

**Interpersonal Networks in International Trade:
Evidence on the Role of Immigrants in Promoting Exports from the
American States***

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The importance of channels through which individuals are made aware of opportunities for advantageous exchange and the evolution of institutions that provide assurance that agreements will be honored have been the focus of a number of papers by Avner Greif, James Rauch, and others.¹ The needed institutions may evolve specifically to provide the required information and trust, or institutions that evolved for other purposes may be extended to do so.

Presumably, information, trust, and commitment are more difficult to obtain when exchange is to occur at a distance or when exchange is to cross linguistic or cultural boundaries, as is the case with much of international trade. How can a prospective exporter be reasonably assured that a market for his good exists, how can he be sure his overseas partners will not cheat him, how can he be sure that he does not incur extraordinary costs in bribes and other payments to distribute his wares in the destination country?

International migrant networks have been recognized as just such an institution capable of providing the information on opportunities and reputations of potential trading partners and of providing a credible threat of sanctions sufficient to deter opportunistic cheating on trading agreements. (See Landa (1994), Rauch (1999, 2001) and Rauch and others (2001, 2002)). Within this genre special interest has been shown in the role of immigrants in promoting bilateral trade between their host and origin countries. Since Gould (1994), which found a important pro-trade role of the foreign-born in both the import and export trade of the United States with the immigrants' countries of origin, the pro-trade effect of immigrants has been confirmed for Canada by Head and Ries (1998), for the United Kingdom by Girma and Yu (2002), and for the

¹ See Greif (2000) for reference to many of these papers.

national level by using the Canadian province as the unit of domestic observation. Extension of study to the sub-national level is important insofar as the immigrant-trade link relies on networks of individuals and families,³ and the empirical models to date, strictly, have been largely applied to heavily aggregated national data. If the pro-trade effect of immigrants cannot be observed at the sub-national level, then the credibility of its operating at the national level should be cast into doubt, and the empirical results to date perhaps attributed to spurious correlation.

Here we parallel the approach of Wagner, Head, and Ries by focusing on the pro-trade effect of the foreign born, “migrant stock,” living in the American states on the bilateral exports of those states to the immigrants’ countries of origin.^{4,5} Data, available from the Massachusetts Institute for Social and Economic Research (MISER), on average annual exports over the 1990 – 1992 period, by state and by country of destination, of manufactured goods, are combined with data on the number of foreign born, by state of residence in 1990 and by country of birth, in an augmented gravity model to test the hypothesis of a pro-trade immigrant effect. The resulting data set comprises 51 states (including the District of Columbia) and 87 foreign countries.

² A parallel literature on the positive impact of already settled immigrants on the settlement choices of their later arriving compatriots is well established in the migration literature. See Nelson (1959), Greenwood (1969, 1975), Dunlevy and Gemery (1977), and Massey (1990). Palloni, et al. (2001) test the hypothesis of social capital in the form of family networks having a positive effect on international migration and find in favor of it.

³ This assumes that the immigrant is relatively stationary in the host country so that he can be identified with a particular subdivision of the larger political entity.

⁴ For the purpose of this study no distinction will be made between “immigrant” and “foreign born.” Our data strictly are on the foreign born, regardless of their immigrant status under American law.

⁵ Studies of American exports at the subnational level have been conducted by Coughlin and Fabel (1988), Coughlin and Pollard (2001), Erickson and Hayward (1991), and Gazel and Schwer (1998), among others. Coughlin and Wall (2003) provide a good survey of the work that has been done to date on state level exports.

fixed effects, destination country fixed effects, and with both sets of fixed effects. Because exports from some states to given destination countries are zero in our sample we use the tobit procedure to estimate the model. Regardless of the specification of the estimating equation a remarkably consistent, robust pro-trade effect for migrant stock is found.

Our approach suggests certain situations in which interpersonal networks are likely to be of special importance. Among these is the hypothesis of Girma and Yu that immigrants from some countries of origin systematically bring with them information more or less useful than that brought by other immigrants. We test this and other corollaries of the basic hypothesis, that are developed below, and find strong support for our approach. We also recognize that the requisite networks may be established not only by immigrants settling in the United States, but also by the return of Americans from extended stays abroad. We test for this network effect in a limited fashion, and find support for it also.

In the next section we review the mechanisms by which immigrants might promote trade. In section 3 we discuss the basic and augmented gravity models that are estimated. We also consider the strengths and weaknesses of the export data employed. Section 4 presents and discusses the empirical findings. Section 5 concludes.

