ON THE PRO-TRADE EFFECTS OF IMMIGRANTS

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Abstract

Using highly detailed data on trade flows from 107 Italian provinces (NUTS-3) between 2003 and 2009, we find that an increase in the number of immigrants causes a substantial increase in the provinces' exports to the immigrants' home country, and that the effect is even larger for imports. Two main explanations have been highlighted in the literature: immigrants foster both bilateral imports and exports because of their superior knowledge of market opportunities in their home-country, and they promote imports of their home-country consumption goods to satisfy their different consumption tastes. In this paper, we offer a new complementary explanation: the trade effect of immigrants can be generated by the increase in the number of host-country-firms due to new foreign-born entrepreneurs. The evidence is positive, especially for imports.

Keywords: Migration, trade, gravity model

JEL Classification: F10, F14, F22, R10.

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1 Introduction

According to recent OECD estimates, at the turn of the century, 4.6% of world population was born in a different country from the one where it currently lived.[1] Italy is no exception. In the year 2000 4.1% of the Italian population was born abroad. This amounts to more or less 2 million people. In the last ten years, which is the time period we will focus on, immigration in Italy has further increased, becoming a highly debated issue not only in academic circles but also among politicians and in the press. Between 2000 and 2009, the number of foreign-born residents rose to 4.2 million, which means that 7% of the total number of Italian residents were born in a different country (ISTAT, 2010).

During the same years Italian participation to world trade increased in nominal terms both in exports and imports, but decreased in terms of world trade shares. The issue of the decline of Italian market's shares also became a very much debated issue. It is often considered as a sign of the difficulties of Italian firms to cope with the increased competition coming from emerging countries, and as an evidence of effects of the very low national productivity grow.

This paper explores the link between the increasing trends of trade and migration, exploring the causal effect of immigrants on international trade in Italy. The Italian case is interesting both in terms of its internal validity as its features (see below) enable to identify a credible causal relationship, and in terms of its external validity as the characteristics of the Italian data where immigrants from several origin countries are represented make the Italian case relevant also for other countries as well, and we think that it can contribute to inform the policy debate on the interplay between immigration

[1] In the OECD countries this share rise to 8.9% (Jean-Christophe Dumont and Widmaier, 2010). 31.4 million of immigrants were living in the USA; 7.8 million in Germany; 5.6 million in France; 5.3 million in Canada; 2 million in Italy. Several non-OECD countries also had very large foreign-born populations. 11 million live in Russia; 6 million in India; 1.8 million in Israel. In relative terms, high shares of immigrants were recorded in several OECD countries (Luxembourg: 37%; Australia: 27%), but also among non-OECD countries (Singapore: 23%, Estonia: 22%, Belize: 21%, and Latvia: 21%). The highest share of immigrants in OECD countries was for Israel, which reported a 40% of immigrants in the population.Some countries, however, have a very low share of foreign-born in their population (below 1%), such as Indonesia, Sri Lanka, Cuba, Colombia, Laos, Peru, Mongolia, Bulgaria and Thailand. Among OECD countries, the lowest shares of immigrants are observed in Mexico (0.4%) and Japan (1.1%).

and international trade.

The Italian immigration-and-trade case is characterized by what we may call a bi-dimensional heterogeneity. The first dimension is related to the incredibly high heterogeneous origins of immigrants (189 countries of origin are included in our data set), to their odd frequency and to the absence of an historical driving force motivating migration, such as a strong colonial heritage. The second dimension is the very high spatial heterogeneity of the Italian economy. We use the tiniest geographical and administrative unit available for both immigration and international trade, i.e. Italian provinces or NUTS-3 areas. Both these dimensions encompass several elements that taken together, as our data allow, offer a very promising setup to the study of the mechanisms that foster the trade openness of a country through the economic and social influences of immigrants.

In Italy, the phenomenon of massive immigration is quite recent. Italy was a land of emigrants at least until the 1960s. It is only in the 1970s that the migration balance started showing a positive sign. To the traditional ethnic groups coming from North Africa, often on a temporary basis, a new diaspora of permanent (essentially domestic assistant) workers entered Italy from the Philippines, Capo Verde and Sri Lanka. In the 1980s, immigrants coming from Central Africa (Senegal, Nigeria, Cote d'Ivoire, Burkina Faso), South America (Peru, Dominican Republic), the Indian sub-continent (India, Pakistan and Sri Lanka again) and Asia (China) established permanently in Italy. The more recent wave of immigration took place in the 1990s. It started in 1991 with the dramatic outflow from Albania and became even more numerically relevant with the fall of the Berlin's wall and the entering of Poland, first, and Romania, afterwards, in the European Union. Italy is now characterized by what anthropologists call "super-diversity," a notion intended to emphasize the level and kind of complexity in immigrants' social and economic participation to national everyday life, way above anything the country had previously experienced (Vertovec, 2007). The relevant ingredients of a super-diverse immigration are "...the increased number of new, small and scattered, multiple-origin, transnationally connected, socio-economically differentiated and legally stratified immigrants who have arrived over the last decade." (Vertovec, 2006) This seems to fit Italy very well.

The second side of the Italian heterogeneity we are going to deal with comes from the profound diversity in the socio-economic characteristics of Italian regions, ranging from a rich and industrialized North-west, very well connected to the core of Europe, to a largely poor and underdeveloped South.

This geographical divide is routed in the social and economic Italian history. Its persistence is remarkable. Regional differences are evident in income per capita, unemployment rates, sectoral specialization, firms clustering, educational levels, crime, and — of course — migration flows. This profound spatial heterogeneity offers a nice setting to investigate the effect of immigrants on geographical entities which experience very different levels of social and economic development.

In our empirical analysis, we turn the minimal participation of Italy to colonialism and the Italian bi-dimensional heterogeneity mentioned before to our advantage. As emphasized by Briant *et al.* (2009), in country-level analyses of the effect of immigrants on trade flows (see Wagner *et al.* (2002) and Peri and Requena-Silvente (2010) for a review of the issue) there are very good reasons to suspect that the correlation between trade and immigration, might depend on one or more omitted common determinants (such as colonial ties, common language or cultural proximity) or might be spoiled by the reverse causality inherent to the fact that immigrants generally migrate to countries where formal or informal links were already established and where trade with their homeland was already present. In the Italian case, differently from other cases such as the UK (and the London area in particular) or France and the US (and the New York area in particular), the super-diversity of the many ethnicities now living in Italy is largely unrelated to colonial heritage, linguistic proximity or institution similarity. This characteristic of the Italian case is therefore particularly convenient in the empirical strategy to pursue the identification of the causal effect that immigrants have on trade flows in and out of Italy. Colonial origins and linguistic proximity can both influence trade — and so they do in the traditional analyses of bilateral trade based on the gravity model (Head *et al.*, 2010, Helliwell, 1999) — and immigration and, therefore, they can confound the relationship between immigrants and trade flows. Moreover, given the relatively recent period we consider, we have good data on immigrations and are able to consider 189 origin countries for migration. This is about two and half times the number of countries considered by Peri and Requena-Silvente (2010), for instance. To the best of our knowledge, our dataset has the most extensive coverage among those pastly considered in the empirical literature, reducing the risk that a specific country selection (e.g., those for which data go back in time or is consistently reported) may bias the estimates of the elasticities of trade to immigration.

The unusual Italian regional economic heterogeneity can be advantageous from an empirical stand point as well. In line with some recent contributions

(Wagner *et al.*, 2002, Dunlevy, 2006, Bandyopadhyay *et al.*, 2008, Briant *et al.*, 2009, Peri and Requena-Silvente, 2010), we will test the relationship between trade and immigration at the scale of Italian provinces. To the best of our knowledge, the Italian provinces are the finest geographical entity to be used in investigating the existing link between immigration and trade. Briant *et al.* (2009) analyze 96 French *départements* which are almost 30 times tinier than US states (Dunlevy, 2006) and more than 100 times smaller than Canadian provinces Wagner *et al.* (2002). Since the size effect of the Modifiable Areal Unit Problem (MAUP) might be important, especially at large scales, (see Briant *et al.* (2010) on the issue) it is of relevance to run the analysis at the tiniest areal unit available. The 107 Italian provinces in our analysis have an average size of 2800 square km, which is less that half the average size of the 96 French *départements* in Briant *et al.* (2009).[2]

To further guarantee the minimal possible spurious correlation, we include country-year fixed effects in the regression to control for the common determinants of trade and immigration at the national level. At the same time, the variability in trade and immigration at the provincial level, after including trading-pairs fixed effects to account for push and pull factors at the home-country and host-region levels, allows us to precisely isolate the pro-trade effect of immigrants. However, to address any potentially remaining bias, we also rely on an instrumental-variable approach and identify the causal effect of immigrants on exports and imports of Italian provinces using a widely employed instrument based on historical immigration enclaves. The effect is indeed positive and significant.

We think that our analysis has at least five merits. First, the risk of a spurious correlation between trade and immigration is minimized due to the very fine geographical scale of our analysis. Second, the extensive country coverage of our dataset ensures that any sample selection bias stemming from the specific choice of the countries entering the analysis has been avoided.

[2]To be more precise, the mean area of Italian provinces is 2,816 square km with a coefficient of variation at 0.17, almost 57 times tinier than American states (162,176 km2, when Alaska and Washington DC are included), and more than 200 times smaller than Canadian provinces (606,293 square km when Nunavut, North-West and Yukon territories are excluded). These administrative units are much smaller and more regular size also with respect to French metropolitan *départements* and Spanish provinces. The mean area of French *départements* is 5,666 square km with a coefficient of variation at 0.33 (when Corsica and overseas French regions are excluded), whereas the related figures for Spanish provinces are 10,118 km2 with a standard deviation at 0.47 (excluding Ceuta and Melilla).

