
| Distance (log)                                       | -1.201***<br>(-46.67)      | -1.342***<br>(-27.09)      | -1.245***<br>(-44.04)         | -1.104***<br>(-9.216)         |
| Contiguity   | 0.340***<br>(4.144)        | 0.415***<br>(4.469)        | 0.354***<br>(4.009)           | 0.109<br>(0.613)              |
| Common colony  | 0.543***<br>(8.022)        | 0.649***<br>(8.634)        | 0.429***<br>(5.806)           | 0.328***<br>(2.753)           |
| Colony 1945  | 1.212***<br>(11.41)        | 1.377***<br>(11.32)        | 0.978***<br>(8.379)           | 0.716***<br>(3.295)           |
| Common language                                      | 0.321***<br>(7.179)        | 0.400***<br>(7.388)        | 0.388***<br>(8.074)           | 0.274***<br>(2.812)           |
| Constant   | -20.23***<br>(-29.33)      | -20.74***<br>(-29.81)      | -21.00***<br>(-24.81)         | -16.53***<br>(-25.06)         |
| MR terms   | yes                        | yes                        | yes                           | yes                           |
| Year FE  | yes                        | yes                        | yes                           | yes                           |
| Importer and Exporter FE                             | yes                        | yes                        | yes                           | yes                           |
| Sargan (p-val.)                                      |                            | 0.174                      |                               | 0.277                         |
| Underidentification test<br>(Kleibergen-Paap p-val.) |                            | 0.000                      |                               | 0.000                         |
| Observations   | 31,207                     | 31,207                     | 23,279                        | 23,279                        |
| R-squared  | 0.748                      | 0.745                      | 0.766                         | 0.761                         |

Notes: Robust t-statistics in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. Observations are clustered by country-pair. In column 2, we instrument both the endogenous variable *Migrants\_ij* and the interactive variable *Migrants\_ij*\**Africa\_i* with our instruments and the interactive terms of each instrument with *Africa\_i*. In column 4, we resort to the same technique.

In column 2, estimation results with the instrumental variable technique (IV-OLS) are presented. The statistical tests confirm the validity of our instruments. The underidentification test of Kleibergen–Paap confirms that our instruments are strongly correlated with the endogenous variable, namely *Migrants\_ij* and *Migrants\_ij*\**Africa\_i*. Moreover, we do not reject the null hypothesis of the Sargan over-identification test which means that our

instruments are valid. The coefficients on our variables of interest remain positive and significant, confirming that migrants have a pro-exports effect, which is especially large in the case of African exports. This result might be related to the fact that African products suffer from especially large trade barriers that can be overcome by migrant networks, namely relatively weak legal institutions and limited or inadequate information about international trading opportunities.

Given the importance of good institutions in promoting trade (Anderson and Marcouiller, 2002; Berkowitz et al., 2006) and the low quality of institutions in Africa, we expect the potential role of migrants to act as a substitute for good institutions, emphasized by Greif (1993) and Rauch (2001), to be particularly relevant for Africa. Greif (1993) and Rauch (2001) suggested that migrant networks can help alleviate contract enforcement issues, since the use of networks can reduce opportunistic behavior. Migrant networks, by building trust or acting as its substitute, can thus especially favor exports in countries with weak legal institutions.

To test this hypothesis, we include in the estimation an interaction term between migrants and the quality of institutions in countries of origin. One of the main impediments to trade might be the existence of a weak mechanism of arbitration in exporting countries to settle disputes between traders. Therefore, we rely on the law and order index from the International Country Risk Guide (ICRG) as a measure of institutional quality, which assesses the strength and impartiality of the legal system and the popular observance of the law.

The results are presented in columns 3 and 4 of Table 1. Column 3 exhibits the results from the OLS estimator, which suggest a mean positive and statistically significant effect of the diaspora from country  $i$  established in country  $j$  ( $Migrants_{ij}$ ) on exports from  $i$  to  $j$  all over the world. The coefficient associated with the interaction term highlights that the positive effect of the diaspora on trade decreases in conjunction with the quality of institutions of the country of origin ( $i$ ). It suggests that the pro-trade effect of migrants is particularly strong in fostering exports for countries with a weak institutional quality, revealing a substitution relationship between the diaspora and institutional quality. This result is confirmed in column 4, after controlling for the potential endogeneity bias with the instrumental variables. Interestingly, we find for all estimators a threshold value for the institutional quality beyond which the diaspora stops fostering trade that exceeds the maximum of the law and order index in our sample, suggesting that migrants have a pro-trade effect, whatever the quality of institutions.

Given the relatively low quality of institutions in Africa, the particularly large pro-trade effect of African migrants can thus be partly explained by the role of migrants to act as a substitute for good institutions.<sup>13</sup> The finding that migrants stimulate exports and that their pro-export effect grows in proportion to the weakness of institutions in exporting countries highlights the contract enforcement channel through which the African diaspora is promoting African exports.

