THE GRADUATE INSTITUTE | GENEVA
INSTITUT DE HAUTES ETUDES
INTERNATIONALES ET DU DÉVELOPPEMENT
GRADUATE INSTITUTE OF INTERNATIONAL
AND DEVELOPMENT STUDIES

HEID Working Paper No: 03/2010

Migrant Networks as Substitute for Institutions: Evidence from Swiss Trade

Pierre-Louis Vézina
Graduate Institute of International and Development Studies

Abstract

This paper uses an untapped dataset on Swiss immigration and a novel instrumental variable to test three channels through which migrants promote trade. The main finding is that migrant networks are an effective substitute for formal institutions in facilitating trade. The effect takes place entirely on the extensive margin, suggesting migrant networks may be reducing fixed entry costs characterized by corruption.

Migrant Networks as Substitute for Institutions: Evidence from Swiss Trade

Pierre-Louis Vézina[1]

First version: May 2008
This version: February 2010

Abstract

This paper uses an untapped dataset on Swiss immigration and a novel instrumental variable to test three channels through which migrants promote trade. The main finding is that migrant networks are an effective substitute for formal institutions in facilitating trade. The effect takes place entirely on the extensive margin, suggesting migrant networks may be reducing fixed entry costs characterized by corruption.

JEL Classification: F22, F14, D73, D8
Keywords: trade, migration, corruption

[1] Graduate Institute of International and Development Studies, pierre-louis.vezina@GraduateInstitute.ch . I thank Richard Baldwin, Marcelo Olarreaga, Peter Schott, Christoph Trebesch, Thierry Verdier, as well as seminar participants at the SSES 2009 Annual Meeting on 24 June for helpful comments.

1. Introduction

International trade flows are affected by factors beyond usual ones such as technology, institutions and policies. Indeed, Rauch (1996) suggested that, in the uncertain environment of international trade, migrant networks could promote trade by reducing search costs and enforcing contracts. Following his groundbreaking analysis, researchers devoted special attention to the role of migrant networks in overcoming trade barriers. While many studies found a positive correlation between migration and trade, it is still not clear what problems migrant networks help to solve. Identifying the causality and the mechanisms at work is therefore of crucial importance to better understand what holds trade back and how it can be set free.

In this paper I combine insights from information-based models of trade (Rauch 1996, 1999), distorted gravity models (Chaney 2008) and models of trade and insecurity (Anderson and Marcouiller 2002) to examine carefully the mechanisms through which migrant networks grease the wheels of international commerce. I study the case of Switzerland, which provides high-quality, unexploited migration data, using a novel instrumental variable method to verify the direction of causality.

I find a positive and significant causal effect of immigration on trade, implying that a 10% increase in immigration from a certain country can increase exports to that country by as much as 4.5%. I find that the effect is bigger when institutions are weak, and almost inexistent when institutions are strongest, highlighting the ability of migrant networks to substitute for formal institutions. I find robust evidence of this substitution effect for different trade flows by examining how the significance and magnitude of the marginal effect vary across various institutional quality levels, such as control-of-corruption, rule-of-law or more specific policy indicators from the Doing Business database. Using various estimation methods, such as IV-2SLS, Poisson pseudo maximum likelihood and 3SLS confirms the findings.

Unlike Rauch and Trindade (2002), who showed ethnic Chinese networks facilitate international trade by helping to match buyers and sellers in characteristics space, I find no ordering of magnitudes when estimating the protrade effect of migrants across product differentiation categories. However, decomposing trade flows into intensive and extensive margins, I find that the protrade effect takes place entirely on the extensive margin, suggesting migrant networks do engender new trade relationships. One possible explanation

could be that, rather than reducing search costs, migrant networks may be reducing fixed entry costs characterized by corruption.

The remainder of the paper is structured as follows. The next section reviews the literature and describes the theoretical mechanisms. A third section presents the empirical strategy and data. The results are discussed in the fourth section. A last section concludes.

2. How migrants affect trade – Literature review

The power of migrant networks to compensate for the lack of contract enforcement in international trade and to provide market information has been an area of empirical research since Greif (1993). Studying the Maghribi traders of the 11th century, he illustrated the importance of networks in providing the framework required for the operation of the market by influencing the cost, if not the feasibility, of trade. For the past millennia, trade diasporas such as the Greeks in Malabar or the Genoese in Syria provided this structure (Bernstein 2008). In his survey of business and social networks in international trade, Rauch (2001) provides many more examples, from the Armenian community of the 17th-18th centuries to today's Hausa in West Africa.

With this framework in mind, Rauch and Trindade (2002) looked at business networks created by ethnic Chinese migrants around the world. By showing that countries with a greater share of Chinese migrants trade more with each other, and that the effect is greater for differentiated products, they pointed up that ethnic Chinese networks facilitate international trade by helping to match buyers and sellers in characteristics space, as well as by deterring opportunistic behaviour through community sanctions.

In this day and age it is not only the Chinese who create such migrant networks as most migrants keep ties to their home country. Much attention has been devoted to migrant networks in the United States. Gould (1994), Herande and Saavedra (2005), Dunlevy (2006), Bandyopadhyay et. al. (2007) and White and Bedassa (2008) used US data to confirm the importance of migrant networks in increasing US exports. Head and Ries (1998) found some evidence for Canada, Koenig (2009) for France, Peri and Requena (2009) for Spain and Felbermayr and Toubal (2008) for OECD countries. Still, the mechanisms at play remain blurry. The literature has suggested three mechanisms through which migrants promote trade: (i) trust, (ii) information and, (iii) preferences.

2.1 Trust

International trade is no easy task, especially when it involves developing countries with unsound institutions. Routes are dangerous, with pirates, professional crooks, imaginary tariffs and corrupt border agents scattered all over. Indeed, one reason why so little trade occurs with developing countries is that their low quality of governance and rapacious corrupt officials affect risk perceptions (Anderson 2000, Anderson and Marcouiller 2002, Dollar and Kray 2002). And if there is a high degree of uncertainty about contract enforcement, a high level of trust is required for transactions to happen (Guiso, Sapienza and Zingales 2009). Thanks to cultural proximity, repeated transactions, or knowledge of implicit business rules, this necessary trust may exist within migrant networks.

Differences in culture and ways of doing business render trade all the more complicated. While tariffs and other formal trade barriers affect homogenously all potential traders, corruption deters mostly those who don't know the rules of the game (Crozet, Koenig and Rebeyrol 2008). Migrants may possess exclusive knowledge about the ways of dealing with border and government officials in their home country which improves their capacity to facilitate, or even create, trade. This knowledge of informal ways should therefore be most useful when formal institutions are on the blink, when contract enforcement is uncertain, or when business cultures are most different. This is what Dunlevy (2006) and White and Bedassa (2008) proposed by showing that corruption and cultural differences increased the protrade effect of immigrants.

