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Isolating the Network Effect of Immigrants on Trade

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1. INTRODUCTION

BEGINNING with the seminal contributions of Gould (1994) and Head and Ries (1998), several recent papers have found a strong, stable and significant empirical correlation between the stock of immigrants in the receiving country and the amount of trade with their country of origin.[1] In several refinements, these studies have analysed the impact of immigration on differentiated versus homogeneous goods, on imports and exports, and on exports of final and intermediate goods. Combining these studies, the overall evidence shows larger effects for exports than for imports, for differentiated than for homogeneous goods, and between culturally distant countries. All these results have been taken as evidence that the positive immigration–trade correlation is driven by network effects: immigrants make it easier for domestic firms to export as they lower information barriers, and therefore, the fixed cost of accessing new markets characterised by different culture and business practices.

This literature, however, has always equated the total number of bilateral migrants with the size of the business network that enhances bilateral trade. What has been lacking is an effort to measure more precisely the size of the business network established by immigrants, isolating its specific effects on trade. To do this, one needs to identify how large is the group of immigrants which, because of their occupation, may facilitate the commercial relations between the host and the origin countries. There are three reasons to believe that total immigrant population is a rather poor and noisy measure of the business networks established by immigrants, and it may correlate with other spurious variables. First, many immigrants into OECD countries are employed in non-tradable service sectors such as construction, household, hospitality or food services. In contrast, firms in the manufacturing sector are responsible for most of the trade. There is no clear connection between those immigrants and the trade activity of manufacturing firms. Second, large aggregate immigration flows from a country may imply some preference in the bilateral relationship or some cultural connection that may also affect trade. These special bilateral relationships may be hard to measure and hence may bias the estimated coefficient of immigration on trade upwards. Finally, while some recent studies have considered special subgroups of immigrants (such as highly educated ones in Felbermayr and Jung, 2009) as more relevant for trade, they have not effectively identified those immigrants as actually participating to the trade-business network. If immigrants suffer from poor skill transferability and skill downgrading (Chiswick and Miller, 2009), their occupation in the destination country, rather than their schooling, is a better measure of their productive contribution. Moreover, some specific occupations may be particularly important in favouring those business networks that enhance trade.

[1] A partial list includes Dunlevy and Hutchinson (1999), Girma and Yu (2002), Rauch and Trindale (2002), Wagner et al. (2002), Combes et al. (2005), Dunlevy (2006), Bandyopadhyay et al. (2008), Felbermayr and Toubal (2012).

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This paper proposes a more precise measure of the trade-business network of immigrants. Using the data on immigrant occupations from OECD (2010), the DIOC-E database, we consider in each country those immigrants in managerial/sales jobs that are pivotal to establishing business connections. We analyse how this group affects trade, once we control for total immigrant flows. The estimated coefficient is a more precise measure of the direct information-diffusion effect on trade channelled by business networks of international migrants. Granted that the whole community of immigrants can play a role in establishing the network, these individuals should be particularly important and most actively involved into trade-promoting international linkages.

A first look at the data and at some stylised statistics suggests that capturing the intensity of bilateral business network with the number (or share) of bilateral migrants can introduce measurement error in the analysis. Table 1 shows (in column 1) the share of immigrants in the population for all European countries. It also shows, in column 2, the percentage of

TABLE 1
Summary Statistics of the Shares of Foreign-Born, Share of Immigrants in Business Networks and Openness to Trade, OECD Countries, Circa 2000

Country ISO Code	*Share of Immigrants in Population (1)*	*Share ISCO 1 Among Immigrants (2)*	*Share ISCO.5 Among Immigrants (3)*	*Share ISCO.9 Among Immigrants (4)*	*Export + Import as per cent of GDP (5)*
AUS	0.245	0.082	0.128	0.071	22.515
AUT	0.138	0.090	0.172	0.109	89.205
BEL	0.095	0.209	0.088	0.102	87.472
CAN	0.206	0.101	0.140	0.047	39.173
CHE	0.253	0.062	0.121	0.026	43.542
CHL	0.017	0.215	0.103	0.000	33.832
CZE	0.040	0.152	0.115	0.025	66.865
DEU	0.118	0.001	0.121	0.000	83.430
DNK	0.058	0.010	0.158	0.108	35.596
ESP	0.068	0.103	0.173	0.164	40.487
EST	0.195	0.248	0.091	0.047	24.840
FIN	0.022	0.016	0.180	0.150	58.455
FRA	0.092	0.137	0.110	0.091	25.389
GBR	0.088	0.158	0.179	0.083	27.333
HUN	0.029	0.142	0.174	0.030	91.634
IRL	0.121	0.137	0.154	0.030	78.988
ISR	0.373	0.081	0.208	0.072	51.849
ITA	0.050	0.099	0.145	0.000	23.479
LUX	0.426	0.100	0.102	0.054	92.100
MEX	0.004	0.193	0.132	0.026	39.231
NLD	0.098	0.042	0.108	0.139	29.028
NZL	0.197	0.117	0.159	0.049	43.876
POL	0.008	0.127	0.103	0.020	36.151
PRT	0.085	0.118	0.140	0.067	37.313
SVK	0.026	0.129	0.061	0.023	12.323
SWE	0.109	0.027	0.234	0.118	39.271
Average	0.115	0.114	0.147	0.065	44.700

Sources: Authors' computations based on OECD DIOC-E migration data and Head et al. (2010) trade data.

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immigrants in occupations as business directors or managers (classified as ISCO-1) that are more directly related to the creation of international business relations and trade opportunities. We will call this group the 'business network immigrants'. Columns 3 and 4 show also the share of immigrants in occupations less directly related to international business networks but still linked to marketing and sales (market salespersons, ISCO-5, and door-to-door and telephone salespersons, ISCO-9). It is easy to notice that countries with similar overall share of immigrants, such as for instance, Belgium and Germany, have a very different percentage of those involved in the 'business network' as represented by the most relevant occupations of 'business manager and directors'. In Belgium, 20 per cent of immigrants are employed in those occupations while in Germany essentially no immigrants are.

Even more interesting as stylised fact are Figure 1a and b. These figures report the correlation between openness to trade and migration shares for four selected representative EU countries (Portugal, UK, Spain and France) and their main migration-origin countries. Figure 1a reports clear positive correlation in each of those countries between business network immigrants from a country (as share of total immigrant stock to this country) and trade with that specific country. For instance, France trades a lot with Germany, the UK trades a lot with the United States and Portugal with Spain. Correspondingly, migrants from those countries involved in business networks occupations are large fractions of the migrant population. In contrast, Figure 1b shows that the same positive correlation does not hold between the stock of migrants from top destination countries (as share of total migrant population in a receiving country) and trade: Germany, United States and Spain do not provide, in relative terms, large migrants flow to France, the UK and Portugal. Furthermore, trade between largest immigrant-partner countries, such as Morocco and Spain, or Angola and Portugal, is relatively limited.

Our findings are reasonably strong and robust. Importantly, even controlling for the bilateral stock of migrants, which can be correlated with several unobserved bilateral variables, the share of migrants in business network occupations has a large and significant effect on trade, mainly through an effect on imports (and much less on exports). Specifically, each business network immigrant generates trade with its country of origin in an amount double of that generated by a non-business network immigrant. The share of business network immigrants works better than the share of highly educated immigrants in predicting trade. Business network immigrants exhibit particularly large effect on imports of differentiated goods, although they also have a significant effect on trade of intermediate and homogeneous goods. When we use the occupational and education categories together, we find that it is mostly highly educated immigrants in business network occupations who enhance trade.

