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DO AFRICAN IMMIGRANTS ENHANCE THEIR HOME NATIONS' TRADE WITH THEIR HOSTS?

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ABSTRACT

Employing data on the immigrant stocks of 43 African home countries who reside in 110 host countries and on trade flows between these countries during the year 2005, we examine whether African immigrants exert positive effects on their home countries' trade with the typical host country. Estimates from Tobit regression models indicate a one percent increase in the number of African immigrants in a given host country increases that country's exports to and imports from the typical home country by 0.132 percent and 0.259 percent, respectively. Further evaluation of these effects from the perspective of each African home country reveals that, in several instances, immigrants do not exert positive and significant influences on trade flows. The considerable variation in the presence of pro-trade influences and the dissimilarity of estimated significant effects suggests that highly divergent immigration and trade structures among African countries may affect whether African immigrants exert pro-trade influences.

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INTRODUCTION

International migration has resulted in a considerable loss of human capital for many African nations. Marfouk (2006) estimates that, due to migration, 10 of the 53 African nations have lost at least 35 percent of their tertiary level-educated labor force. In many countries – specifically, Cape Verde (68%), Gambia (63%), Seychelles (56%), Mauritius (56%) and Sierra Leone (53%) – the loss has been quite severe. Based on this and other information, Akokpari (2006) argues that international migration generally has had adverse effects for African nations. Consequently, it is unsurprising that policymakers in many African countries are concerned with what are often described as potentially catastrophic consequences of increased emigration. Even so, emigration may have positive effects on both aggregate income levels and the growth rates of income for many emigrant source countries. For example, a recent cross-country analysis of the effect of emigration on poverty by Cattaneo (2009) concludes that, *ceteris paribus*, a 10 percent increase in the per capita stock of migrants in OECD nations augments the incomes of the poor in their source countries by an average of one percent. Given that international migrants have also been found to increase the trade and/or foreign direct investment flows between their host and home countries, migrants may confer positive effects on

economic growth and, hence, the economic development of both their host and home nations (Murat and Pistoresi, 2009).

While numerous studies have examined the effects of immigrants on trade, owing to the extensive availability of immigrant stock data for relatively more developed host countries and the intense public interest in the immigration policies of these countries, prior studies have largely focused on the potential effects of immigrants on trade between developed host countries and their immigrants' home countries. Although this emphasis on developed host countries has produced a deeper understanding of the immigrant-trade relationship, the lack of home country-specific data on emigrant stocks has resulted in little attention being given to the implications of the relationship for developing home countries. As Docquier (2007) notes, while the flow of immigrants, particularly those that are highly skilled, from developing home countries to developed host countries is quite large, considerable numbers of people also migrate from one developing country to another. Parsons et al., (2007), for example, reports that as much as one quarter of the world's international migration flow occurs between developing countries. According to Parsons et al., (2007), African countries supply as much as eight percent of the stock of immigrants in Western Europe, and several African countries serve as hosts to millions of immigrants from within the region. Even so, Africa's intra- and inter-regional trade flows are markedly less intensive as compared to flows observed elsewhere. Moreover, little information exists about the influences that immigrants from and within African countries exert on trade between their host and home countries. This paper fills this void by examining whether African immigrants affect their respective home nations' trade with their host nations and, if so, by determining the extent to which the effect varies across the home countries in Africa.

Our study offers several important contributions. First, we extend the related literature by specifically examining the effects of immigrants from African countries on host-home country trade flows. Second, by focusing on the potential impacts of immigrants on trade between various hosts and their African home countries, we enhance our knowledge of the immigrant-trade link as it relates to developing home countries that are less open to international trade as compared to other host/home countries for which the link has been widely examined. Third, by comparing the amount of trade generated by a typical immigrant across our cohort of African home countries, we highlight the role that the heterogeneity of trade and immigration structures among African countries may play in affecting the ability of immigrants to influence host-home country trade flows and, thus, their abilities to contribute to their home nations' economic growth. Finally, our results provide insights that may be useful for the formulation of economic and social policies relating to goods markets and factor markets in developing countries.

The paper proceeds as follows. In section II, we review the related literature. Section III presents our empirical specification, details the data and explanatory variables included in the analysis, and discusses our *a priori* expectations regarding the signs of the respective coefficients. Estimation results are discussed in Section IV, while Section V concludes.

REVIEW OF THE RELATED LITERATURE

Beginning with Gould (1994), who used US data to first analyze the immigrant-trade link, a voluminous literature documents a similar link for many developed/high income host countries and for a few upper-middle income host countries. The literature, which is reviewed thoroughly in Poot and Strutt (2011), White and Tadesse (2011) and White (2010), generally indicates that immigrants increase their host country's imports from their respective home nations due to biases in their tastes and preferences for home country-produced goods. In addition, international trade often involves interactions between parties that reside in countries that differ in their cultures, laws and institutions. These differences may hinder the initiation and completion of trade deals, and, if so, reduce the likelihood that trade takes place and/or the volume of transactions. Essentially, immigrants may increase trade between their home and host nations by narrowing communication gaps and, hence, lowering trade-related search costs. In addition, as immigrants often have connections to social and business networks they may also provide a contract enforcement mechanism that facilitates both the initiation and the completion of trade deals. Supporting this notion, a World Bank (2006) study asserts that by creating well-connected Diasporas, the migration of highly-skilled people, in particular, increases trade flows if immigrants act as intermediaries that expand cooperation and enable the enforcement of contracts.

As noted, pro-trade immigrant influences have been reported for a large number of developed host countries: Some examples include White and Tadesse (2007) for Australia, Head and Ries (1998) for Canada, White (2007b) for Denmark, Bryant et al. (2004) for New Zealand, Blanes (2003) for Spain, and Girma and Yu (2002) for the UK. Based on studies involving upper-middle income host countries, Bacarreza et al. (2006) for Bolivia, Piperakis et al. (2003) for Greece, and Hong and Santhapparaj (2006) for Malaysia also report positive influences of immigrants on the observed host nations' trade with their respective home nations. Examining several other host countries' trade with numerous home countries, including many from Africa, the most recent literature also offers further evidence of the positive influences of immigrants on trade. Some examples are in order as they provide important insights that motivate our study.

Using data for a highly heterogeneous sample of 189 home countries, Bratti et al. (2011) examine the influence of immigrants on trade between their home countries and individual provinces in Italy during the 2003-2009 period. Employing province-level data allows the authors to examine the immigrant-trade link at the lowest level of the host country's geographical and administrative units (both in terms of immigration and international trade). Bratti et al. report that while an increase in the immigrant stock corresponds with substantial increases in the typical province's exports to the immigrants' home countries, an even larger effect is observed on province-level imports from the immigrants' home countries. In addition to the usual explanations in the literature – namely, that immigrants foster bilateral trade due to their superior knowledge of market opportunities in their home countries and as a result of biases in their tastes and preferences for home country produced goods – the authors attribute the pro-trade effects of immigrants, in part, to higher numbers of host country firms being owned by foreign-born entrepreneurs.

While migration has been associated with higher levels of trade, which is often interpreted as evidence for migrants' ability to lower trade-related costs, the literature has largely failed to provide evidence on the roles that migrants may play in lowering firms' trade-related costs and on the mechanisms through which the impact is derived. Hatzigeorgiou and Lodefalk (2011) examine unique employer-employee data for 12,000 Swedish firms for the period 1998-2007 and provide the first in-depth study of the impact of immigrants on firm-level trade. Results obtained from the estimation of a gravity model demonstrate the presence of a significant, positive, and robust impact of immigrants on firm-level trade (imports as well as exports). Further, the authors report that immigrants increase firm-level trade at both the extensive and intensive product margins. The observed robust effects are attributed to the abilities of immigrants to lower firms' trade-related costs through the provision of information and via the buildup of trust channels that reduce frictions and, thus, facilitate trade with their countries of birth.

Mundra (2010) examines the influence of immigrant networks on US trade, particularly through the demand effect, using trade and immigrant stock data for 63 major trading partners and immigrant source countries during the 1991-2000 period. First, employing a standard Heckscher-Ohlin framework to examine immigrants' trade effects when they consume more of the goods that are abundant in their home countries than do the native-born, the author finds the trade effect to be, *a priori*, indeterminate. Second, based on results obtained from estimation of the gravity model, the author reports that while immigrants' income, mostly through a demand effect, has a negative effect on US imports, when immigrants' income is interacted with the size of the immigrant network, measured by the immigrant stock, higher levels of immigrant income correlate with lower immigrant network effects for both US exports (an estimated immigrant stock elasticity of 0.27%) and imports (an elasticity of 0.48%). Finally, using the level of immigrants' income as a proxy variable to capture the extent of immigrant assimilation with the host country population, Mundra indicates that the immigrant network effect weakens as immigrants assimilate.

