Abstract:

While trade liberalization has always been the core of common policies, only in very recent years Europe has started to address the challenge of migration in a comprehensive way. Conventional wisdom considers potential gains from liberalizing trade much higher for European countries than the benefits deriving from liberalization of migration. This paper gives evidence of the benefits European host countries had from immigration, identifying trade channel as the key driver of these benefits. It focuses on 17 European Union member states and 10 extra-European partners with the highest immigration flows towards the EU-27. The period considered is the decade 1997-2006. Controlling for endogeneity, the results I obtain suggest that migration have a statistically significant and robust enhancing effect on European countries exports, this effect being particularly important when considering differentiated commodities rather than homogeneous goods. This confirms the importance of the “network effect” of migration for European countries. Evidence on imports, instead, is puzzled. To my knowledge this is the first attempt in the literature to test the trade enhancing effect of migration using a panel, including a consistent number of European Countries and extra-European partner quite different in terms of geographical location, socio-economics and cultural characteristics and inspecting such recent years. This further extends existing evidence on the network effect and allows considering the results valid in a cross-country analysis over time.

Keywords: International Migration, Economic Integration, Networks, Europe.
JEL: F15, F22.
1. Introduction

Migration and trade are two of the defining issues of our century. They are the two fundamental channels of the phenomenon of globalization we are experiencing. They are both ways to integrate countries around the world, both change the labour supply in origin and host countries and affect the composition of skills in the economy. Indeed, while through trade goods produced by foreign workers come to the home country, through migration flows workers themselves move to the host country. Although these key similarities, traditionally people’s attitudes and governments’ policies vis-à-vis trade and migration have been completely different. Individuals seem to be on average more pro-trade than pro-migration across several countries and governments’ policies are consistent with this public opinion’s pattern. Indeed governments have been much more willing to open up their borders to trade than migration (Mayda, 2006).

In fact trade barriers have been substantially reduced by means of multilateral negotiations through international organizations. However, multilateral agreements over immigration controls still lack and are difficult to be introduced. As Timothy Hatton (2006) notices, there are three main principles underlying multilateral trade negotiations, in particular under the WTO. The first is non-discrimination (Most Favored Nation clause): a concession granted to one party must be granted to all parties in the negotiations. The second is national treatment: foreign firms must be able to sell in the domestic market on the same terms as domestic firms. The third is reciprocity: access to foreign markets is negotiated in exchange for concessions of approximately equal value to foreign suppliers in domestic markets. Hatton (2006) points out that while the first two principles find equivalent elements in existing immigration policies, reciprocity is the missing building block to setting up multilateral framework for immigration policy. Indeed, at least in principle, most countries have immigration policies that do not discriminate among potential immigrants by country of origin. Analogously, still in principle, permanent immigrants are accorded the same rights in receiving-country labour markets as native-born workers. However, if we look for reciprocity, we can notice that migration is seen as a one-way road, driven more by absolute advantage rather than comparative advantage, as in the case of trade flows. But is this element of reciprocity really missing in migration issues? Or is it working in an indirect way exactly
through trade channel? These questions are the starting point of the analysis that follows.

2. General framework

This analysis wants to inspect the existing linkages between trade and migration, using the classical gravity model to explain international trade. The hypothesis to be examined is whether migration can enhance trade. The channels explored are mainly two. First of all, migrants bring preferences for goods produced in their home countries: do they stimulate home-country exports? Preferences introduced by migrants in EU countries, may increase their imports of some products that are not available in sufficient quantities in the host country and at the same time, may introduce imports of new varieties that were not imported before. Thus, in this case, we expect the trade enhancing effect of migration to be particularly important when considering EU member states’ imports from migrants’ origin countries.

Secondly, can migrants serve as trade intermediaries and information providers? The starting point of the research in this sense is the consideration that migrants have a deep knowledge of their home country’s opportunities and potential markets, access to distribution channels, contacts and familiarity to local customs, law and business practices. These considerations lead to the idea that trade enhancing effect of migration will be evident when considering all types of trade flows and it will be more important the more products exchanged between two countries are differentiated (see Gould, 1994, and Rauch & Trinidade, 2002). Indeed, if goods are homogeneous, organized commodity exchanges can help overcoming search costs and for goods with reference price, potential trade opportunities can be broadly identified. For differentiated goods, instead, ethnic networks are the only way to reduce the importance of informal barriers to international trade. These networks created by immigrants can be individual-specific or non individual-specific, depending on the mechanism through which they can reduce transaction costs and leading to different effects on trade (see Gould, 1994, and Girma & Yu, 2002). Indeed, individual immigrants’ business connections or personal contacts with the home country will lower transaction cost, but it could also be the case that transaction costs are lowered because immigrants bring to host country additional
knowledge about foreign markets and about different social institutions. This second effect will be higher the more home and host countries are different and the less information is available on migrants’ home countries.

There is a growing literature about both types of “network effect” of ethnic groups as opposed to classical market approach to international trade. The pioneering study by Gould (1994) inspected the positive effect of United States’ immigrant population on bilateral trade between US and 47 home countries between 1970 and 1986, finding that immigrants’ information spillovers play and important role in determining US trade flows, this trade enhancing effect being more important for consumer goods than for producers goods (the formers tend to be more differentiated products across countries than the latters) and for exports rather than for imports. Girma & Yu (2002) focused on United Kingdom and 48 of its trading partners considering data for 13 years between 1981 and 1993, distinguishing the results between commonwealth and non-commonwealth countries and they found a robust positive relationship between non-commonwealth immigrants and UK exports. Combes, Lafourcade & Mayer (2005) consider not only social networks of migrants but also business networks of firms and analyse their possible trade-creating effect on trade flows among 94 French regions in 1993. They find a strong positive effect of all network variables considered. Blanes (2005) inspect the effect of immigration in intra-industry trade, focusing on the case of Spain and considering 42 source countries for the period 1991-1998. They find evidence of a robust positive effect of immigration on the index of intra-industry trade, but they show weaker evidence that this effect is bigger for trade with less developed partner countries than for trade with countries with a similar level of economic development with respect to Spain. White and Tadesse (2007) study the impact of Australian immigration policy on its trade pattern, considering data on 101 Australian trading partners in the period 1989-2000. Hisham (2009), instead, focuses on the different effects on trade flows of migrants from Middle East and North Africa (MENA) region that move to the European Union with respect to those going to the USA. His results uncover a stronger information

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1 This is in order to distinguish the effect of individual-specific from non individual-specific networks, as explained above. Given that they find a robust trade enhancing effect only in the case of exports to non-commonwealth countries, they conclude the trade-immigration relationship is driven by non-individual specific networks rather than personal contacts and business connections.

2 They consider separately immigrants and emigrants effect but only on bilateral trade flows, not distinguishing import from exports.

3 This effect is stronger in the case of manufactured goods.
effect of MENA migrants to USA and a stronger preference effect of MENA migrants to EU for the 2 year considered separately: 1990 and 2000.

An other important part of the literature mostly abstract from the preference channel and concentrate on network channel, see Rauch & Trinidade(2002) and Kumagai (2007)\textsuperscript{4}. In this regard, among co-ethnic networks active in international trade, the Chinese are considered of exceptional strength and cohesiveness and have received the most attention (see, Rauch (2002)). Moreover, since 1991, these international links have been formalized through the World Chinese Entrepreneurs Convention. Not only the overseas Chinese but also many other ethnic groups living outside their countries of origin create formal or informal associations to which co-ethnic business people from both the host countries and the mother country have access. For example, other co-ethnic networks studied in the literature are the Japanese ones (see Kumagai (2007)).