Interacting the presence of business network immigrants with specific bilateral country characteristics, we also identify what type of bilateral trade relations are particularly encouraged by the presence of business network migrants. For instance, if business networks are catalysts of informational exchange and conductors of norms and rules (as argued in Rauch, 2001), they should be particularly important in facilitating trade between more culturally distant countries. We show that business networks are especially trade enhancing between countries with different legal origin and different official language.

One limitation of this paper is that the data set it employs is available only for one single year. We are therefore unable to control, in our regressions, for country-pair fixed effects that may capture specific heterogeneity affecting a particular trade relation. However, as we control for the total stock of immigrants, we are likely to absorb the effects of common factors

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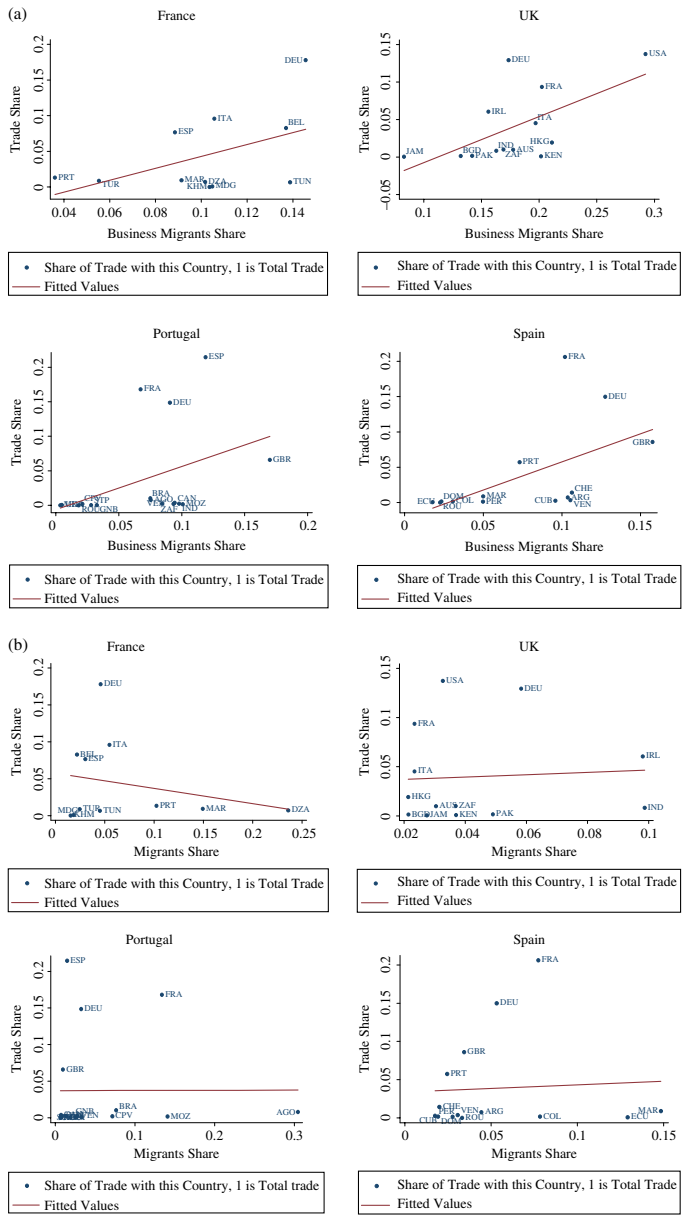
FIGURE 1
(a) Business Migrants Share and Share of Trade to Top Migration Sending Partners in Some Representative Countries. (b) Total Share of Immigrants and Share of Trade to Top Migration Sending Partners in Some Representative Countries



that influence bilateral trade and migration, isolating only the extra effect of business networks in the coefficient of interest.

The rest of the paper is organised as follows. Section 2 describes the data. Section 3 outlines the empirical strategy and discusses the results. Section 4 concludes.

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2. DATA

a. Data Sources

The data on bilateral stocks of migrants are obtained from the OECD DIOC-E database, which covers 89 destination countries and 233 countries of origin.[2] It includes information on 110 million migrants who are at least 15 years old, which represents around 72 per cent of all world migrants (Dumont et al., 2010). Immigrants are distinguished by age, gender, schooling level, labour market status and, most importantly, occupation, using the one-digit level ISCO classification. These data are compiled using numerous national sources, mainly censuses and population surveys. They are available for a cross section of countries in the sense that each country has information relative to one year only. Most of the data collected are relative to one year between 2000 and 2002. For a few of the included countries, the reference year is earlier (e.g. 1996 for Uruguay) or somewhat later (e.g. 2005 for Nicaragua). USA, Argentina, Turkey and Japan use an occupational classification very different from ISCO. They are thus excluded from the analysis.

Data on bilateral trade flows originate from two sources. First, the total value of imports and exports is from the CEPII 'square' gravity data set compiled by Head et al. (2010). This database also contains the set of all other standard gravity variables, such as geographical distance between countries, information on contiguity, common language, past colonial ties and a dummy RTA for having a regional trade agreement in place. The bilateral trade data are merged with the bilateral migration data using the year in which the migration data are observed. Trade data are unavailable for some origin countries, such as the Democratic Republic of Congo, or Serbia and Montenegro, as well as for some country pairs. Thus, the final data set used for the empirical analysis contains 5,097 non-zero observations for exports, and 4,978 non-zero observations for imports (5,230 observations for both imports and exports, if zero trade flows are included). The description of the variables and the summary statistics for each one of them is reported in Table A1 of the Appendix.

Second, to distinguish trade between homogeneous, intermediate and differentiated goods, we use CEPII-BACI data disaggregated at 6-digit product level (Gaulier and Zignago, 2010). These data are matched with the estimated elasticities of Broda and Weinstein (2006) that characterise the degree of differentiation of products within sector. We first use the correspondence table between 6-digit Harmonised Commodity Description and Coding System (HS-6) and the 5-digit SITC Revision 3 nomenclature. The products are further aggregated into three categories according to their elasticity of substitution into homogeneous goods (elasticity above 3.5), intermediate goods (elasticity between 2 and 3.5) and differentiated products (elasticity below 2).

b. Business Network Immigrants: Definitions

Using the OECD DIOC-E database, we measure the size of a bilateral business network as the number of immigrants who work in the destination country in business network occupations. As we mentioned in the Introduction, occupations classified under group 1 of the one-digit occupational ISCO classification are those likely to be most relevant to establish

[2] The database is not 'square', however. In some countries, like Greece, information on up to 206 origin sources is available, in others, like the Netherlands, only the four largest countries of origin are known. On average, there are 96 migrant origin countries per destination.

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international business relations and networks. They include jobs such as senior government officials in special-interest organisations, and managers of enterprises (see Table A2 for the full list of occupations under this group). Government officials may promote trade between countries through their capability to establish long-lasting contacts, initiate bilateral and multilateral relations and influence specific trade policies. Top-level managers are the key decision-makers on international activities of their companies, and they are directly involved in their realisation. These professionals have a direct role in channelling relevant information and knowledge of potential export markets and import opportunities and in facilitating the understanding of cultural and business practice differences.