Based on these empirical findings and on prior theoretical studies that suggest migration triggers a rise in bilateral trade flows through a number of channels, Egger et al. (2011) assesses the functional form of the impact of migration on trade flows in a quasi-experimental setting and provides evidence that suggests the relationship between migration and trade is not log-linear. In particular, the authors report that at low immigrant stock levels the elasticity of trade to migration is quite high but that it declines to zero at about 4,000 immigrants. If immigrant stocks exceed such a level, the results suggest that trade will not increase further. Accordingly, the authors conclude that while the influences of cross-country networks and of other effects related to migration materialize at relatively at low levels of migration, there appears to be satiation as immigrant numbers increase.

Compiling elasticity estimates of immigrants' influences on their host countries' imports from and exports to their home countries from 48 studies published since the 1990s, Genc et al. (2011) conduct a meta-analysis of the distribution of estimated effects. Correcting for heterogeneity and publication bias, they indicate that a 10 percent increase in the number of immigrants may be expected to increase the volume of trade, on average, by about 1.5 percent. However, the impact is lower for trade in homogeneous

goods and, over time, the magnitudes of the elasticity estimates decrease with growing immigrant stocks. They also report that while the typical estimated immigrant effect on imports (that is, the estimated elasticity) is larger than that of exports in about half of the studies considered, the publication bias and heterogeneity-corrected elasticity is slightly larger for exports as compared to imports. Finally, and more importantly, the authors indicate that the magnitudes of the estimates from these studies are often affected by the choice of covariates, the nature of the data (that is, cross-sectional or panel) and the estimation technique. They conclude that elasticity estimates vary between countries in ways that cannot be fully explained by study characteristics, trade restrictions, and immigration policies that may matter for the impact of immigration on trade.

While the noted observations, along with the results from prior studies that date back to the seminal work of Gould (1994), provide important information on the roles that immigrants may play in influencing trade between their host and home countries, because the studies have been undertaken from the perspectives of the host countries the literature potentially suffers from several limitations. First, these studies do not capture all avenues through which immigrants may influence their home countries' trade with countries other than those that serve as the immigrants' host. Second, it is likely that differences exist in the roles that immigrants play as facilitators of host country exports to their home countries and of home country imports from their host countries. These differences may correspond with variation across home countries in terms of the persistence of immigrants' cultural and ethnic ties. Finally, as indicated by Tadesse and White (2011), host country-oriented studies of the immigrant-trade link also fail to account for potential "Dutch disease" effects of immigrants on the export sector of small economies such as those in Africa. Thus, the results from studies that have focused on trade between immigrants' host countries and a given cohort of home countries, while informative, do not allow us to infer whether, for all home countries, immigrants exert positive effects on their respective home country's trade with the typical host country. By examining the immigrant-trade relationship from the perspective of immigrants home countries, in addition to overcoming the limitations of previous studies, we provide a better understanding of the economic effects of immigrants on developing home countries' trade in general and on African countries' trade in particular.

THE EMPIRICAL MODEL, DATA AND VARIABLE CONSTRUCTION

To allow our results to be comparable to those of previous studies, we follow the literature and specify a variant of the gravity model where the volume of bilateral trade (exports or imports: TR_{ij}) between an immigrant's home country (denoted by the subscript i) and their host country (denoted by the subscript j) is presented as an increasing function of the combined economic mass of the home-host country pairs, which is represented by their Gross Domestic Product values (GDP), Y_i and Y_j, respectively, and as a decreasing function of the geodesic distance (GD_{ij}) between them. Equation (1) illustrates the basic model.

$$TR_{ij} = \kappa\left\{\frac{Y_i^{\beta_1} Y_j^{\beta_2}}{GD_{ij}^{\beta_3}}\right\} \quad (1)$$

GDP data are from the World Bank (2008). Trade data are from the International Trade Centre (2008). Geodesic distances between the capital cities of trading partners, used as a proxy for transportation costs, have been calculated by the authors using the great circle method. κ is the constant of proportionality, and β_1, β_2, and β_3 are coefficients to be estimated.

While a straightforward extension of Anderson and van Wincop's (2003) presentation, Equation (1) predicts strictly positive realizations of trade flows between the home countries of African immigrants and their respective host countries. However, for various reasons, including the infeasibility of trade, the lack of imports and/exports during a given year between otherwise potential trading partners (for example, due to changes in trade policy), and the amount of trade taking place being less than a reportable threshold, trade data often contain observations where values are equal to zero. Hence, following Ranjan and Tobias (2005), Eaton and Tamura (1994) and Head and Ries (1998), we modify equation (1) to permit the realization of such zero trade values. The result is provided as equation (2).

$$\tilde{TR}_{ij} = \kappa\left(\frac{Y_i^{\beta_1} Y_j^{\beta_2}}{GD_{ij}^{\beta_3}}\right) - \eta \quad (2)$$

In equation (2), η is a fixed amount of trade that is subtracted from the level predicted by equation (1) so that, when the latent trade values are negative, observed imports and/or exports will be set to zero. Thus, the observed trade flow between an African immigrant's home country i and their host country j can be described as $TR_{ij} = \max\left[\tilde{TR}_{ij}, 0\right]$. Substituting this identity, augmenting equation (2) with variables that represent factors that may facilitate or inhibit bilateral trade flows, taking natural logarithms of the continuous variables on both sides of the resulting equation, and adding an assumed independently and identically distributed error term, ε_{ij}, yields equation (3), our empirical model.[1]

$$\begin{aligned} lnTR_{ij} = {} & \beta_0 + \beta_1 lnIM_{ij} + \beta_2 lnY_i + \beta_3 lnY_j - \beta_4 lnGD_{ij} + \beta_5 lnPOP_i + \beta_6 lnPOP_j \\ & + \beta_7 \Delta lnEXR_{ij} + \beta_8 lnREM_i + \beta_9 lnREM_j + \beta_{10} OPEN_i + \beta_{11} OPEN_{\mathrm{j}} \\ & + \beta_{12} RTA_{ij} + \beta_{13} LLOCK_i + \beta_{14} LLOCK_j + \beta_{15} LANG_{ij} + \beta_{16} ADJT_{ij} + \varepsilon_{ij} \end{aligned} \quad (3)$$

IM_{ij} is the stock of immigrants from home country i residing in host country j (Ratha and Shaw, 2007).[2] The variables POP_i and POP_j represent home and host country population sizes, respectively, and are included in our specification to capture the import demand and/or export supply of the home and host countries. The annual change in the

home-host country exchange rate ($\Delta \ln EXR_{ij}$), computed as $\ln EXR_{ijt} - \ln EXR_{ijt-1}$, captures the effects of changes in the terms of trade (IMF, 2008). Expressed as home country currency units per host country currency unit, an increase in the value of this variable indicates the depreciation of home country j's currency vis-à-vis the host country i's currency and, thus, is expected to correspond with an increase in the home country j's exports to the host country i and a decrease in the home country j's imports from the host country i.

To control for each home country's relative lack of external trading opportunities, we follow Wagner et al. (2002) and include measures of home and host country economic remoteness (REM_i and REM_j), given for country j as $1/\sum_{k=1}^{K}\left[\left(GDP_k / GDP_w\right)/GDST_{jk}\right]$ where GDP_w represents gross global product and k identifies potential trading partners for home country j other than host country i.[3] Lastly, following Head and Ries (1998), we capture each home and host country's general propensity to trade ($OPEN_i$ and $OPEN_j$) by including the sum of each country's total imports and exports divided by its GDP. These variables measure each country's general trade intensity since GDP represents a country's ability to engage in trade (either in terms of income (importing) or output (exporting)). All values, where necessary, have been normalized to 2000 US dollars.

We also include several dummy variables in our empirical model. Capturing the effects of joint membership in major regional trade agreements, we include a dummy variable (RTA_{ij}) which takes the value to one if both the home and the host countries are parties to the same regional trade agreement (Ghosh and Yamarik, 2004).[4] Limao and Venables (2001) report land transport to be seven times more costly than transport by water, and Brooks (2008) estimates that every one percent reduction in transportation costs leads to a two percent rise in a country's exports. To control for related costs, we include the dummy variables ($LLOCK_i$ and $LLOCK_j$) which take the value of one if either country i or country j, respectively, is landlocked. Following Dunlevy (2006) and Hutchinson (2002), who indentify common language as a determinant of trade flows in gravity specifications, we include a dummy variable ($LANG_{ij}$) which is equal to one if the host and home countries share a common language. Similarly, we include the dummy variable ($ADJT_{ij}$) which takes a value of one if the home and host countries share a common border. Data on the geographic location of each country, languages and the adjacency of each pair of home and host countries in our data are from CIA (2008).

Equation (2) presents a baseline augmented gravity equation that conforms to most empirical models used in the previous studies. Estimation of equation (3) allows for determination of whether a general immigrant-trade relationship exists for the cohort of 110 host nations and 43 African home nations in our data during our reference year. Hence, the sign and significance of the coefficient of the immigrant stock variable in equation (3) will inform us of whether African immigrants generally exert the hypothesized positive effects on trade flows between their home and host countries without reference to a particular host/home country. *A priori*, we expect the coefficient of the immigrant stock variable to have a positive sign (i.e., $\beta_1 > 0$).