2. The Importance of Trust and the Origin of Information: The Immigrant-Trade Link

The role of networks in promoting labor market migration has a long history in both economics and sociology. This study of networks is directly applicable to the question of trade in goods. A seminal paper, germane to the current argument, is Granovetter (1973) in which

Granovetter argues that if a person, A, has strong ties to two persons, B and C, then over time (or in an equilibrium state), it is highly likely that B and C will also be joined by a strong tie. Hence, a group characterized by strong ties is likely to be “closed.” We observe that strong ties require commitment; hence, they are costly, and the typical person will have strong ties at most to no more than a few dozen persons (see Granovetter, p. 1375). Weak ties, on the other hand, are characterized by more casual, and low cost, recognition. Granovetter argues that weak ties are important because they provide links to those outside the otherwise closed group, “those to whom we are weakly tied are more likely to move in circles different from our own and will thus have access to information different from that which we receive.” (p. 1371)

I argue that strong ties provide mutual trust; however, information new to the members of the group is more likely to originate outside the group, itself. It is the weak ties that provide information that is new, and, hence, scarce and, therefore, valuable. For trade to develop both trust and information are necessary. Trust can be provided impersonally through the state or other institutions by a well understood system of contracting and enforcement; even here, however, the usefulness of institutionally provided trust will diminish as the degree of standardization of the items traded decreases (see Rauch 1999, p. 7), and the importance of personal, strong ties will increase. Where stable or well understood institutions do not exist, the role of personal, strong ties is central regardless of what is to be exchanged.

Much of the empirical work stimulated by Granovetter has considered the differential effectiveness of weak versus strong ties on the labor market outcomes of those seeking

argument, then, is that immigrants are ideally situated to have access in their host locations to useful information via weak ties and to have the strong ties to their family and co-ethnic friends in both their host and origin locations needed to provide the necessary trust. Family and friends in the origin country, in turn, have access to information in that country again through personal experience and through weak ties to others. Weak ties and personal experience provide information; strong ties provide trust.

In the specific case of manufactured goods exported from the U.S., the potential domestic supplier requires confidence that the goods will sell at a profit in the foreign market. The foreign buyer needs assurance that the merchandise is as claimed. The domestic supplier likewise must be confident in receiving the agreed on payment for his exported merchandise.⁶ Finally, for trade to be profitable, the merchandise must move through the distribution channels in a timely fashion, and the costs, including bribes, needed to move the merchandise must be known with some certainty.

The pro-trade links between immigrants and bilateral trade flows that have been observed and discussed in the literature have been categorized as working by reducing transactions costs in three ways. First, immigrants because of their familiarity with the economies of two different societies are in a better position to recognize opportunities for trade due to product differentiation

⁶ In many cases the banking system will provide sufficient guarantee for the agreed upon payment. In cases of trade with some developing countries or what were the centrally planned states of Eastern Europe, barter or other forms of countertrade often provided payment in kind. The American exporter in such a case then faced the risk of substandard goods being offered as payment. See Caves and Marin (1992) for a general presentation of countertrade; see Hogendorn (1999) for a discussion of the risks of barter trade in the historical case of European – African trade in the precolonial period. Hennart (1989) makes a strong case that countertrade, by building self-enforcing mechanisms into an agreement, can serve to reduce transactions cost.

broadly includes both legal and extra-legal aspects of doing business in their country of origin.

Third, especially if particular entrepreneurs are new to international trade or if they are short term participants, the immigrant community is capable of providing security and guarantees that the participants in the transaction will honor their agreements in spirit as well as in word.⁷

These three links see immigrants serving to increase the opportunity for trustworthy communication between their host and origin countries. Migrants therefore can serve to improve the exporter's (and importer's) knowledge and to mitigate the risks involved. From these follow the following proposition and four corollaries:

Proposition: Immigrants in the host location share ethnic strong ties with those in their particular origin communities; this form of social capital promotes economic contracting and, hence, trade. In the context of the present paper, we expect exports to be greater, *ceteris paribus*, between U.S. states and destination countries when those countries are the source for larger numbers of immigrants in the particular states. This, of course, is what has been found in the studies cited earlier, and is sought for here at the subnational level.

Network links are more important when it is otherwise more costly to obtain quality information about the potential trading partner and where it is more difficult to “navigate” the bureaucratic and commercial environment of the potential partner. This gives rise to four related corollaries:

⁷ A fourth link, that of immigrant tastes, which may promote imports from the country of origin to the immigrants' host country, is not relevant to the present paper.

corruption is more prevalent in the export destination country, then ignorance of how to deal with business partners, government officials, and organized criminal groups can be devastating. Thus, the specific knowledge of norms and people needed to reduce the likelihood of being a victim of fraud and corruption that is possessed within the strong-tie immigrant network can be of great value.⁸ In the present context, we expect the role of immigrants to be greater in promoting bilateral trade when the business or political environment in their origin country is less transparent or more corrupt. We also expect overall trade with such countries otherwise to be below “normal.”

Corollary 2: The role of ethnic networks is more valuable when the native population in the host country is less able to master the language of the potential trading partner. We assume that members of the immigrant community are more likely than the native born in the host country to be competent in both English and the language of their home country. The more “distant” their native language is from English, the greater will be the immigrants’ advantage in dealing with members of their origin countries.⁹

Corollary 3: Related to the above, Girma and Yu have proposed that immigrants can possess either “individual-specific” or “nonindividual-specific” information. Individual-specific information is by their definition always useful in promoting trade.

⁸ Corruption is non trivial in international markets. Anderson and Marcouiller (2002, p. 342) cites a World Bank survey that lists corruption as the second most important obstacle to business worldwide, with crime and theft not far behind.

