Unpacking migrants' pro-trade effect: New evidence from Italian provinces

Anna D'Ambrosio*

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Abstract

A growing literature studies migrants' contribution to the internationalization of regions. Migrants are supposed to promote trade by facilitating the flow of information between the trade partners and by sustaining the enforcement of contracts. However,our understanding of the mechanism underlying such effect is still limited. Drawing on rich transaction-level data on Italian exports provided by the ISTAT, we seek to shed light on the mechanism underlying migrants' pro-trade effect, focusing on Italian NUTS3 regions. Transaction-level data allow identifying differential effects of migration on the number of transactions vis-a-vis the average value per transaction, proxying for the extensive and intensive margins of trade. Transaction data can be aggregated by the level of differentiation of the goods exchanged, which should be informative about the informational content of the good, as well as by the technological intensity of the sectors of the trading firm.

We employ a gravity model where we allow for differentiated exporting capacity of Italian provinces, differentiated importing capacity of the partner countries, and for region (NUTS2)-country level heterogeneity. We document a robust effect of both immigrants and emigrants on trade value and on the number of transactions, but not on the average transaction value. The results are consistent with migrants bridging the fixed, rather than the variable costs of trade. The effect is stronger for differentiated goods and for lower-tech sectors. Overall, the results suggest that migrants' effect is primarily an information effect that bridges the realization of new trade relationships, rather than increasing their value, which applies to sectors of relatively accessible informational content. Moreover, our results confirm recent findings that migrants' effects correlate with the province exporting capacity, consistent with recent results, suggesting a role for migrants in exports that

*Politecnico di Torino

goes beyond the effect on bilateral trade costs onto the productivity of the firms in the region.

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1 Introduction

A growing international literature analyzes the contribution that migration flows, both inward and outward, provide to the internationalization of regions (Gould, 1994; Rauch and Trinidade, 2002; Wagner et al., 2002; Felbermayr et al., 2015; Burchardi et al., 2018). According to this literature, migrants not only contribute to importing "nostalgic goods" from their home countries into the regions where they settle. They actually play a developmentally and economically much more intriguing role in faciliating bilateral exports. The mechanisms underlying immigrants' pro-export effects are usually attributed to an information and an enforcement effect operating within immigrant networks: their familiarity with both the origin and the destination contexts of trade may facilitate the access to business-relevant information and contacts, while their embeddedness in co-ethnic networks is considered to decrease the costs of contract enforcement by weak institutional settings through reputational and reciprocity dynamics. Immigrant networks are usually represented by immigrant stocks which are considered to proxy for the probability of forming a tie between co-ethnics (Rauch and Trinidade, 2002).

Because of the greater developmental relevance of the information and enforcement effect, many studies have chosen, as we do, to focus on the side of exports. In spite of the attention received by this strand of the literature, our understanding of the mechanism underlying such migration effect is still limited (Bratti et al., 2018; Briant et al., 2014; Burchardi et al., 2018; Peri and Requena-Silvente, 2010) . Recent studies have often resorted to a sub-national focus which is crucial to avoid the Modifiable Areal Unit Problem (MAUP) (Openshaw, 1983), which arises when a localised phenomenon is measured at the wrong geographical scale (Bratti et al., 2014). Indeed, the inter-personal contacts leading regional firms to improve their exporting capacity either through an information or an enforcement effect are likely to occur within networks of proximity (Rauch, 2001).

As regards in particular the Italian case, the evidence about a migrants' pro-trade effect for Italian provinces is increasingly compelling (Bratti et al., 2014, 2018). In this paper, we seek to contribute to this literature drawing on rich transaction-level data on Italian exports provided by the Italian Statistical Institute (ISTAT) to dig deeper into the understanding of the mechanism underlying migrants' pro-trade effect, focusing on the case of Italian

NUTS3 regions. These data provide detailed information about the classification of the good (NC8) and of the sector of activity of the trading firm.

The advantages of such detailed data are multifold. First, transaction-level data allow identifying differential effects of migration on the number of transactions vis-a-vis the average value per transaction, i.e the intensive and extensive margins of trade, providing insights on the types of trade barriers that are affected by migrants' brokering role (whether relating to fixed or variable costs, see Peri and Requena-Silvente, 2010). Second, they allow us aggregating transactions according to the level of differentiation of the goods exchanged. According to Rauch (2001) and Rauch and Trinidade (2002), the degree of differentiation should reflect the informational content embodied in the goods, hence a stronger effect of migrants on more differentiated goods would reflect a comparatively more important role of the information versus the enforcement effect. Conversely, the enforcement effect should apply throughout to all kinds of goods. Third, these data allow aggregating transactions by technological intensity of the sectors where the firm is operating.

To address the question of the migration effects on trade, we follow the literature and employ a gravity model of international trade (Anderson and van Wincoop, 2003; Head and Mayer, 2014; Chaney, 2008) where we explicitly allow for differentiated exporting capacity of Italian provinces (Bratti et al., 2018; Burchardi et al., 2018), differentiated importing capacity of the partner countries. Furthermore, we allow for heterogeneity in trading at the region (NUTS2)-country level, which is empirically found to be a strong source of variation in the data.

We apply this rich specification to study the pro-export effects of both immigrants and emigrants and highlight a robust aggregate effect of immigrants and emigrants on both trade value, and the number of transactions for both immigrants and emigrants. Controlling for the exporting capacity of provinces though province-time fixed effects, the effects result similar in magnitude.

These results are consistent with the idea that migrants bridge the fixed, rather than the variable costs of trade, such as the cost of accessing information about the foreign countries (Chaney, 2008; Peri and Requena-Silvente, 2010). Moreover, this effect is stronger for differentiated goods, and for lower-tech sectors.

Overall, the results suggest that migrants' effect is primarily an information effect that bridges the realization of new trade relationships, rather than increasing their value, which applies to sectors of relatively accessible informational content.

