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**Trade, Migration and Integration – Evidence and Policy  
Implications**

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# Trade, Migration and Integration – Evidence and Policy Implications

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*Abstract* This paper takes departure in the unique position taken by Swedish policymakers recently in giving explicit emphasis to migration as a tool for increasing trade. We attempt to put this position to empirical scrutiny. Our results demonstrate that migrants spur exports, especially along the extensive product margin of trade and for differentiated products, but with no significant impact on imports. This suggests that for small open economies with many immigrants being refugees, the aim of using migration to facilitate trade may only be effective with respect to exports. This paper also contributes to the literature on trade and migration by exploiting data on gender and age, which allow us to draw inferences on the underlying impact channels. We adopt an instrumental variable approach to address the endogeneity issue due to potential reverse causality. The pattern of results is consistent with the hypothesis that migration mainly reduces fixed trade costs derived from information and trust friction across migrant host and source countries. Importantly, the results imply that policymakers may be able to promote trade by improving immigrants' labor market integration rather than being restricted to more liberal immigration policies, which is generally more controversial.

JEL Classification: F10, F22, F14

Keywords: Trade, migration, gravity model, trade costs, networks, information, trust, trade policy

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## 1. Introduction

“Migrants have a good knowledge of the business culture, politics, belief systems and languages of their former home countries. Their contact networks put them in a particularly good position to stimulate trade with their countries of origin. [...] Research shows that migrants can facilitate trade between their country of residence and country of birth. Sweden has seen this in practice.”

Ewa Björling, Sweden’s Minister for Trade

Speech at UN Economic Commission for Latin America and the Caribbean, October, 2012

Ever since the pioneering papers of Gould (1994), Head and Ries (1998) and Rauch (2001), there has been a substantial increase in the number of studies analyzing the link between international trade and migration. There are at least two reasons to this expansion of research investigating whether migration spurs trade. First, endowment driven neoclassic trade models postulate that factor mobility (migration) and trade in goods are substitutes. When both migration and trade continued to increase in parallel during the post-war era, economists were motivated to investigate the extent to which migration is able to complement trade. Second, as new trade and growth models developed and evidence made it abundantly clear that countries with more trade friendly policies outperformed closed economies, this encouraged economist to identify and quantify different types of trade barriers. Once it had been established that trade costs were still inhibiting cross-border commercial activity (McCallum, 1995; Anderson and van Wincoop, 2004) and some new trade barriers had been highlighted—such as information and trust friction—it became clear that migration might have a role to play in lowering trade costs.

While evidence of a robust positive relationship between trade and migration can be found in settings that range from individual economies to groups of countries, for countries of different sizes, level of economic development, geography, history, culture, as well as for different types of goods—and even though the evidence has been around for almost two decades—Sweden is the only country to our knowledge where policymakers have given explicit prominence to the idea that migration could facilitate trade.

There are valid reasons for why Swedish policymakers—from government ministers, to members of parliament, to local politicians—have been so particularly keen on utilizing the findings that have suggested a positive influence of migration on trade. Sweden, with its export-oriented economy, is a paragon of the small open economy. Sweden’s economic openness, measured in terms of trade as percent of GDP, was 94 percent in 2011, compared to the average of 54 percent for OECD member countries and 32 percent for the United States (World Bank, 2013). The bulk of the country’s exports come from a relatively small number of multinational companies, which makes the economy highly dependent on foreign trade as well as on open and

predictable markets. Its policymakers know this very well. Subsequently, there is a strong political consensus, from left to right, of the benefits of free trade. As a member of the EU, however, the country is constrained in its options of using conventional trade policy to improve the foreign market conditions for its companies. For instance, Sweden is not allowed to initiate free trade agreements and the European Commission has sole rights to negotiate trade deals with third countries.

It is against this backdrop that the focus on the trade-migration nexus has gained so much attention in Swedish public policy recently. Sweden's policymakers have noted that the research on the trade-migration nexus provides a potential remedy for the constraints entailed by EU membership regarding unilateral action for better trading conditions. The general idea is that immigrants tend to have a good knowledge of the business culture, politics, religion and language of their former home countries. Migrants may be able to lower trade costs through this knowledge and by providing access to contact networks, which reduce trust friction in business relationships. This notion is especially appealing in the eyes of Sweden's policymakers since the country, as one of the most important hosts of immigration among developed countries, already has a large existing stock of potential 'trade facilitators.'

This paper aims at subjecting the beliefs of Swedish policymakers concerning the power of migrants in facilitating trade to empirical scrutiny. We do this by exploiting new trade and migration data for Sweden and 184 of its trading partners over the period 2000-2010. The contribution of this paper is fourfold.

First, it contributes by employing panel estimation techniques and an instrumental variable approach in analyzing the causal relationship between immigration and Sweden's foreign trade. We also examine the causal relationship between immigration and trade using a statistical survey on Swedish firms' hiring decisions. Although Sweden was the first country to start giving emphasis to the trade facilitating role of migrants in a public policy context, no previous study has studied the causal effect of immigration on Swedish foreign trade using instrumental variable analysis. No previous study—to our knowledge—has used survey data to try to clarify the causal characteristic of the trade-migration nexus.

Second, we explicitly address the fact that Sweden has a low level of labor market integration among its foreign born population. Immigrant unemployment is approximately three times as high compared with for natives (SCB 2012) and matching between qualifications and jobs is worse for foreign-born, especially for women (Rooth and Ekberg, 2006; Segendorf and

Teljosuo, 2011).<sup>3</sup> From a policy perspective, it is important to know whether poor integration affects immigrants' postulated capacity to facilitate trade. If integration amplifies the trade impact of immigration, this may justify stronger and better targeted measures at improved labor market participation. On the other hand, if the trade-migration relationship is mainly driven by the prevalence of migrants in the economy, rendering integration irrelevant for the size of the trade-migration relationship, then it might make more sense for policymakers that want to utilize immigration for trade promotion purposes to focus their attention more on implementing more liberal migration policy, especially with respect to countries with which increased trade is considered especially desirable.

Third, this study contributes to the understanding of the role of migration to Sweden's foreign trade by controlling for emigration, which is important in part because Sweden has a large number of multinational firms for its size relative to other countries and it is possible that Swedes move abroad to work for these firms. Also, Swedes tend to travel abroad to a larger extent than other nationalities and many may end up settling in visited countries.<sup>4</sup> Swedish diaspora could be facilitating trade in similar ways as immigrants living in Sweden and this should be controlled for, which has not been done before.

Finally, we analyze the impact of migration on trade along different product margins. Migration may influence trade both through lower fixed and variable trade costs. From a Swedish policy perspective it is important to know which margin might dominate since public spending on trade promotion activities is generally only accepted politically if they aim at lowering fixed trade costs, which are assumed in theory to be more relevant to the extensive margin (*e.g.*, Chaney, 2008) and which in policy are assumed to mainly impede the trade of small and medium sized firms (SOU, 2008; UD, 2009).<sup>5</sup>

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<sup>3</sup> In the latest (2013-2014) country-specific recommendations of the European Commission, one key recommendation for Sweden was to improve labor market integration for "low-skilled youth and people with migrant background". It was specifically noted that at 30.6 percent, the unemployment rate for non-EU nationals exceeds the EU average of 21.3 percent (European Commission, 2013).

<sup>4</sup> The number of departures for international tourism per capita was 1.39 for Sweden in 2010, while the corresponding average number in the OECD was 0.42 (UNWTO, 2013).

<sup>5</sup> The Swedish government appointed a commission in 2007 to investigate the developments of Swedish exports globally and the public instruments in place to promote the internationalization of Swedish firms. The commission published its findings in 2008, putting emphasis on fixed trade costs. In its findings, the commission stated that it had "[i]dentified weaknesses in the Swedish export structure at the firm level. Small and medium sized companies are less successful than large companies, exports to more distant markets are growing slower than exports to the neighboring region, Swedish exports have not been redirected toward rapidly growing markets in Asia and some Swedish source regions have slower export growth than others. These weaknesses are to a large extent related to the existence of fixed trade costs of acquiring the knowledge necessary for successful exports. Here public efforts can make a difference by facilitating [firms'] gathering of knowledge on foreign markets." (SOU, 2008: p. 268, authors' translation)

We find that migration encourages Sweden's exports in the range of 3-4.5 percent as a result of a ten percent increase in the immigrant stock. Unlike previous studies from other countries we find no impact on imports, which we contribute to the large share of immigrants coming from countries in conflict as well as with low overall production and export capacity. We find, however, evidence suggesting a positive link between exports and Swedish diaspora. Furthermore, the results demonstrate that the export influence is the strongest for immigrants who are more integrated in the Swedish labor market, which is a new finding with potentially important implications for policy. The migrant effect is also stronger for differentiated goods and along the extensive product margin of trade, which is consistent with the hypothesis that migration facilitates trade mainly by lowering fixed trade costs through the information and trust channel.

Section 2 discusses Sweden's migration policy and the country's developments in migration and trade. Section 3 provides a conceptual framework and reviews the previous literature. Section 4 presents the method of analysis, the data and addresses some econometric issues. Section 5 analyses the results and section 6 provides conclusions and final remarks.

## **2. Immigration Policy and Trends in Migration and Trade for Sweden**

Between 1998 and 2007, immigration accounted for 77 percent of Sweden's total population increase. In 2007, the country experienced the largest number of incoming immigrants during a single year since measurements began some 150 years ago (SCB, 2013).

The percentage of migrants relative to the domestically born population has also increased over time. In the mid-19<sup>th</sup> century, less than three per thousand people living in Sweden were born in another country. In 1940, foreign-born people made up one percent of the total population, and in 1970, that figure rose to around seven percent. The current figure is about 15 percent or 1.4 million in 2011. Table 1, on the next page, contains information on Sweden's largest immigrant groups and their respective share of the total population in 2012.

