Several sorting scenarios could also affect the estimate. For example, risk-averse households may move to judicial foreclosure states because they value the implicit insurance; these households may also be savers who put down large down payments. Alternatively, borrowers who plan to default on their loans and exploit the judicial protections may move to these states. If lenders cannot identify these households, they may tighten loan terms to compensate for the higher expected losses. These scenarios may not be important empirically, however, if the sorting variables are correlated with control variables in the analysis, or if factors such as proximity to a job, local income tax rates, or school spending matter more than foreclosure laws in the household location decision.

Although it is not possible to give the loan size coefficient a clean interpretation, it seems clear that the mortgage market reaches a different equilibrium in judicial foreclosure states. In these states, borrowers may pay more for their mortgages, purchase smaller houses, or have difficulty becoming homeowners. But borrowers are not necessarily worse off: they may value the insurance provided by the laws. Homeownership might even increase if the judicial protections help borrowers remain in their homes. Although judicial requirements seem to impose costs on borrowers, a full welfare assessment will also require estimates of the law’s benefits.

REFERENCES


THE INFLUENCE OF CORRUPTION AND LANGUAGE ON THE PROTRADE EFFECT OF IMMIGRANTS: EVIDENCE FROM THE AMERICAN STATES

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Abstract—The protrade effect of immigrants on the bilateral export performance of the 50 American states and the District of Columbia with respect to 87 foreign countries is studied. This effect, which posits that a greater number of immigrants in a host location leads to increased trade between the host and the immigrants’ origin country, has been supported in a number of studies. Here, we extend this approach and find that the immigrant effect is greater when the origin country’s political system is more corrupt and less important when Spanish or English is the language of the origin country. State-level export data averaged over the 1990–1992 period are used.

1. Introduction

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 has...
be the focus of papers by Avner Greif, James Rauch, and others. Presumably, the needed information and trust are more difficult to obtain when exchange occurs at a distance or crosses linguistic or cultural boundaries, as is the case with much of international trade. The buyer needs assurance that the merchandise is as claimed, and the supplier must be confident in receiving the agreed-upon payment. Finally, for trade to be profitable, merchandise must move through the distribution channels in a timely fashion, and the costs, including bribes, needed to move the merchandise must be anticipated with some certainty.

Migrant networks are capable of providing this information on opportunities and on the reputations of potential trading partners, and of providing sanctions to reduce opportunistic cheating on agreements. Since Gould (1994), who found an important protrade role for the foreign-born in both the import and export trade of the United States with their countries of origin, the protrade 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 United States in the 1870–1910 period by Dunlevy and Hutchinson (1999). Wagner, Head, and Ries (2002) extended the study of the immigrant-trade link using the Canadian province as the unit of domestic observation.

In this paper we use data at the level of the American state to test the influence of the foreign-born on the bilateral exports of their states of residence to their countries of origin. Our focus is not just on the overall protrade effect, but also on how the strength of that effect depends on the level of corruption in the export destination (immigrants’ origin) country and on the similarity of language and institutions between the United States and the export destination country.

Data from the World Institute for Strategic Economic Research (WISER) on average annual exports of manufactured goods over the 1990–1992 period, by state and country of destination, are combined with data on the number of foreign-born, by state of residence in 1990 and by country of birth, in a gravity model to test the protrade immigrant hypothesis. The model is then augmented to test several conjectures. Notably, we find that the protrade role of immigrants is enhanced if their origin country’s political system is more corrupt and weakened if their native language is English or Spanish.

II. The Importance of Trust and Information

Our starting point is the proposition that immigrants in the host country share strong ethnic ties with persons in their origin communities; these networks are a form of social capital that promotes economic growth by providing information and trust. These networks are more important when it is more costly to obtain information and navigate the bureaucratic and commercial environment of the potential partner. This gives rise to several corollaries:

2. See Marcouiller (2001) and Anderson and Marcouiller (2002) for further discussion.
4. Granovetter’s (1973) discussion or strong and weak ties underlies our network theory. A fuller discussion of the role of strong and weak ties is in an extended version of this paper available from the author or online at http://www.sba.muohio.edu/dunlevja/Research.htm.

First, immigrant networks are more valuable when destination markets are less transparent or more subject to corruption. The role of immigrants, therefore, will be greater in promoting bilateral trade when the political climate in their origin country is more corrupt. Overall trade with such countries, however, will otherwise be below normal.

Second, immigrant networks are more valuable when the native population in the host country is less able to master the language of the potential trading partner. Here, we assume that members of the immigrant community are more likely than natives in the host country to be competent in both their host-country and origin-country languages.

Third, Girma and Yu have proposed that information possessed by immigrants is less useful when the immigrants are from a country whose institutions are similar to those of the host country. Therefore, the more similar the institutions of the immigrant source (export destination) country are to those of the host country, the weaker will be the protrade effect of the immigrants.