⁹ Chiswick and Miller (1998) studied the effect of “language distance” on immigrant assimilation. Hutchinson (2002) applies Chiswick and Miller’s “language distance” variable to international trade but does not incorporate the role of immigrants.

provide, driving the marginal value of the immigrant's network capital toward zero.

Therefore, we assume that the more similar the institutions of the immigrant source (export destination) country are to those of the United States, the lower will be the pro-trade effect of the immigrants. Given our sample of countries, it may be empirically difficult to separate this effect from that of Corollary 2.

Information flows presumably can be generated as well by extended stays of Americans traveling abroad. Levels of trust sufficient to guarantee contracts, that is, strong ties that stand the test of time, may not as a rule result from contacts made by such travel. An exception to this rule, however, may occur when the extended travel is that of religious missionaries. The high levels of emotional intensity, confiding, and reciprocity cited by Granovetter quite possibly characterize the relationships built between missionaries and those they serve.

Corollary 4: Sojourns abroad by natives of the host country may develop a native-held social capital that substitutes for the social capital provided by the immigrants. Such sojourns are especially likely to provide the strong ties required for trust when the sojourn is as a religious missionary. We can test this proposition for one special case, discussed below.

3. Model and Data

In this section we present the basic gravity model used to estimate the impact of immigrants on state-level exports, and we discuss the data, especially the export data, in some detail.

regressors either in an ad hoc manner or on the basis of any of a variety of possible underlying theoretical derivations.¹⁰ In this study, to facilitate interpretation of the results, we use per capita incomes and population, and we enter *MIGRANT STOCK* into the model to reflect the information and cultural network effects discussed above. The gravity model is generally estimated as linear in the logarithms; we follow that practice here and all non-dummy variables are transformed into their logarithms prior to estimation. The coefficients, therefore, are interpreted as elasticities. The model to be estimated is:

$$(1) \ln EXPORTS_{ij} = f(\ln MIGRANT STOCK_{ij}, \ln PCINC_i, \ln POP_i, \ln PCINC_j, \ln POP_j, \ln DISTANCE_{ij}, Z_{ij}, FE_i, FE_j)$$

where $\ln EXPORTS_{ij}$ denotes (the natural logarithm of) the dollar value of exports of manufactures from state i to country j averaged over the years 1990 through 1992, $MIGRANT STOCK_{ij}$ denotes the number of persons born in country j residing in state i as enumerated in the 1990 Census, $PCINC_i$ and $PCINC_j$ denote, respectively, the per capita income, in U.S. dollars, of state i and of country j in 1990, POP_i and POP_j denote, respectively, the populations of state i and country j in 1990,

¹⁰ The theoretical literature on the gravity model as applied to international trade is extensive. Basic references include Bergstrand (1985, 1989); Frankel (1997) provides a good overview of gravity models. Gould (1994) develops a model relating bilateral trade to the size of the migrant stock in the host country. The particular form of the gravity equation employed here can be straightforwardly derived, with a few obvious modifications, following the approach of Rauch and Trindade (2002). Since our model offers no innovations we do not repeat its derivation.

these groupings.

Z_{ij} denotes other variables used to augment this standard form that allow us to test the propositions advanced in the previous section,

FE_i and FE_j denote fixed effects dummy variables for the American states and for the destination countries, respectively.

The exports from a number of states to given foreign destinations are zero in value. This requires two adjustments: first, the logarithm of $EXPORTS_{ij}$ is defined as $\ln(EXPORTS_{ij} + 1)$; second, since the resulting value of $\ln EXPORTS_{ij}$ is zero in those cases where $EXPORTS_{ij}$ is zero, the model is estimated using the tobit procedure.

The appendix gives the sources for the data used in this study. Since the sources are relatively standard, we will discuss further only the export data. These are from the origin of movement (OM) series collected by the U.S. Census Bureau and modified and released by the Massachusetts Institute of Social and Economic Research (MISER).¹¹ These data are reported at the two-digit SIC level. They seek to determine the “point of origin” from which exports begin their journey to the port of export. “Point of origin” can refer to the state in which the factory that produced the item is located, or the location of a distributor, warehouse, or cargo processing facility. The “point of origin” can also be the state that contributes the greatest dollar value to a multi-product shipment, or the state of consolidation in which a multi-product export order is readied for shipment.

¹¹ The following is taken from the U.S. Department of Commerce, International Trade Administration, “State Exports.”

that do their own exporting and for these shipments the state of production is correctly identified. For manufactured goods the data are regarded as the best available. In this study we limit ourselves to exports of goods in the SIC classes 20 – 39, namely, manufactures.

Our trade data comprise exports of the fifty U.S. states and the District of Columbia, referred to here as “states,” to eighty-seven foreign countries. As a result the data set has 4437 observations; of these 239 observations have an export value of zero. The sample of destination countries spans all continents and all ranges of economic development; some countries are major contributors of immigrants to the U.S., others contribute few immigrants; likewise, some countries are major markets for U.S. exports, others are minor trading partners.