We have also examined other occupations which may be relevant in promoting trading networks and in acquiring information to the trading firm. Specifically, individuals employed in occupations within group 5 (shop, stall and market salespersons and demonstrators) may also perform some of the business-related functions, although at a lower level of responsibility. Finally, occupations in group 9 (sales and services elementary occupations, street vendors, and door-to-door and telephone salespersons – see Table A3) may likewise play a role in creating trade connections, especially in trade in differentiated and cultural goods. However, as groups 5 and 9 also contain numerous other occupations that are not related to trade in a direct way, immigrants in those groups are likely to be significantly less relevant for trade. Immigrants employed in any other occupation are defined as non-business network immigrants.[3]

It is interesting to note that the geographical distribution of business migrants (based on group 1 definition) is significantly different from the distribution of the total emigrant stock from any given country. We report in Table A4 of the Appendix countries with the largest stock of emigrants and those with the largest network of business emigrants. The top four countries of origin are the same in the two tables. However, starting from the fifth position, this is not any longer the case. The countries of origin with large stock of emigrants are no longer home to large business network migrants. Moreover, Azerbaijan, USA, Colombia, Georgia, France, China and Algeria appear on the list of top origin countries for business migrants, while none of them is among the top overall migrant origin countries. For some large sending countries, such as Ukraine, Kazakhstan, India or Portugal, top destinations for any migrant and for a business migrant differ as well. This once again suggests the importance of properly capturing both the numbers and the location choices – or sorting – of what one wants to call a business migrant network.

In several countries, business networks as defined above are empty: they are zero or missing, even if there is a non-zero bilateral stock of immigrants. Take, for example, the case of Kazakhstan: its migrants are present in 34 countries, but business migrants are present only in 24 of them (Table A4). In such cases, empty business network cells represent a genuine absence of business network individuals for some country pairs, rather than missing or incorrect data. They hence carry valuable information, and it is important to consider them in the analysis. We thus include these countries into the main analysis, and in the linear-in-logs specifications, we add one to business migration networks. We also check whether including

[3] Some individuals are coded as belonging to the 99th occupation group while there is no such ISCO classification code. These individuals are treated as belonging to non-business networks. Alternatively, we also aggregated them into group 9 of 1-digit ISCO aggregation, and this did not affect the estimation results.

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these zero business networks biases the results. In total, there are 77 per cent non-zero business network observations. The average number of economically active immigrants in a given country pair is 5,118, while the average number of business migrants is 631.

3. EMPIRICAL STRATEGY AND RESULTS

a. Empirical Specification

In our empirical specification, we follow the literature that estimates the effect of migration on bilateral trade, using theory-based gravity-type estimations (Feenstra, 2004). As we have only a cross section available to us, we follow Anderson and Van Wincoop (2003) in the choice of controls and fixed effects. In our main empirical specification, we consider the (log of the) number of the business network immigrants as the relevant variable affecting trade. The rest of the specification is fairly standard:

$$\ln(T_{sdt}) = \alpha_0 + \alpha_1 \ln(share^k_{sdt}) + \alpha_2 \ln(IMMIGRANT_{sdt}) + \alpha_3 \ln Distance_{sd} + \alpha_4 Contig_{sd} + \alpha_5 ComLang_{sd} + \alpha_6 Colony_{sd} + \alpha_7 RTA_{sdt} + s_s + d_d + t_t + u_{sdt}. \quad (1)$$

In specification (1), the variable *ln* (T_{sdt}) measures the logarithm of bilateral value of trade between sending (s) and destination countries *(d)* at time *t*. The exact measure of trade could be, depending on the specification, total export or total import, or disaggregated exports or imports by homogeneous, intermediate and differentiated goods. The variable *ln* (*IMMIGRANT*$_{sdt}$) is the logarithm of total bilateral stock of economically active immigrants aged 15+, born in country *s* and resident of country *d*, at time *t*. The variable $\ln(share^k_{sdt})$ is the count of immigrants in a specific occupation group *k* (that proxies for the business network), as share of total immigrants, also in logs. In particular, the superscript k can take the value 'bus1' that corresponds to ISCO occupation group 1 or value 'bus59' that corresponds to ISCO occupation groups 5 and 9; 'bus' standing for 'business'.

In equation (1), we use the fact that the total size of the immigrant business network, call it *(ImmigrantBus.Network)*$_{sdt}$, is equal to total immigrants multiplied by the share of those in business network occupations. Specifically $(ImmigrantBus.Network)_{sdt} = (share^k_{sdt} \times IMMIGRANT_{sdt})$. Hence, by taking logs and using log properties, we can separate the effect into two terms: $\ln(share^k_{sdt})$ and *ln(IMMIGRANT*$_{sdt}$*)*. The advantage of this type of specification is that it directly builds on the previous studies examining the migration–trade nexus. In addition, in our cross-sectional setting, aggregate migration term also absorbs omitted variables that affect both trade and total migration, allowing us to single out the extra effect of the share of business immigrants on trade.

In some specifications, we include as a falsification test the $share^{nbus}_{sdt}$ where the superscript '*nbus*' indicates all other ISCO occupation groups or non-business migrants. The rest of the equation includes standard gravity controls, such as the logarithm of the distance, dummies to capture the contiguity between two countries, common language, colonial past and the presence of regional trade agreements. They all contribute to controlling for the bilateral trade costs. Furthermore, we also include the full set of host-country d_d and sending country s_s fixed effects to control for the multilateral resistance terms, as prescribed in Anderson and Van Wincoop (2003) and Baldwin and Taglioni (2006). While the data are a cross section and hence each county-pair is observed only once, we include dummies t_t for the exact year of data collection (as it varies from 1996 to 2005).

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b. Aggregate Business Networks and Aggregate Trade

Table 2 shows the main results of the basic specifications. In columns 1–10, the dependent variable is the logarithm of the total value of bilateral imports or exports in US dollars. This linear-in-logs specification converts the zero trade flows into missing, and thus, the sample is restricted to observations with non-zero trade flows.

In columns 1 and 2 of Table 2, we include only the logarithm of the total number of immigrants employed in occupations of group 1, the business networks, $\ln(ImmigrantBus.Network)_{sdt}$, as the explanatory variable of interest. The coefficient on this variable is positive and statistically significant for both exports and imports. These regressions, however, combine in one coefficient the business network effects, which are the focus of our analysis, and the indirect effects of all immigrants that may also absorb some bilateral omitted variables affecting total migration.

In columns 3–4, we implement our preferred specification. In these regressions, we control for the logarithm of the total number of immigrants, and in addition, we include the log of the share of the business network immigrants in the same bilateral relationship. The coefficient on the log of total migrants is positive and significant in both regressions on imports and exports. Its magnitude is around 0.26, which is within the range of values reported in similar studies.[4] In addition to this, the coefficient on the share of immigrants in business networks occupations is positive and statistically significant at 5 per cent for imports. This suggests that individuals in business networks have an impact above and beyond that of the total number of migrants in promoting trade. An increase by 1 per cent in the share of immigrants employed in the business network occupations increases imports by about 0.065 per cent, given the same total stock of immigrants and holding all other country-pair variables constant.

