The Differential Effect of Immigrants and Refugees on Trade with their Home Countries*

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Employing data on refugees and immigrants from 134 countries of origin and 14 destination countries for the years 1990—2005, I compare the extent to which refugees and immigrants differentially affect trade (exports and imports) with their home countries, and provide the first evidence of this differential refugee–immigrant trade effect for the world sample. Using the high–dimensional fixed effect estimation allows me to control for unobserved time–varying multilateral resistance terms, I find that immigrants have a small positive impact on both exports and imports from their home countries while refugees, do not have an effect on either exports or imports. High dimensional fixed effects estimation has not been previously applied within the immigration trade literature. Previous research estimated the effect of immigrants on trade to be between 4–7 percent (6–9 percent) on exports (imports), respectively. Controlling for time–varying multilateral resistance terms allows for a better estimation of the effect of immigration on trade, and finds little evidence of immigrants and refugees on trade with their home countries.

1 Introduction

International migration is a broad topic and encompasses different areas of economic research, including but not limited to studying the effects of migration on eco-

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nomic growth, investment in human capital, cross–country wage differentials, innovation, prices, housing markets and trade. In this paper, I examine the differential effects of immigrants and refugees (a specific subgroup of immigrants) on trade.

The previous literature has looked at the immigrant trade link, but has focused primarily on one host country, cross sectional data and immigrant flows (as opposed to the stock measure used in this paper). Gould and Ruffin (1996), Dunlevy and Hutchinson (1999), Head and Ries (1998), Rauch and Trindade (2002) are among the papers that have found a pro trade effect of immigrnation on trade, while Light (1984) and Saxenian (2002) find that immigrant networks promote international investment flows.

Genc et al. (2012) provide a fairly detailed review of the most influential and relevant literature on trade and immigration. They summarize 48 papers which have looked at the effect of immigration on trade, of which only four papers have looked at a sample of multiple immigrant origin and destination countries, and only one of those four papers has looked at a panel of countries — Lewer and Van den Berg (2009). They use data on immigrant flows between 12 OECD countries and a large set of immigrant source countries during the period 1991-2000, and find that immigration stimulates bilateral trade; Their paper does not differentiate between immigrants and refugees or between trade in commodity or differentiated product types, it also does not control for bilateral fixed effects. According to Lewer and Van den Berg (2009), a 10 percent increase in immigrant flow is associated with a 4.5 (8.8) percent increase in the growth rate of aggregate exports (imports).

This paper contributes to the existing literature in several ways. First, I expand the sample and time period—I have data on 134 origin countries and 14 host countries for the period 1990-2005. Additionally I include time–varying multilateral resistance terms to control for events that are correlated with both trade and immigration over time. I find that there is not a significant effect of immigrants or refugees on exports: a

10% increase in immigrant stock increases imports to their home country by only 1.2% (compared to the previous estimates of over 8%).

Second, I look at the differential effect of immigrants and refugees on trade with their home countries. The previous research has found that immigrants increase host country imports from their respective country of origin because they have preferences for home country goods which are scarce in the new host market. White and Tadesse (2007) refers to this channel as "transplanted home bias". Immigrants also have knowledge of their home country markets and, by exploiting this channel, increase exports to their home country. Dunlevy (2006) describes this channel as the "information bridge hypothesis", which utilizes immigrants' knowledge of home country business practices, language proficiency, and institutional and market differences. Refugees, by definition, are an artifact of an ongoing war, civil or ethnic violence, political unrest, social, racial or religious persecution in their home country, and are placed in their host countries more randomly than immigrants, therefore refugees may minimize the endogeneity problem within the immigrnat–trade literature. Looking at the differential effect of these two migrant groups separately will allow for a better understanding of the roles that different immigrant subgroups play in influencing their host–home country commercial relationships and aid in the formulation of appropriate social policy. To my knowledge this is the first paper to look at the differential effect of immigrants and refugees on trade with their home countries.

Third, it has been previously documented by Rauch (1999),Rauch (2001), Rauch and Trindade (2002), Tadesse and White (2010) that immigrant networks have a stronger impact on trade in differentiated products. Commodity products have more substitutes and common characteristics across countries. Differentiated products may be completely unknown or have a lot of asymmetric information associated with them. Since immigrants possess the knowledge of language, customs, and home markets, they can exploit this asymmetric information and facilitate more trade in these differentiated

products.

When exports and imports are disaggregated into commodity and differentiated product types, I find that neither immigrant stock nor refugee stock has an effect on exports in either product type. There is no statistically significant effect of immigrants on differentiated or commodity imports. This finding counters previous research estimates Tadesse and White (2010), Rauch (1999), Rauch and Trindade (2002), Rauch (2001). Specifically Rauch (1999) estimates an elasticity of immigrants on exports (imports) in differentiated product types to be 0.86, and 0.63 in commodity product types; Tadesse and White (2010) find a differentiated export elasticity of 0.28, commodity elasticity of 1.5 (0.28 and 0.22, respectively, for imports). I, on the other hand, do not find that immigrants (or refugees) exhibit any pro trade effect in either differentiated or commodity product type.

I estimate the differential effect of both immigrants and refugees on commodity and differentiated exports and imports, using the high dimensional fixed effects (exporter–year, importer–year and exporter–importer fixed effects), and find that neither immigrant nor refugee stock has any significant effect on imports in either commodity or differentiated product types.

The difference between my findings and previous literature is attributed to my use of time–varying multilateral resistance terms. It allows me to control for any events which are correlated with both trade and migration decisions over time, and thus provides a more rigorous and complete picture of the relationship between immigration and trade.

This paper proceeds as follows. Section 2 provides some background and statistics on the world migration patterns. In Section 3, I provide a brief review of the literature on immigrant–trade links. Section 4 presents the empirical model and Section 5 discusses the econometric results, while Section 6 concludes.