Third, to further rule out the possibility of an endogeneity bias that could inflate our coefficient of interest, we controlled for omitted common determinants and reverse causality including time-varying country-specific and trading-pair fixed-effects in the regressions, and as in Briant *et al.* (2009), Peri and Requena-Silvente (2010) we make use of an instrumental variables approach, where stocks of foreign-born Italian residents in 2002 (one year before the lower limit of our time-span) serve as instruments. Fourth, in addition to testing the two main explanations highlighted in the literature: the *business and social network effect à la* Rauch (2001) (i.e. immigrants foster both bilateral imports and exports because of their superior knowledge of, or preferential access to, market opportunities in their home-country) and the *transplanted home-bias effect* (White, 2007) (i.e. immigrants promote imports of their home-country consumption-goods to satisfy their different consumption tastes) — in this paper we offer a new complementary explanation: the pro-trade effect of immigrants can be generated by the increase in the number of host-country-firms due to new foreign-born entrepreneurs. In testing this hypothesis we further contribute to highlight the possible channels of transmission going from the geographical settling of immigrants to trade. Finally, we enter in some of the many dimensions of the Italian super-diversity in immigration, giving evidence of the heterogeneous effects of immigrants on trade according to the level of income per capita and the institutional quality of the home-country, and we exploit a nice feature of our dataset, showing that the pro-trade effect of immigrants is higher for small Italian firms.

The remainder of the paper is organized as follows. Section 2 discusses the literature on the pro-trade effects of immigrants and highlights the traditional mechanisms behind this positive effect and the possible role of immigrants' firms in affecting trade. Section 3 presents the data used in the analysis (which is also fully described in the Appendix) and describes Italian super-diversity in immigration. Section 4 includes the benchmark empirical results, and the strategy used to tackle the endogeneity issue and the relevant causal results. Section 5 make an attempt towards investigating heterogeneity of effects and dissecting the causal pathways of the effect of immigrants, and section 6 concludes.

2 The pro-trade effects of immigrants

The international trade literature based on the estimate of a gravity equation (De Benedictis and Taglioni, 2011) — where trade flows between a regional entity i and its international counterpart j are positively associated with economic attractors, such as the GDPs of i and j, and negatively associated with obstacles to international trade, such as distance, — has generally found a strong association between immigration and trade. The presence in i of immigrants from j can be considered as an attracting force, fostering the international trade between i and j.

Different studies (Head and Ries, 1998, Dunlevy and Hutchinson, 1999, Rauch and Trinidate, 2002, Girma and Yu, 2002, Briant *et al.*, 2009, Peri and Requena-Silvente, 2010, Coughlin and Wall, 2010), for different samples, periods and estimation techniques have generally confirmed a strong effect of immigrants on trade. In figure 1 we summarized the results of a sample

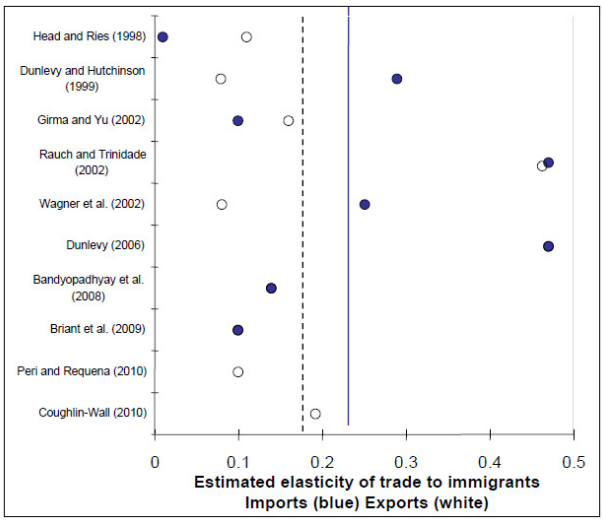


Figure 1: Literature summary. Estimated elasticity of trade to immigrants: Imports (blue) Exports (white).
The figure plots data obtained from several contributions to the literature on the migration effect on trade. Blue dots indicate the elasticity of imports to immigrants, white dots the one of exports. The complete list of papers is in included in the references.

of relevant contributions to the literature in terms of estimated elasticity of trade (imports, in blue, and exports, in white) to immigrants. The vertical lines indicate the simple meta-average elasticity, which is 0.18 for exports

and 0.28 for imports. As it is evident the estimates show a high degree of variability. Wagner *et al.* (2002) set the standard in the literature, underlying the essential role of country-fixed effects to control for omitted variable bias, the advantages of exploiting cross-sectional information on trade and immigration using provincial data (for Canada, in their analysis), and the to deal with the endogeneity problem we discussed before. Since Wagner *et al.* (2002) the variability in the estimates reduces substantially.

One first important evidence of the literature is that the elasticity of imports to immigrants is higher than the one of exports, and that both are positive and generally significantly different from zero. Why?

The mechanisms at the basis of the common explanations of what usually drives the pro-trade effects of immigrants are twofold. The main explanation is rooted in the idea that information costs plays a major role in the fixed cost that firms have to pay to enter foreign markets. In the seminal contribution of Rauch (2001), ethnic networks related to migration flows are likely to reduce some of these information costs. Cross-border networks of people sharing the same country of origin can substitute or integrate organized markets in matching international demand and supply. Several studies have explored the role of ethnic networks in international trade (Rauch and Trinidate, 2002).

A further point associated with this first explanation is also related to the characteristics of immigrants and how these characteristics can reduce the fixed cost of exporting. Language, specific knowledge of homeland institutions and norms, familiarity with homeland (excess) demand, can bridge the home-country and the host-country, if these assets are positively valued and acquired by firms producing in the country were immigrants settled (Wagner *et al.*, 2002, Peri and Requena-Silvente, 2010). Moreover, "immigrant networks may provide contract enforcement through sanctions and exclusions, which substitutes for weak institutional rules and reduces trade costs." (Briant *et al.*, 2009) We may call this explanation the *business and social network effect* of immigrants on trade.

The second, less explored explanation is that immigrants are characterized by different habits in consumption with respect to natives, and they may slowly modify their original home-biased demand after settling in the host-country. Since homeland goods are more costly in the host-country immigrants have an incentive to buy those goods from the home-country itself. Proper empirical evidence on what we may call the *transplanted home-bias effect* of immigrants on trade was, until recently, basically non existent. The significance and magnitude of the effect was generally inferred from the differ-

ence between the estimated immigrants elasticity of imports (to which both effects were contributing) and export (not affected by the transplanted home-bias effect). Since, as it is evident from figure 1, the immigrants elasticity of imports tends to be higher than the one of exports, this was interpreted by deductive reasoning as supporting the idea that there should be something that makes the two elasticities to be different from each other, and this 'something' was attributed to a persistent difference in tastes between immigrants and natives.

Recently, some more clean evidence of the relevance of the transplanted home-bias effect has been put forward by Bronnenberg *et al.* (2010), Atkin (2010) and Mazzolari and Neumark (2010). Bronnenberg *et al.* (2010) looking at the consumption behavior of US consumers migrating across state borders, find that in choosing between the two top brands in a category, past experiences are an important driver of current consumption. Consumers migrating from a certain state tend to partially adapt to local habits to a certain extent, but in spite of the difference in price and in brand availability, they still tend to persist in consuming according to the prevalent choices in the state they migrated from. Even after 50 years migrants still consume 'differently' than locals.

The same evidence is found for India in Atkin (2010), where it is shown that inter-state migrants carry their food tastes with them, consuming food bundles less similar to those consumed in their destination state and more similar to those consumed in their state of origin. Migrants originating from rice-producing states keep consuming rice instead of wheat, notwithstanding rice being relatively more expensive than wheat on the local market. This habit persistence dissipates with time, disappearing slowly and lasting four generations after migration.

The willingness to pay high prices for goods similar to the one consumed in the home-country is also found in Mazzolari and Neumark (2010), where immigration is found to be associated with increased ethnic diversity of restaurants.

If the *business and social network effect* and the *transplanted home-bias effect* can be seen as the classical explanations of the pro-trade effects of immigrants, there is however a third possible, totally disregarded, explanation of how immigrants can foster trade between the country where they settled down and their country of origin: they may became entrepreneurs.

Evidence of this pattern is reported by a number of studies on Europe (Kitching *et al.*, 2009, Sepulveda *et al.*, 2010, Baycan-Levent and Nijkamp,

2009) pointing out the increasing rate of self-employed immigrants in the host-country labor market. The implication of the rapid growth in immigrant entrepreneurship on trade is however not straightforward. If immigrants open up new firms this would generate a pro-competitive effect that would boost exports, the effect would be even larger if it positively interacts with the *business and social network effect* of immigrants. In this case, the dilemma of how the transmission of the specific knowledge about the home-country market opportunities embedded in immigrants to local firms takes place, making them capable of reducing the fixed cost of exporting, would be now simply solved. Immigrants are not transferring any specific knowledge to local firms, they are just exploiting the value of this knowledge by themselves. Unorganized immigrants evolve into immigrant-firms and they could serve the market as import-export agents, selling home-country products to their fellow immigrants or to natives final consumes, and host-country products to the home-country market. A pro-trade effect would be observed both in terms of exports and imports.