The specifications in columns 3 and 4 of Table 2 include the share of business migrant and the total number of immigrants both in logs. One may be concerned that taking a log of a share is not recommendable, and possibly that this induces distortions when adding a value of one to the numerator (immigrants in the business sector) before taking the share. Concerns about the inclusion of zero observations in the log-transformation of the explanatory variables rather than dependent variables are less frequent in the literature. Nevertheless, adding one to a variable before log-transformation can bias the results as the variance in the left-hand side of the distribution of such variable would be inflated. Therefore, we also performed regressions in which we include linearly the share of migrants in business occupations (Table 2, columns 5 and 6). We selected the most inclusive definition of business migrants, encompassing groups 1, 5 and 9, and in these specifications, we do not control for the (logarithm of) total immigrants.[5] These results show that an increase in the share of immigrants in the business sector is associated with an increase in both imports and exports, and both are significant. We, however, prefer the specification in columns 3 and 4: they are more conservative in assessing the effect of business network migrants, they allow building directly on earlier studies, and they allow assessing the additional impact of business migrants, as compared to average migrants, on trade.

In the remaining columns of Table 2, we check for the robustness of this result. We begin by checking alternative definitions of business networks. When we include the share of immigrants in

[4] See Peri and Requena (2010), Table 1, for a survey of recent findings in the literature. Most of the estimates of the elasticity of trade to total migration found in the literature range between 0.1 and 0.25.
[5] Business networks, inclusive of groups 1, 5 and 9, also fare well in specification such as Table 2, columns 1 and 2. Point estimates are 0.244 for imports, and 0.232 for exports.

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TABLE 2
The Effect of Business Networks on Trade: Basic Specifications

	LImports (1)	*LExports* (2)	*LImports* (3)	*LExports* (4)	*LImports* (5)	*LExports* (6)	*LImports* (7)	*LExports* (8)	*LImports* (9)	*LExports* (10)	*LImports* $t+2$ (11)	*LExports* $t+2$ (12)	*Imports* (13)	*Exports* (14)
ln (Immigrant Bus. Network)	0.255**	0.255**												
	(0.019)	(0.019)												
$\ln(share^{bus1})$			0.065*	−0.009							0.095*	0.045	0.121**	0.071**
			(0.033)	(0.026)							(0.048)	(0.041)	(0.030)	(0.022)
$\ln(share^{bus59})$							−0.021	−0.048						
							(0.036)	(0.031)						
$\ln(share^{nbus})$									−0.450**	−0.329**				
									(0.162)	(0.111)				
$share^{bus}$					0.350*	0.297**								
					(0.145)	(0.112)								
ln(IMMI-GRANT)			0.280**	0.258**			0.264**	0.259**	0.252**	0.250**	0.292**	0.297**	0.188**	0.171**
				(0.016)			(0.018)	(0.015)	(0.018)	(0.014)	(0.019)	(0.017)	(0.016)	(0.017)
			(0.019)											
ln(Distance)	−1.241**	−1.382**	−1.169**	−1.286**	−1.451**	−1.565**	−1.164**	−1.283**	−1.161**	−1.281**	−1.037**	−1.147**	−0.789**	−0.834**
	(0.049)	(0.043)	(0.050)	(0.044)	(0.048)	(0.041)	(0.051)	(0.044)	(0.051)	(0.044)	(0.051)	(0.046)	(0.043)	(0.049)
Contiguity	0.069	0.216*	−0.022)	0.107	0.419**	0.528**	−0.009	0.113	0.038	0.145	0.147	0.272*	0.184**	0.228**
	(0.142)	(0.123)	(0.142)	(0.120)	(0.152)	(0.135)	(0.143)	(0.120)	(0.143)	(0.120)	(0.133)	(0.123)	(0.049)	(0.059)
Common language	0.290**	0.230**	0.273**	0.201**	0.531**	0.441**	0.282**	0.191*	0.269**	0.187*	0.131	0.168*	0.066	0.010
	(0.100)	(0.079)	(0.099)	(0.078)	(0.101)	(0.082)	(0.099)	(0.078)	(0.099)	(0.077)	(0.098)	(0.082)	(0.064)	(0.073)
Colony	0.698**	0.662**	0.626**	0.569**	1.281**	1.176**	0.659**	0.570**	0.685**	0.586**	0.627**	0.495**	0.200*	0.121
	(0.130)	(0.108)	(0.129)	(0.105)	(0.138)	(0.113)	(0.129)	(0.105)	(0.128)	(0.104)	(0.125)	(0.099)	(0.079)	(0.095)
RTA	−0.083	−0.172*	−0.0764	−0.159*	−0.035	−0.126	−0.0621	−0.149*	−0.039	−0.137*	0.136	−0.160*	0.451**	0.464**
	(0.085)	(0.075)	(0.084)	(0.074)	(0.089)	(0.078)	(0.085)	(0.074)	(0.085)	(0.074)	(0.088)	(0.081)	(0.075)	(0.079)
Observations	4,978	5,097	4,978	5,097	4,978	5,097	4,978	5,097	4,978	5,097	3,953	4,009	5,441	5,441
R-squared	0.794	0.826	0.795	0.831	0.786	0.82	0.795	0.831	0.796	0.832	0.806	0.83		

Notes:
(i) Dependent variable in columns 1–10 is the log of total value of trade in US dollars (import or export). Dependent variable in columns 11–12 is the log of total value of trade in US dollars (import or export) measured in year $t + 2$.
(ii) Estimation method: OLS. Dependent variable in columns 13–14 is the level of total value of trade in US dollars, including zero trade flows. Estimation method: PMLE. All regressions include time, receiving and sending country fixed effects; robust standard errors are clustered on country pairs.
(iii) ** Significant at 1%; * Significant at 5%.

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occupations within groups 5 and 9 only, we do not find any additional effects on trade (columns 7 and 8). This emphasises the crucial role of immigrants in managerial and top sales position in producing the additional effect on trade. In contrast, the share of immigrant workers in other, non-business and occupations (columns 9–10) has a statistically significant negative effect. Given that we control for the total number of migrants in this specification, this result implies that non-business migrants contribute less to trade than an average migrant. In fact, having a large share of non-business migrants among total immigrants would reduce the beneficial impact of immigration on trade, which will still remain positive, however.

One of the concerns with the cross-sectional type of estimation is the potential joint determination of migration and trade. In fact, in our case, this concern is mitigated by several considerations. First, our migration variable is a stock rather than a flow. This means that it includes migrants with a long-term residence, and not only the new-comers, thus mitigating the possible reverse causality channel. Second, as we control for the stock of immigrants and we focus on the effect of immigrant business networks, it is likely that omitted variables affecting migration and trade are controlled for by the total stock of immigrants. They are absorbed by that term and the additional effect of the share of business immigrants on trade cannot be driven by a generic omitted variable affecting total migration. Some authors emphasise that, in a panel setting, accounting for unobserved pair-specific heterogeneity either by differencing (Felbermayr and Jung, 2009) or by including pairwise country effects (Parsons, 2011) is important to correctly identify the migration–trade relationship. Our data, being cross-sectional, do not allow us to include these very demanding bilateral fixed effects. We still include a destination and sending country fixed effects to control at least for unobservable country-specific factors and for the multilateral resistance terms. And lastly, to address the issue further, we use the trade data in period $t + 2$. By so doing, the stock of immigrants is further predetermined with respect to trade.[6] The effect of business networks is robust to this correction (Table 2, columns 11 and 12).