In conclusion, the growing literature inspecting the effect of migration on trade has found substantial evidence of a trade-creating effect of migration when considering the network effect of immigrants that help to reduce transaction costs associated mainly to weak international legal systems and lack of information about foreign markets and different social institutions. Evidence in support of the role of preference channel is instead puzzled: the impact of immigration on imports results not always positive and in any case not consistently higher than the effect on exports.

In the analysis that follows I concentrate on 17 out of the 27 actual European Union member states, selected as the ones having most complete data on their immigrant population. As for partner countries I considered the ones having the highest migration flows towards the EU-27: Morocco, Turkey, China, Ukraine, Ecuador, Russian Federation, United States, India, Philippines and Brazil. The period considered is the decade 1997-2006. The idea is to start from the study realized by Gould (1994) on United States in order to conduct a similar investigation on the European Union reality of trade and migration linkages. To my knowledge this is the first attempt in the literature to test the trade enhancing effect of migration using a panel, including a consistent number of European Countries and extra-European partner quite different in terms of geographical location, socio-economics and cultural characteristics. This further extends

\textsuperscript{4} In particular they consider individual specific networks.
existing evidence on the network effect and allows considering the results valid in a cross-country analysis over time.

3. Empirical evidence

As already outlined in the previous paragraph, in this paper I consider 17 of the actual 27 European countries. Given the fact that data on migration have been the most difficult to find and are typically incomplete, I selected the 17 reporter countries having more complete data on migration. In particular they are: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Hungary, Italy, Lithuania, Netherlands, Portugal, Slovenia, Slovakia, Spain, Sweden and United Kingdom. As for partner countries I considered the ones having the highest migration flows towards the EU-27: Morocco, Turkey, China, Ukraine, Ecuador, Russian Federation, United States, India, Philippines and Brazil. Thus the cross-section dimension is given by each couple of trading partners and the period considered is the decade for which the most recent data on migration flows are available: 1997-2006.

The dataset has been constructed using different sources. Data on trade flows have been taken from the UN Commodity Trade Statistics Database (UN Comtrade). This Database contains detailed imports and exports statistics reported by statistical authorities of close to 200 countries or areas. For the scope of the analysis I considered bilateral trade flows as a whole and then import and exports separately. Then I divided the commodities following Rauch (1999) conservative classification, considering three groups (differentiated goods, goods with reference price and goods traded in organized exchange).

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5 The other members of actual EU27, excluded from the analysis because of lack of data are: Bulgaria, Cyprus, Estonia, Greece, Ireland, Latvia, Luxembourg, Malta, Poland and Romania.
6 Rauch considers 2 types of classifications: a conservative one and a liberal one. The liberal classification lists 12.28% of industries as producing organized exchanges goods, while the conservative classification identifies 17.83%. In this paper I used the conservative classification to be able to identify also industries producing organized exchange commodities.
7 Note that from this group of commodities I excluded the category “Diamonds (non-industrial), not mounted or set” because, according to UN COMTRADE data, they represent the main part of the value of exports from EU member states considered in the analysis and India, China and United States. The latter three countries are also among the main sources of immigrants to EU. So this is likely to constitute a spurious correlation that might bias the results.
Trade flows are expressed in terms of value. Data are in current international dollars. An international dollar has the same purchasing power over GDP as the U.S. dollar has in the United States. European countries have been considered as reporters and extra-European countries as partners. For reason, in the analysis that follows, when I consider “Imports” ("Exports") as dependent variable, I refer to European countries’ imports (exports). In the case of missing data, when possible, I completed the dataset with trade flows values reported by extra-European states with respect to their European counterparts.

The source of data on migration is instead Eurostat, the only dataset where I found data on the stock of immigrant population living in each EU Member State disaggregated by nationality. Note that when dealing with migration data one has to choose whether to define immigrants as foreign nationals or as foreign born people. Both definitions have positive and negative aspects. In the first case, who is a migrant depend on national naturalization laws which can differ strongly across countries and it is difficult to distinguish between the effect of migration and naturalization policies. Under the second classification, instead, migrants never become natives. Consider that a person born abroad could be perfectly integrated in the living country. Symmetrically, people whose mother was more or less coincidentally in the destination country when they were born are automatically classified as natives of that country even if not integrated at all. Given the crucial role of the linkages of migrants with their home countries for this analysis, I opted for the definition of migrants as foreign nationals.

Note also that data on migration are very inaccurate for many reasons. First, only legal migration can be recorded, although a large part of immigration in European countries is illegal. In 2002 Europol estimated that around 500’000 persons enter the European Union illegally every year. Note that in the period considered the total number of immigrants residing in the 17 countries included in this analysis from the 10 origin countries selected is on average 6.2 million people, thus illegal immigration flows represent almost 10% of total foreign population. For the time being, illegal immigration

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8 Note that a problem arise when using the data on trade flows offered by UN-COMMTRADE: indeed it is not possible to distinguish 0-value flows from missing data in the dataset. Therefore one must choose whether to assume that all those observations are 0s or missing values quite arbitrarily. After the cross check described above I decided to keep missing data.

9 For an exhaustive discussion of the role of different definition of migrant see Geis, Uebelmesser and Werding (2008).

is likely to constitute a large part of the phenomenon of migration. However, this problem can be considered not jeopardizing too seriously the analysis when inspecting the possible effect of co-ethnic business network on international trade. Indeed if illegal migrants’ stocks follow the same geographical distribution of legal ones, the results shouldn’t be distorted by this lack data: there will eventually be only a “size” effect. Another problem as far as data on international migration are concerned, is the fact that these are relatively inaccurate. Given the fact that the issue of migration attracted the attention of researchers only in relatively recent times, it is quite difficult to find accurate databases and in particular disaggregated data. This lack of data is the more serious concern and leave room for more adequate estimation when higher quality data will be available. For the time being, I estimated missing values for the annual stock of immigrant population using the data on immigration and emigration flows by nationality when available in Eurostat database. Similarly to Girma & Yu (2002), I used the stock-flow rule:

\[
S_{ijt} = (1-\delta_{ij}) S_{ijt-1} + IF_{ijt-1} - EF_{ijt-1}
\]

where
- \(S_{ijt}\) is the stock of immigrant population living in country i, with country j’s nationality on January, 1\(^{st}\) of year (t);
- \(\delta_{ij}\) is an attrition rate resulting from possible deaths;
- \(S_{ijt-1}\) is the stock of immigrant population living in country i, with country j’s nationality on January, 1\(^{st}\) of year (t-1);
- \(IF_{ijt-1}\) is the flow of immigrants moving to country i, with country j’s nationality from January, 1\(^{st}\) of year (t-1) to December, 31\(^{st}\) of year (t-1);
- \(EF_{ijt-1}\) is the flow of emigrants leaving country i, with country j’s nationality from January, 1\(^{st}\) of year (t-1) to December, 31\(^{st}\) of year (t-1).

Data on bilateral dummies and other measures of distance have been taken from the “Distance” database of CEPII (Centre d’Etudes Prospectives et d’Informations Internationales). In particular note that the countries sharing a common official language (“comm_lang_off” dummy) are: Brazil and Portugal, Ecuador and Spain, India and United Kingdom, Morocco and Belgium, Morocco and France, Philippines and United Kingdom, United States and United Kingdom. The countries sharing a common border
("contig" dummy) are: Russian Federation and Finland, Russian Federation and Lithuania, Ukraine and Hungary, Ukraine and Slovakia. The countries having past colonial ties ("colony" dummy) are: Brazil and Portugal, Ecuador and Spain, India and United Kingdom, Morocco and France, Philippines and Spain, Russian Federation and Finland, Russian Federation and Lithuania, United States and France, United States and Spain, United States and United Kingdom.