#### 4.2. The pro-exports effect of African migrants

We turn now to the sample of the 52 African countries and their 195 commercial partners in the world to investigate further the migration-trade relationship for both all exported goods and differentiated goods only. The results of the estimation of equation (1) on this sample are presented in Table 2. From columns 1 and 2, with the OLS and IV-OLS estimators, we see that there is a positive and significant relationship between African migrants and total African exports.

According to column 2, a one percent increase in the population of African migrants living all over the world raises the exports of African countries by a coefficient of 0.178 percent. Given that the mean value of bilateral African migration in our sample is 16,770.4 migrants in 2010 and the mean value of African exports is 194.97 million dollars, our result would suggest that one additional migrant creates about 2,100 dollars a year in additional exports for his country of origin.<sup>14</sup> This order of magnitude is comparable to the results found by Felbermayr and Jung (2009), who provide evidence that one additional migrant would create US\$ 2,700 in additional exports for his home country.

We turn next to examine the size of the pro-export effect of African migrants on differentiated goods. As detailed in Section 2, a large share of African exports is constituted of homogeneous goods. The export of differentiated products may face higher information costs than homogeneous ones, which are traded on organized exchanges. Their quality may be difficult to assess or their sheer existence may not be well known. The role played by the diaspora would thus be more critical for non-homogeneous goods and the pro-trade effect should be more prominent (Rauch and Trindade 2002).

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<sup>13</sup> According to descriptive statistics, the average level of institutional quality in African countries is substantially lower than the world average. On a scale from 0 to 6, the world average of the law and order index from the ICRG database is 3.72, whereas the average value for African countries is only 2.8.

<sup>14</sup>  $0.178 \times (1/16770.4) \times 194965700 \approx \text{US\$}2100$ .



**Table 2: Impact of African Diaspora on African Exports**

| VARIABLES  | <i>All goods</i>                   |                                  | <i>Differentiated Goods</i>       |                                   |
|--|------------------------------------|----------------------------------|-----------------------------------|-----------------------------------|
|  | OLS                                | IV-OLS                           | OLS                               | IV-OLS                            |
|  | (1)                                | (2)                              | (1)                               | (3)                               |
|  | Ln(Exports)                        | Ln(Exports)                      | Ln(Exports)                       | Ln(Exports)                       |
| <b>Migrants_ij (log)</b>                             | <b>0.0993***</b><br><b>(5.184)</b> | <b>0.178**</b><br><b>(2.344)</b> | <b>0.114***</b><br><b>(6.852)</b> | <b>0.202***</b><br><b>(3.187)</b> |
| GDP_i (log)  | 0.927***<br>(9.241)                | 0.932***<br>(9.403)              | 0.787***<br>(7.352)               | 0.808***<br>(7.661)               |
| GDP_j (log)  | 0.0776<br>(0.708)                  | 0.0247<br>(0.208)                | 0.223**<br>(2.054)                | 0.146<br>(1.200)                  |
| FTA  | 0.386***<br>(3.532)                | 0.338***<br>(2.909)              | -0.0490<br>(-0.432)               | -0.121<br>(-0.992)                |
| Distance (log)                                       | -1.327***<br>(-14.35)              | -1.175***<br>(-7.096)            | -1.463***<br>(-17.75)             | -1.301***<br>(-9.234)             |
| Contiguity   | 1.148***<br>(5.905)                | 0.966***<br>(3.889)              | 0.881***<br>(4.906)               | 0.653***<br>(2.729)               |
| Common colony  | 0.252*<br>(1.792)                  | 0.243*<br>(1.750)                | 0.633***<br>(5.141)               | 0.654***<br>(5.339)               |
| Colony 1945  | 1.203***<br>(5.044)                | 0.990***<br>(3.383)              | 0.988***<br>(4.599)               | 0.765***<br>(2.844)               |
| Common language                                      | 0.517***<br>(4.214)                | 0.422***<br>(2.752)              | 0.478***<br>(4.450)               | 0.368***<br>(2.774)               |
| Constant   | -11.96***<br>(-11.15)              | -12.51***<br>(-11.73)            | 2.597***<br>(3.176)               | -4.614***<br>(-4.655)             |
| MR terms   | Yes                                | Yes                              | Yes                               | Yes                               |
| Year FE  | yes                                | yes                              | yes                               | yes                               |
| Country FE   | yes                                | yes                              | yes                               | yes                               |
| Sargan (p.-val.)                                     |                                    | 0.491                            |                                   | 0.433                             |
| Underidentification test<br>(Kleibergen-Paap p-val.) |                                    | 0.000                            |                                   | 0.000                             |
| Observations   | 6,151                              | 6,151                            | 5,601                             | 5,601                             |
| R-squared  | 0.583                              | 0.581                            | 0.617                             | 0.615                             |

Notes: Robust t-statistics in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. Observations are clustered by country-pair.

