

Is Immigration Necessary and Sufficient?

The Swiss Case on the Role of Immigrants on International Trade

By

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Abstract

This paper finds varying immigration effects with the type and size of immigrants, as well as their duration of stay and type of products traded, finding overall support for the preference, the information and the enforcement hypotheses. More importantly, this paper introduces the role of cultural proximity into the ethnic networks literature, and suggests that immigration is neither necessary nor sufficient to bridge the cultures of two countries and experience its trade-stimulating effect. It finds that the immigration effect on trade is not as necessary if the home and host countries are already familiar with each other's culture. It also shows that immigration alone is not sufficient, and introduces the level of communication as a catalyst in the process. A proxy used to measure the level of communication turns out to be an important factor, and reduces the role other factors play on the magnitude of the immigrant effect.

Key words: Ethnic networks, culture, communication

JEL codes: F14, F22

1. Introduction

Trade between two countries that have some degree of cultural similarity is typically higher than the trade between two culturally distinct countries. As a result, in empirical models of international trade, it has become a standard to use variables that capture cultural similarity such as common language, common religion, etc. To facilitate trade between countries of different cultures, intermediaries such as immigrants are needed to reduce transaction costs due to unfamiliarity about each other's markets, preferences, misunderstandings and mistrust.

The literature on immigration and trade is fairly empirical, and primarily explains the link by ethnic networks. This paper tries to incorporate culture and communication into the existing literature to more clearly determine the role immigration plays in trade.

Section 2 surveys the empirical literature, and gives details of the preference, the information and the enforcement hypotheses that explain the link between immigration and trade. In the following section, a brief history of immigration in Switzerland is given, and the reasons behind studying the Swiss case in particular are presented. This is followed by the analysis of the immigrant effect on Swiss trade in Section 4. In this section, factors causing variation in the immigration effect are identified, and their implications on the validity of the hypotheses are discussed.

In Section 5, the short literature on cultural proximity is incorporated to the empirical literature on immigration and trade to argue that immigration is neither a necessary condition nor a sufficient condition to reap trade stimulating effects of knowledge on trading partner's culture.

2. Literature on Immigration and Trade

Cultural proximity between two countries is shown to have a positive impact on their bilateral trade. Accordingly, a common culture allows traders in both countries to trade without intermediaries (Lazear, 1999). In contrast, trade between two countries of different cultures can become very costly because of difficulties in communication, possible mistrust and misunderstandings, and unfamiliar preferences. These costs can be reduced by hiring people who are familiar with both cultures to act as intermediaries. Immigrants, who are exposed to both home and host country cultures, can act as such intermediaries. Hence, immigration is expected to lead to more trade.

The literature explains the link between immigration and trade primarily through ethnic networks. According to this mainly empirical literature, trade opportunities between the home and host countries depend on two ethnic networks (Rauch, 2001). One is the immigrants' new connections in the host country and the other is the links they kept in their home country. Wagner, Head and Ries (2002) and Globerman (1995) discuss a number of mechanisms through which these ethnic networks facilitate trade. These can be categorized under preference, information, and enforcement hypotheses.

Preference effect is based on the immigrants' taste developed before migration. Immigrants are representatives of their home country's products. They continue to consume home-country products and that consumption is observed by the locals in the host country. This leads to locals' consumption of products from immigrants' home country, resulting an increase in trade between the home and host countries. The significance of this preference effect depends on strength of host-country networks.

According to the information hypothesis, both ethnic networks promote trade between the host and the home countries by reducing transaction costs. There are transaction costs in identifying the markets, making contacts, establishing facilities, finding agents in foreign markets, ensuring compliance with local laws, and translating communications. The exporter must identify potential markets and obtain access to distribution channels in unfamiliar environments. The importer must find a reliable source of supply. These activities require the knowledge of local language, customs, laws and business practices. Many immigrants possess such information about their home countries and have contacts in their home country. They also possess similar information about their host countries and have contacts in the host country. These information and networks lower the transaction costs in both exports and imports between the host and the home countries.

Lastly, Rauch and Trindade (2002) argue that immigrants facilitate enforcement of contracts by deterring opportunism. They suggest that immigrant communities in host countries are close-knit, and they form networks with co-ethnic people in the host country as well as in their home country. Through these networks, they facilitate international trade by enforcing community sanctions in the presence of weak international legal system. This enforcement effect also benefits both exports and imports.

3. History of Swiss Immigration

As can be seen from Figure 1, Switzerland has the highest proportion of immigrants in its population among all Western European countries.¹ Although Germany, France, the United Kingdom and Spain have larger immigrant populations, the proportion of

immigrants in total population in these countries do not exceed 10%. For other Western European countries, this proportion varies between 2-9%.

Figure 2 gives the Swiss and immigrant populations in Switzerland for the 20th century and for more recent years. Accordingly, except for the period of time between the World Wars and in 1980s, the immigrant population in Switzerland increased at a higher rate than the overall Swiss population. As a result, the proportion of immigrants living in Switzerland in overall population kept increasing. The decrease in the 1980s can be attributed to the fact that a significant majority of the immigrants living in Switzerland were Western Europeans until 1990s. The size of this European immigrant population started decreasing after the formation of the European Union, especially in 1980s right before the formation of the Single Market. The Western Europeans leaving Switzerland were gradually replaced by an influx of immigrants from Southern Europe, in particular from Portugal, Turkey, and former Yugoslavia, as well as Asian, Latin American and African immigrants. These departures and arrivals from different countries stabilized the proportion of foreigners in Switzerland at around 21% in the last decade.

The changes in the home country of immigrants in recent years can be observed in more detail in Table 1. Countries neighboring Switzerland are becoming less important as the home countries of all immigrants as their share in overall immigrant population is decreasing. The only exception is Germany. The changes in immigrants from these countries are either negative or much lower than those from former Yugoslavia, other Europe, especially Central and East Europe, Africa, Americas, Asia and Australia.