2.2 Information

Missing information about available products and tastes results in a search for the right differentiated products that increases trade costs and reduces trade (Rauch 1996). By providing specific knowledge about products' supply and demand in origin and destination countries, migrant networks migrants can lower the informational frictions and render trade feasible. Rauch and Trindade (2002) suggested that the protrade effect of immigrants on homogenous goods could be used to measure their trust effect while their effect on differentiated products also includes the mechanism of market information. They thus identified the information channel by showing that the network effect on trade was statistically bigger for differentiated goods. Felbermayr and Toubal (2008) confirmed this result using data from OECD countries but Felbermayr, Jung and Toubal (2009) applied an updated empirical approach to the Rauch and Trindade (2002) data and did not find the intuitive size ranking of network coefficients across differentiated and exchange traded goods. Hence the theory remains unsettled.

More recently, Peri and Requena (2009) pointed out that immigrants provide market information that reduces the fixed costs of setting up business in their country of origin. But they define these set-up costs broadly, including search costs but also risk costs, such as those created by corruption. Using data from Spain, they did find that immigrants significantly increase exports almost entirely via the extensive margin, as predicted by their impact on fixed entry costs.

2.3 Import preferences

Migrants may have a strong preference for products from their origin country. For example, Indian migrants may want to import spices from India. Rauch (2001) noted that the export elasticity reflects a network effect while the import elasticity also includes a demand effect. The effect of migrants on imports should therefore be stronger than on exports. Felbermayr and Toubal (2008) identify the preference effect by assuming symmetric trust and information effects across exports and imports, while assuming a preference effect only for imports. They find that the preference effect of migration on bilateral trade amounts to up to 63% of the total effect.

The rest of this paper will look at these mechanisms more carefully, studying the case of Switzerland.

3. Empirical method and data

To estimate the protrade effect of migrants and disentangle the mechanisms at work, I use an enhanced log linear version of the gravity equation based on the Anderson and van Wincoop (2003) method to consistently estimate a theoretical gravity equation and calculate the comparative statics of trade frictions. I study the case of Switzerland as it provides untapped high quality immigration data available for seven years from 1996 to 2005 from the Swiss Federal Statistics Office. The model can be written as follows:

$\ln TRADE_{it} = f(\ln MIGRANTS_{it}, \ln GDP_{it}, \ln GDPPC_{it}, \ln DISTANCE_{it}, CORRUPTION_{it}, \ln MIGRANTS_{it} * CORRUPTION_{it}, Z_{it})$,

where

$\ln TRADE_{it}$ is the logarithm of the value of Swiss exports or imports (depending upon the regression) to country i in year t in current US dollars. The data is from the UN Comtrade database,

$MIGRANTS_{it}$ is the stock of immigrants from country i in year t in Switzerland. Data is from the Swiss Federal Statistics Office.

GDP_{it} is country i's Gross Domestic Product in current US dollars in year t, taken from the World Bank's World Development Indicators (WDI)

$GDPPC_{it}$ is country i's Gross Domestic Product per capita in current US dollars in year t, also taken from the WDI,

$DISTANCE_i$ is the distance in km between Zurich and country i's principal city, as reported by CEPII,

$CORRUPTION_{it}$ is an indicator of country i's corruption in year t from the Worldwide Governance Indicators of the World Bank and it measures perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests.

Z_{it} includes other variables that characterise the relationship between country i and Switzerland, such as a common language dummy (German, French or Italian), a shared border dummy, a preferential trade agreement (PTA) dummy built using information found on bilaterals.org[2], as well as dummy variables for country i's insularity, landlockness and a measure of remoteness from the rest of the world, defined as $\left[\sum_{k=1,k\neq i}^{N} GDP_k \, (Dist_{ik})\right]^{-1}$ as suggested by Head (2003).

To examine the search mechanism I aggregate goods according to the Rauch (1999) liberal classification[3]. Homogenous goods, such as coffee or rice, have their prices quoted on organized exchanges. "Reference priced" goods, such as hydrogenated animal oils or resin-based chemical products, have their prices quoted in trade publications. Other goods are classified as "differentiated". To examine how corruption affects the protrade effect of migrants, I interact the corruption indicator with the logarithm of the stock of migrants as in Dunlevy (2006).

3.1 Descriptive statistics

Before proceeding to the estimation I here provide some descriptive statistics. Switzerland trades mostly with rich and developed countries while immigration sources are mostly its neighbours and the ex-Yugoslavian countries (Figure 1). Only four countries are both top 10

[2] These countries are Chile, Israel, Iceland, Jordan, Lebanon, Morocco, Mexico, Norway, Singapore, South Korea, Tunisia and Turkey.
[3] Using the conservative classification leads to the same results.

trade partners and migrant suppliers, i.e. Germany, Italy, France and Spain. There seems to be a clear relationship between immigration and trade. Summary statistics are in Table 1.

Figure 1

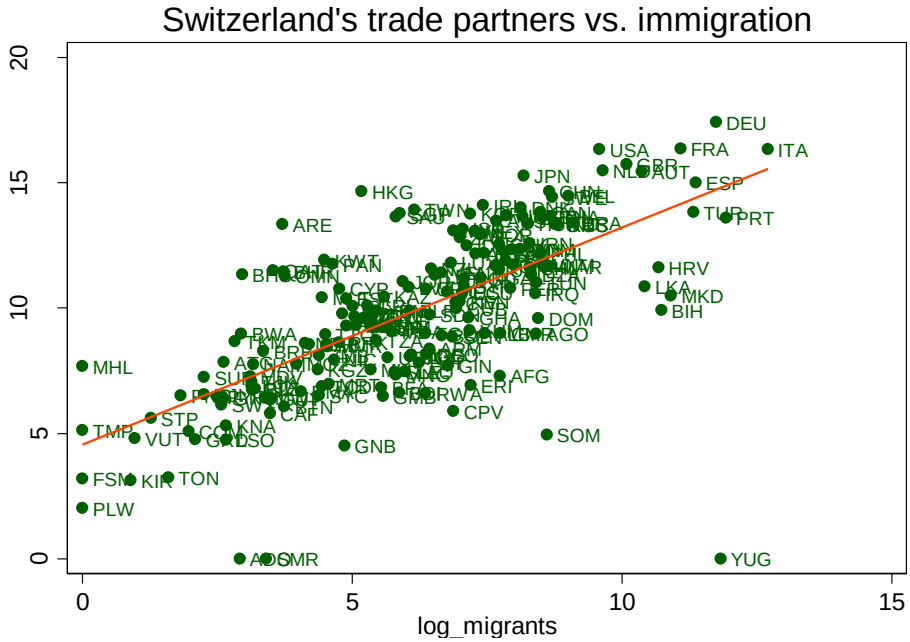


Table 1

Table 1. Summary statistics (Averaged across years)