4. Empirical Findings

Estimation of the basic gravity model with *MIGRANT STOCK* as a regressor is reported in column 1 of Table 1. This serves as the base line regression. All variables obtain statistically significant coefficients of the expected sign; the standard gravity variables’ estimated impacts on trade are generally as expected. The estimated elasticity of *EXPORTS* with respect to *MIGRANT STOCK* is a highly statistically and economically significant 0.29. The estimated impact of migrant stock on state exports stays in the neighborhood of 0.30 to 0.50 regardless of the modifications we make to the model, as reported below. Clearly, there is strong support at the level of the U.S. states for the immigrant pro-trade effect, and the Proposition offered above in section 2, is affirmed.

corruption for 1997 - 1998.¹² This is the date of observation closest to our observation period of 1990 – 1992. “CORRUPTION” is added to the regression in two ways. First it is interacted with the logarithm of Migrant Stock in order to determine whether the pro-trade effect of migrant stock is greater when the export destination country is less transparent as asserted by Corollary 1. Second the logarithm of Corruption is added as a regressor to capture any intercept shift effects of corruption on trade flows.

Similarity of language has been found to be trade-creating.¹³ Corollary 2, however, asserts that similarity of language should reduce the value that immigrants contribute to trade facilitation. The effect of similarity of language on the pro-trade effect of immigrants is considered by entering a variable that is the interaction of an English language (or Spanish language) dummy variable with the logarithm of Migrant Stock. If English (Spanish) is the native language of the export destination country then immigrants do not possess as great an advantage over native-born Americans insofar as communication skills are concerned. Immigrants from such countries presumably still have pro-trade effects, but effects that are smaller than those of immigrants with abilities in more valuable (at the margin) languages. We also expect that, *ceteris paribus*, trade with English (Spanish) speaking countries will, in general,

¹² The World Bank reports their index as ranging more or less between -2.5 and $+2.5$. Their index is of “control of corruption.” We therefore use its negative to measure “corruption” which is interacted with the logarithm of MIGRANT STOCK. In order to obtain the intercept shift variable we add 2.5 to the negative of the reported value to ensure that logarithms of the values can be obtained. Observations on the corruption variable do not exist for Cape verde Islands, Grenada, Laos, or Western Samoa. As a result 204 observations are lost; for the resulting set of observations 174 of the 4233 observations have a value of 0 for the dependent variable.

¹³ See, e.g., Frankel (1997) or Hutchinson (2002).

similar to those of the U.S. bring with them human and social capital of less usefulness (at the margin) than immigrants from other countries (Girma and Yu's contention), is closely intertwined with both issues of corruptions and of language. Hence, evidence for Corollary 3 is implicit in the coefficients obtained on the previously described variables. Nevertheless, we identify Canada, the United Kingdom, Australia, and New Zealand as having the legal and commercial systems (the "British System") most similar to those of the U.S. Again a dummy variable is interacted with Migrant Stock and also used as a separate intercept variable.

The last Corollary, that extended foreign travel by Americans can substitute for the pro-trade effect of immigrants is tested for a special case. The Mormon Church requires missionary service of its members. As a result many young Mormon adults spend extended periods abroad. Many of them learn the basics of the language of the country to which they are assigned, and we may presume that they develop strong ties with native people of those countries. There is anecdotal evidence of the business contacts these missionaries bring back to the United States, in particular, to the state of Utah, which is home to the Mormon Church.¹⁵

We use the link between Mormon missionaries and the state of Utah to test Corollary 4.

Admittedly, this is a very narrow test of the information and trust that might develop between

¹⁴ In our sample the English speaking countries are: Canada, Belize, Jamaica, Trinidad, Grenada, Guyana, the United Kingdom, Ireland, Cyprus, Jordan, India, Pakistan, Bangladesh, Singapore, Malaysia, the Philippines, Hong Kong, Australia, New Zealand, Western Samoa, Cameroon, Sierra Leone, Ghana, Nigeria, Uganda, Kenya, South Africa, Zambia, and Zimbabwe. The Spanish-speaking countries are: Mexico, Guatemala, El Salvador, Honduras, Nicaragua, Costa Rica, Panama, Dominican Republic, Colombia, Venezuela, Ecuador, Peru, Bolivia, Chile, Paraguay, Uruguay, Argentina, Spain, and the Philippines.

¹⁵ See the article by Bernard Wysocki in the Wall Street Journal, (1996) that spotlights the positive impact of Mormon missionaries on the overseas business contacts of firms located in Utah.