On the other hand, immigrant-firms can substitute home-country firms in the assembling of intermediate products of host-country firms. In this case the presence of immigrant-firms would reduce the incentives to host-country firms to search for low-cost opportunities abroad (foreign outsourcing), reducing exports. Similarly, importing-firms may find it convenient to locally produce home-country like goods instead of importing them from the homeland. All this being conditional on the cost of transport, pretty much along the same reasoning of the concentration-proximity trade-off in the theory of horizontal FDI. In any case, what we may call the *migrant entrepreneurship effect* of immigrants on trade, can either reinforce both classical effects or counterbalance them.

3 Data and descriptive statistics

3.1 Italy as super-diversity

Our data are obtained from mainly two datasets publicly available from the Italian National Statistical Institute (ISTAT). Trade flow data refer to the value of imports and exports of 107 Italian Provinces (NUTS-3) with around 210 country trading partners around the world, over the period 2002-2009.[3]

[3]More precisely, we will consider 103 provinces until 2006 and 107 afterwards.

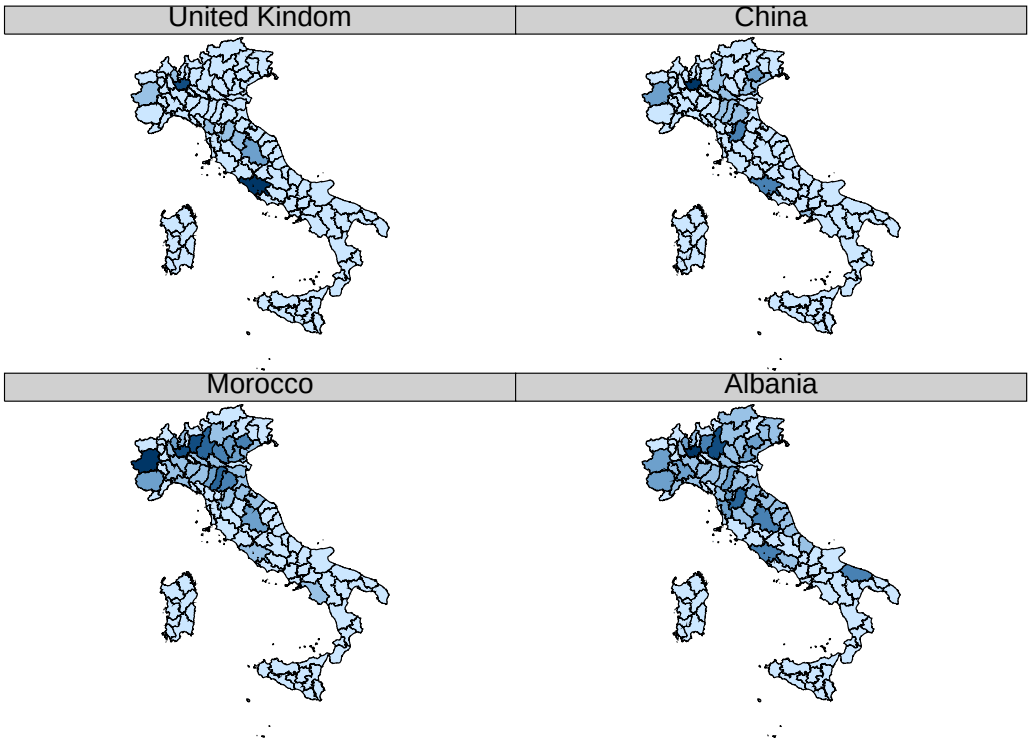


Figure 2: Immigrants in Italy at the provincial level, 2001 (the intensity of blue grows in the number of immigrants).

The figure plots data of immigrants from four of the largest foreign communities in Italy. The data is at the provincial level (107 provinces in 2010, and does not include data on 3 of the new Italian Provinces established after 2001). Data come from the Italian National Statistical Institute.

The data are measured such that exports and imports are associated with the province of shipment, i. e. the province where the custom transaction was registered.[4] Values are originally reported in current euros, which we converted in current US dollars using the nominal exchange rate from the *World Development Indicators* (WDI on-line database) to make them consistent with GDP data used in gravity equations.

The information on the number of foreign born residents by province and country of origin is obtained from ISTAT as well, and cover the same time period. Our explanatory variable of interest is the stock of immigrants by country of origin (home-country) and province of destination (in the host-country, which is in our case Italy). We define immigrants as residents born abroad with a foreign nationality. Immigration in Italy has increased very fast in the last few years. Between 2002 and 2009 foreign-born population grew steadily at an average of 15.5 percent per year, reaching 4 millions in 2009. As we mentioned, with respect to any previous North-American and European study, Italian provinces represent the finest geographical unit where the relationship between trade and migration is investigated.

Table 1 shows the top 20 countries of origin of immigrants in 2009. The top five countries by the number of foreign-born population are Romania, Albania, Morocco, China and Ukraine, accounting for 50 percent of the total foreign population. Comparing the rank of these top 20 countries of origin, and especially the average growth rate over the period, gives an idea of the change in the composition of immigrants by the country of origin. In 2009, the majority of the foreign-born population came from Eastern Europe (Romania, Ukraine, Rep. of Moldova, Poland), which experienced also the highest growth rate over the period. The change in the ranking between 2002 and 2009 is reported in Figure 3 which shows some big movers. Moldova and Ukraine, for instance, gain 32 and 23 positions, respectively, while Senegal looses 9 positions.

An interesting feature of the immigration pattern in Italy is the uneven distribution of immigrants across Italian provinces. Figure 4 shows the map of Italy where provinces are colored according to the share of foreign-born population in the total population, with 'darker' provinces having a higher

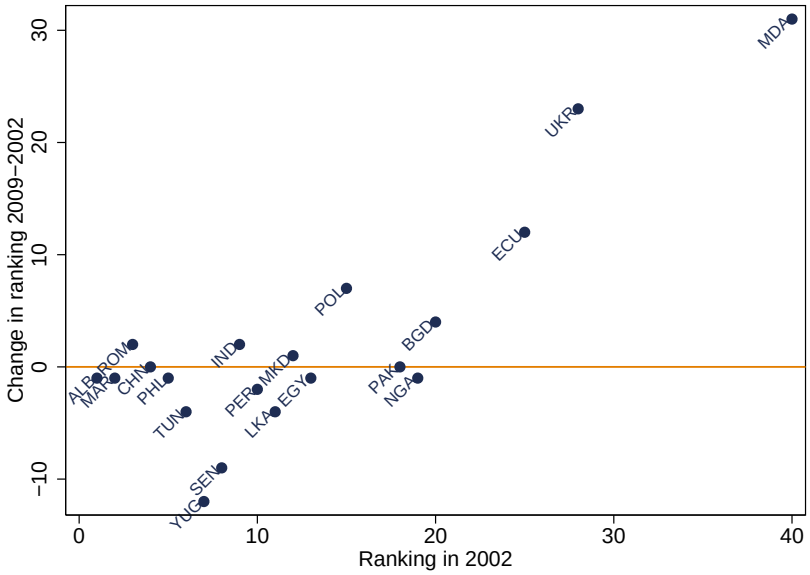
[4]The information of Extra-EU transactions are based on the Documento Amministrativo Unico (DAU) which is done for each commercial transaction, for the intra-EU exchanges the custom system has been replaced, since 1993, by the Intrastat standard.

Table 1: Immigrants by country of origin

Ranking in 2009	Country of origin	Number of immigrants in 2009	% of total immigrants in 2009	Annual growth rate, 2002/2009 (%)	Ranking in 2002
(1)	Romania	887763	20.96	40.45	(3)
(2)	Albania	466684	11.02	11.76	(1)
(3)	Morocco	431529	10.19	10.51	(2)
(4)	China	188352	4.45	15.51	(4)
(5)	Ukraine	174129	4.11	68.99	(28)
(6)	Philippines	123584	2.92	9.67	(5)
(7)	India	105863	2.50	16.99	(9)
(8)	Polonia	105608	2.49	20.04	(15)
(9)	Moldova	105600	2.49	60.20	(40)
(10)	Tunisia	103678	2.45	8.33	(6)
(11)	Macedonia	92847	2.19	16.25	(12)
(12)	Peru Peru	87747	2.07	14.60	(10)
(13)	Ecuador	85940	2.03	32.67	(25)
(14)	Egypt	82064	1.94	13.82	(13)
(15)	Sri Lanka	75343	1.78	11.99	(11)
(16)	Bangladesh	73965	1.75	20.27	(20)
(17)	Senegal	72618	1.71	10.24	(8)
(18)	Pakistan	64859	1.53	16.72	(18)
(19)	Serbia	57877	1.37	1.19	(7)
(20)	Nigeria	48674	1.15	12.97	(19)
	Top 20 countries	3,434,724	81.1	20.66	
	TOTAL	4,223,154	100	14.9	

Source: ISTAT

Figure 3: Ranking of immigrants by country of origin



share of immigrants. While in 2002 none of the 103 provinces registered a share higher than 10 percent, in 2009,[5] 23 provinces had over 10 percent of foreign born residents, mainly in the Center and North of the country.

Even if the distribution across the country of foreign residents is concentrated in Northern Italy, the number of provinces with zero immigrants from a particular country of origin is rather small. This is an istance of what we called 'super-diversity'. Table 2 reports the mean number of nationalities registered in each province at the beginning and at the end of the period we are studying. Looking at the summary statistics, the mean value of nationalities found in a province is around 111 in year 2002, and about 124 in 2009, provinces with less nationalities coverage are concentrated, as we may expect looking at Figure 4, in Southern provinces.

Focusing the attention on the data, we have to note that a significant portion of the variation comes from the cross-country dimension of the dataset.