During a substantial part of its history, it was instead high levels of emigration that characterized Sweden's development. Since the collection of statistics for external migration started during the mid 19<sup>th</sup> century, up to the 1930s, Sweden experienced an extensive net outflow of people. Approximately one fifth of the Swedish male population that was born in the latter half part of the 19<sup>th</sup> century choose to emigrate (Nilsson, 2004).<sup>6</sup>

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<sup>6</sup> Reasons for the outflow of emigrants, which persisted for almost eight decades, operated both through push and pull factors. They varied from push factors such as laws that impeded the people's freedom, for instance with respect to religion, to natural disasters such as crop failures. Pull factors, especially for the

TABLE 1. Table 1. Sweden's Largest Immigrant Groups, 2012

Immigrant country	Total stock	Share of population	Immigrant country	Total stock	Share of population
1 Finland	163,867	1.71%	11 Norway	42,884	0.45%
2 Iraq	127,860	1.34%	12 Thailand	35,554	0.37%
3 Poland	75,323	0.79%	13 Chile	28,425	0.30%
4 Serbia/Yugoslavia	69,269	0.72%	14 Syria	27,510	0.29%
5 Iran	65,649	0.69%	15 China	26,824	0.28%
6 Bosnia-Herzegovina	56,595	0.59%	16 Lebanon	24,743	0.26%
7 Germany	48,731	0.51%	17 United Kingdom	22,670	0.24%
8 Turkey	45,085	0.47%	18 Romania	22,079	0.23%
9 Denmark	44,209	0.46%	19 Afghanistan	21,484	0.22%
10 Somalia	43,966	0.46%	20 India	19,415	0.20%

Source: Statistics Sweden (2013); authors' calculations.

Sweden's real shift from an emigration to immigration country took place after the end of the Second World War. Economic growth in Europe surged after the war and the production capacity on the continent could not fulfill rising demand. Sweden had been neutral throughout the war, which had kept its factories and infrastructure intact. However, Sweden could not reap the full benefits of this surge in demand since many firms faced challenges of adapting production to the new circumstances, and importantly, because companies faced labor shortages (Magnusson, 1999). Consequently, the government liberalized immigration policy and in 1954 a common Nordic labor market was established. As a result, the whole post-war period up until the 1970s became characterized by considerable net immigration to Sweden. The inflow of foreigners was driven by labor demand, mostly from other European countries with excess labor, such as Finland, Italy, Greece and the former Yugoslavia.

When labor force immigration came to a halt in the 1970s due tighter rules and declining labor demand in export industries, immigration patterns changed in regard to source countries and reasons for immigration. Asylum seekers came to dominate the net inflow of immigrants and source countries shifted to the Balkans in the 1990s and later to countries outside Europe (Lundh and Ohlsson, 1999).

Sweden has continued to be an important country of immigration, in part by remaining one of the most important destination countries for asylum seekers. Furthermore, in recent years Sweden again opened up to labor immigration.

A comparison of inflows of asylum seekers by destination country for the OECD shows that Sweden has the highest number of asylum seekers per capita. For the period 2006-10,

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majority of emigrants that moved to America, included possibilities of higher living standards through higher-paying jobs and better access to fertile lands for farming (Keeley, 2009).

Sweden received 28,210 asylum seekers on average per year, which is in the same range as the United Kingdom (28,250 asylum seekers)—a country with a population almost seven times that of Sweden—and exceeds the numbers of even larger countries such as Germany (OECD, 2013).

In regard to immigration, Sweden’s decision to join the European Union in 1995 was a turning point as it opened up the labor market to the rest of the EU. The enlargement of the Union by ten new countries in 2004 was likely even more important as many of these new member nations were Eastern European countries with a much lower standard of living than the rest of the EU. Unlike many other EU member states, however, Sweden did not impose temporary restraints to the freedom of movement of people from these new member countries (Wadensjö, 2012). Further steps towards opening up the labor market to immigrant workers have been taken since then. In 2007, the most substantial reform to immigration policy since the 1970 was passed through Parliament, which *de facto* opened up the Swedish labor market for immigrant workers from any country as long as a firm was willing to employ (JD, 2012).

Immigration has increased in parallel with a substantial rise in foreign trade. In 1975, Sweden’s imports and exports of goods together amounted to approximately USD 21 billion. A decade later, in 1985, total foreign trade of goods totaled USD 72 billion and in the year 2000, that number had almost tripled. In 2010, despite a financial and economic crisis, Sweden imported goods for USD 152 billion. Exports amounted to USD 162 billion.

TABLE 2. Exports to Immigrant Source Regions

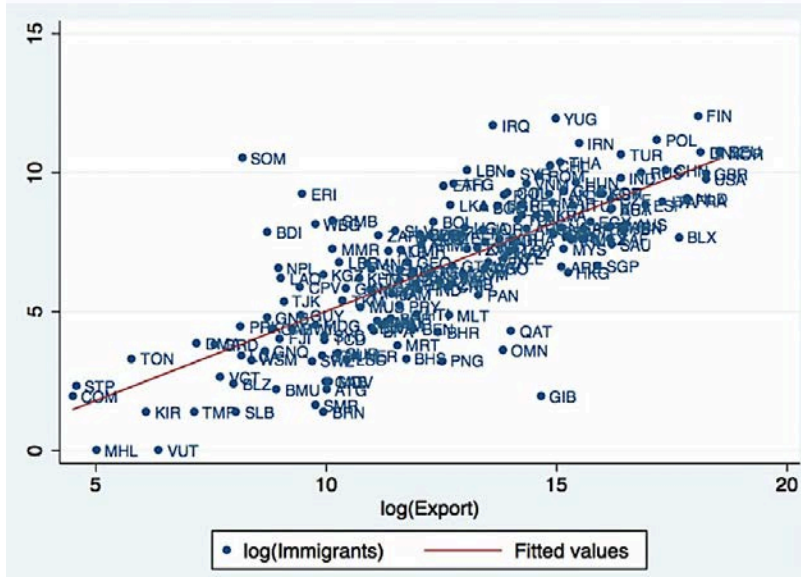
	Immigrants ('000)			Exports (million SEK)		
	2000	2010	Change	2000	2010	Change
World	1,003	1,383	38%	756,010	1,067,359	41%
Rest of Europe	411	434	6%	499,000	693,000	39%
East Europe and Central Asia	240	335	39%	40,700	89,300	119%
Middle East	141	242	72%	15,400	28,800	87%
East Asia and Pacific	54	106	97%	74,100	97,200	31%
Americas	75	95	26%	113,000	117,000	4%
East and Southern Africa	36	78	117%	1,212	3,750	209%
South Asia	27	56	105%	3,602	16,600	361%
North Africa	11	19	68%	7,984	15,400	93%
West Africa	8	17	128%	1,012	6,309	523%

Source: Statistics Sweden; authors’ calculations.

In one decade, from the year 2000 to 2010, imports of goods increased by close to 60 percent, while exports rose by 41 percent. During the same period, the total number of foreign-born persons rose by about 380,000 people, or 38 percent. Figure 1 shows the fitted relationship between Sweden’s immigrant stocks and the level of exports with respect to immigrant source countries.



FIGURE 1. Fitted Relationship: Exports to Immigrants Source Countries (2010)



### 3. Previous Literature

Studies have suggested two main theoretical channels through which migration influences foreign trade by lower trade costs. First, migrants may increase trade through abundant and unique information about their countries of birth, including the ability to communicate in foreign languages. Migrants may also help firms adapt their products and marketing approaches to foreign settings, both when entering a foreign market and thereafter (Casella and Rauch, 2002). Second, migrants have contacts and access to social and business networks in their countries of birth, which can help promote trust between sellers and buyers from different countries. Migrants could also facilitate enforcement of contracts by providing input to the drafting of contracts and by limiting opportunistic behavior via participation in cross-national networks (*e.g.*, Greif, 1989; and Herander and Saavedra, 2005).<sup>7</sup>

<sup>7</sup> In the neoclassical framework, trade and migration are substitutes (Mundell, 1957). Relaxing underlying assumptions, for example allowing for non-identical technologies across countries, it is possible to instead achieve complementarity (Markusen, 1983; Schiff, 2006). Rauch (1991) expanded this approach in a Heckscher-Ohlin model. Some trade-theoretical studies demonstrate how the link between trade and migration can be characterized either by substitutability or complementarity depending on factors such as the skill level of migrants and in which industry of the host country's economy migrants are employed (Panagariya, 1992). Iranzo and Peri (2009) extended a two-country model of trade and factor mobility and considered technological heterogeneity as well as skill differences. In addition to showing that countries may gain economically from migration via increased wage earnings for migrants and expanded output in certain industries of the economy, they showed that migration also results in increased trade. Based on a production-theory approach, Kohli (2002) used a joint revenue function with domestic output as well as exports and found immigration to stimulate imports and to shift the output mix towards non-trade goods, but with no strong relationship with exports. Using a similar methodology and data from the United Kingdom, Hijzen and Wright (2010) treated immigrants and imports as intermediate inputs, from which

Many people who have immigrated to Sweden throughout history have become successful traders thanks to their knowledge of foreign markets and international contacts, whose stories serve as anecdotal evidence in support of the main thesis of the trade-migration literature. Several of the merchants of the Hanseatic League (or simply the ‘Hansa’), a powerful confederation of merchants that were active in the Baltic and the North Sea between the 14<sup>th</sup> and the 17<sup>th</sup> centuries, serve as prime examples. Especially many of the German Hansa merchants who settled permanently in Sweden started trading businesses that became successful through the networks and contacts of these immigrants.<sup>8</sup> Louis de Geer (1587-1652) was a Belgium-born merchant and banker who had established a prosperous business in Holland before migrating to Sweden in 1627, where he became citizen. Louis de Geer kept his fruitful finance and trading business in Amsterdam but utilized his knowledge of foreign markets and contact networks in the trading hubs of places like London, Lisbon, Seville and Venice to develop a new successful trading business in Sweden. Benjamin Hall and his family immigrated to Sweden from England sometime in the late 18<sup>th</sup> century. The family brought with them important knowledge of the British market and kept their connections with the former home country throughout their time in Sweden, which certainly helped of the sons of the family, John Hall, to develop a prosperous business that came to dominate the export of iron from Sweden’s second largest city, Gothenburg, to the United Kingdom for a long time (Johnson, 2010).

Generally, migrants are expected to reduce uncertainty in international trade through their knowledge and access to networks. Establishing open flows of information and knowledge and lowering the risk of shocks from surprising ‘bad news’ can be important for firms seeking to enter into foreign trade because they lower the sunk costs involved (Bernanke, 1983; Dixit, 1989). When migrants provide firms with information and improve trust in relations with their countries of origin, investment decisions, such as the level of participation in foreign trade, become more elastic and more in touch with changes in external conditions in potential foreign markets, as well as with potential trade partners (Bloom, 2007). Because foreign trade, as well as offshoring, can be risky and permeated with uncertainty, migrants’ abilities to reduce uncertainty may be especially important. Through contacts and access to networks, migrants may be in particularly good positions to help firms to address problems and issues that affect businesses abroad on a recurring basis. This could lower variable costs related to firm trade.

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complementarity between high skilled immigrants and imports was confirmed (unskilled immigrant workers were substitutes in production).