Finally, the source of data on GDP of origin and destination countries is the World Bank database of World Development Indicators (WDI). More precisely, I considered gross domestic product converted to international dollars using purchasing power parity rates. World Bank calculate GDP as the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources.

Before starting the empirical analysis, it is important to get a general overview of the pattern of the data included in the dataset, going over the main characteristics the variables considered. As for the two main variables which are the focus of this study, the actual pattern of immigration and the external trade flows (extra-Eu27) are well depicted by the two following maps.
Map1 shows foreign population living in European countries, while map2 shows external bilateral trade flows in European countries. From the comparison of the two maps, focusing on EU-15 member states, the correspondence between high-migration-receiving countries and high-trading countries is clear. Turning our attention to new member states, instead, the pattern is mixed-up. In general, as far as trade flows are concerned, the picture is more homogeneous, while for immigration there seems to be a clear and strong distinction between EU-15 and EU-12. Indeed, while immigration in the 15 “old member states” in the last decade has been high and increased steadily; the 12 “new member states” initially experienced substantial migration outflows, while only in late years increasingly host immigrants from poorer neighborhood countries. In
particular, among the 17 European countries selected as destination countries in the analysis, 12 are “old member” of the EU (Austria, Belgium, Denmark, France, Germany, Italy, Luxembourg, Netherland, Portugal, Spain, Sweden and United Kingdom), while 5 are “new members”, entered in the EU in 2004 (Czech Republic, Hungary, Lithuania, Slovenia, Slovakia). Note also that while the common European trade policy exist with a well designed framework that all member states acknowledged, a common European migration policy has just started to be developed, and will need to take into account the different migration history of each member state.

A general view of the dataset’s characteristic can be drawn from the summary statistics of the variables included. They are presented in Table 1 below.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Obs</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total trade flows</td>
<td>1513</td>
<td>4402</td>
<td>11711</td>
<td>2.7661</td>
<td>134697</td>
</tr>
<tr>
<td>Total imports</td>
<td>1593</td>
<td>2199</td>
<td>5576</td>
<td>0.1081</td>
<td>59183</td>
</tr>
<tr>
<td>Total exports</td>
<td>1524</td>
<td>2073</td>
<td>6485</td>
<td>0.1352</td>
<td>86217</td>
</tr>
<tr>
<td>Differentiated goods’ trade</td>
<td>1613</td>
<td>3122</td>
<td>9573</td>
<td>0.0479</td>
<td>116750</td>
</tr>
<tr>
<td>Trade in goods with reference price[11]</td>
<td>1311</td>
<td>230</td>
<td>444</td>
<td>0.0254</td>
<td>4482</td>
</tr>
<tr>
<td>Homogeneous goods’ trade</td>
<td>1498</td>
<td>579</td>
<td>1425</td>
<td>0.0564</td>
<td>15123</td>
</tr>
<tr>
<td>Differentiated goods’ imports</td>
<td>1616</td>
<td>1570</td>
<td>4819</td>
<td>0.0003</td>
<td>55383</td>
</tr>
<tr>
<td>Differentiated goods’ exports</td>
<td>1613</td>
<td>1548</td>
<td>5309</td>
<td>0.0002</td>
<td>75189</td>
</tr>
<tr>
<td>Imports of goods with reference price</td>
<td>1508</td>
<td>281</td>
<td>628</td>
<td>0.0017</td>
<td>5270</td>
</tr>
<tr>
<td>Exports of goods with reference price</td>
<td>1507</td>
<td>295</td>
<td>819</td>
<td>0.0019</td>
<td>9853</td>
</tr>
<tr>
<td>Homogeneous goods’ imports</td>
<td>1594</td>
<td>306</td>
<td>1042</td>
<td>0.0001</td>
<td>20164</td>
</tr>
<tr>
<td>Homogeneous goods’ export</td>
<td>1528</td>
<td>84</td>
<td>461</td>
<td>0.0001</td>
<td>7225</td>
</tr>
<tr>
<td>Origin countries’ GDP</td>
<td>1700</td>
<td>2133705</td>
<td>3275117</td>
<td>56921</td>
<td>1380000</td>
</tr>
<tr>
<td>Destination countries’ GDP</td>
<td>1700</td>
<td>631708</td>
<td>731959</td>
<td>27911</td>
<td>2830135</td>
</tr>
<tr>
<td>Immigrant population</td>
<td>1700</td>
<td>36318</td>
<td>159884</td>
<td>0.0000</td>
<td>2053564</td>
</tr>
</tbody>
</table>

TABLE 1: Summary statistics of some of the variables included in the dataset: means, standard deviations and extreme values.

Considering the 2 variables concerning GDP of origin and destination countries we can notice the mean is higher for origin countries than for European countries, but not surprisingly, data on European countries GDP are much more homogeneous than those relative to origin countries. Indeed, on the origin side, the sample includes a number of countries that are much bigger than European Member States such as United States, \[\text{See note 7}\]
China, India, and the Russian Federation. Moreover, the aim of European regional policy is exactly the focus on convergence of its member states’ level of welfare. The 10 origin countries considered, instead, are at very different stages of economic development, given that the sample includes, among the others, United States and Morocco, China and Ukraine.