[5]Note that in 2009 there are 107 provinces, due to the new administrative units established in 2005

Figure 4: Percentage of foreign-born population across Italian provinces. Year 2002 (panel a) and year 2009 (panel b)

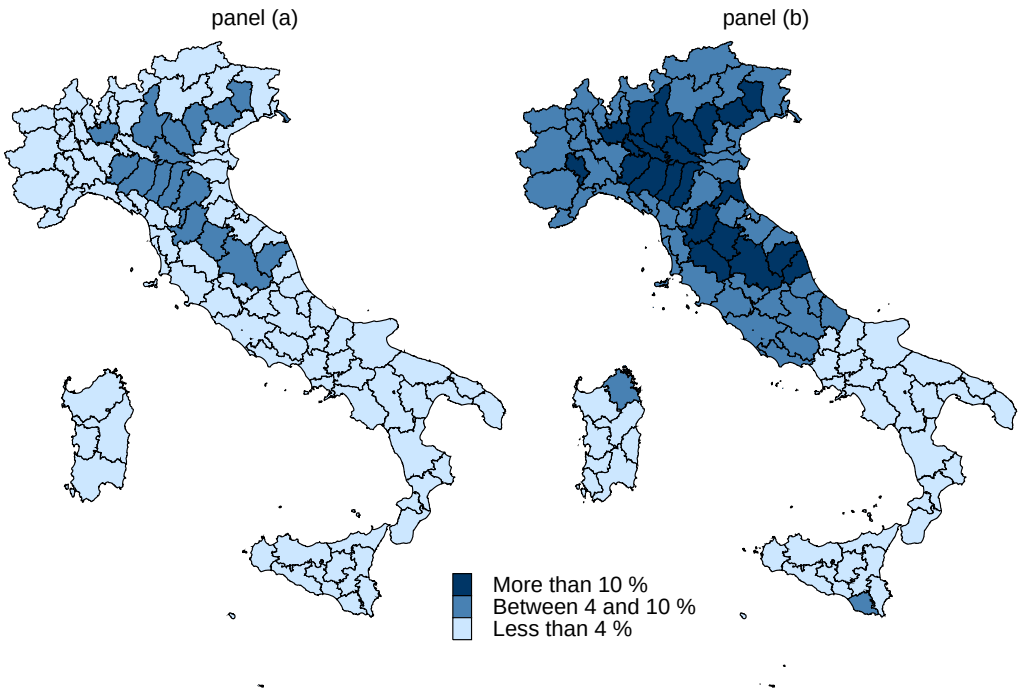


Table 2: Migrants' location by province and country of origin

	Mean	Std. Dev	Min	P25	Median	P75	Max
Year 2002							
Nationalities per province	111.92	23.39	49	97	112	128	175
Provinces per country	82.07	24.37	1	68	95	102	103
Year 2009							
Nationalities per province	124.91	20.46	58	113	126	139	179
Provinces per country	90.23	22.35	1	83	100	106	107

Note: The total number of Italian provinces is 103 (107 from 2006) while the total number of foreign nationalities is 189.

For instance, the regression of trade flows on country-specific dummies returns an R^2 of 55% for exports, 61% for imports and 71% for immigration. As we will explain later, we deal with this cross-country variation using a full set of fixed-effects. Table 3 depicts the within-country, within-province, and within-time correlations between (ln)exports, (ln)imports, (ln)distance and immigration. Formally, this is the correlation between the residuals of the regression of each dependent variable on country-specific, province-specific and year-specific dummies. As expected, distance is negatively correlated with exports and imports, the correlation being stronger for imports. By way of contrast, immigration is significantly and positively correlated with both exports and imports. Distance and immigration are also negatively correlated, as it is well known that immigration flows also share a gravity pattern.

Table 4 reports the summary statistics for trade flows, as well as the average immigrant stock and distance of import and export flows by province. The average distance of trade flows is quite high, over 6,400 km, but if we restrict the analysis to the strictly positive flows the average distance shrinks to 5,100 km for imports and 5,385 km for exports. Interestingly enough, the average number of foreign-born residents is between 200 and 280, but with a significant variation across provinces and nationalities. The most widely represented country of origin (Romania), in facts, records over 139,000 residents just in the province of Rome.

As a preliminary check on the correlation between trade and migration flows, we report in Figure 5 the kernel density of the log value of imports and exports for the provinces with a positive value of migrants against those without foreign-born population from a particular country.[6]) As we can see, the two distributions are quite different: provinces tend to trade more with the countries of origin of their immigrants.

Another channel through which ethnic networks may affect trade flows is business creation. In order to test for this effect we will use information on the distribution of foreign firms over provinces, nationalities and years. Data are taken from the Italian Chamber of Commerce. Table 5 shows the top 20 countries of origin of immigrants entrepreneurs in 2009. The first five countries of origin were: Morocco, China, Romania, Switzerland and Germany,

[6]The figure reports the standardized values of both imports and exports.

Table 3: Within-country, within-year correlations

	Exports	Imports	Distance	Immigrants
Exports	1.0000			
Imports	0.1248	1.0000		
Distance	-0.0206	-0.0641	1.0000	
Immigrants	0.0753	0.1166	-0.0747	1.0000

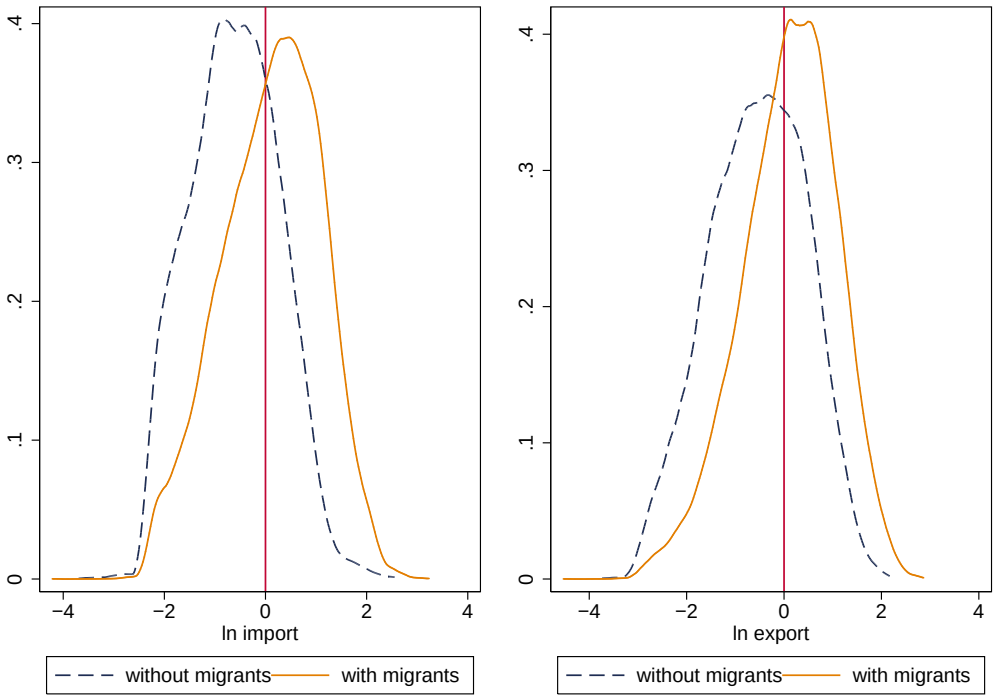
Note: correlations are significant at 1% level

Table 4: Summary Statistics (2002-2009)

	Mean	Std. Dev	Min	P25	Median	P75	Max
Strictly positive exports 102957/157718							
Exports	20985.01	109576.50	0	68.41	716.63	6805.21	4968820
Distance	5385.64	3912.44	73.86	1841.07	4583.35	8288.85	19029.86
Immigrants	207.56	1389.90	0	0	7	48	139821
All exports 157718							
Exports	13698.84	89094.68	0	0	58.32	2036.22	4968820
Distance	6471.09	4334.02	73.86	2945.17	5879.97	8921.47	19029.86
Immigrants	136.44	1127.37	0	0	1	18	139821
Strictly positive imports 74259/ 157718							
Imports	29018.07	243106.7	0	76.17	863.10	7737.83	19228701
Distance	5100.91	3980.44	73.86	1515.41	4277.60	8559.80.209	19029.86
Immigrants	280.12	1628.79	0	2	14	83	139821
All imports 157718							
Imports	13662.69	167440.40	0	0	0	657.71	19228701
Distance	6471.09	4334.02	73.86	2945.17	5879.97	8921.47	19029.86
Immigrants	136.44	1127.37	0	0	1	18	139821

Note: Exports and imports are in thousands of euros, immigrants in number of foreign-born Italian residents. Distance is the average number of kilometers between provinces' centroids and foreign capital cities.

Figure 5: Kernel distribution of trade flows for provinces with and without immigrants



that accounted for over 25% of the total number of foreign entrepreneurs in Italy. A remarkable feature is the uneven geographical distribution across provinces, in column five of table 5 is reported the coefficient of variation of the number of foreign entrepreneurs per province, the average value is quite high 0.98, and in general even higher for the non-OECD countries of origin. In Appendix we report also projections of the province share of total foreign entrepreneurs and some country-specific distributions.