When compared to other Western European countries, there are a number of factors that make Switzerland an interesting case for analysis, especially in the last 10-15 years.

First of all, it has a very high proportion of immigrants in its population. Therefore, immigration will probably have a significant impact on its international trade.

Once, the overwhelming majority of these immigrants were from Western European countries. Given the cultural similarity between the Swiss and other Western European countries, Western European immigrants were not expected to have much of an impact on Swiss trade with their home countries. However, in the last 10-15 years, significant changes have been occurring in the composition of immigrants in Switzerland. The share of Western Europeans in overall immigrant population has been decreasing, being replaced by immigrants from countries that Switzerland has less in common. Furthermore, unlike the other European countries, these immigrants did not come from former colonies, since Switzerland never colonized the world. Hence, new immigrants are bringing new preferences, and valuable information about trade opportunities in their home countries. Because of this, the impact of immigration on trade is expected to be even more significant.

Lastly, only a very small proportion of these immigrants have applied for naturalization. Although this could be a result of tough conditions for obtaining Swiss nationality, this is partly a result of low demand on the part of immigrants to fully assimilate into Swiss population. Immigrants in Switzerland want to keep their connections in their home country, and they do not want their preferences to completely resemble to those of a local Swiss. These facts will make the impact on the trade between Switzerland and the home country of immigrants even stronger.

All of these factors indicate that immigrant populations in Switzerland will likely play an important role in Swiss trade with their home country. Figure 3 shows similar shifts in

immigrant populations and trade volumes between home and host countries over time. For both imports from and exports to the home country of immigrants, there seems to be a positive relationship with the size of immigrant population. However, since many factors might have contributed to the coincident movements in trade and immigration captured by this figure, this relationship needs to be more formally analyzed.

4. Analysis

Following Gould (1994), and Head and Ries (1998), gravity model of international trade is used for analysis. This simple empirical model is augmented by immigration variables to assess the link between immigration and trade.

Previous studies on this subject have used either cross-sectional or time series data. Head and Ries' (1998) analysis on Canadian trade, that of Dunlevy and Hutchinson's (1999, 2001) on US trade, Girma and Yu's (2002) on UK trade, and Rauch and Trindade's (2002) on Chinese immigrants found a significant link between immigration and trade using cross sectional data. However, Gould's (1994) time series analysis led to much smaller effects. For the reasons mentioned in the previous section, this study covers Swiss trade, in particular that during 1990-2002 with 164 countries. Beside the countries studied, another important difference across these analyses is the specification of the gravity model.

a. Specification of the model

Regression (1) in Table 2 is the simplest gravity model used. It only includes distance to the partner country, d_p , the partner's and the Swiss GDP, Y_p and Y_{ch} , their respective populations, POP_p , and POP_{ch} , and the size of immigrant (permanent resident)

population from partner country, PR_p . The dependent variable is Swiss imports from partner country. All variables are in natural logarithms. For zero observations in both import and immigration data, Eaton and Tamura's (1994) technique is followed. All variables have the expected sign, and all are significant with the exception of Swiss GDP and Swiss population. Since the variation is mostly across partner countries, this outcome is not very surprising. The important result is that immigrant population positively impacts the imports from their home country. In particular, a 1% increase in immigrant population leads to 0.25% increase in imports.

However, there are a number of specification issues with this simple model. First of all, numerous factors affect both immigration and trade levels. Distance, cultural and historical ties, partner countries' openness to trade, level of investment and economic development can be counted as the most important factors. Since these promote both trade and immigration, failure to control them might lead to an upward bias in estimates of the immigration effect.

To address this issue, a number of independent variables are added to the model. A dummy variable for adjacency to Switzerland, D_p^A , is used to take distance into account in addition to d_p . To address cultural ties, religious distance of the partner countries, d_p^R , and common language dummy variable, D_p^L , are added. Euclidean distance is assumed in finding the religious distance between partners, which is based on the square root of the sum of the squared differences in proportions of populations for each religion.²

Per Rauch and Trindade (2002), the probability that randomly chosen individuals in both countries share a common language, L_p , is included in the model. Its second order

term is also included to allow diminishing effects of this language variable. Since Switzerland does not have colonies, historical ties are not specifically taken into account.

O_p , openness to trade, measured by the share of total trade in partner's GDP, is also one of the additions as in Head and Ries (1998). The level of investment and economic development is captured by relative factor endowments variable, RF_p .³

$$RF_p = \left| \ln \left(\frac{K_p}{L_p} \right) - \ln \left(\frac{K_{ch}}{L_{ch}} \right) \right| \quad (1)$$

According to Heckscher-Ohlin theorem, trade volume is expected to increase with larger differences in factor endowments.⁴

Lastly, per Wagner Head and Ries (2002), a remoteness index, R_p , is added as well:

$$R_p = 1 / \sum_i (Y_i / Y_w) / d_{ip} \quad (2)$$

This index is in a way weighted average of bilateral distances with partner countries' share in world output. According to Anderson, and van Wincoop (2003), omission of this index, also known as the location index, is said to bias the estimates of trade volume downward in a systematic manner for relatively isolated countries. Therefore, it is expected to have a positive coefficient.

As can be seen in column (2) of Table 2, all of the additions to the model are significant and have the expected signs. As anticipated, after controlling for these factors, the immigrant effect is now slightly smaller (0.22 instead of 0.25).

This gravity model does not consider the role of relative prices in determining trade patterns. In the absence of trade impediments, this omission would be justifiable, since the law of one price would prevail. Given the argument in the literature that transaction

costs constitute significant barriers to trade, Bergstrand (1985) is followed, and relative prices are allowed to influence trade. GDP deflators, nominal exchange rates, and import and export price indices are entered to the gravity model. However, due to data unavailability for most home countries, the sample size is almost halved. Furthermore, these additions turned out to be insignificant, and their inclusion did not have a major effect on other variables' magnitude or significance. Therefore, the results of this regression are not presented, and these variables are removed from the following models.⁵ Incidentally, Gould (1994) also used price levels in both home and host countries with export and import price indexes, and obtained insignificant coefficients for these variables.