One of the problems with the linear-in-logs specification adopted in columns 1–10 of Table 2 is that the conversion of the zero trade flows into missing values may introduce selection bias and cause loss of valuable information. The gravity literature offers several ways of dealing with this problem. First, it is possible to add a small number (usually one) to the actual value of the dependent variable (trade flows). We can then perform an OLS estimation using this new variable.[7] We have augmented the total value of trade by one, and by 10 dollars, and found that the magnitude of the coefficient on the share of business immigrants almost doubles in the export regressions and becomes statistically significant, while it changes only slightly, in the import regression. In both cases, immigrants in the business network remain a significant determinant of imports and exports. These results – not reported in the tables – are available on request. Alternatively, the literature (Santos Silva and Tenreyro, 2006) suggests employing Poisson maximum likelihood (PMLE) method of estimation, so that the dependent variable can be included in levels rather than in logs, and we can include the zero values of trade as they are. We check the robustness of our results to this estimation method. It produces consistent estimates only if the error terms satisfy the log normality and

[6] We also included values of trade at $t + 5$, and the results remained relatively robust to this (they are available on request). At the same time, our trade data are only available until 2006; thus, in such regressions, we are losing some of the migration data: our migration sample drops to years 1995–2001, which means dropping 21 of 89 destination countries.

[7] There is little guidance in the literature as to the choice of this small number, and several authors have stressed high sensitivity of the results to the chosen number (see, for instance, Head et al., 2010).

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homoscedasticity conditions, which are indeed very strong assumptions. PLME may even produce serious bias if the number of zeros is large (Martin and Pham, 2009). In our sample, about 25 per cent of the observations for imports and 22 per cent of observations for exports have zero values, which is relatively low. The results of PMLE estimation are shown in columns 13 and 14 of Table 2. For imports, these results are similar to the OLS estimates: the coefficient on the logarithm of the share of business network immigrants is positive and statistically significant, although it almost doubles in magnitude. For exports, we also find a positive and significant sign on the coefficient on the logarithm of the share of business network immigrants. We thus can conclude that the simpler and more robust least square estimations perform relatively well: the most consistent and significant effect of business networks is found on imports. The importance of information diffusion through business networks seems to encourage imports in the country of destination. In what follows, we use the more standard OLS technique based on non-zero trade flows, and we will analyse more in depth how this effect varies across goods and countries.

Overall, the effect of business network immigrants on imports is always significant, robust and stable across specifications. In contrast, the effect on exports is more unstable and less precisely estimated. This implies that preferences of business network immigrants may affect the imports of their trading companies. At the same time, if imports are intermediate goods which are used in production and re-export, information relative to opportunities to purchase them can reduce the fixed costs of opening up a new import relationship. This effect on import seems stronger than on export, also possibly because the uncertainty on the quality/reliability of a supplier is more important in affecting trade relationship than information/reliability of customers.

Before moving to more detailed analysis, let us provide the reader with an idea of the magnitude of this effect. Consider a 10 per cent increase in the average country-pair stock of active migrants. This would amount to an increase from 5,118 to 5,630 immigrants, or 512 individuals per country pair. Without taking into account the occupational differences, this increase would lead to a 2.8 per cent rise in total imports (coefficient on *ln(IMMIGRANT*) from Table 2, column 3). Given that the average value of imports in the sample is $484.88 million, such an increase would equal $13.58 million. This means that one additional average immigrant generates an extra $26,516 value of imports.[8] However, if these additional 10 per cent of immigrants were to be all employed in business network occupations, this would raise the average business share of migrants from 0.137 to 0.216, a 57 per cent increase. Using the coefficient on $ln(share^{bus1})$

[8] These numbers are comparable to those obtained by Head and Ries (1998), who found that an extra migrant in Canada generated $8,000 of imports almost two decades earlier. Given that the value of imports in the world has increase by about a half since the 1992, their projection year, while the world stock of migrants has increased by about 20 per cent (the World Bank, 2010); and given that our coefficient on *LIMMIGRANT* is also almost twice as high as the one obtained by Head and Ries (1998), our aggregate result is very similar to theirs. In contrast, our result is almost 10 times higher than the one obtained by Felbermayr and Jung (2009), who found that an additional migrant creates about $2,700 in additional trade in 2000. The discrepancy is due to (i) a different coefficient on *LIMMIGRANT*, which is twice as low in their study; (ii) a different average number of migrants per country pair (27,000 persons in their sample of OECD receiving countries, versus 5,118 persons in our sample); (iii) the fact that our measure of migrant stock is comprised of the active immigrant population, while they use total migrant stock, including inactive and out of the labour force individuals; (iv) different methodology used: Felbermayr and Jung (2009) use first-differences approach; (v) different dependent variable: we use imports and exports separately, rather than looking at geometric average of trade flows.

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reported in Table 2, column 3, such an increase would raise total imports by additional 3.71 per cent. An extra 'business' migrant would generate $35,124 additional value of imports (on top of the $26,516), and hence, in total, more than double as compared to an average migrant.

c. Business Networks and Trade of Homogeneous and Differentiated Goods

Table 3, columns 1–6 show the trade-creating effect of business networks when trade is disaggregated into different categories of goods according to their elasticity of substitution. This disaggregation allows testing a specific implication of the Chaney (2008) model. If migration reduces the fixed costs of doing business with a foreign country and hence the fixed cost of exporting there or of importing from there, this model suggests that highly differentiated goods should benefit more from such cost reduction as compared to other goods. The reduction of fixed costs, in fact, would allow entry of more firms into those markets.

We look separately at the effect on imports (columns 1–3) and exports (columns 4–6), continuing to proxy business networks with the share of immigrants employed in occupations of group 1 and controlling for the logarithm of total immigrants. Business networks based on occupations in group 1 have the strongest impact on imports and no significant effect on export. The most significant import effects of business network immigrants are achieved for differentiated and intermediate goods. This is in line with the information theory, if we

TABLE 3
Business Networks and Trade in Homogeneous and Differentiated Goods

	Imports			*Exports*		
	Differentiated (1)	*Intermediate (2)*	*Homogeneous (3)*	*Differentiated (4)*	*Intermediate (5)*	*Homogeneous (6)*
$\ln(\text{share}^{bus1})$	0.091**	0.110**	0.046	−0.025	0.007	0.004
	(0.034)	(0.033)	(0.037)	(0.028)	(0.027)	(0.029)
ln(IMMIGRANT)	0.287**	0.276**	0.259**	0.257**	0.281**	0.270**
	(0.021)	(0.019)	(0.022)	(0.016)	(0.017)	(0.018)
ln(Distance)	−1.139**	−1.146**	−1.309**	−1.357**	−1.355**	−1.400**
	(0.051)	(0.049)	(0.058)	(0.045)	(0.044)	(0.051)
Contiguity	−0.063	−0.023	0.038	−0.153	−0.266*	−0.040
	(0.136)	(0.131)	(0.139)	(0.128)	(0.126)	(0.132)
Common language	0.332**	0.242**	0.363**	0.299**	0.275**	0.175*
	(0.104)	(0.097)	(0.112)	(0.083)	(0.081)	(0.089)
Colony	0.643**	0.521**	0.432**	0.660**	0.630**	0.519**
	(0.135)	(0.124)	(0.127)	(0.112)	(0.112)	(0.117)
RTA	0.064	0.094	0.273**	0.029	0.0371	0.146*
	(0.088)	(0.082)	(0.091)	(0.078)	(0.075)	(0.083)
Observations	4,459	4,529	4,471	4,806	4,816	4,775
R-squared	0.83	0.829	0.787	0.821	0.822	0.789

Notes:
(i) Dependent variable: the logarithm of the value of trade in US dollars (import or export).
(ii) Estimation method: OLS.
(iii) All regressions include the full set of time, receiving and sending country effects; robust standard errors are clustered on country pairs.
(iv) ** Significant at 1%; * Significant at 5%.