Table 5: Immigrants' firms by country of origin

Ranking in 2009	Country of origin	Number of firms in 2009	% of total firms in 2009	Coeff. of Var in 2009	Annual growth rate, (%)	Ranking in 2002
(1)	Morocco	56784	7.42	1.10	12.01	(4)
(2)	China	49074	6.41	1.98	12.51	(5)
(3)	Romania	48176	6.30	2.09	29.55	(16)
(4)	Switzerland	43609	5.70	1.13	1.83	(1)
(5)	Germany	36287	4.74	1.21	3.30	(2)
(6)	Abania	34303	4.48	1.07	21.00	(11)
(7)	France	26292	3.43	1.83	0.05	(3)
(8)	Egypt	20897	2.73	4.97	8.55	(6)
(9)	Tunisia	15384	2.01	1.40	8.58	(14)
(10)	Bangladesh	15380	2.01	3.79	18.50	.
(11)	Senegal	14343	1.87	1.43	6.80	(12)
(12)	Serbia	13125	1.71	1.74	2.97	(8)
(13)	United Kindom	12399	1.62	2.18	1.23	(7)
(14)	Argentina	11948	1.56	1.46	1.58	(9)
(15)	United States	10547	1.37	2.22	0.81	(10)
(16)	Venezuela	9694	1.26	1.44	1.93	(15)
(17)	Belgium	9402	1.22	1.25	0.74	(13)
(18)	Pakistan	8951	1.17	1.95	18.81	(28)
(19)	Brasil	8271	1.08	2.06	7.99	(20)
(20)	Nigeria	7540	0.98	2.36	11.42	(23)
	Top 20 countries	452406	59.61	8.51		
	TOTAL	764408	100	6.71		

Source: Chamber of Commerce. The coefficient of variation is referred to the mean number of foreign firms by nationality and year

4 Empirical results

4.1 Empirical specification and OLS results

The gravity model of international trade (De Benedictis and Taglioni, 2011), has been recently reformulated by Chaney (2008) to include the effect of heterogeneous firms to bilateral trade flows. In particular, he obtains the following equation describing the determinants of exports X_{ijt}

$$ln(X_{ijt}) = const + ln(w_{it}^{-\gamma} Y_{it}) + ln(Y_{jt}\theta_{jt}^{\gamma}) - \gamma\, ln(\tau_{ijt}) - (\frac{\gamma}{\sigma - 1} - 1)\, ln(f_{ijt}) \quad (1)$$

where i, j and t are province (in our setting), country and time subscripts, respectively. The term $ln(w_{it}^{-\gamma} Y_{it})$ includes the effect of the exporting country wages (w_{it}) and nominal income (Y_{it}); $ln(Y_{jt}\theta_{jt}^{\gamma})$ captures the effect of the importing country nominal income (Y_{jt}) and its remoteness from the rest of the world (θ_{jt}); τ_{ijt} captures iceberg transport costs per unit of export and f_{ijt} the fixed costs for firms in province i to export in country j. σ and γ are the elasticity of substitution of traded goods and the shape parameter of the Pareto distribution of firm productivity, respectively.

Equation (1) can be made operational in studies of the effect of immigration on trade by simply imposing some structure on the fixed costs term $ln(f_{ijt})$. In particular, they assume that $ln(f_{ijt}) = ln\ f(ln(IMM_{ijt}))$. The estimable equation then becomes

$$ln(X_{ijt}) = \boldsymbol{\delta}_{ij} + \boldsymbol{\theta}_{jt} + \boldsymbol{\phi}_t + \ln(Y_{it}\, Y_{jt}) + \alpha\, ln(IMM_{ijt}) + \beta ln(DIST_{ij}) + \epsilon_{ijt} \quad (2)$$

where, as in Peri and Requena-Silvente (2010), assuming that bilateral variable costs, τ_{ijt} are relatively constant over time (namely in the short time period we consider), we can absorb the term $\gamma ln(\tau_{ijt})$ into a set of *region*-country dummies $\boldsymbol{\delta}_{ij}$ and the effect of geodesic distance ($DIST_{ij}$).[7] We can also absorb the effect of remoteness $\gamma ln(\theta_{jt})$ into the country by time effects $\boldsymbol{\theta}_{jt}$, and the term $-\gamma ln(w_{it})$, assumed common to all provinces, is captured by the time effect $\boldsymbol{\phi}_t$ encompassed in the country by time fixed effects. ϵ_{ijt} is a stochastic error term capturing the determinants of trade omitted from the model; since the relevant choices are not independent

[7] Due to the high number of provinces and countries considered we could not include province-country fixed effects, which would have produced around 20,000 variables, and include instead region-country fixed effects. In Italy there are 20 administrative regions (NUTS-2).

at the country-pair level, we clustered the robust standard errors at the country-pair level not imposing any homoscedasticity in the error-structure. Gross regional output and GDP are used to measure the variables Y_{it} and Y_{jt}, respectively. Gross province output and all provinces' values have been scaled to match Italian GDP in WDI. Peri and Requena-Silvente (2010) assume that $\partial lnf/\partial ln(IMM) < 0$, i.e. immigration reduces fixed costs of exporting, which gives in equation (2) a positive coefficient on $ln(IMM)$ ($\alpha \equiv -(\frac{\gamma}{\sigma-1} - 1)\frac{\partial lnf}{\partial ln(IMM)} > 0$).[8]

Table 6 shows the OLS results. We report various specifications, including different fixed effects. Columns (1) and (2) report the estimates of the immigration elasticities of exports and imports, respectively, when including separate fixed effects for time, countries and provinces. The estimated elasticities are 0.25 for exports and 0.48 for imports, respectively, in line with those obtained by Dunlevy (2006) and Rauch and Trinidate (2002), which do not include trading-pair fixed effects. Columns (3) and (4) include trading pair and province-year fixed effects. The estimated elasticities fall to 0.11 for exports and 0.34 for imports, respectively. Columns (5) and (6) report estimates from the same specifications used in Peri and Requena-Silvente (2010) including trading-pair and country-year fixed effects (our *benchmark specification*, hereafter), and as far as our main coefficient of interest (α) they are very close (sometimes equal) to those in the previous two columns. Table 6 shows the importance of including trading-pair fixed effects to account for potential unobserved time-invariant factors affecting both immigration and trade flows between potential trading partners, while the choice between country-year fixed effects and province-year fixed effects appears of relatively less importance apart from the insignificance of the income effect for imports when considering province-year fixed effects. When trading-pair dummies are not included we obtain larger elasticities.

4.2 Endogeneity and two-stages least squares (2SLS)

This first set of results confirms the evidence in the raw data and suggests that immigrants *may* have an effect on imports and exports. However, a potential pitfall with our OLS estimates is that, even after controlling for trading-pair fixed effects, immigrant inflows may be endogenous with respect

[8]We omit from the IMM variable the subscripts to simplify the notation, although the variable varies by province, time and country.

to export or import flows.[9] The endogeneity problem may be determined by trading-pair *time-variant* unobservables which simultaneously affect immigrant's flows and trade. We seek to address this issue with an IV (2SLS) strategy using an instrument based on supply-push factors, in line with Peri and Requena-Silvente (2010) and motivated by the presence of historical immigrant enclaves (Card, 2001). The presence of a community of immigrants from a given country in a certain province is likely to decrease immigration costs and increase returns to migration for new immigrants of the same nationality that settle in the same province. Indeed, co-nationals already present in a province may offer hospitality, financial support or help new migrants to find a job on the locally labor market. For these reasons, we expect the stock of immigrants to be highly correlated with the inflow of new immigrants. Accordingly, we adopt the following procedure to build an instrumental variable. We compute the total number of immigrants by country for Italy as a whole in each year, and we allocate them to each province according to the distribution of immigrants by nationality across provinces in 2002, restricting the analysis to the period 2004-2009.[10] In this way, we compute an *imputed stock of immigrants*, which is used as an instrument for the observed stock.

The main threat to identification comes from time-varying trading-pair unobserved factors *during the period observed* which simultaneously affect provinces' trade with a given country and the stock of immigrants from that country. In this respect, the main determinants of the imputed stock of immigrants described above should be exogenous, i.e. uncorrelated with such unobservables. The net immigration flows by country to overall Italy in each year, referring to the entire country, should not be affected by trading-pair *shocks*, especially when shocks are related to very small geographical units, such as Italian provinces. As for the remaining two components, the distribution of immigrants by nationality across provinces and the stock of immigrants by nationality in each province, being both measured in 2002 and

[9] A second potential pitfall regards how to treat zero-trade-flows and which is the most appropriate estimator to be used in gravity equations when the trade flows matrix is sparse (see Silva and Tenreyro (2006) for a seminal contribution and De Benedictis and Taglioni (2011) for a review of the issue). We estimated the model using Tobit, Poisson and Negative Binomial models. Results are qualitatively similar to our benchmark estimation. They are available upon request.

[10] As all controls enter with a one-year lag, trade in 2004 is regressed on the stock of immigrants in 2003.

conditional on trading-pair fixed effects, should not be theoretically correlated with any trading-pair shock taking place during the estimation period. It is worth noting that conditional on the trading-pair fixed effects, identification mostly comes from within-countries differences in the annual net inflows of immigrants in Italy as a whole, and that factors operating at the origin country level on all potential immigrant destinations, such as the effect of macro-economic or political crisis, are purged out using country-year dummies.

We report in Table 7 the results of 2SLS. The first column shows that the instrument turns out to be very strong. Also the partial R^2 is very high, 60 percent. The trade elasticities in columns (3) and (4) are very precisely estimated and turn out to be 0.20 for exports and 0.51 for imports, a bit larger than those obtained with OLS on the same sample, which are reported in the first two columns. Apart from endogeneity, differences between OLS and 2SLS may also stem from the fact that with OLS we are also using variations in the stock of immigrants by province caused by inter-province migrations of foreign immigrants. It is difficult to say in advance the direction of the OLS bias that these geographical movements may cause. For instance, if immigrants in very large communities with well established trade flows with their origin countries tend to move to neighboring provinces where people of their nationality are less represented and where there is less competition between immigrants for finding a job or starting a business, this would cause a negative bias to OLS.

