6-2010

# The Effects of Refugee and Non-Refugee Immigrants on US Trade with their Home Countries

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*The Journal of International Trade & Economic Development*
Vol. 19, No. 2, June 2010, 289–317



# The effects of refugee and non-refugee immigrants on US trade with their home countries

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(*Received 21 July 2008; final version received 3 October 2008*)

Employing data on US immigrants and trade with 59 home countries for the years 1996–2001, we compare the extent to which refugee and non-refugee immigrants affect US trade with their home countries and provide the first evidence of variation in the US immigrant–trade relationship across immigrant types. We also consider the abilities of refugee and non-refugee immigrants to offset the trade-inhibiting influence of cultural distance. Our results show that while immigrants, in general, exert positive influences on US imports from – and exports to – their home countries, the influence of refugee immigrants is quite minimal when compared with that of non-refugee immigrants. For both immigrant types, however, evidence supporting the notion that immigrants act to offset cultural distance is observed. To conceptualize the economic meaning of our results, we provide estimates of the extent to which each type of immigrants offset transport costs.

**Keywords:** cultural distance; gravity; immigrants; networks; refugees; trade



## 1. Introduction

Starting with Gould (1994), who first documents an immigrant–trade link using US data, a voluminous literature has been published detailing the influences of immigrants on trade for various host countries. More recent studies (Mundra 2005; Tadesse and White 2010a; White 2007a, 2009) confirm the pro-trade influences of immigrants for the US and document that the effect of immigrants on US–home country trade is sensitive to cultural, institutional and economic differences between the US and the immigrants' home countries. Yet, little attention has been paid to examining whether the influence of immigrants on US–home country trade varies by immigrants' entry classifications. As the extent to which immigrants influence trade is generally sensitive to their anthropogenic characteristics,

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ISSN 0963-8199 print/ISSN 1469-9559 online

DOI: 10.1080/09638190903217537
http://www.informaworld.com

which may differ by entry classification, examining variation in the immigrant-trade link across immigrant types may provide new insights into the channels through which the link is assumed to operate. It also fosters a better understanding of the roles that different types of immigrants play in influencing their host-home country commercial relationships and may benefit the formulation of appropriate social policy. In fact, the ongoing debates over US immigration and trade policies also underscore the importance of garnering a complete understanding of the topic. Our work augments the literature by contrasting immigrant–trade links between two broad, yet distinct, immigrant categories: immigrants admitted as refugees and asylum-seekers (hereafter generalized as 'refugees') and immigrants admitted under the guise of filling labor market vacancies, diversity promotion, and family reunification, etc (hereafter 'non-refugees').

Immigrants, generally, are thought to influence trade between their host and home countries in a variety of ways that have been categorized into two broad channels. First, they may increase host country imports from their respective home countries if they arrive with strong preferences for home country goods and find neither the desired products nor reasonable substitutes available. White (2007a) refers to this channel as 'transplanted home bias'. Second, immigrants may have knowledge of home country markets that, if exploited, could increase trade flows. Dunlevy (2006) describes this channel as the 'information bridge hypothesis', while Greenaway et al. (2007) presents this channel as involving both a 'cultural bridge' and an 'enforcement bridge', each of which utilizes immigrants' knowledge of home country customs and business practices, language abilities, or understanding of complex informal contracting structures to reduce the asymmetry of information arising from cultural and, hence, institutional differences, thereby increasing trade flows. Likewise, through their connections to home country business or social networks, immigrants may affect trade if their connections facilitate transmission of information regarding business opportunities or deter opportunistic behavior, perhaps through a form of reputation-enforcement (Rauch and Watson 2002; Rauch and Trindade 2002; and Rauch 1999, 2001). As noted, the analysis of whether refugee and non-refugee immigrants' use of these abilities equally affects host-home country trade may have important policy implications.