As far as trade flows are concerned, instead, summary statistics show that exchanges are mainly concentrated in differentiated products, and that the thinnest portion of trade flows’ value concerns commodities exchanged on organized markets. On average European countries imports are slightly higher in value than exports, but exports are much more dispersed, i.e. imports standard deviation is much lower than exports’ one. Table 2 presents the decomposition of each variable’s variance in between groups and within groups variance.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>Min</th>
<th>Max</th>
<th>Observations</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total trade flows</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>overall</td>
<td>4401.8</td>
<td>11711.2</td>
<td>2.8</td>
<td>134697.0</td>
<td>N = 1513</td>
</tr>
<tr>
<td>within</td>
<td>11271.4</td>
<td>3387.4</td>
<td>4.8</td>
<td>95247.4</td>
<td>n = 168</td>
</tr>
<tr>
<td></td>
<td>-20172.0</td>
<td></td>
<td></td>
<td>50420.1</td>
<td>T-bar = 9</td>
</tr>
<tr>
<td><strong>Differentiated goods’ trade</strong></td>
<td>3121.6</td>
<td>9573.4</td>
<td>0.0</td>
<td>116749.6</td>
<td>N = 1613</td>
</tr>
<tr>
<td>overall</td>
<td>9426.4</td>
<td>2747.4</td>
<td>0.2</td>
<td>83229.3</td>
<td>n = 170</td>
</tr>
<tr>
<td>within</td>
<td></td>
<td></td>
<td>-19636.0</td>
<td>45161.8</td>
<td>T-bar = 9</td>
</tr>
<tr>
<td><strong>Trade in goods with reference price</strong></td>
<td>230.1</td>
<td>444.4</td>
<td>0.0</td>
<td>4482.2</td>
<td>N = 1311</td>
</tr>
<tr>
<td>overall</td>
<td>401.6</td>
<td>147.0</td>
<td>0.1</td>
<td>2675.5</td>
<td>n = 165</td>
</tr>
<tr>
<td>within</td>
<td></td>
<td></td>
<td>-415.3</td>
<td>2269.0</td>
<td>T = 8</td>
</tr>
<tr>
<td><strong>Homogeneous goods’ trade</strong></td>
<td>579.1</td>
<td>1425.4</td>
<td>0.1</td>
<td>15123.0</td>
<td>N = 1498</td>
</tr>
<tr>
<td>overall</td>
<td>1371.3</td>
<td>402.3</td>
<td>0.2</td>
<td>10091.9</td>
<td>n = 169</td>
</tr>
<tr>
<td>within</td>
<td></td>
<td></td>
<td>-2614.0</td>
<td>5610.2</td>
<td>T = 9</td>
</tr>
<tr>
<td><strong>Total imports</strong></td>
<td>2198.9</td>
<td>5576.3</td>
<td>0.1</td>
<td>59183.1</td>
<td>N = 1593</td>
</tr>
<tr>
<td>overall</td>
<td>5322.0</td>
<td>1997.6</td>
<td>2.6</td>
<td>36871.6</td>
<td>n = 170</td>
</tr>
<tr>
<td>within</td>
<td></td>
<td></td>
<td>-12990.7</td>
<td>33857.7</td>
<td>T-bar = 9</td>
</tr>
<tr>
<td><strong>Total exports</strong></td>
<td>2072.6</td>
<td>6485.4</td>
<td>0.1</td>
<td>86217.1</td>
<td>N = 1524</td>
</tr>
<tr>
<td>overall</td>
<td>6298.8</td>
<td>1678.7</td>
<td>0.9</td>
<td>60728.0</td>
<td>n = 169</td>
</tr>
<tr>
<td>within</td>
<td></td>
<td></td>
<td>-13484.9</td>
<td>27561.7</td>
<td>T-bar = 9</td>
</tr>
<tr>
<td><strong>Differentiated goods’ imports</strong></td>
<td>1570.3</td>
<td>4819.2</td>
<td>0.0</td>
<td>55383.0</td>
<td>N = 1616</td>
</tr>
<tr>
<td>overall</td>
<td>4620.0</td>
<td>1749.0</td>
<td>0.2</td>
<td>32053.9</td>
<td>n = 170</td>
</tr>
<tr>
<td>within</td>
<td></td>
<td></td>
<td>-12925.5</td>
<td>31267.2</td>
<td>T-bar = 10</td>
</tr>
<tr>
<td><strong>Differentiated goods’ exports</strong></td>
<td>1548.4</td>
<td>5308.8</td>
<td>0.0</td>
<td>75189.3</td>
<td>N = 1613</td>
</tr>
<tr>
<td>overall</td>
<td>5272.7</td>
<td>1372.0</td>
<td>0.0</td>
<td>53695.4</td>
<td>n = 170</td>
</tr>
<tr>
<td>within</td>
<td></td>
<td></td>
<td>-12179.7</td>
<td>23042.3</td>
<td>T-bar = 9</td>
</tr>
</tbody>
</table>

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12 Note, however, that these origin countries are not necessarily wealthier.
13 The comparison is based mainly on mean values.
14 See note 7
In table 2, the total variation of $x_{it}$ around the mean $\bar{x}$ is decomposed into between variation across individuals (based on $x_i$ deviation around $\bar{x}$ where the last term is the global mean) and within variation over time for each country (based on $x_{it}$ deviation around country averages $\bar{x}_i$). In the within variation formula, the global mean is added back in order to make results comparable, but this sometimes make the within variation greater than the overall one. Note that for all variable there is much more variation across individuals (between variation) than over time (within variation). This result is important when choosing the estimation method in the following chapters because with high between variation, the use of within estimator would lead to considerable efficiency loss.
4. A model of trade and migration

Following the literature, the model used for the study is a reduced-form gravity equation:

\[ \ln(TV_{ij}) = \alpha_{ij} + \beta_1 * \ln(GDP_i) + \beta_2 * \ln(GDP_j) + \beta_3 * \ln(DIST_{ij}) + X \gamma + \varepsilon_{ij} \]

where
- \( TV_{ij} \) is the bilateral trade flow between country \( i \) and country \( j \);
- \( \alpha_{ij} \) represent cross-section specific heterogeneity;
- \( GDP_i \) and \( GDP_j \) are the Gross Domestic Products of the two countries that trade;
- \( DIST_{ij} \) is the bilateral distance between country \( i \) and country \( j \);
- \( X \) is a \((K \times 1)\) vector of additional explanatory variables (mainly dummies trying to capture other measures of “distance” in a broader sense between two countries), where \( K \) is the number of these regressors.

The gravity equation is so-named because it is a theory of trade volumes which is analogous to the physical theory of gravity: trade between a pair of countries depends positively on the product of economic size (GDPs) and negatively on distance, just as the force of gravity between two bodies increases with the product of their mass and decreases with distance.

One of the criticisms that was made to the gravity equation was that it had no theoretical foundation. Subsequently, it has been recognized that the gravity equation can be derived from different models. In particular, Helpman and Krugman (1985) have shown that the gravity equation can be derived from the monopolistic competition model with increasing returns to scale. On the other hand, for example, Eaton and Kortum (2002) have shown that a gravity-type relationship can also be derived from a Ricardian model of trade in homogenous goods. Thus, the gravity equation has many possible theoretical foundations.

The particular specification of the gravity model used in this analysis is a system of gravity equations of the form:
\[
\ln(TV_{ij,t}) = \alpha_{ij} + \beta_1 \ln(GDP_{it}) + \beta_2 \ln(GDP_{jt}) + \beta_3 \ln(DISTCAP_{ij}) + \\
\gamma_1 \ln(MIGRATION_{ij,t}) + \gamma_2 \times CONTIG_{ij} + \gamma_3 \times COMLANG \_OFF_{ij} + \gamma_4 \times COLONY_{ij} + \epsilon_{ij,t}
\]

Where

- \(TV_{ij,t}\) is the bilateral trade flow between country I and country j at time t;
- \(\alpha_{ij}\) represent cross-section specific heterogeneity;
- \(GDP_{it}\) and \(GDP_{jt}\) are the Gross Domestic Products at time t of the two countries that trade;
- \(DISTCAP_{ij}\) is the geodesic distance between capital cities of country i and country j; calculated following the great circle formula, based on latitudes and longitudes of those capital cities;
- \(MIGRATION_{ij,t}\) is the stock of foreign population in country i with citizenship from country j at time t;
- \(CONTIG_{ij}\) is a dummy variable equal to 1 if country i and country j have common borders and equals 0 otherwise;
- \(COMLANG \_OFF_{ij}\) is a dummy variable equal to 1 if country i and country j share a common national language and equals 0 otherwise;
- \(COLONY_{ij}\) is a dummy variable equals to 1 if country i and country j had a past colonial relationship and equals 0 otherwise;
- \(\epsilon_{ij,t}\) is the error term.

The model used, thus, is the basic gravity equation, where the matrix X is augmented to include migration flows. The intention is to test whether migration is able to explain part of the “missing trade” that the basic gravity specification is not able to capture. The background for the analysis, as explained before, is the possible trade-enhancing effect of migration increasingly inspected by economic literature. There are, however, a number of differences from the previous literature.

First of all the analysis is intended to focus on EU-27 countries as destination countries and their main extra-European origin countries. In particular, among the 27 countries of today’s EU, 17 have been selected as the ones having reported more complete data on
migration flows. The countries of origin, instead, have been selected as the ones having the highest migration flows towards the EU-27. The period considered is the 10 years for which the most recent data on migration flows are available, that is from 1998 to 2007. The fact that during part of this period EU27 didn’t exist yet shouldn’t affect the analysis since the migration phenomenon considered are is internal but external. The reason for the focus on the analysis on EU27 countries is the willingness to link the result of the analysis to the present debate on European migration policy. Indeed, as pointed out above, using a panel and including a consistent number of European countries and a wide range of partner countries very different in terms of social and political institutions, level of economic development and wealth diffusion, allows considering the results valid in a cross-country analysis over time. Finally, also the time dimension is important. The majority of previous papers analyzes separately singles years and compares the result of the empirical study for each year. This study, instead, takes on a panel dimension and estimates the average impact of migration on trade flows considering 10 consecutive years. If one believes that the link between migration and trade is a dynamic process and not something static, the issue of time is even more important. In particular if one think, as discussed before, that migration has a stronger effect the more two countries are distant in terms of culture, it is likely the case that cultural distances among countries around the world have changed a lot in the new millennium with respect to the 90s. For this reason the results found in previous literature for the 1990s are not necessarily true in more recent years given the speed of globalization diffusion.