5 Explaining the effect and investigating heterogeneity

In the previous section, we have shown that the positive association between trade and immigrants can be qualified as causal, and that the Chaney's model of trade offers a way of interpreting this effect as immigrants lowering the fixed costs of exporting (and importing). As we mentioned, the *business and social network effect* is not the only possible explanation of the causal effect of immigrants on trade, and it could be important to provide in this section other pieces of evidence that are consistent with the *transplanted home-bias effect* and the *migrant entrepreneurship effect* of immigrants on trade.

For this reason, we try to enrich the specification in equation (2) with

some interaction terms whose inclusion is theoretically grounded. Peri and Requena-Silvente (2010) exploits a nice feature of Chaney's model which predicts different impacts of fixed costs on differentiated and homogeneous goods. We exploit here a different — but equally interesting — prediction of that model. Indeed, Chaney (2008) predicts that the impact of fixed costs on export increases with the shape parameter of the Pareto distribution (γ), according to which firm heterogeneous productivity is distributed. To put it in other words, as firm productivity is likely to map into firm size, the larger is the shape parameter, the lower is average firm size, and the larger is the expected effect of the stock of immigrants on exports. The intuition is straightforward: larger firms are likely to export irrespective of the presence in the province of immigrants, and given that a reduction of fixed costs has an effect on the extensive margin only, an increase in the province stock of migrants is likely to have a positive effect especially on smaller firms which, thanks to the reduction of fixed costs, are allowed to enter foreign markets. Hence, starting from this theoretical prediction, we assume that the distribution of productivity is province-specific (γ_i), and we include in the estimating equation (2) an interaction term between the stock of immigrants and the average size of Manufacturing firms in the province, on which we expect a negative sign. The estimates are included in column (1)-(2) of Table 8. The interaction term is indeed negative, and significant in both the export and the import equations, as predicted by Chaney's model. A one standard deviation (0.48 in the dataset) increase in the average firm size (measured in ln) reduces the elasticity of exports by -0.11 and the one of imports by -0.03.[11] This evidence is consistent with the idea that immigrants reduce the fixed costs of exporting, and that this effect is more relevant for smaller firms.

Consistent with the interpretation of immigrants reducing fixed costs is also the idea that their role should be more important for countries in which these fixed costs are relatively higher due to less complete markets and weaker contracting and enforcement mechanisms. According to this argument, we may expect the effect to be higher in less developed countries. In columns (3) and (4) of table 8, we include in the regressions the (nominal) countries' per capita GDP in US dollars (in logs), and its interaction with the stock of immigrants. The interaction turns out to be statistically significant and

[11] In specifications with interaction terms, the interacted variables are always centered (zero mean).

negative for both imports and exports, confirming that immigrants may be important for spurring Italian trade especially with low-income countries. The same finding is obtained for instance by White (2007) on his analysis of US trade. A one standard deviation increase in log per capita GDP (1.64) reduces the immigrant elasticity of exports by 0.23 and of imports by 0.08. In columns (5) and (6) we interact the stock of immigrants with (log) average per capita GDP of provinces. The trade-creating effect of immigrants appears to be significantly lower in richer provinces, but only for exports.

The same hypothesis is assessed in table 9, in which following Briant *et al.* (2009) we include in the benchmark specification some proxies of the quality of institutions for foreign countries and their interaction with the stock of immigrants. In the period studied, our provinces appear to trade especially with countries characterized by weaker institutions (see the Appendix for a detailed description of the different indicator). This is consistent with the raw trade data showing an increasing importance of Eastern Europe and African countries compared to OECD countries. The interaction term between institutions and immigrants is negative, as expected, that is immigrants reduce the fixed cost of exporting (importing) especially with countries characterized by poor institutions as they may substitute the market in matching demand and supply, or provide contract enforcement through sanctions and exclusions. The only exception to this general pattern is the indicator of political stability, which acts to increase trade and the elasticity of trade to immigrants. These results are in line with Dunlevy (2006) and Briant *et al.* (2009). Just to have a rough idea of the effect of institutions, *reducing* by one standard deviation the rule of law (e.g., the average difference in the period between France and Buthan), which is one unit, raises the elasticity of exports to immigrants by 0.19 and of imports by 0.17.[12]

In table 10, we investigate the *migrant entrepreneurship effect* of immigrants on trade. Until now, we have considered immigrants as individual and unorganized units. However, it may be the case that immigrants-firms would promote trade exchanges with their home country. As a proxy of the stock of immigrant firms (or immigrant entrepreneurs) we include in the regression

[12]Briant *et al.* (2009) observe that the quality of institutions may be endogenous with respect to trade. For instance, trade openness may contribute to improving institutions. However, they claim that considering one single country, Italy in our case, is likely to make this problem less severe. In this respect, we have an advantage with respect to their study also because Italy's colonial experience was very limited, both geographically and temporally.

the number of limited companies (*societa' di capitali*), as this is the only data available to us, owned by foreign-born entrepreneurs. This is likely to be an underestimate of the stock of immigrant entrepreneurs. We estimate specifications replacing the stock of immigrants with the stock of immigrant firms (columns (1) and (2)), and including both variables (columns (3) and (4)). Immigrant firms are statistically *negatively* associated with exports only when they are jointly included with the stock of immigrants, while they are always statistically positively associated with imports. Different interpretations could be given to the negative correlation between the stock of immigrant firms and exports. A possible explanation is the one we stressed before: immigrant firms that act as sub-constractors for domestic firms, reduce the latter's needs of sending abroad raw materials or intermediate goods for transformation and subsequent re-importing. The asymmetry in the effect of immigrant firms is surely interesting, and would deserve further attention.

An empirical regularity, in most regressions we estimated until now, is that the elasticity of imports to immigrants is much higher than the one of exports. As highlighted by Rauch (2001), the difference may be accounted for by the effect of differences in preferences and tastes between immigrants and natives, which are likely to affect imports but not exports. In short, the gap between the two elasticities may be due to the *transplanted home-bias*. This bias may be justified both by culture, tradition, habit formation, or by the lower prices of the goods typically consumed by low-income immigrants in their home countries. Another interpretation is that elasticites are goods-specific (Briant *et al.*, 2009, Peri and Requena-Silvente, 2010), and as a result the different elasticities may reflect the different goods-mix typically exported and imported by Italian provinces. To move from speculation towards a direct test this hypothesis, we estimated the benchmark specification only on the food sector. The results are reported in table 11. When focusing on a single sector, the import and the export elasticites appear to be very close (columns (1) and (2)). Incidentally, the elasticities for imports is also very close to the one measured on the imports for all sectors, suggesting that immigrants may increase especially food imports. In columns (3) and (4), following the observation that immigrant entrepreneurs are especially active in the provision of ethnic goods, among which ethnic food has certainly a special importance, we include the stock of immigrant firms. The estimates show that although immigrant firms increase both import and export of foods, they are likely to explain a great deal of the positive association between the presence of immigrants in Italian provinces and food imports from their

homeland. To put it differently, business creation may be a primary channel through which immigrants spur international trade.

6 Concluding remarks

This paper uses the large increase of immigrants from several countries into Italian provinces that took place in the years between 2002 and 2009, to estimate the causal effect of immigrants on import and export flows. Using a panel of bilateral trade flows for 107 Italian provinces (NUTS-3) and 189 countries and corresponding data for immigrant stocks in Italian Provinces by country of origin, we find a large and robust elasticity of import and export flows to migrants. Our preferred estimates, including trading-pair and country by year fixed effects, indicate that a 10 percent increase in immigrant stocks leads to a 1.1 percent increase in both export and a 3.4 percent increase in import flows. Although the very fine geographical disaggregation considered (Italian provinces), way smaller than all units previously considered in the empirical literature, and the inclusion of trading-pair fixed effects are likely to attenuate the potential endogeneity bias, we also report instrumental variables estimates. Instrumenting observed immigration stocks with imputed stocks based on immigrant enclaves constructed using the distribution of immigrants in 2002, we also find very significant elasticities, of about 0.35 for exports and 0.51 for imports, using two-stage least squares.

The main explanation given in the literature is related to the fact that immigrants reduce the fixed costs of exporting. We provide several pieces of evidence consistent with this story. Indeed, the elasticity of exports and imports to immigrants are generally higher in provinces with smaller firms (Chaney, 2008), and when trade take places with relatively poor countries or countries with weaker institutions (Dunlevy, 2006, Briant *et al.*, 2009).

We also explore an alternative explanation for the immigrant-trade link: the effect may be mediated by the creation of business by immigrants (immigrant entrepreneurs). Curiously enough, after including the stock of immigrant firms in the augmented gravity equation, we find a statistically significant and negative association with exports and a significant and positive association with imports. We put forward that the former could be explained by domestic firms substituting foreign outsourcing with domestic immigrant-firms sub-contractors. For future research, we plan to focus our analysis on sectors where foreign outsourcing and domestic sub-contracting is widespread

to further investigate this speculation. Once the stock of immigrants is included, the imports' elasticity to migrants falls remarkably, while the stock of immigrant firms attract a highly significant and large coefficient, suggesting that creation of firms may be the main channel through which immigrants raise imports.