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assume a fixed cost of setting up a new import location. The impact of the total number of migrants on trade is still positive and significant. Using these coefficients from column 1 of Table 3, a 10 per cent increase in the total stock of migrants, ceteris paribus, would raise imports in differentiated goods by 2.87 per cent. If the same number of extra migrants is employed in business-related occupations, ceteris paribus, imports in differentiated goods would go up by 5.19 per cent.[9] These results are in line with the theory that business networks should encourage especially trade of differentiated goods as in those cases information barriers may be particularly costly. We will also come back further to this issue when we consider the specific effect of immigrant network by education, in following subsection.

d. Business Networks: Occupational or Educational Effect?

Is it possible that our measure of business networks simply captures the effect of highly educated individuals on trade? Felbermayr and Jung (2009) have argued that highly educated immigrants are those most conducive to trade flows as they may be better vehicles of international information. To distinguish between the effect of the specific business network occupations and the effect of highly educated immigrants, we proceed as follows. First, using the information on the number of individuals with different levels of education, we control for the shares of individuals with secondary and tertiary education in addition to the business network share (Table 4, columns 1–2).[10] The estimates reveal that once we control for the share of immigrants in business network occupations, the share of highly educated immigrants is not significant any longer, while business network immigrants continue to be significant for import. In columns 3 and 4 of Table 4, we show a variation of the previous approach. Following the specification of Felbermayr and Jung (2009), we include as explanatory variables the stocks of immigrants disaggregated into three education categories: basic schooling, secondary schooling and tertiary schooling. We also include the share of immigrants in business network occupations. Similarly to these authors, we find a significant trade-creating effect of the highest education group for exports. In contrast, we also find a significant impact on imports of immigrants with secondary education and no trade-enhancing effect for those with only primary schooling. We also continue finding a strong effect of the business network shares on imports. Highly educated immigrants seem to encourage exports while business network immigrants seem more relevant in promoting imports.

To explore this issue further, we use the occupation and education definitions jointly. We group immigrant workers into business networks and education cells. We include the log of the share of business network immigrants with low, intermediate and high education level (Table 4, columns 5–8). In columns 5 and 6, the omitted group is the share of all non-business migrants. In columns 7 and 8, the omitted group is the share of non-business migrants with primary schooling only. The results show that only the share of immigrants who are both in business network occupations and highly educated has an unambiguous additional trade-

[9] We used also the Rauch (1999) classification into referenced, intermediate and differentiated goods. The results (not reported) are similar to those of Table 4, and the most significant effect of business networks is on the intermediate group of goods.

[10] Immigrants' education is reported under 4 categories: 1 – no education, completed primary, uncompleted secondary; 2 – completed secondary; 3 – completed tertiary; 99 – unknown. Individuals with unknown education are treated as if they were in category 1.

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TABLE 4
Business Networks and Education of Immigrants

	LImports (1)	*LExports* (2)	*LImports* (3)	*LExports* (4)	*LImports* (5)	*LExports* (6)	*LImports* (7)	*LExports* (8)
$\ln(share^{bus1})$	0.127 **	0.065	0.153**	0.016				
	(0.054)	(0.045)	(0.052)	(0.045)				
$\ln(share^{edu2})$	0.003	−0.124						
	(0.081)	(0.066)						
$\ln(share^{edu3})$	0.024	0.055						
	(0.069)	(0.061)						
$\ln(tot^{edu1})$			0.037	0.009				
			(0.044)	(0.039)				
$\ln(tot^{edu2})$			0.136*	0.034				
			(0.067)	(0.059)				
$\ln(tot^{edu3})$			0.088	0.217**				
			(0.056)	(0.050)				
$\ln(share_{bus1\_edu1})$					−0.165**	−0.080	−0.164**	−0.036
					(0.049)	(0.046)	(0.051)	(0.043)
$\ln(share_{bus1\_edu2})$					0.118*	−0.151*	0.114*	−0.172**
					(0.064)	(0.059)	(0.067)	(0.062)
$\ln(share_{bus1\_edu3})$					0.235**	0.305**	0.244**	0.238**
					(0.067)	(0.057)	(0.083)	(0.076)
$\ln(share_{nbus\_edu2})$							−0.010	0.098
							(0.114)	(0.102)
$\ln(share_{nbus\_edu3})$							−0.079	0.190**
							(0.091)	(0.094)
ln(IMMI-GRANT)	0.260**	0.258**			0.262**	0.209**	0.246**	0.226**
	(0.024)	(−0.0203)			(0.032)	(0.025)	(0.031)	(0.026)
Observations	3,470	3,498	3,115	3,137	1,794	1,796	1,744	1,747
R-squared	0.819	0.825	0.823	0.836	0.862	0.870	0.867	0.873

Notes:
(i) Dependent variable: the logarithm of the total value of trade in US dollars (import or export).
(ii) Estimation method: OLS.
(iii) All regressions include the full set of time, sending and receiving country effects, as well as distance, contiguity, common language, colonial past and RTA controls.
(iv) Robust standard errors are clustered on country pairs.
(v) ** Significant at 1%; * Significant at 5%.

creation effect beyond that of the overall number of immigrants, as compared to non-business migrants regardless of their education level. The effect of business network highly educated immigrants, we now find, is large and significant both on import and export. Furthermore, the share of poorly educated business network migrants has a negative impact on imports, implying that their contribution to trade is less than that of an average migrant. From column 8, non-business migrants with tertiary schooling also have a pro-export effect, suggesting that immigrants even in other occupations (e.g. doctors, engineers, professors, scientists) can help generating the kind of networks that induce trade.

Finally, Table 5 analyses the impact of the immigrant business networks on trade of homogeneous, intermediate and differentiated goods when controlling also for immigrants by schooling. Once the stocks of migrants by education level are controlled for, we find that business networks have a positive and significant effect on imports of any types of goods,

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TABLE 5
Business Networks and Education of Immigrants: Trade in Homogeneous and Differentiated Goods

	Imports			*Exports*		
	Differentiated (1)	*Intermediate (2)*	*Homogeneous (3)*	*Differentiated (4)*	*Intermediate (5)*	*Homogeneous (6)*
$\ln(\text{share}^{bus1})$	0.236**	0.158**	0.144**	0.003	0.047	0.115*
	(0.055)	(0.055)	(0.059)	(0.048)	(0.051)	(0.056)
$\ln(\text{total}^{edu1})$	0.038	−0.015	0.054	0.083**	0.069*	0.114**
	(0.039)	(0.038)	(0.043)	(0.037)	(0.039)	(0.042)
$\ln(\text{total}^{edu2})$	0.186**	0.275**	0.137**	−0.075	−0.024	−0.005
	(0.061)	(0.058)	(0.065)	(0.056)	(0.061)	(0.067)
$\ln(\text{total}^{edu3})$	0.081	0.049	0.099*	0.292**	0.286**	0.217**
	(0.052)	(0.052)	(0.055)	(0.045)	(0.048)	(0.057)
Observations	3,008	3,035	3,004	3,116	3,136	3,116
R-squared	0.841	0.843	0.820	0.836	0.824	0.805

Notes:
(i) Dependent variable: the logarithm of the value of trade in US dollars.
(ii) Estimation method: OLS.
(iii) All regressions include the full set of time, host and home fixed effects, as well as distance, contiguity, common language, colonial past and RTA controls.
(iv) Robust standard errors are clustered on country pairs.
(v) ** Significant at 1%; * Significant at 5%.

which is larger for differentiated goods and smaller for homogeneous goods. The effect on exports is instead small and not significant or only marginally so. This specification extends the one of Felbermayr and Jung (2009) to differentiated trade. Consistent with their general finding, immigrants with tertiary schooling are conductive to higher exports, and they also promote imports in homogeneous goods.[11] Controlling for the schooling level of immigrants is important because most of the impact on trade arises due of the share of tertiary educated. In fact, we find that highly educated individuals stimulate trade in almost all types of goods (in exports of differentiated, intermediate, and homogeneous goods, and in imports of homogeneous goods). However, even when we control for those, we find that trade can still benefit from specific business networks, especially when it concerns imports.

e. Interactions of Business Networks with Common Factors

Do business networks of migrants help to create trade between all country pairs equally? To quantify which type of bilateral relationship may be most affected, we further analyse the interactions of business networks with country-pair factors. Specifically, we look at interactions with common language,[12] common colonial past, common religion and common legal origin. In Table 6, these interactions are included one at a time.

