

Immigrant-Based Networks and the U.S. Bilateral Trade: Role of Immigrant Occupation

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Abstract

This paper is an empirical investigation of the effect of immigrants' occupation on the bilateral trade between the country of origin and the host country, U.S. The effectiveness of the immigrant based network in stimulating bilateral trade through the immigrant *information effect* (lowering informal trade barriers) depends on immigrants' occupation in the host country. Using data across 62 trading partners (as well as immigrant sending countries) over 1991 – 2000 we find that executives, managerial and professional immigrants significantly increase U.S. bilateral trade with their home country and this effect is strongest for differentiated (consumer or finished) goods. This work not only contributes to the debate on the effect of immigration on trade, but also highlights an important contribution of the high-skilled migrants on promoting exports of their home country.

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I. Introduction

The empirical trade literature has recently seen an increasing interest in exploring the role of coethnic and social networks in explaining the missing trade links (Trefler 1995) and home bias in international trade (McCallum 1995 and Helliwell 1998). In theoretical work Grief (1993) and Rauch and Casella (1998) have shown that business and social networks help in alleviating informational trade barriers. There is increasing evidence in empirical trade that the immigrant population living in a country provides the social and coethnic networks that facilitate trade with their home country by removing some informal trade barriers and lowering transactions cost to trade (Gould 1994 , Rauch and Trindade 2002, Mundra 2005, Herander and Saavedra 2004). Immigration and international trade has drastically increased around the world and particularly for the U. S. During the period 1981-1990 total immigration to the U.S. was around 7.3 million and which had increased to more than 9 million during 1991 – 2000 and almost 70% of the immigrants for the year 2000 came from Latin America.² In addition, we observe that the U. S. international trade with the immigrants' home country is on the rise. The value of U. S. imports for the period 1987 – 1995 with North America have increased by 110%; with Pacific Rim, by 125%; and with Latin American regions, by 100%. Similarly, U. S. exports with North America went up by 95%; with Pacific Rim, by 65%; and with Latin America, by 46%.³

² From U.S. Immigration and Citizenship Services (formerly called INS, the Immigration and Naturalization Service).

³ Author's calculation from the trade data in International Economic Review, United States International Trade Commission, Washington DC.

In international trade theory there is no consensus on whether labor and goods and services flow are substitutes or complements making a strong case for an empirical investigation of the effect of labor flows on the international trade between two countries. Different trade models predict that labor flows and trade flows can be substitutes under certain conditions and if those particular conditions do not hold, they can be complements. Moreover, the literature has found that the immigrants (or immigrants based networks) have a positive effect on bilateral trade for the U.S. (Gould 1994; Dunlevy and Hutchinson 1999; Dunlevy 2004; Rauch 1999; Herander and Saavedra 2005), for Canada (Head and Reis 1998) and for Netherlands (White 2007). Rauch and Trindade (2002) show that the ethnic Chinese population increases bilateral trade between countries more for differentiated goods than for the homogeneous goods. Mundra (2004) estimating a nonparametric transaction cost as a function of the immigrant stock found that immigrants have a positive and most significant effect only for the U. S. imports of finished or consumer products. In this paper we are investigating the effect of immigrants' occupation on the U.S. bilateral trade flows with their home country.

Immigrants carry home-country information that helps in matching buyers and sellers and enforcement of trading contacts (*information effect*). Immigrants have information on different traders and the type of goods available both in the U. S. and their home countries, which helps in promoting bilateral trade between U. S. and their home country. In addition, immigrants' information on the legal set up in their country of origin; and familiarity with the home-country language and how business is conducted in their home country helps in enforcing trading contacts with their home country. The effect of immigrants' information on trade will depend on the immigrants' occupation; not all categories of immigrants will have similar positive effect on

trade, particularly in building trading contacts and lowering transaction costs to trade. The effect of immigrants on the U.S. bilateral trade flows across immigrant occupation has not yet been examined.

Our key empirical result is that in addition to the size of the immigrant network the distribution of the immigrant network across different occupation in the U.S. play a significant role in trade promotion. We find that for both exports and imports as well as across homogenous and differentiated goods the executives and managers have a significant effect on trade than no occupation group. This paper will add to the literature by highlighting that the pro-trade effect of immigrants on trade varies across the immigrant's occupation and the type of goods. Given that most of the developed countries prefer skilled migration; this paper highlights an important positive effect of high-skilled immigration on the country of origin, particularly export promotion.

The plan of the paper is as follows. Section II puts forth arguments supporting our principal hypothesis that the effectiveness of the immigrant based network in stimulating bilateral trade is dependent on immigrants' occupation. In Section III we present the empirical model and describe the data. Section IV discusses our results and we conclude in Section V.

II. Immigrant Information Effect – Role of Immigrant Occupation

Immigrants increase trade between the U. S. and their home country is by providing home country information in the U. S. This information reduces informal trade barriers and

stimulates trade between the U. S. and the immigrant's home country; immigrants in the U. S. provide co ethnic networks, an immigrant enclave that helps in trade. These ethnic and social networks provide strong pull for more immigration and helps in building a pool of home country information in the U. S. In the literature it is well documented that the immigrant information has two distinct effects: matching buyers and sellers and enforcement of trading contacts.