Last but not least, we check whether the higher elasticity of imports with respect to exports may be explained by the effect of preferences and tastes (transplanted home-bias) in line with Rauch (2001). Were this the case, we would have expected the gap to be even higher in the food sector, where due to culture and habit formation, tastes differences between immigrants and natives are particularly marked. However, we find very similar elasticities for imports and exports of food, 0.37 and 0.38, respectively. We put forward that in line with Chaney's theoretical model and the most recent empirical findings (Peri and Requena-Silvente, 2010), the trade elasticity to immigrants may be goods-specific, depending for instance on the degree of market differentiation. In this case, when focusing on trade in all sectors the estimated elasticity would be an average elasticity depending on the composition of the goods-mix and the relative weight of the different goods exported by Italian provinces.

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Table 6: OLS estimates

	Export (1)	Import (2)	Export (3)	Import (4)	Export (5)	Import (6)
ln(Y_i Y_j)	0.639***	0.072	0.757***	0.116	2.102***	2.097***
	(0.070)	(0.085)	(0.068)	(0.084)	(0.038)	(0.047)
ln IMM	0.251***	0.482***	0.112***	0.344***	0.107***	0.344***
	(0.024)	(0.029)	(0.022)	(0.031)	(0.024)	(0.031)
ln distance	-0.346	-1.600***	-2.042***	-2.680***	-1.939***	-2.932***
	(0.229)	(0.185)	(0.427)	(0.641)	(0.414)	(0.648)
contiguity	1.837***	5.101***				
	(0.468)	(0.567)				
EU, EFTA	-0.235***	-0.256**				
	(0.063)	(0.106)				
country, province, year FE	yes	yes				
trading-pair, province-year FE			yes	yes		
trading-pair, country-year FE					yes	yes
N. observations	133,698	133,698	133,698	133,698	133,698	133,698
R squared	0.77	0.73	0.81	0.77	0.80	0.77

*, **, *** statistically significant at the 10, 5 and 1 percent level, respectively.

$^{(a)}$ In regressions with interaction terms, the interacted variables are centered to have zero mean.

Note. The dependent variables are ln(1 + exports) and ln(1 + imports), in the the export and import equations, respectively. Standard errors are clustered by trading-pair and robust to heteroskedasticity.

Table 7: Two-stage least squares estimates

	OLS		2SLS			
	Export	Import	Export		Import	
			1st stage	2nd stage	1st stage	2nd stage
	(1)	(2)	(3)	(4)	(5)	(6)
Imputed ln IMM			0.713***		0.713***	
			(0.008)		(0.008)	
Partial R2			0.60		0.60	
ln IMM	0.117***	0.353***		0.190***		0.507***
	(0.025)	(0.033)		(0.036)		(0.045)
N. obs.	114,849	114,849	114,849	114,849	114,849	114,849

*, **, *** statistically significant at the 10, 5 and 1 percent level, respectively.
Note. All estimates include ln(Y_i Y_j), ln distance, and trading-pair and country-year FE. Standard errors are clustered by trading-pair and robust to heteroskedasticity.

Table 8: Heterogeneity: firm size and percapita GDP (GDP/P)

	Firm size		Country GDP/P		Province GDP/P	
	Export	Import	Export	Import	Export	Import
	(1)	(2)	(3)	(4)	(5)	(6)
ln(Y_i Y_j)	2.070***	2.051***	2.138***	2.112***	2.118***	2.016***
	(0.038)	(0.048)	(0.037)	(0.047)	(0.043)	(0.052)
ln IMM (c)	0.089***	0.317***	0.053**	0.323***	0.135***	0.331***
	(0.024)	(0.032)	(0.024)	(0.031)	(0.024)	(0.032)
ln distance	-1.635***	-2.866***	-2.040***	-2.971***	-1.747***	-2.872***
	(0.413)	(0.625)	(0.411)	(0.647)	(0.419)	(0.642)
ln average firm size (c)	0.376***	0.463***				
	(0.051)	(0.068)				
ln IMM * ln average firm size (c)	-0.239***	-0.071***				
	(0.019)	(0.025)				
ln country GDP/P (c)			-2.314***	-2.954***		
			(0.294)	(0.228)		
ln province GPD/P (c)					0.252	1.078***
					(0.199)	(0.240)
ln country GDP/P × ln IMM (c)			-0.142***	-0.054***		
			(0.012)	(0.015)		
ln province GDP/P × ln IMM (c)					-0.510***	-0.047
					(0.037)	(0.046)
N. observations	130,810	130,810	133,595	133,595	132,966	132,966
R squared	0.80	0.77	0.80	0.77	0.80	0.77

*, **, *** statistically significant at the 10, 5 and 1 percent level, respectively.
Note. All estimates include trading-pair and country-year FE. Standard errors are clustered by trading-pair and robust to heteroskedasticity. In all specifications with interaction terms variables are mean centered (zero mean) before computing the interactions.

Table 9: Heterogeneity: quality of institutions

	Rule of law		Regulatory quality		Gov. efficiency		Political stability		Control of corruption	
	Export	Import	Export	Import	Export	Import	Export	Import	Export	Import
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
ln(Y_i Y_j)	2.125***	2.118***	2.144***	2.132***	2.144***	2.135***	2.127***	2.125***	2.138***	2.133***
	(0.037)	(0.047)	(0.037)	(0.047)	(0.037)	(0.047)	(0.037)	(0.047)	(0.037)	(0.047)
ln IMM (c)	0.072***	0.313***	0.074***	0.318***	0.073***	0.315***	0.063**	0.297***	0.073***	0.310***
	(0.025)	(0.031)	(0.024)	(0.031)	(0.024)	(0.031)	(0.025)	(0.032)	(0.024)	(0.031)
Quality of institutions (c)	-2.932***	-4.706***	-0.473*	-0.640***	-0.452**	-0.628***	1.139***	0.933***	-0.417	-0.702***
	(0.521)	(0.628)	(0.253)	(0.099)	(0.230)	(0.090)	(0.315)	(0.333)	(0.283)	(0.108)
Quality of institutions × ln IMM (c)	-0.192***	-0.172***	-0.222***	-0.166***	-0.216***	-0.180***	-0.114***	-0.120***	-0.178***	-0.175***
	(0.020)	(0.023)	(0.021)	(0.026)	(0.020)	(0.023)	(0.019)	(0.023)	(0.019)	(0.023)
ln distance	-2.013***	-2.999***	-2.018***	-2.994***	-2.042***	-3.020***	-1.995***	-2.994***	-2.023***	-3.016***
	(0.412)	(0.643)	(0.412)	(0.642)	(0.410)	(0.644)	(0.411)	(0.646)	(0.411)	(0.644)
N. observations	133,595	133,595	133,068	133,068	133,068	133,068	133,080	133,080	133,068	133,068
R squared	0.80	0.77	0.80	0.77	0.80	0.77	0.80	0.77	0.80	0.77

*, **, *** statistically significant at the 10, 5 and 1 percent level, respectively.

Note. All estimates include trading-pair and country-year FE. Standard errors are clustered by trading-pair and robust to heteroskedasticity. In all specifications with interaction terms variables are mean centered (zero mean) before computing the interactions.

Table 10: Immigrant firms

	Export (1)	Import (2)	Export (3)	Import (4)
ln(Y_i Y_j)	2.208***	2.165***	2.136***	2.050***
	(0.037)	(0.046)	(0.039)	(0.048)
ln IMM firms	-0.045	0.358***	-0.146***	0.196***
	(0.034)	(0.038)	(0.037)	(0.041)
ln IMM			0.165***	0.264***
			(0.026)	(0.034)
ln distance	-2.048***	-2.945***	-1.994***	-2.859***
	(0.413)	(0.650)	(0.414)	(0.650)
N. observations	133,698	133,698	133,698	133,698
R squared	0.80	0.77	0.80	0.77

*, **, *** statistically significant at the 10, 5 and 1 percent level, respectively.
Note. All estimates include trading-pair and country-year FE. Standard errors are clustered by trading-pair and robust to heteroskedasticity.

Table 11: Food sector

	Export (1)	Import (2)	Export (3)	Import (4)
ln(Y_i Y_j)	1.703***	1.111***	1.606***	0.957***
	(0.048)	(0.045)	(0.050)	(0.044)
ln IMM	0.384***	0.374***	0.220***	0.113***
	(0.031)	(0.032)	(0.034)	(0.031)
ln IMM firms			0.406***	0.648***
			(0.046)	(0.047)
ln distance	-0.585	0.119	-0.432	0.362
	(0.970)	(0.989)	(0.966)	(0.996)
N. observations	133,698	133,698	133,698	133,698
R squared	0.67	0.65	0.67	0.65

*, **, *** statistically significant at the 10, 5 and 1 percent level, respectively.
Note. All estimates include trading-pair and country-year FE and refer to the food sector only. Standard errors are clustered by trading-pair and robust to heteroskedasticity.

7 Appendix

A Data description

Trade data. Trade data are taken from the public available database of the Italian Institute of Statistics (ISTAT). Trade flows refer to the value of imports and exports of 107 Italian Provinces (NUTS-3) with around 200 trading partners around the world, over the period 2002-2009. Data are measured such that exports and imports are associated with the province of shipment, i. e. the province where the custom transaction was registered. Information of Extra-EU transactions are based on the Documento Amministrativo Unico (DAU) which is done for each commercial transaction, for the intra-EU exchanges the custom system has been replaced, since 1993, by the Intrastat standard. Import and export from each province are reported in current euros, we than express it in US current dollars, using the nominal exchange rate from WDI.

