EXPATRIATES AND TRADE

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Expatriates and Trade*

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Abstract

The study quantifies the contribution to bilateral trade flows of expatriates from the OECD economies living in less developed countries. Similarly to the results of the existing research that focused on immigrants moving in the opposite direction, the expatriates promote trade between the country of origin and country of residence. The expatriates' facilitation of trade is nonetheless relatively weaker and works likely through different channels. Using a unique dataset on bilateral migration stocks, a 10 percent increase in the size of an expatriate community leads to a 0.6 percent average increase in its OECD trade partner's imports against a 2.5 percent impact of immigrants in OECD countries. The import facilitating role of expatriate networks is centered in host countries with low institutional quality. In economies lying within the lowest third of the institutional quality distribution, a 10 percent increase in expatriate stock would lead to a 1.7 percent increase in imports into their country of origin. The figures on expatriates' role in exports are not statistically different from zero.

Abstrakt

V této studii kvantifikuji příspěvek emigrantů z vyspělých zemí OECD, kteří žijí v rozvojových zemích. Emigranti ze zemí OECD podporují mezinárodní obchodní toky. Narozdíl od stávajícího výzkumu, jenž potvrzuje pozitivní roli vztah mezi migrací a mezinárodním obchodem, je však jejich role relativně menší a operuje pravděpodobně prostřednictvím odlišných mechanizmů. Prostřednictvím nové databáze ukazuji, že 10 procentní nárůst populace emigrantů vede k pouze 0.6 procentnímu nárůstu importů do rozvojové země, ve které sídlí. U imigrantů v zemích OECD činí tento nárůst 2.5 procenta. Největší efekt lze nalézt v rozvojových zemích s hůře fungujícími institucemi. Výsledky pro exporty z rozvojové země, kde emigranti z OECD působí, nejsou statisticky odlišné od nuly

Keywords: international trade, migration, informal trade barriers
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1 Introduction

Extensive evidence exists which reveals that immigrant networks facilitate bilateral trade between their country of origin and host economies (e.g., Gould, 1993; Head and Ries, 1998; Combes, Lafourcade and Mayer, 2005). The main operating mechanisms include the transmission of information, knowledge of local institutions in trade partner's market, informal contract enforcement among the network's members, and transplanted demand for home-country products. Immigrants' knowledge of cultural patterns, social values, and organization of society in their country of origin helps identify profitable trade opportunities and works towards their successful realization. Similarly, the inefficient bureaucracy, weak legal culture and enforcement institutions of many countries increase trade costs that immigrants could avoid through own contacts and enforcement rules.[1]

It remains *ex ante* unclear what and how strong mechanisms are at work for a less typical case of migration, namely that of OECD expatriates located in generally poorer, less developed countries.[2] For example, immigrants tend to concentrate at either the top or bottom of a host country's occuptional ladder (see Stalker, 2000). While a significant fraction of immigrant populations in OECD countries occupy lower-status jobs, and entrepreneurship in the trade sector might be one of a few profitable alternatives, expatriates are likely to face a relatively wider range of opportunities. In addition, as advanced market economies dispose of dense trading infrastructure and information flows, the host's demand for expa-

[1] Greif (1994) describes the evolution of informal enforcement mechanisms among the 14th century Maghribi traders in an environment where formal contracting rules were absent.

[2] Since migrants from advanced market economies are likely to differ from typical migrants from developing countries in their income levels, access to credit, or motivation to migrate, I label the former 'expatriates' rather than 'immigrants'.

triate network services might be lower. Expatriates might be also less able to understand the actual functioning of a host's society as compared to immigrants with ties to a source country. Finally, expatriate populations tend to be distinctly smaller in comparison to their counterparts in OECD countries.[3]

The present study analyzes the trade impact of expatriates from advanced market economies such as the U.S. or Canada that are located in less developed countries and compares it to the trade effect of immigrants in OECD economies. By using migrant stocks of *both* trading partners, the approach differs from the existing empirical work that typically takes the perspective of a host country with zero emigration and relates the immigrant stocks (or flows) to the country's bilateral trade figures. The approach thus removes the artifitial distinction between host and source countries and allows for richer differentiation of migrant effects on trade.

The study also investigates the trade impact of immigrants from former colonies. Trade partners with fa former colonial relationship might have more similar social and political institutions, so that the value added of the immigrants' knowledge might relatively decrease. I test this hypothesis for a number of past colonial powers and complement the existing empirical evidence for the UK data by Girma and Yu (2002).

The following section reviews the empirical evidence on the role of immigrant ties in international trade. Sections 3 and 4 provide the details on data sources and methodology, Section 5 presents empirical results, Section 6 checks for the robustness of results, and the final section concludes.

[3] On the other hand, Gould (1993) finds that the impact of immigrant networks decreases with size, thus favoring a relatively larger role for networks from developed host economies.

2 Trade and migrant networks

Given the existing data constraints and the lack of information on *bilateral* immigrant stocks, a study does not exist that evaluates the impact on trade of migrant communities from *both* trading partners. A number of authors instead focused on a given host economy, used available figures on local immigrant populations, and implicitly assumed that a host's overseas populations were either equal to zero or irrelevant for bilateral trade flows. The pioneering study by Gould (1993) analyzed trade patterns of the U.S. economy between 1970 and 1986 and estimated a 10-percent increase in immigrant stock to boost U.S. exports by 4.7 percent and U.S. imports by 8.3 percent. Another work by Head and Ries (1998) employed Canadian data and estimated the link between immigration and trade to be relatively weaker (a 1.0-1.3 percent increase for exports from and 3.1-3.9 percent for imports into Canada).[4]

Their successors focused on either other OECD economies,[5] and/or evaluated the more detailed mechanics of the migration-trade link.[6] Konečný (2009) has been one of the few studies that analyzed the migration and trade relationship within the context of several host countries.[7] Using the data on foreign-born populations located in 19 OECD-member economies, the study shows that the relative impact on trade of immigrant networks declines

[4] The stronger effect for import is usually attributed to the combination of transplanted preferences channel and network effects. The transplanted preferences mechanism is driven by the immigrants' demand for source-country products. For exports the preference-driven link is not operative.