Even if best attempts are made to have the correct specification, potentially there remain a number of unobserved variables. Wagner, Head and Ries (2002) argue that cross-sectional estimates may be upward biased due to these unobserved characteristics. One way to avoid this bias is to use country-fixed effects. However, this comes with the cost of losing information content of cross-sectional variation, and according to Griliches (1986), this exacerbates the measurement errors, biasing the estimates downward. In his time series analysis, Gould (1994) used country fixed effects, and found a much smaller role for immigrants in trade of their host country.

You can find the results of fixed effects regression in column (3) of Table 2. While the addition of year fixed effects had a negligible impact of the model's parameters, the country fixed effects biased the results downward as expected, rendered some parameters insignificant, and sometimes changed the signs of some other coefficients.

Hence, a technique that exploits cross-sectional information, and at the same time, one that controls for unobserved variables is needed. For this purpose, Wagner, Head and Ries (2002) use fixed effects at national level and use observations at provincial level in their study of Canadian trade. This has the advantages of fixed effects, but still makes use of the cross-sectional variation.

This ad-hoc solution cannot be applied in the absence of provincial data. Instead, lagged imports can be used as another independent variable. This is recommended by Eichengreen and Irwin (1997), who also contend that the gravity model is often used without adequate care for considering the omitted variables. Given that desired trade flows may depart from the actual flows over time, and because of decision, production or delivery lags, including a lagged value of the imports flows as an explanatory variable is necessary to take these possible dynamic effects into account. A lagged dependent variable was also included in the gravity model of Gould (1994).

Column (4) of Table 2 presents the results of the model with lagged imports. All variables except the Swiss GDP and the adjacency variable are significant with correct signs. The inclusion of the lag reduced the immigrant effect to 0.11 from 0.22.

Lastly, Wagner, Head and Ries (2002) use a no immigrant dummy to separately handle cases with no or very few immigrants. This dummy variable takes the value of one if the number of immigrants is less than five, and the natural logarithm of the number of immigrants is set equal to zero. As can be seen from column (5) in Table 2, the no immigrant dummy has a significant negative coefficient. Note also that the inclusion of this dummy reduced the immigrant effect to 0.09. Having an immigrant population increases trade opportunities regardless the size of the immigrant population.

b. Diminishing marginal effects of immigration

Gravity models imply a constant elasticity relationship between trade and immigration. Constant elasticity, captured by the coefficient of the immigrant population in the regression model, implies that a 1% increase in immigrant population leads to the same percentage increases on imports regardless of the number of immigrants. This approach does not suit well to theoretical explanations of immigrants effects. A more reasonable depiction of the information hypothesis is that immigrants have a decreasing marginal effect on trade. New additions into already large immigrant communities will have decreasing opportunities to generate new trade. The information about their home country that new immigrants bring along is not as valuable. Immigrants' foreign market information may even become obsolete after a certain size is reached. Hence, the effects of the immigrants tend to increase at a decreasing rate as their community gets larger.

The same conclusion is implied by the preference hypothesis, albeit a different scenario is depicted. Accordingly, the host country population has already been exposed to home-country products of immigrants. The new immigrants do not bring much in terms of new set of preferences; hence their impact on the preferences of the host country's population is limited. Only the enforcement hypothesis does not necessarily imply decreasing marginal effects.

Another explanation for this decreasing marginal immigration effect comes from the trade substitution hypothesis. Once a critical mass is reached, immigrants might cause production in the host country to be substituted for goods that previously had been imported.⁶ Due to economies of scale, manufacturing activities in the host country could be more attractive than importing. This could develop to the extent that immigrants

possess specialized knowledge relations to technology or production methods, to the extent that domestic producers accommodate immigrant preferences by home production, or to the extent that foreign capital flows with immigrants.

Gould's (1994) specification allows for decreasing marginal effects of immigration. This involves estimation of an immigration information variable and an information sensitivity parameter. His approach is not derived from the theory; therefore, a much simpler approach is adopted in this analysis, yet with a similar outcome. A second order term of the size of the immigrant population is added.⁷ As can be seen from column (6) of Table 2, while the first order term is positive and significant, the second order term is significantly negative, providing evidence for decreasing marginal effects.

c. Impact on exports

Although the analysis so far has been on the imports of the host country, the implications of the information and enforcement hypotheses extend to its exports as well. The immigrants have valuable knowledge about the host-country markets, and have networks with the locals of the host country. They are also able to deter opportunism and facilitate enforcement of contracts on the export side of trade. Hence, these hypotheses suggest that immigrants affect not only the imports from but also the exports to their home countries. In contrast, the preference effect is only on the imports. Trivially, their preference for home country products can only influence the imports of these products. Head and Ries (1998) find a bigger effect of immigration on imports than exports. This could imply that either the preference effect is more important than both information and enforcement effects costs, or for some reason immigrants find it easier to set up importing businesses than exporting businesses. Supporting this finding, the results of

Dunlevy and Hutchinson (1999) imply that the preference effect is approximately double the information/enforcement effects. However, Girma and Yu (2002) obtain a smaller immigration effect on imports than on exports. Gould (1994) also finds that exports are more positively affected than imports.⁸

According to regression (7) in Table 3, the immigration effect on exports of the host country is stronger. While the coefficient of the first order term is 0.24 in imports, it is 0.31 in the exports regression. The second order term in the exports regression is also higher, implying a much faster decreasing marginal effects of immigration for exports.