Immigrants. Data on foreign born residents by Province are taken from the demographic portal of ISTAT, and reports the stock of foreign-born residents per province at the 31 of december of each year (from 2002-2009).

Immigrant firms. Data on firms created by foreign born residents by Province are taken from the Italian Chamber of Commerce and refer to all sectors (from 2002-2009). The disaggregation by sector is only available in the EU, non-EU categories.

GDP. Data on country Gross Domestic Product are taken from the *World Development Indicators*, and are expressed in current US dollars. The GDP of Italian Provinces are taken from ISTAT and then rescaled to match the value of national Italian GDP, as reported in WDI.

*Governance.*The governance indicators of the World Bank reflect the statistical compilation of responses on the quality of governance given by a large number of enterprise, citizen and expert survey respondents in industrial and developing countries, as reported by a number of survey institutes, think tanks, non-governmental organizations, and international organizations. The indicators are constructed using an unobserved components methodology described in detail in the paper of Daniel Kaufmann, Aart Kraay and Massimo

Mastruzzi (2010). "The Worldwide Governance Indicators : A Summary of Methodology, Data and Analytical Issues". World Bank Policy Research. The six governance indicators are measured in units ranging from about -2.5 to 2.5, with higher values corresponding to better governance outcomes.

Political stability and absence of violence measures the perceptions of the likelihood that the government will be destabilized or overthrown by unconstitutional or violent means, including domestic violence and terrorism. *Government effectiveness* captures perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies. *Regulatory quality* captures perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development. *Rule of law* captures perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence. *Control of corruption* captures 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 elitès and private interests.

Firm Size. The average firm size per province is constructed using the firm level data from the Bureau Van Dijk AIDA dataset. In order to compute the average firm size per province we use the information about the manufacturing firms.

B Additional Graphs

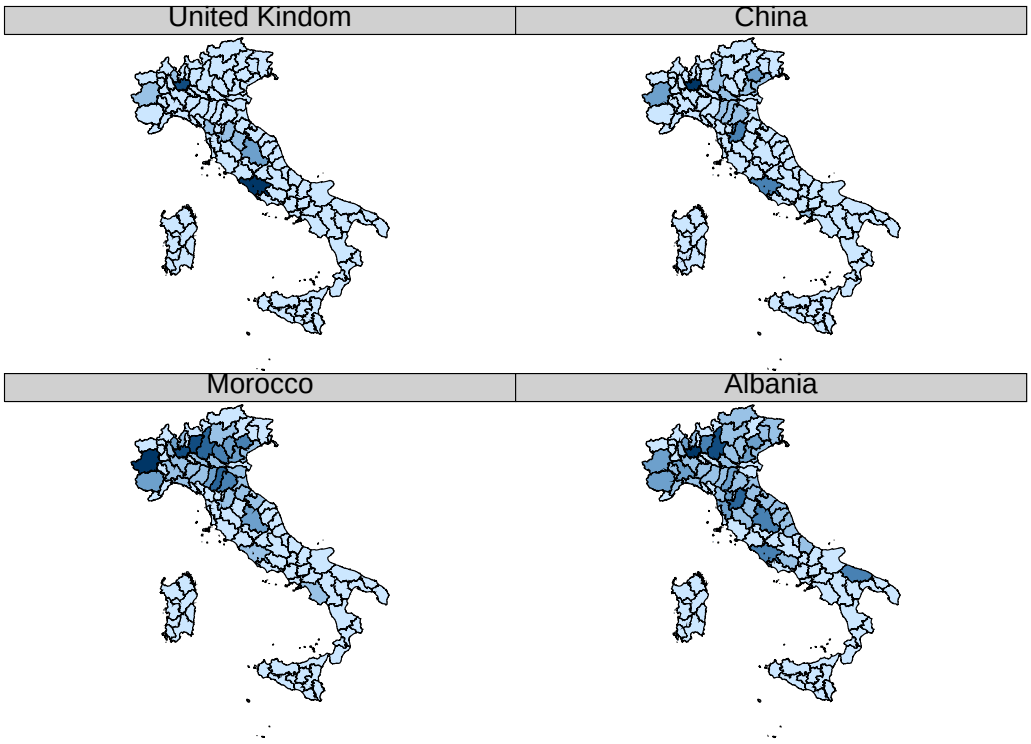

Figure 6: Immigrants in Italy at the provincial level, 2009 (the intensity of blue grows in the number of immigrants).

The figure plots data of immigrants from four communities in Italy. The data is at the provincial level (107 provinces in 2010, and does not include data on the three new Italian Provinces established after 2009). Data come from the Italian National Statistical Institute.

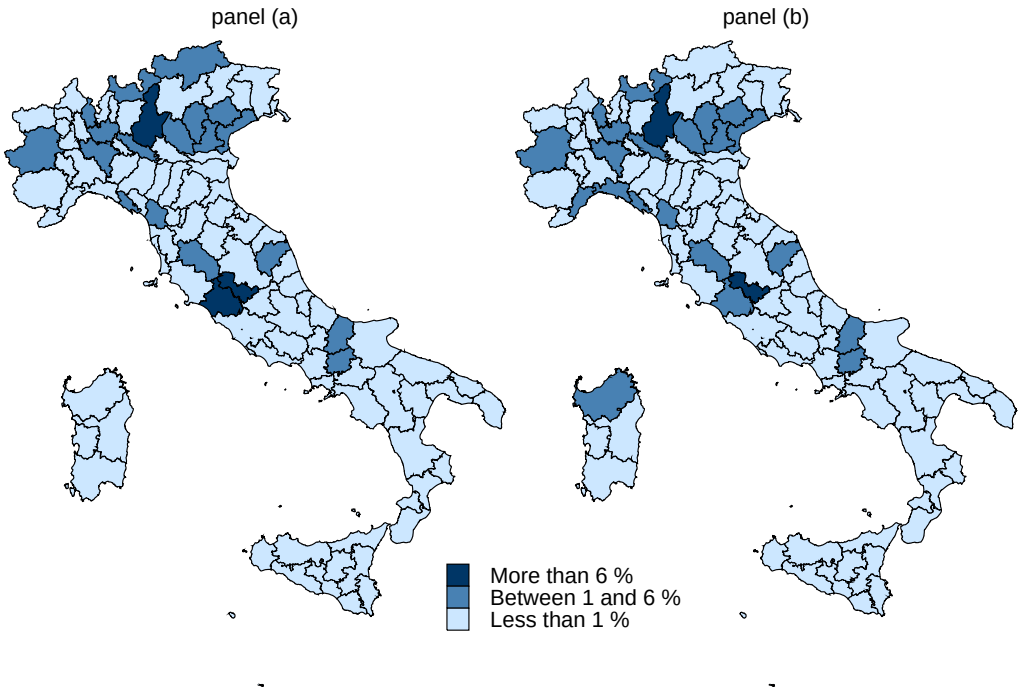

Figure 7: Share of Foreign entrepreneurs in Italy at the provincial level, 2009. Data come from the Italian Chamber of Commerce

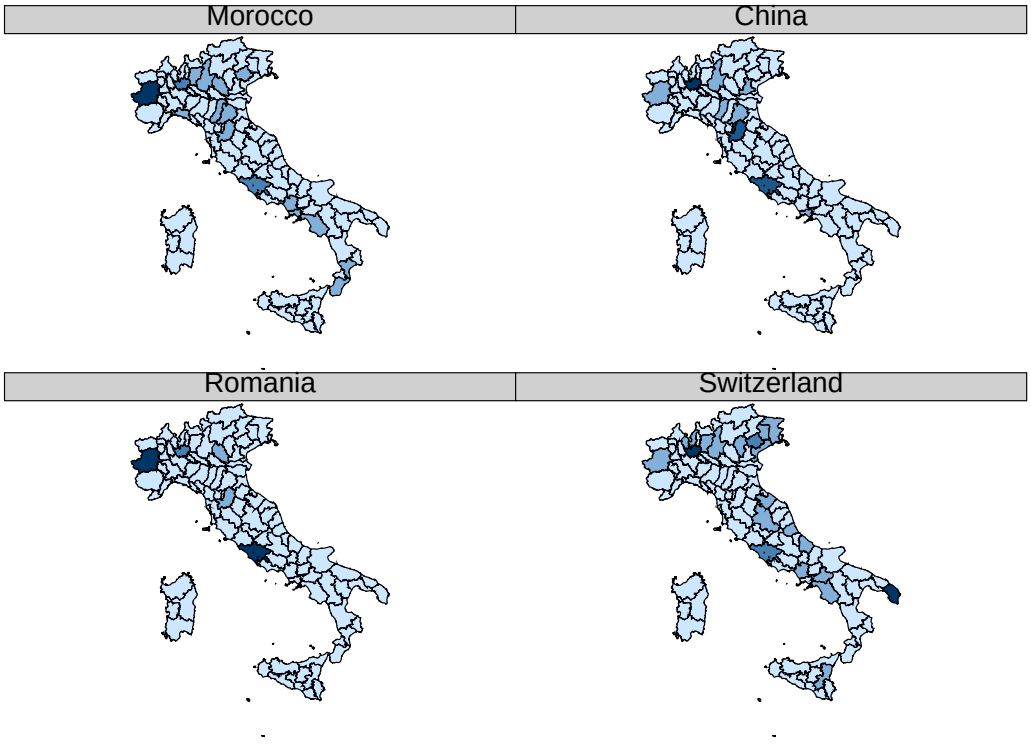

Figure 8: Foreign entrepreneurs in Italy at the provincial level, 2009 (the intensity of blue grows in the number of immigrants). Data come from the Italian Chamber of Commerce