2 Background

International migration plays an important role in political, economic and social development and is a high-priority topic for both developing and developed countries. According to the *United Nations Population Fund, 2015* (n.d.) in 2015, 244 million people, or about 3.3 percent of the world's population, lived outside their country of origin (a 41 percent increase compared to 2000). This figure includes almost 20 million refugees. The majority of migrants left their home countries in search of better economic and social opportunities. Others were forced to flee various types of crises—like the current mass movement of refugees. Among the most relevant factors that contribute to the immigrants' choice of a relocation destination are the prospects for employment, standard of living, and immigration laws.

Europe and United States host the largest number of immigrants at 72 million, and 46 million respectively. According to the UNPF statistics, in 2005 Europe received 1.8 million immigrants, which accounted for almost 85% of its total population growth in that year. By 2010 there were 47.3 million immigrants living throughout Europe (almost 10% of the total European population). Germany, France, United Kingdom, Spain, Italy, and Netherlands experienced the highest immigration rates.

Some of the factors that influence immigration to the U.S. include family reunification, better employment opportunities, and humanitarian needs. The U.S. Commission on Immigration Reform (1990-1997) sought to limit legal immigration to the U.S. to approximately 550,000 immigrants a year. However, in 2010 one million immigrants obtained legal permanent resident status in the U.S. Immigration policy remains a heavily debated and controversial topic in the U.S.

In the last 15 years, Asia added more international migrants than any other major region—a total of 26 million. By 2015, two out of three international migrants lived in Europe or Asia and nearly half of all migrants worldwide were born in Asia.

About two thirds of all worldwide migrants live in only 20 countries, with USA being the top migrant host country (hosts 19 percent of all migrants), followed by Germany, Russia, Saudi Arabia, United Kingdom, and United Arab Emirates.

The patterns of migration and host countries differ for refugees. A "refugee" is a person who, "owing to well-founded fear of being persecuted for reasons of race, religion, nationality, membership of a particular social group or political opinion, is outside the country of his nationality and is unable, or owing to such fear, is unwilling to avail himself of the protection of that country; or who, not having a nationality and being outside the country of his former habitual residence as a result of such events, is unable or, owing to such fear, is unwilling to return to it."[1] According to the United Nation High Commissioner for Refugees (UNHCR), there were 21.3 million of refugees worldwide in 2015, with 54% of all worldwide refugees coming from only three countries— Syria (4.9m), Afghanistan (2.7m), and Somalia (1.1m). Top hosting countries for refugees are Turkey (2.5m), Pakistan (1.6m), Lebanon (1.1m), Iran (979,400), Ethiopia (736,100), and Jordan (664,100 refugees). These are the highest levels of forced displacement on record.

The appendix section of this paper provides visual maps of the immigrant and refugee stocks over time. Figures 1(a) and 1(b) show the maps of immigrants from 134 origin countries in 1990 and 2005 respectively. Similarly, 1(c) and 1(d) show the refugees from 134 countries in 1990 and 2005. Both figures are consistent with the statistics on world migration patterns, and provide further support for studying the differential effect of immigrants and refugees on trade. The maps show that not only did the total numbers of immigrants and refugees increase over this 15 year period, but

[1]Subsequent international documents and agreements (Cartagena Declaration on Refugees and the Convention Governing the Specific Aspects of Refugee Problems in Africa) have expanded this definition to include persons fleeing the general effects of armed conflict and/or natural disaster. A crucial requirement to be considered a "refugee" is crossing an international border. People forcibly displaced from their homes who cannot or choose not to cross a border are not refugees, even if they share many of the same characteristics as those who do. Internally displaced people, unlike refugees, do not have special rights, status or recognition specific to their situation in international law.

the composition of the host countries has also varied over time.

With such unprecedented levels of international migration, we need more reliable studies that identify and analyze the trends and effects of migration across various migrant subgroups, since they can have differential effects on the economy. This paper will focus on the differential effect of different migrant types—immigrants and refugees on cross country trade.

3 Literature Review

Starting with Gould (1994), who first documents an immigrant–trade link using US data, literature has analyzed influences of immigrants on trade for various host countries, and found support for pro–trade influences of immigrants on trade. Some papers, like Dunlevy and Hutchinson (1999) and Girma and Yu (2002), find that migration creates incentives for domestic host country firms to produce relevant substitutes for the home products demanded by migrants. Rauch and Trindade (2002) and Felbermayr and Toubal (2008) focus particularly on Chinese groups of migrants, and also estimate the effect of the global ethnic network on global bilateral trade. In addition, the effects that they estimate compare the case of the existing Chinese global network to the case of a complete absence of such a network, making their reported coefficients of immigrant effect on trade non–comparable to most other studies.

The literature is not clear on whether the immigrants influence exports more than imports or vice versa. Results reported by Gould (1994) and Girma and Yu (2002) find that immigrants' influence on host country exports is greater than their influence on imports. However, White and Tadesse (2007) and Head and Ries (1998) report pro-import trade effects of immigrants which exceed the pro-export effects. My results support the former finding of Gould (1994) and Girma and Yu (2002).

Rauch and Trindade (2002), Felbermayr and Toubal (2008), Lewer and Van den

Berg (2009), Hatzigeorgiou (2010) have looked at the effects of migrants on trade for the "world" sample. As mentioned previously, Rauch and Trindade (2002) and Felbermayr and Toubal (2008) focus on Chinese groups of migrants, and also estimate the effect of the global ethnic network on global bilateral trade. Hatzigeorgiou (2010), looks at the link between migration and trade flows for Sweden and its 180 trade partners between 2002 and 2007. He controls for time and region fixed effects, and finds that a 10 percent increase in migrant stock results in a 7 percent (9 percent) increase in exports (imports), respectively. Lewer and Van den Berg (2009) has looked at a panel from 1991-2000. However, their paper doesn't control for high–dimensional fixed effects (i.e. importer–year, exporter–year, and exporter–importer fixed effects).