Variable		Obs	Mean	Std. Dev.	Min	Max
Migrants		182	8010.2	31925.9	0	329462.3
Control of corruption		178	-0.00	0.98	-1.65	2.39
GDP		188	1.75E+11	8.17E+11	5.12E+07	9.69E+12
GDP per capita		166	8578.9	9106.9	555.91	46427.4
Distance		182	3706.327	2396.928	207.5064	11612.89
Remoteness		197	.0477716	.0400126	.0007104	.1920954
PTA		197	.0364559	.1654659	0	1
Island		182	.1978022	.3994411	0	1
Landlocked		182	.2032967	.4035616	0	1
Border		182	.021978	.1470161	0	1
Common language		182	.1868132	.3908367	0	1
Swiss migrants		194	7225.33	25320.8	0	239185
Migrants in France		195	31554.4	128252.9	0	1333587.0
Visa restrictions		187	.6256684	.485249	0	1
Passport costs		121	48.82826	43.95142	0	333.57
Exports	Differentiated	197	352040.8	1372601.0	0	1.47E+07
	Reference priced	197	86996.4	386457.8	0	4247782.0
	Homogenous	197	21449.1	88778.5	0	630809.5
Imports	Differentiated	197	323076.9	1783088.0	0	2.21E+07
	Reference priced	197	78965.1	387245.2	0	4349311.0
	Homogenous	197	42094.7	147648.1	0	1101462.0

3.2 Basic specification

The relationship between trade and immigration may be driven by partner-specific unobservables such as cultural fondness. I therefore include partner-fixed effects in the model described above. The model to be estimated becomes:

$$\ln TRADE_{it} = f(\ln MIGRANTS_{it}, \ln GDP_{it}, \ln GDPPC_{it}, \text{CORRUPTION}_{it}, PTA_{it}, \alpha_i, \omega_t),$$

where α_i is a country-specific fixed effect and ω_t is a time fixed effect. I include time fixed effects to take into account global trends in trade. I omit the interaction of immigration and corruption, as this mechanism operates across countries. Indeed, I do not expect yearly variations in corruption to impact the protrade effect of a specific migrant network.

4. Empirical findings and robustness checks

Results are in table 2. I find a positive and significant effect of migrants on total exports (column 1). It suggests a 10% increase in immigration results in a 3.4% increase in exports to the origin country. However, I do not find a significant impact on total imports (column 5). This is counterintuitive since it should capture a network and a demand effect. Neither corruption, trade agreements nor GDP seem to explain the yearly variation in exports and imports, while GDP per capita has a strong and positive impact on both flows.

To investigate further, I decompose trade flows according to the Rauch (1999) classification and run the same regressions. I find positive and significant migrant elasticities for exports of homogenous and differentiated goods (columns 3 and 4) and for imports of differentiated products (column 8) of 0.58, 0.31 and 0.29, respectively. The protrade effect does not appear stronger for exports of differentiated goods than for homogenous ones, as would be implied by higher search costs. Strangely, a deterioration of corruption seems to lead to more exports of homogenous and referenced goods (columns 2 and 3). To further explore these findings, I decompose trade flows into two margins.

Table 2

Within partner regressions

	Exports				Imports			
	Total	Homogenous	Referenced	Differentiated	Total	Homogenous	Referenced	Differentiated
ln (migrants)	0.338**	0.583***	0.121	0.313**	-0.063	-0.128	-0.091	0.285*
	(0.01)	(0.00)	(0.41)	(0.02)	(0.69)	(0.55)	(0.59)	(0.08)
control of corruption	-0.05	-0.546**	-0.301*	0.008	0.09	-0.095	-0.298	-0.021
	(0.77)	(0.03)	(0.1)	(0.96)	(0.65)	(0.72)	(0.16)	(0.92)
ln (GDP)	0.298	0.643*	0.24	0.244	-0.116	-0.862**	-0.229	-0.062
	(0.2)	(0.06)	(0.34)	(0.28)	(0.67)	(0.02)	(0.43)	(0.83)
ln (GDP per capita)	1.898***	0.844	0.703	2.220***	2.346***	2.630***	1.039*	1.860***
	(0.00)	(0.22)	(0.17)	(0.00)	(0.00)	(0.00)	(0.08)	(0.00)
PTA	-0.216	-0.445	-0.015	-0.19	-0.027	0.179	-0.138	0.032
	(0.47)	(0.31)	(0.96)	(0.52)	(0.94)	(0.7)	(0.71)	(0.93)
Constant	-15.4***	-20.84***	-4.98	-16.92***	-7.906	5.545	3.545	-8.347
	(0.00)	(0.00)	(0.31)	(0.00)	(0.14)	(0.44)	(0.54)	(0.14)
Observations	1067	1067	1067	1067	1067	1067	1067	1067
R2 (within)	0.148	0.098	0.032	0.167	0.089	0.034	0.05	0.112

Note: All regressions include year dummies and partner fixed effects. Heteroscedastic-consistent p-values in parentheses. ***, ** and * denote statistical significance at the 1%, 5% and 10% levels, respectively.

4.1 Migrant networks and the margins of trade

Peri and Requena (2009) pointed out that migrants provide information that reduces the costs of setting up business in their country of origin, but not variable costs, such as transport costs and tariffs. Within the Chaney (2008) distorted gravity model, a reduction in fixed entry costs causes an extension of trade but does not affect the amount exported by each firm[4]. These entry costs can be defined as search costs or as insurance costs that increase with corruption. If migrants' diminish these insurance costs thanks to their knowledge of the rules-of-the-game and trust, they should have an impact on the extensive margin.

The preference effect, however, operates through an increase in demand, which, according to the Chaney (2008) model, does affect the amount sold by each exporting firm. Hence, an increase in migrants should increase both margins of imports.

I follow Peri and Requena (2009) and decompose exports and imports into an extensive margin, defined as the number of HS 6-digit product lines per partner per year, and an intensive margin, defined as the average value per transaction. I then estimate the same gravity model for the two margins of trade separately. For the extensive margin I use the Poisson and negative binomial models, as it is a count variable.

Results in table 3 confirm the previous findings and prove more illuminating. All seems to take place at the extensive margin. I find positive, significant and robust effects on the extensive margin of exports of homogenous and differentiated goods and on the extensive margin of imports of differentiated goods. These confirm that, year-on-year, an increase in

[4] This is because the optimal price and quantity produced by a firm does not depend on fixed trade costs in the model. However, a reduction in fixed costs reduces the productivity threshold for the exporting firm, hence affecting only the extensive margin.

immigration will lead to the creation of trade in new products. More precisely, a 10% increase of migrants increases the number of exported homogenous product lines by around 2.3% (column 1), of exported differentiated product lines by 1.2% (column 3), and the number of imported differentiated product lines by at least 1.1% (column 6). Still, I find no ordering of coefficients across product differentiation categories. This suggests the entry costs migrants networks lower may be insurance costs rather then search costs. Further examination is in order.