Moreover, comparing the specification including differentiated region-level exporting capacity with the one including differentiated province-level capacity reveals that migrants' effects correlate with the province exporting capacity, consistent with the findings in (Bratti et al., 2018), suggesting a role for migrants in exports that goes beyond the effect on bilateral trade costs onto the productivity of the firms in the region.

The remainder of this paper is organised as follows. Section 2 presents the theoretical framework. Section 4 describes the data. Section 3 presents the empirical model and its specifications. Section 5 collects and discusses the main results. Section 6 concludes.

2 Theoretical framework

Italy is traditionally and remains an emigration country, which turned into an immigration destination in the 1980s (Del Boca and Venturini, 2003; Bonifazi et al., 2009). The variety in the immigrants' countries of origin, with Asian and Eastern European countries being highly represented along with substantial shares of Latin-American immigrants, has led Bratti et al. (2014) to apply the concept of *superdiversity* to the Italian case (Vertovec, 2007). This refers to "new, small and scattered, multiple-origin, transnationally connected, socio-economically differentiated and legally stratified immigrants who have arrived over the last decade" (p.1024). As regards their economic integration, the concentration coefficients of immigrants' employment show that immigrants in Italy are comparatively more concentrated in the manufacturing sector than in other European countries, with the exception of Germany Hidalgo et al. (2007); Murat and Paba (2003).

2.1 The Model

In order to study the effects of migration on trade, we resort to the vast literature that explains trade patterns through gravity models(Anderson and van Wincoop, 2003; Head and Mayer, 2014), which we augment with migration variables (Felbermayr et al., 2015). The cross-sectional version of the "structural form" of the gravity equation can be expressed as in equation 1, which applies the notation in Eaton and Kortum (2002) and Head and Mayer (2014):

$$X_{ni} = \frac{Y_i}{\Omega_i} \frac{X_n}{\Phi_n} \phi_{ni}. \tag{1}$$

In this equation, X_{ni} represents the volume of trade between country n (importing country) and country i (exporting country); Y_i represents the "mass" of production of exporting country, X_n represents the "mass" of expenditures of the importing country; the "multilateral resistance term" (Anderson and van Wincoop, 2003) corresponds to $(\Omega_i \Phi_n)^{-1}$. The factors composing the multilateral resistance terms can be interpreted as, respectively, the average market access available to the exporting country (Ω_i) and the degree of competition in the importing country (Φ_n). More precisely, Ω_i represents the "expenditure-weighted average of relative access" and Φ_n the "accessibility-weighted sum of exporters' capabilities" (Head and Mayer (2014): 9-10). The term ϕ_{ni} captures bilateral costs of trade, including both natural and man-made trade barriers as well as their respective elasticities.

Immigration and emigration are traditionally considered to affect this term in the gravity equation, i.e. to operate at the level of the trade costs. The mechanisms underlying migrants' pro-export effects are usually attributed to an information and an enforcement effect operating within migrant networks. Their familiarity with both the origin and the destination contexts of trade may facilitate the access to business-relevant information and contacts, while their embeddedness in co-ethnic networks is considered to decrease the costs of contract enforcement by weak institutional settings through reputational and reciprocity dynamics.

Moreover, migrants directly add up to demand X_n, as they promote imports from their country of origin because of their "transplanted home bias" in consumption, i.e. their preference for home country goods.

The terms referring respectively to the importer income and multilateral resistance term and the exporter production and multilateral resistance term can be grouped under two "monadic" terms into the "general" form of the gravity equation (2)

$$X_{ni} = GS_iM_n\phi_{ni}, \tag{2}$$

where S_i represents the production of the exporter and its multilateral resistance term; M_n represents the income of the importer and is multilateral resistance term; G is a constant and ϕ_{ni} is the bilateral costs term.

Peri and Requena-Silvente (2010), using a dataset which is based on Spanish transaction-level data, articulate for the first time the differential impact of immigrants on the intensive and extensive margins of trade. They apply an empirical model based on Chaney (2008), which is reported in equation (3) (with slight changes in notation to ensure coherence with Eaton and Kortum, 2002 and Head and Mayer, 2014):

$$ln(X_{nit}) = \text{Const} + ln(w_{it}^{-\gamma}Y_{it}) + ln(X_{nt}\theta_{nt}^{\gamma}) - \gamma ln(\tau_{nit}) - \left(\frac{\gamma}{\sigma - 1} - 1\right) ln(f_{nit}) \tag{3}$$

In this equation, w_{it} represents the wage level of the exporting province or, more generally, the costs incurred in the home country to enter foreign markets, which in a general equilibrium framework correspond to productivity; γ is a parameter which is inversely related to firm heterogeneity in productivity; θ is a "remoteness" parameter which, together with its elasticity, is very similar to a multilateral resistance term from the side of the importer; τ_{nit} represents the variable costs of trade; σ is the elasticity of substitution between goods and f_{nit} represents the fixed costs of trade. This equation is obtained aggregating the exports of firms with heterogeneous productivity, which are able to enter foreign markets

if they overcome a productivity threshold $\bar{\alpha}_i$[1]. Head and Mayer (2014) have shown that the Chaney (2008) model, among other trade models, is theoretically compatible with the general form of the gravity equation when assuming Pareto distribution of firm productivity and on no upper bound in the productivity threshold (p. 15). The first two terms of the equation are captured by the monadic terms, while the last two terms are captured in the trade cost term.

An important implication of the model to our research question is that the elasticity of trade with respect to fixed trade costs goes entirely through the extensive margin elasticity $\frac{\gamma}{(\sigma-1)} - 1$, while factors altering the variable costs of trade affect both the intensive and the extensive margins of trade and ultimately depend on the homogeneity in the productivity distribution (Chaney, 2008, p.1717). Peri and Requena-Silvente (2010) hypothesize that immigrants positively affect trade volumes mainly by reducing the fixed costs f_{nit}; coherently, they find that immigrants increase in the extensive margin of trade, i.e. the number of transactions, leaving the intensive margin of trade virtually unaffected. They interpret this result as an indication that immigration reduces the fixed, rather than the variable, costs of trade.