<sup>8</sup> These included people such as Godke van Memel (13<sup>th</sup> century), Fredrik Finland (14<sup>th</sup> century) and Johan van Brakel (14<sup>th</sup> century).

One additional channel through which immigrants may increase a country's foreign trade, which has been largely ignored in the previous trade-migration literature, is the possibility that migrants bring with them new ideas that become the basis of new firms that start producing goods for exports. In the case of Sweden, there are several historical examples of this, perhaps the earliest relating to the Walloons, a people who migrated to Sweden in the 17<sup>th</sup> century from mainly southern Belgium. In Sweden they continued to develop their techniques of forging high-quality iron. Their superior methods together with Sweden's abundance of wood necessary for energy in production, contributed to making Sweden one of the most important exporters of iron at the time. Later, Dutch immigrants made an important contribution during the 18<sup>th</sup> century to the development of Sweden's pulp and paper production, which also became an important export product for the economy. Sweden's oldest engineering industry was founded 1822 by Daniel Fraser, a Scottish immigrant (Johnson, 1997; 2007).

In addition to the information and trust channel and the less explored 'entrepreneurial mechanism', migrants may affect trade through their taste and demand preferences for products from their country of origin. This has been noted in the literature on taste discrimination (Becker, 1957; Phelps, 1972) and is what White (2007) has illustratively called the 'transplanted home bias.'

In a pioneering study by Gould (1994), the impact of immigrants in the US was investigated with respect to 47 immigrant source countries over a period of 16 years. The results, which indicated a positive effect of immigration on US foreign trade, resulted in several more studies being conducted for the US (*e.g.*, Dunlevy and Hutchinson, 1999; White, 2007; Bandyopadhyay *et al.*, 2008; Jansen and Piermartini, 2009), other countries (for Canada, *e.g.*, Head and Ries, 1998; Wagner *et al.*, 2002; Partridge and Furtan, 2008; for the UK, Girma and Yu, 2002; for France, Combes *et al.*, 2005; for Spain, *e.g.*, Blanes, 2005; Peri and Requena-Silvente, 2010) as well as for groups of countries (for the OECD, *e.g.*, Lewer, 2006; for a global cross-section of countries, Hatzigeorgiou, 2010a).

Wagner *et al.* (2002), Egger *et al.* (2012) and Law *et al.* (2013) provide good reviews of the empirical literature on the trade-migration nexus.<sup>9</sup> Overall, the link has been found to be larger for trade with dissimilar countries, trade with countries with weak institutions and trade in differentiated products. Genç *et al.* (2011) conducted a meta-analysis based on 48 studies and found that, according to the existing research, a ten percent increase in a country's immigrant stock was associated with 1-2 percent increase in foreign trade. Studies have also shown a strong positive correlation between provincial migration stocks and foreign trade, beyond that between

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<sup>9</sup> Our appendix also includes a comprehensive list of previous studies.

out-of-province stocks and in-province trade (*e.g.*, Serrano-Domingo and Requena-Silvente, 2013).<sup>10</sup>

In sum, most studies have found a positive and statistically significant relationship between immigration and countries' trade with source countries. Despite the bulk of macroeconomic evidence these findings have not provided ubiquitous answers to policymakers in terms of how to view the potential role of migration as a potential vehicle for promoting foreign trade. Importantly, since these studies have not been conducted in the context of labor market analysis, policymakers in countries like Sweden, with considerable unemployment among immigrants—especially young and female immigrants that come from non-European countries—may have little to learn from previous studies as to identify optimal ways of materializing the theoretically postulated presumption that migrants facilitate trade. One contribution of this paper is to bridge this gap in the previous literature by analyzing the role of integration to the possible trade promoting capacity of immigrants in Sweden.

One previous study has looked at trade and immigration for Sweden: Hatzigeorgiou (2010b) studied this relationship and found a positive link, but did not consider product margins of trade and failed to investigate explicitly the causal direction of the link. In order to explain through which mechanisms the potential trade enhancing impact of migration is derived, the analysis should consider different product margins of trade, which in the case of Sweden has never been done. Moreover, the data covered the period up until 2007, just when the most important piece of immigration reform in several decades was passed through Parliament. As a result of this reform, which came into effect in 2008, employers were allowed to hire foreign workers from any country. This could have increased the risk of endogeneity of migration with respect to trade, which means that for Sweden in particular, the endogeneity issue concerning the

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<sup>10</sup> A handful of studies that have emerged lately have tried to utilize firm-level data to analyze the trade-migration nexus. Koenig (2009) examined the relation between a measure of regional immigrant stocks in 1982 and the export propensity of French firms *vis-à-vis* 61 countries in the period 1986-1992 and found a positive and statistically significant association between regional immigrant stocks and firm export propensity, especially for immigrant groups with a higher average age and level of education. Hiller (2011) and Bastos and Silva (2012) studied the relation between total emigrant stocks and exports for a cross section of firms in Denmark in 2001 and in Portugal in 2005, respectively. The former study indicated that emigrants only foster exports of small firms, while the latter suggested that firms in regions with historically large emigration flows are more likely to export and that they export more. Based on an analysis of firm exports from a set of European countries and the regional share of immigrants in four Central European countries, Pennerstorfer (2012) concluded that the proportion of immigrants is strongly associated with export propensity. Hiller (2013) analyzed the role of immigrant employees and regional immigrant communities in export intensity and two-digit product margins of trading Danish manufacturers with respect to 168 countries during the 1995–2005 period. This study found a positive but weakly significant association between immigrant workers and firm export sales.

trade-migration link must be addressed using instrumental variable analysis, which this study does.

#### 4. Model Specification and Estimation Approach

Following the hypothesis that migrants have the potential to reduce information and trust friction and thus facilitate for trade between their current home countries and the countries where they were born, we express our gravity model regression equation in terms of a treatment (immigrants in Sweden),  $M_{jt}$ , on an outcome (trade),  $x_{jt}$  which represents Swedish exports (or imports) to (or from) country  $j$  at time  $t$ , after controlling for relevant co-influencing variation, included in a vector of control variables,  $Z_{jt}$ :

$$\ln(x_{jt}) = \alpha + \beta \ln(m_{jt}) + Z_{jt}\gamma + \varepsilon_{jt}.$$

We include a large number of relevant observables into vector  $Z_{jt}$  in order to isolate the relationship between the immigrant stock variable and foreign trade. As a benchmark, we regress a traditional specification on the augmented gravity equation, where the vector of controls include partners' GDP, distance, contiguity, whether the partner country is landlocked, has English as the main language, is a developing country and also its level of openness to trade in terms of tariffs and non-tariff barriers. Year dummies absorb variation caused by year specific shocks and time-varying characteristics of Sweden.

The vector of controls included in our regressions is similar to the controls included in the previous literature using the gravity model (*e.g.*, Rose, 2004; 2005; Baier and Bergstrand, 2007). In the benchmark case, we have however excluded conventional covariates that control for shared colonial history, common language and so forth. This is because Sweden is the only country where Swedish is the official language (except for Finland, which shares a border with Sweden). Furthermore, Sweden has no history of colonizing other countries, which renders these variables irrelevant.

Anderson and van Wincoop (2003) emphasized the importance of controlling for bilateral trade costs relative to countries' average trade transaction costs in regard to the rest of the world, so-called multilateral trade resistance. Since we cannot construct a specification which captures multilateral trade resistance through time-specific partner country fixed effects, we construct and include time-specific region fixed effects. Together with the comprehensive sets of controls and additional fixed effects, we believe we have minimized the risk of omitted variable bias.

A general issue in estimating the gravity model concerns datasets where many countries do not trade with each other. This could imply that the trade data may not resemble that of a

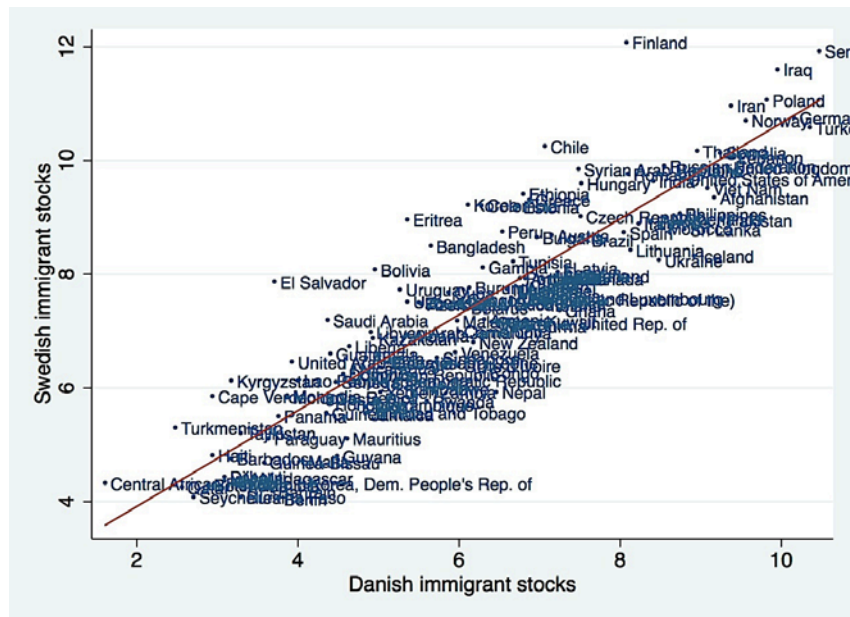
random sample. For this study, however, the problem of censored trade is not considered a problem since Sweden in fact trades with most countries. Also, Swedish trade data is of high quality and suffers only from a small number of missing observations.

A more serious problem concerns that of reverse causality between trade and migration. If trade spurs migration rather than *vice versa*, the treatment variable is to be considered endogenous. Several studies have tried to provide evidence on the direction of causation, mostly using instrumental variable analysis. Following work by McKenzie (2007) and Javorcik *et al.* (2011), some studies used passport costs and legal barriers to migration as an instrument, demonstrating that the direction of causation runs from migration to trade. While Gould (1994), Aguiar *et al.* (2007), Hatzigeorgiou (2010b), Sangita (2013) and other studies have come to the same conclusion, there has still not been proven beyond doubt that the direction of causality runs from migration to trade for all countries under all circumstances. Previous findings are not necessarily externally valid. The potential endogeneity of migration with respect to trade is still an unsettled issue which needs to be addressed by each country-specific study if the aim is to provide insights for policy. In the case of Sweden, we are convinced the endogeneity concern needs to be addressed explicitly using instrumental variable methods.