Rauch (1999) established a classification of internationally traded goods in three groups: those traded on organized exchanges, those not traded on organized exchanges but possessing reference prices, and all the others. For disaggregated values of exports, we rely on BACI, the CEPII international trade database at the product level, constructed by Gaulier and Zignago (2010). By aggregating exports according to Rauch's classification, we obtain for each country the value of its exports of differentiated products (those not traded on organized exchanges) to each of its commercial partners for the years 1980, 1990 and 2000.<sup>15</sup>

<sup>15</sup> In this section we cannot refer to the year 2010, because the version of BACI that we use does not contain trade flows for that year.

Columns 3 and 4 present the results. We see that the pro-exports effect of African migrants is particularly important in the case of differentiated goods. This result illustrates that migrant networks not only play an important role as a substitute for institutions, but also in bridging information gaps between trading countries.

#### 4.3. African migrants and intra-African trade

Migrants seem to foster exports from their country of origin both by helping to enforce contracts within a weak institutional environment, and by improving information on trading opportunities and on products. National borders in Africa have seldom been drawn, however, to reflect ethnic differences and very often one observes the same ethnic group living on both sides of a border. Under these conditions, migration to join one's ethnic group in a neighboring country may not contribute as much in fostering exports. Hence, in this section, we will analyze whether the pro-trade effect of migration is enhanced when migrants settle in a country whose ethnic groups are different from their own or when they settle in a more distant country.

Focusing on trade between Niger and Nigeria, Aker et al. (2010) found that common ethnicity across the Niger-Nigeria border promote trade flows between the two countries (through a reduction of the border effect on price dispersion). Belonging to the same ethnic group can promote trade through cultural similarities (Guiso et al. 2009) and trusting relationships (Greif 1993). Since fixed trade costs are higher in culturally distant countries, migrants should produce a larger effect on exports in this case (Peri and Requena-Silvente, 2010). Migrants should thus especially favor trade in countries which are ethnically different because of lower cultural similarity and less established trusting relationships.

To empirically examine whether the diaspora-trade relationship depends on ethnical proximity between the trading partners, we introduce in equation (1) an interaction term between migrants and differences in ethnicity among country pairs. To measure ethnicity differences for each country pair, we use data on ethnic families drawn from Murdock (1959), who distinguishes fifteen distinct ethno-linguistic families in Africa. In some countries, only one large ethnic family is present, whereas several of them are present in other countries. In addition, we use Fearon's (2003) data on the proportion of the population belonging to each ethnic group. Using information from the CIA's World Factbook, the Encyclopedia Britannica, the Library of Congress Country Study and from national sources, Fearon (2003) proposes a list of 822 ethnic groups in 160 countries that represent at least one percent of the country population in the early 1990s. We aggregate these ethnic groups into the fifteen large

ethnic families proposed by Murdock (1959) to obtain data on the share of the population in each country belonging to each of the fifteen ethnic families. Our measure of ethnic differences corresponds thus to the average share of population belonging to ethnic families that are different within each country pair, as follows:

$$EthnicDiff_{ij} = \frac{1}{2} \left( \sum_e^m S_{ei} + \sum_f^n S_{fj} \right)$$

where  $ij$  represents a country pair,  $e$  (respectively  $f$ ) is an ethnic family that is present only in country  $i$  (respectively  $j$ ) and their total number is  $m$  (respectively  $n$ ).  $S_{ei}$  (respectively  $S_{fj}$ ) is the share of the population belonging to ethnic family  $e$  (respectively  $f$ ) in the population of country  $i$  (respectively  $j$ ).

The results are presented in Table 3, both with the OLS and IV-OLS estimator (columns 1 and 2). According to the statistical tests reported in the table, we cannot reject the validity of our instruments. In column 2, the estimated coefficient on the interactive term between migrants and ethnic differences is positive and significant. This result suggests that the wider the ethnic differences between the migrants' country of origin and their country of destination, the greater the positive effect of migrants on exports from their country of origin to their country of destination. Interestingly, the coefficient of *Migrants* is not statistically significant, meaning that there is no pro-export effect of migrants when the variable *EthnicDifference* is equal to zero (which is the case for only 2 percent of the country pairs in our sample). This result would suggest that ethnicity ties are far more important in fostering exports than a common nationality, at least in the context of African countries.

Given that informational barriers and search costs are higher the wider the geographic distance between two countries, we will test the hypothesis of whether the pro-trade effect of migrants is greater when they settle in more distant countries. To this end, we estimate the equation (1), augmented by an interaction term between migrants and distance on the same sub-sample of intra-African exports. Results are presented in Table 3 in columns 3 and 4. We first note both that the standard variables used in gravity-model estimation exhibit the expected signs and the various statistical tests support the validity of our instruments in the IV-OLS estimation.