[5] Studies dealing with immigration and trade include e.g., Girma and Yu (2002) exploiting U.K. data, Spain (Blanes, 2005), France (Combes et al., 2005), New Zealand (Law and Bryant, 2005), or Greece (Piperakis, 2003). Rauch and Trindade (2002) used data on Chinese minorities in South-East Asia.

[6] For example, White (2007)b's study on U.S. data classifies the immigrants' countries of origin according to their income, Head and Ries (1998) discuss the possible role of the length of stay, Dunlevy (2006) focuses on corruption and the role of common language.

[7] Other studies on trade and migration using the OECD migration data include working papers by Dolman (2007), and Felbemayr and Toubal (2008).

with the GDP of a source country, is generally smaller than estimates from preceding studies, and the immigrant networks might actually shift trade flows between countries.

Girma and Yu (2002) extend studies focusing on the individual mechanisms at work. The authors evaluate the immigrants' ability to overcome informal trade barriers related to their source country's social institutions. Using the UK data on the stock of immigrant population by country of origin over 1981 and 1991, the authors argue that immigrants from the institutionally more similar Commonwealth countries are on average less engaged in trade as compared to immigrants from other countries. Their argument states that while immigrants generally know their source countries' markets and social institutions, the benefits of this knowledge become lower once the concerned country is institutionally close to their current location, which in turn reduces immigrants' incentive to trade. The complementary evidence on the role of institutional quality and institutional similarity to the immigrants' contribution to trade (emphasized by Girma and Yu, 2002) will be examined in more detail in the following sections.

3 Estimation strategy and specification

I use the gravity relationship derived by Helpman (1984) and employed by the study on trade and immigration by Head and Ries (1998). Imports from country j into country i in an integrated world economy with non-negative trade costs producing symmetric differentiated products can be expressed as

$$T_{ij} = s_{ij} GDP_j,$$

where s_{ij} corresponds to the share of products from country j that are consumed by agents in country i, and GDP_j stands for the output of country j. Trade costs distort the

pattern of trade and imply

$$s_{ij} = \frac{GDP_i}{\sum_{i=1}^{N} GDP_i} \frac{1}{\tau_{ij}},$$

where $\sum_{i=1}^{N} GDP_i$ corresponds to world GDP and τ_{ij} is a trade cost parameter for countries i and j. Putting the two terms together, taking natural logarithms, and assuming that $\tau_{ij} = \exp(-\mathbf{x}'_{ij} b)$ with $\mathbf{x}_{ij}$ representing a $k \times 1$ matrix of variables affecting the trade costs and b corresponding to a $k \times 1$ vector of regression coefficients results into the following empirical specification:

$$\ln T_{ij} = b_0 \ln GDP_i GDP_j + \mathbf{x}'_{ij} b + d'_{ij} + \alpha_j + \varepsilon_{ij}. \tag{1}$$

The gravity relationship thus proportionally links trade flows to the incomes of trading economies.

The vector $\mathbf{x}_{ij}$ in Equation 1 contains a number of factors affecting the costs of trade between countries i and j. Immigrant and expatriate networks assumed to reduce trade costs are measured by the natural logarithms of migrant stocks located in both trading partners. This specification has been used in a number of existing studies on immigrant networks and international trade (e.g., Girma and Yu, 2002; Head and Ries, 1998; or Herander and Saavedra, 2005). The natural logarithm of distance between trading partners represents a proxy for transportation costs. Dummies for colonial past and language allow for a differential propensity to trade given that the trade partners share a common colonial past or speak a common language.

For an evaluation of Girma and Yu's (2002) hypothesis of a minor impact of immigrant networks from former colonies, vector $\mathbf{x}_{ij}$ contains a binary indicator equal to one for observations containing a former imperial power and her past colony. This measure covers

developing countries that are either member countries of the Commonwealth, or have been French, Spanish, Dutch, Portugese, Belgian, Italian, or German colonies. Alternative proxies used in the estimation are the interaction terms of the natural logarithm of migrant stocks with dummy variables describing separately each of the former imperial powers (the U.K., France, Spain and others) and their colonies. Additional interaction terms of immigrant networks with index of institutional quality and dummy for common language have been created to control for the possibility of a relatively larger role of immigrants from institutionally weaker countries and countries speaking different languages (see Dunlevy, 2006).

Equation 1 is augmented by d'_{ij}, a $1 \times (i + j)$ vector of country j and i fixed effects. α_j correponds to an error term correlated within the OECD economy j. The error term ε_{ij} is specific to each country pair ij and independent of other errors. To account for within-group correlation and heteroscedasticity within the OECD economies, I adopt fixed effects and clustered-errors approach by Liang and Zeger (1986). The robust covariance estimator by Liang and Zeger (1986) should thus account for any remaining within-group correlation in excess of j's fixed effects.

4 Data

The estimation of expatriate networks' effects has been until now impossible due to the absence of information on foreign-born populations in developing economies that typically form the source of migration. The present study uses a recently published database on international bilateral migration stocks compiled by the University of Sussex and the World Bank compiled by Parson, Skeldon, Walmsley, and Winters (2007). The database provides unique data on stocks of foreign-born populations in advanced market economies and developing

countries. The database consists of a 226 x 226 matrix containing migrants by country of birth (i.e., the foreign-born population). The information was collected from the year 2000 round of censuses whenever possible, and older data were included where such information was unavailable. Using a variety of techniques, Parson et al. (2007) estimated the missing data and reconciled all the available information to create a complete matrix of international bilateral migrant stocks.

