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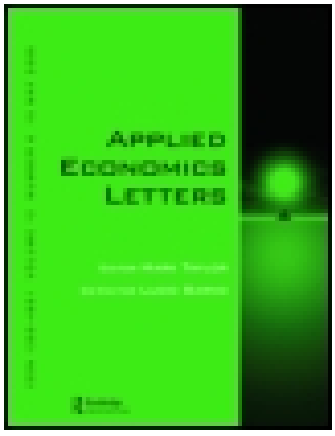

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Do immigrants reduce bilateral trade costs? An empirical test

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We use the first comprehensive estimates of bilateral trade costs to test the extensively stated, but rarely evaluated, hypothesis that immigrants reduce trade-related transaction costs. Our results provide robust and direct evidence supporting this often-posited hypothesis. We examine the period from 1995 through 2010 using data that represent 174 immigrant home countries and 19 OECD member host countries. We find that a 10% increase in the stock of immigrants from a given home country that reside in a given host country corresponds with a 1.04% decrease in the overall bilateral trade costs between the home and host countries. While different in magnitudes, we also find that the effect of immigrants, in reducing trade costs, persists across both manufactured and agricultural products.

Keywords: gravity model; immigrants; trade costs

JEL Classification: F220; F140

I. Introduction

Some countries exchange larger volumes and/or wider varieties of goods and services, and/or transact with a broader sets of partners, than do others. A measure of the degree of separation between potential trading partners, trade costs influence the depth and breadth of a country's involvement in international trade. Anderson and Van Wincoop (2004) define trade costs as all costs incurred in getting a good or service to its final user. These costs come in many forms: transportation costs, policy barriers, information acquisition, contract enforcement, general distribution, currency exchange and legal fees associated with operating in different environments and cultural settings. In an increasingly globalized and networked world, trade costs also matter as a determinant of the pattern of bilateral investment and the geographical distribution of production (Arvis *et al.*, 2013). Thus, trade costs are of considerable importance to firms, policymakers and researchers.

Economists maintain a keen interest to estimate, understand and explain the determinants, magnitude and evolution of bilateral trade costs (Jacks *et al.*, 2010); this interest spans several fields within economics. Of direct relevance to the work presented here, the trade-migration literature extensively posits that immigrants foster trade linkages between their home and host countries by reducing trade costs. The proposition has been largely attributed to the ability of immigrants to minimize information asymmetries, thus reducing the costs of matching importers and

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exporters and costs related to lax contract enforcement, and the capacity of immigrants to bridge cultural differences between parties that reside or operate in different institutional and cultural settings. An additional pro-trade influence of immigrants relates to their biased preferences for products made in their home countries. Preferences for home country-produced goods aside, the basis for immigrants' pro-trade influences rests on the hypothesis that immigrants reduce trade costs.

Existing evidence supporting the proposition that immigrants act to offset or reduce trade costs is mainly derived from trade flow regressions in which immigrant stocks are used as an explanatory variable.[1] Positive coefficient estimates of the stocks of immigrants from such regressions may provide support for the notion that immigrants contribute to increased bilateral trade flows; however, given that trade flow variables, not trade costs, are typically used as the dependent variable series, such results do not corroborate the proposition that immigrants indeed reduce bilateral trade costs. Using newly available, comprehensive estimates of bilateral trade cost data, in this study, we provide the first direct test of whether immigrants reduce trade costs, a hypothesis invoked so extensively in the trade-migration literature.

Our findings show that immigrants indeed directly contribute to reductions in bilateral trade costs. To this end, we find that a 10% increase in the stock of immigrants from a given home country that reside in a given host country corresponds with a 1.04% decrease in the overall bilateral trade costs between the corresponding home and host countries. While different in magnitudes, we also find that the effect of immigrants, in reducing trade costs, persists across both manufactured and agricultural products. Our observation is relevant, particularly given the constraints that trade costs impose on trade linkages among developing countries and their economic integration with the rest of the world and when one considers the heated debates on immigration policies in advanced economies.

II. The Empirical Model, Data and Variables

Employing the inverse form of the gravity model developed by Novy (2013) in conjunction with data on export and import flows and information on domestic production levels, Arvis *et al.* (2013) provide the first comprehensive bilateral trade costs data. We use this measure of trade costs as our dependent variable series. Our data span the period from 1995 through 2010 and consists of unbalanced observations on bilateral trade costs for the 174 immigrant home countries and 19 OECD member host countries for which data on bilateral immigrant stocks are available.