The first effect of matching between traders is an important immigrant link on trade; Dunlevy (2004) calls it as the *information bridge*. Since immigrants have information on traders and the type of goods available in the U. S. and their home countries, they help in promoting international trade between U. S. and their home country. For instance, Korean exports substantially increased since the early 1970s, when a massive influx of Koreans to the U. S. began. By virtue of the advantages associated with their language and ethnic background, many Korean immigrants have been able to establish business-importing merchandise from Korea (Min 1990). Rauch and Trindale (2002) used language, colonial ties, and share of Chinese population to estimate the effect of social networks on bilateral trade. They use birth language as a proxy for similar taste and find that language does not have a significant effect on differentiated goods, whereas colonial ties and Chinese share of population does. This supports their hypothesis that social networks through matching buyers and sellers and better trade negotiations stimulate trade. In addition to the matching of buyers and sellers, immigrants bring information on how the business is conducted in their home country helping in enforcement for trading contacts, Dunlevy (2004) calls this the *cultural bridge*. As pointed out by Grief (1993) that coethnic networks promote trade by preventing violation of trading contacts, particularly when the legal environments are not well developed.

The literature, however, has not addressed the issue that all immigrants are not at an equal footing on how they generate trade with their home country. The social capital and coethnic networks created by the immigrants in the U.S. will vary based on their occupation and so will their information affect generating international trade. There is increasing evidence on crucial role played by Indian business and social networks in the IT sector (such as TiE, The Indus Entrepreneurs) in facilitating Indian immigrant entrepreneurs. An Indian immigrant who is a homemaker or a student might not have the same social capital and will not be participating in the TiE's social networking and entrepreneurship meetings and will have less information effect on trade than the Indian immigrant who is an engineer or a CEO. Moreover, the size and quality of the immigrants' coethnic network in the U.S. will vary according to their occupations; engineers will network with other engineers and professionals from India. There will be more exchange of ideas and innovation across managerial and professional immigrant groups and this will have a greater potential in lowering informal trade barriers and generate increasing trade with their home countries. Herander and Saavedra (2004) using U.S. state level exports have shown that the geographical proximity to the other immigrant group members from their home country is an important determinant of the strength of the immigrants' trade promoting channels. If an engineer or a receptionist or a home maker is in an identical proximity with other immigrant groups, our hypothesis is that the engineer will have stronger information effect promoting trade with their home country than the home maker.⁴

Girma and Yu (2002) argued that if the immigrants have an individual specific effect they should increase trade of host country with all the countries of origin. They find that for United

⁴ In this paper however we are not controlling for spatially how far immigrants are from their fellow country men in the U.S.

Kingdom immigrants from non-Commonwealth countries had a significant effect on trade, whereas immigrants from Commonwealth countries did not. They then conclude that immigrants carry significant non-individual specific information like foreign market information rather than individual specific information such as personal business contacts and hence their effect on trade is “non-universal”. However, they argue that is an overlap between the two types of information. Moreover, their evidence is contradicted by Combes *et al.*(2002) who find a significant positive effect of domestic migration on trade within departments for one country – France. In this paper we propose that what is important for trade building is the size and the quality of the immigrants’ network and the individual migrants’ occupation is important indicator of the quality and determinant of the effectiveness of immigrants’ network in trade creation with the home-country, both via the foreign market information and business contacts.

There is also increasing evidence of the important role played by export intermediaries in stimulating U.S. exports, particularly for the small exporters who rely on third parties more than big multinationals having in-house export departments (Becker and Porter 1983 and Peng and Ilinitch 1997). In the 1990s it was increasingly realized in the U.S. that to increase the competitiveness of U.S. exports the export intermediaries have to play an important role in mitigating the trade barriers for the U.S. firms (U.S. Small Business Administration 1989, 1991). Peng (1998) using a large mail survey finds that for more than 50% of the export intermediaries in the U.S. specializes in Asian and Latin American region, which are increasingly the major new immigrant sending countries as well as big trading partners for the U.S.. Peng also finds that over 90% of the intermediaries in his sample had a in-house foreign language specialist and close to 40% of the personnel who worked in these intermediaries were immigrants, which made

these export intermediaries expert in foreign regions and helped them to stimulate U.S. exports. Light et al.(2002) have also highlighted the role of immigrants as middlemen in trade promotion; however using the census data they find that entrepreneurship rates significantly increase U.S. exports but not U.S. imports. However, Head and Ries (1998) examining the role of the independent class of immigrants in trade promotion for Canada fail to find any positive effect of entrepreneur group of immigrants on trade and they argue that is possibly due to point system used in the Canadian immigration.

Immigrant stock and occupation captures the information effect because immigrant's occupation will explain to what extent the immigrant is able to use the co ethnic networks and the information for trading. Our first hypothesis is that not all categories of immigrants will have similar pro-trade effect on trade, particularly in building trading contacts and lowering transactions cost to trade and the most significant and positive effect should be from the professional and higher skilled immigrants. For instance, the managers, professionals, and executives will have a more significant effect on trade promotion with their home country and this effect should be present both for the U. S. exports and U. S. imports. Moreover, this effect of immigrants on trade across their different occupations will vary across the type of goods; whether the commodity is homogenous or differentiated good.