Recent empirical trade literature finds some support for the hypothesis that migrants and trade are complements, and more migrants contribute to more cross country trade. Gould and Ruffin (1996) and Rauch (1999) were among the first researchers who began to question the way of measuring migrants as units of labor. Both Rauch and Gould criticize the conventional trade literature (comparative advantage view) view that migrants are a substitute for trade. They believe that such a view fails to acknowledge the fact that immigrants also bring along intangible human capital in the form of, for example, foreign language and home market knowledge, cultural diversity, human networks and education, which stimulate trade.Unlike physical capital, which could be easily expropriated or depreciated, intangible human capital (in the form of language knowledge, culture and informal networks) is more easily transmitted, better protected against theft, and depreciates over time at a much lower rate. Human networks and knowledge of the foreign markets that immigrants bring along strengthen and facilitate trade between migrants country of origin and their host country. Immigration networks, by providing channels of knowledge diffusion, reduce the information, communication and set-up costs between locations and, therefore, can be thought to have a trade creation effect via the reduction in trade costs Rauch and Trindade (2002).

Similar research by Peri and Requena-Silvente (2010) looking at the effects of immigrants on the extensive (effect on the number of transactions) and intensive (effect on the average value per transaction) margins of exports, finds that immigrants increase both the number of transactions and the value per transaction in exports for the receiving country. Their finding is based on the above mentioned idea of reduction in the fixed cost associated with exports and results from the immigrants' ability to lower the transaction costs of trade making exports to their country of origin relatively cheaper. However, their paper is limited to the Italian market, while I consider a panel of world trade with immigrants and refugees coming from 134 countries of origin to 14 countries of destination.

Previous research has not accounted for the fact that immigrants' influence on trade may differ by their entry classification. Thus, in order for us to gain better perspective of the effect of immigrants on trade with their home countries, we need to consider how this effect varies across immigrant types, which will allow for a better understanding of the roles that different immigrant subgroups play in influencing their host–home country commercial relationships and aid in the formulation of appropriate social policy. Ongoing debates over immigration and trade policies furthermore underscore the importance of a better and more complete understanding of this topic.

Previous literature has focused on gravity equations to estimate trade and migration flows. Tinbergen (1962), who has perfected the use of gravity equations for estimating bilateral trade flows, in which the volume of trade between two countries is proportional to their respective GDPs and is reversely related to their "multilateral resistance terms", use geographic distance, common border, language, currency union dummies, and trade agreements as his "trade resistance terms". The gravity equation has been the preferred empirical method in international trade and migration literature. Despite the fact that it provides a good fit for most data sets of regional and international trade, despite having a good fit. Its assumptions violate Jensen's inequality and, under het-

eroskedasticity assumptions, which are not unreasonable when working with panel data, log–linearized models estimated by OLS lead to biased parameter (elasticity) estimates.

Silva and Tenreyro (2006), find that under heteroskedasticity, the parameters of the log–linearized gravity models estimated by OLS (which is the typical practice in the trade and migration literature) produce biased estimates of the true elasticities. They suggest a multiplicative method for estimating constant elasticity models (such as typical gravity models), using pseudo–maximum–likelihood (PML) estimation technique. This method is consistent in the presence of heteroskedasticity, which is an issue when working with a panel of countries and migrants. Silva and Tenreyro (2006) show that heteroskedasticity affects both the traditional gravity estimation by Tinbergen (1962) as well as the more recently used gravity estimations techniques which use multilateral resistance terms, such as Anderson and Van Wincoop (2003). I estimate the effect of immigrants and refugees on trade using several approaches— a traditional Anderson and Van Wincoop (2003) multilateral resistance terms method, as well as high dimensional fixed effects (importer–year, exporter–year, and importer–exporter fixed effects) proposed by Guimarães and Portugal (2009) and tested by Head and Mayer (2013).

4 Data

I use a bilateral data set, which contains data on exports and imports between 14 migrant–destination countries and 134 originating over the period 1990—2005. In addition, I have data on refugees, which allow me to look at the differential effect of immigrants and refugees on trade with their home countries.

For trade data, I use Direction of Trade Statistics (DOTS) data. DOTS has data on exports (FOB) and imports (CFI) for all the country pairs in the world. I am using the data on exports and imports between 14 countries hosting immigrants and refugees and 134 countries of their origin for the years 1990—2005. The data for both exports

and imports are broken down by SITC Revision 2 four digit level codes, which allows to observe bilateral annual exports and imports in detail, by product type. I then use James Rauch's product classification (Rauch (1999)) to collapse bilateral exports and imports into commodity or differentiated product types.

For immigrant data, I construct data using the *United Nations Statistical Data Base* (n.d.) and Kim and Cohen (2010). Data on immigrant stocks come from the United Nations and are available for the years 1990, 1995, 2000, and 2005. I use immigrant flwo data from Kim and Cohen (2010) to interpolate intervening years, resulting in bilateral immigrant stock data from 1990—2005. Refugee data come from *United Nations High Commissioner for Refugees* (n.d.) and contain annual refugee stocks for the years 1990—2005.

Data on economic variables (i.e., GDP, population) come from Penn World Tables Feenstra et al. (2015). Standard gravity measures (openness to trade, total distance from the country centers, shared border, common language, common colonizer, currency union, regional trade agreements) are taken from *CEPII* (n.d.)— a French research center in international economics (Institute for Research on the International Economy).

More detailed explanation of the data, specific variables and variable construction can be found in the Appendix of the paper.

5 Empirical Model Specification

This paper uses a time, exporter and importer fixed effects to account for the observable and unobservable time invariant trade costs (multilateral resistance terms) between the two trading partners. These high–dimensional fixed effects also absorb any dynamic forces that may change over time and affect both trade and immigration (such as GDPs, population growth, etc.). This estimation technique has been proposed by Guimarães and Portugal (2009), and tested by Head and Mayer (2013).