**Table 3- Impact of the African Diaspora on intra-African exports**

| VARIABLES  | OLS                      | IV-OLS                     | OLS                        | IV-OLS                       |
|--|--------------------------|----------------------------|----------------------------|------------------------------|
|  | (1)<br>Ln(Exports)       | (2)<br>Ln(Exports)         | (3)<br>Ln(Exports)         | (4)<br>Ln(Exports)           |
| <b>Migrants_ij (log)</b>                             | <b>0.0267</b><br>(0.579) | <b>-0.0111</b><br>(-0.104) | <b>-0.373*</b><br>(-1.725) | <b>-1.155***</b><br>(-2.867) |
| <b>Migrants_ij*Ethnic Diff</b>                       | <b>0.0673</b><br>(1.170) | <b>0.230***</b><br>(2.857) |                            |                              |
| <b>Migrants_ij*Distance</b>                          |                          |                            | <b>0.0579**</b><br>(2.067) | <b>0.194***</b><br>(3.656)   |
| Ethnic Difference                                    | -0.898**<br>(-2.358)     | -1.736***<br>(-3.684)      |                            |                              |
| GDP_i (log)  | 0.674***<br>(4.005)      | 0.661***<br>(3.540)        | 0.661***<br>(3.990)        | 0.621***<br>(3.676)          |
| GDP_j (log)  | 0.261<br>(1.408)         | 0.219<br>(1.145)           | 0.251<br>(1.370)           | 0.109<br>(0.588)             |
| FTA  | 0.328**<br>(2.292)       | 0.280*<br>(1.866)          | 0.289**<br>(2.025)         | 0.0819<br>(0.534)            |
| Distance (log)                                       | -1.654***<br>(-9.839)    | -1.571***<br>(-6.486)      | -2.139***<br>(-9.668)      | -2.375***<br>(-6.545)        |
| Common colony  | 0.865***<br>(3.970)      | 0.438**<br>(2.541)         | 0.320<br>(1.580)           | 0.200<br>(0.967)             |
| Common language                                      | 0.477**<br>(2.244)       | 0.525***<br>(3.091)        | 1.034***<br>(4.695)        | 0.383*<br>(1.820)            |
| Contiguity   | 0.571***<br>(2.829)      | 0.964***<br>(3.917)        | 0.690***<br>(3.568)        | 1.009***<br>(3.688)          |
| Constant   | -12.33***<br>(-6.711)    | -9.132***<br>(-4.941)      | -13.45***<br>(-7.514)      | -13.81***<br>(-7.350)        |
| MR terms   | yes                      | yes                        | yes                        | yes                          |
| Year FE  | yes                      | yes                        | yes                        | yes                          |
| Country FE   | yes                      | yes                        | yes                        | yes                          |
| Sargan (p-val.)                                      |                          | 0.798                      |                            | 0.116                        |
| Underidentification test<br>(Kleibergen-Paap p-val.) |                          | 0.000                      |                            | 0.000                        |
| Observations   | 1,881                    | 1,881                      | 1,899                      | 1,899                        |
| R-squared  | 0.605                    | 0.601                      | 0.600                      | 0.573                        |

Notes: Robust t-statistics in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. Observations are clustered by country-pair.

We instrument both the endogenous variable *Migrants\_ij* and the interactive variable *Migrants\_ij\*Ethnic Difference* with our instruments and the interactive terms of each instrument with *Ethnic Difference*.

Turning to the variables of interest, we see that the coefficients on *Migrants* are negative and significant but that the interaction term between *Migrants* and the log of distance is positive and significant. Given that the net effect of migration on exports is the sum of these two coefficients, the result suggests a non-linear effect of migrants on exports, turning positive for values of the log of distance larger than 5.95. Only 13 pairs of countries (representing about 1% of country-pairs in our sample) have a distance lower than this threshold. Above this value, the positive effect of African migration on intra-African exports grows larger the more distant are the countries of origin and of destination. Migrants have thus a positive effect on

intra-African trade which is especially large when they settle in countries far away from their countries of origin.

#### 4.4. Robustness checks

We have performed several robustness checks (presented in Table 4). We have first introduced variations in the set of instruments, using only two of them, namely *Network* and *BSSA* (column 1). We have then corrected for multilateral trade resistance by including time-varying country-fixed effects, instead of using the Baier and Bergstrand (2009) method, in the IV-OLS estimation (column 2). Finally, given the large prevalence of zero trade flows in our data set, which are undefined when converted into logarithms, we have used the Poisson Pseudo Maximum Likelihood estimator in its IV form to take into account the information provided by the zero trade flows (column 3). The estimations show that our results are robust.