Given that our data represent 110 host countries (a number that is significantly larger than the counts of home countries included in any previous study) and that the influences of immigrants on trade may vary from one home country to another, we also estimate a variant of equation (3) for each home country in our data. While controlling for the potential effects of factors that host country-oriented studies often fail to account for, the results obtained from these estimations allow us to evaluate the effects of immigrants on each African home country's trade with the host countries in our data set.[5] An additional, but minor, modification of equation (3) allows the estimation of average import/export effects for each home country in our study. Equation (4) illustrates the resulting model.

$$\begin{aligned}\ln TR_{ij} = {} & \beta_0 + \sum_{i=1}^{43}\left[\beta_{1i}\left(\ln IM_{ij}\, xHOME_i\right)\right] + \beta_2 \ln Y_i + \beta_3 \ln Y_j - \beta_4 \ln GD_{ij} + \beta_5 \ln POP_i \\ & + \beta_6 \ln POP_j + \beta_7 \Delta \ln EXR_{ij} + \beta_8 \ln REM_i + \beta_9 \ln REM_j + \beta_{10} OPEN_i \\ & + \beta_{11} OPEN_j + \beta_{12} RTA_{ij} + \beta_{13} LLOCK_i + \beta_{14} LLOCK_j + \beta_{15} LANG_{ij} \\ & + \beta_{16} ADJT_{ij} + \sum_{i=2}^{43} \beta_{17i}(HOME_i) + \sum_{j=2}^{110} \beta_{18j}(HOST_j) + \varepsilon_{ij} \end{aligned} \quad (4)$$

The dummy variables $HOME_i$ and $HOST_j$, respectively, take the value of one for each of the home (i = 1, 2, 3…, 43) and host (j = 2, 3, …, 110) countries and are equal to zero otherwise. β_{1i} , the coefficient of the interaction term between the stock of immigrants from a given home and the dummy variable representing the specific $HOME_i$ country, indicates the home country-specific average effects of immigrants residing in the typical host country. Replacing the home country-specific dummy variables with each of the host country-specific dummy variables $HOST_j$ (j = 1,.., 110) and re-estimating equation (4), we obtain the host country-specific average effects of immigrants on trade flows with the typical home country. Finally, to indicate the economic significance of the effects of immigrants on their respective home country's trade and to compare the magnitudes of the effects across immigrants from different home countries, using the coefficients derived from equation (4) we estimate the additional amount of trade (exports and imports) that would be generated per-immigrant from each of our reference home countries.

EMPIRICAL RESULTS

Descriptive Statistics

Table 1 presents the descriptive statistics for the variables included in our model. During our reference year, 2005, about 3,652 immigrants from the typical African home country resided in the typical host country in our data set. The typical host country exported roughly $1.10 worth of goods ($39.8 million) to the typical home country for every $1.00 worth of goods ($35.7 million) it imported from the typical home country. The typical host and home countries are located about 6,828 miles apart. While the typical African home country has a GDP of about $15 billion, a population of about 17 million, and a trade openness value of 0.83, the typical host nation has a GDP of $340 billion (23 times

larger than the typical African home nation's GDP), a population of 38.3 million (more than double that of the typical African home nation), and a slightly higher (0.97) trade openness value. Fewer than 10 percent of the included home and host countries share the same official language or are members to one or more of the same regional trading agreements. Also, only 2 percent of country pairs share common borders. Finally, about 30 percent of the home nations and 21 percent of African immigrants' host nations are landlocked. Accounting for factors that may facilitate or hinder bilateral trade flows, we examine the extent to which immigrants from African home nations affect bilateral trade between their respective home and host nations. To this end, information on the distribution of African emigrants across different host countries and their respective host nation's trade relations with different African home nations is relevant. Table 2 lists the number of African home nations that each of the host countries in our study have trade relations with and each of the host nations' average stock of immigrants from the African home nations. Ranging from Tajikistan, which trades with only nine of the African home nations in our sample, to the US and the UK which have trade relations with almost all of the African home nations, the home nations in our study account for about 31 percent of the countries in the world that have trade relations with a typical host nation in our data. Furthermore, during our reference year, 31 of the 110 nations did not host any immigrants from the cohort of African nations. Across host nations outside of the continent, the largest stocks of African immigrants are found in France (3.7 million), Spain (891,274), the UK (708,469), and the US (673,543). Among host nations within Africa, Cote d'Ivoire and South Africa, followed by the Sudan, Tanzania and Uganda, host relatively larger numbers of immigrants from other African home nations.

TABLE 1 DESCRIPTIVE STATISTICS OF THE VARIABLES IN THE MODEL

Variable	Mean	Std. Dev.
Host Country Exports (thousands US$)	39,781.57	301,969.70
Host Country Imports (thousands US$)	35,705.85	231,255.80
Immigrant Stock	3,652.33	37,324.86
Geodesic Distance between Home and Host Countries	6,828.77	3,499.56
Home Country GDP (billions of US$)	15.10	32.00
Host Country GDP (billions of US$)	340.00	1,250.00
Home Country Population (millions)	17.30	18.90
Host Country Population (millions)	38.30	117.00
Percent Change in Exchange Rate	1.43	3.59
Home Country Economic Remoteness	467,503.80	789,782.00
Host Country Economic Remoteness	160,428.10	448,237.70
Home Country Trade Openness	0.83	0.46
Host Country Trade Openness	0.97	0.58
Home Country Landlocked (dummy variable)	0.30	0.46
Home Country Landlocked (dummy variable)	0.21	0.41
Home-Host Country Adjacency (dummy variable)	0.02	0.14
Common Language in Home and Host Countries (dummy variable)	0.09	0.29
Host-Home Membership in Common Regional Trade Agreement(s) (dummy variable)	0.08	0.28

Standard deviations in parentheses.

TABLE 2
TRADE RELATIONSHIPS OF AFRICAN NATIONS AND CONCENTRATION/DISPERSION OF AFRICAN IMMIGRANTS ACROSS HOST COUNTRIES

Host	No. of African Countries with which the Host has Trade Ties	Average Stock of Immigrants from African Home Country	Host	No. of African Countries with which the Host has Trade Ties	Average Stock of Immigrants from African Home Country
Albania	37	0 (0)	Korea, Republic	43	0 (0)
Argentina	43	0 (0)	Kyrgyz Republic	27	0 (0)
Armenia	33	0 (0)	Latvia	40	0 (0)
Australia	43	4,096.52 (13,218.12)	Lesotho	19	173.43 (684.39)
Austria	43	430.36 (1,783.05)	Lithuania	41	0.47 (0.97)
Bangladesh	25	0 (0)	Luxembourg	43	146.61 (465.43)
Belarus	43	0 (0)	Macao	23	0 (0)
Belgium	43	3,364.46 (12,522.67)	Macedonia, FYR	40	16.04 (101.45)
Belize	28	1.94 (4.5)	Madagascar	41	435.41 (1949.18)
Benin	25	1,398.19 (4,896.05)	Malawi	41	5,366.97 (25,480.37)
Bolivia	39	3.81 (6.92)	Malaysia	43	0 (0)
Brazil	43	103.1 (517.17)	Mauritania	26	2,112.26 (8,480.08)
Brunei	22	0 (0)	Mauritius	42	43.07 (198.53)
Bulgaria	43	0 (0)	Mexico	43	18.38 (42.05)
Burkina Faso	25	15,565.2 (60,981.42)	Moldova	41	0 (0)
Cambodia	21	0 (0)	Mozambique	40	6,814.2 (23,245.59)
Cameroon	40	821.48 (4,691.45)	Namibia	40	1,303.87 (6,055.25)
Canada	43	6,624.15 (10,438.85)	Netherlands	43	5,578.96 (24,026.54)
Cape Verde	37	31.15 (143.57)	New Zealand	43	756.61 (3,652.09)
Cent. Af. Rep.	23	465.8 (1,420.21)	Nicaragua	40	5.18 (13.87)
Chad	22	4,484 (14,555)	Norway	43	440.88 (865.62)
Chile	40	25.07 (54.62)	Panama	27	7.24 (15.14)
Colombia	43	6.24 (20.85)	Papua New Guinea	19	0 (0)
Comoros	20	1,051.23 (4,701.24)	Paraguay	37	4.07 (24.77)
Costa Rica	40	0 (0)	Peru	42	4.77 (8.28)
Cote d'Ivoire	42	47,589.43 (174,800.7)	Philippines	43	41.47 (116.97)
Croatia	43	0 (0)	Poland	43	37.36 (77.59)
Czech Republic	43	36.1 (62.58)	Portugal	43	4,390.32 (15,963.41)
Denmark	43	427.34 (866.52)	Romania	42	0 (0)
Dominica	29	0 (0)	Russian Federation	43	0 (0)
Dom.Republic	21	12.47 (29.04)	Rwanda	39	2,668.4 (15,544.35)
Ecuador	38	5.25 (10.34)	Senegal	42	6,296.01 (21,305.81)
El Salvador	37	0 (0)	Slovak Republic	43	5.62 (9.01)

TABLE 2 (continued)