The data on bilateral exports and imports have been obtained from the Direction of Trade Statistics compiled by the International Monetary Fund. I employ five-year averages of real trade volumes over 1999-2003, instead of using the data for a single year in order to reduce the additional problem of zero observed exports and imports for some countries and years.[8] A measure of circle distance between capital cities has been retrieved from Jon Haveman's web page or added manually if values are missing.[9]

I use five-year averages (1999-2003) of the restricted Index of Economic Freedom as a measure of institutional quality. The Index of Economic Freedom produced by the Heritage Foundation compiles evaluations of nine areas essential for the functioning market environment. The restricted version includes only those areas that most closely relate to the institutional quality in trade context - corruption, non-tariff trade barriers, rule of law and regulatory burden - and drops inflation, fiscal burden, restrictions on banks, labor regulation and government intervention. Finally, figures on GDP and GDP per capita have been

[8] Dunlevy (2006) uses a similar approach by averaging bilateral export data at the U.S. state level over 1990-1992. The current sample contains 157 pairs with imports and 69 pairs with exports below 100 thd U.S. dollars over the five-year period. Nonetheless, the random-effect tobit estimates with host-country dummies lead to very similar results (both qualitatively and quantitatively).

[9] Jon Haveman's web page is available at http://www.macalester.edu/research/economics/PAGE/HAVEMAN/Trade.Resources/TradeData.html#Gravity.

Table 1: Summary statistics

Variable	Obs.	Mean	Std.Dev.	Min	Max
Imports_{ij}^{x}	2,409	409.08	3,438.94	0	120,767.4
Exports_{ij}^{x}	2,641	283.41	2,064.99	0	94,023.73
OECD economies					
GDP_{i}^{xx}	2,641	947,000	1,870,000	19,400	9,012,508
$\text{GDP per capita}_{i}$	2,641	25,391.18	8,063.58	11,958.24	49,045.66
$\text{Immigrant stock}_{ij}$	2,641	19,420	197,533.6	1	9,336,719
Inst.quality_{i}	2,641	74.55	5.93	60,7	81
Developing economies					
GDP_{j}^{xx}	2,586	51,400	1,350,000	206	1,027,513
$\text{GDP per capita}_{j}$	2,641	3,020.99	4,592.12	0	24,715.53
$\text{Expatriate stock}_{j}$	2,641	1,902.96	12,608.22	0	342,137
Inst.quality_{j}	2,604	46.21	15.86	13,8	92,5
Other variables					
Distance_{ij}	2,641	6,938.22	3,849.23	200	19,158.67
$\text{Common language}_{ij}$	2,641	0.06	0.23	0	1
$\text{Colonial relationship}_{ij}$	2,641	0.03	0.17	0	1

^{x} Trade figures from the perspective of OECD countries
^{xx} in millions of 1998 U.S.dollars

collected from the World Development Indicators published by the World Bank. To avoid the potential endogeneity problem of the GDP variable, GDP and GDP per capita figures from 1998 have been used as proxies. Table 1 contains summary statistics for all variables of interest.[10] The following sub-sections discuss the estimation results for both exports and imports.

5 Empirical results

Table 2 reports the estimated coefficients from regressions with the natural logarithm of exports from and imports to the OECD countries as dependent variables, fixed effects for

[10] Table A.1 in Appendix A1 presents the full list of 21 advanced market economies and 135 less developed economies that passed the data availibility constraints. The use of the terms exports and imports in the text always refer to the direction of trade from the perspective of the advanced market economy. The terms developing and less developed economies in the text will be used interchangeably.

both trade partners, and clustering by OECD economies.[11] Columns (1) and (4) deliver estimates from benchmark regressions absent interaction terms and the expatriates' networks variable. The coefficients have expected signs and reasonable values. The estimate on immigrant networks located in the OECD economies is smaller than the corresponding coefficient in the imports equation, which is in accord with the much empirical evidence (e.g., Gould, 1993; Head and Ries, 1998) and the hypothesis that while immigrants in advanced market economies in general promote both exports and imports through the reduction of trade costs and demand for source-country products, in the case of exports from a host country, the latter channel should be absent. The estimates suggest that a 10-percent increase in the size of immigrant stock in a given OECD country would promote the country's exports by 2 percent and imports by 2.9 percent on average, which is slightly above the middle of the range provided by the existing literature.[12] [13]

The adjacent columns include the proxy for expatriates' networks. According to the estimates from regressions with the added expatriates variable, a 10-percent increase in the trade partner's immigrant population in the OECD economies would boost the country's exports by 1.8 and imports by 2.6 percent. The results with the added expatriate variable in Columns (2) and (5) thus maintain the previous conclusions with respect to the immigrant network term. The newly introduced expatriates facilitate imports by an average 0.3-0.5

[11] The coefficient estimates on the interactions of migrant terms with dummies for common language are presented in the Appendix A1 (together with the remaining output). None of the coefficients passed the 10-percent significance level and in some cases had the opposite sign.

[12] E.g., a static version of the model by Girma and Yu (2002) produces a 1.6 percent increase in UK exports and a 1 percent rise in UK imports from non-Commonwealth economies. Head and Ries (1998) estimate a 1-1.3 percent boost for Canadian bilateral exports and 3.1-3.9 percent for imports. The study on U.S. exports by Herander and Saavedra (2005) states 1.6 percent.

[13] For a complete list of all explanatory variables and estimation results for exports see Columns (1)-(3) in Table A1.2 in Appendix A1. For the corresponding import estimates see Columns (1)-(3) in Table A1.3 in Appendix A1.

Table 2: Fixed effects results with ln exports and ln imports as dependent variables.

	Ln(Exports)$_{ij}$			Ln(Imports)$_{ij}$		
Dependent variables$^{£}$	(1)	(2)	(3)	(4)	(5)	(6)
Ln immigrant stock$_{ij}$	0.202***	0.182***	0.239***	0.292***	0.262***	0.146***
	(0.028)†	(0.030)	(0.063)	(0.032)	(0.03)	(0.049)
Ln expatriate stock$_{ij}$	-	0.030	0.049	-	0.053	0.342***
		(0.028)	(0.057)		(0.036)	(0.106)
Inst. quality$_{ij}$ x Ln imms$_{ij}$	-	-	-0.001	-	-	0.003**
			(0.001)			(0.001)
Inst. quality$_{ij}$ x Ln expats$_{ij}$	-	-	0.000	-	-	-0.006***
			(0.001)			(0.002)
Colonial relationship$_{ij}$	-	-	0.002	-	-	-0.053
x Ln imms$_{ij}$			(0.092)			(0.081)
Colonial relationship$_{ij}$	-	-	-0.063	-	-	-0.026
x Ln expats$_{ij}$			(0.049)			(0.062)
R^2	0.483	0.482	0.448	0.404	0.412	0.375
Obs.	2,641	2,516	2,498	2,427	2,340	2,321

$^{£}$For complete estimates see Tables A1.2 and A1.3 in Appendix A1.
^{x}Standard errors in parentheses. *, **, *** - significant at 10%, 5%, and 1% respectively.
†Standard errors account for clustering by host country.

percent after a 10 percent increase, the actual level depending on the direction of bilateral trade flow. The estimated trade impact of expatriate networks is nonetheless statistically not different from zero.