III. Empirical Model and Data

Gravity Specification

The empirical model is based on the ‘gravity framework,’ where the trade between the U. S. and its trading partners, who are also immigrant-sending countries, is explained by different economic factors in the U. S. and the home countries. It is very well known in empirical trade literature that Gravity Model works well in overall explanation of the trade between countries and is consistent with many trade theories.⁵ We begin our specification with Frankel (1997) basic Gravity model where the trade (F_{ij}) is proportional to the product of GNP or GDP of the two countries (Y_i and Y_j) and inverse to distance between the two countries, D_{ij} :

$$F_{ij} = \frac{Y_i Y_j}{D_{ij} X_{ij}} \quad (1)$$

To this multiplicative Gravity model we add product of per capita GNP, which takes into account the diverse stage of development of different countries (Frankel 1995, Rauch 1999). The vector X_{ij} includes factors that assist or hinder trade through affecting trading cost. In addition to the total income capturing the size of the economy and relative income accounting for the similarity between the U. S. and other countries, we include on the lines of Frankel whether U.S. and its trading partners are both English speaking countries; whether the trading partner is adjacent to the U.S. Trade flows between U. S. and its bordering countries, Canada and Mexico, is enhanced by a common border and also by the fact that they belong to NAFTA.

⁵ Helpman and Krugman (1985.) and Helpman (1987) showed that the bilateral trade between countries is proportional to their GDP levels in the differentiated products and increasing returns framework, whereas Deardroff (1998) have tried to reconcile the Gravity models with traditional H-O frameworks.

We categorize immigrants network in the U.S. based on the immigrants' occupation. The immigrants who are in executive and professional occupation will have a stronger immigrant network with fellow professionals from their country and will be in a position to provide stronger stimulus to trade between the U.S. and their home country. They will be using the home country knowledge and information in entrepreneurial activities opening new channels of trade with their home country; involved in a more efficient search of goods and buyers or sellers in the home country and better trade negotiations. On the other hand if the immigrant is a homemaker or a retired person or is a construction worker or in farming they might not have the kind of immigrant networks one needs to increase trade via the information effect. Following 2000 Census we categorize immigrants into the following four categories of occupation: management, professional and related occupation; sales and office administration; construction, precision workers and laborers and no occupation (includes retired persons, students, home-makers). The gravity model in (1) extends to

$$F_{USj} = (GNP_{US}GNP_j)^\alpha (PGNP_{US}PGNP_j)^\beta (Distance)_j^{-\gamma} e^{-X_{USj}} \quad (2)$$

In equation (2), F_{USj} is US exports to the home country of the immigrants in the export model and US imports to the home country of the immigrants in the import model.

$GNP_{US}GNP_j$ is the product of the U.S. and the home country GNP;

$PGNP_{US}PGNP_j$ is the product of the per capital GNP of the home country and the U.S.;

Distance is the bilateral distance between the home country and the U.S. and

$$X_{USj} = (Adjacency_{USj}, \ln (IMMSTOCK)_{USj}, Proportion\ of\ Immigrants_{USjk})$$

Adjacency is a dummy variable which takes the value 1 if the U.S and the home country are adjacent to each other (this captures the dummy for Canada and Mexico)⁶

$\ln (IMMSTOCK)_{USj}$ is the immigrant stock in the U.S. measures the size of the immigrant network from country j in the U.S.

Proportion of Immigrants is the proportion of immigration stock in the U.S from the home country j across k occupations capturing the immigrant network effect.

We group the six occupation categories given in the census (2000) into four occupation categories as follows:

k=1: Management, Professional and Related Occupation (PROPPROEXC)

k=2: Services, Sales and Office Occupation (PROPSERSLS)

k=3: Construction, Production, Laborers and Farming (PROPPCRLABFFF)

k=4: No occupation (Homemaker, Students, Unemployed or Retired persons,

The econometric model after taking log on both sides of (2) and over time t is

$$\ln F_{USjt} = \rho + \alpha \ln(GNP_{US}GNP_j)_t + \beta \ln(PGNP_{US}PGNP_j)_t + \gamma \ln(Distance) + \delta Adjacency_{USj} + \sum \delta_k Proportion\ of\ Immigrants_{kUSjt} + \delta \ln (IMMSTOCK)_{USjt} + \varepsilon_{USjt} \quad (3)$$

Where k goes from 1 to 3 and the proportion of immigrants with no occupation is the reference category and ε_{USj} is the usual iid error term. The econometric model given in equation (3) controls for the size of immigrant stock from each country as well as the distribution of the immigrants across occupation groups.

⁶This also captures the NAFTA trade agreement among U.S., Canada, and Mexico for the years 1994 – 2000.