Using migrants’ stock as regressor also poses the problem of the possible endogeneity of this variable with respect to trade flows, an issue already discussed in previous literature. Indeed, by considering trade as dependent variable and migration among the regressors, I am implicitly focusing the analysis on trade-migration linkages running from migration to trade. However causality can go in both directions, since both trade and migration can change the labor supply in origin and host countries and it can be the case that trade reduces economic incentives for international migration (Carbaugh, 2007). Reverse causality can also be due to greater trade increasing familiarity between two countries and strengthening their political relations.
Other possible sources of endogeneity of the migration variable can be omitted variables that are determinants of both trade and migration. Think for example to a progress in transport technology linking two countries (Schiff, 2006), or an unobserved productivity shock in a state that simultaneously rise trade flows and attract new migrants. These positive exogenous shocks may affect both migration and trade flows but cannot be captured by the explaining variables already included in the gravity equation, thus will fall in the error term. The matter of endogeneity will be addressed during the analysis.

5. Empirical analysis

As explained in sections 2 and 3, the first hypothesis I want to test is whether migration can stimulate trade because migrants bring in the host country preferences for goods produced in their home country, increasing imports. The second hypothesis is the existence of a trade enhancing effect of migration, acting through a networks effect. The latter should be particularly evident as far as differentiated internationally traded commodities are concerned, for reasons previously clarified. Thus I applied the gravity equation to different dependent variables and compared the results. First I considered the total value of bilateral trade flows between each pair of countries. Then I divided the commodities following Rauch conservative classification\textsuperscript{15}, considering three groups (differentiated goods indicated with “N”, goods with reference price named “R” and goods traded in organized exchange called “W”). Finally I considered separately imports and exports. For each of these groups I run the same regression described in section 3, i.e.:

\[
\ln(TV_{ijt}) = \alpha_{ij} + \beta_1 \ln(GDP_{it}) + \beta_2 \ln(GDP_{jt}) + \beta_3 \ln(DISTCAP_{ij}) + \\
+ \gamma_1 \ln(MIGRATION_{ijt}) + \gamma_2 \text{CONTIG}_{ij} + \gamma_3 \text{COMLANG}_\text{OFF}_{ij} + \gamma_4 \text{COLONY}_{ij} + \epsilon_{ijt}
\]

\textsuperscript{15} Rauch considers 2 types of classifications: a conservative one and a liberal one. The liberal classification lists 12.28% of industries as producing organized exchanges goods, while the conservative classification identifies 17.83%. In this paper I used the conservative classification to be able to identify also industries producing organized exchange commodities.
To implement the empirical analysis I used the software STATA. All variables are considered in logarithms rather than in levels. This means that each coefficient will express the elasticity of trade value to an increase in its respective explanatory variable.

The first step of the analysis has been to test whether I could use fixed or random effect model for estimation of the panel gravity model described in section 3. As econometric theory of panel data analysis tells us, these two models differ because of the assumption they make on the form of the time-invariant unobserved heterogeneity that panel data are supposed to have. The basic individual specific effects model is of the form:

$$ y_{it} = \alpha_i + x_{it} \beta + \epsilon_{it} $$

where $\epsilon_{it}$ is iid over i and t, with $E(\epsilon_{it}) = 0$ and $\text{cov}(x_{itk}, \epsilon_{it}) = 0$ for every k, where k is the number of independent variables included in the regression.

Fixed effects model allows the unobserved cross-section specific effect $\alpha_i$ to be potentially correlated with the observed regressors: $\text{cov}(x_{it}, \alpha_i) \neq 0$. Random effects model assumes that $\text{cov}(x_{it}, \alpha_i) = 0$, that is unobserved effect is distributed independently of the regressors. Given the fact that I want to estimate a gravity equation, the use of a pure fixed effect model is ruled out. Indeed, it wouldn’t allow to identify separately the intercept form the coefficients of all time-constant explanatory variables. Moreover a within-estimator may lead to considerable efficiency loss, as pointed out in the variance analysis in chapter 3. However, it is important to check whether $\alpha_i$ is correlated with some explanatory variables. Thus, I run the Hausman test to compare the result of fixed and random effect estimations. Note that if $\text{cov}(x_{it}, \alpha_i) = 0$ is true, both estimators will be consistent, but the random effect will be more efficient than the fixed effect. If on the contrary $\text{cov}(x_{it}, \alpha_i) \neq 0$, only fixed effect estimator will be consistent. This consideration is at the basis of the Hausman Test. The test interprets a statistically significant difference between fixed effect and random effect estimator as evidence against the random effect model. Note that the assumption at the basis of the test is that $\text{cov}(x_{itk}, \epsilon_{it}) = 0$: indeed correlation between $x_{itk}$ and $\epsilon_{it}$ for any k, i and t causes both fixed effect and random effect to be inconsistent, thus,
generally their limits in probability will differ. In the case of our data this assumption will be discussed further in the subsequent models.

The test statistic is of the form:

\[ H = \left( \hat{\beta}_{FE} - \hat{\beta}_{RE} \right) \left[ A \text{var}(\hat{\beta}_{FE}) - A \text{var}(\hat{\beta}_{RE}) \right]^{-1} \left( \hat{\beta}_{FE} - \hat{\beta}_{RE} \right) \]

Where \( \hat{\beta}_{FE} \) is the (k+1) X 1 vector of fixed effect estimates, \( \hat{\beta}_{RE} \) is the (k+1) X 1 vector of random effect estimates, \( A \text{var}(\hat{\beta}_{FE}) \) is the asymptotic variance of the fixed effect vector of estimates and \( A \text{var}(\hat{\beta}_{RE}) \) is the asymptotic variance of the random effect vector of estimates. Note that, under the assumption of the test,

\[ A \text{var}\left[ \sqrt{N}(\hat{\beta}_{FE} - \hat{\beta}_{RE}) \right] = A \text{var}[\sqrt{N}(\hat{\beta}_{FE} - \beta)] - A \text{var}[\sqrt{N}(\hat{\beta}_{RE} - \beta)]. \]

The Hausman statistic is then distributed asymptotically as a chi-squared with k+1 degree of freedom.

Note that the only coefficients we can estimate using the fixed effect model are the time varying ones. Thus, in order to implement the test, first of all I isolated the time-varying regressors and I run fixed and random effect estimation on an equation of the form:

\[
\ln(TV_{ijt}) = \alpha_{ij} + \beta_1 \ln(GDP_{it}) + \beta_2 \ln(GDP_{jt}) + \beta_3 \ln(DISTCAP_{ij}) + \\
+ \gamma_1 \ln(MIGRATION_{ijt}) + e_{ijt}
\]

Then I compared the results of the two estimates with the Hausman test. The test do not reject the null hypothesis stating that the difference in coefficients is not systematic. However, the correlation \( \text{corr}(x_{it}, \alpha_i) \) estimated by STATA in the fixed effect model was -0.49, so the assumption, at the basis of the Random Effect model, that \( \text{cov}(x_{it}, \alpha_i) = 0 \) seems a bit strict.