Columns (3) and (6) provide some additional insights into the benchmark model. For exports, the added interactions of migrant variables with proxies for institutional quality and shared colonial past change neither the qualitative nor quantitative conclusions with respect to immigrant and expatriate effects. On the other hand, both networks have statistically significant effect on imports into the OECD countries. The institutional quality interactions in import equations are significant, suggesting considerable heterogeneity of the immigrant and expatriate effects across less developed economies. Taking the average value of the institutional quality term across developing countries (46.2), a 10-percent rise in the

immigrant networks' size implies a 2.7-percent increase in imports, in the case of expatriates, the effect amounts to 0.6 percent. The quantitative conclusions thus remain the same as those based on the coefficient estimates from columns (3) and (4) yet have now become statistically significant also for expatriates from OECD countries.

The positive and significant sign on the immigrants' interaction with institutional quality in Column (6) is not in line with studies suggesting a weaker immigration-trade link for less corrupt countries (see Dunlevy, 2006). The present results have been, however, obtained from a different dataset and test of Dunlevy's results in different empirical settings. The set of less developed economies in the this study excludes the advanced economies as providers of immigrants and exploits additional heterogeneity among less developed economies in the sample.

The results presented in Table 2 provide a rather mixed picture. While the estimates on the effect of immigrant networks generally conform to the existing literature, the expatriates contribution seems to be relatively smaller, limited only on imports into OECD countries, and relevant mainly for agents located in less institutionally developed countries. The following two tables provide a more detailed perspective on immigrant and expatriates' role in trade between their host and source countries.

Columns (1) and (3) in Table 3 report the estimates from the benchmark fixed-effect specification interacting the migrant terms with the continuous institutional quality index values. For Columns (2) and (4), I recoded the institutional quality measure into three binary variables, each indicating the location within the quality index distribution, and created the interactions of migrant terms with the dummies for the middle or top of the distribution

Table 3: Fixed effect estimates differentiating migrants' impact on trade by terciles of institutional quality distribution.

	Ln(Exports)$_{ij}$		Ln(Imports)$_{ij}$	
Dependent variables$^{£}$	(1)	(2)	(3)	(4)
Ln immigrant stock$_{ij}$	0.239***	0.212***	0.146***	0.222***
	(0.063)	(0.042)	(0.049)	(0.034)
Ln expatriate stock$_{ij}$	0.049	0.044	0.342***	0.17**
	(0.057)	(0.041)	(0.106)	(0.061)
Inst. quality$_{ij}$ x Ln imms$_{ij}$	-0.001	-	0.003**	-
	(0.001)		(0.001)	
Inst. quality dummies	-	-	-	-
- 2nd tercile x Ln imms$_{ij}$	-	-0.032	-	0.054
		(0.024)		(0.044)
- 3rd tercile x Ln imms$_{ij}$	-	-0.065	-	0.068
		(0.043)		(0.049)
Inst. quality$_{ij}$ x Ln expats$_{ij}$	0.000	-	-0.006***	-
	(0.001)		(0.002)	
Inst. quality dummies				
- 2nd tercile x Ln expats$_{ij}$	-	0.003	-	-0.109**
		(0.039)		(0.052)
- 3rd tercile x Ln expats$_{ij}$	-	-0.010	-	-0.18**
		(0.038)		(0.069)
R^2	0.448	0.442	0.375	0.385
Obs.	2,498	2,498	2,321	2,321

$^{£}$For complete estimates see Tables A1.2 and A1.3 in Appendix A1.
^{x}Standard errors in parentheses. *, **, *** - significant at 10%, 5%, and 1% respectively.
†Standard errors account for clustering by host country.

part.[14]

The estimated interactions provide information on the parts of the institutional quality distribution that drive the results. For the immigrant networks, the role of institutional quality is relatively minor as the dummy interaction terms for either trade flow are not statistically different from the baseline immigrant network coefficient. The differences be-

[14] For a complete list of all explanatory variables and estimation results for exports see Columns (4) and (5) in Table A1.2 in Appendix A1. For the corresponding import estimates see Columns (4) and (5) in Table A1.3, Appendix A1.

tween selected institutional quality groups thus seem to be spread quite uniformly over the individual parts of the quality index distribution.

The overall picture changes for expatriates' networks. Expatriates located in economies with lower institutional quality are the only ones that on average support bilateral exports from the OECD countries. The marginal impact on trade of expatriates from the top two-thirds of the institutional quality distribution is not statistically different from zero.

The signs of the interactions with colonial past dummies in most cases conform to the expectations. They are, however, not statistically significant and thus provide a rather limited statistical support for the links between the institutional similarity (as proxied by shared colonial past) and the trade effects of migrant networks presented, e.g., in Girma and Yu (2002). The situation changes for imports, once the colonial interaction terms become replaced by the interactions of migrant terms and four separate dummies for former colonies of the U.K., France, Spain, and the remaining imperial powers. As can be seen from the coefficient estimates in Column (4), while the results for the UK fails to pass the usual significance levels, the corresponding interactions for Spain and France do.

The role of expatriates from former colonial powers (as opposed to immigrants) seems to be no different from the role of other migrants located in countries without a shared colonial past.[15] The next sub-section discusses the results for exports from advanced market economies.

[15] Complete results on both imports and exports can be found in Tables A1.2 and A1.3 in Appendix A1.

Table 4: The estimated interactions of migrant network terms and colonial past.