Another variable that should be taken into account is the number of immigrants from host country to home country. Due to symmetry, the host country's population living in the home country should affect the home country's imports, i.e. the exports of host country. Therefore, the exports regression should include host-country immigrants in the home country. Typically this data is not available, and therefore, it was absent from the models of the literature mentioned in this paper. The Swiss data set used in this paper provides such information so that the role of Swiss immigrants in the exports of Switzerland can be analyzed. In model (8) of Table 3, Swiss exports are regressed against Swiss population living abroad. A positive but diminishing marginal immigrant effect is observed, similar to the immigrant effect on Swiss imports. Note that the coefficient of Swiss immigrants in the home country's imports (0.64) is higher than the home-country immigrants in Switzerland's imports. This implies that Swiss immigrants communicate better with the locals of the home country than the home-country immigrants with the Swiss locals in carrying information about their markets, reflecting their preferences for their country's products, and enforcing the contracts.

The data set also provides information about double nationals that returned to their home country. Since these people have lived in the host country long enough to have their preferences influenced by the host country's products, upon their return to their home country, they will affect the preferences of locals in their home country. Hence, their return is expected to positively affect the exports of their previous host country. The results in column (9) in Table 3 actually suggest that double nationals pass these preferences to the locals of their home country much better than Swiss nationals living abroad, as the coefficients of Swiss living abroad became insignificant after the inclusion of double nationals into the model. This result makes sense since double nationals will communicate with the locals much better than immigrants.

Regression (10) of imports of the host country includes the double nationals that returned to their home country. It shows that double nationals are not a significant factor in imports of host countries any more. This might be explained by weakened ethnic networks left in host countries due to lack of communication, hence their restricted enforcement ability, or their preferences that are no longer observable in the host country.

Overall, it seems that the ability to communicate is the key in determining whether the effect of immigration on exports or imports is going to be larger, rather than one hypothesis over the other.

d. Differences across product groups

While the enforcement and the information hypotheses do not suggest differences in the immigration effect across different product groups, the preference hypothesis implies a different impact of immigration on trade of different product groups.

The preference effect is expected to be small for homogenous products, and larger for differentiated products. It would especially apply to finished consumer manufactures and processed foodstuffs. For producer goods, which are not differentiated, the immigration effect through preference is expected to be small.

On the other hand, according to the information hypothesis, the opportunities for trade come from awareness of cost differentials and of differentiated products. Immigrants possess this information and reduce some of the transaction costs of trade. Since cost differentials are important for producer goods such as crude goods and semi-manufactures, and consumer goods are primarily differentiated, this hypothesis suggests immigrant effects on all types of products. Similarly, the enforcement hypothesis is about immigrants' higher ability to deter opportunism, which can exist in trade of both consumer and producer goods.

In the following regressions, products are first divided into broad groups of consumer and producer products as in Gould (1994), and then into five narrower groups of crude foodstuffs, processed foodstuffs, crude materials, semi-manufactures, and consumer manufactures, following Dunlevy and Hutchinson (2001).⁹ While significant impact of immigration on consumer goods is considered as support for the preference hypothesis, the extent of pro-trade effects on crude goods, or semi-manufactures provides support for the information and enforcement effects.

As can be seen from columns (11) and (12) of Table 4, the immigrant effect on consumer goods is more pronounced. Both first and second order terms of immigrant population are significant for consumer products. In contrast, these terms have the correct signs but are insignificant for producer goods. Similarly, Gould (1994) finds that

immigrant links to the home country have the greatest effects on the trade of consumer products.

Columns (13) through (17) show the results for the narrower groups of products. The most pronounced immigration effect is for consumer manufactures. The effect is smaller for semi-manufactures. While a positive significant effect is observed in crude materials, the impact on crude foodstuffs appears negative and insignificant. A positive effect is also observed for processed foodstuffs. The extent of the immigration effect on consumer manufactures and processed foodstuff provide strong support for the preference hypothesis. However, there is also support, albeit smaller, for the information and enforcement hypotheses. For all product groups except crude foodstuffs, the immigration effect is positive and significant. The magnitude of the immigration effect identifies the product categories, where the information provided by the immigrants is most valuable. According to the results, information on crude materials is most valuable for its trade followed by semi-manufactures. In their study of US trade, Dunlevy and Hutchinson (2001) find that immigration strongly affects imports of finished and semi finished goods, and does not strongly affect imports of crude goods.

e. Differences across immigrant types

Not all immigrants are the same. Different types of immigrants have the different amounts of information about the home markets, or have different ability to enforce contracts, or to affect the preferences of the locals. Each type will have different degrees of contacts with the locals to transfer these information or preferences to them. Head and Ries (1998) make a distinction between different types of immigrants (independent, refugee, entrepreneur, and family), as the Canadian immigration data set they use allows

to do so. They find that refugees have the least impact on trade, and to their surprise, independents have more effect on trade than the entrepreneurs.

Immigrants vary in terms of the strength of their relations and communication with ethnic networks in both home and host countries. In this analysis, a distinction is made among permanent residents, naturalized citizens, NAT_p , asylum applicants or refugees, $ASYL_p$, and other foreigners living in Switzerland, OF_p . Permanent residents are best suited to have an impact on trade according to all hypotheses as their connections with both home and host country networks are strongest. Unlike naturalized citizens, they are not completely assimilated, so they still carry preferences for home country products. They still have valuable information about their home markets, and still have strong connections in their home country. In contrast, asylum applicants or refugees will have preferences against their home country products. Furthermore, the information and especially the enforcement effects will be opposite. Since they fear persecution at home, they would be reluctant to communicate or find it difficult to engage in commercial transactions with ethnic networks in their home country. They can not enforce contracts as well since they can not travel back as often due to fear of backlash. For other foreigners, the networks with locals in host country have not developed sufficiently to have an impact on trade.

Regressions (18)-(20) of Table 5 provide support for these expectations. Naturalized citizens no longer have a significant impact on trade, and asylum applicants or refugees have a significant negative impact on trade. As the proportion of other types of foreigners increase in the overall immigrant population, the immigration effect is significantly reduced.

f. Role of duration of stay

Rauch (2001) examines the changes in ethnic networks in international trade over time. He argues that while, on the one hand, the importance of collateral that ethnic networks offer for traders is diminishing, on the other hand, information intensity of trade complements ethnic networks. The longer they stay at the host country, the weaker the enforcement ability of immigrants will be, since the strength of their home networks will diminish. Similarly, with time the immigrants will gradually be assimilated into the host country's population. Their preferences will eventually be similar to those of locals of the host country. Hence, preference effect will diminish with the duration of stay as well.