Note that fixed-effect country pairs are very important in gravity estimation (Baldwing & Taglioni, 2006). Indeed, time invariant country dummies can eliminate part of a possible omitted variable bias. Specifically they will eliminate the country-specific component of the bias, deriving from all country-specific characteristics not included in the regression.
that are determinants of both trade and migration (see section 4). On the downside, as explained before, the use of a pure fixed effect model is impossible to estimate a gravity equation because it can not identify the effect of any time-invariant parameters, which are fundamental in this context. Given these considerations and the results of the analysis, I decided to adapt the model specification used in Girma and Yu (2002) to my dataset. Thus, the model I estimated first is

\[
\ln(TV_{i,j,t}) = \alpha_i + \alpha_j + \beta_1 \ln(GDP_{i,j}) + \beta_2 \ln(GDP_{j,i}) + \beta_3 \ln(DISTCAP_{i,j}) + \\
+ \gamma_1 \ln(MIGRATION_{i,j}) + \gamma_2 \ln(CONTIG_{i,j}) + \gamma_3 \ln(COMLANG - OFF_{i,j}) + \gamma_4 \ln(COLONY_{i,j}) + \varepsilon_{i,j,t}
\]

where \(\alpha_i, \alpha_j, \alpha_t\) are destination, origin and time fixed effects and \(\varepsilon_{i,j,t}\) is iid over \(i, j\) and \(t\). Note that the dummies introduced allows to ”clean” the error term from potential individual-specific characteristics and possible time-specific effect that may be correlated with other regressors, as it could be the case for omitted variables that are determinants of both trade and migration, as discussed before. In particular the use of time dummies is meant to capture possible macroeconomic and trade policy factors that may affect EU trade as a whole.

In the random effect model used in this paper I apply to data a FGLS estimator that corrects for possible interclass correlation in the error term. Moreover, cluster-robust standard errors are obtained using bootstrap resampling method.

Turning the attention to estimation results, according to the theoretical background of the gravity equation and to previous literature, I expect the two economic masses (proxied by countries’ GDP) to have a positive effect on trade flows (\(\beta_1>0; \beta_2>0\)), while

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16 Note that also Combes, Lafourcade & Mayer (2005) used a similar specification, but in a cross-section framework.

17 Note also that I estimated separately the three effects because this allows to have a sufficient number of observations in order to carry out dummies’ estimation. In any case, I am not interested in the estimated value of each intercept per-sè but I need them as controls. Moreover note that, if I had introduced a set of joint dummies \(\alpha_{i,j}\) in the model, I would have created 180 dummies to be estimated. In his case, instead, I have ”only” 37 dummies. This reduces the so called ”incidental parameters” problem.

18 In a RE model with cross-section and time dimensions identified respectively by the subscripts \(i\) and \(t\), interclass correlation of the error term is defined as \(\rho_{\varepsilon} = \text{corr}(\varepsilon_{it}, \varepsilon_{is}) = \sigma_{\alpha}^2 / \sigma_{\alpha}^2 + \sigma_u^2, \forall s \neq t\), where \(\varepsilon_{it}\) is the error term of the model: \(\varepsilon_{it} = \alpha_i + u_{it}\), where \(\alpha_i\) is i.i.d. with variance \(\sigma_{\alpha}\) and \(u_{it}\) is i.i.d. with variance \(\sigma_u\).
distance is likely to have a negative impact on trade ($\beta_3 < 0$). Indeed, the more the two countries produce, the more they will trade between each other. Distance, on the contrary, increases trade costs. Moreover, the fact of having a common border, having a common official language or past colonial ties are likely to have a trade enhancing effect ($\gamma_2, \gamma_3, \gamma_4 > 0$). The point of this analysis is to study the impact of migration flows on trade flows thus the size and particularly the direction of the effect expressed by $\gamma_4$. The results of the analysis are reported in Table 3.

First of all, note that the two coefficients of origin and destination countries’ GDP are both positive and significant in all specifications.\(^\text{19}\) This means that countries’ economic

\(^\text{19}\) Except in the case of homogeneous goods trade: in this case GDP of destination countries has no effect.
masses are important determinant of their trade flows, being them either imports or exports and either differentiated or homogeneous goods. Note however that the trade elasticity to extra-European partners’ GDP is always higher than trade elasticity to European countries’ GDP and the difference is particularly evident in the case of imports. This result is not surprising if we think that European countries GDPs have a much lower variability among countries, this being exactly one of the focus of European policies that intend to stimulate convergence of its member states’ level of welfare. As already explained, instead, the 10 origin countries considered are at very different stages of economic development.

Distance has a negative and significant effect when considering any of the dependent variables, as we would expect from theory. All other dummy variables for common borders, common official language and past colonial ties are positive when significant. Only exceptions are goods traded on organized exchange: in this case dummies effect is not significantly different from zero and this could be the sign that organized markets are able to neutralize market imperfections reducing the importance of all other measures of “distance”, in a broader sense, between two countries.

Considering now the variable of main interest for the purpose of this paper, the coefficient expressing the impact of migration on trade flows is always positive when significant. However, note that the impact of migration on European countries’ exports is about six times the effect on imports. This result indicates that there is no preference effect of immigrants stimulating their home-country exports (that would require a higher coefficient for EU imports). Note that it is opposite to what finds Foad (2009) in his analysis, where he underlines the importance of the preference effect for MENA migrants living in European Countries as opposed to those living in the USA. The strong positive effect of migration on EU exports I find here, instead, means that extra-European migrants create opportunities for European industries to expand their distribution in their home countries. This happens in particular where formal market structures do not operate because they act as information providers, since they have a deep knowledge of their home country’s potential markets, access to distribution channels, contacts and familiarity to local customs, law and business practices. Indeed, migration effect is not significantly different from 0 in the case of homogeneous goods,
but positive and significant for the other two of Rauch’s categories. However, note that trade enhancing effect of migration seems to be higher for trade in goods with reference price than for differentiated commodities. For this reason, evidence on the second hypothesis is puzzled: if migrants create co-ethnic networks that help overcoming trade frictions where formal exchange structures are not effective I would expect higher elasticity for differentiated goods than for commodities with reference price. To better understand the mechanisms behind these results, it is interesting to split each one of Rauch’s categories between imports and exports and repeat the regression for each group: “ExportN” and “ImportN” (differentiated goods), “ExportR” and “ImportR” (goods with reference price), “ExportW” and “ImportW” (homogeneous goods). A similar disaggregation is used by Girma and Yu (2002), White and Tadesse (2007) and Foad (2009). Results are reported in Table 4 below.
TABLE 4: Result of the estimation of the gravity equation described above for different specification of the dependent variable, using a random effect model. Fixed country-specific and time-specific dummies are included in the model but omitted in the table for sake of simplicity. ***, **, *= significance at 1%, 5% and 10% level respectively. Bootstrap standard errors (to correct for eventual clusters in variance) are reported in parenthesis.