Data

Our sample consists of 62 countries over 1991 – 2000.⁷ The list of the countries is given in Appendix A. The U.S. export and import data is obtained from the extension of the World Trade Database of Statistics Canada, which is a part of the NBER World Trade Database by Feenstra et al. (2005).⁸ The nominal GNP and population is from the Penn World tables 6.1 (<http://pwt.econ.upenn.edu>). Annual data on immigrants across occupation is from the Immigration Statistical Yearbook by the Immigration and Naturalization Services (INS).⁹ The data on distance and English language is obtained from Frankel.¹⁰

Classification of Commodities: Organized Exchange, Referenced Price, and Differentiated

Following Rauch's (1999) classification we group the commodities at the SITC 4 level into three groups: Organized exchange, Referenced Price, and Differentiated goods using 4 digit SITC trade data (reference trade data). Internationally traded goods classified into organized exchange if they are listed on the organized exchange, whereas they are classified as referenced price if their prices are quoted in trade bulletins. Differentiated goods are not homogenous goods and cannot be listed on any organized exchange or have a reference price printed in trade bulletins. Immigrants' networks will be most effective in trade creation through their information effect matching buyers and sellers in differentiated goods and the least effective in the goods traded on the organized exchange. Immigrant networks can also play an important

⁷ We add El Salvador and Nicaragua and remove Yugoslavia from the sample of countries used in Frankel (1997).

⁸ The data is downloaded from the Center for International Data at the UC Davis and the details are given in the <http://cid.econ.ucdavis.edu>. NBER Working paper 11040.

⁹ INS is now called U.S. Immigration and Citizenship Services, though we refer as INS for convenience

¹⁰ Distance is from "Direct-Line Distances", International Edition, Gary L. Fitzpatrick and Marilyn J. Modlin, Scarecrow Press, Inc. Metuchen NJ and London 1986.

role in matching buyers and sellers in the referenced price group and possibly increasing trade with their home country. The models given in (3) and (4) are estimated for both aggregate U.S. exports and imports as well as across three classifications of goods: Homogenous, Organized and Differentiated.

The Immigrant Network Variable: across Occupation

We calculate the stock of the immigrants across occupation using the INS flow data and the 2000 US Census. Immigrant stock gives a better proxy for the immigrants' network in the U.S. and in the past papers the Census data is used to calculate the stock variable at the national level as well as the state level (Dunlevy 2004; Herander and Saavedra 2005). INS collects annual information on legal permanent residents from different countries in the year the individual obtains an immigration status (they might be in the U. S. from many years or they might have arrived to the U. S. that year as a Legal Permanent Resident).¹¹ For ease of data availability we use the 2000 Census data and use the annual INS data for the years 1991- 2000 to calculate immigrant stock variables for the years 1991 – 2000 as follows:

$$SImm_{jkt-1} = SImm_{jkt} - Imm_{jkt}$$

where *SIMM* is the stock of immigrants from country *j* in occupation *k* and *Imm* is the annual flow of immigrants in occupation *k* in the year *t* and *t* goes from 1991- 2000. This estimate of the immigrant stock is not exact because it does not take into account mortality and emigration of the immigrants, but due to lack of data this estimate has been used in the literature (Dunlevy 2004; Herander and Saavedra 2005).

¹¹ This data is also used by Orrenius and Zovodny (2006) to study immigrant earnings across occupation.

If immigrant occupation played a role in the trading opportunities one would expect that higher the proportion of executive and professional immigrants from a country higher will be the immigrant network effect on trade. A CEO and an engineer will be better able to mitigate information barriers and will be in a better position to match buyers and sellers with their home country. Professional and executive immigrants will be in a better position in facilitating trade than immigrants in production or in construction or in farming. Higher the proportion of professional and executives than other occupation for an immigrant group stronger will be the immigrant network for that country. We will expect that immigrants in the management and professional occupation will have the most significant effect on trade compared to any other group. Table 1 shows the top 32 trading partners for U.S. in terms of exports and imports. We see that 56% of the 32 countries for U.S. imports and 59% countries for U.S. exports have more than 25% of their immigrants in the Management and Professional occupation.

Endogeneity of the Size and the Distribution of the Immigrant Stock

The immigrant stock and the distribution of the immigrants across occupation maybe endogenous to the level of trade flow in the econometric model given by equation (3). There might be omitted factors simultaneously affecting the trade flows and the immigrants stock from country j in time period t .¹² Nevertheless, we tested for the endogeneity of the immigrant stock

¹² Previous work in this area have argued that endogeneity is not an issue because immigration is a stock and the trade is a flow variable.

using Hausman (1978) test and the evidence in support of the endogeneity of the immigrant stock is weak (at 10% level of significance only for U.S. imports).

It is well known that from some countries migrants are positively selected and from some other countries they are negatively selected (Borjas 1987, 1999; Chiquiar and Hanson 2005; Chiswick 1999; McKenzie and Rapoport 2006). Table 2 shows the mean proportion of immigrants across various occupation groups for all 62 countries in our sample. We see that for Taiwan proportion of immigrants in management and professional related occupation is 43% whereas for Mexico it is 5%. On the other hand for the proportion of immigrants in construction, production, laborers and farming from Mexico is 31% whereas from Taiwan it is only 4%. The migrant selection literature has found that migrants from countries that are further away from the U.S. (hence migration costs are higher) and with a higher enrollment in tertiary education and lower income inequality tend to be positively selected. Whereas, for countries with higher income inequality and lower migration costs migrants to the U.S. tend to be negatively selected.