The inverse relationship between the elasticity of substitution and trade in equation 3 implies that, by relatively homogenous goods (high σ), the effect of a reduction on trade barriers will be comparatively small. Conversely, by differentiated goods, the effect of a reduction in trade barriers will be larger. This conclusion is fully in line with the one in Rauch and Trinidade (2002), where the classification in Rauch (1999) into homogeneous, reference-priced and differentiated goods, is used to illuminate the dynamics underlying the network effect. The authors assume that immigrants' "information effect" will affect differentiated goods more strongly, while the "enforcement effect" will affect all products equally. Since their work, many empirical works on the migration-trade link have found evidence that the trade-facilitating role of immigrants is mainly driven by the information effect.

Incidentally, Head and Mayer (2014) have shown that, by assuming that the fixed costs of trade are expressed as a function of costs incurred in the exporting market, of costs incurred in the destination market and of bilateral-specific costs, as in Arkolakis et al. (2012): $f_{ni} = \varrho_{ni} w_i^{\mu} w_n^{1-\mu}$, the Chaney model can be expressed in the general form of the gravity equation (Head and Mayer, 2014)[p.16]:

[1]The introduction of such a threshold is due to the model in Melitz (2003), that analyzes the impact of trade on intra-industry reallocation. It derives from the assumption of firm heterogeneity and is functional to explain that the exposure to trade forces less productive firms to exit and more productive firms to enter the export markets. Chaney (2008) model, as well Helpman et al. (2008), include these assumptions in gravity models to explain the effects of fixed and variable costs of trade on both margins of trade (Melitz, 2008).

$$S_i = N_i \bar{\alpha}_i^{-\gamma} w_i^{-\gamma-\mu\left(\frac{\gamma}{\sigma-1}-1\right)} \text{ and } \phi_{ni} = \tau_{ni}^{-\gamma} \varrho_{ni}^{-\left(\frac{\gamma}{\sigma-1}-1\right)} \tag{4}$$

In this equation, N_i represents the mass of active firms in country i and $\bar{\alpha}_i$ is the productivity threshold required to access foreign markets in country i. This way of expressing the equation suggests another channel through which migration can potentially affect trade, provided the immigration stock from a given country in a given province has a significant effect on the overall wage level of the province: w_i. This term has been considered as fixed across provinces by (Peri and Requena-Silvente, 2010), but could be more broadly construed, in line with Head and Mayer (2014), as the costs incurred domestically to export. This would represent a measure of the exporting capacities of the province and may actually affect S_i in the general gravity equation, hence trade. The effect of migration on wages and productivity is a debated issue in the literature. If immigration reduces wages, such as in Borjas (2003), the wage-related component of the elasticity of trade to immigration should be positive; on the other hand, Ottaviano and Peri (2006) find a positive effect of immigration on productivity which should increase the costs but also make it easier for firms to overcome the productivity threshold and export. An indirect way to test whether further research would be promising in this direction is to look at whether variations in the expressions used to account for the exporter-side monadic term affect the estimates on immigration: if the domestic costs are correlated with immigration, changes in the monadic term should have an effect on the immigration coefficients.

2.2 Migration, trade and multilateral resistance terms with subnational units

When applying the analysis of the migration-trade link to subnational units, a question that must be addressed relates to how to express the multilateral resistance term in case of sub-national units. The intuition behind introducing the term in country-level analysis is that "changes in bilateral trade costs influence trade between two countries to the extent that the change in bilateral costs is greater than the change in the average trade barriers of each country towards all its partner countries" (Anderson and van Wincoop, 2003)[p.176]. Turning to the trade between a given province and a given country, the same argument can be applied: changes in bilateral trade costs influence trade between that province and that country to the extent that the change in bilateral costs is greater than the change in the average trade barriers of that province towards all its partner countries, and that the change in bilateral costs is greater than the change in average trade barriers between the country and all the other countries and provinces it trades with. Hummels (1999) and Anderson and van Wincoop (2003) argue that the multilateral resistance terms can be accounted for by country fixed effects; in a panel context, Baldwin and Taglioni (2007) show that the time variation in the multilateral resistance terms should be accounted for with

importer-time and exporter-time effects (and omitting these terms configures the "gold-medal mistake" in gravity literature). When using export data at the province level, this implies using province-time as the exporter-time effects, and country-time as the importer-time effects.

Country-time effects are intended to capture macroeconomic shocks and events in foreign countries likely to affect both trade and immigration. Province-time dummies are intended to capture the state of the local economies, including the level of wages and domestic production costs discussed in section 2.1, which are well likely to vary by province and may also be affected by the immigration stocks. When focussing on the exports of provinces, omitting province-time effects would imply that the average market access of two different provinces be assumed to be the same; in case we look at province imports, this would imply that the degree of competition be assumed to be the same. Extending an argument about firms in Head and Mayer (2014), however, there is no specific reason why this should *a priori* assumed to be the case. This applies especially when looking at cases, like the Italian case, where the sub-regional articulation of the economy has marked the specificity of the development model. In spite of the importance to recognise this subnational variation, time-varying subnational effects have only been very recently included in the analysis of the migration-trade link (Burchardi et al., 2018; Bratti et al., 2018).

Furthermore, it is necessary to account for the correlation between the unobservable component of the bilateral trade determinants and the included trade determinants (Baldwin and Taglioni, 2007; Head et al., 2010). These could for instance regard the cultural proximity or historical ties between the region where the province is located and a partner country, such as long-term emigration ties from a region to a country (e.g. Piedmont and Argentina), or institutional partnerships between a given region and a partner country such as those described in Stocchiero (2009) between Veneto and Romania.

The migration-trade link has been investigated in the case of Italy by Murat and Pistoresi (2009), Bratti et al. (2014) and Bratti et al. (2018), with quite different approaches. The main contribution by Murat and Pistoresi (2009), who use a pooled cross-section of country-level data from 1990 to 2005, relates to noting that the argument that immigrants facilitate trade can be applied to expatriates as well, a dimension of interest for countries like Italy and Spain which have historically been marked by sizable emigration flows[2].