I also estimate the model with a more traditional gravity equation with destination, origin and year fixed effects, proposed by Anderson and Van Wincoop (2003) [2], as well as Poisson Maximum Likelihood estimator proposed by Silva and Tenreyro (2006) [3] and I find similar results to the previous literature. The primary estimation equation is presented below:

An equation for exports [4] with multilateral high dimensional fixed effects takes the following form:

$$ln(AggregateExports)_{ijt} = \beta_1 ln(Immigrants)_{ijt-1} + \beta_2 ln(Refugees)_{ijt-1} + \beta_3 RTA_{ijt} + \theta_{it} + \omega_{jt} + \delta_{ij} + \epsilon_{ijt} \quad (1)$$

In equation (1) each observation is an export origin (immigrant host) (i), export destination (immigrant origin) (j), time (t) pair of aggregate exports from the 14 immigrant host countries and 134 immigrant origin countries in a given year.$(AggregateExports)_{ijt}$ is the aggregate exports from the immigrant host country to the immigrants home country, $(Immigrants)_{ijt-1}$ is the immigrant stock residing in the host country in the previous year, $(Refugees)_{ijt-1}$ is the refugee stock residing in the host country in the previous year, RTA_{ijt} is a dummy variable equal to 1 if the two trading partners have a regional trade agreement in place in a given year, θ_{it} is the exporter-year fixed effects,

[2] A simple gravity equation, like the one used by Anderson and Van Wincoop (2003) predicts that trade flows (exports and imports) are proportional to the size of the economy of both trading countries and are inversely related with measures such as bilateral country distance, and positively related to sharing a common border, a regional trade agreement or a common colonizer, all of which are expected to increase trade between them.

[3] Gravity equation use has also recently come under criticism for its negligence of *Jensen's inequality*. On the implications specifically pertinent to the trade literature is the fact that under the presence of heteroskedasticity, the parameters of log linearized models estimated by OLS lead to biased estimates of the true elasticities. Since it is not a a far fetched assumption that a panel dataset, with a large number of years, partners, product types, etc. is prone to the presence of heteroskedasticcity, I also estimated my model using the Poisson Maximum Likelihood estimator proposed by Silva and Tenreyro (2006).

[4] Similarly for imports the dependent variable will be $ln(AggImports)_{ijt}$, with the subscript signs reversed for the relevant covariates.

ω_{jt} is the importer–year fixed effects, δ_{ij} is the exporter-importer fixed effect, and ϵ_{ijt} is the error term.

For a robustness check, and to be able to compare my preferred specification to the ones previously used in the literature, I also estimate an augmented gravity equation (such as Anderson and Van Wincoop (2003)), for which I use equation (2) [5] below. I find similar results to the previous literatures' findings, using this estimation:

$$ln(AggregateExports)_{ijt} = \beta_1 ln(GDP)_{it} + \beta_2 ln(GDP)_{jt} + \beta_3 (Conflict)_{jt} + \\ + \beta_4 (RTA)_{ijt} + \beta_5 ln(Immigrants)_{ijt-1} + \beta_6 ln(Refugees)_{ijt-1} + \zeta_{ij} + \mu_t + \phi_{ijt} \quad (2)$$

where each observation is an export origin (immigrant host) (i), export destination (immigrant origin) (j), time (t) pair of aggregate exports from the 14 immigrant host countries and 134 immigrant origin countries in a given year.

6 Results

6.1 Aggregate Exports

Results for aggregate exports are presented in Table 1 and Table 1. Table 1 presents the results for aggregate exports from 14 immigrant–host countries to 134 immigrants-origin countries. Column (2) allows for a differential effect of refuges. Looking at the results in the first column of Table 1, we see immigrants do not have an effect on exports to their home countries, while refugees have a slight negative effect. A 10 percent increase in refugee stock, decreases exports to their home country by 0.32 percent). These estimates are much lower than the results reported by Hatzigeorgiou (2010)—a 7 percent increase in exports for each additional 10 percent increase in immigrants.

[5] As in the equation (1), for imports the dependent variable will be $ln(AggImports)_{jit}$, with the subscript signs reversed for the relevant covariates.

Lewer and Van den Berg (2009) reports a 4.5 percent growth in exports as a result of 10 percent increase in immigrant stock. This difference is directly attributable to the fact that both Lewer and Van den Berg (2009) and Hatzigeorgiou (2010) do not control for bilateral fixed effects, use flows instead of stocks, and do not differentiate between immigrant subgroups.

Table 2, where I control for exporter–year, importer–year and exporter–importer fixed effects, has comparable results for immigrants and insignificant for refugees. Introducing additional bilateral controls allows to control for events that are correlated with both trade and migration patterns over time. Controlling only for immigrants (Column 1 of Table 2), shows that neither immigrants nor refugees have an effect on exports to their home countries. When I allow for a differential effect of refugees, the results do not change. This is not surprising, given the presence of high dimensional fixed effect. Any kind of turmoil is likely to increase both the influx of refugees, and a decrease in trade between the two partners. However, $(Conflict)_{jt}$ used in regression (1), is not a perfect variable and country–year (importer–year, exporter–year) fixed effects do a much better job of capturing the effect of refugees on exports, and the negative coefficient of refugees on aggregate exports goes away.

6.2 Commodity and Differentiated Exports

Previous research has pointed out that immigrants may affect exports in commodity and differentiated product types differently. Rauch (1999), Rauch (2001), Rauch and Trindade (2002), Dunlevy (2006), White and Tadesse (2007), Tadesse and White (2010) posit that immigrant networks have a stronger impact on trade in differentiated products. Commodity products have more substitutes and common characteristics across countries. Differentiated products may be completely unknown or have a lot of asymmetric information associated with them. Since immigrants possess the knowledge of

language, customs, and home markets, they can exploit this asymmetric information and facilitate more trade in these differentiated products.

Once exports are disaggregated into commodity and differentiated product types, the results change slightly, and are reported in Table 3. Immigrants don't have an effect on commodity exports on their own or when introducing refugees separately. There doesn't seem to be an effect of either refugees or immigrants on differentiated product types either. This finding differs from the previous literature, which suggested that immigrants affect exports in differentiated type products more.

Controlling for high-dimensional fixed effects with the exporter–importer, exporter–year and importer–year effects (Table 3), neither immigrants nor refugee have a significant effect on either commodity or differentiated exports. The results are similar to those reported in Table 2 for aggregate exports with high dimensional fixed effects.