Table 3

Table 3. Marginal effect of migrants on trade margins (within partners)

	Exports			Imports		
	Homogenous	Referenced	Differentiated	Homogenous	Referenced	Differentiated
	Intensive margin					
FE OLS	0.485***	-0.005	0.109	-0.083	-0.049	-0.090
	(0.00)	(0.98)	(0.32)	(0.73)	(0.77)	(0.41)
FE Poisson	-0.328	-0.148	-0.056	0.255	-0.345	-0.134
	(0.27)	(0.64)	(0.63)	(0.58)	(0.28)	(0.37)
	Extensive margin					
FE Poisson	0.311***	0.196***	0.200***	0.085	0.162	0.209***
	(0.00)	(0.00)	(0.00)	(0.42)	(0.16)	(0.00)
FE Negative binomial	0.236***	0.036	0.117***	0.063	0.028	0.107***
	(0.00)	(0.29)	(0.00)	(0.29)	(0.52)	(0.00)

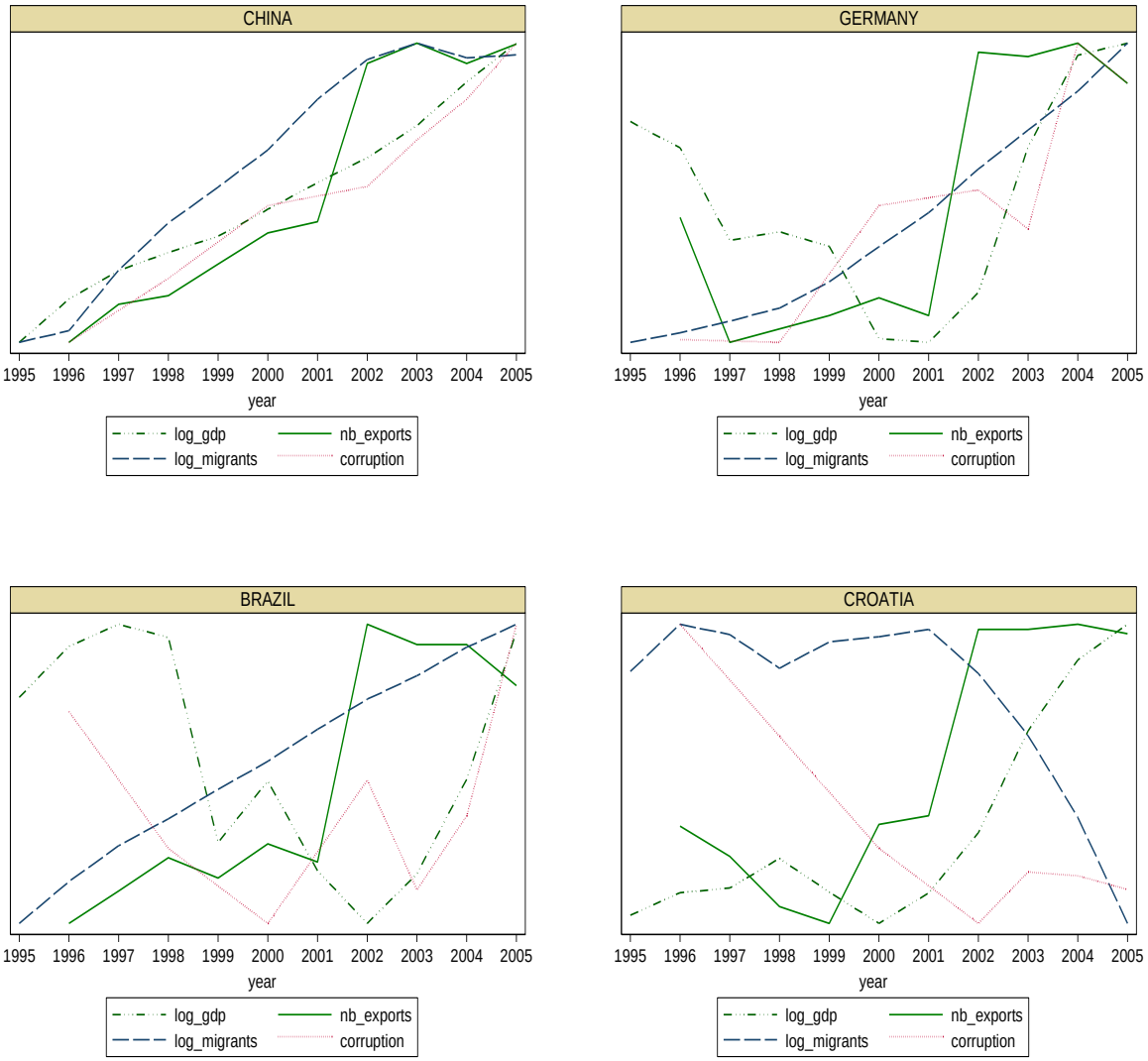
Note: All regressions include year dummies and partner fixed effects. Heteroscedastic-consistent p-values in parentheses. ***, ** and * denote statistical significance at the 1%, 5% and 10% levels, respectively.

4.2 Causality

Several econometric issues may challenge the validity of the results above. While the findings indicate yearly increases in immigration are correlated with trade creation, they do not reveal the direction of causality. Maybe new trade partnerships beget migration flows. Previous research has solved this problem by using lagged migration as an instrument for current migration. Yet, it is not clear this instrument is strictly excludable, as the protrade effect could operate with a lag. Moreover, from 1995 to 2005, partner countries may have seen their trade and migration follow long run trends. As seen in figure 2, some countries, e.g. China, have seen upward trends in all variables. A positive and significant coefficient would not reveal much if this were the case in most countries. Also, as seen in the case of Croatia, migrants started leaving Switzerland massively around 2001 but the number of export products didn't fall, indicating persistence in trade relationships. This is simply to illustrate that the within country variation, at least over a ten-year period, is not what one should look at to estimate the protrade effect of migrants. The levels of migration and trade across countries should provide more information.

Also, given that I want to estimate the protrade effect of migrants across different levels of corruption, a fixed effect approach is, once again, not appropriate. Indeed, corruption variation within a country is often meaningless over a ten-year period. For example, corruption in Germany has been increasing, while it has been fluctuating in Brazil (figure 2). The within country changes do not reflect that Brazil may have remained corrupt for Swiss exporters while Germany remained frictionless.

Figure 2



To identify causality, I use an instrumental variable (IV) approach on an averaged cross section. An averaged cross section provides many advantages. First, yearly data noises are cancelled. Second, I am able to estimate a protrade effect that varies across countries according to the level of corruption.