III. Model and Data

The basic gravity equation relates exports between $i$ and $j$ as an increasing function of the incomes and populations of the two trading entities and as a decreasing function of the distance between them; factors that alter the costs and benefits of trade are then added to the list of regressors on the basis of any of a variety of possible underlying theoretical derivations. We enter migrant stock ($MS$) into the model to reflect the sought-after information and cultural network effects. The model to be estimated is

$$\ln \text{EXPORTS}_{ij} = f(\ln MS_{ij}, \ln PCGSP_i, \ln GSP_j, \ln PCGDP_j, \ln GDP_i, \ln DISTANCE_{ij}, Z_j),$$

where

$$\ln \text{EXPORTS}_{ij}$$

denotes (the logarithm of) the dollar value of exports of manufactures from state $i$ to country $j$ averaged over 1990 through 1992,

$MS_{ij}$

denotes the number of persons born in country $j$ residing in state $i$ as enumerated in the 1990 Census,

$GSP_i$ and $GDP_j$

denote, respectively, the gross state product of state $i$ and the gross domestic product of country $j$ in U.S. dollars in 1990,

$PCGSP_i$ and $PCGDP_j$

denote, respectively, the per capita GSP of state $i$ and the per capita GDP of country $j$ in 1990,

$DISTANCE_{ij}$

denotes the distance from the principal or most central city of state $i$ to the capital or major city of country $j$,

$Z_j$

denotes other variables used to augment this standard form that allow us to test the corollaries advanced in the previous section.

NOTES

2. See Marcouiller (2001) and Anderson and Marcouiller (2002) for further discussion.
4. Granovetter’s (1973) discussion or strong and weak ties underlies our network theory. A fuller discussion of the role of strong and weak ties is in an extended version of this paper available from the author or online at http://www.sba.muohio.edu/dunlevja/Research.htm.

5. Anderson and Marcouiller (2002, p. 342) cite a World Bank survey that lists corruption as a significant obstacle to business worldwide.
6. Hutchinson (2002) applies the language distance measure of Chiswick and Miller (1998) to international trade but does not incorporate the role of immigrants. Language distance does not play a role in the present paper.
7. A fourth corollary, that quality information and trust are more important for trade in differentiated goods than for homogeneous products and that the immigrant effect should therefore be more pronounced in the case of more highly differentiated goods, has been confirmed by Gould (1994), Rauch (1999), Rauch and Trindade (2002), and Dunlevy and Hutchinson (1999), among others. A fifth corollary allows that overseas stays by the native-born from the host country may also be trade-creating. These issues are addressed in the extended version of the paper, with inconclusive results.
8. Basic references include Bergstrand (1985).
Given the geographically disaggregated nature of our data, the exports from a number of states to given foreign destinations are zero in value. This requires two adjustments: first, the logarithm of \( \text{EXPORTS}_{ij} \) is redefined as \( \ln(\text{EXPORTS}_{ij} + 1) \); second, because the resulting value of \( \ln(\text{EXPORTS}_{ij} + 1) \) is 0 in those cases where \( \text{EXPORTS}_{ij} \) is 0, the model is estimated using the tobit procedure.

The data sources are relatively standard, so we will discuss further only the export data. These are from the origin of movement series collected by the U.S. Census Bureau and released by WISER. These data, available at the two-digit SIC level, report the point of origin from which exports begin their journey. Point of origin generally refers to the state in which the factory that produced the item is located, or the location of a distributor, warehouse, or cargo-processing facility. Although the state of origin of movement and the state of production are not always identical, for manufactured goods the effect of institutional similarity. These results are reported in column 2.

Our data comprise exports of the 50 U.S. states and the District of Columbia, referred to as states, to 87 foreign countries. The destination countries span all continents and all ranges of economic development; some are major contributors of immigrants to the United States, others contribute few immigrants; some are major markets for U.S. exports, others are minor trading partners.

IV. Empirical Findings

Estimation of the basic gravity model with \( MS \) is reported in column 1 of table 1. The estimated marginal effects on observed exports, unconditional on whether the observation on exports is censored, are reported. The estimated elasticity of \( MS \) on \( \text{EXPORTS} \)

\[
\ln MS_{ij} = 0.29 (9.54) \quad 0.37 (11.03) \quad 0.47 (14.54) \quad 0.24 (7.22) \quad 0.39 (10.96)
\]

is a statistically and economically significant 0.29; this is some two times as large as the effect reported by Head and Ries (1998), by Girma and Yu (2002), and by Wagner, Head, and Ries (2002). The proposition offered above is affirmed.

All coefficients on the standard gravity variables are statistically different from 0. The elasticities on GSP (1.82) and on foreign GDP (3.09) are in the upper range of what is usually reported. Though the negative coefficients obtained on the per capita income coefficients are counterintuitive they are consistent with what Gould found for exports from the United States as a whole. The estimated elasticity of distance, \( -1.40 \), is standard.