**Table 4 - Impact of African Diaspora on African Exports – Robustness Tests (different sets of instruments and inclusion of time-varying-country fixed effects)**

| VARIABLES   | IV-OLS                           | IV-OLS                            | IV-PPML                           |
|---|----------------------------------|-----------------------------------|-----------------------------------|
|   | (1)<br>Ln(Exports)               | (2)<br>Ln(Exports)                | (3)<br>Exports                    |
| <b>Migrants_ij (log)</b>                          | <b>0.175**</b><br><b>(2.291)</b> | <b>0.137**</b><br><b>(0.0661)</b> | <b>0.182**</b><br><b>(0.0753)</b> |
| GDP_i (log)                                       | 0.929***<br>(9.459)              |                                   | 0.867***<br>(0.0585)              |
| GDP_j (log)                                       | 0.0152<br>(0.129)                |                                   | 0.597***<br>(0.119)               |
| FTA   | 0.325***<br>(2.815)              | 0.331**<br>(0.135)                | 0.591**<br>(0.233)                |
| Distance (log)                                    | -1.178***<br>(-7.099)            | -1.289***<br>(0.151)              | -0.495**<br>(0.219)               |
| Contiguity  | 0.980***<br>(3.929)              | 0.823***<br>(0.224)               | -1.037***<br>(0.372)              |
| Common colony                                     | 0.235*<br>(1.698)                | 0.349***<br>(0.134)               | 0.294<br>(0.453)                  |
| Colony 1945                                       | 0.981***<br>(3.338)              | 0.963***<br>(0.287)               | 1.094***<br>(0.375)               |
| Common language                                   | 0.428***<br>(2.807)              | 0.431***<br>(0.139)               | -0.742***<br>(0.151)              |
| Constant  | -12.40***<br>(-11.74)            | 8.260***<br>(1.492)               |                                   |
| MR terms  | yes                              | no                                | yes                               |
| Year FE   | yes                              | yes                               | yes                               |
| Country FE  | yes                              | yes                               | no                                |
| Country x year FE                                 | no                               | yes                               | no                                |
| Sargan (p-val.)                                   | 0.614                            | 0.231                             |                                   |
| Underidentification test (Kleibergen-Paap p-val.) | 0.000                            | 0.000                             |                                   |
| Observations                                      | 6,204                            | 6,596                             | 10,437                            |
| R-squared   | 0.580                            | 0.630                             | 0.113                             |

Notes: Robust t-statistics in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. Observations are clustered by country-pair.

## CONCLUSION

This paper aimed at assessing whether the African diaspora reduced transaction costs associated with trade and thereby could serve to complement trade. By providing a better treatment of endogeneity, drawing on a new database, and focusing on Africa where the informal barriers to trade could be more pronounced, the paper hoped to reach more robust results and shed greater light on the transmission channels between migration and trade.

Our results suggest that migrant networks have a positive effect on bilateral exports, an effect that turns out to be larger in the case of African exporters. This large pro-export effect of African migrants could be partly explained by the existence of weaker institutions in Africa for which migrants' networks provide a substitute. The effect appears also particularly important for the exports of differentiated products, suggesting that migrants also play an important role in reducing information costs. Focusing on intra-African trade, the pro-trade effect of migrants was found to be particularly strong for exports to countries which are ethnically and geographically distant, confirming the important role played by migrants in both information cost reduction and mitigation of cultural differences and distrust.

These results suggest that diasporas, dispersed all over the world, can play a crucial informational role to ease informal trade barriers by providing information on market risks and opportunities. This trade facilitation effect might be especially important for African countries whose products might be unknown and where institutions are weak. This paper contributes therefore in highlighting the positive contribution that diasporas can make in the economic development of their countries of origin. Too often, the negative aspects of their decision to migrate are put forward, their skills, knowledge, and entrepreneurial capabilities being lost to their home countries.

Some African countries have begun efforts to tap their diasporas to provide market information about the countries in which they now live. Activities include the establishment of diaspora trade councils and participation in trade missions and business networks. The Ethiopian, Kenyan, and Ugandan embassies in London and Washington, for instance, support business and trade forums to attract diaspora investors and to match suppliers with exporters. Most often, however, African embassies have little information on even the number of their diaspora members. This paper shows that migrants can play a critical role in opening export markets for products from their home countries and their support should be more actively sought. A whole policy agenda would need to be developed to reach out more effectively to the diasporas and tap to a greater extent into these resources.