6.3 Aggregate Imports

According to Head and Ries (1998) immigrants' effect on imports and exports may be different. Immigrants may have a direct impact on imports because of their preferences for goods produced in their home country. This effect is likely to be larger for differentiated rather than commodity products, where there is little reason to prefer products sourced from a specific country and the 'specific' variety may be unavailable locally. Since international trade imposes much higher costs than domestic transactions, setting up an export connection requires finding potential markets, accessing distribution channels, and local product demand in foreign environments. The importer, on the other hand, needs to find a reliable source of product supply. Both export and import activities require knowledge of local customs, laws, traditions, and markets. These requirements could be facilitated by the immigrants' knowledge of their home countries' language, customs, laws, traditions, and markets. These assets lower the

transactions costs for both exports and imports, however they may do so differentially. Elasticities for imports may be higher, because the knowledge of the home market may increase both imports and exports, but preferences for home–country goods increases only imports. Immigrants may also have similar preferences as the native population in the host country, but they may find it easier to set up importing businesses rather than exporting businesses.[6]

In Table 5, we observe a slight pro–trade effect of refugees, while immigrants do not have an effect on aggregate imports. This is true for results reported in Column 2 of Table 7 where we observe a differential effect of immigrants and refugees. Column 1 reports the effect of immigrants only, and fails to find any significant effect of immigrants on imports from their home country. Table 6, controls for high dimensional fixed effects. Column 1 enters immigrant stock separately and finds a 1.2 percent increase in imports for each 10 percent increase in immigrant stock in the host country. Once we estimate the effect of immigrants and refugees differentially (Column 2), we fail to find any significant effect of either refugees or immigrants on aggregate imports.

6.4 Commodity and Differentiated Imports

Both immigrants and refugees fail to exhibit significant effect on imports in commodities (Table 4). There is a slight significant effect of immigrants on imports in differentiated product types. A 10 percent increase in immigrant stock in the host country raises imports to the host country by 2.2 percent when immigrants enter separately (Column 3), and by 1.5 percent, when we allow for a differential effect of immigrants and refugees (Column 4). Refugees have a slight positive effect of 0.6% increase in differentiated imports to their host country, for each 10% increase in their stock in the host country.

[6]Gould (1994) found that immigrants affect exports more than imports. His specification had the log of trade depend on the fraction of immigrants in a host country's population.

Table 8 reports the results for regressions with high dimensional fixed effects (exporter–year, importer–year and exporter–importer fixed effects), and finds that immigrants have a modest positive effect on commodity imports when allowed for differential effect of refugees to enter into the regression—a 10% increase in immigrant stock is translated into 1.76% increase in commodity imports from their home country, while they do not have any effect on differentiated products. Refugees, on the other hand, have no effect on commodity imports but do have a slight positive effect on differentiated imports from their home counties. A 10% increase in refugee stock translates into 0.4% increase in differentiated product types from their country of origin.

7 Conclusion

Employing data on refugees and immigrants from 134 countries of origin and 14 destination countries for the years 1990—2005, I differentiate between the immigrant and refugee effect on exports and imports in commodity and differentiated products. I find that immigrants have a small positive impact on imports in differentiated goods and have an insignificant effect on aggregate exports or imports (or in exports in commodity products). Refugees, have a slight positive effect on aggregate imports and do not have a signficant effect on aggregate exports. Furthermore, controlling for importer–year, exporter–year, and exporter–importer fixed effects, I find that the effect of immigrants and refugees on trade is modest, economically insignificant and roughly half the magnitude of a typical augmented gravity regression estimate reported by the previous literature. Immigrants affect trade, but it doesn't seem that their effect is primarily via the network channel contrary to the previous findings. This result is attributable to the use of time-varying country specific multilateral resistance terms (high–dimensional fixed effects), which allow me to control for any events correlated with both trade and migration decisions over time, and thus provide a more rigorous and complete picture

of the relationship between immigration and trade.

8 Tables and Graphs Appendix

Table 1: Aggregate Exports from 14 immigrant-host countries to 134 immigrant-origin countries (1990-2005) with 1 year immigrant and refugee lag .

	(Exports no Ref)	(Exports with Ref)
Real GDP imm origin	0.391***	0.385***
	(0.097)	(0.097)
Real GDP imm host	1.442***	1.429***
	(0.326)	(0.327)
Conflict imm origin	0.158*	0.155*
	(0.094)	(0.094)
RTA	0.047	0.045
	(0.042)	(0.042)
Imm stock	-0.032	-0.009
	(0.045)	(0.044)
Ref stock		-0.020**
		(0.010)
Obs.	5,308	5,308
Year fixed effects	Y	Y
Country-pair fixed effects	Y	Y

Note: Robust standard errors are shown in parentheses *** p<0.01, ** p<0.05, * p<0.1. Both regressions have country-pair and year f.e.

Table 2: Aggregate Exports with high-dimensional fixed effects and with 1 year immigrant and refugee lag.

	(Exports with no Ref)	(Exports with Ref)
Imm stock	0.006	0.010
	(0.056)	(0.056)
Ref stock		-0.005
		(0.013)
RTA	0.060	0.059
	(0.082)	(0.082)
Obs.	4,817	4,817
Exporter*Importer fixed effects	Y	Y
Importer*Year fixed effects	Y	Y
Exporter*Year fixed effects	Y	Y

Note: Robust standard errors are shown in parentheses *** p<0.01, ** p<0.05, * p<0.1. Both regressions have importer-year, exporter-year, and exporter-importer f.e.

Table 3: Commodity and Differentiated Exports from 14 immigrant-host countries to 134 immigrant-origin countries (1990-2005) with 1 year immigrant and refugee lag.