Column 5 of Table 1 presents the results of this regression. We find here that the estimated elasticity of Migrant Stock on export flows is a statistically and economically significant 0.40. The estimated coefficient on the interaction variable *CORRUPTION*ln MIGRANT STOCK* is a statistically significant 0.086, implying, as hypothesized, that the pro-trade role for immigrants does increase if their home country environment is more corrupt. For instance, when combined with the estimated elasticity of 0.40 of the migrant stock variable, we find that the implicit pro-trade elasticity of immigrants from Guatemala, whose modified corruption index equals 0.819, is 0.47 while the elasticity for immigrants from Hong Kong, whose modified corruption index is – 1.313, is 0.29. Hence, the hypothesis that immigrants from countries with greater corruption will have a greater pro-trade effect is confirmed with our sample. The estimated coefficient on our intercept shift variable, the logarithm of *CORRUPTION* is a statistically significant – 1.06, which supports the second part of Corollary 1 that, ceteris paribus, trade is deterred by corruption. While this latter result is well grounded in the literature, we believe that the former finding, regarding the interaction of the role of immigrant networks and corruption on trade, is novel.

The estimated coefficient on the English Language-Migrant Stock interacted variable is small and without statistical significance. While we might infer from this that there is little distinction in the pro-trade effect of immigrants for English speaking countries as compared to the reference group, it is best to put off discussion of this effect for the moment. Immigrants from Spanish speaking countries, however, are estimated to have a statistically significant

coefficients of the intercept shift variables are 1.03 for English speaking countries and a large 3.07 for Spanish speaking countries, and both are statistically significant. This suggests that exports to English speaking countries and to Spanish speaking countries, after controlling for size, distance, corruption, and the other included variables are well above the norm. Corollary 2 therefore receives strong support in the case of Spanish, but not English, language.

We next report the estimated effect of “institutional similarity.” The coefficient on the interaction of Migrant Stock and Institutional Similarity is a statistically significant -0.46 . This establishes that the large volume of American trade with Canada and the U.K. is not driving our finding of a greater volume of exports to English speaking countries.¹⁶ We also get here a fuller insight into the total effect of “British” and English speaking on exports. With respect to Corollary 3, it appears that immigrants from the four British System countries play virtually no role in promoting exports to their countries of origin: the sum of the coefficients on Migrant Stock and on the interaction of Migrant Stock with each of English Language and Institutional Similarity is 0.012. The Girma-Yu conjecture, therefore, receives support. Insofar as the Institutional Similarity shift variable is concerned, a strongly statistically significant positive trade effect is found, and this is in addition to the positive intercept shift effect that continues to be found for the English language dummy variable.

¹⁶ It is often observed that sub-Saharan African countries are less involved in the world economy than other nations. Our sample includes a number of these countries, many of which are English speaking. In order to determine whether these countries affected our empirical findings in a systematic manner, an intercept shift dummy variable equal to unity if the export destination country of observation is located in sub-Saharan Africa was added to the previous specification. In unreported results it was found that the Africa dummy variable had a very small, statistically insignificant effect on the trade of the states; inclusion of this dummy in no appreciable way affected the estimated coefficients on any of the other variables.

suggestive that development of strong ties by Americans with people in other countries does have a pro-trade effect of a similar sort to that of foreign immigrants in the United States.

A skeptic might argue that the modified gravity model fails to control for a great deal of unobserved heterogeneity across the American states and across the foreign countries that are the destinations for the states' exports. No allowance is made, for instance, for the industrial base of the state or whether the state borders an ocean; similarly no attempt is made to control for the barriers to trade that a destination country may have erected. In order to correct for such heterogeneity we re-estimate the model first using state-specific dummy variables, then using destination country-specific dummy variables, and then both sets of fixed effects.¹⁷ We do this in each case for the basic gravity model and then for the model that incorporates all of the modifications introduced above.

Table 2 columns 1 and 2 present the results of estimating the gravity model with state fixed effects; column 3 presents the results of estimating the model with country fixed effects and column 4 reports the results of using both state and country fixed effects. Note that the state-specific variables or country-specific variables are excluded from these estimations as appropriate. In the interest of brevity only the results in column 2 will be discussed.¹⁸

Column 2 reports the results of estimating the full model with state fixed effects.

Comparing these results with the full model reported in column 5 of Table 1, we again find that

¹⁷ Mátyás (1997) argues for the use of using fixed effects in estimating gravity models. Since our observations are all for a single time period we cannot follow the stronger advice of Cheng and Wall (2002) to use trading pair specific bilateral fixed effects.

¹⁸ As can be seen from Table 2, the conclusions below hold across all combinations of fixed effect estimation.

Inclusion of state specific effects reduces (in absolute value) the estimated roles of Institutional Similarity by some 45 per cent; nevertheless, the coefficients on the Institutional Similarity terms remain statistically significant and economically meaningful. Clearly, state specific heterogeneity, although it does exist, does not significantly alter the link between immigrant stock and state exports. The basic proposition and of most of its corollaries remains intact.

5. Conclusions

Our results confirm the basic proposition that immigrants, a group with the appropriate mix of weak ties with native-born Americans and strong intra-cultural ties with their countrymen, have a pro-trade effect on exports from the American states. We find a remarkably consistent estimate of the elasticity of immigrants on exports across a wide variety of specifications of the model. The basic result is undiminished by inclusion of state fixed effects, country fixed effects, or both state and country fixed effects.