Bratti et al. (2014), using province-level panel data for the period 2002-2011, include income terms at the province level and a measure of bilateral distance of each country towards each province, but bilateral time-invariant effects at the region-country level and time-varying effects at the region and country level. The implied assumption is that the average market access be the same across provinces within the same region, and that the special

[2]Flisi and Murat (2011) have investigated the link between migration - immigrants and emigrants - and FDI in 5 countries including Italy.

institutional, cultural and contractual relationships with given countries differ significantly across provinces of the same region. At the same time, they account for different production and expenditure capacities within the region and for some bilateral specificity between the province and the partner country by adding province-country distance. With this specification, the authors obtain a significant coefficient in the immigrant stocks at the province level and they interpret this result as a confirmation of the scale at which the migration-trade link operates, i.e. the province level (cfr. also Herander and Saavedra, 2005).

3 Empirical Strategy

The empirical, log-linearised model that we draw from our discussion in section 2.1 is as follows:

$$ln(Y_{nit}) = \beta_1 \ln(\text{Immi}_{nit-1}+1) + \beta_2 \ln(\text{Emi}_{nit-1}+1) + \beta_3 ln(X_{nt-1} \times Y_{it-1}) + \beta_4 ln(dist_{ni}) + \\ + \gamma_{\mathbf{1}} \theta_{\mathbf{nt}} + \gamma_{\mathbf{2}} \omega_{\mathbf{it}} + \gamma_{\mathbf{3}} \eta_{\mathbf{nr}} + \varepsilon_{nit} \quad (5)$$

Where:

Y_{nit} = Exports, measured in thee different ways: X_{nit}, i.e. the nominal value of the exports from province i to country n at time t; NT_{nit}, i.e. the number of transactions between province i and country n in year t; AVT_{nit}, i.e. the average value per transaction between province i and country n.

Immi_{nit} = Stock of immigrants from country n living in province i at time t;

Emi_{nit} = Stock of emigrants from province i living in country n at time t;

X_{nt} = Total expenditures by country n, approximated by country GDP,

Y_{it} = Total production by province i, approximated by province gross product;

$\theta_{\mathbf{nt}}$ = vector of the importer-time effects, corresponding to country-time dummies;

$\omega_{\mathbf{it}}$= vector of the exporter-time effects, corresponding to province-time dummies;

$\eta_{\mathbf{nr}}$= vector of the region-country fixed effects

ε_{nit}=random error term

As discussed, the differentiated exporting capacity of provinces derives from the need to take into consideration the so-called "Multilateral Resistance Term" (MRT) in the trade

literature (Anderson and van Wincoop, 2003), while the country-region effects are meant to absorb most of the correlation between included regressors and trading pair-specific factors. As such, this represents one of the most comprehensive specifications of the migration-trade link.

Standard works on the migration-trade link set $Y_{nit} = X_{nit}$, i.e. investigate the link between migration and trade volumes. In addition to this, we follow Peri and Requena-Silvente (2010), and also study the relationship between migration and NT_{nit}, hence studying the effect of migration on the extensive margin, and between migration and AVT_{nit}, the intensive margin.

This basic specification can be estimated as such or separately for different types of goods (differentiated, homogeneous and reference-priced; see Rauch, 1999) and for different levels of technological intensity described in section 4, possibly yielding insights on the underlying mechanism.

4 Data

In this paper, we exploit a rich database of micro-data provided by the Lab for Elementary Data Analysis of the Italian Statistical institute (Laboratorio ADELE, ISTAT) upon formal request for authorization; for data sensitivity reasons, the data can exclusively be accessed within the ISTAT offices using the equipment provided by the institution. The datasets used in this paper are derived from the aggregation, by province-country pair and by year, of the information about individual transactions in goods that are collected monthly from customs and are articulated into two categories: (i) Sales/Purchases with EU countries (Intrastat System) ("*Cessioni-Acquisti beni con i paesi UE (Sistema Intrastat)*") and (ii) import-export with non-EU countries ("*Commercio speciale esportazione-importazione extra-UE*"). Taking the perspective of Italian provinces with a view to gain insights of relevance for regional development, it was opted to focus on the side of the exports only. Relying on transaction-level data, we can separate, for each province-country pair and year, the number of transaction from the average value per transaction, i.e., respectively, measures of the extensive and intensive margins of international trade, following the approach used by Peri and Requena-Silvente (2010) on Spain. Table B.2 reveals a very high correlation between the number of transactions and the overall value of the trade between a given province-country pair in a given year (0.93). The average value per transaction of a given pair has a lower correlation with overall trade volumes (0.59) and even lower with the number of transactions.

The micro-data contain information about the sectoral classification of the transactions at the 8-digit level of the Combined Nomenclature classification (NC8) and at the 5-digit

level of the NACE classification (in Italian, Ateco). In order to exploit this information, three different datasets were produced:

1. The first database aggregates all information by province-country pair and year;
2. The second database aggregates the information by product type according to the classification in Rauch (1999) by homogeneous goods, reference-priced goods and differentiated goods[3], and then by province-country pair and year; however, as the Rauch classification is based on the SITC4 classification and the data are available by the NC8 classification, a two-step conversion had to be performed (from NC8 to SITC5 through the correspondence tables available at the RAMON-Eurostat website[4], and then from SITC5 to SITC4). This conversion procedure led to some information loss by missing correspondence in the conversion table from NC8 to SITC5 and from SITC4 to Rauch classification. Two subtypes of the resulting database were produced, corresponding respectively to Rauch's "conservative" and "liberal" classification.
3. The third database aggregates the information by technological intensity of the manufacturing industry and services sector based on Eurostat classification of the 3-digit NACE rev.2 classification[5]. The classification leads to four categories of technological intensity in manufacturing industries (high, medium-high, medium-low, and low).