Passport cost, however, does not constitute a good candidate for a proxy variable within an instrumental variable framework in the case of Sweden. The reason is that passport costs and other administrative costs of immigrating to Sweden historically have been minimal or even non-existent. Administrative costs have not been a barrier to immigration, in other words. Thus, passport cost cannot be used to achieve consistent estimates in presence of endogenous migration with respect to trade. Using exclusively lagged immigrant data to instrument for current immigrant stocks, as Peri and Requena (2010), may not satisfy excludability if immigrants' influence on trade costs takes time to materialize.

In the spirit of Tai (2009), who used French migration data to instrument for Swiss immigrant stocks, we use immigrant stocks of Denmark (the closest neighbor to the south) to instrument for Swedish stocks. The immigrant stocks of Sweden and Denmark are very similar. Out of the ten biggest immigrant populations of Sweden (Denmark is of course excluded), seven of the same countries make up the one of Denmark's ten most substantial immigrant populations. Although the two countries' migration policies have not always been in sync historically, overall similarities in terms of welfare system, economic development, absence of war and armed conflict in modern times provide a reasonable explanation for the high degree of correlation between the two countries' immigrant stocks. Tai (2009) found that Swiss and French immigrant stocks are correlated, but we believe the case for using this type of instrument is even stronger

with respect to Sweden. Beyond instrument relevance, the econometrics requires excludability of the instrument *vis-à-vis* the endogenous variable. In this context, the neighboring country's immigrants should not be able to impact the trade of the exporting country of interest. We have no reason to think that immigrants' in Denmark are able to influence Sweden's trade with immigrant source countries.



<sup>11</sup> As discussed, before the 1960s, immigrant workers were mainly recruited from relatively poor European countries such as Italy, Greece, Spain and Yugoslavia; afterwards, immigration flows were largely made up of refugees.

reform was mainly bolstered as a way of encouraging productivity and filling labor shortages in specific sectors.<sup>12</sup>

It should be recognized, however, that although the aim of the immigration reform was not to promote trade, there are ways through which the reform may have lead trade to become driving force for immigration. For instance, Swedish firms may be more inclined to hire workers from countries with which they trade or have commercial experience, which in the context of our study would cause a problem of endogeneity.

This source of potential endogeneity at the level of the firm is difficult to address because information is rarely available about firms' deliberations and decisions on hiring and foreign trade, which probably explains why previous studies have not been able—beyond theoretical arguments and anecdotal examples—to provide evidence that could abate the endogeneity concern due to reverse causality. Ideally, it would be demonstrated that firms' hiring of foreign-born workers are not influenced with respect to preexisting trade relationships or planned decisions related to trade with immigrant source countries.

To address this issue, we managed to include questions in a Swedish business survey to find out more about the hiring decisions of firms, especially with respect to workers that are born in other countries. The results of this statistical survey indicate that a majority of the responding firms do not make a point of hiring foreign-born workers for reasons explicitly related to their foreign trade; only 9% of the relevant firms stated that knowledge and contacts in other markets were important factors in hiring immigrants. In light of these survey results, therefore, we cannot reject the proposition that hiring of immigrant employees is exogenous to trade.<sup>13</sup>

The survey does not provide a complete and satisfying answer to the potential endogeneity concern because surveys entail their own methodological problems, such as sample selection. We therefore address the issue of potential endogeneity due to reverse causality explicitly in our analysis by estimating the immigrant treatment effect using panel estimation techniques as well as instrumental variable method together with a lagged approach. The

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<sup>12</sup> Additional information on this bill (Prop. 2007/08:147) can be found in JD (2013).

<sup>13</sup> The survey, which included a set of questions proposed by the authors, was conducted by the Swedish Federation of Business Owners (SFBO), Sweden's largest independent business association. It was carried out during March and April of 2013. Approximately 4,000 firms were asked to participate in the survey, and about 1,200 did, which is a normal response rate for a survey conducted by the SFBO. The questions that were proposed by the authors focused on foreign trade, workforce composition, and hiring decisions. One question (translated from Swedish) was as follows: "Based on what qualities does your firm decide to hire foreign-born worker(s)?" The questionnaire asked the respondents to rank various qualities from 1–5 based on importance (1 being "Not at all important" and 5 being "Very important"). Only 3% answered that knowledge of foreign markets and foreign contacts was a very important quality, and only an additional 6% considered this knowledge somewhat important. Conversely, 52% answered that this knowledge was not at all important.



extension of the analysis investigates different sets of controls and analysis for different types of goods along varying product margins and importantly looks at the role of labor market integration.

The dataset constructed for this study includes 184 partner countries and covers the period 2000-2010. Trade and migration data are taken from Statistics Sweden. Information on the GDP and population of trading partners comes from the World Bank's World Development Indicators. The geographical indicators come from the Centre d'Etudes Prospective et d'Informations Internationales. Trade openness is an index based on data from World Bank, the WTO and the US Department of Commerce, constructed by the World Heritage Foundation, which uses countries' trade-weighted average tariff level ( $t_j$ ) plus the incidence of non-tariff barriers to trade ( $n_j$ ) expressed as

$$\tau_j = \left[ \left( \frac{\hat{t}_j - t_j}{\hat{t}_j - \tilde{t}_j} \right) \cdot 100 \right] - n_j,$$

where  $\hat{t}_j$  and  $\tilde{t}_j$  represent the upper and lower bounds of the partner country's tariffs in percent;  $\tilde{t}_j > 0$  and  $\hat{t}_j < 0.5$ . Using both qualitative and quantitative measurements,  $n_j$  is estimated for product groups and services over various sectors in country  $j$ . The existence of non-tariff barriers to trade leads to a lower degree of freedom of trade.<sup>14</sup>

## 5. Results

We report estimated results for each of the estimation approaches. As a benchmark we regress a conventional type gravity equation with year dummies and quasi-controls for time-variant multilateral trade resistances (year-region dummies). The main specification is regressed using within panel estimation, which we also use for providing extended results for testing the role of labor market integration of immigrants to their postulated trade facilitating premises. We adopt a lagged variable approach and instrumental variable regression using the generalized methods of moment estimator to analyze the direction of causation. Then we estimate the trade-migrant link along different product margins of trade and for different types of goods as to further disentangle the channels of influence. Finally, we check the robustness of our results.

### 5.1 Pooled OLS Regression

The results for both exports and imports are presented in Table 3. Looking at the main variable of interest—the stock of immigrants—the results indicate that foreign-born people have a positive and statistically significant relationship with trade. A ten percent increase in the immigrant stock is estimated to be positively related to approximately two percent more exports to the immigrant

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<sup>14</sup> Further details on the data can be found in the appendix.

source country on average. The corresponding link with imports is estimated to be around four percent.

TABLE 3. Pooled OLS Regression Results for Aggregate Trade

	Exports	Imports
	(1)	(2)
Immigrants	0.194*** (0.046)	0.434*** (0.084)
GDP	0.865*** (0.051)	1.016*** (0.094)
Distance	-0.821*** (0.137)	-0.117 (0.273)
Contiguity	1.101*** (0.262)	1.227** (0.525)
Landlocked	-0.569*** (0.156)	-0.839** (0.336)
English	0.610*** (0.138)	0.457 (0.293)
Developing	-0.409** (0.174)	-0.938*** (0.283)
Trade freedom	0.864*** (0.206)	1.159*** (0.389)
Observations	1648	1607
Adjusted $R^2$	0.873	0.785

Notes: Robust and clustered standard errors are in parentheses. The dependent variable is natural log of exports (imports). Regressions account for year and region-year fixed effects, though their coefficients are not shown for brevity.

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

All of the other coefficients have the expected sign: the partner country's GDP has a positive and significant influence on trade with Sweden; the distance from Sweden impacts exports negatively; trade is suggested to be larger with respect to countries with which Sweden shares a border; exports are also higher to countries that have English as official language, while trade is lower with those countries that are landlocked and with respect to developing economies; countries with lower barriers to trade both export and import more to/from Sweden.<sup>15</sup>

## 5.2 Within Estimation

Table 4 provides results from within panel estimation with year indicators, quasi-controls for time-variant multilateral trade resistances as well as partner-specific fixed effects. The immigrant stock variable is positively related to more exports to immigrant source countries. The coefficient is larger than the corresponding estimate from pooled OLS regression and the size of the estimated relationship suggests that an increase in the number of immigrants from a country by ten percent is associated with a three percent export increase to that specific country on average.

<sup>15</sup> Time-variant country-specific variables for Sweden are not possible to estimate due to the inclusion of the year-specific dummies.

For imports, however, the immigrant coefficient is not statistically significant at conventional levels. Previous studies have found a stronger relationship with respect to imports, which has generally been explained by the transplanted home bias because unlike exports, imports can be facilitated both through lower information and trust friction as well as via favoritism in demand of goods originating in immigrants' source countries. Nevertheless, the insignificant coefficient with respect to imports is not unexpected in the case of Sweden.

TABLE 4. Within Panel Data Estimation Results for Aggregate Trade

	Exports	Imports
	(1)	(2)
Immigrants	0.295*	0.292
	(0.151)	(0.288)
GDP	-0.0844	0.230
	(0.158)	(0.222)
Developing	0.143	-0.580
	(0.220)	(0.409)
Trade freedom	0.150	0.257
	(0.120)	(0.315)
Observations	1950	1859
Adjusted $R^2$	0.226	0.030

Notes: Robust and clustered standard errors are in parentheses. The dependent variable is natural log of exports (imports). Regressions account for partner, year and region-year fixed effects, though their coefficients are not shown for brevity.

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

As explained, Sweden in practice has had a moratorium on labor immigration from non-Nordic (and later from non-EU) countries for 40 years. In 1968, new restrictive immigration rules were adopted for countries outside of Scandinavia and it was not until 2008 that Sweden again adopted more liberal labor immigration policies. The country continued to remain, however, particularly open to refugee immigration for the entire period. For several decades, therefore, refugees seeking shelter rather than workers seeking jobs characterized immigration to Sweden. It is against this backdrop that the insignificant immigrant coefficient with respect to imports should be understood. Immigrants that were forced to move to Sweden are more likely to come from countries with low capacity to export. Therefore, even though most migrants are capable of lowering information and trust friction, indicated by the positive coefficient with respect to exports, there might simply not exist the sufficient conditions in all immigrant's countries of birth for the relevant mechanisms to materialize.<sup>16</sup>

<sup>16</sup> The number of immigrants from Iraq provides an illustrative example in this regard. Iraqis in Sweden has grown drastically over the past few years and today constitute the second biggest immigrant group in the country. Although Iraq has experienced substantial economic growth for several years (GDP expanded by an estimated 10.2 percent in 2012), which has contributed to a considerable increase of Swedish exports to the country, crude oil makes up 84 percent of the country's exports (CIA, 2013). In this sense, it makes sense to assume that while Iraqi immigrants may have been able to contribute to promoting Swedish

Additional control variables are not statistically significant at conventional levels, which we attribute to the many fixed effects that are likely to absorb much of the idiosyncratic unobserved variation. We also attribute the lower level of statistical significance of the immigrant variable in regard to exports compared to OLS pooled regression to the inclusion of year indicators and partner-specific fixed effects, alongside quasi-controls for time-variant multilateral trade resistances. While all of the other coefficients are insignificant, the immigrant variable is still significantly related to higher exports at the 10 percent level.