We also go beyond the basic proposition and test four corollaries to the basic proposition. These corollaries and their tests, insofar as confirming that corruption and language affect trade flows by working through the migrants and insofar as testing the parallel role of American travelers abroad in promoting exports, are new to the literature. The role of institutional similarity found by Girma and Yu for the United Kingdom is confirmed for the case of the American states. A more basic conclusion is that the links between immigrants and exports uncovered here are consistent with an important role being played by both of Granovetter's strong and weak ties.

Columbia, Costa Rica, Cameroon, Cape Verde, Cyprus, Czechoslovakia, Denmark, Dominican Republic, Ecuador, Egypt, El Salvador, Fiji, Finland, France, Germany, Ghana, Greece, Grenada, Guatemala, Guyana, Hong Kong, Honduras, Hungary, Iceland, India, Indonesia, Iran, Ireland, Israel, Italy, Jamaica, Japan, Jordan, Kenya, Korea, Laos, Luxembourg, Malaysia, Mexico, Morocco, Netherlands, New Zealand, Nicaragua, Nigeria, Norway, Pakistan, Panama, Paraguay, Peru, Philippines, Poland, Portugal, Senegal, Singapore, Sierra Leone, South Africa, Spain, Sri Lanka, Sudan, Sweden, Switzerland, Syria, Taiwan, Thailand, Trinidad, Tunisia, Turkey, Uganda, United Kingdom, Uruguay, Venezuela, Western Samoa, Yugoslavia, Zambia, and Zimbabwe.

EXPORTS_{ij}: The average current dollar value of exports of manufactures (SIC 20 – 39) from state *i* to country *j* for the years 1990, 1991, and 1992. The data are from the MISER Origin of Movement series and are available at the level of the individual American state.

MS_{ij}: Migrant Stock. The number of people born in country *j* residing in state *i* as recorded in the 1990 Census. From Lapham [n.d.]

PCINC_i: Gross State Product of state *i* in 1990. The data are from the U.S. Department of Commerce, Bureau of Economic Analysis.

POP_i: Population of state *i*. From the 1990 U.S. Census.

PCINCF_j: Real Per Capita Income of export destination country *j* in 1990. From Penn World Table, Series GRIP: Real GDP per capita in constant dollars (1985 international prices).

POPF_j: Population of destination country *j* in 1990. From International Monetary Fund, International Financial Statistics database.

CORRUPTION_j: Equals the (negative of) the index for country *j* of “Control of Corruption, 1997/98” taken from Kaufman, Kraal, and Zoido-Lobatan, “Governance Matters, II: Updated Indicators for 2001 – 02,” World Bank.

ENGLISH_j: English Language. Equals 1 if the country of export destination is significantly English speaking. The list of countries so identified is given in the text.

SPANISH_j: Spanish Language. Equals 1 if the country of export destination is significantly Spanish speaking. The list of countries so identified is given in the text.

FE_i and *FE_j*: State and Destination Country specific dummy variables; *FE_i* (*FE_j*) equals 1 if the observation is for state *i*, (country *j*) otherwise equal to 0.

Midwest (Chicago) which corresponds to the Census region of the same name.

West (Reno, Nevada) which comprises the states of the Census region of the same name except for Hawaii and Alaska.

Hawaii (Honolulu) which is the state of Hawaii.

Alaska (Anchorage) which is the state of Alaska.

Southeast (Atlanta) which comprises the Census Divisions of East South Central and South Atlantic.

West South Central (Dallas) which is the Census Division of the same name.

References

- Alesina, Alberto and Eliana La Ferrara, "Who Trusts Others?," *Journal of Public Economics*, 85 (2), August 2002, 207 – 234.
- Anderson, James E. and Douglas Marcouiller, "Insecurity and the Pattern of Trade: an Empirical Investigation," *Review of Economics and Statistics*, 84 (2), May 2002, 342 – 352.
- Bergstrand, Jeffrey H., "The Gravity Equation in International Trade: Some Microeconomic Foundations and Empirical Evidence," *Review of Economics and Statistics*, 67, 1985, pp. 474 – 481.
- Bergstrand, Jeffrey H., "The Generalized Gravity Equation, Monopolistic Competition, and the Factor Proportions Theory of International Trade," *Review of Economics and Statistics*, 69, 1989, pp. 143 – 153.
- Caves, Richard E. and Dalia Marin, "Countertrade Transactions: Theory and Evidence," *Economic Journal*, 102, September 1992, 1171 – 1183.
- Cheng, I-Hui and Howard J. Wall, "Controlling for Heterogeneity in Gravity Models of Trade and Integration," Federal Reserve Bank of St. Louis, Working Paper, June 2002.
- Chiswick, Barry, and Paul Miller, "English Language Fluency Among Immigrants in the United States," *Research in Labor Economics*, 17, 1998, 151 – 200.
- Coughlin, Cletus C. and Oliver Fabel, "State Factor Endowments and Exports: an Alternative to Cross-Industry Studies," *Review of Economics and Statistics*, 70 (4), Nov. 1988, 696 – 701.