	Ln(Exports)$_{ij}$		Ln(Imports)$_{ij}$	
Dependent variables$^{£}$	(1)	(2)	(3)	(4)
Ln immigrant stock$_{ij}$	0.239***	0.228***	0.146***	0.145***
	(0.063)	(0.058)	(0.049)	(0.051)
Ln expatriate stock$_{ij}$	0.049	0.029	0.342***	0.33***
	(0.057)	(0.06)	(0.106)	(0.11)
Colonial relationship$_{ij}$	0.002	-	-0.053	-
x Ln imms$_{ij}$	(0.092)		(0.081)	
Colonial power dummies				
- Spain x Ln imms$_{ij}$	-	-0.010	-	-0.174*
		(0.094)		(0.086)
- France x Ln imms$_{ij}$	-	-0.004	-	-0.12**
		(0.064)		(0.053)
- UK x Ln imms$_{ij}$	-	-0.008	-	-0.041
		(0.073)		(0.077)
- Others x Ln imms$_{ij}$	-	0.117	-	-0.023
		(0.155)		(0.124)
Colonial relationship$_{ij}$	-0.063	-	-0.026	-
x Ln expats$_{ij}$	(0.049)		(0.062)	
Colonial power dummies				
- Spain x Ln expats$_{ij}$	-	-0.027	-	0.013
		(0.083)		(0.09)
- France x Ln expats$_{ij}$	-	0.03	-	0.075
		(0.047)		(0.055)
- UK x Ln expats$_{ij}$	-	-0.05	-	-0.048
		(0.047)		(0.053)
- Others x Ln expats$_{ij}$	-	-0.039	-	-0.022
		(0.099)		(0.087)
R^2	0.448	0.442	0.375	0.376
Obs.	2,498	2,498	2,321	2,321

$^{£}$Fixed-effects specification. For complete estimates see Tables A1.2 and A1.3 in Appendix A1.
^{x}Standard errors in parentheses. *, **, *** - significant at 10%, 5%, and 1%.
†Standard errors account for clustering by host country.

5.1 The immigrant vs. expatriate effects

The estimates of immigrant and expatriate effects on trade confirm the importance of variables capturing the relative position of both host and source countries. Should the relationship between immigrant/expatriate networks and bilateral trade flows be identical irrespective of the characteristics of the country of origin and host country, one should observe that expatriate networks promote the OECD economy's exports in the same way as immigrants promote its imports. The expatriates' impact on exports should furthermore exceed their effect on imports, where the transplanted-preferences channel discussed in previous sections is absent, and the sole trade-facilitating force should operate through the reduction of trade costs. Yet neither of the two cases hold true, as expatriates' contribution to trade falls short of that of immigrant networks and expatriates promote only imports into OECD from institutionally weaker countries.

The present results thus suggest that the incentives and functioning of immigrant networks in the OECD economies seem to be qualitatively different from expatriate networks residing in less developed countries.

Part of this difference, namely the lower coefficients on expatriate networks with respect to their immigrant counterparts located in developed economies, is consistent with the study by White (2007a). The author finds that immigrants coming from lower-income countries contribute more to bilateral trade. His argument, based on the evaluation of U.S. data, claims that to the extent that lower-income economies have generally weaker contracting and enforcement mechanisms, immigrants from such countries might better exploit their source country knowledge and engage in profitable trade opportunities.

Expatriate knowledge, on the other hand, would likely be in relatively lower demand given the dense trading infrastructure and information flows in their country of origin. Furthermore, under the assumption that expatriates might be less able to understand the cultural patterns, social values, and organization of a host's society as compared to the OECD immigrants born in less developed countries, one could also expect their trade contribution to be relatively lower.[16] Given that the institutional quality index is positively correlated with per capita income, the estimates from Table 3 seem to partially capture this effect. The abovementioned finding, however, does not explain as to why the estimated expatriates' contribution to the exports of the OECD economies is lower (indeed not different from zero) than their impact on imports,[17] and why the expatriates facilitate only imports from countries with weak institutions.

There are several potential explanations for these two effects. Assume the expatriates maximize their earnings and decide according to the relative profitability of trade with respect to other activities. Also assume that the costs of trade are negatively related to the hosting, less developed country's institutional quality and that the expatriates' knowledge of institutions helps reduce these costs. Other things being equal, the expatriates will be more likely to trade in countries with relatively weaker institutions, given that net profits from trade will be higher. Nonetheless, the potential traders also have to decide as to what direction of trade they choose. The generally small size of expatriate communities

[16] The current dataset is unlikely to include managers from the OECD countries that have been sent abroad by their employers, given that their length of stay and legal status would be different from a typical immigrant. The trade contribution of such individuals might be notably higher if their mission is related to foreign investments or trade contracts by their mother companies.

[17] The insignificance of the interaction terms in Table 2.3 suggests that expatriates contribute to trade in no different way than other agents of the host country.

and the prevailing low purchasing power in less developed economies could make supplying of the host's market unprofitable. Instead, the expatriates' attention might be directed towards supplying overseas OECD markets, so that one could ultimately observe the empirical pattern found in Table 3.

An alternative explanation for the expatriates' facilitation of the OECD imports as opposed to exports might relate to the cross-sectional nature of the present sample. The expatriates are likely to face a relatively wide range of business and/or employment opportunities (Stalker, 2000). While some of these opportunities (such as, e.g., the agricultural production or the extraction of mineral resources) might over time materialize as imports into the country of origin, the initial source-country exports they might have likewise stimulated would be missing in the estimations, assuming that these investments have been made before the observed period.[18]

6 Robustness checks

6.1 The role of the immigrant-network measures and migrants from other countries

Konečný (2009) argues for the inclusion of relative measures of immigrant networks in addition to the commonly employed natural logarithm of immigrant stock or other level variables. A simple gravity model in which agents produce either locally or form a joint venture with foreign partner illustrates that the impact on trade might vary with the size of the immigrant community relative to the market size of the country of origin, as well as with the overall shares of immigrant communities with respect to the populations of trade partners.

[18] A more detailed analysis of the particular mechanism at work would require a shift from the aggregate data towards information collected at a micro-level.