To meet our objective, we employ US immigrant and trade data with 59 home countries that span the years 1996–2001. Historically, the US has accepted relatively diverse and large numbers of immigrants; however, passage of the several pieces of legislation – most notably, the Immigration and Nationality Act of 1965 – transformed the basis for immigrant entry by granting priority to immigrants based on family reunification, filling vacancies in the labor market, and permitting entrance of refugees and asylum-seekers, thus changing the composition of subsequent immigrant inflows.[1] Refugees, as set forth in the Act, are immigrants who are unable or

unwilling to return to their home countries due to persecution or a well-founded fear that, upon return, they may face persecution due to their race, religion, nationality, political opinion, or membership(s) in a particular social group(s). Non-refugee immigrants, for our purpose, are those admitted to the country to fill labor market vacancies, for family reunification or as part of the diversity lottery. To provide an indication of the relative magnitudes of refugee and non-refugee immigrant inflows, approximately 3.6 million of the more than 28.5 million documented immigrants who arrived in the US during the 1946–2001 period were classified as refugees. This not inconsequential number of refugee arrivals is equivalent to 12.6% of the observed inflow of immigrants during this period (United States Department of Homeland Security 2004; United States Department of Justice, Immigration and Naturalization Service 1960–2001; United Sates Department of Commerce, Bureau of the Census 1951).



The potential differences in the abilities of refugee and non-refugee immigrants to affect US–home country trade can be attributed to two general facets. First, most refugee immigrants arrive in the US after spending a considerable number of years in a third country and, in the process, may adapt their tastes and preferences to consumption of goods and services available in the countries that embraced them during their transition. Thus, the extent to which, through their transplanted home bias effects, refugee immigrants affect US trade with their home countries may differ from those of non-refugee immigrants, who often arrive in the US directly from their home countries. Second, the extent to which, through their cultural bridge and network effects, non-refugee immigrants affect US trade with their home countries may differ from those of refugee immigrants as the latter have tenuous ties to their home countries and may face difficulties, due to fears that those in their networks may face persecution, in using their network connections to conduct transactions. These reasons give rise to our three working hypotheses: first, that the effect of non-refugee immigrants on US imports is greater than that of refugee immigrants. Second, given that refugees have limited abilities to maintain/foster connections with their home country-based trading partners, we hypothesize that they are also less influential in increasing US exports to their home countries through their cultural and enforcement bridge effects. While these hypotheses provide reasonable grounds to expect differences in the extent to which refugee and non-refugee immigrants might influence US trade with their home countries, as mentioned earlier, to date no research has examined such differences. Third, suggestive of greater roles that immigrants could play than have been discussed in the literature, recent studies indicate that immigrants partially offset the effects of cultural distance on their host country's trade with their home countries (Tadesse and White 2010a, 2010b; White and Tadesse 2009). Based on the findings from these studies and the observation that, compared with typical non-refugee immigrants, refugee

immigrants are less connected to their home country, we also hypothesize that the abilities of refugee and non-refugee immigrants to counter any associated trade-inhibiting influences of cultural distance differ from one another; again, this is a further elaboration of the emphasis of most recent studies that examine the immigrant–trade link.

Results from our study indicate that while immigrants exert positive influences on US imports from and exports to their home countries, the influence of refugees on US trade with their home countries is quite minimal when compared with that of non-refugee immigrants. For both immigrant types, our findings support the notion that immigrants act to offset cultural distance; with the related effects of non-refugee immigrants being stronger than those of refugees. To conceptualize our results, we estimate each immigrant type's ability to offset transport costs (as represented by geodesic distance). Our findings indicate the importance of accounting for immigrant types when undertaking empirical analysis involving the immigrant–trade link while implying the need for more detailed analysis of immigrant characteristics.

The paper proceeds as follows. Section 2 provides a review of the related literature. Section 3 presents the empirical specification, while Section 4 details both the data and the variable construction. Estimation results are discussed in Section 5, and Section 6 concludes.



## 2. Review of the immigrant–trade link literature

As mentioned at the outset, evidence of a robust positive relationship between immigrants and host–home country trade has been reported for several home countries. Following Gould (1994), pro-trade immigrant influences have been documented for Canada (Helliwell 1997; Head and Ries 1998; Wagner et al. 2002), Greece (Piperakis et al. 2003), Malaysia (Hong and Santhapparaj 2006), New Zealand (Bryant et al. 2004), and Spain (Blanes 2003, 2006; Blanes and Martin-Montaner 2006). Examining Canada–Taiwan trade, Ching and Chen (2000) also find evidence of pro-trade immigrant effects. Similarly, Greenaway et al. (2007) and Rauch and Trindade (2002) employ Chinese population shares to represent the presence of ethnic Chinese networks and report that such networks increase bilateral trade flows. Studies conducted using US state-level export data also report pro-export immigrant effects (Co et al. 2004; Bardhan and Guhathakurta 2005; Herander and Saavedra 2005; Dunlevy 2006; Tadesse and White 2007; and Bandyopadhyay et al. 2008). Examining intra-France trade, Combes et al. (2005) report a pro-trade influence of migrants. Finally, Blanes (2005) for Spain and White (2008) for the US report that immigrants exert positive influences on intra-industry trade.