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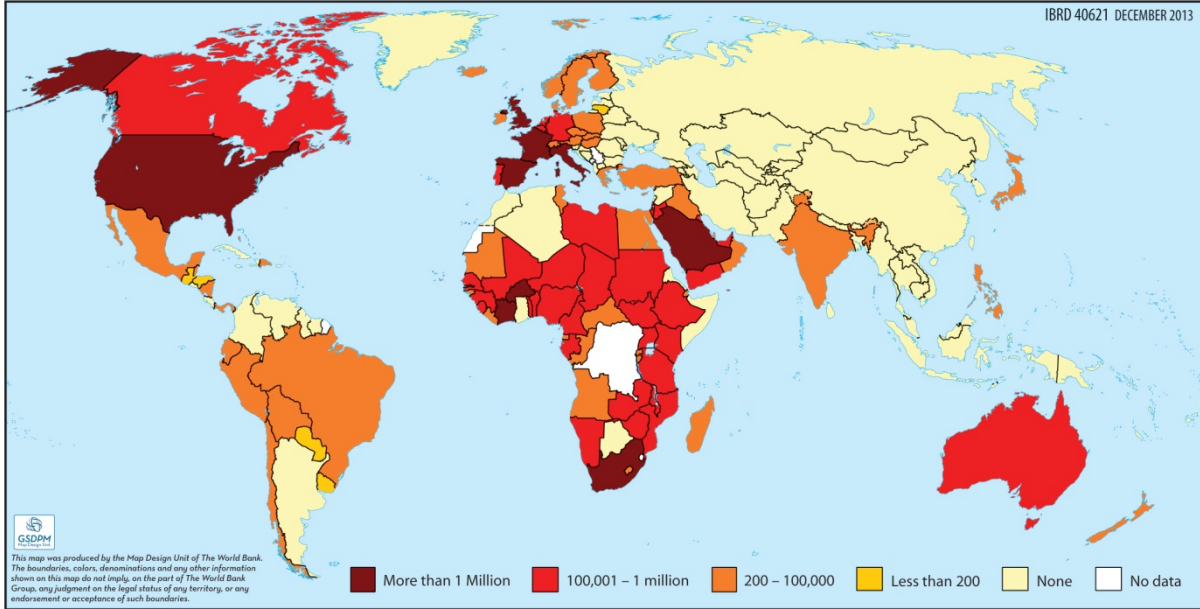


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## APPENDIX A: FEATURES OF AFRICAN MIGRATION AND AFRICAN TRADE

Figure A.1. African migrants in the world in 2010



APPENDIX A -CONTINUED: FEATURES OF AFRICAN MIGRATION AND AFRICAN TRADE

**Table A.1. Destination of African emigrants as a percentage of all African emigrants (2010)**

| Developing countries |                           |                         |                                 |             |            | High Income countries |
|----------------------|---------------------------|-------------------------|---------------------------------|-------------|------------|-----------------------|
| Africa               | East Asia and the Pacific | Europe and Central Asia | Latin America and the Caribbean | Middle East | South Asia | All regions           |
| 50.7                 | 0                         | 0                       | 0.1                             | 6.3         | 0          | 42.9                  |

**Table A.2. Destination of African exports by region as a percentage of total African exports**

|                      | Total<br><i>in millions of USD</i> | Africa      | East Asia and the Pacific | Europe and Central Asia | Latin America and the Caribbean | Middle East | South Asia | High Income countries | Total      |
|----------------------|------------------------------------|-------------|---------------------------|-------------------------|---------------------------------|-------------|------------|-----------------------|------------|
| <b>1980</b>          |                                    | (in %)      |                           |                         |                                 |             |            |                       |            |
| <b>Total exports</b> | <b>58 684</b>                      | <b>3.6</b>  | <b>0.7</b>                | <b>2.8</b>              | <b>2.03</b>                     | <b>0.3</b>  | <b>0.5</b> | <b>90</b>             | <b>100</b> |
| differentiated goods | 4 737                              | 5.6         | 3                         | 0.8                     | 1.1                             | 0.5         | 3.3        | 85.8                  | 100        |
| <b>1990</b>          |                                    |             |                           |                         |                                 |             |            |                       |            |
| <b>Total exports</b> | <b>66 902</b>                      | <b>8</b>    | <b>1.1</b>                | <b>2.2</b>              | <b>1.2</b>                      | <b>0.7</b>  | <b>1.1</b> | <b>85.7</b>           | <b>100</b> |
| differentiated goods | 9 054                              | 6.7         | 3.1                       | 1.5                     | 0.8                             | 1.4         | 5.7        | 80.7                  | 100        |
| <b>2000</b>          |                                    |             |                           |                         |                                 |             |            |                       |            |
| <b>Total exports</b> | <b>136 181</b>                     | <b>9.1</b>  | <b>4.3</b>                | <b>2.2</b>              | <b>3.3</b>                      | <b>0.6</b>  | <b>4.3</b> | <b>76.2</b>           | <b>100</b> |
| differentiated goods | 17 300                             | 9.5         | 3                         | 0.7                     | 0.9                             | 1.1         | 6.4        | 78.4                  | 100        |
| <b>2010</b>          |                                    |             |                           |                         |                                 |             |            |                       |            |
| <b>Total exports</b> | <b>448 903</b>                     | <b>10.9</b> | <b>13.9</b>               | <b>2.2</b>              | <b>3.4</b>                      | <b>1</b>    | <b>6.6</b> | <b>62</b>             | <b>100</b> |
| differentiated goods | n.a.                               | n.a.        | n.a.                      | n.a.                    | n.a.                            | n.a.        | n.a.       | n.a.                  | n.a.       |