- Coughlin, Cletus C. and Patricia S. Pollard, "Comparing Manufacturing Export Growth Across States: What Accounts for the Differences?," Federal Reserve Bank of St. Louis *Review*, January/February 2001, 25 – 40.
- Coughlin, Cletus C. and Howard J. Wall, "NAFTA and the Changing Pattern of State Exports," *Regional Science*, forthcoming, 2003.
- Dunlevy, James A. and Henry A. Gemery, "The Role of Migrant Stock and Lagged Migration in the Settlement Patterns of Nineteenth Century Immigrants," *The Review of Economics and Statistics*, 59(2), May 1977, pp. 137 – 144.
- Dunlevy, James A. and William K. Hutchinson, "The Impact of Immigration on American Import Trade in the Late Nineteenth and Early Twentieth Centuries," *The Journal of Economic History*, 59, 1999, pp. 1043 – 1062.
- Erickson, Rodney A., and David J. Hayward, "The International Flows of Industrial Exports from U.S. Regions," *Annals of the Association of American Geographers*, 81 (3), 1991, 371 – 390.
- Frankel, Jeffrey A., *Regional Trading Blocs In the World Economic System*. Washington, D. C.: Institute for International Economics, 1997.
- Gazel, Ricardo C. and R. Keith Schwer, "Growth of International Exports Among the States: Can a Modified Shift-Share Analysis Explain It?," *International Regional Science Review*, 21 (2), 1998, 185 – 204.
- Girma, Sourafel and Zhihao Yu, "The Link between Immigration and Trade: Evidence from the United Kingdom," *Weltwirtschaftliches Archiv*, 138 (1) 2002, 115 – 130.

- Gould, David M., "Immigrant Links to the Home Country: Empirical Implications for U.S. Bilateral Trade Flows," *Review of Economics and Statistics*, 76, 1994, pp. 302 – 316.
- Granovetter, Mark S., "The Strength of Weak Ties," *American Journal of Sociology*, 78 (6) May 1973, 1360 – 1380.
- Greenwood, Michael J., "An Analysis of the Determinants of Geographic Labor Mobility in the United States", *The Review of Economics and Statistics*, 51 (2), 1969, 189 - 194.
- Greenwood, Michael J., "Research on Internal Migration in the United States: A Survey", *Journal of Economic Literature*, 13 (2), 1975, 397 – 433.
- Greif, Avner, "The Fundamental Problem of Exchange: A Research Agenda in Historical Institutional Analysis," *European Review of Economic History*, 4, 2000, 251 – 284.
- Head, Keith and John Ries, "Immigration and Trade Creation: Econometric Evidence from Canada," *Canadian Journal of Economics*, 31 (1), February 1998, pp. 47-62.
- Hennart, Jean-Francois, "The Transaction-Cost Rationale for Countertrade," *Journal of Law, Economics, and Organization*, 5 (1), Spring 1989, 127 – 153.
- Hogendorn, Jan, "Mechanisms to Assure the Quality of Imported Goods in Precolonial West African Trade," *African Economic History*, 27 (1999), 23 – 43.
- Hutchinson, William K. "Does Ease of Communication Increase Trade? Commonality of Language and Bilateral Trade," *Scottish Journal of Political Economy*, 49 (5), December 2002, pp. 544 – 556.

- Hutchinson, William K. and James A. Dunlevy, "The Pro-Trade Effect of Immigration on American Exports During the Classical Liberal Period," Vanderbilt University, *Working Paper*, October, 2001.
- Kaufmann, Daniel, Aart Kraay, and Pablo Zoido-Lobatan, "Governance Matters, II: Updated Indicators for 2001-02." World Bank, January 15, 2002.
- Landa, Janet T., editor, *Trust, Ethnicity, and Identity: Beyond the New Institutional Economics of Ethnic Trading, Networks, Contract Law, and Gift-Exchange*. Ann Arbor: University of Michigan Press, 1994.
- Lapham, Susan, "The Foreign Born Population in the United States: 1990," U.S. Bureau of the Census, Population Division, Ethnic and Hispanic Branch. mimeo, n.d.
- Massey, Douglas S., "The Social and Economic Origins of Immigration," *Annals of the American Academy of Political and Social Science*, 510, July 1990, 60-72.
- Mátyás, Laszlo, "Proper Econometric Specification of the Gravity Model," *World Economy*, 20 (3), 1997, 363 – 368.
- Montgomery, James D., "Social Networks and Labor-Market Outcomes: Toward and Economic Analysis," *American Economic Review*, 81 (5), December 1991, 1408 – 1418.
- Montgomery, James D., "Weak Ties, Employment, and Inequality: An Equilibrium Analysis," *American Journal of Sociology*, 99 (5), March 1994, 1212 – 1236.
- Nelson, Phillip, "Migration, Real Income and Information," *Journal of Regional Science*, 1 (Spring 1959), 43 – 73.
- Palloni, Alberto, Douglas S. Massey, Miguel Ceballos, Kristin Espinosa, and Michael Spittal, "Social Capital and International Migration: A Test Using Information on