The Swiss data provides the number of immigrants with different duration of stay. Regression (21) of Table 6 shows the results when immigrant population is divided into groups with duration of stay of 0 to 4 years, 5 to 29 years, and 30 years or more. The results provide support for decreasing immigrant effect with duration of stay. While the immigrant effect is positive and significant for immigrants with duration of stay of 0 to 4 years, it is positive but insignificant for immigrants with 5 to 29 years of stay, and negative and significant for those that stayed for 30 years or more.

5. Immigration: Is it necessary and sufficient?

Immigration is neither a necessary nor a sufficient condition to bridge the cultures of home and host countries and hence experience increases in trade as a result. Culturally similar countries are already familiar with each other's culture, and therefore, they are already experiencing the trade stimulating impact of familiarity in the trading partner's culture. Immigration is necessary to bridge only the cultures that are different.

Lazear (1998) argues that the potential impact of immigration on trade is greatest when cultural differences between the home and host countries are greatest, and when the locals of the host country can learn about the home country culture at low cost. This implies that for culturally similar home and host countries, immigration is not necessary in contrast to culturally distinct home and host countries. Regression (22) of Table 7 tests for this argument. Here, cultural differences are measured by two variables of the model: religious distance and the probability that randomly chosen individuals in both countries share a common language. These variables are interacted with the immigrant population to see if the immigrant effect varies with cultural differences. According to the results, the immigrant effect gets stronger when the cultural difference is larger. This is the case when the religious distance is larger, as well as when the probability that individuals from both countries share a common language is smaller. These results suggest that immigration is not necessary to experience the trade stimulating impact of cultural familiarity if the two cultures are already similar, but immigration becomes more important and effective if the two countries are culturally different.

However, immigration alone is not sufficient to realize the trade-stimulating impact. If the immigrants are not communicating with the locals of the host country, this impact will be only minimal. The host country will experience an increase in trade with the home country of immigrants, only because the immigrants are continuing to consume their home country's products. Although immigration helps in bridging the two cultures, and thus results in more trade, this result depends on the level of communication between the immigrants and the locals of the host country. Immigrants living in segregation or isolated from the host country population are not expected to have much impact on trade.

Although it is not stated specifically, communication seems to be assumed by all three hypotheses linking immigration to trade.¹⁰ The significance of the preference effect depends on the strength of host country networks, in other words to the extent of communication of the immigrants with the locals. Similarly, the significance of the information and enforcement effects depend on the strength of both home and host country networks. Since immigrants have no problem communicating with their co-ethnic countrymen in their home country, the significance of these effects primarily relies on the level of communication immigrants have in the host country. In sum, independent of the hypothesis explaining the link between immigration and trade, the strength of the link depends on the level of communication between immigrants and host-country locals.

The level of communication that immigrants have with the locals of the host country varies depending on their type, duration of stay, and size. Hence, part of the changes observed in the immigration effect due to these factors in the previous section is because the level of communication varies with these factors.

Not all types of immigrants have the same ability or possibility to communicate with the locals. Hence, the reason why different immigration effects are observed across types of immigrants is partly different levels of communication. Similarly, communication with the locals increases with the duration of stay. However, at the same time, preferences of the consumers have already been observed by the locals, and their information about home markets has already been exploited. Hence, with duration of stay, on the one hand you expect larger immigrant effects due to more communication; on the other hand you expect smaller effects due to weakening home networks.

Lastly, the level of communication with the locals of the host country varies with the size of the immigrant population. When the size is small, the relative amount of communication is high, whereas it decreases as the size increases. Larger immigrant communities tend to live together, reducing the chances or the need to communicate with the locals. Hence, decreasing marginal immigrant effect result is partly due to the lower relative amount of communication as the immigrant size increases. Regression (23) of Table 7 tests this by including a variable measuring the level of communication between the immigrants and the locals of the host country, namely the number of bi-national marriages. This variable is interacted with the size of immigration population. With these additions, the second order term for immigration population becomes insignificant and removed from the model. In other words, the decreasing marginal effect of immigration is actually due to relatively less communication with the locals when the immigrant population is large. Note also that communication increases the volume of trade, and when the immigrant population is large, communication becomes less important.¹¹

6. Conclusions

The empirical literature finds that the immigrant effect on trade varies with the type and size of immigrants, as well as their duration of stay and type of products traded. In analyzing these different effects, the literature claims support in their findings for one of the three competing hypotheses, namely, the preference, the information, and the enforcement hypotheses. This paper also finds varying immigration effects, without trying to pin down only one hypothesis to explain it all. In fact, there is overall support for all of the above-mentioned hypotheses in this paper's results.

This paper bridges the cultural proximity literature with the ethnic networks literature, and suggests that immigration is neither necessary nor sufficient to bridge the cultures of two countries and experience its trade stimulating effect. It finds that the immigration effect on trade is smaller and thus not as necessary if the home and host countries are already familiar with each other's culture. The paper also shows that immigration alone is not sufficient for the trade stimulating effect. It introduces the level of communication as the catalyst in the process immigration leads to trade. This seems to be an unspoken assumption in all of the hypotheses. If the immigrant communities live in isolation from the host country locals, their preferences will not be observed by locals; the information they have about home markets would not be useful; and lastly, enforcement of contracts would not be fully effective if they do not communicate with the host country side of the contract. In fact, a lot of factors that change the immigrant effect considered in the literature and in this paper captures the changing level of communication.

This paper tried to explicitly proxy the level of communication between immigrants and the locals with the number of bi-national marriages. This variable turned out to be an important factor, and at the same time, its inclusion in the model reduced the role of size of immigration play. If data on the level of communication can be obtained for each type of immigrant, or for immigrants with different duration of stay, the implications of this paper can be further tested.