## APPENDIX B: VARIABLE DEFINITION AND SOURCES

| Variable                      | Definition  | Source  |
|-------------------------------|---|---|
| <b>Dependant variables</b>    |   |   |
| $Exports_{ij}$                | Total value of exports of the country $i$ to the country $j$ , millions of US\$   | DOTS (IMF)  |
| $DiffExports_{ij}$            | Variable constructed based on Rauch (1999) classification of goods with exports flows disaggregated by product in thousands of US\$     | BACI (CEPII)<br>Gaulier and Zignago (2010)<br>Available at<br><a href="http://www.cepii.fr/anglaisgraph/bdd/baci.htm">http://www.cepii.fr/anglaisgraph/bdd/baci.htm</a>   |
| <b>Control variables</b>      |   |   |
| $Migrants_{ij}$               | Stock of migrants from country $i$ living in country $j$  | Global bilateral migration database of the World Bank, available at<br><a href="http://data.worldbank.org/data-catalog/global-bilateral-migration-database">http://data.worldbank.org/data-catalog/global-bilateral-migration-database</a> (for 1980 to 2000) and at<br><a href="http://www.worldbank.org/prospects/migrationandremittances">www.worldbank.org/prospects/migrationandremittances</a> (for 2010) |
| $GDPC_i$                      | Per capita gross domestic product of country $i$ , current million US\$   | World Development Indicators (2012)   |
| $GDPC_j$                      | Per capita gross domestic product of country $j$ , current million US\$   |   |
| $Distance_{ij}$               | Geographical distance between the largest cities of $i$ and $j$ weighted by the proportion of the city's overall country population, km | CEPII distance database available at<br><a href="http://www.cepii.fr/anglaisgraph/bdd/distances.htm">http://www.cepii.fr/anglaisgraph/bdd/distances.htm</a>   |
| $Contiguity_{ij}$             | 1 for countries sharing a border  |   |
| $Common\ colony_{ij}$         | 1 for pairs in colonial relationship post 1945  |   |
| $Colony\ 1945_{ij}$           | 1 for common colonizer post 1945  |   |
| $Language_{ij}$               | 1 for countries sharing a common official language  | Dataset available at<br><a href="http://www.worldtradelaw.net/fta/ftadatabase/ftas.asp">http://www.worldtradelaw.net/fta/ftadatabase/ftas.asp</a>   |
| $FTA_{ij}$                    | 1 for countries having a regional or bilateral trading agreement in force   |   |
| $Law\ and\ order_j$           | An index of law and order ranging from 0 to 6, where a higher number indicates a better system of law and order.                        | ICRG database available at<br><a href="http://www.prsgroup.com/ICRG.aspx">http://www.prsgroup.com/ICRG.aspx</a>   |
| <b>Instrumental variables</b> |   |   |
| $BSSA_{ij}$                   | Dummy variable equal to 1 if a social security agreement has been signed between country $i$ and country $j$                            | NATLEX's database (ILO) available at<br><a href="http://www.ilo.org/dyn/natlex/natlex browse.home">http://www.ilo.org/dyn/natlex/natlex_browse.home</a> and author's computation  |
| $Network_{ij}$                | Share of migrants from $i$ living in country $j$ 10 years ago   | Global bilateral migration database of the World Bank and author's calculation  |
| $LifeExp_{ij}$                | Difference in life expectancy between country $i$ and country $j$   | World Development Indicators (2012) and author's calculation  |