The three proposed relative measures that might influence trade between host j and source country i include 1) the share in host population of a given immigrant stock relative to the country of origin GDP_i, 2) the population share of the overall immigrant stock (regardless of origin) within a given host country, and 3) the size of the overseas diaspora relative to the population in the diaspora's country of origin.

The first measure controls for the size of trade partners. Assuming that immigrants match exclusively with agents from their country of origin and the rest of the host's population searches randomly, the positive effect on trade of a marginal increase in immigrant stock would on average rise with the stock's share in the host country and its relative size with respect to the source country market. The second measure controls for the possible negative effects on bilateral trade of immigrant links of immigrant communities from other source countries. The more immigrants in a given host country match with agents in their countries of origin, the lower the probability will be that host's native agents will trade with given trade partner. Finally, the third measure accounts for the potentially negative bilateral trade effects of source country diasporas located in other countries. The larger the overall diaspora is relative to the population of the country of origin, the lower the chances are of a host's native agents to find a match in the concerned source country.[19]

Since the fixed-effect specification employed in previous sections precludes the estimation of country-level relative measures potentially affecting trade, I adopt a two-stage version of Equation 1 using the methodology developed by Donald nad Lang (2007). The two-step procedure starts with the OLS regression of the natural logarithm of bilateral exports/imports

[19] For a detailed exposition to the assumptions and mechanisms driving the results, see Konečný (2009).

on variables differing across country pairs ij, country j- and i-fixed effects:

$$\text{1st stage: } \ln T_{ij} = b_0 \ln GDP_i GDP_j + \mathbf{x}'_{ij} b + a_0 \frac{\frac{m_{ij}}{N_j}}{\frac{GDP_i}{GDP_I}} + d'_{ij} + \varepsilon_{ij},$$

where the term following the coefficient a_0 is the newly added share in the host population of a given immigrant stock relative to the country of origin GDP_i.

In the second stage, I run a feasible GLS with the relevant fixed effect coefficient estimates from the first stage as dependent variables and country i- (or j-) level variables on the right-hand side of the regression:

$$\text{2nd stage:} \quad \hat{d}_j = c(J) + \mathbf{x}'_j z + a_1 \frac{\sum_{i=1}^{I} m_{ij}}{N_j} + u_j, \; \hat{var}(u_j) = \hat{\sigma}^2 I(J) + \Sigma_{\hat{d}_j} \tag{2}$$

$$\text{and} \quad \hat{d}_i = c(I) + \mathbf{x}'_i w + a_2 \frac{\sum_{j=1}^{J} m_{ij}}{N_i} + u_i, \; \hat{var}(u_i) = \hat{\sigma}^2 I(I) + \Sigma_{\hat{d}_i}, \tag{3}$$

where Equation 2 estimates the coefficient on the host trade diversion term, Equation 3 estimates the coefficient on the source trade diversion term, and $\hat{var}(u_{\{j,i\}})$ stands for the variance of the respective 2nd-stage error term $u_{\{j,i\}}$. The vectors of country-specific terms $\mathbf{x}_i$ and $\mathbf{x}_j$ include the natural logartihms of real GDP and GDP per capita, the corresponding relative measure, the share of exports in GDP, and the Heritage Foundation measure of institutional quality. $\frac{\sum_{i=1}^{I} m_{ij}}{N_j}$ stands for the population share of the overall immigrant stock (regardless of origin) within a given host country, $\frac{\sum_{j=1}^{J} m_{ij}}{N_i}$ represents the size of the overseas diaspora relative to the population in the diaspora's country of origin. The GLS procedure uses fixed effect covariance estimates $\Sigma_{\{\hat{d}_j, \hat{d}_i\}}$ from the 1st stage for the construction of weights.[20] Table 5 presents the results using Donald and Lang's (2007) 2-step estimation procedure.

[20] For more details see Donald and Lang (2006), p. 224-225.

Table 5: Regression results including relative measures of immigrant networks.

	Ln(Exports)_{ij}		Ln(Imports)_{ij}	
Dependent variables$^{£}$	(1)	(2)	(3)	(4)
Ln immigrant stock_{ij}	0.183***	0.159***	0.281***	.251***
	0.015	0.016	0.023	0.025
Ln expatriate stock_{ij}	-	0.035*	-	0.060**
		0.020		0.030
Immigrant stock_{ij} relative	0.239***	0.245***	0.201**	0.181**
to country of origin GDP_i	0.078	(0.072)	0.074	0.089
Share of overall imm. stock	-9.637*	-9.042	-6.411	-5.465
in OECD country	5.193	5.330	4.600	4.609
Overseas diaspora	-0.617	-0.684	-2.041*	-1.342
relative to country of origin	0.765	0.779	1.076	1.084
R^2	0.483	0.482	0.404	0.412
Obs.	2,585	2,460	2,378	2,291

$^{£}$2-step estimates Donald and Lang (2007).
^{x}Standard errors in parentheses. *, **, *** - significant at 10%, 5%, and 1%.

The estimates' signs conform to the *ex ante* expectations. The trade impact of immigrant and expatriate stocks has remained statistically significant despite a slight decrease in levels, and the expatriate network term in the exports equation in Column (2) remains significant at the 10% level. Despite the consistency with immigrant-driven shifts in trade flows modelled in Konečný (2009), the overall net effect of immigrant networks on aggregate trade is still non-negative.

6.2 Endogeneity and large migrant populations

The study's results from previous sections might be subject to the potential endogeneity of migrant network terms. Over time, trade partners could learn about the living conditions in the other country and might pass the information further to potential migrants. Trade might

provide employment opportunities within the immigrant/expatriate communities engaged in trading[21] and thus reduce the ex ante uncertainty of agents considering migration.