The result is especially important now since most immigration related problems stem from inadequate amount of communication between the immigrants and the locals of the host country.

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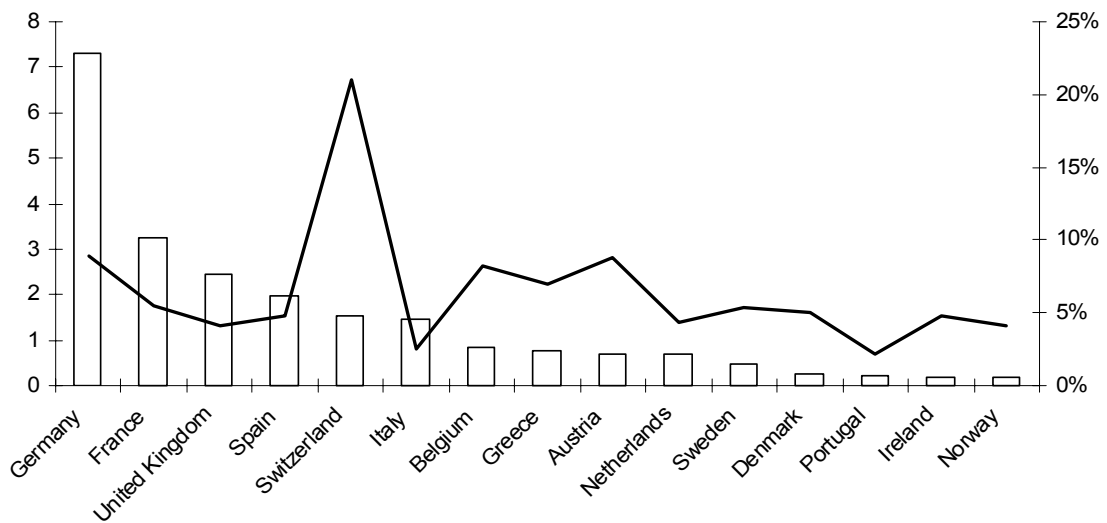


Figure 1. Immigration populations in Western European countries in 2002.
 Note: Population figures are in millions.
 Source: Eurostat

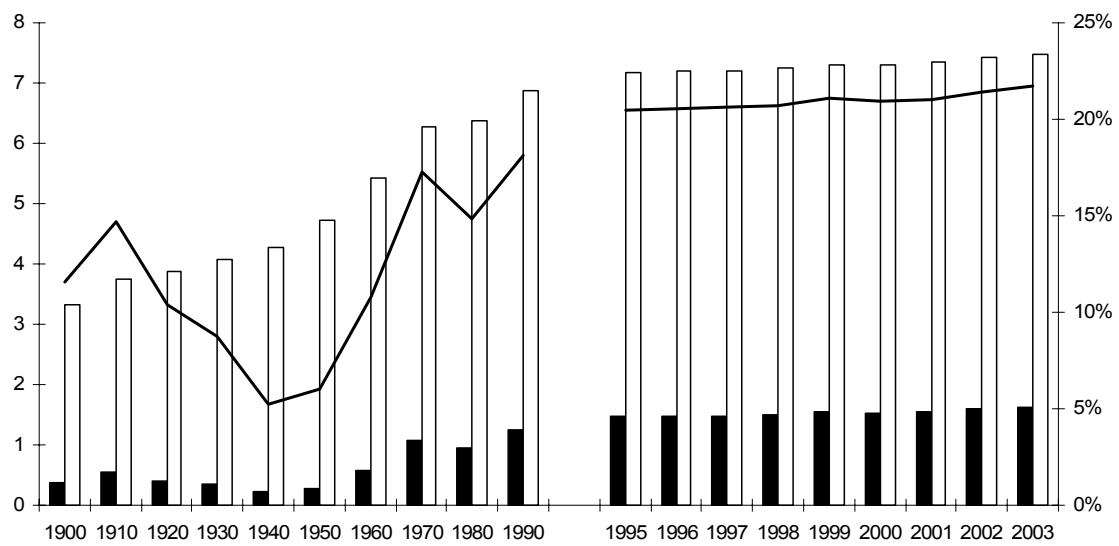


Figure 2. Immigrant and total Swiss populations

Note: Populations figures are in millions.

Source: Swiss Federal Statistical Office

	1995	1996	1997	1998	1999	2000	2001	2002	2003	Change
Germany	91976	93686	95737	98934	103701	109785	117664	126056	135083	46.9%
France	55407	55974	56750	57881	59879	61688	63338	65122	67758	22.3%
Italy	361892	352669	344591	336850	329773	321795	316041	310331	310127	-14.3%
Austria	28454	28385	28297	28290	28473	29191	30200	31365	32223	13.2%
Portugal	135646	137848	137148	136581	135727	135449	136246	141762	149506	10.2%
Spain	102320	98516	94898	91302	87624	84266	81832	79751	77952	-23.8%
Yugoslavia	296118	307514	316607	324979	337090	344324	352044	355269	362667	22.5%
Turkey	79372	80177	80333	80286	80630	80165	80158	79457	81529	2.7%
Other Europe	87752	86096	86383	87544	91104	95312	101258	104692	109449	24.7%
Africa	28800	29911	31345	32953	35446	37618	40442	42967	47432	64.7%
Americas	38585	40361	42285	44043	46955	49687	53404	56015	60137	55.9%
Asia	54914	56004	58366	61486	67386	72002	81731	88398	95059	73.1%
Australia	1999	2023	2096	2248	2568	2829	3186	3324	3342	67.2%
TOTAL	1363235	1369164	1374836	1383377	1406356	1424111	1457544	1484509	1532264	12.4%

Table 1. Nationality of immigrant population in recent years
Source: Swiss Federal Statistical Office