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>Imports N</th>
<th>Exports N</th>
<th>Imports R</th>
<th>Exports R</th>
<th>Imports W</th>
<th>Exports W</th>
</tr>
</thead>
<tbody>
<tr>
<td>Migration</td>
<td>0.04</td>
<td>0.08**</td>
<td>0.02</td>
<td>0.06**</td>
<td>0.02</td>
<td>0.01</td>
</tr>
<tr>
<td></td>
<td>(0.027)</td>
<td>(0.038)</td>
<td>(0.032)</td>
<td>(0.028)</td>
<td>(0.048)</td>
<td>(0.049)</td>
</tr>
<tr>
<td>GDP_ origin</td>
<td>1.66***</td>
<td>2.67***</td>
<td>0.70**</td>
<td>2.24***</td>
<td>0.76*</td>
<td>3.60***</td>
</tr>
<tr>
<td></td>
<td>(0.346)</td>
<td>(0.422)</td>
<td>(0.317)</td>
<td>(0.380)</td>
<td>(0.447)</td>
<td>(0.739)</td>
</tr>
<tr>
<td>GDP_ destination</td>
<td>0.96*</td>
<td>2.84***</td>
<td>1.59***</td>
<td>1.25</td>
<td>1.42*</td>
<td>0.55</td>
</tr>
<tr>
<td></td>
<td>(0.528)</td>
<td>(0.825)</td>
<td>(0.482)</td>
<td>(1.204)</td>
<td>(0.855)</td>
<td>(1.246)</td>
</tr>
<tr>
<td>Distance</td>
<td>-1.54***</td>
<td>-1.81***</td>
<td>-1.20***</td>
<td>-2.16***</td>
<td>-1.63***</td>
<td>-1.63***</td>
</tr>
<tr>
<td></td>
<td>(0.266)</td>
<td>(0.225)</td>
<td>(0.424)</td>
<td>(0.270)</td>
<td>(0.396)</td>
<td>(0.414)</td>
</tr>
<tr>
<td>Contiguity</td>
<td>1.06**</td>
<td>1.18*</td>
<td>2.14***</td>
<td>1.39*</td>
<td>1.60</td>
<td>2.05</td>
</tr>
<tr>
<td></td>
<td>(0.426)</td>
<td>(0.645)</td>
<td>(0.478)</td>
<td>(0.791)</td>
<td>(1.425)</td>
<td>(1.499)</td>
</tr>
<tr>
<td>Common official language</td>
<td>1.20***</td>
<td>0.75*</td>
<td>0.90**</td>
<td>0.67*</td>
<td>0.58</td>
<td>2.15**</td>
</tr>
<tr>
<td></td>
<td>(0.317)</td>
<td>(0.451)</td>
<td>(0.456)</td>
<td>(0.353)</td>
<td>(0.696)</td>
<td>(1.016)</td>
</tr>
<tr>
<td>Colony</td>
<td>-0.29</td>
<td>-0.23</td>
<td>-0.16</td>
<td>-0.25</td>
<td>-0.47</td>
<td>-0.21</td>
</tr>
<tr>
<td></td>
<td>(0.265)</td>
<td>(0.411)</td>
<td>(0.383)</td>
<td>(0.390)</td>
<td>(0.612)</td>
<td>(0.757)</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.91</td>
<td>0.90</td>
<td>0.88</td>
<td>0.91</td>
<td>0.78</td>
<td>0.74</td>
</tr>
</tbody>
</table>

Also in this case, the coefficient of migration variable is always positive but it loses its significance in the case of homogeneous goods and when considering imports. In particular note that the trade enhancing effect of migration is stronger for differentiated goods’ exports than for exports of goods with reference price. This supports the idea that a network effect does exist, meaning that migrants help to reduce transaction costs associated to international trade.

On the one hand, alleviation of transaction costs acts through the lowering of informational barriers, benefiting mainly differentiated goods because for these commodities it is more difficult for consumers to obtain relevant information on goods produced in another location and for non-local producers to find the right partner and learn about local consumers’ tastes. In the case of homogeneous goods, instead, organized commodity exchanges can help overcoming search costs and for goods with reference price, potential trade opportunities can be broadly identified.
On the other hand, transaction costs may be lowered by migrants’ networks also because they can act as substitutes of contract enforcement law where international legal system is weak and this effect is transversal to all goods’ categories. For these reasons, as expected, networks seem to matter for exports in all types of goods, but their trade enhancing effect steadily increase with the differentiation of products and disappear in the case of homogeneous goods. Note also that one could expect migrants’ network effect to be less important for imports than for exports given the fact that information about European market is widely available worldwide.

As already discussed in section 4, using migrants’ stock among regressor poses the plausible problem of the possible endogeneity of this variable with respect to trade flows. Indeed in this study I am implicitly focusing the analysis on trade-migration linkages running from migration to trade, but there could be potential omitted variables and/or reverse causality problems. Following existing literature, the possible endogeneity problem here is partially mitigated by the use of total stock of migrant population living in a country at the beginning of the reference year. Indeed, migration variable is a stock variable, while trade variable is defined as yearly flow. This reduces both simultaneity and reverse causality problems. Moreover, in the econometric model used up to now, I controlled for part the possible correlation between some endogenous regressors and the country-specific and timespecific heterogeneity by virtually cleaning the error term with the dummy variables \( \alpha_i, \alpha_j, \alpha_t \). However, I am still assuming \( \text{cov}(x_{it}, \varepsilon_{it}) = 0 \), i.e. all regressors are considered not correlated with the time varying error term of the model.

In order to check for robustness of the results obtained from previous analysis and control for this second source of endogeneity I apply to my dataset an IV Random Effect model. I use as instrumental variable three migration lags, this being the best choice in consideration of the trade-off between the number of lags used and the number of observation the panel keeps. Note that network effects within migrant communities have been widely discussed in migration literature and are recognized to be an important determinant of migration flows, see for example Gross & Schmitt (2003) and Pedersen, Pytlikova & Smith (2008). Note also from table 5 that the first three lags of migration
variable have a much higher correlation with that variable than with any of the other measures of migration.

<table>
<thead>
<tr>
<th></th>
<th>Bilateral trade</th>
<th>Imports</th>
<th>Exports</th>
<th>Bilateral trade N</th>
<th>Bilateral trade R</th>
<th>Bilateral trade W</th>
<th>Migration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Migration _lag1</td>
<td>0.1581</td>
<td>0.1404</td>
<td>0.16</td>
<td>0.1589</td>
<td>0.1541</td>
<td>0.0924</td>
<td>0.9976</td>
</tr>
<tr>
<td>Migration _lag2</td>
<td>0.1595</td>
<td>0.14</td>
<td>0.1629</td>
<td>0.1608</td>
<td>0.1548</td>
<td>0.0914</td>
<td>0.9933</td>
</tr>
<tr>
<td>Migration _lag3</td>
<td>0.1585</td>
<td>0.1381</td>
<td>0.1628</td>
<td>0.1605</td>
<td>0.1536</td>
<td>0.088</td>
<td>0.9883</td>
</tr>
</tbody>
</table>

TABLE5: Simple correlations among instrumental variables, instrumented independent variable and dependent variable.

Moreover the partial correlation remains significantly different from 0 once all other exogenous variables have been controlled for\textsuperscript{20}. The results of the estimation are presented in table 6.

\textsuperscript{20} This has been checked from the first stage of the regressions that follows, which are not reported but are available on request.
First of all, note that in this case the coefficient of origin countries’ GDP is positive and significant in all specifications, but the trade elasticity to European countries’ GDP is not significantly different from zero, except in the case of exports. This result again can be referred to the fact that European countries GDPs have a much lower variability, given the aim of European policies that intend to stimulate convergence of its member states’ level of welfare.

Distance has always a negative and significant effect, as expected, while all other dummy variables that measure “distance” in a broader sense are positive and significant, except in the case of goods traded on organized exchange.