	(Comm noref)	(Comm ref)	(Diff noref)	(Diff ref)
Real GDP imm origin	0.077	0.982***	0.514***	0.509***
	(0.098)	(0.013)	(0.109)	(0.110)
Real GDP imm host	1.410***	0.800***	1.297***	1.286***
	(0.474)	(0.021)	(0.365)	(0.366)
Conflict imm origin	0.244**	-0.077	0.204*	0.202*
	(0.101)	(0.076)	(0.107)	(0.107)
RTA	0.168***	2.139***	0.005	0.003
	(0.061)	(0.056)	(0.045)	(0.046)
Imm stock	-0.003	0.020	-0.025	-0.005
	(0.053)	(0.013)	(0.055)	(0.054)
Ref stock		-0.013		-0.017
		(0.011)		(0.012)
Obs.	5,308	5,308	5,308	5,308
Year fixed effects	Y	Y	Y	Y
Country-pair fixed effects	Y	Y	Y	Y

Note: Robust standard errors are shown in parentheses *** p<0.01, ** p<0.05, * p<0.1. Both regressions have country-pair and year f.e.

Table 4: Commodity and Differentiated Exports with high-dimentional fixed effects and with 1 year immigrant and refugee lag.

	(Comm noref)	(Comm ref)	(Diff noref)	(Diff ref)
Imm stock 5 year lag	0.092	0.072	0.137*	0.147*
	(0.098)	(0.103)	(0.075)	(0.079)
Ref stock 5 year lag		0.015		-0.008
		(0.024)		(0.018)
RTA				
Obs.	4,203	4,203	4,203	4,203
Exporter*Importer fixed effects	Y	Y	Y	Y
Importer*Year fixed effects	Y	Y	Y	Y
Exporter*Year fixed effects	Y	Y	Y	Y

Note: Robust standard errors are shown in parentheses *** p<0.01, ** p<0.05, * p<0.1.All regressions have exporter-year, importer-year and exporter-importer f.e.

Table 5: Aggregate Imports from 134 immigrant-origin countries to 14 immigrant-host countries (1990-2005) with 1 year lag on immigrant and refugee stocks.

	(Imports noref)	(Imports ref)
Real GDP imm host	-0.037	-0.015
	(0.365)	(0.367)
Real GDP imm origin	0.484***	0.487***
	(0.106)	(0.105)
Conflict imm origin	-0.142**	-0.139**
	(0.059)	(0.058)
RTA	0.175**	0.180**
	(0.076)	(0.076)
Imm stock	0.083	0.056
	(0.056)	(0.055)
Ref stock		0.024*
		(0.013)
Obs.	4,945	4,945
Year fixed effects	Y	Y
Country-pair fixed effects	Y	Y

Note: Robust standard errors are shown in parentheses *** p<0.01, ** p<0.05, * p<0.1. Both regressions have country-pair and year f.e.

Table 6: Aggregate Imports with high-dimensional fixed effects and 1 year immigrant and refugees lag.

	(Imports noref)	(Imports ref)
Imm stock	0.147**	-0.006
	(0.064)	(0.079)
Ref stock		-0.002
		(0.018)
RTA	-0.090	0.065
	(0.107)	(0.111)
Obs.	4,399	4,392
Exporter*Importer fixed effects	Y	Y
Importer*Year fixed effects	Y	Y
Exporter*Year fixed effects	Y	Y

Note: Robust standard errors are shown in parentheses *** p<0.01, ** p<0.05, * p<0.1. Both regressions have importer-year, exporter-year, and exporter-importer f.e.

Table 7: Commodity and Differentiated Imports from 134 immigrant-origin countries to 14 immigrant-host countries (1990-2005) with 1 year lag on immigrant and refugee stocks.

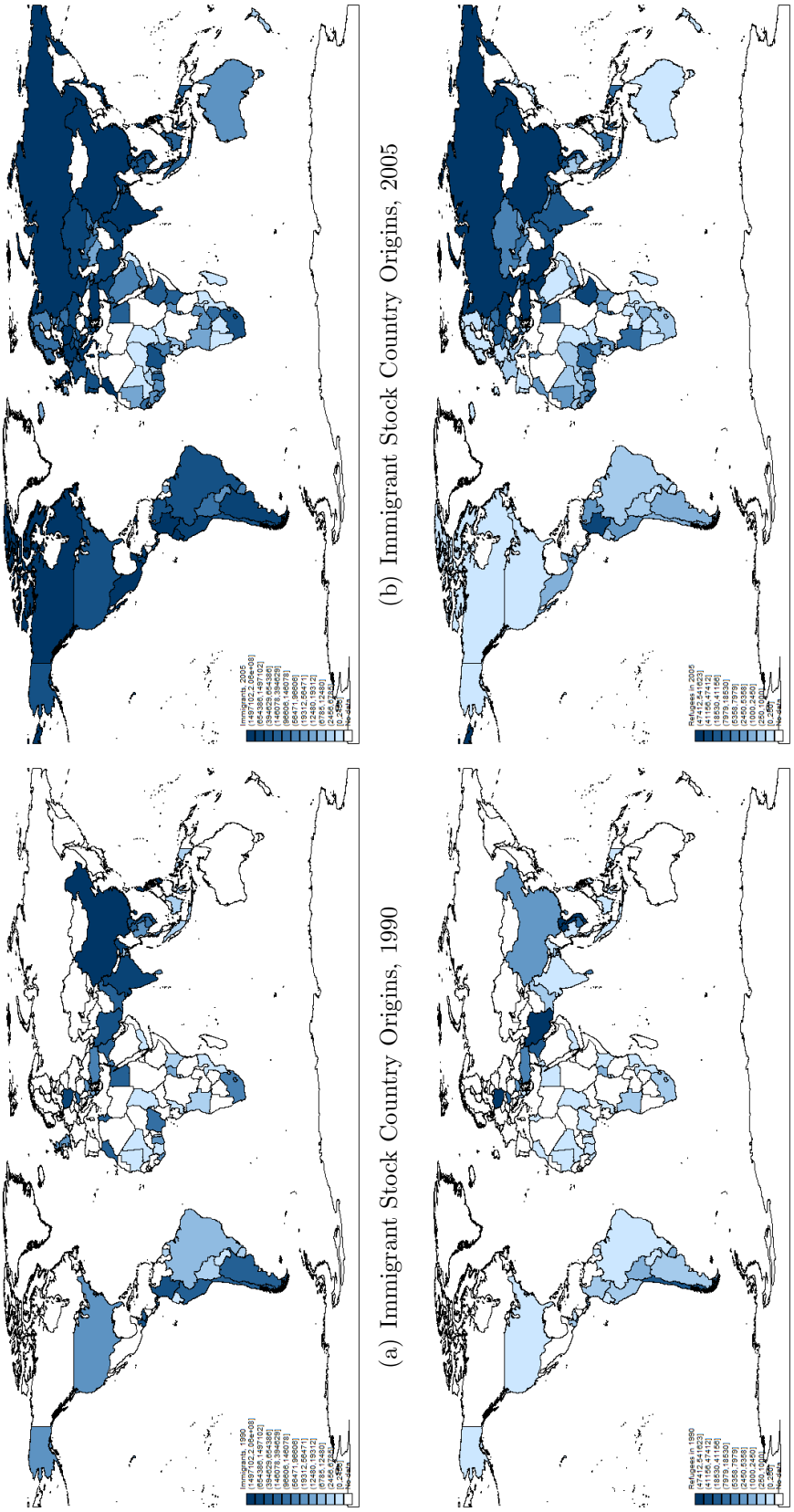
	(Comm noref)	(Comm ref)	(Diff noref)	(Diff ref)
Real GDP imm host	0.243	0.237	0.089	0.146
	(0.513)	(0.514)	(0.401)	(0.403)
Real GDP imm origin	0.430***	0.429***	0.402***	0.411***
	(0.141)	(0.142)	(0.124)	(0.124)
Conflict imm origin	-0.064	-0.065	-0.130**	-0.121*
	(0.070)	(0.070)	(0.065)	(0.064)
RTA	0.143	0.141	0.222***	0.236***
	(0.092)	(0.092)	(0.074)	(0.074)
Imm stock	0.045	0.052	0.220***	0.149***
	(0.089)	(0.085)	(0.056)	(0.057)
Ref stock		-0.006		0.062***
		(0.019)		(0.016)
Obs.	4,944	4,944	4,944	4,944
Year fixed effects	Y	Y	Y	Y
Country-pair fixed effects	Y	Y	Y	Y