In order to account for the possible endogeneity of the size and the occupational distribution in model given in equation (4) we estimate a system consisting of the three occupation categories (PROPPRORXC, PROPSERSLS, PROPPCRLABFFF) and $\ln(\text{IMMSTOCK})$ together with trade flows using 3SLS. We estimate the system using the popular instruments or the exogenous factors for migration (not present in the trade flows specification in equation 3), such as home-country income inequality measure (gini coefficient), whether the home country allows a dual citizenship, personal computers and telephone lines (per 100 people). We also include home country education measures such as level of secondary and higher education attainment

rates for the home country. The data on computer use and telephone lines is obtained from the World Development Indicators. Income inequality is obtained from UNU/WIDER World Income Inequality database. The annual education data is obtained from the Barro and Lee (2000) dataset.¹³ We assume that there are some common factors that affect the size and occupational distribution of the immigrant stock, and the trade flows, making the errors across the equations to be correlated. Our results from 3SLS are similar to that of the OLS results discussed in the next section.¹⁴ For robustness check we further re-estimate the model given in equation (3) after dropping the obvious extreme cases with migrant selection such as Mexico, Canada, Nigeria, South Africa, and Taiwan and the results from the model does not change.

IV. Results of Estimation

The results from the estimation of model in equation (3) for aggregate U.S. exports and imports is given in Table 3. Similar to the previous literature we find that the size of immigrant network has a strong positive effect on both U.S. exports and imports and both the immigrant export and import elasticity is around 0.4. For both U.S. exports and imports we find that immigrant network consisting of professional and executives is significant at 1% in increasing bilateral trade with the home country of the immigrants compared to immigrants with no occupation after we control for the size of the immigrant network. However, immigrants in service and sales as well as in the laborers and farming have no significant effect on the U.S.

¹³ Data on the dual citizenship is obtained from the U.S. Office of Personal Management Investigation Service (2001) "Citizenship Laws of the World".

¹⁴ As is well known if we rule out the cross-correlation in the system 3SLS is reduced to 2SLS. Even if the 3SLS is sensitive to the specification of each equation the correlation across the errors makes sense. Results from 3SLS are available from the author upon request.

exports and imports. This supports our hypothesis that immigrants' occupation will influence the immigrants' networking abilities with the immigrants' home country and with natives. The quality of the immigrant network has an effect on the strength of the immigrant networks in trade promotion. After controlling for immigrant network by including $\ln(\text{IMMSTOCK})$ a one percentage point increase in the proportion of executives and professional immigrants from a country increase U.S. exports to that country by 3% and U.S. imports by 4%.

Examining the immigrant's occupation effect across Rauch's different classification of goods we find that the immigrant network elasticity for U.S. exports across all the categories of U.S. exports is around 0.5, whereas it is as high as 0.9 for differentiated imports (see Table 4). We also find that the professional executives and managerial immigrants continue to have a significant effect on trade for both exports and imports across organized, referenced price and differentiated goods (around 4%). The biggest effect of this group is in differentiated imports, a one percentage increase in the proportion of immigrants who are professional and managers increase U.S. imports in differentiated goods with their home country by 8%. However, in contrast to aggregate trade we find that immigrants in sales and services have a significant effect on the exports and imports of referenced price goods. A one percentage increase in the proportion of immigrants in sales and service occupation increase U.S. exports by 1% (significant at 10%) and lowers U.S. imports by 4% (significant at 1%). This supports our hypothesis that the information effect promoting trade varies with occupation and the type of goods. The proportion of immigrants in construction and farming also have a significant effect on the U.S. imports with the highest effect on the imports of differentiated goods (around 4%).

This also tends to provide support that the immigrants in construction and labor have significant demand effect than the information effect and this is largest for differentiated goods.¹⁵

For the other gravity variables we find that the GNP and per capita GNP are highly significant and have the expected sign. We also find that higher the distance between U.S. and the home country lower is the trade, though we find that the adjacent dummy for Canada and Mexico is significant for U.S. exports at the aggregate, referenced price and differentiated category and for differentiated imports.

English Language Dummy and Size of Immigrant Stock – Some Evidence of Substitution

The literature has often used English speaking home-country dummy as an indicator of cultural familiarity between the home country and the host country. In addition, it is also argued that immigrants are familiar with the language of their home country and that this language familiarity helps in trade promotion. As an additional model we included an interaction term in equation 3 between English speaking dummy and the size of the Immigrants stock (ENGLISH*IMMSTOCK). In this interaction model we find that the coefficient attached to ENGLISH is always positive (large magnitude) and the coefficient attached to the (ENGLISH*IMMSTOCK) is negative and both are significant. This implies that English dummy and the presence of the immigrant stock are substitutes in trade promotion. Controlling

¹⁵ Our findings support the literature that there is more significant effect of immigrants across occupations for differentiated and referenced price goods than organized exchange. (Rauch 1998 . Mundra 2005, Herander and Saavedra 2005).

for other factors the effect of the English speaking country dummy on trade is lowered by the size of the immigrant stock present in the U.S.