As for migration variable, note that endogeneity appears not to change the pattern of results: if anything it seems to introduce a downward bias, given that all migration coefficients are larger when instrumented. Indeed, the impact of migration on European
countries’ exports almost doubles the effect on imports. Moreover, trade enhancing effect of migration seems to be higher for trade in goods with reference price than for trade in differentiated commodities. The coefficient of migration is not significantly different from 0, instead, in the case of homogeneous goods’ trade. Also in this case, thus, to better understand the mechanisms behind these results, it’s interesting to split each one of Rauch’s categories between imports and exports: “ExportN” and “ImportN” (differentiated goods), “ExportR” and “ImportR” (goods with reference price), “ExportW” and “ImportW” (homogeneous goods). Results are reported in Table 7 below.

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>Imports N</th>
<th>Exports N</th>
<th>Imports R</th>
<th>Exports R</th>
<th>ImportsW</th>
<th>Exports W</th>
</tr>
</thead>
<tbody>
<tr>
<td>Migration</td>
<td>0.11***</td>
<td>0.15**</td>
<td>0.15***</td>
<td>0.12**</td>
<td>0.14*</td>
<td>-0.05</td>
</tr>
<tr>
<td></td>
<td>(0.037)</td>
<td>(0.071)</td>
<td>(0.056)</td>
<td>(0.057)</td>
<td>(0.082)</td>
<td>(0.105)</td>
</tr>
<tr>
<td>GDP_origin</td>
<td>1.74***</td>
<td>3.33***</td>
<td>1.31***</td>
<td>2.46***</td>
<td>1.09</td>
<td>3.62***</td>
</tr>
<tr>
<td></td>
<td>(0.468)</td>
<td>(0.627)</td>
<td>(0.377)</td>
<td>(0.478)</td>
<td>(1.094)</td>
<td>(1.222)</td>
</tr>
<tr>
<td>GDP_destination</td>
<td>0.44</td>
<td>2.40</td>
<td>0.73</td>
<td>1.38</td>
<td>0.93</td>
<td>1.09</td>
</tr>
<tr>
<td></td>
<td>(0.907)</td>
<td>(1.503)</td>
<td>(0.635)</td>
<td>(0.975)</td>
<td>(1.353)</td>
<td>(1.514)</td>
</tr>
<tr>
<td>Distance</td>
<td>-1.42***</td>
<td>-1.68***</td>
<td>-0.93*</td>
<td>-2.04***</td>
<td>-1.19**</td>
<td>-1.35***</td>
</tr>
<tr>
<td></td>
<td>(0.257)</td>
<td>(0.203)</td>
<td>(0.496)</td>
<td>(0.296)</td>
<td>(0.353)</td>
<td>(0.422)</td>
</tr>
<tr>
<td>Contiguity</td>
<td>0.74*</td>
<td>0.98*</td>
<td>1.71***</td>
<td>1.27*</td>
<td>2.07</td>
<td>2.07</td>
</tr>
<tr>
<td></td>
<td>(0.413)</td>
<td>(0.529)</td>
<td>(0.386)</td>
<td>(0.679)</td>
<td>(0.806)</td>
<td>(1.294)</td>
</tr>
<tr>
<td>Common official language</td>
<td>0.94***</td>
<td>0.56</td>
<td>0.49</td>
<td>0.49</td>
<td>0.17</td>
<td>2.42**</td>
</tr>
<tr>
<td></td>
<td>(0.297)</td>
<td>(0.417)</td>
<td>(0.452)</td>
<td>(0.322)</td>
<td>(0.603)</td>
<td>(0.966)</td>
</tr>
<tr>
<td>Colony</td>
<td>-0.30</td>
<td>-0.22</td>
<td>-0.11</td>
<td>-0.24</td>
<td>-0.00</td>
<td>-0.18</td>
</tr>
<tr>
<td></td>
<td>(0.299)</td>
<td>(0.385)</td>
<td>(0.418)</td>
<td>(0.341)</td>
<td>(0.468)</td>
<td>(0.783)</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.90</td>
<td>0.89</td>
<td>0.89</td>
<td>0.92</td>
<td>0.77</td>
<td>0.67</td>
</tr>
</tbody>
</table>

TABLE7: Result of the estimation of the gravity equation described above for different specification of the dependent variable. The model used is an IV random effect, as described above. Fixed country-specific and time-specific dummies are included in the model but omitted in the table for sake of simplicity. ***, **, *= significance at 1%, 5% and 10% respectively.

Note that also in this case the coefficient of migration variable is always positive when significant. In particular, note three important results from this set of estimates.

First of all, in the case of European countries’ exports, the effect of migration follows the same pattern of the first part of the analysis and the coefficient increases steadily.
with the differentiation of goods. This confirms the idea that an important network effect does exist, meaning that migrants help to reduce transaction costs associated to international trade. Secondly, the positive effect of migration is stronger for exports than for imports in the case of differentiated goods, suggesting that the pattern of total trade flows is driven by this category of good. This is not surprising, given that trade in differentiated goods represents on average 66% of yearly bilateral trade flows for the sample considered in this paper. Finally, when analyzing imports, instead, the downward bias due to endogeneity seems to be more important, especially when considering homogeneous goods and goods with reference price. Indeed there seems to be a stronger preference effect driving trade in these two categories of commodities. Note that for these categories, the positive effect of migration is much higher for imports than for exports. This result is coherent with the effect found by Foad (2009) when analysing trade and migration linkages for MENA migrants living in EU and USA in the year 2000. In his analysis he finds EU member states’ imports in commodities with reference price would be significantly higher than those of United States, all else equal. Moreover his analysis uncover that migration has a particularly strong effect on imports in goods with reference price.

6. Conclusions

Migration and trade are two crucial elements of our contemporary world. They have many elements in common, but people’s attitudes and governments’ policies vis-à-vis trade and migration have always been completely different. If we consider more closely the case of Europe, while trade liberalization have always been at the core of common policies, only in very recent years Europe has started to address the challenge of migration in a comprehensive way. However, migratory pressures are growing, EU member states are increasingly confronted with major integration challenges and global competition for high skilled worker has intensified. The common wisdom is that potential gains from liberalizing trade are much higher for European countries, than the benefits deriving from liberalization of migration, or, more precisely, that the only “winner” of migration deals are migrants themselves. But what if migration is a win-win game? What if also host countries economies has been benefiting from being immigration receiver?
This idea has been the starting point of this study that tried to investigate the trade enhancing effect of migration following the growing literature on ethnic networks among migrants that help overcoming informal trade barriers and increase trade flows. The results found are important because they shed some light on present European reality of trade and migration in a cross country perspective. For this reason they allow some policy prescriptions. When considering European countries’ exports the results found are clear and robust to different specification of the model. Indeed the overall impact of migration on European countries’ exports is positive and significantly different from 0. This network effect of migration steadily increases with the differentiation of goods traded. Thus, migrants have a trade enhancing effect, creating co-ethnic networks that help overcoming trade frictions where formal exchange structures are not effective. This means that migrant act as informal “ambassadors” of their home country, creating opportunities for European firms to expand their distribution in the partner countries markets. This underlines the importance of the potential effect of co-ethnic business network on international trade, that is great and could be further encouraged with ad hoc policies, both at European and at national level.

In the case of imports, instead, evidence is more puzzled. At first sight, migrants seem not to stimulate their home countries’ exports. Nevertheless, this import-side effect of migration on trade may be downward biased by the problem of endogeneity. Indeed, in the first part of the analysis elasticities of imports to the migration variable is not significantly different from 0, regardless of the import category considered as dependent variable. In the second part of the analysis, when instrumented, migration effect on imports is always significantly different from 0, but it is lower in the case of differentiated goods. This result is coherent with previously mentioned literature, but deserves further investigation.

[21] Here I refer to the dummy variable random effect model.
[22] Total imports, imports in differentiated commodities, imports in goods with reference price or imports in homogeneous goods.
[23] Here I refer to the instrumental variable random effect model.
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