The province-country export data just described, either aggregate or articulated by product type or technology level, constitute the dependent variables of the model. Each of the three databases described above has been merged with a dataset articulated by province-country pair and year and containing information about immigrant stocks, emigrants stocks, country and province population, country GDP and per-capita GDP, province income and per-capita income distance, dummies for belonging to Eurozone, EU, European Economic Area, OECD, past colonial ties with Italy, contiguity with Italian border provinces and other gravity-relevant variables derived from publicly available sources (see table B.3). The main variables of interest are those relating to immigration and emigration; they derive respectively from the publicly available demographic statistics of the ISTAT and from the AIRE (Anagrafe Italiana Residenti all'Estero, i.e. the Italian Registry of Residents Abroad). The correlation between the log of the two variables that is reported in table B.2 is relatively low (0.18).

Clearly, the migration variables should be viewed as imperfect proxies of immigrant and emigrant stocks. Following the literature on the migration-trade link, throughout this paper we refer to "immigration" in a province as the stock of residents in that province who hold

[3]The classification by SITC4 code can be downloaded at `http://www.macalester.edu/research/economics/PAGE/HAVEMAN/Trade.Resources/TradeData.html#Rauch`

[4]Available at `http://ec.europa.eu/eurostat/ramon/relations/index.cfm?TargetUrl=LST_REL`

[5]Available at `http://epp.eurostat.ec.europa.eu/cache/ITY_SDDS/Annexes/htec_esms_an3.pdf`

a non-Italian citizenship. Hence, the portion of foreign-born people that have acquired the Italian nationality is neglected. It also only refers to formally residing people, neglecting undocumented immigrants, and it furthermore neglects the intra-national mobility that is not registered in changes of residence. Similarly, the emigration variable used here is imperfect as it refers to the stock of people that have moved their residence outside Italy but are still recorded in the election registries in Italy. These data are not informative as to the country of birth of these emigrants, and thus in principle one cannot distinguish return migrants from the native Italian diaspora: only the portion of former residents in Italy who have expatriated and still vote in Italian elections is represented. Yet, maintaining one's voting rights in Italy implies the persistence of strong ties to Italy. It is thus relatively safe to assume these data to more closely reflect the dynamics of the Italian emigrant population than the dynamics of return migration. Furthermore, neither immigration nor emigration data at the province level allow distinguishing between economically active and inactive migrants; consequently, it cannot be elicited from these data whether migrants' contribution to trade is "active", e.g. as entrepreneurs, intermediaries or labour force who sell primarily to their home country, or whether it is an "indirect" one that goes through familiarization and trust-building in the destination context with the home countries. This is a consequence of the sub-national level of analysis: at the NUTS 3 level, the availability of detailed data on immigrants' characteristics, especially on skills, employment status and length of stay is severely constrained: the results of the Labour Force Survey are only considered as reliable at the NUTS 1 level.

The length of the panel available for our analysis depends on the availability of data about immigration and emigration[6]. Because the data about emigration are only available from 2006 on, while data about immigration are available from 2002 to 2010, the time period available for the joint analysis of immigration and emigration effects on trade is limited to 2006-2010. Due to data availability issues affecting the emigrant variable, this period coincides with the burst of the global financial crisis. The regional structure of opportunities has substantially worsened during this period, hence imputing the missing emigration data on the pre-crisis period with the information collected during the crisis may lead to mistakes. Hence, we take a conservative approach and use official data only, accepting that our analysis will have to rely on a reduced time span. Yet, in Appendix we do report the results of our analyses run for the entire 2002-2010 period using immigration data only. The results are remarkably similar and reassuring that, at least for what concerns immigration, the shorter time span does not substantially affect the results. Due to our focus on the number of transactions, we opted not to add one unit to the zero trade flows when taking logs. This implies that our sample available for the analysis is an unbalanced panel of positive flows covering combinations of 103 provinces and 164 countries over a period of four years. All regressors are lagged one year to mitigate simultaneity. Our final estimation sample covers about 9300 dyads per year, leading to an estimation sample of

[6] As it is common practice, in empirical estimation one unit is added to immigration and emigration

37,328 observations for the 2006-2010 period. The summary statistics are reported in table B.1 and the correlation matrix in Table B.2.

5 Results

Table 1 reports the results of our baseline estimates. In the upper panel we include the full set of fixed effects, i.e. province-year, country-year and region-country. In the bottom panel of table, we check the sensitivity of our estimates to the level at which the multilateral resistance term is allowed to vary: here, the exporting capacity is considered to be the same across provinces in the same region and region-year effects are included instead of province-year effects. Comparing the two panels, it emerges clearly that the level at which the exporting capacity is allowed to vary has relevant implications for the estimation of our variables of interest. Indeed, by allowing for heterogeneous province-level exporting capacity, the estimated immigration and emigration effects dramatically shrink. This implies that there is correlation between bilateral migration and the exporting capacity of provinces which must be taken into account when estimating the migration effects, in line with the findings by Bratti et al. (2018). Clearly, if more economically dynamic provinces within the same region attract more immigrants from any country, failing to include province-specific controls may lead to attribute to migrants an effect that is actually due to the specificity of the provinces where they locate. Second, it may be that the effect of migration on trade is not only channelled through the bilateral cost term ϕ_{nit} in equation 2 but also through the monadic terms. On the side of immigrants, this would imply that their effect on trade may also act at the level of the productivity of the exporting firms; on the side of emigrants, this would imply that provinces with more emigrants would also export more.

Overall, these results provide clear support to the empirical relevance of including time-varying exporter effects at the province-level, in line with the implications of the gravity theory. Hence, in what follows, we will only consider, from now on, the more demanding specification including province-time effects.

More specifically, the results in Table 1 reveal a positive and significant effect of both immigration and emigration on bilateral trade, which is mainly driven by the effect of migrants on the extensive margin. On the other hand, the effect of migrants on the intensive margin, measured by the average value per transaction, results null or even negative. In line with the findings by Peri and Requena-Silvente (2010) on the Spanish case, these results suggest that migrants affect the extensive margin of trade by, arguably, reducing the fixed costs of trade in possibly lower value-added sectors.