Conclusions

In this paper we examine the role of the immigrant's occupation in generating trade with their home country via the coethnic immigrant network in the U.S. for the period 1991 – 2000. We classify immigrants into four occupations and find that the managerial and professional immigrants are the most successful in stimulating trade with their home country via the information effect and through potential networking with other fellow immigrants and natives, even after controlling for the size of the immigrant network. While examining the effect of immigrants' occupation across goods classified as organized exchange, referenced price and differentiated commodities we find that the immigrants in professional and executive professions have a positive significant effect on the U.S. exports as well as U.S. imports. However, immigrants in farming and immigrants working as laborers have a significant positive effect on U.S. imports, particularly in differentiated products. Our results are robust across various models and possibly taking into account the endogeneity of the size and occupational distribution. This paper makes an important contribution in understanding the role of immigrants' occupation in bilateral trade between their country of origin and the host country as well as highlights the positive impact of high-skilled emigration on the exports and potentially economic growth and development of the country of origin.

References

- Barro, R. and Jong Wa Lee. "International Data on Educational Attainment: Updates and Implications" CID Working Paper No. 42.
- Borjas, G. J., Self-selection and the earnings of immigrants, *American Economic Review*, 77, 4 (1987): 531-53.
- Borjas, G. J., *Heaven's door: immigration policy and the American economy*, Princeton, N.J.: Princeton University Press (1999).
- Chiquiar, D. and G. H. Hanson, International migration, self-selection, and the distribution of wages: Evidence from Mexico and the United States, *Journal of Political Economy*, 113, 2 (2005): 239-81.
- Chiswick, B. (1999): Are immigrants favorably self-selected?, *American Economic Review – Papers and Proceedings*, 89, 2 (1999): 181-85.
- Combes, P. P., Lafourcade, M. and Mayer, T. "Can Business and Social Networks Explain the Border Effect Puzzle?" Working Paper 2002.
- Dunlevy, J. A. "Interpersonal Networks in International Trade: Evidence on the Role of Immigrants in Promoting Exports from the American States." *Review of Economics and Statistics* (2004).
- Dunlevy, J. A., and W. K. Hutchinson. "The Impact of Immigration on American Import Trade in the Late Nineteenth and early Twentieth Century." *The Journal of Economic History* 59.4 (1999): 1043-62.
- Feenstra, R.C., R.E. Lipsey, Deng Haiyan, Alyson C. Ma, Hengyong Mo. "World trade Flows: 1962-2000" NBER Working Paper Series, Working Paper 11040.
- Frankel, J. A. *Regional Trading Blocs in the World Economic System*. Washington DC: Institute for International Economics, 1997.
- Gould, D. M. "Immigrant Links to the Home Country: Empirical Implications for U. S. Bilateral Trade Flows." *Review of Economics and Statistics* 76 (1994): 302-16.
- Greenwood, M. J. and J. M. McDowell "The Factor Market Consequences of U.S. Immigration," *Journal of Economic Literature* 24(4), 1986: 1738-1772.
- Grief, A. "Contract Enforceability and Economic Institutions in early Trade: The Maghribi Traders' Coalition." *American Economic Review* 83.3 (1993): 525-548.
- Hausman, J. A. "Specification Tests in Econometrics" *Econometrica* 46 (1978): 1251-1271.

- Head, K., and J. Reis. "Immigration and Trade Creation: Econometric Evidence from Canada." *Canadian Journal of Economics* 31.1 (1998): 47-62.
- Helliwell, John F., *How Much Do National Borders Matter?* (Washington D.C.: Brookings Institution, 1998).
- Herander Mark G. and Luz A. Saavedra "Exports and the Structure of Immigrant-Based Networks: The Role of Geographical Proximity." *The Review of Economics and Statistics* 87:2 (2005): 323-335.
- Light, I., M. Zhou, and R. Kim. "Transnationalism and American Exports in an English-Speaking World" *International Migration Review*, 2002.
- McCallun, John. "National Borders Matter: Canada – U.S. Regional Trade Patterns," *American Economic Review* 85 (1995), 615-623.
- Min, P. G. "Korean Immigrants in Los Angeles." in Institute of Social Science Research, ISSR Working Papers 2.2, University of California, Los Angeles, 1990.
- McKenzie D. and Hillel Rapoport, " Self-Selection Patterns in Mexico-U.S. Migration: The Role of Migration Networks." *World Bank Working Paper*, August 2006.
- Mundra, K. "Immigration and International trade: a Semiparametric Empirical Investigation." *The Journal of International Trade and Economic Development* 14(1),(2005): 65-91.
- Orrenius, P. M. and M. Zavodny, "Does Immigration Affect Wages? A look at Occupation-Level Evidence." Working paper 0302 Federal Reserve Bank of Dallas 2006.
- Peng, Mike W., "Behind the Success and Failure of U.S. Export Intermediaries- Transaction Agents, and Resources," Quorum Books 1998.
- Rauch, J. E. and Casella, Alessandra, "Overcoming Informational Barriers to International Resource Allocation: Prices and Group Ties," National Bureau of Economic Research working paper no. 6628 (1998).
- Rauch, J. E. "Networks Versus Markets in International Trade." *Journal of International Economics* 48 (1999): 7-35.
- Rauch, J. E. and V. Trindale. "Ethnic Chinese Networks in International Trade." *The Review of Economics and Statistics* 84.1 (2002): 116-130.
- Trefler, Daniel, "The Case of the Missing Trade and Other Mysteries," *American Economic Review* 85:5 (1995), 61-69.