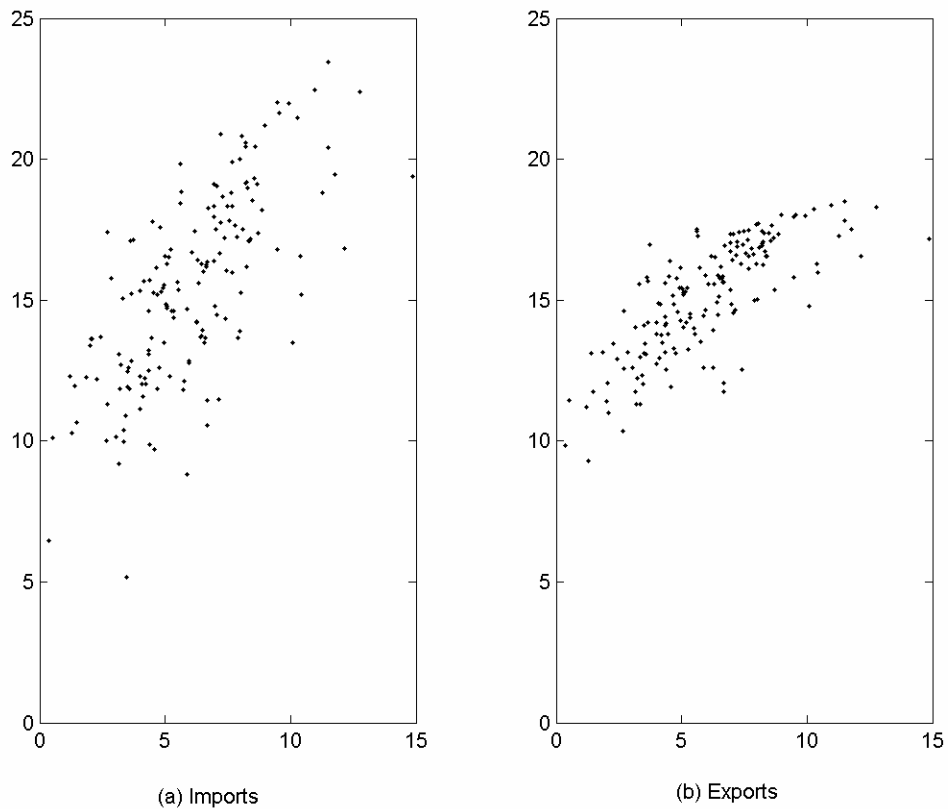


Figure 3. Swiss trade and immigration 1990-2002

Notes: Natural logarithm of average immigrant populations from each home country is plotted on the x axis against the natural logarithm of average trade.

Sources: UN Comtrade and Swiss Federal Statistical Office

$M_{ch,t}$	(1)	(2)	(3)	(4)	(5)	(6)
α	3.36 (0.47)	94.9 (0.01)	51.0 (0.37)	53.4 (0.06)	51.3 (0.06)	50.1 (0.07)
d_p	-0.31 (0.00)	-0.48 (0.00)	2.00 (0.00)	-0.27 (0.00)	-0.26 (0.00)	-0.26 (0.00)
Y_p	1.38 (0.00)	2.80 (0.00)	-0.14 (0.37)	1.07 (0.00)	1.04 (0.00)	1.02 (0.00)
Y_{ch}	0.78 (0.16)	0.43 (0.29)	0.44 (0.43)	0.35 (0.28)	0.36 (0.26)	0.38 (0.26)
POP_p	-0.13 (0.01)	-0.93 (0.00)	-2.74 (0.00)	-0.36 (0.00)	-0.36 (0.00)	-0.38 (0.00)
POP_{ch}	-2.40 (0.21)	-9.45 (0.00)	1.13 (0.46)	-4.97 (0.02)	-4.77 (0.02)	-4.70 (0.02)
PR_p	0.25 (0.00)	0.22 (0.00)	0.40 (0.00)	0.11 (0.00)	0.09 (0.00)	0.24 (0.00)
PR_p^2	-	-	-	-	-	-0.01 (0.03)
D_p^{NPR}	-	-	-	-	-0.43 (0.07)	-
D_p^A	-	1.19 (0.03)	-0.22 (0.48)	0.34 (0.25)	0.38 (0.22)	0.58 (0.13)
d_p^R	-	-0.57 (0.01)	-27.8 (0.00)	-0.29 (0.07)	-0.31 (0.06)	-0.29 (0.08)
D_p^L	-	-5.60 (0.00)	5.38 (0.12)	-2.46 (0.00)	-2.44 (0.00)	-2.38 (0.00)
L_p	-	38.6 (0.00)	-42.0 (0.10)	16.6 (0.00)	16.4 (0.01)	16.0 (0.01)
L_p^2	-	-48.4 (0.00)	35.4 (0.18)	-20.8 (0.01)	-20.7 (0.01)	-20.3 (0.01)
R_p	-	0.84 (0.00)	-1.48 (0.01)	0.30 (0.01)	0.26 (0.02)	0.22 (0.04)
O_p	-	0.56 (0.00)	0.51 (0.02)	0.30 (0.00)	0.30 (0.00)	0.31 (0.00)
RF_p	-	0.87 (0.00)	0.19 (0.26)	0.35 (0.00)	0.35 (0.01)	0.36 (0.00)
$M_{ch,t-1}$	-	-	-	0.60 (0.00)	0.60 (0.00)	0.60 (0.00)
d.f.	2,038	1,985	1,810	1,984	1,983	1,983
Adj. R ²	0.637	0.663	0.859	0.797	0.797	0.797