Host	No. of African Countries with which the Host has Trade Ties	Average Stock of Immigrants from African Home Country	Host	No. of African Countries with which the Host has Trade Ties	Average Stock of Immigrants from African Home Country
Equatorial Guinea	21	76.66 (351.29)	Slovenia	42	0 (0)
Estonia	40	0 (0)	South Africa	42	26,293.6 (92,997.36)
Ethiopia	41	7,508.34 (45,908.05)	Spain	43	20,727.32 (105,367.3)
Finland	43	132.13 (249.36)	Sudan	40	14,520.72 (64,314.24)
France	43	71,481.84 (241,447.9)	Swaziland	25	1,388.11 (5,083.35)
Gabon	40	4,390.28 (11,467.01)	Sweden	43	1,055.83 (2,080.11)
Gambia, The	33	6,553.09 (22,983.65)	Switzerland	42	1,400.37 (2,126.28)
Georgia	32	0 (0)	Syrian Arab Republic	32	0 (0)
Germany	43	8,285.6 (18,212.74)	Tajikistan	9	0 (0)
Greece	43	973.67 (4,350.25)	Tanzania	42	11,082.25 (32,882.84)
Guatemala	40	0.64 (3.54)	Thailand	43	0 (0)
Guinea-Bissau	18	617.18 (2,295.72)	Togo	24	1,730.93 (7,916.05)
Honduras	33	0.34 (0.94)	Trinidad and Tobago	39	0 (0)
Hong Kong	42	0 (0)	Tunisia	42	499.5 (2,370.95)
Hungary	43	34.99 (83.83)	Turkey	43	94.93 (192.63)
Iceland	34	11.48 (27.8)	Uganda	41	10,034.13 (30,931.88)
India	43	103.26 (423.91)	Ukraine	43	0 (0)
Iran	41	0 (0)	United Kingdom	43	16,476.03 (34,155.82)
Ireland	43	457.19 (1,423.4)	United States	43	15,663.79 (27,403.32)
Israel	42	9,208.01 (36,610.82)	Uruguay	39	4.82 (14.31)
Italy	43	12,397.68 (45,552.16)	Venezuela	38	34.25 (138.48)
Japan	43	163.42 (363.99)	Zambia	37	3,027.59 (10,213.15)
Kazakhstan	40	0 (0)	Total	36.5	3,624.12 (37,181.81)

Standard deviations in parentheses.

Comparing the relative stocks of African immigrants across host countries, we find that with the exception of France, Portugal and Italy (where they account for 49%, 35%, and 24%, respectively), African immigrants do not account for sizable proportions of the total immigrant populations in host nations located outside of Africa. In the UK and in the US, for example, immigrants of African origin accounted for 16 percent and 2 percent of the immigrant populations, respectively. On the contrary, in more than 50 percent of the host nations within the region, African immigrants accounted for more than 67 percent of the total immigrant stock in each host country. The relatively larger proportion of immigrants of African descent in several host nations within the region, as compared to host nations in other regions, when coupled with the economic and social reasons that generally induce immigrants to choose a country as their host nation, suggest that many of the immigrants in African host nations are refugees.

The presence of variation in the proportion of the stock of African immigrants among host nations within and outside the region underscores the need to examine whether or not the immigrant-trade link reported in prior studies applies to immigrants of African origin both from their home and their host countries' perspectives. Thus, we first address the general immigrant-trade link from the host nations' perspectives. We then proceed to consider the effect of immigrants on each home country's trade with the typical host nation.

The African Immigrant-Trade Relationship

In Table 3, we present both the coefficients and the decomposition of the estimated effects (that is, the trade-initiation effects and trade-intensification effects) for each of the variables included in our base model (presented as equation (2)). The results were obtained from application of the Tobit regression technique using both host nations' imports from [columns (a)-(c)] and exports to [columns (d)-(f)] each of the African home countries in our study as the dependent variable series. We employ the Tobit technique for two reasons that are specific to our trade data and research questions. First, even though they serve as hosts to immigrants from African home countries, some host nations in our study have no trade relationship with the African home countries in our study, resulting in a zero value for the dependent variable series during the reference year.[6] A zero value of trade for a given year, however, may not imply a lack of trade relationship between the countries, since a zero trade value may arise, for example, due to the total volume of transactions conducted being lower than a reportable threshold. The use of the Tobit technique enables us to account for the prevalence of zero trade values without necessarily equating zero with the lack of a trade relationship in other years (Eaton and Tamura, 1994). Second, a rise in the volume of bilateral trade flows between a given pair of host and home countries may indicate an increase in the level of existing trade (for example, as a result of a rise in the demand for goods already being traded or for different sets of goods and/or a fall in transactions costs that may be attributed to immigrants) or the initiation of new trade (for example, due to new transactions involving goods that were not previously traded), or a combination of both events. In addition to accounting for zero trade values, the Tobit technique allows the decomposition of the estimated effects of changes in a variable on home-host country trade flows into separate trade-initiation and trade-intensification effects.

We begin our discussion of the results by referencing the coefficient estimates of the immigrant stock variable reported in Table 3. It is from these coefficients that we confirm whether the generally-reported pro-trade effect of immigrants applies to immigrants of African descent. We observe that the Tobit coefficients of the immigrant stock variable (in both the host imports and host exports regressions) are positive and highly significant ($p<0.01$), indicating that immigrants of African descent exert the hypothesized pro-trade effects on their host country's imports from and exports to their home countries. While the coefficients are not directly interpretable, given the double-logarithmic functional form of the estimation equation and, specifically, the size of the Tobit regression parameters, which are very small relative to the median host-home country trade values in our study, following Head and Ries (2002) we heuristically interpret the Tobit coefficients as elasticity estimates. Accordingly, the estimates presented in columns (a) and (d) indicate that a one percent increase in the stock of African immigrants in the typical host country corresponds with respective increases of 0.259 percent and 0.132 percent in the host country's imports from and exports to the typical African home country.

Comparing the relative effects of immigrants on their typical host nation's imports and exports, the results indicate that the observed effect of African immigrants on the typical host country's imports is nearly twice the magnitude of their effect on the host's exports to their respective home countries. These findings correspond with the observation of Dunlevy and Hutchinson (1999, 2001), Wagner et al., (2002) and Bryant et al., (2004) who, among others, report that immigrants exert greater effects on their host country's imports than on their host's exports to the typical home country.[7]

Decomposing the coefficients into trade-initiation and trade-intensification effects (reported, respectively, in columns (b) and (c) for host imports and columns (e) and (f) for host exports), we observe that both effects are significant. Accordingly, while a one percent increase in the stock of African immigrants in a given host nation would raise the likelihood that the given host country's imports from the typical African home country by 0.0166 percent, it would raise the volume of imports by about 0.172 percent.[8] The corresponding initiation and intensification effects on the host country's exports to the typical African home country are 0.005 percent and 0.08 percent, respectively.

Turning to the remaining variables included in the base model, we find that with one exception, all coefficients are of the *a priori* expected signs. Hence, as hypothesized, higher GDP values correspond with increased host country exports and imports, and greater geodesic distance between the typical African immigrants' host and home nations has a negative effect on bilateral trade. Again, consistent with the hypothesized positive effects of market size, the coefficients of the population variables are positive and significant in both regressions. The coefficients of the variable representing the change in the home-host country exchange rate are statistically insignificant in both regressions. While greater host country economic remoteness is detrimental to a nation's exports and imports, unexpectedly, the typical African home nation's economic remoteness corresponds with increased imports and exports.

TABLE 3. TOBIT ESTIMATES OF THE EFFECTS OF AFRICAN IMMIGRANTS ON HOST-HOME COUNTRY TRADE

	Host Imports (Home Exports)		
	(a)	(b)	(c)
ln $Immigrants_{ij}$	0.259***	0.172***	0.0166***
	(0.0253)	(0.0168)	(0.00162)
ln GDP_i (Home)	2.685***	1.785***	0.172***
	(0.201)	(0.134)	(0.0129)
ln GDP_i (Host)	0.278*	0.185*	0.0178*
	(0.147)	(0.0975)	(0.0094)
ln Geographic $Distance_{ij}$	-1.510***	-1.004***	-0.0967***
	(0.117)	(0.0775)	(0.00747)
ln $Population_j$ (Home)	0.348***	0.232***	0.0223***
	(0.0693)	(0.0461)	(0.00444)
ln $Population_i$ (Host)	0.453***	0.301***	0.0290***
	(0.0610)	(0.0405)	(0.00391)
Δ ln Exchange $Rate_{ij}$	0.0273	0.0182	0.00175
	(0.0182)	(0.0121)	(0.00116)
ln Econ. $Remot._i$ (Home)	1.404***	0.933***	0.0899***
	(0.205)	(0.136)	(0.0131)
ln Econ. $Remot._i$ (Host)	-0.706***	-0.469***	-0.0452***
	(0.131)	(0.0869)	(0.00837)
Trade $Openness_i$ (Home)	1.640***	1.090***	0.105***
	(0.161)	(0.107)	(0.0103)
Trade $Openness_i$ (Host)	0.953***	0.634***	0.0610***
	(0.111)	(0.0741)	(0.00714)
Regional Trade $Agreement_{ij}$	2.104***	1.554***	0.0985***
	(0.262)	(0.174)	(0.0168)
$Landlocked_i$ (Home)	-0.847***	-0.550***	-0.0574***
	(0.132)	(0.0881)	(0.00849)
$Landlocked_i$ (Home)	-0.886***	-0.569***	-0.0616***
	(0.151)	(0.100)	(0.00965)
Common $Language_{ij}$	1.542***	1.108***	0.0791***
	(0.193)	(0.129)	(0.0124)
Adjacent (Home and $Host)_{ij}$	-0.667	-0.425	-0.0473
	(0.450)	(0.299)	(0.0288)
Constant	-75.16***	-49.96***	-4.814***
	(8.465)	(5.627)	(0.542)
Observations	4,112		
Pseudo R-Squared	0.613		
Log Likelihood Ratio	-8,657		
Sigma (Std. Error)	3.33 (0.046)**		
Chi-Squared (df)	3,119 (167)***		