To instrument for migrants in Switzerland, my first IV is the number of migrants in France, which I get from the Global Origin Migrant Database. The reason for which this provides a good instrument is that France and Switzerland have a similar distribution of migrants' origins. However, migrants in France cannot help Swiss trade. To increase the variance in predicted migration in my first stage regression I also add Swiss visa restrictions as a second IV. The logic here is that, for reasons of perceived security and immigration-control, Switzerland might use visa restrictions to intentionally deter individuals from some countries to immigrate. These restrictions to immigration should not affect trade through channels other than migration. The visa restriction dummy is from Neumayer (2006). The interaction term is instrumented by the interaction of the IVs described above with the corruption variable. Results are in table 4.

Table 4

IV-2SLS enhanced trade gravity estimates

	Exports			Imports		
_	Homogenous	Referenced	Differentiated	Homogenous	Referenced	Differentiated
ln (migrants)	0.320**	0.314*	0.014	-0.020	0.085	0.469***
	(0.03)	(0.07)	(0.84)	(0.94)	(0.60)	(0.00)
control of corruption	1.103*	0.490	1.051***	-0.333	1.186**	0.821
	(0.09)	(0.42)	(0.00)	(0.73)	(0.04)	(0.17)
ln (migrants) *	-0.113	-0.035	-0.138***	0.045	-0.059	-0.062
control of corruption	(0.15)	(0.62)	(0.00)	(0.70)	(0.41)	(0.39)
ln (GDP)	0.911***	0.942***	1.052***	1.248***	1.095***	0.823***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
ln (GDP per capita)	-0.016	-0.080	0.043	-0.366	0.157	0.403*
	(0.94)	(0.64)	(0.71)	(0.29)	(0.43)	(0.07)
ln (distance)	-0.979***	-0.726***	-0.542***	-0.209	-0.576**	-0.204
	(0.00)	(0.00)	(0.00)	(0.58)	(0.02)	(0.35)
border	-0.642	-0.057	0.795**	0.241	0.449	0.519
	(0.25)	(0.91)	(0.05)	(0.77)	(0.44)	(0.32)
common language	0.576*	-0.570*	-0.221	0.142	0.121	-0.168
	(0.09)	(0.05)	(0.14)	(0.73)	(0.70)	(0.62)
island	1.061**	-0.059	0.089	0.799	-0.016	0.223
	(0.04)	(0.87)	(0.64)	(0.24)	(0.97)	(0.57)
landlocked	-0.008	-0.583*	-0.174	0.212	-0.637*	0.081
	(0.98)	(0.06)	(0.25)	(0.68)	(0.07)	(0.80)
PTA	0.742	0.358	-0.051	1.223	-0.126	-0.407
	(0.44)	(0.33)	(0.86)	(0.12)	(0.77)	(0.38)
Remoteness	-0.849	4.431	-2.085	-6.048	-0.643	-6.730*
	(0.82)	(0.14)	(0.20)	(0.17)	(0.86)	(0.06)
N	156	156	156	156	156	156
Adj R2	0.794	0.875	0.939	0.597	0.845	0.846
Hansen J p-val	0.24	0.07	0.30	0.04	0.09	0.89
Cragg-Donald F	17.04	17.04	17.04	17.04	17.04	17.04

Note: Heteroscedastic-consistent p-values in parentheses. ***, ** and * denote statistical significance at the 1%, 5% and 10% levels, respectively. Only inference on non-interacted variables is of interest in this table. Excluded instruments are ln (migrants

Among control variables, only GDP and distance seem to explain trade flows across product types. As for migrants, a first look at the table suggests coefficients slightly smaller on

exports and bigger on imports of differentiated products than what the within-partner regressions revealed. However, these effects vary with corruption, hence the need to push the analysis of the interaction further.

4.3 The role of corruption and other trade inhibitors

While Dunlevy (2006) limited his analysis of the interaction of migrants and corruption to the significance of the interaction term, I here further analyze it by plotting the marginal effects of migrants on trade at different levels of corruption as well as their confidence intervals in Figure 3[5]. Indeed, conclusions based on the standard error of the interaction term alone do not tell the whole story (Greene, p. 124, and Brambor et al, 2008).

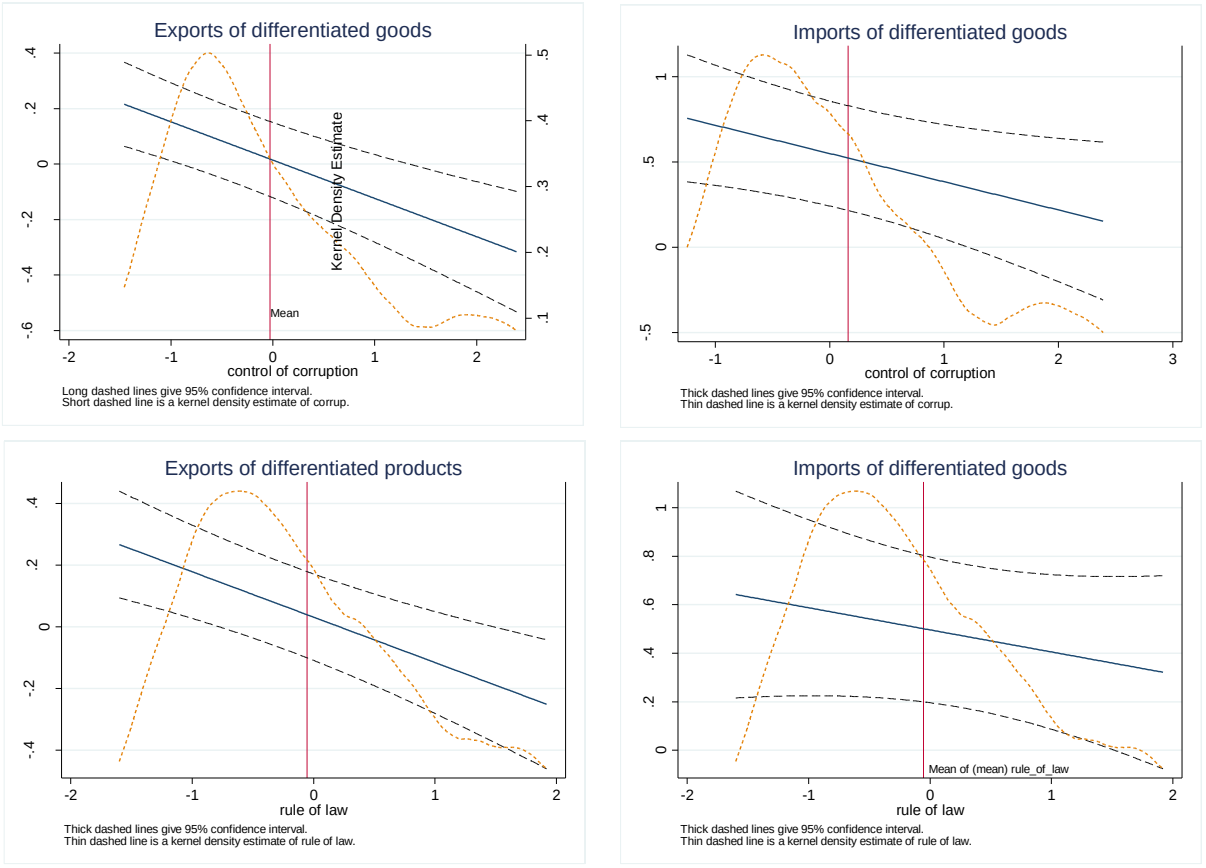
For simplicity I only show the figures for selected flows. I superpose the density estimate of the corruption variable to indicate its distribution among trade partners. One can hence visualize for which proportion of countries the effect is significant. The marginal effect of migrants on trade is increasing in corruption for all types of goods except imports of homogenous goods. This confirms the trust provision mechanism as migrants play a bigger role the worst the risk perception. Once again, these results do not indicate a stronger effect for differentiated products.