**APPENDIX C: DESCRIPTIVE STATISTICS**

| Variable  | Observations | Mean    | Std. Dev. | Min    | Max     |
|---|--------------|---------|-----------|--------|---------|
| <u>Sample of all countries in the world</u>                                       |              |         |           |        |         |
| <i>Exports<sub>ij</sub></i>   | 31207        | 640.847 | 5380.043  | 0      | 289850  |
| <i>Migrants<sub>ij</sub></i> (log)  | 31207        | 5.191   | 3.058     | -0.600 | 16.269  |
| <i>GDPC<sub>i</sub></i> (log)   | 31207        | 8.136   | 1.598     | 4.541  | 11.566  |
| <i>GDPC<sub>j</sub></i> (log)   | 31207        | 8.296   | 1.673     | 4.541  | 11.566  |
| <i>Distance<sub>ij</sub></i> (log)  | 31207        | 8.503   | 0.902     | 4.100  | 9.886   |
| <i>Contiguity<sub>ij</sub></i>  | 31207        | 0.043   | 0.203     | 0      | 1       |
| <i>Common colony<sub>ij</sub></i>   | 31207        | 0.089   | 0.285     | 0      | 1       |
| <i>Colony 1945<sub>ij</sub></i>   | 31207        | 0.020   | 0.142     | 0      | 1       |
| <i>Language<sub>ij</sub></i>  | 31207        | 0.196   | 0.397     | 0      | 1       |
| <i>FTA<sub>ij</sub></i>   | 31207        | 0.140   | 0.347     | 0      | 1       |
| <i>Law and order<sub>j</sub></i>  | 23279        | 3.905   | 1.514     | 0      | 6       |
| <i>BSSA<sub>ij</sub></i>  | 31207        | 0.101   | 0.301     | 0      | 1       |
| <i>LifeDiff<sub>ij</sub></i>  | 31207        | 3.796   | 0.340     | -0.01  | 4.533   |
| <i>Network<sub>ij</sub></i>   | 31207        | 0.016   | 0.072     | 0      | 0.983   |
| <u>Sample of 52 African origin countries and 195 destination countries</u>        |              |         |           |        |         |
| <i>Exports<sub>ij</sub></i> (all goods)   | 6151         | 79.598  | 600.429   | 0.001  | 28506.8 |
| <i>Exports<sub>ij</sub></i> (differentiated goods)                                | 5601         | 16788   | 120532.2  | 0.006  | 5496952 |
| <i>Migrants<sub>ij</sub></i> (log)  | 6151         | 5.163   | 3.055     | -0.463 | 14.169  |
| <i>GDPC<sub>i</sub></i> (log)   | 6151         | 6.496   | 1.017     | 4.541  | 9.903   |
| <i>GDPC<sub>j</sub></i> (log)   | 6151         | 8.358   | 1.825     | 4.541  | 11.566  |
| <i>Distance<sub>ij</sub></i> (log)  | 6151         | 8.346   | 0.847     | 5.088  | 9.869   |
| <i>Contiguity<sub>ij</sub></i>  | 6151         | 0.075   | 0.263     | 0      | 1       |
| <i>Common colony<sub>ij</sub></i>   | 6151         | 0.182   | 0.386     | 0      | 1       |
| <i>Colony 1945<sub>ij</sub></i>   | 6151         | 0.023   | 0.151     | 0      | 1       |
| <i>Language<sub>ij</sub></i>  | 6151         | 0.326   | 0.469     | 0      | 1       |
| <i>FTA<sub>ij</sub></i>   | 6151         | 0.131   | 0.338     | 0      | 1       |
| <i>BSSA<sub>ij</sub></i>  | 6151         | 0.058   | 0.234     | 0      | 1       |
| <i>LifeDiff<sub>ij</sub></i>  | 6151         | 3.425   | 0.456     | -0.009 | 4.340   |
| <i>Network<sub>ij</sub></i>   | 6151         | 0.021   | 0.078     | 0      | 0.901   |
| <u>Sample of 52 African origin countries and 52 African destination countries</u> |              |         |           |        |         |
| <i>Exports<sub>ij</sub></i>   | 1881         | 20.066  | 101.936   | 0      | 2077.96 |
| <i>Migrants<sub>ij</sub></i> (log)  | 1881         | 6.074   | 3.291     | 0      | 14.08   |
| <i>GDPC<sub>i</sub></i> (log)   | 1881         | 6.359   | 0.900     | 4.541  | 9.903   |
| <i>GDPC<sub>j</sub></i> (log)   | 1881         | 6.343   | 0.929     | 4.541  | 9.903   |
| <i>Distance<sub>ij</sub></i> (log)  | 1881         | 7.523   | 0.789     | 5.088  | 8.987   |
| <i>Contiguity<sub>ij</sub></i>  | 1881         | 0.242   | 0.428     | 0      | 1       |
| <i>Common colony<sub>ij</sub></i>   | 1881         | 0.457   | 0.498     | 0      | 1       |
| <i>Language<sub>ij</sub></i>  | 1881         | 0.569   | 0.495     | 0      | 1       |
| <i>FTA<sub>ij</sub></i>   | 1881         | 0.326   | 0.469     | 0      | 1       |
| <i>Ethnic Difference<sub>ij</sub></i>   | 1881         | 0.538   | 0.377     | 0      | 1       |
| <i>BSSA<sub>ij</sub></i>  | 1881         | 0.119   | 0.324     | 0      | 1       |
| <i>LifeDiff<sub>ij</sub></i>  | 1881         | 3.841   | 0.237     | 2.797  | 4.340   |
| <i>Network<sub>ij</sub></i>   | 1881         | 0.045   | 0.109     | 0      | 0.901   |