Javorcik, Ozden, Spatareanu, and Neaguet (2006) used the natural logarithm of population density and the share of passport costs in real GDP per capita as instruments for migrant networks in their study on the link between migration and FDI. The correlations between these variables[22] and the stock of immigrants in the current data are, however, negligible (-0.01 and -0.03, respectively), and in the case of population density even with the opposite sign.[23]

The correlations of the two instrumental variables (IVs) and migrant levels when all expressed in natural logarithms are higher (0.13 and -0.06, respectively). In the 2SLS regressions on exports and imports with the logarithms of both IVs and the natural logarithm of immigrant stock as the instrumented variable, the Shea partial R-squared failed to pass 0.01 for any combination of the instruments, the coefficients on instrumental variables had theoretically implausible signs, and joint F-tests in the first stage did not prove to be significant. The weakness of the available instruments thus precludes the quantification of the degree of endogeneity. The data might also contain influential observations driving the estimation results. To check for this possibility, I estimate the benchmark regressions without country pairs that exceeded critical values of the `dfbeta` test on influential obervations in Stata. The same exercise has been repeated for expatriate stocks. The results remain nonetheless qualitatively the same.

[21] Peng's (1998) survey on the characteristics of trade intermediaries located in the U.S. reported 40 percent of U.S. intermediary officers or managers to be foreign-born.

[22] The instruments have been taken from McKenzie (2005).

[23] A similar result has been found in Konečný (2009).

7 Conclusion

This study evaluates the contribution of expatriate networks to bilateral trade between host and source countries, a topic that has not been studied previously due to data constraints. The study shows that similarly to immigrants in the OECD countries, expatriates from advanced market economies seem to facilitate bilateral trade with their country of origin. The expatriates' contribution to trade (as compared to immigrants located in OECD) is rather limited and seems to operate through different mechanisms. Following a 10 percent increase in the size of an expatriate community, the predicted average increase in imports into OECD economies revolves around 0.6 percent. The same increase in immigrant stock, on the other hand, would correspond to more than a 2.5 percent change. The trade facilitating role of expatriate networks becomes most evident in host countries with low institutional quality. In economies lying within the lowest third of the institutional quality distribution, a 10 percent increase in expatriate stock would result in a predicted 1.7 increase in imports into their country of origin. For the remaining parts of the distributions as well as for exports, the study did not find any empirical evidence on expatriates' involvement. A more detailed analysis of individual mechanisms at work would call for the use of more detailed, micro-level information instead of the commonly used data on aggregate migrant stocks.

The study has additionally addressed the cross-sample validity of the findings by Girma and Yu (2002) on the interactions between the migrant network variables and institutional similarity proxied by a shared colonial past. The estimations reveal that there is some, though not particularly strong, evidence that the trade contribution of immigrant networks from past colonies operating in former imperial powers is relatively lower.

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8 Appendix A1

Table A1.1: Countries in the sample.

OECD economies	Less developed economies		
Australia	Albania	Georgia	Pakistan
Austria	Algeria	Ghana	Panama
Belgium	Angola	Guatemala	Pakistan
Canada	Argentina	Guinea	Panama
Denmark	Armenia	Guinea-Bissau	Papua N.Guinea
Finland	Azerbaijan	Guyana	Paraguay
France	Bahamas	Haiti	Peru
Germany	Bahrain	Honduras	Philippines
Greece	Bangladesh	Hong Kong	Poland
Ireland	Barbados	Hungary	Qatar
Italy	Belarus	India	Romania
Luxembourg	Belize	Indonesia	Russian Fed.
Netherlands	Benin	Iran	Rwanda
New Zealand	Bolivia	Iraq	Samoa
Norway	Bosnia and Hrzg	Israel	Saudi Arabia
Portugal	Botswana	Jamaica	Senegal
Spain	Brazil	Jordan	Sierra Leone
Sweden	Bulgaria	Kazakhstan	Singapore
Switzerland	BurkinaFaso	Kenya	Slovakia
UK	Burundi	Kuwait	Slovenia
USA	Cambodia	Kyrgyzstan	Somalia
	Cameroon	Latvia	SouthAfrica
	CapeVerde	Lebanon	SriLanka
	Centr.Afr.Rep.	Lesotho	Sudan
	Chad	Libya	Suriname
	Chile	Lithuania	Swaziland
	China	former Yugoslavia	Syria
	Colombia	Madagascar	Tajikistan
	Congo	Malawi	Tanzania
	Costa Rica	Malaysia	Thailand
	Cote d′Ivoire	Mali	Togo
	Croatia	Malta	Trinidad and Tbg
	Cuba	Mauritania	Tunisia
	Cyprus	Mauritius	Turkey
	Czech Republic	Mexico	Turkmenistan
	Djibouti	Moldova	Uganda
	Dominican Rep.	Mongolia	Ukraine
	Ecuador	Morocco	UAE
	Egypt	Mozambique	Uruguay
	El Salvador	Myanmar	Uzbekistan
	Eq. Guinea	Namibia	Venezuela
	Estonia	Nepal	Vietnam
	Ethiopia	Nicaragua	Yemen
	Fiji	Niger	Zambia
	Gabon	Nigeria	Zimbabwe
	Gambia	Oman	

Table A1.2: Regression results with ln exports as the dependent variable.

Dependent variables	(1)	(2)	(3)	(4)	(5)
Ln immigrant stock$_{ij}$	0.202***	0.182***	0.239***	0.212***	0.228***
	(0.028)	(0.030)	(0.063)	(0.042)	(0.058)
Ln expatriate stock$_{ij}$	-	0.030	0.049	0.044	0.029
		(0.028)	(0.057)	(0.041)	(0.06)
Inst. quality$_{ij}$ x Ln imms$_{ij}$	-	-	-0.001	-	-0.001
			(0.001)		(0.001)
Inst. quality dummies					
- 2nd tertile x Ln imms$_{ij}$	-	-	-	-0.032	-
				(0.024)	
- 3rd tertile x Ln imms$_{ij}$	-	-	-	-0.065	-
				(0.043)	
Inst. quality$_{ij}$ x Ln expats$_{ij}$	-	-	0.000	-	0.000
			(0.001)		(0.001)
Inst. quality dummies					
- 2nd tertile x Ln expats$_{ij}$	-	-	-	0.003	-
				(0.039)	
- 3rd tertile x Ln expats$_{ij}$	-	-	-	-0.010	-
				(0.038)	
Colonial relationship$_{ij}$	-	-	0.002	0.012	-
x Ln imms$_{ij}$			(0.092)	(0.093)	
Colonial power dummies					
- Spain x Ln imms$_{ij}$	-	-	-	-	-0.010
					(0.094)
- France x Ln imms$_{ij}$	-	-	-	-	-0.004
					(0.064)
- UK x Ln imms$_{ij}$	-	-	-	-	-0.008
					(0.073)
- Others x Ln imms$_{ij}$	-	-	-	-	0.117
					(0.155)
Colonial relationship$_{ij}$ x	-	-	-0.063	-0.064	-
Ln expats$_{ij}$			(0.049)	(0.05)	
Colonial power dummies					
- Spain x Ln expats$_{ij}$	-	-	-	-	-0.027
					(0.083)
- France x Ln expats$_{ij}$	-	-	-	-	0.03
					(0.047)
- UK x Ln expats$_{ij}$	-	-	-	-	-0.05
					(0.047)
- Others x Ln expats$_{ij}$	-	-	-	-	-0.039
					(0.099)
Common language$_{ij}$	-	-	-0.052	-0.058	-0.037
x Ln imms$_{ij}$			(0.082)	(0.082)	(0.084)
Common language$_{ij}$	-	-	0.04	0.041	0.028
x Ln expats$_{ij}$			(0.048)	(0.05)	(0.054)
R^2	0.483	0.482	0.448	0.442	0.452
Obs.	2,641	2,516	2,498	2,498	2,498