For exports of differentiated goods, the effect is positive and significant only for countries with control of corruption below -0.8, or worse than Russia's. For imports of differentiated goods, the effect can be as high as 0.75 and is positive and significant for most countries, unless they are as clean as Japan. For exports of homogenous goods (not graphed), the effect is positive and significant for countries where corruption is worse than in Morocco, where it is close to the world average.

[5] The standard error of interest is
$\hat{\sigma} = \sqrt{var(\hat{\beta}_{migrants}) + corruption^2 var(\hat{\beta}_{interaction}) + 2(corruption)cov(\hat{\beta}_{migrants}\, \hat{\beta}_{interaction})}$.

Figure 3

The marginal effect of migrants on trade at different levels of corruption

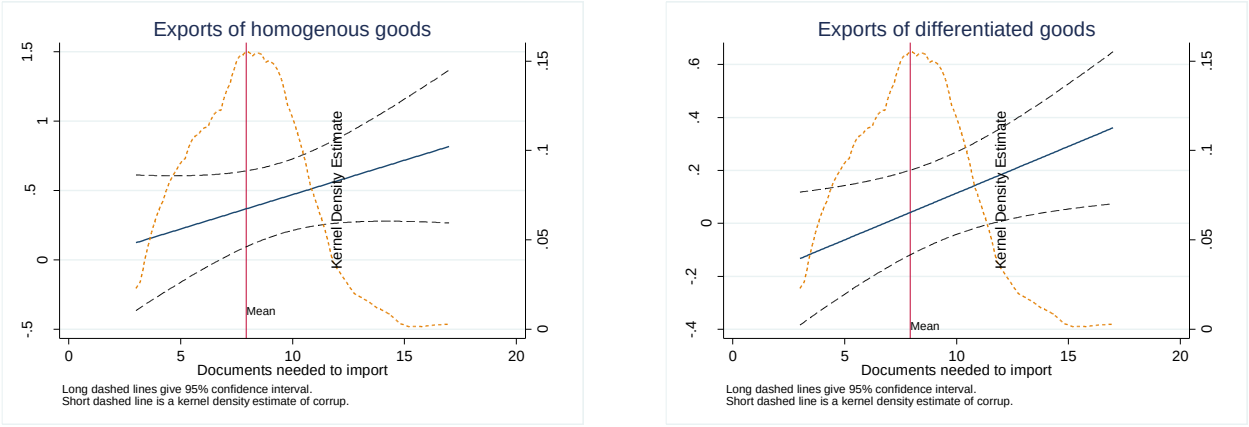


The substitution effect between migrants and institutions is robust to the use of an alternate measure, i.e. the rule of law from the World Governance Indicators (Figure 3), and also to measures of border corruption, i.e. the number of documents (or days) required to import[6]. As seen in Figure 4, the effect of migrants on exports is bigger when many documents are required, highlighting the role of knowledge of the rules-of-the-game. For homogenous goods exports, migrants play a significant role only when 7 or more documents are needed (as in Argentina or Malaysia). I also find (graphs not shown) that for differentiated goods exports, 12 documents need to be required for migrants to play a significant role (as in Angola and Malawi). For imports of differentiated goods, migrants play a significant role only when 6 or more export documents are needed (as in Armenia or Bangladesh) or when it takes at least 22 days to export (as in Belize and Belarus) while for the import of homogenous goods migrants do not play a significant role.

[6] As this indicator is not available for the years covered but only starting in 2006, this should be only indicative.

Figure 4

The marginal effect of migrants on exports for different import document requirements



I also verify if my results hold when applying a 3SLS (which combine the IV regressions with a SUR system) and a Poisson pseudo maximum likelihood model[7] which is more precise and consistent in the case of log-linearized models with heteroskedasticity (Santos Silva and Tenreyro 2006). The IV Poisson and 3SLS regressions confirm previous results, while the Poisson does not perform as well. Table 5 compares the marginal effects of migrants on the different trade flows estimated using the methods discussed above. The joint significance of migrant networks and their interactions with corruption is also given. Across all methods the robustness of the joint significance stands out, except for import of homogenous goods. This confirms a clear, causal protrade effect that substitutes for formal institutions across all types of flows, except imports of homogenous goods.

Table 5

	Exports			Imports		
	Homogenous	Referenced	Differentiated	Homogenous	Referenced	Differentiated
OLS	0.158	0.326	0.022	-0.007	0.284	0.323
	(3.430)**	(8.250)***	(7.630)***	(0.010)	(5.500)***	(6.850)***
IV-2SLS	0.437	0.392	0.023	0.096	0.162	0.550
	(6.330)**	(6.400)**	(12.64)***	(0.15)	(5.830)*	(16.26)***
Poisson	0.007	0.167	0.055	-0.027	-0.009	0.133
	(1.130)	(10.02)***	(1.490)	(0.100)	(1.950)	(2.300)
IV-Poisson	0.452	0.461	0.009	-0.197	0.163	0.529
	(5.790)*	(4.530)*	(16.68)***	(2.590)	(18.74)***	(24.51)***
3SLS	0.420	0.753	0.114	0.013	0.673	0.765
	(10.32)***	(33.05)***	(12.82)***	(0.040)	(18.09)***	(24.16)***

Marginal effects are estimated at the mean of control of corruption. The joint significance of ln(migrants) and its interaction with control of corruption is given by the F statistics in parenthesis. ***, ** and * denote statistical significance at the 1%, 5% and 10% levels, respectively.

[7] For the Poisson pseudo-ML estimation the dependant variable is in levels, not logs.

For another robustness check I also run the regressions including Swiss migrants in partner countries using data from the Global Migrant Origin Database. Oddly, I find no significant effect of Swiss migrants but no change to previous results. Also, I estimate the model using passport costs as a predictor of emigration in the first stage, as Javorcik et al. (2006). McKenzie (2007) showed that high passport costs are associated with lower levels of outward migration and tend to be correlated with other emigration barriers imposed by countries. Using this IV reduces the sample to 113 observations but confirms the results (not shown). Also, as Rauch (1996) had suggested migrant networks facilitate trade through contract enforcement, they should be most useful the worse the contract enforcement measure from Doing Business, even though this measure captures local and not international contracts. However, I do not find such results. Contract enforcement in partner countries does not even explain trade with Switzerland.