Note: Robust standard errors are shown in parentheses *** p<0.01, ** p<0.05, * p<0.1. All regressions have country-pair and year f.e.

Table 8: Commodity and Differentiated Imports with high-dimensional fixed effects and 1 year immigrant and refugees lag.

	(Comm noref)	(Comm ref)	(Diff noref)	(Diff ref)
Imm stock	0.174	0.190	0.066	0.040
	(0.115)	(0.117)	(0.084)	(0.085)
Ref stock		-0.023		0.037*
		(0.026)		(0.019)
RTA	0.208	0.198	0.130	0.147
	(0.164)	(0.164)	(0.120)	(0.120)
Obs.	4,392	4,392	4,392	4,392
Exporter*Importer fixed effects	Y	Y	Y	Y
Importer*Year fixed effects	Y	Y	Y	Y
Exporter*Year fixed effects	Y	Y	Y	Y

Note: Robust standard errors are shown in parentheses *** p<0.01, ** p<0.05, * p<0.1. All regressions have exporter-year, importer-year and exporter-importer f.e.



(a) Immigrant Stock Country Origins, 1990

(b) Immigrant Stock Country Origins, 2005

(c) Refugee Stock Country Origins, 1990

(d) Refugee Stock Country Origins, 2005

Figure 1: Immigrant and Refugee Stock (1990,2005)

Note: Refugees from 134 countires of origin residing in Australia, Belgium, Canada, Denmark, Finland, Germany, Hungary, Iceland, Italy, Norway, New Zeland, Spain, Sweden or USA in 1990 and 2005.

Table 9: Aggregate Exports ROW:Pooled Descriptive Statistics. N=7,027

	Mean	S.D.	Min	Max
Aggregate Exports (thousands of USD)	1,854,178	12,978,540	6	362,876,032
Commodity Exports (thousands of USD)	436,254	2,891,009	0	75,639,502
Differentiated Exports (thousands of USD)	1,417,924	10,269,398	1	288,179,645
Number of Product Types	278	214	2	1,526
Number of Differentiated Product Types	204	142	1	942
Number of Commodity Product Types	75	75	1	586
Real GDP immi origin, in mill 2005USD	403,280	1,153,605	122	12,564,300
Real GDP immi host, in mill 2005USD	2,320,246	3,762,094	75,686	12,564,300
Distance (in km to most populated cities)	6,837	3,938	81	18,825
Regional Trade Agreement	0.12	0.32	0.00	1.00
Conflict immi host	0.05	0.22	0.00	1.00
Conflict immi origin	0.27	0.45	0.00	1.00
Common offical primary language	0.14	0.35	0.00	1.00
Immigrant stock	62,356	385,466	1	10,309,054
Refugee Stock	1,812	12,856	1	350,000

Note: N=7,027. Statistics are for a total of 14 countries of export origin and 134 import destinaitons over the period 1990-2005.

Table 10: Aggregate Imports ROW:Pooled Descriptive Statistics. N=6,493

	Mean	S.D.	Min	Max
Aggregate Imports (thousands of USD)	2,178,837	12,082,876	0	280,275,840
Commodity Imports (thousands of USD)	591,058	3,176,975	0	111,839,991
Differentiated Imports (thousands of USD)	1,587,778	9,673,213	0	247,635,096
Number of Product Types	194	199	2	1,188
Number of Differentiated Product Types	142	139	1	820
Number of Commodity Product Types	52	63	1	368
Real GDP immi host, in mill 2005USD	2,468,974	3,863,526	75,686	12,564,300
Real GDP immi origin, in mill 2005USD	420,035	1,153,057	122	12,564,300
Distance (in km to most populated cities)	6,881	3,999	81	18,825
Regional Trade Agreement	0.13	0.33	0.00	1.00
Conflict immi origin	0.27	0.44	0.00	1.00
Conflict immi host	0.05	0.23	0.00	1.00
Common offical primary language	0.14	0.35	0.00	1.00
Immigrant stock	65,643	400,063	3	10,309,054
Refugee stock	1,827	13,075	1	350,000

Note: N=6,493. Statistics are for a total of 14 import destination countries and 134 export origin countries over the period 1990-2005.