[x]Standard errors in parentheses. *, **, *** - significant at 10%, 5%, and 1% respectively.

Table A1.3: Regression results with ln imports as the dependent variable.

Dependent variables	(1)	(2)	(3)	(4)	(5)
Ln immigrant stock$_{ij}$	0.292***	0.262***	0.146***	0.222***	0.145***
	(0.032)	(0.03)	(0.049)	(0.034)	(0.051)
Ln expatriate stock$_{ij}$	-	0.053	0.342***	0.17**	0.33***
		(0.036)	(0.106)	(0.061)	(0.11)
Inst. quality$_{ij}$ x Ln imms$_{ij}$	-	-	0.003**	-	0.003**
			(0.001)		(0.001)
Inst. quality dummies					
- 2nd tertile x Ln imms$_{ij}$	-	-	-	0.054	-
				(0.044)	
- 3rd tertile x Ln imms$_{ij}$	-	-	-	0.068	-
				(0.049)	
Inst. quality$_{ij}$ x Ln expats$_{ij}$	-	-	-0.006***	-	-0.006***
			(0.002)		(0.002)
Inst. quality dummies					
- 2nd tertile x Ln expats$_{ij}$	-	-	-	-0.109**	-
				(0.052)	
- 3rd tertile x Ln expats$_{ij}$	-	-	-	-0.18**	-
				(0.069)	
Colonial relationship$_{ij}$	-	-	-0.053	-0.052	-
x Ln imms$_{ij}$			(0.081)	(0.083)	
Colonial power dummies					
- Spain x Ln imms$_{ij}$	-	-	-	-	-0.174*
					(0.086)
- France x Ln imms$_{ij}$	-	-	-	-	-0.12**
					(0.053)
- UK x Ln imms$_{ij}$	-	-	-	-	-0.041
					(0.077)
- Others x Ln imms$_{ij}$	-	-	-	-	-0.023
					(0.124)
Colonial relationship$_{ij}$ x	-	-	-0.026	-0.024	-
Ln expats$_{ij}$			(0.062)	(0.062)	
Colonial power dummies					
- Spain x Ln expats$_{ij}$	-	-	-	-	0.013
					(0.09)
- France x Ln expats$_{ij}$	-	-	-	-	0.075
					(0.055)
- UK x Ln expats$_{ij}$	-	-	-	-	-0.048
					(0.053)
- Others x Ln expats$_{ij}$	-	-	-	-	-0.022
					(0.087)
Common language$_{ij}$	-	-	-0.032	-0.032	-0.041
x Ln imms$_{ij}$			(0.058)	(0.064)	(0.058)
Common language$_{ij}$	-	-	-0.059	-0.062	-0.058
x Ln expats$_{ij}$			(0.041)	(0.044)	(0.043)
R^2	0.404	0.412	0.375	0.385	0.376
Obs.	2,427	2,340	2,321	2,321	2,321

[x]Standard errors in parentheses. *, **, *** - significant at 10%, 5%, and 1% respectively.

Table A1.4: Correlation table for trade flows and migrant stocks.

	Ln Imports$_{ij}$	Ln Exports$_{ij}$	Ln Imm stock$_{ij}$	Ln Expats$_{ij}$
Ln Imports$_{ij}$	1			
Ln Exports$_{ij}$	0,812	1		
Ln Immigrant stock$_{ij}$	0,633	0,659	1	
Ln Expatriates$_{ij}$	0,559	0,562	0,543	1

Table A1.5: Country pairs in the sample with a common colonial past.

Mother country	Colony	Mother country	Colony
Belgium	Burundi	Spain	Costa Rica
	Rwanda		Cuba
France	Benin		Dominican Rep.
	Burkina Faso		Ecuador
	Cambodia		El Salvador
	Cameroon		Eq. Guinea
	Chad		Guatemala
	Congo		Honduras
	Cote d'Ivoire		Jamaica
	Djibouti		Mexico
	Gabon		Morocco
	Guinea		Nicaragua
	Haiti		Paraguay
	Lebanon		Peru
	Madagascar		Philippines
	Mali		Uruguay
	Mauritania	UK	Bangladesh
	Mauritius		Barbados
	Morocco		Cyprus
	Niger		Ghana
	Senegal		Guyana
	Togo		Hong Kong
	Tunisia		India
	Vietnam		Jamaica
Italy	Ethiopia		Kenya
	Libya		Malaysia
	Somalia		Malta
Netherlands	Guyana		Mauritius
	Indonesia		Nigeria
	Suriname		Pakistan
Portugal	Angola		Sierra Leone
	Brazil		South Africa
	Cape Verde		SriLanka
	Guinea-Bissau		Tanzania
	Mozambique		Trinidad and Tbg
Spain	Argentina		Uganda
	Bolivia		Zambia
	Chile		Zimbabwe
	Colombia		

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