TABLE 3 (continued)

	Host Exports (Home Imports)		
	(d)	(e)	(f)
ln Immigrants$_{ij}$	0.132***	0.0800***	0.00503***
	(0.0232)	(0.0176)	(0.00111)
ln GDP$_i$ (Home)	1.342***	1.002***	0.0631***
	(0.184)	(0.140)	(0.00879)
ln GDP$_i$ (Host)	1.030***	0.887***	0.0558***
	(0.132)	(0.101)	(0.00633)
ln Geographic Distance$_{ij}$	-2.132***	-1.580***	-0.0994***
	(0.107)	(0.0812)	(0.00511)
ln Population$_i$ (Home)	0.260***	0.219***	0.0138***
	(0.0636)	(0.0484)	(0.00305)
ln Population$_i$ (Host)	0.321***	0.188***	0.0118***
	(0.0560)	(0.0424)	(0.00267)
Δ ln Exchange Rate$_{ij}$	0.0176	0.00916	0.000576
	(0.0166)	(0.0126)	(0.000795)
ln Econ. Remot.$_i$ (Home)	0.468**	0.365**	0.0230**
	(0.188)	(0.143)	(0.00898)
ln Econ. Remot.$_i$ (Host)	-0.512***	-0.277***	-0.0174***
	(0.117)	(0.0892)	(0.00561)
Trade Openness$_i$ (Home)	0.495***	0.330***	0.0208***
	(0.148)	(0.113)	(0.0071)
Trade Openness$_i$ (Host)	1.624***	1.155***	0.0726***
	(0.101)	(0.0770)	(0.00484)
Regional Trade Agreement$_{ij}$	1.677***	1.318***	0.0562***
	(0.241)	(0.184)	(0.0116)
Landlocked$_i$ (Home)	-1.417***	-1.129***	-0.0857***
	(0.121)	(0.0927)	(0.00583)
Landlocked$_i$ (Home)	-0.752***	-0.847***	-0.0648***
	(0.138)	(0.106)	(0.00666)
Common Language$_{ij}$	1.714***	1.672***	0.0657***
	(0.179)	(0.135)	(0.00848)
Adjacent (Home and Host)$_{ij}$	-0.587	-0.0845	-0.00549
	(0.415)	(0.315)	(0.0198)
Constant	-43.71***	-36.35***	-2.287***
	(7.715)	(5.867)	(0.369)
Observations	4,112		
Pseudo R-Squared	0.701		
Log Likelihood Ratio	-8,503		
Sigma (Std. Error)	3.06 (0.042)**		
	3,957		
Chi-Squared (df)	(167)***		

*Standard errors in parentheses. "***", "**", and "*" indicate significance from zero at the 1%, 5% and 10% levels, respectively*

The coefficients of the variables representing the trade openness of both the host and the home nations are positive and significant across all estimations. This indicates that the volume of bilateral trade flows between the typical African immigrants' host and

home countries is larger the more open the host and the home countries generally are to trading. Similarly, if the typical African immigrants' home and host nations are parties to the same regional trade agreement(s) or share a common language, they tend to trade more with one another relative to those host-home nation pairs that are not members to the same regional trade agreement(s) or that do not share a common language. Indicative of the importance of port facilities and the higher costs associated with land transport as compared to sea transport, we find that the volume of trade between African immigrants' home and host nations is lower if one or both of the host and the home countries lack coastal access.

As has been observed in previous studies for migrants from many other countries, the results presented here indicate that migrants from African countries typically exert statistically significant and economically considerable positive effects on their host nation's trade with their home countries. Nonetheless, as discussed earlier, whether this finding uniformly applies to immigrants from each African home country and to migrants from African nations who reside in each host nation are empirical questions that cannot be answered using the results from our base model. As the latter question has been investigated for several host nations, we focus on the former.

Examining the Effects of Immigrants from the Home Countries' Perspectives

Having confirmed that immigrants of African descent exert pro-trade effects that are comparable to those documented by prior studies for immigrants from other countries, we turn our attention to the question: do immigrants from each African home country exert positive effects on trade between their respective home and host countries? We address this question because, although the results presented in Table 3 allow us to say that the immigrant-trade link observed from previous studies also applies, generally, to immigrants from African countries, we cannot infer whether similar effects are observed for immigrants from each home country. Two important factors dictate the need for further analysis; namely, variation in the average stock of immigrants from each of the African home countries and considerable differences in their concentration/dispersion across different host countries. The values presented in column (a) of Table 4 indicate considerable differences in the number of countries that host immigrants from different African nations: varying from fewer than 85 countries (for Lesotho, Eritrea, Chad and Guinea-Bissau, etc) to more than 100 countries (for Algeria, Ethiopia and Kenya, etc). The values clearly reveal that while immigrants from some African countries are found in just a few host countries, immigrants from several other home countries are found in more than 85 percent of the host countries in our data.

TABLE 4. EFFECTS OF AFRICAN IMMIGRANTS ON HOME COUNTRY'S IMPORTS AND EXPORTS TO A TYPICAL HOST

Emigrants' Home Country	(a) Number of Host Countries	(b) Host Import (Home Exports)	(c) Host Exports (Home Imports)
Algeria	109	0.2465 (0.1253)*	-0.0166 (0.1143)
Benin	82	0.4304 (0.1841)**	0.0065 (0.142)
Botswana	108	0.6396 (0.1684)***	0.4635 (0.1639)***
Burkina Faso	82	0.3559 (0.1804)*	0.0822 (0.1733)
Cameroon	106	0.3031 (0.132)**	0.307 (0.1307)**
Cape Verde	98	0.2756 (0.0745)***	0.1939 (0.108)*
Central African Republic	86	0.5742 (0.1744)***	0.1767 (0.145)
Chad	76	0.3646 (0.2624)	0.0674 (0.1992)
Comoros	73	0.3469 (0.1246)***	0.3804 (0.1587)**
Congo, Dem. Rep.	81	0.3305 (0.1253)***	0.1506 (0.1261)
Cote d'Ivoire	108	0.1259 (0.118)	0.0055 (0.1107)
Djibouti	74	0.1318 (0.2029)	0.0811 (0.2177)
Egypt, Arab Rep.	92	0.1493 (0.0732)**	-0.077 (0.0926)
Equatorial Guinea	80	0.7668 (0.2497)***	0.2914 (0.1964)
Eritrea	74	0.2492 (0.1108)**	0.1831 (0.1125)
Ethiopia	106	0.3632 (0.095)***	0.1767 (0.1018)*
Gabon	107	0.4721 (0.2005)**	0.1725 (0.1329)
Gambia, The	91	0.2579 (0.1125)**	0.126 (0.1499)
Ghana	106	0.0242 (0.0969)	-0.0198 (0.1089)
Guinea	88	0.3288 (0.152)**	0.0003 (0.1249)
Guinea-Bissau	70	0.1256 (0.1463)	0.2469 (0.1598)
Kenya	110	0.2781 (0.0901)***	-0.0755 (0.0818)
Lesotho	72	0.0965 (0.1684)	0.0296 (0.1727)
Madagascar	108	0.5105 (0.1001)***	0.2074 (0.1247)*
Malawi	107	0.3253 (0.1548)**	0.3361 (0.1383)**
Mali	108	0.0836 (0.1105)	-0.1052 (0.096)
Mauritania	87	0.3669 (0.179)**	0.0086 (0.1545)
Mauritius	108	0.3337 (0.1006)***	0.1072 (0.1176)
Morocco	108	-0.061 (0.0867)	0.0462 (0.0953)
Mozambique	104	0.314 (0.1601)*	0.252 (0.1439)*
Namibia	106	0.4381 (0.1304)***	0.3485 (0.136)**
Rwanda	99	0.1349 (0.1421)	0.3258 (0.1351)**
Senegal	107	0.3048 (0.1089)***	0.079 (0.1105)
Seychelles	96	0.5634 (0.1603)***	0.1363 (0.1506)
South Africa	109	0.1526 (0.0685)**	0.0971 (0.0936)
Sudan	105	0.1103 (0.1242)	0.1679 (0.1284)
Swaziland	85	0.5529 (0.2445)**	0.1948 (0.2169)
Tanzania	106	0.2815 (0.1088)**	0.0201 (0.1146)
Togo	83	0.348 (0.1605)**	0.0577 (0.1557)
Tunisia	109	0.1099 (0.1224)	0.1068 (0.119)
Uganda	107	0.3411 (0.1174)***	0.2213 (0.1169)*
Zambia	101	0.1279 (0.1413)	0.1547 (0.1302)
Zimbabwe	90	0.1293 (0.1227)	0.1296 (0.1006)