9 Data Appendix

This appendix provides further description of the data sources and manipulations used in this paper.

1). World Trade Data. Data on world bilateral exports and imports by SITC Revision 2 4 digit level codes come from WITS (World Indicators of Trade Statistics) database. Data are from the UN Comtrade database, downloaded from the WITS website by SITC Rev.2 4–digit level codes. Raw data files contain bilateral export and import data by year and SITC 4 digit level industry codes. Export and import values are in millions of 2005 USD.

2). Gravity Measures. Data on bilateral distance, common official primary language, trade agreements come from *The Centre d'Etudes Prospectives et d'Informations Internationales* (CEPII). CEPII makes available a "square " gravity dataset for all world pairs of countries, for the period 1948 to 2006, allowing the estimation of international flows as a function of GDP, population and trade costs. An official or national language is defined as a language spoken by at least 20% of the population of a country (Mayer and Zignago, 2006). If the destination and the origin have a common official language, the independent variable "common official language is defined to equal 1; otherwise, the variable equals 0. Geographical distance is defined as the distance (in kilometers) between the two capital cities. Distances were calculated from the cities longitude and latitude using the great circle formula (Mayer and Zignago, 2006).

3). Real GDP Data. Data on the real GDP come from PWT8.1 for each of the years corresponding to the trade data. PWT version 8.1 is a database with information on relative levels of income, output, inputs and productivity, covering 167 countries between 1950 and 2013.

4). Rauch Product Classification. James Racuh has data which contains a categorization of SITC Rev.2 industries according to three possible product types: differentiated,

reference priced or commodity (homogeneous). Here, I group reference priced with differentiated products, and rename homogeneous products commodities as has been done previously in the literature. I end up with 2 categories: commodities and differentiated products. Source: Rauch (1999). There are a total of 15,943 product codes, of which 6,571 are classified as homogeneous or commodity products and 9,372 are classified as differentiated.

5).Immigrant Stock. Data on immigrants come from two sources. Data on immigrant stock by destination and origin at 5 year intervals (1990-2005) come from the United Nations Department of Economic and Social affairs. Since the stock data is on.y available at 5 year increments, I also use data on immigrnat inflow, provided by Kim and Cohen (2010), and interpolate the immigrant stock data for the remaining years (assuming constant outflow over the 5 year increments). A more detailed description of each source of immigrant data as well as the interpolation procedure is described below.

5a).Immigrant Stock UN. The total sample size for the UN immigrant stock is 31,444 observations, 7,786 observations in each of the five year increments, that is 7,786 observations in 1990, in 1995, 2000 and 2005 respectively. For the whole sample, 888 or about 38.75% of those observations are zero. In the UN data, zero (0) indicates that the value of the stock of immigrants is either zero, rounded to zero or that data are not available. All the estimates of the stock data refer to the mid-point (1 July) of each year indicated, thus making it a set of mid-year estimates of the total international migrant stock by origin and destination for 1990,1995,2000, and 2005. The data on migrant stock may also indirectly contain information on refugee stock. The coverage of refugees in population censuses is uneven. Some countries when granting refugee status count refugees in their population census as any other international migrant.

5b).Immigrant Inflow Data from Kim & Cohen. Data on immigrant inflows from Croatia, Hungary, and United Kingdom are excluded because there are too many miss-

ing values. Whenever a country reported zero migrants, the observation was also excluded. After the elimination of zeros, there were 77,658 observations (48,832 for inflows and 28,826 for outflows).

5c).Interpolating UN Immigrant Stock Data with Kim & Cohen Immigrant Flow Data. I used the stock data for 1990, 1995, 200, and 2005 and then interpolated the numbers for 1991-2004, using the flow data by Kim & Cohen. Since we are dealing with inflows but not so much outflows (including deaths, etc.), I assumed constant outflows over each five year interval to arrive at the estimate of the immigrant stock which was available from UN migrant stock data for 1990, 1995, etc. It may be useful to refer to a simple formula below

After the interpolation procedure, the sample size for immigrant stock drops to 25,993. There are 150 (0.5%) observations where immigrant stock is equal to zero and 117 observations where it's less than zero. In addition 4,391 observations out of 25,993 (16,89%) are missing.

6).Refugee Stock. The data on the stock of refugees come from the United Nations High Commissioner for Refugees (UNHCR). Refugee statistics are generally based on individual registration records,kept by the government of the host countries.

7).Major Episodes of Political Violence and Warfare (MEPV). Data on conflicts come from the Major Episodes of Political Violence (MEPV) and Conflict Regions, 1946-2014 collected by the Center for Systemic Peace (www.systemicpeace.org).

Coding Measures: MEPV defines major episodes of political violence as systematic episodes of lethal violence resulting in at least 500 directly-related deaths over the course of the episode. Episodes include international wars, civil wars, and ethnic violence, and are assigned a societal-systemic magnitude impact ranging from 0 to 10. I create a dummy variable from these categories, and assign a 1 to the variable $(Conflict)_{jt}$ equal to one if the impact score is over three.

ACTOTAL: Total summed magnitudes of all (societal and interstate) conflict episode,

is the variable equal to :

ACTOTAL = INTTOT + CIVTOT

where INTTOT: Total summed magnitudes of all interstate episodes and CIVTOT: Total summed magnitudes of all societal episodes.

I use ACTOTAL, and create a dummy variable $(Conflict)_{jt}$ from it. It's assigned a value of 1, if the magnitude score of ACTOTAL is greater than 3, otherwise $(Conflict)_{jt}$ is equal to zero.

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