The model is modified to address the influence of corruption in the export destination country, the roles of both English and Spanish languages, and the effect of institutional similarity. These results are reported in column 2.

Here, \( MS \) obtains a statistically significant coefficient of 0.37, somewhat stronger than what was obtained in the baseline specification. The estimated coefficients on the standard gravity variables are little affected by the inclusion of corruption, language, and institutional similarity.

The variable \( \text{CORRUPTION} \) is expressed in terms of deviations from its own mean, and it is configured so that a higher value is associated with greater corruption. It appears in the regression in two ways. First, it is interacted with the logarithm of \( MS \) in order to determine if the protrade effect of immigrants is greater when the export destination country has a higher level of corruption. Second, it is added as a regressor to capture any intercept-shift effects of corruption on trade flows.

The estimated coefficient on the interaction of \( \text{CORRUPTION} \) and \( MS \) is a statistically significant 0.17, implying, as hypothesized, that the protrade role for immigrants increases if their home country’s political environment is more corrupt. For instance, when combined with the estimated \( MS \) elasticity of 0.37, the implicit protrade elasticity of immigrants from Guatemala, whose modified corruption index

\[
0.13 (0.20)
\]

is 0.94 (28.47)

\[
0.84 (23.89)
\]

1.26 (8.59)

3.01 (35.69)

2.12 (7.64)

1.90 (8.75)
Trade-creating. The second corollary, however, asserts that similarity and corruption on trade is novel. The finding regarding the interaction of the role of immigrant networks and corruption on trade is novel.

Similarity of language between two countries has been found to be trade-creating. The second corollary, however, asserts that similarity of language should reduce the contribution of immigrants to trade promotion. The third corollary similarly argues that immigrants from countries with legal and commercial institutions similar to those of the United States will contribute less to trade creation than immigrants from other countries. We consider the effect of language and institutions by entering variables that are the interaction of ENGLISH, SPANISH, and INSTITUTIONAL SIMILARITY with the logarithm of MS. We also expect that trade with these countries will involve lower transactions costs, and that exports to them, ceteris paribus, will be greater. This effect is tested using intercept-shift dummy variables.

Both language-migrant-stock variables are statistically significant: −0.17 for the ENGLISH × MS interaction and −0.44 for the SPANISH × MS interaction. This suggests that the protrade effect of migrants from English-speaking countries is almost 50% weaker than that for the reference group; migrants from Spanish-speaking countries are estimated to have no protrade effect whatsoever. The coefficients of the intercept-shift variables are both statistically significant—2.12 for English-speaking countries and 3.57 for Spanish-speaking countries—indicating that exports to English-speaking and to Spanish-speaking countries, ceteris paribus, are well above the norm. The second corollary receives strong support. Neither institutional similarity coefficient is meaningfully different from 0; the third corollary is not supported.

One might argue that the modified gravity model fails to control for heterogeneity across the American states and across the foreign countries. No allowance is made, for example, for state or country price levels or for barriers to trade in the destination countries.

Our results confirm the basic proposition that immigrants have a protrade effect on exports from the American states. We also go beyond the basic proposition to test three corollaries and find that a higher level of corruption in the destination country strengthens the protrade role of immigrants, although it otherwise leads overall to reduced trade. We also find that language similarity between the United States and the export destination country reduces the protrade effect of migrants, although language similarity otherwise promotes trade. Institutional similarity is not found to be important for the protrade effect of immigrants in the American states. These results are undiminished by inclusion of state or destination fixed effects.

REFERENCES


In unreported estimations the roles of the Mexican and Canadian borders were considered, with little effect on the results.
THE EMPIRICAL ASSESSMENT OF TECHNOLOGY DIFFERENCES: COMPARING THE COMPARABLE

Manuel Frondel and Christoph M. Schmidt*

Abstract—Since the first statement of Hicks’s induced innovation hypothesis in 1932, a large number of theoretical and empirical studies have analyzed the issue of price-induced technological change—many of them on the basis of substitution elasticities. This note compares technologies across space and time on the basis of factual and counterfactual substitution elasticities and argues that differences in estimated substitution elasticities should be decomposed into two counterfactual components. The first component is designed to indicate how the ease of substitution is altered by varied economic circumstances; the second addresses the question of how technologies would compare under genuinely comparable situations. This argument is illustrated by the example of energy-price elasticities of capital before and after the oil crisis of the early 1970s.

1. Introduction

As more and more evidence points to the existence of potentially substantial climate change, price-induced technological change has increasingly attracted attention from environmental economists due to its possibly ameliorating role regarding environmental problems. In particular, Popp (2002, p. 160) recently found that energy prices have strongly significant positive effects on energy-saving innovation. Within a product-characteristics framework, Newell, Jaffe, and Stavins (1999) also provide empirical evidence that energy

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