Table 1: Estimation results: Baseline model
Trade volumes, Number of Transactions, Average Value per Transaction

Dependent variable	$ln(X_{nit})$	$ln(NT_{nit})$	$ln(AVT_{nit})$
	(1)	(2)	(3)
$ln(Immi_{nit-1}+1)$	0.035***	0.052***	-0.017**
	(0.013)	(0.009)	(0.008)
$ln(Emi_{nit-1}+1)$	0.046***	0.036***	0.010
	(0.014)	(0.009)	(0.009)
$ln(X_{nt-1} \times Y_{it-1})$	0.006	0.024***	-0.019***
	(0.007)	(0.005)	(0.004)
$ln(dist_{ni})$	-1.662***	-1.610***	-0.052
	(0.356)	(0.284)	(0.246)
Country-region dummies	Yes	Yes	Yes
Country-year dummies	Yes	Yes	Yes
Province-year dummies	Yes	Yes	Yes
N	37,328	37,328	37,328
r2	0.823	0.897	0.433
Region-year instead of province-year effects			
$ln(Immi_{nit-1}+1)$	0.184***	0.184***	-0.000
	(0.015)	(0.011)	(0.008)
$ln(Emi_{nit-1}+1)$	0.117***	0.076***	0.042***
	(0.014)	(0.010)	(0.009)
$ln(X_{nt-1} \times Y_{it-1})$	0.238***	0.209***	0.029***
	(0.006)	(0.005)	(0.003)
$ln(dist_{ni})$	-1.308***	-1.024***	-0.284
	(0.418)	(0.330)	(0.291)
Country-region dummies	Yes	Yes	Yes
Country-year dummies	Yes	Yes	Yes
Province-year dummies	No	No	No
Region-year dummies	Yes	Yes	Yes
N	37,328	37,328	37,328
r2	0.770	0.847	0.354

Standard errors clustered at the pair level in parentheses. * p<0.1, ** p<0.05, *** p<0.01.

5.1 Product differentiation

Table 2 reports the coefficients of $ln(\text{Immi}_{nit}+1)$ and $ln(\text{Emi}_{nit}+1)$ for different levels of product differentiation, classified according to Rauch (1999) conservative classification (differentiated, reference-priced and homogeneous goods). Precisely where the literature predicts a stronger trade-promoting effect by migrants, i.e. by differentiated goods, we do find a stronger trade-promoting effect of both immigration and emigration. In line with the findings of previous literature, migrants' effect positive but insignificant, on the trade value of reference-priced and homogeneous goods. A "reference price" is defined by Rauch (1999) as "*a price that is quoted without mentioning a brand name or other producer identification. Commodities that possess reference prices are taken to be sufficiently homogeneous that if traders see the price differential between two countries' markets is large enough to cover customs and transport costs, they know it is profitable to ship the product.*" (p.1187). These results are also in line with the findings by (Briant et al., 2014), who refer to Rauch's definition of differentiated goods as "complex" goods.

Table 2: Regression results: OLS estimates on log-linear model. Product differentiation

Dependent variable	$ln(X_{nit})$	$ln(NT_{nit})$	$ln(AVT_{nit})$
Differentiated goods			
$ln(\text{Immi}_{nit-1}+1)$	0.042***	0.053***	-0.011
	(0.014)	(0.010)	(0.008)
$ln(\text{Emi}_{nit-1}+1)$	0.065***	0.057***	0.007
	(0.014)	(0.010)	(0.009)
Reference-priced goods			
$ln(\text{Immi}_{nit-1}+1)$	0.068	0.068**	-0.000
	(0.046)	(0.032)	(0.026)
$ln(\text{Emi}_{nit-1}+1)$	0.036	0.047	-0.011
	(0.049)	(0.032)	(0.029)
Homogeneous goods			
$ln(\text{Immi}_{nit-1}+1)$	0.025	0.035**	-0.010
	(0.022)	(0.016)	(0.012)
$ln(\text{Emi}_{nit-1}+1)$	0.054**	0.038**	0.016
	(0.021)	(0.016)	(0.012)

Clustered standard errors in parentheses; * p<0.1, ** p<0.05, *** p<0.01

The greater informational content embodied in differentiated products, which according to Rauch and Trinidade (2002) constitutes an informal trade barrier which migrants are able to overcome, is associated in our estimates with a stronger and statistically significant positive effect of migration. The Italian production structure has historically been marked by highly export-oriented firms specialised precisely in these sectors. All the *Made in Italy* sectors are included in this subgroup. Not surprisingly, the most precise effects are

estimated for this subgroup of goods.

Looking at the number of transactions, though, the above-presented picture becomes more blurred. Specifically, migrants' effects is positive and significant on the extensive margin of trade for all kinds of goods, for both immigrants and emigrants, with the only exception of the emigrants' effects on reference-priced goods. By contrast, no significant effect of migrants can be identified on the intensive margin of trade.

Overall, these results strongly support the interpretation that migrants bridge the fixed costs of trade. On the other hand, the evidence that the migrants' effects are stronger for differentiated (or "complex") goods is less strong than found in the previous literature. This suggests that there is a set of fixed costs (primarily, language barriers) that migrants can bridge independently of the product complexity. Interpreting these results as evidence of an enforcement, rather than of an information effect seems less correct considering that there may be different skills at play in the intermediation of the trade of complex vs. simple goods. For this reason, we exploit the detailed sectoral classification in our data to study whether migrants' effect changes by technological intensity.

5.2 Technological intensity

Table 3 report the results of the regressions run separately by different levels of technological intensity of firms' sectors.