4.4 Causality at the extensive margin

As within partner the protrade effect was acting entirely on the extensive margin, I now replicate the cross section regressions on the margins of trade. Here, the extensive margin is defined as the number of HS 6-digit product lines per partner, and the intensive margin as the average value per transaction. Again, my results confirm those of Peri and Requena (2009), as the impact of migrants is positive and significant only on the extensive margin. The Poisson, IV Poisson and negative binomial, confirm this result and provide further evidence that a larger community of migrants reduces the fixed costs of exporting to their countries of origin (table 7). Figure 5 shows the marginal effect of migrants on the extensive margin of exports. I find a somewhat bigger effect on exports of differentiated goods than on homogenous ones, though not significant.

Peri and Requena (2009) suggested that the fixed costs of trade with countries with severe problems of inefficiency of institutions could be so high that the presence of migrant networks could decrease fixed trade costs no matter how differentiated the goods. On the other hand, developed countries fixed costs are not large and the presence of a migrant network should predominantly affect the transmission of complex information that is likely to be more relevant for differentiated goods. Hence, I also ran these regressions on a sample restricted to low corruption countries (with control of corruption above average). I still found no evidence of a significantly stronger effect on differentiated products, whether for imports or exports. This finding, combined with the institution-substitution effect, strongly suggests migrant networks cause an extension of exports through a reduction of fixed entry costs

characterised by risk and corruption, rather than through a reduction of search costs, characterised by product differentiation.

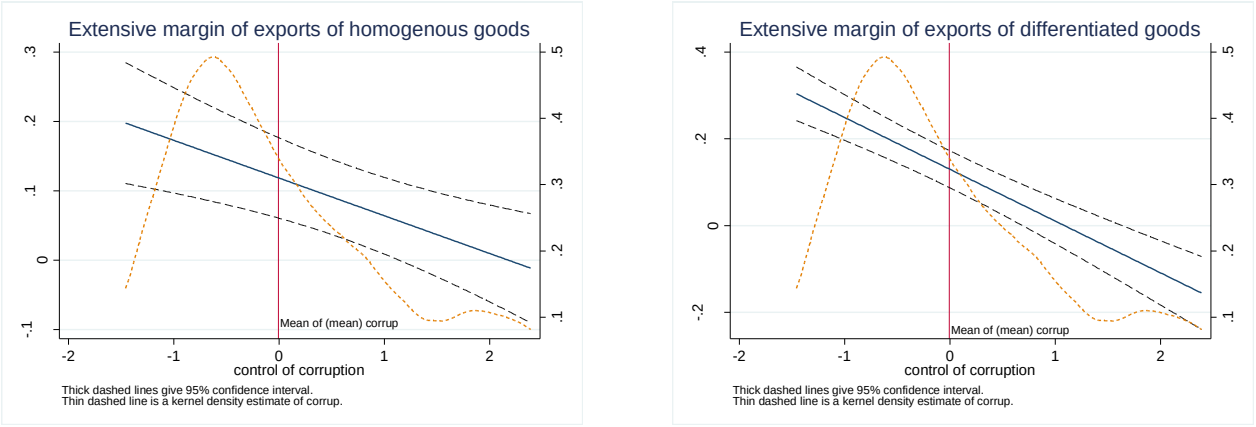
Table 6

	Exports			Imports		
	Homogenous	Referenced	Differentiated	Homogenous	Referenced	Differentiated
			Intensive margin			
Poisson	-0.202	0.045	-0.035	-0.267	-0.068	-0.005
	(3.81)	(4.35)	(2.73)	(8.30)**	(2.50)	(0.01)
IV-Poisson	0.185	0.177	-0.040	0.086	-0.214	0.075
	(2.86)	(7.95)**	(1.52)	(17.4)***	(8.77)**	(1.91)
OLS	-0.030	0.111	-0.058	-0.229	-0.000	0.074
	(0.06)	(2.18)	(1.63)	(2.15)	(1.51)	(0.89)
IV-2SLS	0.221	0.104	-0.018	-0.245	-0.174	0.246
	(0.89)	(2.40)*	(0.25)	(0.72)	(1.77)	(2.72)*
			Extensive margin			
Poisson	0.118	0.149	0.130	0.228	0.219	0.131
	(20.2)***	(35.1)***	(95.5)***	(23.7)***	(34.2)***	(94.7)***
IV-Poisson	0.148	0.138	0.149	0.257	0.266	0.159
	(5.51)*	(11.1)***	(46.2)***	(14.1)***	(6.54)**	(43.7)***
Negative	0.126	0.192	0.131	0.261	0.293	0.134
binomial	(21.5)***	(57.3)***	(101.3)***	(36.3)***	(50.3)***	(87.7)***

Marginal effects are estimated at the mean of control of corruption. The joint significance of ln(migrants) and its interaction with control of corruption is given by the F statistics in parenthesis. ***, ** and * denote statistical significance at the 1%, 5% and 10% levels, respectively. Controls are as listed in table XX.

Figure 5

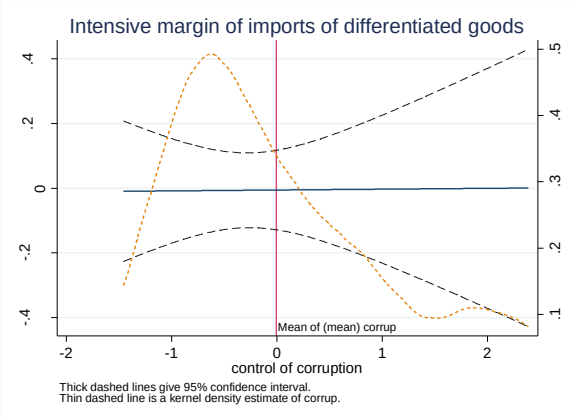
The marginal effect of migrants on the extensive margin of exports

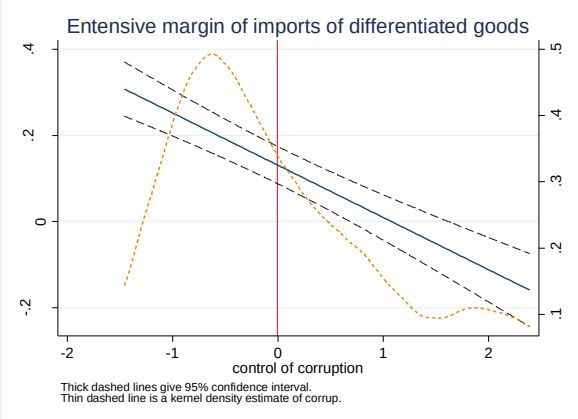


For imports, according to Chaney (2008), an increase in migrants should increase both the intensive and extensive margins, with the effect on the intensive margin being only a demand effect. Surprisingly, I find no effect of migrants on the intensive margin of imports. This either rejects the demand effect or suggests that it also operates on the extensive margin. Indeed, as shown in Figure 6, the effect on the extensive margin of imports is significant and depends on corruption.