### **5.3 Interaction Effects and the Role of Emigrants**

Since migrants are postulated by theory to influence trade through the reduction in informal trade barriers, more specifically mainly through the information and trust channel, it is possible that the immigrant trade facilitating capacity varies across countries with different levels of relevant trade frictions.

In Table 5, columns 1-3 provide results from regressions for exports with interaction terms. We would expect immigrants from developing countries to have a stronger association with exports to their source countries due to relatively higher prevalence of informal trade barriers. We would also expect immigrants' trade facilitating capabilities to be relatively more important for countries with less open trade policies and countries with higher levels of corruption. To test the first proposition, the preferred specification was estimated with an interaction term made up from the immigrant variable and the variable indicating whether the partner country is a developing economy. We perform the same exercise with variables controlling for trade policies and prevalence of corruption.

The result in the first column confirms that immigrants from countries with developing economies have a stronger association with exports relative to immigrants from richer nations. Likewise, as expected, we find that immigrants from countries with less open economies and those countries with higher levels of corruption are associated with higher exports. The marginal effect of immigration is robust to the inclusion of all these interaction terms and coefficients of the average marginal trade-migrant elasticity is more or less stable around 0.25-0.30 percent.

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exports to Iraq, the country does not produce much for the foreign market overall, making it difficult for Iraqi immigrants to utilize their knowledge and contacts with respect to imports.

TABLE 5. Interaction Effects and Estimation Results with Emigrants

	Developing country (0,1)	Trade openness	Corruption absence	Emigrant control
	(1)	(2)	(3)	(4)
<b>dy/dx Immigrants</b>	<b>0.255*</b> <b>(0.154)</b>	<b>0.280*</b> <b>(0.150)</b>	<b>0.263*</b> <b>(0.151)</b>	
Immigrants	0.143 (0.159)	0.659** (0.272)	0.515*** (0.189)	0.256** (0.108)
Interaction	0.230** (0.106)	-0.0908* (0.050)	-0.0715** (0.034)	
Emigrants				0.144** (0.07)
Observations	1950	1950	1950	169
Adjusted $R^2$	0.236	0.227	0.228	0.8372

Notes: Robust and clustered standard errors are in parentheses. The dependent variable is natural log of exports (results for imports can be found in the appendix). Regressions account for partner, year and region-year fixed effects, though their coefficients are not shown for brevity.

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

It may not only be foreign-born people living in Sweden that help to facilitate Swedish exports to immigrant source countries. Similarly, Swedes living abroad could also contribute to lower trade costs.<sup>17</sup> Swedish emigrants may also increase exports through their own transplanted home bias. To test this ‘emigrant pull effect,’ we run a regression where the emigrant variable is included to control for the total number of Swedes living in relevant partner countries. Since this data is only available for one year, however, it is not possible to augment the main specification with the emigrant covariate. We instead include conventional gravity variables together with region-specific controls in lieu of the year and partner-specific fixed effects. The result is provided in column 4, which demonstrates that emigrants are associated with higher exports, although the estimated relationship is not as strong or substantial as the corresponding link with immigrants.

The result that Swedish emigrants are positively related to more exports from Sweden to emigrants’ home countries means that they are positively related to more imports from Sweden to their country of residence. At first glance, this may seem inconsistent with our finding that immigrants in Sweden do not spur imports on average. As we have discussed, however, we attribute the absence of a significant impact on imports to the large share of refugees in the Swedish immigrant population. Swedish emigrants, on the other hand, do not face the same

<sup>17</sup> Just like there are many examples of immigrants who have contributed to Sweden’s foreign trade throughout history, there are corresponding anecdotes in regard to Swedish emigrants. For instance, naval master Gustaf Öberg emigrated to China in the 1870s and worked as merchant in both China and Indochina. During the 1890s he began importing and selling telecommunication devices from Swedish company LM Ericsson (Johnson, 2013). Export orders from China increased at the turn of the century, after Öberg founded a company which was granted the right to become telephone network operator in Shanghai. Today, Ericsson has nearly half of the Chinese market in mobile communications (Wickman, 2013).

constraints in terms of utilizing their knowledge and contacts to also spur imports from their country of origin. Hence, we consider it logical that emigrants have a positive association with Swedish exports (imports from the perspective of their country of residence), while there is no significant impact on imports of immigrants in Sweden. Furthermore, it is possible that a considerable portion of Swedish emigrants is hired in Swedish multinational firms with offices abroad. A Swedish firm which wants to penetrate a foreign market with the aim of conducting trade between Sweden and that country and hires a Swede to manage the operations overseas, this would imply almost a mechanical positive relationship between emigration and trade. In light of the relatively large number of multinational firms founded and active in Sweden in proportion to the country's size, this mechanism cannot be ruled out.

Notably, our explanation regarding the reason for why immigrants in Sweden—unlike previous studies—do not have an impact on imports, is supported by the inclusion of the emigrant variable when the dependent variable is imports (column 4 in Table 6 in the appendix). The emigrant variable is here statistically significant, which in line with our hypothesis suggests that immigrants from countries with an overall export capacity are able to facilitate imports as well as exports, which is not generally the case for immigrant refugees.<sup>18</sup>

#### **5.4 Estimating the Impact of Labor Market Integration**

How is the knowledge and contacts of immigrants transformed into lower trade costs? The exact way through which trade costs are lower as a result of immigration has not been well established in the previous literature. It is possible that migrants disseminate information and encourage trust which lower trade costs just by being present in their new country of residence, but we find this explanation less likely. Instead, we hypothesize that it is mainly via employment in firms or through setting up new firms that their trade enhancing capabilities materialize. If this is true, it is possible that the relationship may vary in regard to groups of immigrants with various levels of integration into the Swedish labor market. Employment levels vary not only between natives and people born abroad, but also within the group of foreign-born people, not the least across gender and age groups. For instance, the employment rate in Sweden for all native-born males in 2012 was 78 percent, while it was ten percentage points lower for foreign-born males, 68 percent. Native-born females had an employment level of 76 percent and foreign-born women 59 percent, which corresponds to a considerable difference of 17 percentage points (OECD, 2013).

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<sup>18</sup> As a test of diminishing returns of migration to exports, we also regressed a specification which included a squared immigrant stock term. We found no evidence of diminishing returns.

To test for this hypothesis, immigrants are divided into different groups depending on their gender and their age. We consider foreign-born people below the age of 35 as ‘young’, those between 35 and 54 as ‘middle aged’ and those older than 55 as ‘old.’

As seen in Table 6, estimating the trade-immigrant relationship for male and female immigrants separately demonstrates a consistent significant and positive immigrant-link with exports for males. For female immigrants, however, the coefficient is not significant at conventional levels. At the same time, middle-aged immigrants are significantly related to more exports by the same degree as male immigrants in general. Young immigrants are also positively related to more exports, but the coefficient is smaller. No statistically significant link is found for old immigrants.

TABLE 6. Panel Estimation Results for Gender and Age Subgroups (proxies for labor market integration)

	Male	Female	Young	Middle	Old
	(1)	(2)	(3)	(4)	(5)
Immigrants	0.288** (0.136)	0.252 (0.166)	0.203* (0.112)	0.280** (0.122)	-0.0000196 (0.000)
GDP	-0.0886 (0.159)	-0.0910 (0.159)	-0.0846 (0.160)	-0.0877 (0.158)	-0.0856 (0.159)
Developing	0.139 (0.218)	0.0821 (0.228)	0.125 (0.218)	0.118 (0.222)	0.0872 (0.209)
Trade freedom	0.138 (0.120)	0.163 (0.122)	0.144 (0.122)	0.180 (0.123)	0.168 (0.128)
Observations	1936	1929	1927	1924	1987
Adjusted $R^2$	0.228	0.224	0.228	0.226	0.193

Notes: Robust and clustered standard errors are in parentheses. The dependent variable is natural log of exports (results for imports can be found in the appendix). Regressions account for partner, year and region-year fixed effects, though their coefficients are not shown for brevity.

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

The results for these subgroups of immigrants indicate that the strongest impact on exports is found for foreign-born people who have a stronger position in the Swedish labor market, either through employment in Swedish firms or through self-employment.<sup>19</sup> Unemployment is more common for immigrant women than for males and for young as well as old people. Subsequently, we interpret the results for the different subgroups based on gender and age to be suggestive of our proposition that the trade-migration nexus is likely to be derived from immigrants’ employment in Swedish firms rather than an abstract ‘presence effect.’

<sup>19</sup> Unfortunately we do not have data to disentangle between employment in firms from self-employment. We have to accept the fact that the ‘integration parameter’ may either come from foreign-born workers disseminating information to firms in which they are employed and/or through as founders and managers of new firms.

## 5.5 Causality

We start to analyze the direction of causation by lagging the immigrant parameter by three periods, with results displayed in columns 1 and 2 of Table 7. While this approach leads to fewer observations, the results are robust to the inclusion of lagged variables, which suggests that the direction of the within-partner-country relationship is from immigrants to trade.<sup>20</sup>

Now we turn to instrumental variable analysis. Potential endogeneity of the immigrant employment parameter is tested with a Hausman test, which indicates that the parameter is not necessarily endogenous.<sup>21</sup> Nevertheless, since there are legitimate theoretical reasons for suspecting that the relationship might be characterized by reverse causality, we prefer to be safe than sorry and proceed with instrumental variable (IV) analysis.

The IV-estimation results are presented in columns 3 and 4 of Table 7. We find that the coefficient of the immigrant stock is strongly statistically significant and positive for exports, but not for imports, as was also the case with panel estimation. With respect to exports, the instrumental variable approach using the generalized method of moments (GMM) estimator however suggests a stronger immigrant impact relative to panel estimation.