Table 3: **Technological intensity - Manufacturing sector**

	High-tech			**Mid-high-tech**		
Dependent variable	$ln(X_{nit})$	$ln(NT_{nit})$	$ln(AVT_{nit})$	$ln(X_{nit})$	$ln(NT_{nit})$	$ln(AVT_{nit})$
$ln(\text{Immi}_{nit-1}+1)$	-0.008	0.017	-0.025	-0.007	0.020	-0.027**
	(0.024)	(0.014)	(0.016)	(0.021)	(0.015)	(0.012)
$ln(\text{Emi}_{nit-1}+1)$	0.035	0.053***	-0.018	0.083***	0.059***	0.024*
	(0.027)	(0.016)	(0.017)	(0.022)	(0.015)	(0.013)
	Mid-low tech			**Low-tech**		
Dependent variable	$ln(X_{nit})$	$ln(NT_{nit})$	$ln(AVT_{nit})$	$ln(X_{nit})$	$ln(NT_{nit})$	$ln(AVT_{nit})$
$ln(\text{Immi}_{nit-1}+1)$	0.028	0.033***	-0.005	0.033*	0.037***	-0.003
	(0.018)	(0.012)	(0.011)	(0.017)	(0.013)	(0.009)
$ln(\text{Emi}_{nit-1}+1)$	0.071***	0.058***	0.013	0.059***	0.047***	0.013
	(0.020)	(0.012)	(0.013)	(0.017)	(0.013)	(0.009)

Clustered robust standard errors in parentheses. * p<0.1, ** p<0.05, *** p<0.01

The picture that emerges from this table is much clearer, confirming also a distinct effect

of immigrants and emigrants. The tables show that the effects of immigrant networks are positive and significant on the low-tech and mid-low tech sectors only. These results are consistent with the interpretation that immigrants mainly promote trade in lower-value added sectors (which are proxied here as low-tech sectors). Coherently with the aggregate findings, the effect of immigrants on the average value per transaction is even negative. On the other hand, the emigrants' effects are positive and significant on the number of transactions for all kinds of sectors, operating in all cases mainly through the extensive margin.

The insignificant effects of immigration stocks on high-tech trade can be explained as follows. High-tech firms are likely to be comparatively highly productive and to rely on highly skilled partnerships in a globalized market. In such sectors, the scope for trade facilitation through co-ethnic networks is likely limited: while high-tech goods can be highly differentiated, the information content is not necessarily more accessible to immigrants or emigrants as it is likely not to be so much culture-related but rather related to highly complex and product-specific knowledge. Transnational communities of practice, not necessarily mediated by regular physical proximity (Breschi and Lissoni, 2001), are likely to play a stronger role in mediating exports. Similar arguments can apply to mid-high tech sectors.

As regards the manufacturing of goods with low levels of technology, the usual explanations in the migration-trade literature seem to apply to expatriates networks. By low levels of technology, higher immigration stocks result to positively affect the number of transactions as well as trade volumes. Overall, there is evidence of a positive effect of immigration in promoting exports in the lower-tech ends of manufacturing, which by the way correspond to the *Made in Italy* sectors.

On the other hand, the emigrants' effect is not only a network effect but also a demand effect. Thus, irrespective of their level of qualification and of their ability to facilitate trade in more high-tech sectors, their demand as final consumers or as entrepreneurs operating in downstream sectors of the value chain is likely to add up to the drivers of the positive effect that is identified for emigrants on all sectors.

6 Discussion and Conclusions

In this chapter, a theory-consistent gravity model linking immigration and emigration to trade has been tested for the Italian case; the structure of the data allowed disaggregating trade values into the intensive margin and extensive margins, and to compare migrants' effects for different levels of technological intensity and product differentiation.

Our results strongly confirm that migrants' effects are to be attributed to their ability to bridge the fixed costs of trade, in line with the (Chaney, 2008) model and with the

findings in (Peri and Requena-Silvente, 2010). Their effect is found to be more significant for more differentiated goods, but due to different channels. As regards immigrants, their trade-promoting effect applies exclusively to lower-tech and mid-low tech sectors. Taking into account that immigrants are often assumed to be relatively less skilled than natives in economic models, and in the Italian case in particular, (De Arcangelis et al., 2014; Accetturo et al., 2012), it may be difficult to expect that they are able to facilitate the flow of information regarding the trade of very high-tech goods. We interpret our results as an indication that migrants' effect is primarily an information effect that bridges the realization of new trade relationships, rather than increasing their value, which applies to sectors of relatively accessible informational content. The negative effect observed for immigrants on the intensive margin of the trade in mid-high-tech goods suggests that there may be an additional channel at play. Indeed, beyond the trade costs term, immigrants could affect the productive capacity of provinces and operate through the exporters' "monadic" term. By keeping production costs low thanks to the immigrants' lower bargaining power, firms may have a way to avoid costly investments in R&D or relocations abroad (Murat and Paba, 2003). Further research should address this finding and interpretation more directly.

On the other hand, the effect of emigrants operates throughout to all sectors. Being the result of not only a more standard network effect but also of a "preference" or "transplanted home bias effect", emigrants' effects are not surprisingly larger in magnitude than immigrants', even if their differences are not statistically significant. Compared with previous literature, and due to our quite demanding specification in terms of fixed effects, our results highlight a relatively smaller effect of immigrants and emigrants, whose elasticities of about 0.05 are in line with the results of the IV estimates by (Bratti et al., 2014). Further research may attempt to disentangle the relative sizes of the two effects.

Overall, in spite of the demanding specification, our results may still suffer from endogeneity. Even with this caveat, the strongly positive effect of both immigration and emigration on trade is a highly policy relevant result which should be taken into consideration when devising internationalisation strategies for national firms.