Figure 6

The marginal effect of migrants on the margins of imports





5. Conclusion

This paper presents evidence, from a never-before exploited migration data set, of a causal effect of migrants on both exports and imports. The migrant networks' effect is found to be a strong substitute for formal institutions. Not only do I confirm Dunlevy's (2005) result using Swiss instead of US data, I also show that the substitution effect is causal and robust to the use of various institutional measures and across organized exchange, reference priced and differentiated goods. However, I find no ordering of magnitudes across these categories, breaking with the previous literature. Nonetheless, I show that the protrade effect of migrant networks takes place entirely on the extensive margin, indicating a fixed cost reduction mechanism. Taken together, these results suggest that migrant networks, rather than reducing search costs, could be reducing fixed-entry costs characterised by corruption thanks to their knowledge of the rules-of-the-game.

After waves of globalization, international exchange still faces various obstacles and shaky institutions remain an ongoing concern. This paper provides further evidence that migrant networks can substitute for formal institutions and bring about new trade relationships. Considering the productivity and welfare gains associated with trade, this clearly highlights a major benefit from immigration.

References

Anderson J. E., 2000, "**Why Do Nations Trade (So Little)?**" Pacific Economic Review 5: 115-134.

Anderson J. E. and D. S. J. Marcouiller, 2002 "**Insecurity and the Pattern of Trade: An Empirical Investigation**" Review of Economics and Statistics, 84: 342-352.

James E. Anderson & Eric van Wincoop, 2003. "**Gravity with Gravitas: A Solution to the Border Puzzle**," American Economic Review, American Economic Association, vol. 93(1), pages 170-192, March.

Bandyopadhyay, Subhayu & Cletus C. Coughlin & Howard J. Wall, 2007. "**Ethnic networks and U.S. exports**," Working Papers 2005-069, Federal Reserve Bank of St. Louis

Bernstein William J., 2008, **A Splendid Exchange: How Trade Shaped the World**, Atlantic Monthly Press

Brambor, Thomas, William Clark & Matt Golder (2008) "**Understanding Interaction Models: Improving Empirical Analyses**." in W. Paul Vogt.. Selecting Research Methods. London: Sage Publications.

Chaney, Thomas, 2008. "**Distorted Gravity: The Intensive and Extensive Margins of International Trade**," American Economic Review, American Economic Association, vol. 98(4), pages 1707-21, September

Crozet, Matthieu & Pamina Koenig & Vincent Rebeyrol, 2008. "**Exporting to Insecure Markets: a Firm-Level Analysis**," **Working Papers** 2008-13, CEPII research center.

Dollar D. and A. Kraay, 2002, "**Institutions, Trade, and Growth**", Journal of Monetary Economics, 50: 133-162.

Dunlevy, James A. 2006. "**The Influence of Corruption and Language on the Protrade Effect of Immigrants: Evidence from the American States**," The Review of Economics and Statistics, MIT Press, vol. 88(1), pages 182-186, July

Felbermayr, Gabriel J. and Toubal, Farid, **Revisiting the Trade-Migration Nexus: Evidence from New OECD Data** (March 1, 2008).

Felbermayr, Gabriel J & Benjamin Jung & Farid Toubal, 2009. "**Ethnic Networks, Information, and International Trade: Revisiting the Evidence**," 306/2009, Department of Economics, University of Hohenheim, Germany

Gould, David M, 1994. "**Immigrant Links to the Home Country: Empirical Implications for U.S. Bilateral Trade Flows**," The Review of Economics and Statistics, MIT Press, vol. 76(2), pages 302-16, May

Greene, William H. Econometric Analysis (5th Edition) Prentice Hall; (September 1, 2002)

Greif, Avner, 1993. "**Contract Enforceability and Economic Institutions in Early Trade: the Maghribi Traders' Coalition**," American Economic Review, American Economic Association, vol. 83(3), pages 525-48, June.

Guiso, Luigi & Sapienza, Paola & Zingales, Luigi, 2009. "**Cultural Biases in Economic Exchange**," Quarterly Journal of Economics, MIT Press, Vol. 124, No. 3

Head, Keith & John Ries, 1998. "**Immigration and Trade Creation: Econometric Evidence from Canada**," Canadian Journal of Economics, Canadian Economics Association, vol. 31(1), pages 47-62, February

Head, Keith, 2003, **Gravity for beginners**, mimeo, UBC

Herander, Mark G. and Saavedra, Luz A., "**Exports and the Structure of Immigrant-Based Networks: The Role of Geographic Proximity**," *Review of Economics and Statistics* 87 (2005):323-35.

Javorcik, Beata S. & Ozden, Caglar & Spatareanu, Mariana & Neagu, Cristina, 2006. "**Migrant networks and foreign direct investment**," Policy Research Working Paper Series 4046, The World Bank

Koenig, Pamina 2009. "**Immigration and the export decision to the home country**," PSE Working Papers 2009-31, PSE

McKenzie, David, 2007. "**Paper Walls Are Easier to Tear Down: Passport Costs and Legal Barriers to Emigration**," World Development, Elsevier, vol. 35(11), pages 2026-2039, November.

Neumayer, Eric (2006) **Unequal Access to Foreign Spaces: How States Use Visa Restrictions to Regulate Mobility in a Globalised World**, Transactions of the British Institute of Geographers 31 (1), 2006, pp. 72-84

Giovanni Peri & Francisco Requena, 2009. "**The Trade Creation Effect of Immigrants: Evidence from the Remarkable Case of Spain**," NBER Working Papers 15625, National Bureau of Economic Research, Inc.

Rauch, James E, 1996. "**Trade and Search: Social Capital, Sogo Shosha, and Spillovers**," NBER Working Papers 5618, National Bureau of Economic Research, Inc

Rauch, James E., 1999. "**Networks versus markets in international trade**," Journal of International Economics, Elsevier, vol. 48(1), pages 7-35, June

Rauch, James E. 2001. "**Business and Social Networks in International Trade**," Journal of Economic Literature, American Economic Association, vol. 39(4), pages 1177-1203, December.

Rauch, James E. & Vitor Trindade, 2002. "**Ethnic Chinese Networks In International Trade**," The Review of Economics and Statistics, MIT Press, vol. 84(1), pages 116-130, February

Santos Silva J. M. C. & Silvana Tenreyro, 2006. "**The Log of Gravity**," The Review of Economics and Statistics, MIT Press, vol. 88(4), pages 641-658, 09

White, Roger Tadesse, Bedassa 2008, "**Cultural Distance and the US Immigrant-Trade Link**" The World Economy, Vol. 31, Issue 8, pp. 1078-1096