See Table 3 notes

The results presented in columns (b) and (c) indicate that the pro-trade effects of immigrants observed from estimation of the general model do not necessarily apply to emigrants from every African nation. More specifically, while we find that immigrants from 31 of the 43 African countries (72% of the home countries) have the hypothesized positive and significant effects on their respective home nation's exports (that is, the typical host nation's imports), for only 11 of the 43 African home nations (26% of the home countries) is the case true when it comes to the imports of each African home country from a typical host (that is, the exports of the typical host). Similarly, we find the hypothesized positive effects on the home country-specific exports for 10 of the 11 home countries where positive effects are also found for their imports. Given the finding that African emigrants have the hypothesized pro-export effects for only 26 percent of the home countries and have pro-import effects for 72 percent of the African home countries, our observation from the general model of relatively smaller effects for the magnitude of African immigrants on their typical host country's exports to the typical home is not surprising. In addition to the observed variation in the number of home countries for which immigrants from African nations are found to exert statistically significant pro-trade effects, there exists considerable variation in the concentration/dispersion of immigrants originating from different home countries (that is, comparing the relative total numbers of migrants originating from each of the African home countries while taking into account the respective number of host countries in which they reside). Table 5 presents the dispersion/concentration of immigrants from each of the African home nations across the host countries in our data together with the average imports and exports of each African home country. Accordingly, the values listed in column (a) of the table indicate that, while we find Kenyan and Algerian immigrants in more than 100 of the host countries included in our study and immigrants from Eritrea and Lesotho in fewer than 80 host nations, the relative sizes/concentrations of emigrants from Kenya, Eritrea and Lesotho in a typical host are not significantly different from one another. That is, for every Kenyan or Eritrean emigrant, we find roughly four Algerian emigrants.

Given such differences in the relative sizes and dispersions of immigrants from different African home nations, it is perhaps not surprising to observe significant variation in the hypothesized pro-trade effects of emigrants across different home countries. Thus, we can say that our observation (or lack thereof) of variation in home country-specific immigrant effects, obtained when conducting the analysis from the home countries' perspectives, may be attributed in part to the differences in the size (stock) of immigrants, the relative dispersion of the given stock and variation in the average amount of trade that each of the home nation conducts. To this end, using the results obtained from the estimation of equation (3) for each of the 43 home nations in our study, we present home country-specific per-immigrant effects in Table 6.[9] The results further show that the observed home country-specific per-immigrant effects are of dissimilar magnitudes even across different home nations where we observe either pro-import or pro-export effects or both. Accordingly, among the 31 African home nations where immigrants had the hypothesized pro-exports effects, we find that the proportional effect of a one percent increase in the stock of emigrants on the respective home country's exports vary from as low as 0.15 percent (in Egypt and South Africa) to 0.47 percent and 0.64 percent (in Gabon and Botswana), respectively.[10]

TABLE 5. RELATIVE SIZE AND DISTRIBUTION OF IMMIGRANTS FROM DIFFERENT AFRICAN HOME NATIONS

Home Country	Number of Host Countries	Immigrants (a)	Exports by Home (b)	Imports by Home (c)	Home Country	Number of Host Countries	Immigrants (a)	Exports by Home (b)	Imports by Home (c)
Algeria	109	14,944.91	373,968.40***	149,106.70**	Lesotho	72	3,285.59	6,191.52***	1,422.88***
		(131,721)	(1,311,983)	(448,684)			(24,683)	(44,165)	(7,357)
Benin	82	1,385.14**	979.19***	6,808.27***	Madagascar	108	1,037.38***	5,917.43***	8,615.93***
		(7,751)	(2,579)	(19,401)			(7,937)	(29,508)	(27,284)
Botswana	108	320.46***	36,066.50	26,132.03	Malawi	107	796.95***	3,794.22***	8,141.73***
		(2,414)	(293,386)	(230,885)			(3,652)	(11,482)	(36,233)
Burkina Faso	82	12,294.90	----	----	Mali	108	8,741.43	8,149.35***	11,278.22***
		(109,533)	----	----			(55,578)	(43,751)	(31,492)
Cameroon	106	1,726.95**	18,857.24***	15,900.03***	Mauritania	87	890.20***	----	----
		(7,331)	(60,405)	(49,502)			(5,146)	----	----
Cape Verde	98	1,633.49**	838.53***	4,394.13***	Mauritius	108	1,011.47***	14,333.64***	17,543.73***
		(6,717)	(2,772)	(18,243)			(4,720)	(64,420)	(42,475)
Central African Rep.	86	147.12***	1,699.42***	1,350.48***	Morocco	108	22,825.89*	96,756.24	159,236.70***
		(1,137)	(5,254)	(4,608)			(106,525)	(386,447)	(450,304)
Chad	76	1,121.07***	21,870.43	4,019.80***	Mozambique	104	7,063.73	3,961.81***	12,389.21***
		(6,448)	(160,346)	(11,672)			(35,758)	(17,519)	(63,277)
Comoros	73	480.95***	----	----	Namibia	106	130.29***	18,308.45**	19,910.70
		(2,821)	----	----			(663)	(82,589)	(180,012)
Congo, Dem. Rep.	81	4,262.43	13,418.44***	14,725.51***	Rwanda	99	1,812.11	993.93***	2,422.12***
		(15,057)	(63,671)	(39,286)			(11,573)	(4,536)	(6,912)
Cote d'Ivoire	108	1,190.16***	43,955.70	29,305.40	Senegal	107	3,804.74	7,777.49***	23,805.05**
		(5,753)	(160,551)	(141,437)			(16,815)	(23,553)	(71,880)
Djibouti	74	160.51***	1,009.69***	7,439.63***	Seychelles	96	112.75***	2,408.57***	4,677.70***
		(849)	(7,097)	(25,385)			(448)	(11,245)	(13,259)
Egypt, Arab Rep.	92	4,870.51	104,177.40**	210,558.80***	South Africa	109	5,952.97	312,665.9***	338,734.0***
		(16,491)	(294,300)	(445,831)			(22,897)	(823,020)	(896,772)

TABLE 5 (continued)

Home Country	Number of Host Countries	Immigrants (a)	Exports by Home (b)	Imports by Home (c)	Home Country	Number of Host Countries	Immigrants (a)	Exports by Home (b)	Imports by Home (c)
Equatorial Guinea	80	989.50***	51,592.23	10,588.27***	Sudan	105	2,616.05	6,564.61***	35,979.98
		(6,337)	(192,169)	(35,364)			(15,668)	(34,164)	(81,994)
Eritrea	74	9,980.39	----	----	Swaziland	85	1,027.72**	19,922.11	20,436.90
		(56,188)	----	----			(8,743)	(126,673)	(157,227)
Ethiopia	106	3,597.38	4,726.51***	20,071.42***	Tanzania	106	1,628.32**	9,844.00***	16,018.54***
		(16,612)	(14,310)	(50,209)			(7,218)	(32,738)	(45,305)
Gabon	107	154.89***	40,187.70	11,509.97***	Togo	83	657.02***	1,116.24***	5,158.52***
		(1,143)	(295,065)	(53,561)			(2,844)	(2,602)	(12,446)
Gambia, The	91	508.78***	42.51***	3,204.95***	Tunisia	109	4,370.96	73,889.63	94,055.54
		(1,953)	(133)	(6,807)			(36,092)	(370,274)	(365,658)
Ghana	106	6,188.52	42,269.55	59,021.67	Uganda	107	1,322.90***	4,152.16***	9,653.51***
		(32,226)	(184,699)	(131,318)			(7,041)	(12,232)	(24,209)
Guinea	88	3,963.33	----	----	Zambia	101	1,360.23***	13,975.31***	19,671.71*
		(20,520)	----	----			(6,168)	(60,213)	(112,535)
Guinea-Bissau	70	1,436.24**	1,303.45***	2,160.14***	Zimbabwe	90	7,734.07	12,348.04***	17,651.51**
		(5,957)	(10,167)	(7,650)			(54,168)	(56,835)	(88,124)
Kenya	110	3,553.18	21,102.04**	30,561.28	***All Countries***	***110***	***3,652.33***	***40,976.81***	***41,706.26***
		(18,023)	(70,033)	(90,566)			***(37,325)***	***(315,258)***	***(238,910)***
Eastern Africa		***2,193.86***	***7,610.38***	***15,975.25***	***Southern Africa***		***3,032.39***	***53,231.44***	***57,992.32***
		(209,277)	***(708,166)***	***(1,233,824)***			***(304,455)***	***(10,973,843)***	***(11,835,931)***
Northern Africa		***12,006.49***	***163,417.04***	***151,338.20***	***Western Africa***		***2,896.13***	***18,966.97***	***15,445.17***
		(976,681)	***(15,037,250)***	***(3,885,443)***			***(307,348)***	***(1,745,855)***	***(1,540,112)***