Wagner D., Keith Head, and J. Reis, "Immigration and the Trade of provinces," *Scottish Journal of Political Economy*, 49(5) (2002): 507- 525.

Wei, Shang-Jin. "Intra-National Versus International Trade: How Stubborn are Nations in Global Integration?" National Bureau of Economic Research Working Paper no. 5531 (1996).

Table 1: Top 32 Trading partner: Average U.S. Exports, Average U.S. Imports and the Proportion of Management and Professional Immigrants (1991 – 2000)

Imports			Exports		
Country	Avg. U.S. Imports (\$)	Average Propexc (%)	Country	Avg. U.S. Exports	Average Propexc (%)
Canada	\$153,226,991	28	Canada	\$114,642,994	28
Japan	\$111,216,272	31	Mexico	\$72,009,743	5
Mexico	\$69,566,294	5	Japan	\$66,475,381	31
China	\$56,187,200	31	UK	\$33,902,120	31
West Germany	\$38,193,603	20	West Germany	\$32,159,952	20
Taiwan	\$28,907,383	42	South Korea	\$24,560,022	23
UK	\$28,016,407	31	France	\$22,498,391	21
South Korea	\$22,767,733	23	Taiwan	\$19,358,650	42
Italy	\$20,275,825	13	Singapore	\$17,263,079	38
France	\$20,041,570	21	China	\$14,851,049	31
Malaysia	\$16,937,099	37	Netherlands	\$13,661,580	28
Singapore	\$16,042,163	38	Hong Kong	\$13,170,280	28
Thailand	\$11,092,938	13	Australia	\$12,153,626	41
Venezuela	\$10,651,372	26	Brazil	\$10,621,781	17
Brazil	\$9,864,688	17	Malaysia	\$10,406,061	37
Hong Kong	\$9,601,936	28	Italy	\$10,019,772	13
Saudi Arabia	\$8,940,435	21	Belgium	\$9,510,636	29
Philippines	\$8,248,199	26	Spain	\$7,413,176	25
Switzerland	\$8,028,079	31	Thailand	\$6,891,729	13
Indonesia	\$7,628,441	26	Saudi Arabia	\$6,014,930	21
Belgium	\$7,284,365	29	Ireland	\$5,609,931	21
Israel	\$7,025,089	35	Switzerland	\$5,251,588	31
India	\$6,989,396	28	Philippines	\$5,237,960	26
Netherlands	\$6,685,138	28	Venezuela	\$5,108,059	26
Sweden	\$6,524,063	29	Israel	\$4,953,501	35
Ireland	\$5,980,803	21	Argentina	\$4,427,402	18
Nigeria	\$5,629,717	43	Sweden	\$4,104,163	29
Australia	\$4,593,533	41	Indonesia	\$3,902,186	26
Colombia	\$4,509,604	15	Colombia	\$3,880,005	15
Spain	\$4,046,428	25	Turkey	\$3,293,275	26
Norway	\$3,110,650	22	India	\$3,127,919	28

Table 2.- Average proportion of Immigrants across Occupation Groups by Countries

Country	Management and Professional and Related Occupation (%)	Services, Sales and Office Occupation (%)	Construction, Production, Laborers, and Farming (%)	No Occupation (Homemaker, Students, Unemployed or Retired persons) ¹⁶ (%)	Total Immigrants
Algeria	12	11	6	71	17316
Argentina	18	15	8	59	173060
Australia	41	21	7	32	47568
Austria	21	16	6	58	60523
Belgium	29	18	6	46	29838
Bolivia	19	32	17	32	4184
Brazil	17	34	16	34	166742
Canada	28	19	8	45	706962
Chile	5	41	18	36	489079
China	31	23	10	37	940412
Colombia	15	30	17	38	408677
Denmark	26	19	7	48	28286
Ecuador	10	27	24	40	249212
Egypt	19	15	6	60	140903
El Salvador	6	30	26	38	692755
Ethiopia	10	19	9	62	99580
Finland	20	12	5	63	28271
France	21	14	4	62	200486
Ghana	15	22	8	55	81736
Greece	13	14	8	64	235955
Hong Kong	28	29	7	35	178989
Hungary	19	15	10	55	85641
Iceland	19	15	5	61	7476
India	28	11	5	56	1355335
Indonesia	26	22	8	44	62601
Iran	34	25	8	33	232667
Ireland	21	19	11	49	139186
Israel	35	25	8	32	88291
Italy	13	17	12	57	458896
Japan	31	25	6	38	244368
Kenya	38	34	8	20	28661
Kuwait	28	26	8	37	14155
Libya	32	26	14	27	4223
Malaysia	37	25	7	31	41003
Mexico	5	22	31	43	7525353

¹⁶ This category in the INS data includes children.