- Family Networks,” *American Journal of Sociology*, 106 (5), March 2001, 1261 – 1298.
- Rauch, James E., “Business and Social Networks in International Trade,” *Journal of Economic Literature*, 39, December 2001, 1177 – 1203.
- Rauch, James E., “Networks versus Markets in International Trade,” *Journal of International Economics*, 48, 1999, 7 – 35.
- Rauch, James E. and Alessandra Casella, editors, *Networks and Markets*, New York: Russell Sage Foundation, 2001.
- Rauch, James E. and Vitor Trindade, “Ethnic Chinese Networks in International Trade,” *The Review of Economics and Statistics*, 84 (1), February 2002, 116 – 130.
- U.S. Department of Commerce, International Trade Administration, “State Exports, Appendix: Guide to State and Sub-State Export Data.” [n.d.]
<http://www.ita.doc.gov/td/industry/otea/state/technote.htm>
- Wagner, Don, Keith Head and John Ries, “Immigration and the Trade of Provinces,” *Scottish Journal of Political Economy*, 49 (5), December 2002, pp. 507 – 525.
- Wysocki, Jr., Bernard, “Worldly Blessings: Utah’s Economy Goes Global, Thanks in Part to Role of Missionaries,” *Wall Street Journal*, LXXVII (115), March 28, 1996,
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Table 1: Tobit estimation with corruption, language measures, and other effects

	(1)	(2)	(3)	(4)	(5)
ln MIGRANT STOCK _{ij}	0.29 (9.52)	0.40 (13.35)	0.44 (12.46)	0.41 (11.34)	0.40 (11.10)
CORRUPTION _j * ln MS _{ij}		0.084 (5.24)	0.12 (6.93)	0.086 (4.87)	0.086 (4.89)
ln CORRUPTION _j		-0.94 (5.90)	-1.18 (7.27)	-1.06 (6.37)	-1.06 (6.38)
ENGLISH _j *ln MS _{ij}			-0.022 (0.59)	0.052 (1.34)	0.055 (1.40)
ENGLISH _j			1.03 (4.46)	0.78 (3.32)	0.78 (3.30)
SPANISH _j *ln MS _{ij}			-0.32 (7.21)	-0.30 (6.90)	-0.30 (6.94)
SPANISH _j			3.07 (11.36)	2.96 (10.93)	2.96 (10.94)
INSTITUTIONAL SIMILARITY _j *ln MS _{ij}				-0.45 (4.41)	-0.46 (4.51)
INSTITUTIONAL SIMILARITY _j				2.26 (3.23)	2.32 (3.31)
UTAH _i					0.77 (2.69)
ln POP _i	1.82 (30.52)	1.65 (28.58)	1.73 (30.30)	1.74 (30.61)	1.76 (30.73)
ln PCINC _i	0.51 (2.77)	0.23 (1.30)	0.37 (2.15)	0.40 (2.35)	0.47 (2.72)
ln POPF _j	3.11 (46.07)	2.68 (30.76)	3.00 (30.86)	3.05 (30.99)	3.06 (31.12)
ln PCINCF _j	2.16 (43.46)	1.86 (24.52)	2.12 (25.40)	2.19 (25.29)	2.13 (25.38)
DISTANCE _j	-1.46 (16.00)	-1.17 (13.22)	-0.87 (9.00)	-1.06 (10.29)	-1.09 (10.49)
Log likelihood	-10698	-9948	-9844	-9830	-9826
Pseudo R ²	0.17	0.17	0.18	0.18	0.18

Note: t-values in parentheses. Dependent variable is ln (EXPORTS_{ij} +1).

Table 2: Tobit estimation, state, country fixed effects

	<u>State fixed effects</u>		<u>Country FE</u>	<u>State and Country FE</u>
	(1)	(2)	(3)	(4)
ln MIGRANT STOCK _{ij}	0.37 (12.26)	0.53 (15.30)	0.34 (9.66)	0.47 (13.50)
CORRUPTION _j * ln MS _{ij}		0.077 (4.81)		
ln CORRUPTION _j		-1.00 (6.68)		
ENGLISH _j *ln MS _{ij}		0.017 (0.49)		
ENGLISH _j		0.82 (3.87)		
SPANISH _j *ln MS _{ij}		-0.31 (7.76)		
SPANISH _j		3.17 (12.96)		
INSTITUTIONAL SIMILARITY _j *ln MS _{ij}		-0.26 (2.82)		
INSTITUTIONAL SIMILARITY _j		1.21 (1.90)		
UTAH _i			0.52 (1.91)	
ln POP _i			1.78 (28.62)	
ln PCINC _i			0.40 (2.36)	
ln POP _{Fj}	2.99 (46.57)	2.81 (30.82)		
ln PCINCF _j	2.11 (45.48)	2.01 (26.32)		
DISTANCE _j	-1.18 (13.49)	-0.62 (5.53)		
Pseudo R ²	0.20	0.21	0.22	0.26

Note: t values are in parentheses. The coefficients on the Fixed Effect dummy variables are not reported. Dependent variable is $\ln(\text{EXPORTS}_{ij} + 1)$.