*Mean values presented with standard deviations in parentheses. Statistical significance from the overall mean is denoted as follows: "***", "**", and "*" indicate significance at the 1%, 5% and 10% levels, respectively*

TABLE 6. ESTIMATE EFFECT OF A ONE PERCENT INCREASE IN AFRICAN IMMIGRANT STOCK ON THE HOME COUNTRY'S TRADE

	Estimated Per-Immigrant Effect			Estimated Per-Immigrant Effect	
Home Country	Home Imports	Home Exports	Home Country	Home Imports	Home Exports
Algeria	29.54 (162.3)	32.41 (176.81)	Lesotho	48.66 (382.59)	35.11 (259.03)
Benin	2.91 (14.79)***	3.67 (20.7)***	Madagascar	5.00* (16.55)**	6.93 (27.35)***
Botswana	25.07 (111.48)	40.07 (186.33)	Malawi	85.14 (679.54)	88.42 (646.80)
Burkina Faso	12.70 (79.3)*	14.22 (84.27)*	Mali	3.21 (17.17)***	4.25 (24.44)***
Cameroon	11.82 (56.08)**	13.51 (75.57)**	Mauritania	31.37 (204.99)	44.69 (321.98)
Cape Verde	0.16 (1.38)***	0.26 (2.22)***	Mauritius	14.56 (54.94)**	16.36 (64.65)*
Central African Rep.	5.54 (26.37)***	6.32 (35.16)***	Morocco	14.84 (56.14)*	17.88 (65.89)*
Chad	16.4 (84.91)	18.49 (88.38)	Mozambique	39.21 (206.63)	39.1 (194.39)
Comoros	2.98 (14.73)***	3.26 (16.40)***	Namibia	70.49 (356.58)	71.04 (363.33)
Congo, Dem. Rep.	1.76 (10.64)***	3.05 (22.57)***	Rwanda	0.30 (1.134)***	0.29 (1.20)***
Cote d'Ivoire	132.93 (869.83)	160.57 (1,152.08)	Senegal	2.95 (20.42)***	2.10 (10.67)***
Djibouti	1.01 (5.07)***	1.46 (6.25)***	Seychelles	21.93 (102.36)	27.35 (147.53)
Egypt, Arab Rep.	16.51 (56.17)*	15.23 (55.64)**	South Africa	94.76 (334.89)*	105.24 (432.62)
Equatorial Guinea	543.95 (2,790.18)	745.99 (4,287.37)	Sudan	22.03 (163.03)	34.97 (262.15)
Eritrea	1.10 (5.54)***	1.36 (7.02)***	Swaziland	32.32 (155.23)	38.9 (162.68)
Ethiopia	4.36 (19.67)***	5.09 (24.01)***	Tanzania	8.53 (36.95)***	6.91 (25.96)***
Gabon	46.36 (172.33)	76.47 (308.67)	Togo	11.87 (55.77)**	27.84 (154.32)
Gambia, The	0.29 (1.57)***	0.42 (2.47)***	Tunisia	14.91 (42.66)**	14.50 (38.97)**
Ghana	4.81 (17.02)***	6.03 (23.57)***	Uganda	7.72 (26.3)***	7.25 (28.07)***
Guinea	4.15 (18.45)***	5.58 (29.78)***	Zambia	3.64 (15.78)***	3.80 (16.89)***
Guinea-Bissau	0.63 (4.26)***	0.60 (3.74)***	Zimbabwe	12.03 (45.52)**	15.14 (66.53)**
Kenya	4.35 (14.24)***	3.88 (14.12)***	***All Countries***	***31.99 (449.41)***	***39.65 (656.24)***
Eastern Africa	***8.24(789.76)***	***10.09(1,137.03)***	***Southern Afrca***	***46.94(3,538.74)***	***50.38(3,758.06)***
Northern Africa	***19.06(820.33)***	***20.20(973.09)***	***Western Africa***	***44.09(10,418.72)***	***59.79(14,180.34)***

See Table 5 notes

The Economic Significance of the Variation in the Observed Effects

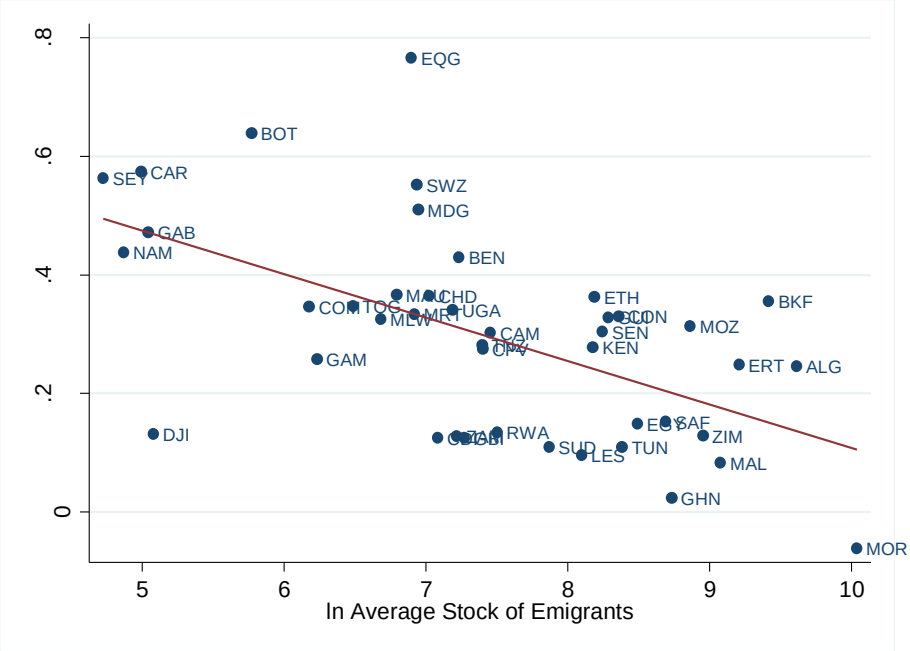
As indicated above, controlling for heterogeneity in the trade and immigration structures of immigrants' home nations, we find considerable variation in the observed effects of immigrants from different African home countries. Among other things, this variation may result from one or both of the following: (i) the existence of differences in the factors that underlie the ability of and the extent to which immigrants from various countries affect their respective home countries' trade flows, and/or (ii) the presence of a threshold level in the size or dispersion of immigrant stocks beyond which the statistical significance of the observed effects of immigrants on their respective home nation's trade might change. In particular, if such a threshold exists, it would allow the determination of when we might observe immigrant effects on home country's trade, the level at which the effect can be optimized, and the ranges over which the effects are economically marginal or substantial. Leaving future research to identify the factors that may underlie the ability of and the extent to which immigrants from different countries affect their respective home countries' trade, we thus turn to the determination of whether there is a threshold size (in the stocks of immigrants) at/beyond which we might observe a change in the pattern of the estimated home country-specific effects of immigrants. We do so by examining the distribution of the estimated home country-specific effects of immigrants (for both exports and imports) against the natural logarithm of the average stocks of immigrants from the home countries in our study.[11]

Figure 1 clearly depicts a strong negative relationship between the observed home country-specific effects of immigrants (on exports) and the corresponding average size (stocks) of emigrants from each home country. This suggests that, although there is considerable variation in the extent to which immigrants from various African countries influence their respective home countries' exports to their host countries, the magnitude of the observed effect is higher for home countries with relatively smaller average stocks of immigrants and it is lower for home countries characterized by relatively larger average stocks of emigrants. The scatter plot, however, does not suggest a threshold in the average stocks of immigrants at/beyond which the estimated home country-specific effects would start to change. We believe this is particularly so, first, because we find a number of African home countries for which the estimated immigrants' effects are statistically insignificant both at low, medium and high levels of immigrant stocks. Second, our sample size is very small (just 43 home countries and data representing a single year). Finally, the lack of discernable threshold levels may be due to transaction costs (due to information asymmetries and lack of trade-facilitating infrastructure, etc) being more important determinants of the magnitudes of immigrants' pro-trade effects. For example, if product and/or market-related information is sufficiently asymmetric and/or if trade-facilitating infrastructure is lacking (as is common among the reference African countries), then it may be that trade-related transaction costs are sufficiently high to constrain the emergence of a pattern in immigrants' abilities to act as trade intermediaries.