[11] Trade disaggregation also suggests a potential role for immigrants with secondary schooling for imports.
[12] For the language variable, instead of the traditionally used 'common official language' variable, we also explored the 'aggregate index of linguistic indices' proposed in Melitz and Toubal (2012). This is as a newly built richer measure of language commonalities between countries. In the regressions

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The main business network effects on imports are, with some exceptions, still significant. At the same time, common language, colonial past and common legal origin reduce the importance of the business networks (although not always in a significant way). This is because if countries already have commonalities, the presence of business networks is less relevant. In these countries, there are fewer cultural barriers to trade to overcome, and the role of business networks as conductors of culture, norms and common values is less important. Conversely, in countries with different legal origin, the effect of business networks is more important. These countries differ in the way legal systems are organised. Such differences imply significant variations in the protection of outsider investors' and trade partner rights, in writing and enforcing contracts, including the ones related to shipment and supply, judicial procedures and settling disputes (La Porta et al., 2008). Bridging these differences with information acquired through the business networks, and relying on the credibility established by individual contacts is thus especially relevant for stimulating trade.

Common religion seems to be the only 'cultural variable' that works to strengthen the effects of business networks. This may be because religion would not establish *ex ante* trade ties, but once immigrants establish their networks, religion may reinforce them. This may be consistent with historical examples from some religions which were functional to establishing trade relations between some countries.[13] It is also in line with the idea that certain religions can be more conducive than others for forming international trade networks (Lewer and Van den Berg, 2007). The fact of belonging to the same religion may create additional reputation mechanisms that are vital for coordinating and reinforcing expectations between trading partners (Greif, 1989, 1993).

4. CONCLUSIONS

In this paper, we have proposed a new estimation of migration networks' impact on trade based on new, more precise measures of migration networks. We have shown that, controlling for the overall size of the bilateral stock of migrants, individuals employed directly in business network occupations produce a significant additional effect on trade and especially on imports from their home countries. They generate more than double value of trade compared with average migrants. Moreover, this occupation-based measure adds very valuable information to a schooling-based one in explaining bilateral trade and especially import of differentiated goods. When controlling for the bilateral stock of migrants, and for the share of tertiary educated migrants, knowing the share of business network migrants still increases the ability to predict trade, especially bilateral imports. It is business migrants with highest education that have the most unambiguous pro-trade effect. When controlling for schooling, we also find a particularly large effect of business networks on imports of differentiated goods, but also imports of intermediate goods are encouraged.

Our findings also suggest that the business network effect is especially important for culturally distant countries, such as countries with different legal origin or language. In such setting, business networks are particularly effective in fulfilling their function of information sharing, of helping overcome problems related to differences in legal enforcement, of

[13] Cohen (2002) reproduced in Felbermayr et al. (2010, p. 170), says: 'the Spanish Jews were indispensable for international commerce in the Middle Ages. […] Lebanese Christians developed trade between various parts of the Ottoman empire'.

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TABLE 6
Interactions of Business Networks with Bilateral Features

	LImports	*LExports*	*LImports*	*LExports*	*LImports*	*LExports*	*LImports*	*LExports*
	Language		*Colony*		*Religion*		*Legal origin*	
	(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
ln($share^{bus1}$)	0.072**	0.008	0.063*	−0.011	0.065*	−0.046	0.095**	0.011
	(0.035)	(0.027)	(0.034)	(0.026)	(0.038)	(0.028)	(0.035)	(0.027)
Interaction	−0.063	−0.135*	−0.009	0.043	−0.005	0.089**	−0.160**	−0.102**
	(0.072)	(0.058)	(0.065)	(0.068)	(0.038)	(0.029)	(0.048)	(0.041)
ln (IMMIGRANT)	0.279**	0.257**	0.279**	0.255**	0.279**	0.255**	0.278**	0.255**
	(0.019)	(0.016)	(0.019)	(0.016)	(0.019)	(0.015)	(0.019)	(0.016)
Colony	0.621**	0.558**	0.596**	0.652**	0.618**	0.559**	0.602**	0.544**
	(0.130)	(0.106)	(0.201)	(0.190)	(0.130)	(0.105)	(0.131)	(0.107)
Religion	−0.038	0.174**	−0.038	0.173**	−0.050	0.363**	−0.041	0.172**
	(0.066)	(0.052)	(0.066)	(0.052)	(0.108)	(0.087)	(0.066)	(0.052)
Legal	0.085	−0.045	0.082	−0.049	0.082	−0.049	−0.234*	−0.249**
	(0.067)	(0.057)	(0.067)	(0.057)	(0.067)	(0.057)	(0.123)	(0.107)
ln(Distance)	−1.173**	−1.285**	−1.170**	−1.278**	−1.170**	−1.281**	−1.168**	−1.277**
	(0.050)	(0.044)	(0.051)	(0.044)	(0.050)	(0.044)	(0.050)	(0.044)
Contiguity	−0.044	0.078	−0.028	0.114	−0.029	0.136	−0.060	0.090
	(0.143)	(0.121)	(0.142)	(0.119)	(0.142)	(0.119)	(0.142)	(0.119)
RTA	−0.088	−0.165*	−0.082	−0.152*	−0.083	−0.145*	−0.093	−0.159*
	(0.085)	(0.074)	(0.085)	(0.074)	(0.084)	(0.074)	(0.085)	(0.074)
Comlang	0.107	−0.0878	0.245*	0.208*	0.245*	0.206*	0.244*	0.206*
	(−0.195)	(−0.159)	(−0.104)	(−0.082)	(−0.104)	(−0.0826)	(−0.103)	(−0.083)
Observations	4,978	5,097	4,978	5,097	4,978	5,097	4,978	5,097
R-squared	0.796	0.832	0.795	0.832	0.795	0.832	0.796	0.832

Notes:
(i) Dependent variable is the log of total value of trade in US dollars (import or export).
(ii) Estimation method: OLS.
(iii) First row heading indicates the dependent variable. Second row heading indicates the variable that is interacted with the variable $ln(share^{bus1})$ (i.e. language, colony, religion, legal origin). Each interaction is included once at a time.
(iv) All regressions include time, host and home fixed effects; robust standard errors are clustered on country pairs.
(v) ** Significant at 1%; * Significant at 5%.

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providing legal advice and experience. As the international legal systems remain weak, and trade disputes are settled mainly in national courts using national legislations, migrant business networks play the key role of informational intermediaries. If receiving countries are to expand trade-related benefits from migration, clearly, promoting entrepreneurship and facilitating establishment of businesses by migrants can be valuable. For example, policies such as the European blue card, which favours the free movement of highly skilled individuals (business network migrants among them) and provisions as the E-2 visa for entrepreneurs (who invest and hire local workers in the United States) would encourage trade with the countries of origin of those immigrants.