TABLE 7. Results from Lagged Panel Regression and 2-step GMM IV analysis

	Lagged approach <sup>a</sup>		IV analysis	
	Exports	Imports	Exports	Imports
	(1)	(2)	(3)	(4)
Immigrants	0.222* (0.124)	-0.0690 (0.273)	0.440** (0.213)	-0.633 (0.429)
GDP	0.0175 (0.062)	0.256 (0.235)	0.0902* (0.053)	0.514*** (0.173)
Developing	-0.0531 (0.181)	-0.448 (0.660)	-0.0841 (0.169)	-0.651 (0.463)
Trade freedom	0.0849 (0.156)	0.117 (0.375)	0.0115 (0.126)	0.153 (0.341)
Observations	1414	1362	1509	1447
Adjusted / Centered R <sup>2</sup>	0.191	0.017	0.2544	-3.5403

Notes: Robust and clustered standard errors are in parentheses. The dependent variable is natural log of exports (imports). Regressions account for partner, year and region-year fixed effects, though their coefficients are not shown for brevity. Excluded instruments in GMM estimation are the logarithm of Danish immigrant stocks and Swedish immigrant stocks lagged by two periods.

<sup>a</sup> Lagged by three periods

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

The within-partner-country IV analysis indicates that causality runs from immigration to trade. Concerning instrument validity, the Kleibergen-Paap rk Lagrange multiplier and Wald F statistics make us reject the null hypotheses of under-identification and weak partial correlation

<sup>20</sup> Additional regressions with lags of two and four periods did not render the immigrant coefficient insignificant.

<sup>21</sup> The test rejected the null hypothesis of no endogeneity at the 17 percent level.



between the instrument and the immigrant employment variable. Finally, the assumption that the instrument is exogenous to the error term is examined with Hansen's J test, on the basis of which we do not reject the null hypothesis of exogeneity at conventional significance levels.<sup>22</sup>

These results do not only suggest that the impact of immigration on exports is statistically significant, but also economically substantial. A ten percent increase of the immigrant stock is associated with an increase of exports to migrant source countries by around 4.4 percent on average, which is a larger than the average 1-2 percent increase suggested by the meta-analysis of Genç *et al.* (2011).

## 5.6 Results to Disentangle the Mechanisms of Influence

Migration has the potential to influence both the extensive and intensive product margins of trade. Still, as pointed out by Coughlin and Wall (2011), it is not necessarily the case that migrants' impact on entry trade costs is identical to their impact on costs that determine the intensity of existing trade relationships. Theory does not provide a clear answer to what margin migrants are expected to have the most significance. Arguably, migrants may be able to lower fixed trade costs, in terms of lowering entry barriers by providing connections and access to networks vital for conducting business in a foreign market for the first time. Yet it is also reasonable to expect migrants to possess ability to lower variable trade costs, for instance by facilitating for perpetual business processes in former home countries.

In order to differentiate between effects on different product margins of trade, we perform separate regressions based on the number of products traded and the average traded value per product at the most disaggregate (eight-digit) level. Furthermore, alongside the analysis of the product margins of trade, we perform tests to check the validity of the hypothesis that migrants lower trade costs by reducing information and trust friction. We would expect a stronger association for trade in differentiated goods than for trade in homogeneous goods, because trade in differentiated goods tends to be more elastic with respect to knowledge and trust. Following Rauch (1999), trade data is divided into three categories: differentiated goods, reference-priced goods and homogeneous goods, where the latter two groups are assumed here to be homogeneous.<sup>23</sup> We then perform estimations separately for these groups.

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<sup>22</sup> For exports: Kleibergen-Paap ( $p$ )=0.0000, Kleibergen-Paap ( $F$ )=240.138, Hansen J ( $p$ )= 0.8196.

<sup>23</sup> Bastos and Silva (2010) confirmed the validity of such a binary classification using firm-product-partner-country data for Portugal in 2005. Export unit values differ substantially more within a product category at the 8-digit CN level for differentiated goods.

Table 8. Estimation Results for Differentiated and Homogeneous Goods across Product Margins

	Panel estimation		IV estimation	
	Differentiated	Homogeneous	Differentiated	Homogeneous
	(1)	(2)	(3)	(4)
EXTENSIVE MARGIN <sup>a</sup>	0.202*** (0.059)	0.210** (0.084)	0.331*** (0.112)	0.461 (0.744)
Observations	1786	1736	1420	1388
Adjusted / Centered $R^2$	0.122	0.140	-0.1739	-2.3230
INTENSIVE MARGIN <sup>b</sup>	0.0604 (0.104)	-0.0530 (0.138)	-0.363 (0.226)	0.613 (1.680)
Observations	1786	1736	1420	1388
Adjusted / Centered $R^2$	0.078	0.133	-3.6945	-3.7939

Notes: Robust and clustered standard errors are in parentheses. Regressions account for partner, year and region-year fixed effects, though their coefficients are not shown for brevity. Excluded instruments in GMM estimation are the logarithm of Danish immigrant stocks and Swedish immigrant stocks lagged by two periods.

<sup>a</sup> Dependent variable is the logarithm of the total number of exported products.

<sup>b</sup> Dependent variable is the logarithm of the average value of exports per product.

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

As indicated by the results in Table 8, immigrants enhance trade with source countries along the extensive product margin rather than along the intensive margin. We interpret this as evidence of migrants' ability to lower mainly fixed trade costs, rather than variable trade costs.

The immigrant trade impact for the extensive margin is suggested by IV estimation to be stronger for differentiated compared to within panel estimation, and also relative to homogeneous goods, which is insignificant according to IV estimation. This indicates that migrants' role in lowering fixed trade costs concerns especially differentiated goods, which is consistent with the hypothesis that migration mainly lower trade costs by reduction of information and trust friction.

## 5.7 Robustness Checks

Table 9, on the next page, provides results from various robustness checks. The positive immigrant impact on exports is not suffering from problems due to zero or missing trade flows: the key results are robust to both adding a constant to the dependent variable and estimating the main specification using the Tobit estimator. Neither the exclusion of the largest immigrant source countries nor the largest trading partners alter the main results.

Table 9. Robustness Checks

	Dep. variable: ln(Exports+1)	Tobit estimation	Excl. top five immigrant countries	Excl. top five export markets
	(1)	(2)	(3)	(4)
Immigrants	0.438** (0.213)	0.643*** (0.047)	0.425** (0.216)	0.442** (0.214)
GDP	0.0923* (0.052)	0.405*** (0.057)	0.0886 (0.054)	0.0896* (0.053)
Developing	-0.0804 (0.169)	0.152 (0.134)	-0.0838 (0.168)	-0.0795 (0.169)
Trade freedom	-0.0342 (0.139)	0.245* (0.138)	-0.00945 (0.125)	0.0111 (0.126)
Observations	1511	1959	1464	1473
Adj. / Cent. $R^2$ / Likelihood	0.119	-2783.7715	0.131	0.130

Notes: Robust and clustered standard errors are in parentheses. The dependent variable is natural log of exports. Regressions account for partner, year and region-year fixed effects, though their coefficients are not shown for brevity. Excluded instruments in GMM estimation are the logarithm of Danish immigrant stocks and Swedish immigrant stocks lagged by two periods.

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

## 6. Conclusion and Final Remarks

Evidence of a positive relationship between trade and migration has been around for almost two decades. Despite of this, governments have largely failed to give emphasis to the potential trade facilitating effect of migration in public policy. This paper took departure in the unique position of decision makers in Sweden—a paragon of a small open economy with a substantial immigrant population—have taken in giving explicit emphasis to the potential trade enhancing role of migration in public policy. Several senior members of government, parliament and authorities have started put forward that the country should consider utilizing its large immigrant population with the aim of increasing foreign trade.

The purpose of this study has been to contribute to the literature on the trade-migration nexus in general and specifically to put policymakers' statements regarding migration as a trade enhancing tool to empirical scrutiny.

To fulfill this aim we used new trade and migration data for Sweden to estimate—using panel data techniques and instrumental variable methodology—a gravity model that control for unobserved effects as well as possible endogeneity of immigration. The analysis provides evidence in support of the hypothesis that migration encourages Sweden's exports in the range of 3-4.5 percent as a result of a ten percent increase in the immigrant stock. Unlike previous studies, we found no effect with respect to imports, which we contributed to the large share of immigrants coming from countries in conflict and with general low overall production and export capacity. This means that in the case of Sweden—and possibly also other countries where many immigrants are refugees—the aim of utilizing migration as a trade enhancing tool may mainly be

effective with respect to exports. We found evidence of a positive link between exports and the emigrant diaspora.

This study adds to the existing literature on trade and migration in several ways. In addition to implementing a robust estimation strategy and an instrument for Swedish immigrant stocks which deals with a potential endogeneity problem, an important contribution of this paper has been to analyze the importance of migrants' labor market integration to impact on trade costs. In light of the fact that unemployment rates in Sweden vary considerably between groups of immigrants according to factors such as gender and age, we have been able to infer that immigrants' impact on trade are likely to derive from employment in Swedish firms; the effect is strongest for immigrants that are better integrated in the Swedish labor market. We furthermore found that the effect is stronger for differentiated goods and along the extensive product margin of trade, which is consistent with the hypothesis that migration facilitates trade mainly by lowering fixed trade costs and through the information and trust channel.

The findings from this study may have important implications for policy. Unemployment among immigrants in Sweden, as in many other developed countries, is considerably higher than for the native population. The benefit of facilitating increased integration of migrants into the labor force seems particularly relevant in light of the findings of this study. The results of this study have suggested that immigration, emigration and integration can encourage exports. Thus, they could provide options for countries aiming to promote trade and internationalization among its firms, beyond conventional trade policy. In this vein, Swedish policymakers are correct in giving prominence to migration within a trade context. Importantly, since our results suggest that integration may enhance the positive impact of immigration on exports, policymakers could promote trade by improving immigrants' labor market integration and by encouraging entrepreneurship among immigrants. This means policy initiatives are not necessarily restricted to adopting more liberal immigration policies that are generally more controversial.

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## **A P P E N D I X**

### **‘Migration, Trade and Integration – Evidence and Policy Implications’**

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#### **1. Data and Further Descriptive Statistics**

Table 1 provides information on the variables used for estimation and their sources. Table 2 lists all the countries included in the data. Table 3 provides a snapshot of the panel dataset for 2010.

Foreign trade data were obtained from the Swedish Foreign Trade Statistics (FTS) office. These include export/import values—in SEK—and information on the destination/source country. With respect to merchandise, trade is reported at the 8-digit, so-called Combined Nomenclature (CN8) level. The CN is the European Union classification system for merchandise. Essentially, it adds two additional digits to the conventionally used 6-digit Harmonized Commodity Description and Coding System (Harmonized System), developed by the World Customs Organization. For non-EU member countries, merchandise trade data were obtained from compulsory registration data collected by Swedish Customs.