We estimate Equation 1, our baseline specification, for three different dependent variable series: aggregate bilateral trade costs facing each country and, separately, the bilateral trade costs facing traders of manufactured and agricultural products.

$$\begin{aligned} lnTradeCosts_{ijt} &= \alpha_0 + \beta_1 lnIMMG_{ijt} + \beta_2 lnGDIST_{ij} + \beta_3 CBORD_{ij} \\ &+ \beta_4 COLNG_{ij} + \beta_5 COLRE_{ij} + \beta_6 LLOCK_{it} \\ &+ \beta_7 LLOCK_{jt} + \beta_8 MTRAG_{ijt} + \beta_9 REMOT_{it} \\ &+ \beta_{10} REMOT_{jt} + \varepsilon_{ijt} \end{aligned} \tag{1}$$

Our empirical specification includes several control variables that are often used as standard proxies for trade costs in gravity models of bilateral trade flows: the geodesic distance between potential trading partners, and dummy variables that indicate trading partners' adjacency, common official language(s), colonial relationships, joint membership in one or more multilateral trade agreements, and access to the sea. We also control for time-varying factors, such as the economic remoteness of trading partners, which may influence trade costs by limiting the availability of trading opportunities, and our primary variable of interest: the stocks of immigrants from each of the home countries that reside in each of the host countries.

Data on bilateral immigrant stocks are from the OECD (2013), and GDP figures used in the computation of the economic remoteness variables are from the World Bank (2014). All other variables are from the CEPII (2014). Table 1 lists the variables, descriptive statistics and *a priori* expected signs of the respective coefficient estimates for the variables included in our empirical model.

[1] See, for example, Gould (1994), Girma and Yu (2002), and Tadesse and White (2013).

Table 1. Panel descriptive statistics of the variables

Variable	Variable description		Mean	SD	Min	Max	Observations	*A priori* expected sign
$TradeCosts_{ijt}$	Trade costs, total	Overall	203.366	123.223	0.186	1078.267	$N = 16\,731$	
		between		94.774	58.010	465.193	$n = 175$	
		within		83.302	−94.643	935.595	T-bar = 95.60	
$MnftCosts_{ijt}$	Trade costs, manufactured goods	Overall	194.543	118.571	0.714	980.549	$N = 16059$	
		between		90.511	53.459	434.566	$n = 172$	
		within		80.999	−87.528	838.180	T-bar = 93.36	
$AgriCosts_{ijt}$	Trade costs, agricultural goods	Overall	262.790	144.740	25.027	1320.590	$N = 12071$	
		between		99.716	98.617	920.460	$n = 171$	
		within		120.275	−175.265	1190.267	T-bar = 70.59	
$LLOCK_i$	Landlocked dummy (Home)	Overall	0.177	0.382	0.000	1.000	$N = 22\,188$	+
		between		0.395	0.000	1.000	$n = 187$	
		within		0.000	0.177	0.177	T-bar = 118.65	
$LLOCK_j$	Landlocked dummy (Host)	Overall	0.118	0.322	0.000	1.000	$N = 22\,188$	+
		between		0.024	0.028	0.177	$n = 187$	
		within		0.322	−0.059	1.090	T-bar = 118.652	
$CBORD_{ij}$	Common border dummy	Overall	0.019	0.136	0.000	1.000	$N = 22\,188$	–
		between		0.048	0.000	0.327	$n = 187$	
		within		0.126	−0.308	1.007	T-bar = 118.65	
$COLNG_{ij}$	Common language dummy	Overall	0.110	0.313	0.000	1.000	$N = 22\,188$	–
		between		0.114	0.000	0.345	$n = 187$	
		within		0.291	−0.236	1.102	T-bar = 118.65	
$COLRE_{ij}$	Colonial link dummy	Overall	0.040	0.196	0.000	1.000	$N = 22188$	–
		between		0.049	0.000	0.228	$n = 187$	
		within		0.190	−0.188	1.033	T-bar = 118.65	
$GDIST_{ij}$	Geodesic distance	Overall	7234.063	4393.179	115.447	19 516.560	$N = 22\,096$	+
		between		2551.739	3074.728	15 394.540	$n = 186$	
		within		3542.564	−6877.908	20 398.100	T-bar = 118.79	
$REMOT_{it}$	Economic remoteness (Home)	Overall	5589.685	2491.021	1183.669	11 728.150	$N = 21\,911$	+/–
		between		2480.707	1246.849	11 643.640	$n = 184$	
		within		107.857	4844.763	6679.177	T-bar = 119.08	
$REMOT_{jt}$	Economic remoteness (Host)	Overall	3524.093	2784.426	1183.669	10 905.200	$N = 22188$	+/–
		between		220.407	2,578.832	4365.883	$n = 187$	
		within		2776.398	490.667	11 850.460	T-bar = 118.65	
$MTRAG_{ijt}$	Multilateral trade agreement dummy	Overall	0.201	0.401	0.000	1.000	$N = 22137$	–
		between		0.264	0.000	0.836	$n = 187$	
		within		0.288	−0.635	1.194	T-bar = 118.38	
$IMMG_{ijt}$	Immigrant stock, total	Overall	37.325	286.507	0.000	11 746.540	$N = 22\,175$	
		between		97.243	0.006	1231.923	$n = 187$	–
		within		268.384	−1194.537	10 551.940	T-bar = 118.58	