Consequently, given the differences in the number of countries that serve as hosts to immigrants from various African countries, the differences in the dispersion of immigrants from each of the home countries in our study and the variation in the trade structures of the African countries, inference about the relative economic significance of

the effects of immigrants on home country's trade that can be made from the coefficient estimates presented in Table 4 is not entirely straightforward. For example, from Figure 1, despite being significant, we observe that the relative magnitude of the estimated effects of emigrants from South Africa (denoted as SAF) is lower than that of many other African countries with relatively smaller average stocks of emigrants. However, South Africa has a relatively larger volume of exports and a larger average stock of emigrants than do many other African home nations in our study. As a result, the economic significance (that is, the actual dollar values of trade) of the observed 0.15 percent home

FIGURE 1. HOME COUNTRY-SPECIFIC IMMIGRANT-EXPORT EFFECTS V. AVERAGE STOCK OF EMIGRANTS FROM EACH HOME COUNTRY (ACROSS THE 110 HOST COUNTRIES)



country-specific export effect of a one percent increase in the stocks of emigrants on South Africa's trade with the typical host country may actually be greater than the 0.64 percent increase that is expected to result from a corresponding one percent increase in the stocks of emigrants on Botswana's exports to the typical host. Thus, to provide a better understanding of the economic significance of the estimated effects of immigrants on their respective home nation's trade with a typical host, using the coefficient estimates obtained from country-specific estimation of equation (3), we quantify the per-immigrant dollar values of additional trade that would be generated in each of the home countries in our study. Tables 5 and 6, respectively, present the average actual export and import values of immigrants from each of the home nations in our study, the estimated dollar value of home country-specific per-immigrant effects.

The figures in the tables reveal an interesting contrast. While we find that the average level of trade (exports and imports) between, say, Algeria ($370 million), Egypt ($104.2 million), Morocco ($96.8 million), and South Africa ($312.7 million) and a typical country that hosts immigrants from each of these countries are significantly larger than those observed for several other African home nations, the amount of additional trade that would be generated per-immigrant from each of these nations is not necessarily the highest, with the exception of those from South Africa. To this end, our results reveal that, ranging from $0 to $105 (for exports) and $0 to $94.8 (for imports), the amount of additional trade that a typical immigrant from a given home nation in Africa creates stands at an average of $40 (for the home country's exports to), and $32 (for the home country's imports) from a typical host.

CONCLUSIONS

Results from prior studies of the effects of immigrants on trade flows between their home and host countries that frequently focus on developed host countries indicate that immigrants generally exert positive influences. Extrapolating from these findings, based on results obtained from the analysis of data from major immigrant host countries and without analyzing the problem from the perspectives of the home countries, would suggest that the pro-trade effects observed for developed host countries extend to immigrants from all home nations. Based on analysis of the effects of immigrants on host-home trade flows between more than 100 countries, Tadesse and White (2011) indicate that such inference may be misleading. Given the presence of significant differences in the economic structures of host countries for which most available studies of the immigrant-trade link have been conducted and the diversity of immigrants' home countries, generalization of the results observed for a few host countries to developing home/host nations, in general, and African countries in particular, where there is considerable heterogeneity in the trade and immigration structure, is therefore highly questionable.

Using data for 43 African home countries, many of which have experienced rapid increases in emigration rates, and 110 host countries (43 countries in Africa and 67 countries in other regions), we examine the immigrant-trade link from both the host and home countries' perspectives and address the following questions: Do immigrants from African home countries influence bilateral trade flows between their host and home nations? Do the positive influences of immigrants on their host countries' trade with their home countries observed from the analysis of other home countries extend to African home countries? And, if so, how consistent or variable are the observed effects across the African home countries that also have considerable differences in their trade and immigration structures?

Our results, obtained using the Tobit regression technique, which allows us to account for potential zero trade values in a setting that is consistent with the existing literature (for examining the problem from host countries perspectives), indicate that a one percent increase in the proportional stock of African immigrants in a given host would raise the typical host nation's exports to and imports from the given African home

country by 0.132 percent and 0.259 percent, respectively. Analysis of the effects from each of the African home country's perspective, however, yields a different picture: increases in the stocks of immigrants originating from several African home countries, for which trade and immigration structures are highly divergent, do not necessarily produce increases in the respective home countries' exports to or imports from the typical host country. To this end, while the hypothesized positive effects of immigrants on home countries' exports were observed for only 31 of the African home countries, we find the associated effects on home country imports for just 12 of the 43 African home countries. Further, for only 11 of these home countries are the effects of immigrants on both the home countries' exports and imports positive and statistically significant. We also find that the magnitudes of the observed effects are quite dissimilar across the home countries. As argued, these findings suggest that the extrapolation of the conclusions derived from findings conducted largely from the host countries' perspectives to developing countries, may be erroneous.

Given the heterogeneity in the trade and immigration structures of the home nations and despite the presence of positive effects of African immigrants on their typical host countries' trade with their home countries, the significant variation in the observed effects of immigrants both in statistical and relative economic significance across the different countries implies the following: First, the prevalence of potentially different factors underlying the ability of and the extent to which immigrants from developing home countries in general, and African home countries in particular, are able to exert influences on their specific home countries' trade (exports as well as imports) with their host countries. Second, there may exist a threshold in terms of the size or the dispersion of immigrant stocks beyond which they might be able to exert discernible effects on their respective home nations' trade with their respective host nations. To this end, while scatter plots of the estimated home country-specific effects of immigrants against the stocks of immigrants from each home country and our measure of their respective dispersion indicate the presence of negative relationships, we were not able to identify threshold levels beyond which the observed effects may change.

Two important implications for the formulation of social, immigration and economic policies could be directly inferred from these findings. First, the loss of human capital facing several African home countries due to emigration may not be as economically devastating as is often suggested by policy makers. This is because, consistent with observations from other studies, we show that immigrants of African descent have statistically significant and economically considerable impacts on trade flows between their home and host countries. This is particularly significant when considering our finding that in 31 of the 43 home countries considered, immigrants specifically enhance their home countries exports to their host nations. Second, given variation in the magnitudes of observed effects, it is clear that the benefit of enhanced migration across different home/host countries is starkly different. It is therefore important for economic and/or social policy makers in different African countries to focus on formulating country-specific policies towards migration instead of attempting to address it by adopting common policies at the regional level.

Finally, given the lack of large panel or time-series data on the stock of immigrants from African home countries and, hence, the relatively small data set (one

year) that we utilize in this study, while they may serve as baseline estimates, our observations may not serve for formulating enhanced migration and trade policy measures. When home-country specific-emigrant stocks data over extended period of time are available, in addition to corroborating our observation, we suggest that future studies focus on establishing a threshold immigrant stock level at which immigrants start to have statistically significant pro-trade effects on their home countries' trade as well as the level at which such effects may begin to taper off.

ENDNOTES

[1] The gravity equation was first applied to trade flows by Tinbergen (1962). Anderson and van Wincoop (2003), Feenstra et al. (2005), Eaton and Kortum (2002), Deardorff (1998), Davis (1995), Bergstrand (1985), Helpman and Krugman (1985) and Anderson (1979) provide theoretical foundations for the model.

[2] The bilateral migration matrix is available at http://go.worldbank.org/ HO0EXUQVV0.

[3] Internal distance, when k=j, is derived as 0.4 times the square root of the nation's land mass (Head and Mayer, 2000).

[4] The Regional Trade Agreements considered are the European Union/European Economic Community, European Free Trade Arrangement, European Economic Area, Canada-US Free Trade Arrangement/North American Free Trade Agreement, Asia Pacific Economic Community, Central American Common Market, Latin America Free Trade Association/Latin America Integration Agreement, Andean Community, Caribbean Community/Carifta, Organization of Eastern Caribbean States, Southern Cone Common Market (Mercado Comùn del Sur), Group of Three, Association of Southeast Asian Nations, The Papua New Guinea-Australia Trade and Commercial Relations Agreement, Bangkok Agreement, South Pacific Regional Trade and Economic Agreement, Australia-New Zealand Closer Economic Relations Trade Agreement, East Asian Economic Caucus, South Asian Association for Regional Cooperation/SAARC Preferential Trading Arrangement, Central European Free Trade Area, Arab Common Market, Economic Cooperation Council, Gulf Cooperation Council, Economic and Monetary Community of Central Africa, East African Community/East African Co-operation, South African Customs Union Agreement, Economic Community of West African States, South Africa Development Community/Southern African Development Coordination Conference, and the Common Market for Eastern and Southern Africa.

[5] Given the cross-sectional nature of our data it should be noted that when estimating equation (2) for each home country in our data the home country-specific explanatory variables will drop out.

[6] A typical home country in our data has had no imports from or exports to roughly 17% of the host countries in the study during the reference year.

[7] The effect of immigrants on host country imports, however, does not have to exceed their effects on the host country exports to the home country. Girma and Yu (2002) and White (2007) for example, find greater effects of immigrants on their host country exports than imports.

[8] We repeated our analysis using 2006 trade flow data as well. Changes in the effects observed from using the 2005 trade data are marginal.

[9] In order to check the robustness of results obtained from our estimation of equation (3), we also estimate equation (2) for each of the home countries.

[10] These estimates were derived using the coefficients of the home country-specific stock of immigrants from the Tobit regression of exports or imports of the home country to all countries in our data. The estimated effects thus include the trade initiation and intensification effects.

[11] While all the relationships we examine show the presence of a consistently negative relationship, although of various degrees, for the sake brevity, we present only the scatter plot of the distribution of the estimated home-country-specific exports effects against the logarithm of the corresponding average stocks of emigrants.

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