Sweden is the reporter in our data set. To address the issue of correctly matching data from different sources, which can be problematic with respect to the appearance of new countries—mainly as a result of the break-up of the Soviet Union, Yugoslavia and Czechoslovakia—Yugoslavia was treated as one entity (under the heading of Serbia). The former Czechoslovakia was treated as a separate entity (under the heading of the Czech Republic). One advantage of this approach is that it facilitates panel data analysis because partner countries are consistent over the years covered in the study. Migrants from the former Soviet Union (USSR), which disintegrated before the period covered in our data set, were re-classified as having been born in Russia and consequently matched with Sweden’s trade with Russia. This is somewhat unsatisfactory but was necessary because we lacked information on the parts of the USSR from which the immigrants came. Consequently, immigrants born in the USSR were assumed to only be able to potentially affect trade with Russia, not with independent countries that were once republics in the USSR. Finally, to make the data on trade and migration consistent with the gravity data, trade and migration information for Belgium and Luxembourg were merged, as were data for Liechtenstein and Switzerland.

#### **2. Literature Review**

Table 4 provides a comprehensive list of previous studies of the trade-migration nexus.

#### **3. Estimation Results in Full**

Tables 5-8 provide estimation results in full.

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**Tables and Figures**

TABLE 1. Data Description and Sources

Variable	Definition	Sources
Exports/Imports	Merchandise trade in 1,000 SEK (approx. 148 USD)	Statistics Sweden
Immigrants	Number of foreign-born individuals from a specific partner country.	Statistics Sweden
Developing	Unity if the partner is a developing country (<\$6,000), in line with the definition of Rodrik (2008), zero otherwise	World Bank
Emigrants	Number of Swedish-born individuals living in a specific partner country.	Global Migrant Origin Database
GDP	Partner’s GDP calculated in constant prices.	World Bank
Distance	Distance in kilometers between Stockholm and the partner’s capital.	CEPII
Adjacency	Unity if the partner shares a national border with Sweden, zero otherwise.	CEPII
Landlocked	Unity if the partner is landlocked, zero otherwise.	CEPII
English	Unity if English is official language in the partner country, zero otherwise.	CEPII
Trade openness	Index based on the partner’s trade-weighted average tariff, plus the incidence of non-tariff barriers to trade (0-100, where higher values correspond to freer trade).	Heritage Foundation
Corruption absence	Index of the incidence of corruption (0-100, where a higher value corresponds to a lower incidence of corruption).	Heritage Foundation

TABLE 2. Countries included in the Sample

Afghanistan	Dominica	Latvia	Sao Tome and
Albania	Dominican Republic	Lebanon	Principe
Algeria	East Timor	Lesotho	Saudi Arabia
Angola	Ecuador	Liberia	Senegal
Antigua and Barbuda	Egypt	Libyan Arab Jamahiriya	Serbia
Argentina	El Salvador	Lithuania	Seychelles
Armenia	Equatorial Guinea	Madagascar	Sierra Leone
Australia	Eritrea	Malawi	Singapore
Austria	Estonia	Malaysia	Solomon Islands
Azerbaijan	Ethiopia	Maldives	Somalia
Bahamas	Fiji	Mali	South Africa
Bahrain	Finland	Malta	Spain
Bangladesh	France	Marshall Islands	Sri Lanka
Barbados	Gabon	Mauritania	Sudan
Belarus	Gambia	Mauritius	Suriname
Belgium and Luxembourg	Georgia	Mexico	Swaziland
Belize	Germany	Micronesia	Switzerland
Benin	Ghana	Moldova, Rep. of	Syrian Arab Republic
Bermuda	Gibraltar	Mongolia	Tajikistan
Bhutan	Greece	Morocco	Tanzania, United Rep. of
Bolivia	Grenada	Mozambique	Thailand
Botswana	Guatemala	Namibia	Togo
Brazil	Guinea	Nepal	Tonga
Brunei Darussalam	Guinea-Bissau	Netherlands	Trinidad and Tobago
Bulgaria	Guyana	New Zealand	Tunisia
Burkina Faso	Haiti	Nicaragua	Turkey
Burma	Honduras	Niger	Turkmenistan
Burundi	Hong Kong	Nigeria	Tuvalu
Cambodia	Hungary	Norway	Uganda
Cameroon	Iceland	Oman	Ukraine
Canada	India	Pakistan	United Arab Emirates
Cape Verde	Indonesia	Palau	United Kingdom
Central African Republic	Iran	Panama	United States of America
Chad	Iraq	Papua New Guinea	Uruguay
Chile	Ireland	Paraguay	Uzbekistan
China	Israel	Peru	Vanuatu
Colombia	Italy	Philippines	Venezuela
Comoros	Jamaica	Poland	Viet Nam
Congo	Japan	Portugal	West Bank and Gaza
Congo (Democratic Republic of the)	Jordan	Qatar	Yemen
Costa Rica	Kazakstan	Romania	Zambia
Cote d'Ivoire	Kenya	Russian Federation	Zimbabwe
Cuba	Kiribati	Rwanda	
Cyprus	Korea	Saint Kitts and Nevis	
Czech Republic	Korea, Dem. People's Rep. of	Saint Lucia	
Denmark	Kuwait	Saint Vincent and the Grenadines	
Djibouti	Kyrgyzstan	Samoa	
	Lao People's Democratic Republic	San Marino	

TABLE 3. Summary Statistics for Key Variables

	Mean	Median	Std. dev.	Min.	Max.
Export value	5,226,837	195,521	1.58e+07	0	1.24e+08
Import value	4,565,493	19,859.5	1.64e+07	0	1.94e+08
Number of immigrants	6,315.174	587.5	19,895.8	0	195,447
Number of emigrants	1,635.582	42	6,161.085	0	54,466

Note: The data refer to the year 2010 (except for emigrants). Monetary values are in 1,000 SEK (approximately 148 USD). Only merchandise trade is considered.

TABLE 4. Sweden's Largest Immigrant Groups, 2012

	Immigrant country	Total stock	Share of population		Immigrant country	Total stock	Share of population
1	Finland	163,867	1.71%	11	Norway	42,884	0.45%
2	Iraq	127,860	1.34%	12	Thailand	35,554	0.37%
3	Poland	75,323	0.79%	13	Chile	28,425	0.30%
4	Serbia/Yugoslavia	69,269	0.72%	14	Syria	27,510	0.29%
5	Iran	65,649	0.69%	15	China	26,824	0.28%
6	Bosnia-Herzegovina	56,595	0.59%	16	Lebanon	24,743	0.26%
7	Germany	48,731	0.51%	17	United Kingdom	22,670	0.24%
8	Turkey	45,085	0.47%	18	Romania	22,079	0.23%
9	Denmark	44,209	0.46%	19	Afghanistan	21,484	0.22%
10	Somalia	43,966	0.46%	20	India	19,415	0.20%

Source: Statistics Sweden (2013); authors' calculations.

FIGURE 1. Fitted Relationship: Exports to Immigrant Source Countries (2010)

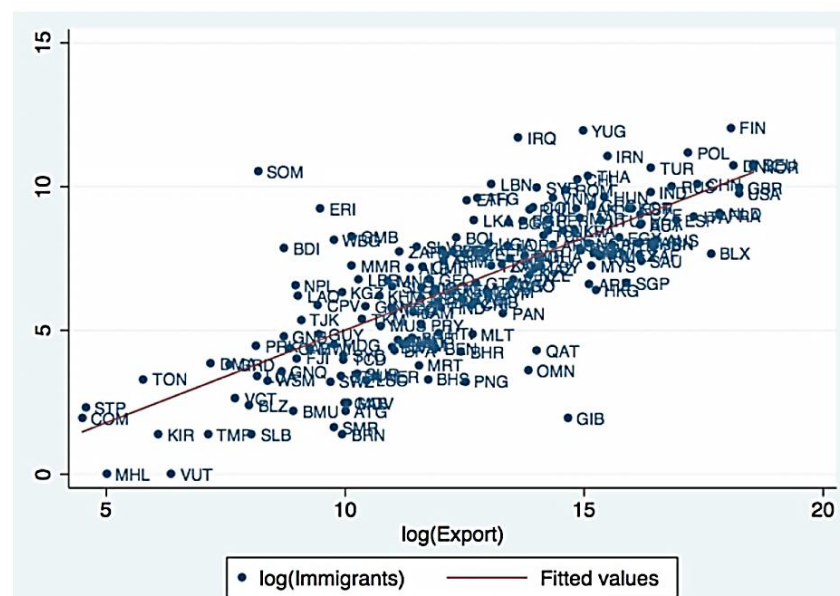


TABLE 5. Exports to Immigrant Source Regions

	Immigrants ('000)			Exports (million SEK)		
	2000	2010	Change	2000	2010	Change
World	1,003	1,383	38%	756,010	1,067,359	41%
Rest of Europe	411	434	6%	499,000	693,000	39%
East Europe and Central Asia	240	335	39%	40,700	89,300	119%
Middle East	141	242	72%	15,400	28,800	87%
East Asia and Pacific	54	106	97%	74,100	97,200	31%
Americas	75	95	26%	113,000	117,000	4%
East and Southern Africa	36	78	117%	1,212	3,750	209%
South Asia	27	56	105%	3,602	16,600	361%
North Africa	11	19	68%	7,984	15,400	93%
West Africa	8	17	128%	1,012	6,309	523%

Source: Statistics Sweden; authors' calculations.