III. Do Immigrants Reduce Bilateral Trade Costs?

Table 2 presents results obtained from pooled and panel data estimation of Equation 1. The coefficient of the immigrant stock variable in all estimations is negative and statistically significant, ranging in magnitude from −0.133 (for trade costs involving agricultural products) to −0.0897 (for aggregate trade costs). Indicating the robustness of the estimated coefficients, the magnitudes remain consistent across both the pooled OLS and the panel data estimations. Given the double-logarithmic functional form of Equation 1, the results from the fixed effects estimation (which the Hausman tests indicates as more appropriate) show that, *ceteris paribus*, a one per cent increase in the stocks of immigrants from country *i* residing in country *j* corresponds with bilateral trade cost reductions of 0.11% for manufactured products, 0.13% for agricultural products, and 0.10% for trade in goods from both sectors. Although variable across countries, consistent with these observations, results obtained from a linear random coefficient mixed effects model estimation, in which we account for clustering of the trading partners across different regions, also reveal that the average home and/or host country-specific effect of immigrants on trade costs is negative and statistically significant.

A direct validation of the hypothesis so frequently posited in the trade-migration literature, these results strongly indicate that immigrants reduce bilateral trading costs. Given that developing countries are better positioned to produce and trade primary products, a sector that is subject to greater resistance, the relatively larger magnitude of the effects of immigrants on bilateral trade costs involving the agriculture sector is also interesting from policy perspective.

The coefficients of the remaining variables are both statistically significant and, generally, are of the anticipated signs. Greater geodesic distance between trading partners corresponds with higher trade costs. Trade costs are relatively lower among partners that share a common border, that have a common official language, and/or that are parties to a mutual multilateral trade agreement. Being landlocked corresponds with higher trading costs. Results from the fixed effects model further indicate that economic remoteness is, on average, associated with higher trading costs in host countries but with lower trading costs in home countries. Treating each of the home countries as clusters and allowing for the effects of immigrants to vary across the home and host countries, in an alternative specification, we also find that greater economic remoteness is associated with a rise in trade costs except in the case of agricultural products. The effects of all other variables remain consistent with the results reported in Table 2, again indicating the robustness of our findings.

IV. Conclusions

The trade-migration literature presents evidence that is consistent with the notion that immigrants facilitate trade flows between their home and host countries by minimizing information asymmetries and, thus, the search costs of matching importers with exporters, by reducing lax contract enforcement and/or by bridging cultural differences between parties that reside and operate in varying institutional and cultural settings. Consequently, it has been extensively posited that immigrants reduce bilateral trade costs. However, due to a lack of consistent estimates of comprehensive bilateral trade costs, only indirect evidence, obtained from trade flow (exports/imports) regressions in which immigrant stocks were used as an explanatory variable, exists to support the proposition.

Using newly available, comprehensive bilateral trade costs data involving a total of 174 home countries and 19 OECD member host countries, we provide the first empirical evidence that shows, *ceteris paribus*, the larger the stocks of immigrants from a given home country that reside in a given host country, the lower are the bilateral trade costs both at the aggregate and sector level (agricultural and manufactured goods). Indicating the robustness of these results, we also show that, with the exception of two countries, the average home country- and/or host country-specific effects of immigrants on bilateral trade costs are consistently negative and statistically significant for each of the 174 countries included in our study. Our findings suggest that, crafted carefully, increased bilateral flow of immigrants may lead to further global integration of the world economies by enhancing the participation of home countries that face relatively greater resistance to engage in international trade.