Table 2. Effect of immigrant population

Note: One-sided p-values are given inside the parentheses

	(6)	(7)	(8)	(9)	(10)
	$M_{ch,t}$	$X_{ch,t}$	$X_{ch,t}$	$X_{ch,t}$	$M_{ch,t}$
PR_p	0.24 (0.00)	0.31 (0.08)	–	–	0.24 (0.00)
PR_p^2	-0.01 (0.03)	-0.02 (0.01)	–	–	-0.01 (0.03)
PR_{ch}	–	–	0.64 (0.00)	-0.05 (0.40)	–
PR_{ch}^2	–	–	-0.04 (0.00)	-0.01 (0.33)	–
DN_{ch}	–	–	–	0.34 (0.00)	-0.01 (0.32)
d.f.	1,983	1,983	1,225	630	1,712
Adj. R ²	0.797	0.654	0.616	0.681	0.806

Table 3. Different effects on exports and imports

	(11)	(12)	(13)	(14)	(15)	(16)	(17)
	$M_{ch,t}^{CON}$	$M_{ch,t}^{PRO}$	$M_{ch,t}^A$	$M_{ch,t}^B$	$M_{ch,t}^C$	$M_{ch,t}^D$	$M_{ch,t}^E$
PR_p	0.40 (0.00)	0.10 (0.15)	-0.05 (0.32)	0.30 (0.00)	0.37 (0.00)	0.16 (0.06)	0.49 (0.00)
PR_p^2	-0.02 (0.01)	-0.00 (0.37)	0.01 (0.15)	-0.00 (0.42)	-0.01 (0.11)	-0.00 (0.31)	-0.02 (0.00)
d.f.	1,983	1,983	1,983	1,983	1,983	1,983	1,983
Adj. R ²	0.762	0.768	0.751	0.766	0.799	0.767	0.781

Table 4. Effect on different product groups

$M_{ch,t}$	(18)	(19)	(20)
PR_p	0.23 (0.00)	0.20 (0.01)	0.19 (0.01)
PR_p^2	-0.01 (0.07)	-0.01 (0.15)	-0.00 (0.39)
NAT_p	-0.03 (0.26)	–	–
$ASYL_p$	–	-0.07 (0.01)	–
OF_p	–	–	-0.12 (0.00)
d.f.	1,847	1,270	1,270
Adj. R ²	0.797	0.839	0.839

Table 5. Effect of different immigrant types

$M_{ch,t}$	(21)
PR_p^{0-4}	0.13 (0.02)
PR_p^{5-29}	0.01 (0.44)
PR_p^{30+}	-0.10 (0.02)
d.f.	1,982
Adj. R ²	0.797

Table 6. Effect of duration of stay

$M_{ch,t}$	(22)	(23)
PR_p	0.22 (0.02)	0.17 (0.00)
PR_p^2	-0.01 (0.01)	–
d_p^R	-0.67 (0.08)	-0.27 (0.09)
$PR_p * d_p^R$	0.06 (0.21)	–
L_p	18.3 (0.00)	15.5 (0.01)
$PR_p * L_p$	-0.47 (0.03)	–
MAR_p	–	0.13 (0.03)
$PR_p * MAR_p$	–	-0.02 (0.02)
d.f.	1981	1,982
Adj. R ²	0.798	0.797

Table 7. Effect of communication

Appendix. Product categories based on Lipsey (1963)

The consumer products group consists of processed foodstuffs, and manufactures for consumption. Crude foodstuffs, crude materials and semi-manufactures compromise make up the producer products group. 3-digit SITC codes of each are given below.

Crude Foodstuffs (A): 001,041,043,044,045,081,121,211,212,222,223.

Processed Foodstuffs (B):011,012,016,017,022,023,024,025,034,035,036,037,042,046,047,048,054,056,057,058,059,061,062,071,072,073,074,075,091,098,111,112,122.

Crude Materials (C):231,244,245,246,247,248,272,273,274,277,278,281,282,283,284,285,286,287,288,289,291,292,321,322,325,333,334,335,342,343,344,345,351,411,421,422,431,511,512,513,514,515,516,522,523,524,525.

Semi-Manufactures (D):232,251,261,263,264,265,266,267,268,269,531,532,533,541,542,551,562,571,572,573,574,575,579,581,582,583,591,592,593,597,598,611,613,621,625,629,633,634,641,642,651,659,661,662,663,664,667,671,672,673,674,675,676,677,678,679,681,682,683,684,685,686,687,689,691,692,693,694,695,711,712,713,714,716,718,721,722,723,724,725,726,727,728,731,733,735,737,741,742,743,744,745,746,747,748,749,751,752,759,771,772,773,774,776,778,782,784,786,791,792,793,811,872,873,874,883,891,893,895.

Manufactures of Consumption (E):553,554,612,635,652,653,654,655,656,657,658,665,666,696,697,699,761,762,763,764,775,781,783,785,812,813,821,831,841,842,843,844,845,846,848,851,871,881,882,884,885,892,894,896,897,898,899.

End notes

¹ Tiny states of Luxembourg and Liechtenstein are excluded.

² A nested structure is assumed for Christianity and Islam to take into account different denominations within these religions. This formulation results in a measure that recognizes the similarity in two Christian countries against non-Christian countries and the differences in denominations in comparisons against other Christian countries.

³ Similarity in income level is also tried in the regressions, yielding similar conclusions.

⁴ Gould (1994) also controls for cross-country differences in endowments, and finds that immigration leads to trade.

⁵ These results are available from the author upon request.

⁶ Trade substitution effect of immigration first discussed in Diaz-Alejandro (1970).

⁷ According to this approach, immigrant elasticity is coefficient of first order term plus two times the ratio of the coefficient of second order term to immigrant size. No immigrant dummy variable is removed from the model, since it becomes insignificant in the presence of second order term.

⁸ In particular, Gould suggests that if immigrant stock is less than 5000, the effect on exports is higher, and if it is more than 5000, the effect on imports is higher.

⁹ See the appendix for SITC codes of products used in these classifications.

¹⁰ Strength of the host and home country networks is often mentioned in these hypotheses. Communication may be what is implied by this strength of the networks.

¹¹ Due to unavailability of data on number of bi-national marriages for each type of immigrant, and for different categories of duration of stay, statements made about the role of communication in these factors cannot be tested at this point.