TABLE 6. Previous Studies on Trade and Migration (Sorted by data level and date of publication)

Author	Date of publication	Data level	Country coverage	Author	Date of publication	Data level	Country coverage
Gould	1994	macro	US	Parsons	2012	macro	World
Head and Ries	1998	macro	Canada	Vézina	2012	macro	Switzerland
Dunlevy and Hutchinson	1999	macro	US	Law <i>et al.</i>	2013	macro	New Zealand
Ching and Chen	2000	macro	Canada	White and Tadesse	2007a	macro	Italy
Girma and Yu	2002	macro	UK	White and Tadesse	2007b	macro	Australia
Rauch and Trinidad	2002	macro	World	Faustino and Leitão	2008a	macro	Portugal
Piperakis <i>et al.</i>	2003	macro	Greece	Faustino and Leitão	2008b	macro	Portugal
Bruder	2004	macro	Germany	Hatzigeorgiou	2010a	macro	Sweden
Bryant <i>et al.</i>	2004	macro	New Zealand	Hatzigeorgiou	2010b	macro	World
Parsons	2005	macro	EU-15	Helliwell	1997	meso	North-America
Caravire Bacarreza and Ehrlich	2006	macro	Bolivia	Wagner <i>et al.</i>	2002	meso	Canada
Hong and Santhapara	2006	macro	Malaysia	Bardhan and Guhatkakurta	2004	meso	US
Lewer	2006	macro	OECD-countries	Herander and Saavedra	2005	meso	US
Ghatak and Piperakis	2007	macro	UK	Dunlevy	2006	meso	US
White	2007	macro	Denmark	Co <i>et al.</i>	2007	meso	US
Blanes	2008	macro	Spain	Bandyopadhyay <i>et al.</i>	2008	meso	US
Felbermayr <i>et al.</i>	2008	macro	World	Partridge and Furtan	2008	meso	Canada
Ivanov	2008	macro	Germany	Tadesse and White	2008	meso	US
Qian	2008	macro	New Zealand	White and Tadesse	2008	meso	US
Ghatak <i>et al.</i>	2009	macro	UK	Briant <i>et al.</i>	2009	meso	France
Gonçalves and Africano	2009	macro	EU	White	2009	meso	US
Jansen and Piermartini	2009	macro	US	Peri and Requena	2010	meso	Spain
Kandogan	2009	macro	Switzerland	Tadesse and White	2010	meso	US
Lewer and van den Berg	2009	macro	World	Bowen and Pédussel-Wu	2011	meso	OECD-countries
Murat and Pistoiesi	2009	macro	Italy	Coughlin and Wall	2011	meso	US
Tai	2009	macro	Switzerland	Artal-Tul <i>et al.</i>	2012	meso	Italy-Portugal-Spain
Piperakis	2011	macro	EU	Bratti <i>et al.</i>	2012	meso	Italy
Bo and Jacks	2012	macro	Canada	Good	2012	meso	North-America
Egger <i>et al.</i>	2012	macro	World	Koenig	2009	micro	France
Felbermayr and Toubal	2012	macro	OECD-countries	Hiller	2011	micro	Denmark
Konečný	2012	macro	World	Bastos and Silva	2012	micro	Portugal
Murat	2012	macro	UK	Pennerstorfer	2012	micro	Central European countries
Aleksynska and Peri	2014	macro	World	Hiller	2013	micro	Denmark

TABLE 7. Interaction Effects and Estimation Results with Emigrants in Full Sample (Exports)

	Developing dummy	Trade openness	Corruption absence	Emigrant control
	(1)	(2)	(3)	(4)
<b>dy/dx Immigrants</b>	<b>0.255*</b> <b>(0.154)</b>	<b>0.280*</b> <b>(0.150)</b>	<b>0.263*</b> <b>(0.151)</b>	
Immigrants	0.143 (0.159)	0.659** (0.272)	0.515*** (0.189)	0.256** (0.108)
GDP	-0.0989 (0.135)	-0.0845 (0.158)	-0.0905 (0.159)	0.737*** (0.111)
Developing	-1.319** (0.644)	0.152 (0.219)	0.169 (0.219)	-0.654* (0.332)
Trade freedom	0.128 (0.119)	0.713** (0.346)	0.176 (0.114)	-0.0788 (0.353)
Immigrants x Developing	0.230** (0.106)			
Immigrants x Trade freedom		-0.0908* (0.050)		
Immigrants x Corruption absence			-0.0715** (0.034)	
Distance				-0.560* (0.292)
Contiguity				0.797** (0.402)
Landlocked				-0.350 (0.294)
English				0.767*** (0.274)
Corruption absence			0.469* (0.272)	
Emigrants				0.144** (0.066)
Fixed effects	Partner, year, region-year	Partner, year, region-year	Partner, year, region-year	Region
Observations	1950	1950	1950	169
Adjusted $R^2$	0.236	0.227	0.228	0.824

Notes: Robust and clustered standard errors are in parentheses. The dependent variable is the natural log of the exports.

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

TABLE 8. Interaction Effects and Estimation Results with Emigrants in Full Sample (Imports)

	Developing dummy	Trade openness	Corruption absence	Emigrant control
	(1)	(2)	(3)	(4)
<b>dy/dx Immigrants</b>	<b>0.276</b> <b>(0.291)</b>	<b>0.355</b> <b>(0.281)</b>	<b>0.281</b> <b>(0.289)</b>	
Immigrants	0.238 (0.310)	-1.095* (0.620)	0.371 (0.425)	0.294* (0.162)
GDP	0.233 (0.217)	0.230 (0.222)	0.227 (0.221)	1.017*** (0.151)
Developing	-1.108 (1.054)	-0.616 (0.408)	-0.576 (0.417)	-0.773 (0.504)
Trade freedom	0.250 (0.316)	-1.949** (0.972)	0.272 (0.324)	0.869 (0.843)
Immigrants x Developing	0.0826 (0.140)			
Immigrants x Trade freedom		0.346*** (0.126)		
Immigrants x Corruption absence			-0.0255 (0.093)	
Distance				0.0812 (0.463)
Contiguity				2.071*** (0.697)
Landlocked				-0.567 (0.468)
English				0.295 (0.413)
Corruption absence			0.117 (0.657)	
Emigrants				-0.00531 (0.115)
Fixed effects	Partner, year, region-year	Partner, year, region-year	Partner, year, region-year	Region
Observations	1859	1859	1859	165
Adjusted $R^2$	0.030	0.039	0.029	0.734

Notes: Robust and clustered standard errors are in parentheses. The dependent variable is the natural log of imports.

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

TABLE 9. Panel Estimation Results for Gender and Age Subgroups for Imports

	Male	Female	Young	Middle	Old
	(1)	(2)	(3)	(4)	(5)
Immigrants	0.205 (0.277)	0.387 (0.292)	0.203 (0.223)	0.201 (0.231)	0.0000177 (0.000)
GDP	0.245 (0.220)	0.226 (0.221)	0.223 (0.225)	0.242 (0.220)	0.218 (0.220)
Developing	-0.576 (0.405)	-0.531 (0.425)	-0.592 (0.407)	-0.609 (0.409)	-0.624 (0.403)
Trade freedom	0.247 (0.313)	0.305 (0.312)	0.256 (0.315)	0.325 (0.313)	0.264 (0.320)
Observations	1853	1838	1846	1835	1883
Adjusted $R^2$	0.030	0.030	0.029	0.029	0.035

Notes: Robust and clustered standard errors are in parentheses. The dependent variable is the natural log of imports.

Regressions account for partner, year and region-year fixed effects, although their coefficients are not shown for the sake of brevity.

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$



TABLE 10. Robustness Checks for Imports

	Dep. variable: ln(Imports+1)	Tobit estimation	Excl. top five immigrant countries	Excl. top five import markets
	(1)	(2)	(3)	(4)
Immigrants	-0.138 (0.375)	0.715*** (0.071)	-0.673* (0.409)	-0.645 (0.433)
GDP	0.373** (0.160)	0.814*** (0.084)	0.464*** (0.168)	0.513*** (0.173)
Developing	-0.409 (0.463)	-0.429* (0.224)	-0.677 (0.465)	-0.649 (0.463)
Trade freedom	0.374 (0.376)	0.891*** (0.247)	0.0630 (0.337)	0.153 (0.341)
Observations	1511	1959	1403	1411
Adj./Cent. $R^2$ / Likelihood	-0.100	-3795.3484	-4.250	-4.416

Notes: Robust and clustered standard errors are in parentheses. The dependent variable is the natural log of imports. Regressions account for partner, year and region-year fixed effects, although their coefficients are not shown for brevity. Excluded instruments in GMM estimation are the logarithm of Danish immigrant stocks and Swedish immigrant stocks lagged by two periods.

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

FIGURE 2. Fitted Relationship: Swedish vs. Norwegian Immigrant Stocks (2010)

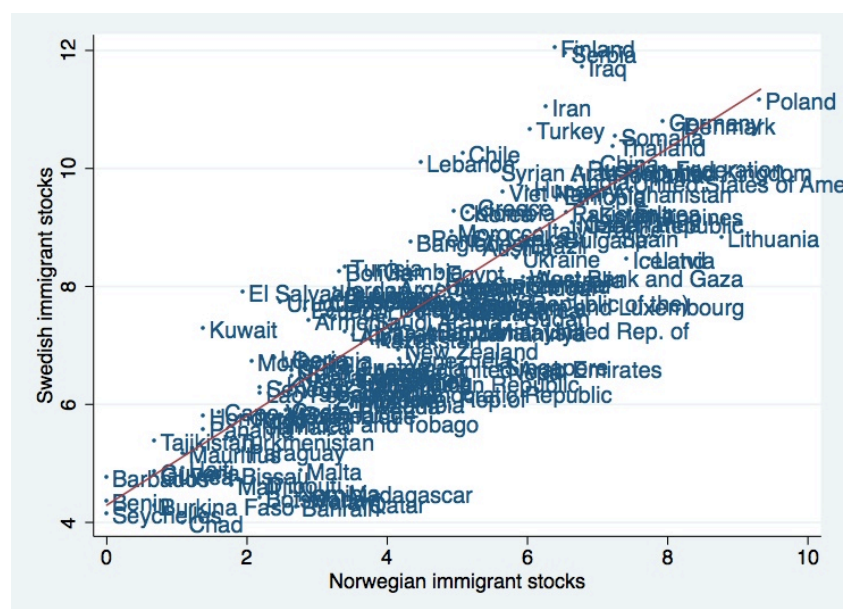


TABLE 11. Results from Alternative IV Analysis

	Original (1)	Alternative 1 (2)	Alternative 2 (3)
Immigrants	0.440** (0.213)	0.293 (0.215)	0.331 (0.228)
GDP	0.0902* (0.053)	-0.0455 (0.121)	-0.0857 (0.154)
Developing	-0.0841 (0.169)	-0.0692 (0.165)	-0.153 (0.176)
Trade freedom	0.0115 (0.126)	0.0924 (0.130)	0.0826 (0.129)
Observations	1509	1420	1372
Adjusted R2	0.2544	-0.358	-3.474

Notes: Robust and clustered standard errors are in parentheses. The dependent variable is natural log of exports. Regressions account for partner, year and region-year fixed effects, though their coefficients are not shown for the sake of brevity.

Excluded instruments are the logarithm of Danish immigrant stocks and Swedish immigrant stocks lagged by two periods (column 1), Norwegian immigrant stocks and Swedish immigrant stocks lagged by two periods (column 2), Danish and Norwegian immigrant stocks and Swedish immigrant stocks lagged by two periods (column 3).

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

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