Morocco	28	38	12	22	22396
Netherlands	28	18	8	45	86539
New Zealand	40	24	11	26	18224
Nicaragua	11	32	17	40	170062
Nigeria	43	30	12	14	90790
Norway	22	13	6	58	29627
Pakistan	29	30	16	24	139464
Paraguay	21	35	17	27	6961
Peru	16	33	18	32	211877
Philippines	26	32	12	31	1096818
Poland	14	22	21	43	377587
Portugal	11	21	28	40	190983
Saudi Arabia	21	20	7	52	10516
Singapore	38	19	4	39	16794
South Africa	47	24	6	24	46387
South Korea	23	28	10	40	708049
Spain	25	23	10	41	80228
Sudan	15	31	28	26	10327
Sweden	29	19	6	45	42322
Switzerland	31	17	5	47	36415
Taiwan	42	19	4	35	274140
Thailand	13	22	38	26	170617
Tunisia	27	21	10	42	5304
Turkey	26	19	12	43	62609
UK	31	21	7	41	593700
Uruguay	20	28	19	33	22377
Venezuela	26	28	11	35	76292
West Germany	20	21	9	50	651135

Table 3.- Dependent Variable: LOG of U.S. Exports and U.S. Imports for the years 1991 – 2000.

Variables	Exports	Imports
$\ln (GNP_{us}GNP_j)$	0.434*** (0.046)	0.480*** (0.070)
$\ln (PGNP_{us}PGNP_j)$	0.636*** (0.051)	0.671*** (0.079)
$\ln (DISTANCE)$	-0.1222 (0.146)	-0.299 (0.224)
<i>ADJACENT</i>	1.239*** (0.476)	1.032 (0.734)
<i>ENGLISH</i>	0.026 (0.130)	0.303*** (0.294)
<i>PROPPROEXC</i>	0.033*** (0.007)	0.041*** (0.016)
<i>PROPSERSLSASP</i>	0.001 (0.007)	-0.009 (0.011)
<i>PROPPCRLABFFF</i>	0.004* (0.008)	0.019 (0.013)
<i>L(IMMSTOCK)</i>	0.403*** (0.044)	0.410*** (0.067)
Number of Obs.	575	583
Adj-Rsquared	0.65	0.47
F-statistic (p-value)	119.1(0.00)	58.5(0.00)

No Occupation proportion is the reference category. *** Significant at 1%. ** Significant at 5%. *Significant at 10%

Table 4.- Dependent Variable: LOG of U.S. Exports and Imports with Immigrant Occupation: Organized Exchange, Reference Priced, and Differentiated Group

Variable	Exports			Imports		
	Organized Exchange	Referenced Price	Differentiated	Organized Exchange	Referenced Price	Differentiated
$\ln (GNP_{us}GNP_j)$	0.553*** (0.051)	0.509*** (0.048)	0.363*** (0.045)	0.610*** (0.076)	0.302*** (0.059)	0.443*** (0.063)
$\ln (PGNP_{us}PGNP_j)$	0.031 (0.057)	0.604*** (0.054)	0.731*** (0.051)	-0.163* (0.084)	0.620*** (0.066)	0.957*** (0.070)
$\ln (DISTANCE)$	-0.186*** (0.163)	-0.159 (0.152)	-0.073*** (0.144)	-1.091*** (0.235)	-0.499*** (0.185)	0.388*!a (0.198)
<i>ADJACENT</i>	0.808 (0.530)	0.999** (0.496)	1.391** (0.469)	1.146 (0.770)	0.607 (0.604)	2.08** (0.649)
<i>ENGLISH</i>	-0.439***!b (0.153)	0.142 (0.136)	-0.119 (0.129)	0.137 (0.226)	0.323*** (0.171)	-0.502***!b (0.181)
<i>PROPPROEXC</i>	0.040*** (0.008)	0.035*** (0.007)	0.041*** (0.007)	0.033*** (0.012)	0.031*** (0.009)	0.079*** (0.011)
<i>PROPSERSLSASP</i>	-0.003 (0.008)	0.014* (0.008)	-0.002 (0.007)	-0.008 (0.012)	-0.036*** (0.009)	-0.019** (0.010)
<i>PROPPCRLABFF</i>	0.001 (0.009)	0.011* (0.008)	0.003 (0.008)	0.037*** (0.014)	-0.005 (0.010)	0.044*** (0.011)
$\ln (IMMSTOCK)$	0.485*** (0.049)	0.443*** (0.046)	0.469*** (0.043)	0.05 (0.077)	0.567*** (0.057)	0.896***! (0.061)
Number of Obs.	571	573	573	567	568	576
Adj R-squared	0.58	0.66	0.67	0.30	0.56	0.70
F-statistic (p-value)	89.8(0.00)	122.9(0.00)	132.7(0.00)	26.17(0.00)	82.2(0.00)	147.3(0.00)

No Occupation proportion is the reference category. *** Significant at 1%. ** Significant at 5%. *Significant at 10%

! In the alternative specification where we include the interaction of the English dummy and the Immigrant size we find (a) negative distance effect (b) significant positive effect of English language for all type of goods and for both export and import, however this effect is lower with larger size of immigrant networks.