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APPENDIX

TABLE A1
Variables Description and Sample Statistics

Variable	*Description*	*Obs*	*Mean*	*SD*	*Min*	*Max*
ln(Exports)	Log of total value of exports in US dollars	5,097	16.40	3.24	2.78	26.25
ln(Imports)	Log of total value of imports in US dollars	4,978	16.07	3.68	2.57	25.92
ln(ImmigrantBus. Network)	Log of total number of immigrants in occupations of ISCO group 1, plus one, in a given country pair	6,594	2.55	2.45	0.00	12.84
$\ln(share^{bus1})$	Log of the ratio of total number of immigrants in occupations of ISCO group 1 plus one, over the total number of active immigrant population in a given country pair	6,594	−1.92	1.37	−13.10	0.69
$\ln(share^{bus59})$	Same, for ISCO groups 5 and 9	6,594	−1.13	0.88	−10.06	0.69
$\ln(share^{nbus})$	Same, for all other ISCO groups	6,594	−0.04	0.30	−3.30	0.69
ln(IMMIGRANT)	Log of total number of active immigrant population, aged 15+ plus one in a given country pair	6,594	4.59	2.79	0.69	14.54
ln(Distance)	Log of population-weighted distance between countries, km	5,441	8.53	0.90	5.08	9.89
Contiguity	1 for countries sharing a border	5,441	0.04	0.19	0.00	1.00
Common language	1 for countries sharing a common official or primary language	5,441	0.15	0.36	0.00	1.00
Colony	1 for countries ever having a colonial relationship	5,441	0.04	0.19	0.00	1.00
RTA	1 for countries having a regional trading agreements in force	5,441	0.14	0.35	0.00	1.00
$\ln(share^{edu2})$	Log of the ratio of immigrants with secondary education plus one over the total number of migrants in a given country pair	5,592	−0.94	0.64	−5.18	0.69
$\ln(share^{edu3})$	Same for tertiary education	5,951	−0.75	0.79	−8.00	0.69
$\ln(tot^{edu1})$	Log of the total number of immigrants with primary education in a given country pair plus one	4,810	3.95	2.58	0.69	13.13
$\ln(tot^{edu2})$	Same for secondary education	5,592	4.09	2.52	0.69	14.09
$\ln(tot^{edu3})$	Same for tertiary education	5,951	4.03	2.44	0.69	13.30
$\ln(share^{bus1\_edu1})$	Log of the ratio of immigrants in ISCO group 1 and having primary education plus one, over the total number of immigrants in a given country pair	2,368	−4.17	1.30	−10.12	0.00
$\ln(share^{bus1\_edu2})$	Same for secondary education	3,537	−3.23	1.12	−8.69	0.00
$\ln(share^{bus1\_edu3})$	Same for tertiary education	4,304	−2.62	1.15	−9.00	0.00
$\ln(share^{nbus\_edu2})$	Same for non-business network, secondary	5,501	−1.19	0.62	−5.20	0.00
$\ln(share^{nbus\_edu3})$	Same for non-business network, tertiary	5,784	−1.07	0.74	−8.11	0.00

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TABLE A2
Occupations under Group 1 of ISCO-88 Classification

11	Legislators and senior officials
111	Legislators and senior government officials
114	Senior officials of special-interest organisations
1141	Senior officials of political party organisations
1142	Senior officials of employers', workers' and other economic-interest organisations
1143	Senior officials of humanitarian and other special-interest organisations
12	Corporate managers
121	Directors and chief executives
122	Production and operations managers
1221	Production and operations managers in agriculture, hunting, forestry and fishing
1222	Production and operations managers in manufacturing
1223	Production and operations managers in construction
1224	Production and operations managers in wholesale and retail trade
1225	Production and operations managers in restaurants and hotels
1226	Production and operations managers in transport, storage and communications
1227	Production and operations managers in business services enterprises
1228	Production and operations managers in personal care, cleaning and related services
1229	Production and operations managers not elsewhere classified
123	Other specialist managers
1231	Finance and administration managers
1232	Personnel and industrial relations managers
1233	Sales and marketing managers
1234	Advertising and public relations managers
1235	Supply and distribution managers
1236	Computing services managers
1237	Research and development managers
1239	Other specialist managers not elsewhere classified
13	Managers of small enterprises
131	Managers of small enterprises
1311	Managers of small enterprises in agriculture, hunting, forestry and fishing
1312	Managers of small enterprises in manufacturing
1313	Managers of small enterprises in construction
1314	Managers of small enterprises in wholesale and retail trade
1315	Managers of small enterprises of restaurants and hotels
1316	Managers of small enterprises in transport, storage and communications
1317	Managers of small enterprises of business services enterprises
1318	Managers of small enterprises in personal care, cleaning and related services
1319	Managers of small enterprises not elsewhere classified

TABLE A3
Other Occupations with Business-oriented Potential

52	Models, salespersons and demonstrators
522	Shop, stall and market salespersons and demonstrators
5220	Shop, stall and market salespersons and demonstrators
91	Sales and services elementary occupations
911	Street vendors and related workers
9111	Street vendors
9113	Door-to-door and telephone salespersons

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TABLE A4
Top 15 Origin Countries for All Migrants in the Sample

Country of Origin	*Total Stock (number) of Emigrants*	*Present in this Number of Destination Countries*	*Top 1 Destination Country*	*Top 2 Destination Country*
Ukraine	2,367,370	48	Russia	Israel
Kazakhstan	1,643,157	34	Russia	Germany
Great Britain	1,346,297	57	Australia	Canada
Germany	966,422	59	Great Britain	Switzerland
Russia	916,444	53	Germany	Israel
India	828,163	52	Great Britain	Nepal
Turkey	812,900	49	Germany	Austria
Poland	782,453	48	Germany	Canada
Italy	777,299	53	Switzerland	Canada
Bosnia and Herzegovina	754,986	42	Croatia	Switzerland
Morocco	697,622	44	France	Spain
Portugal	613,659	46	France	Canada
Belorussia	556,140	42	Russia	Lithuania
Indonesia	546,504	41	Malaysia	The Netherlands
Uzbekistan	546,114	34	Russia	Kyrgyzstan

TABLE A5
Top 15 Origin Countries for Business Migrants in the Sample

Country of Origin	*Total stock (number) of Business Emigrants*	*Present in this Number of Destination Countries*	*Top 1 Destination Country*	*Top 2 Destination Country*
Ukraine	391,991	44	Russia	Poland
Kazakhstan	201,429	24	Russia	Kyrgyzstan
Great Britain	199,109	55	Australia	Canada
Germany	138,250	57	Great Britain	Russia
Azerbaijan	89,248	18	Russia	Armenia
Italy	87,183	52	Canada	France
USA	82,121	56	Great Britain	Canada
India	77,558	49	Great Britain	Canada
Uzbekistan	70,187	20	Russia	Kyrgyzstan
Georgia	67,253	25	Russia	Armenia
Portugal	61,193	37	Brazil	Venezuela
Colombia	60,427	38	Venezuela	Spain
France	58,899	53	Great Britain	Spain
China	57,749	56	Canada	Australia
Algeria	53,768	34	France	Canada

Sources: Authors' calculations based on OECD DIOC-E database.

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