Table 2. Pooled OLS, panel random and fixed effects estimates of the effects of immigrants on bilateral trade costs

	OLS			Panel random effects			Panel fixed effects		
Variables	*(a)*	*(b)*	*(c)*	*(d)*	*(e)*	*(f)*	*(g)*	*(h)*	*(i)*
ln Immigrants$_{ijt}$	−0.100***	−0.102***	−0.102***	−0.0897***	−0.0909***	−0.119***	−0.104***	−0.133***	−0.106***
	(0.00118)	(0.00124)	(0.00156)	(0.00322)	(0.00327)	(0.00490)	(0.00326)	(0.00480)	(0.00350)
ln Distance$_{ij}$	0.0697***	0.0921***	0.128***	0.197***	0.213***	0.229***			
	(0.00595)	(0.00625)	(0.00605)	(0.0161)	(0.0160)	(0.0196)			
Landlocked$_i$	0.177***	0.155***	0.212***	0.249***	0.231***	0.228***			
	(0.00696)	(0.00750)	(0.00954)	(0.0455)	(0.0479)	(0.0474)			
Landlocked$_j$	0.205***	0.204***	0.370***	0.227***	0.226***	0.372***			
	(0.00905)	(0.00960)	(0.0112)	(0.0161)	(0.0159)	(0.0224)			
Adjacent$_{ij}$	−0.490***	−0.449***	−0.397***	−0.242***	−0.217***	−0.215***			
	(0.0227)	(0.0226)	(0.0169)	(0.0483)	(0.0511)	(0.0592)			
Colonial relationship$_{ij}$	0.0210	0.0364***	0.0634***	0.0396	0.0327	0.0931**			
	(0.0130)	(0.0137)	(0.0130)	(0.0302)	(0.0305)	(0.0384)			
Common language$_{ij}$	−0.0703***	−0.0697***	−0.0982***	−0.0660***	−0.0718***	−0.0184			
	(0.0106)	(0.0112)	(0.0104)	(0.0225)	(0.0231)	(0.0362)			
ln economic remoteness index$_{it}$	0.253***	0.239***	0.0718***	0.145***	0.129***	−0.0476	−0.485**	−0.745***	−0.514*
	(0.00751)	(0.00796)	(0.00785)	(0.0439)	(0.0468)	(0.0448)	(0.233)	(0.213)	(0.261)
ln economic remoteness index$_{jt}$	0.265***	0.265***	0.171***	0.214***	0.214***	0.153***	0.275***	0.221***	0.286***
	(0.00645)	(0.00706)	(0.00700)	(0.0126)	(0.0123)	(0.0187)	(0.0129)	(0.0205)	(0.0135)
Mutual trade agreement$_{ijt}$	−0.230***	−0.231***	−0.185***	−0.0711***	−0.0744***	−0.0391	−0.285***	−0.295***	−0.305***
	(0.00957)	(0.00993)	(0.0102)	(0.0207)	(0.0222)	(0.0263)	(0.0257)	(0.0343)	(0.0266)
Constant	0.334***	0.244***	2.475***	0.660*	0.630	2.879***	7.185***	10.13***	7.312***
	(0.0807)	(0.0856)	(0.0849)	(0.380)	(0.407)	(0.394)	(1.942)	(1.731)	(2.180)
No. of observations	16,503	15,844	12,008	16,503	15,844	12,008	16,558	12,008	15,899
Adj. R^2	0.658	0.645	0.540	0.644	0.620	0.516	0.491	0.442	0.482
Log-likelihood ratio	−15421	−15110	−9764				−8013	−7057	−8276
F-Statistic	1285***	1175***	698.1***				146.8***	75.42***	134.0***
Partner dummies				Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Wald χ^2				4729***	4923***	2985***			
σ^2_e				0.254	0.266	0.290	0.282	0.328	0.295
σ^2_u				0.210	0.223	0.187	0.495	0.516	0.513

Notes: Dependent variables: Columns (a), (d) and (g) = ln*TradeCosts*$_{ijt}$ *(of All Products)*; (b), (e), (h) = ln*TradeCosts*$_{ijt}$ *(of Manufactured Products)*; and (c), (f), (i) = ln*TradeCosts*$_{ijt}$ *(of Agricultural Products)*. Robust SEs are in parentheses. ***, ** and * denote statistical significance from zero at the 1%, 5% and 10% levels, respectively.

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