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A Robustness checks: Immigrants only, 2002-2012

Table A.1: Estimation results: Baseline model
Trade volumes, Number of Transactions, Average Value per Transaction

Dependent variable	X_{nit}		NT_{nit}		AVT_{nit}	
	(1)	(2)	(3)	(4)	(5)	(6)
$ln(Immi_{nit-1}+1)$	0.042***	0.208***	0.057***	0.203***	-0.016**	0.005
	(0.011)	(0.013)	(0.008)	(0.010)	(0.007)	(0.007)
$ln(X_{nt-1}) \times ln(Y_{it-1})$	0.011*	0.253***	0.028***	0.220***	-0.017***	0.033***
	(0.006)	(0.006)	(0.004)	(0.005)	(0.003)	(0.002)
$ln(dist_{ni})$	-1.738***	-1.377***	-1.638***	-1.080***	-0.099	-0.297
	(0.299)	(0.351)	(0.243)	(0.280)	(0.196)	(0.236)
Constant	21.283***	19.371***	13.141***	8.381***	8.142***	10.990***
	(2.433)	(2.811)	(1.969)	(2.239)	(1.584)	(1.889)
Country-region FE	Yes	Yes	Yes	Yes	Yes	Yes
Country-year FE	Yes	Yes	Yes	Yes	Yes	Yes
Province-year FE	Yes	No	Yes	No	Yes	No
Region-year FE	No	Yes	No	Yes	No	Yes
N	6.7e+04	6.7e+04	6.7e+04	6.7e+04	6.7e+04	6.7e+04
R2	0.817	0.763	0.895	0.844	0.408	0.331

Standard errors clustered at the pair level in parentheses. * p<0.1, ** p<0.05, *** p<0.01.

Table A.2: **Technological intensity - Manufacturing sector**

	High-tech			**Mid-high-tech**		
Dependent variable	$ln(X_{nit})$	$ln(NT_{nit})$	$ln(AVT_{nit})$	$ln(X_{nit})$	$ln(NT_{nit})$	$ln(AVT_{nit})$
$ln(\text{Immi}_{nit}+1)$	-0.004	0.022	-0.026	0.000	0.025	-0.024**
	(0.024)	(0.014)	(0.016)	(0.021)	(0.015)	(0.012)
	Mid-low tech			**Low-tech**		
Dependent variable	$ln(X_{nit})$	$ln(NT_{nit})$	$ln(AVT_{nit})$	$ln(X_{nit})$	$ln(NT_{nit})$	$ln(AVT_{nit})$
$ln(\text{Immi}_{nit}+1)$	0.033*	0.037***	-0.004	0.038**	0.040***	-0.002
	(0.018)	(0.012)	(0.011)	(0.017)	(0.013)	(0.008)

Clustered robust standard errors in parentheses. * p<0.1, ** p<0.05, *** p<0.01

Table A.3: Regression results: OLS estimates on log-linear model. Product differentiation

Dependent variable	$ln(X_{nit})$	$ln(NT_{nit})$	$ln(AVT_{nit})$
Differentiated goods			
$ln(\text{Immi}_{nit}+1)$	0.052***	0.058***	-0.006
	(0.012)	(0.009)	(0.007)
Reference-priced goods			
$ln(\text{Immi}_{nit}+1)$	0.008	0.020	-0.012
	(0.019)	(0.014)	(0.010)
Homogeneous goods			
$ln(\text{Immi}_{nit}+1)$	0.041	0.057**	-0.016
	(0.037)	(0.026)	(0.020)

Clustered standard errors in parentheses; * p<0.1, ** p<0.05, *** p<0.01

B Data Appendix

Table B.1: **Summary Statistics**

Variable	Obs	Mean	SD	Min	Max
$ln(X_{nit})$	37,328	13.34	2.79	2.30	21.97
$ln(NT_{nit})$	37,328	3.76	2.31	0	12.17
$ln(AVT_{nit})$	37,328	9.58	1.09	2.30	19.38
$ln(Immi_{nit}+1)$	37,328	2.68	2.077	0	11.94
$ln(Emi_{nit}+1)$	37,328	1.40	2.01	0	14.69
$ln(X_{nt}) \times ln(Y_{it})$	37,328	32.36	19.88	-35.63	113.01
$ln(dist_{ni})$	37,328	8.23	.94	1.00	9.84

Table B.2: **Correlation Matrix**

		(1)	(2)	(3)	(4)	(5)	(6)	(7)
(1)	$ln(X_{nit})$	1.00						
(2)	$ln(NT_{nit})$	0.93	1.00					
(3)	$ln(AVT_{nit})$	0.59	0.24	1.00				
(4)	$ln(Immi_{nit}+1)$	0.43	0.47	0.10	1.00			
(5)	$ln(Emi_{nit}+1)$	0.27	0.26	0.13	0.18	1.00		
(6)	$ln(X_{nt}) \times ln(Y_{it})$	0.63	0.62	0.30	0.30	0.39	1.00	
(7)	$ln(dist_{ni})$	-0.19	-0.23	0.01	-0.27	0.15	0.11	1.00

Table B.3: **Main Data Sources**

Variable	Description	Source
X_{nit}	Nominal value of the exports from province i to country n at time t	ISTAT micro-data on bilateral exports: "*Cessioni-Acquisti beni con i paesi UE (Sistema Intrastat)*" and "*Commercio speciale esportazione-importazione extra-UE*"
NT_{nit}	Number of transactions between province i and country n at time t	
AVT_{nit}	Average value per transaction between province i and country n at time t	
$Immi_{nit}$	Foreign residents in province i with country n citizenship in year t	Demo-ISTAT database, `http://demo.ISTAT.it/` for 2002-2010.
Emi_{nit}	Emigrants from province i to country n in year t	Registry of Italian Citizens Residing Abroad of the Ministry of Interior - AIRE (Anagrafe Italiani Residenti all'Estero)
X_{nt}	Partner country GDP in year t	IMF World Economic Outlook, `http://www.imf.org/external/pubs/ft/weo/2013/01/weodata/index.aspx`. World Bank World Development Indicators, `http://databank.worldbank.org/data/home.aspx`
Y_{it}	Province income in year t	2002-2008: ISTAT `http://www3.ISTAT.it/salastampa/comunicati/non_calendario/20110105_00/`. 2009-2010: Istituto Tagliacarne (`http://www.tagliacarne.it`).
$dist_{ni}$	Geodesic distance between capitals in km	Google Maps, `https://maps.google.com`