Several other studies examine variation in the immigrant–trade link across home countries and product classifications. White (2007a) reports

that the US immigrant–trade link is driven by immigrants from relatively low-income countries. Considering the influence of immigrants on US–home country trade across product classifications, Rauch (1999) and Mundra (2005) find that immigrants exert stronger pro-trade effects on differentiated products. Allowing for variation in the effects of immigrants on trade across home country income classifications and Rauch (1999) product classifications, White (2009) concludes that the links are weakest for US exports of homogeneous products to high-income countries and strongest for US imports of differentiated products from low-income countries. Examining Danish data, White (2007b), however, reports a different result: immigrant–trade links are greatest in magnitude for trade in differentiated products with high-income immigrant countries, and weakest, yet positive, for trade in homogeneous products with low-income immigrant countries. Further, less variation was found, across product types and home country income classifications, in the Danish immigrant–trade link relative to the US case. White suggests the differences in findings may be attributable to the relative homogeneity of the Danish population, relative to the US population, which could foster an increased ability for immigrants from all home country classifications to increase trade via preferences for unavailable home country products or through their connections to home country networks.

Using UK data and stratifying their sample of home countries by 'commonwealth' or 'non-commonwealth' affiliation, Girma and Yu (2002) report pro-trade influences for immigrants in the latter classification and attribute the differences in immigrants' effects on trade to institutional dissimilarities between the UK and non-commonwealth countries. Indirectly testing Girma and Yu's conclusion, White and Tadesse (2007) classify Australian immigrants' home countries by their access to preferential treatment (in terms of immigrant entry, assisted migration, etc) under the White Australia policy, and consider whether Australia's abandonment of the policy led to subsequent variation in immigrant–trade links. The authors report that immigrants from nations not afforded preference under the policy exert stronger proportional influences on Australian imports, while those from nations afforded preference exert stronger influences on exports and propose that the observed variation may stem from the home country's cultural dissimilarities with Australia. Despite these evidences, which imply the influence of immigrants on home–host country trade is immigrant-specific (i.e. individual abilities and home country characteristics), neither of these studies nor that of Herander and Saavedra (2005), which reports significant differences between the effects of immigrants who reside in a given state and those who reside in other states on US state-level exports to the immigrants' home countries, consider entry classification (which may encompass both immigrant-specific and immigrant home country attributes) as a potential source for the observed variation.

The only study that has considered variation in immigrant–trade links across entry classifications is that of Head and Ries (1998). Employing trade and immigration data for Canada and 136 immigrant home countries for the years 1980–1992 and using five different immigrant entry classes: family immigrants, refugees, independent immigrants, entrepreneurs and other business classes (investors and the self-employed), the authors demonstrate the existence of significant heterogeneity across entry classes in terms of the influences of immigrants on Canada–home country trade. Refugees are reported to have no significant influence on Canadian exports, although they significantly increase Canadian imports. To the contrary, independent immigrants are found to exert the strongest influence on Canadian trade. Since such immigrants are selected using a points-based system that considers educational attainment, occupational demand and other factors, Head and Ries identify independent immigrants as likely to be more skilled; thus explaining the relative strength of the observed pro-trade influence. Family immigrants are also found to exert positive influences on both imports and exports. Business and entrepreneur classes of immigrants exert lesser, yet positive, influences on exports and positive, yet relatively weak, influences on imports. While our data precludes such detailed analysis, we are able to distinguish between immigrants who entered the US as refugees (for humanitarian reasons) and those who entered as non-refugees (for economic reasons, to fill labor market vacancies, as part of the diversity lottery or for family creation/reunification). Further, we employ a relatively new measure of US–home country cultural distance to capture the related influences of cultural (dis)similarity on trade flows. This enables us to consider variation in the immigrant–trade relationship across distinct immigrant types while accounting for potential differences in their abilities to offset the trade-inhibiting effects of cultural and institutional differences and the effects of transportation costs as represented by geodesic distance.



## 3. Intuition and empirical specification

Following the lead of prior studies, we employ a variation of the standard gravity specification.[2] In its most simple derivation, the gravity specification models trade between two countries $i$ and $j$ during year $t$ ($\tilde{T}_{ijt}$) as an increasing function of the trading partners' combined economic mass ($Y_{it}Y_{jt}$) and a decreasing function of transportation costs, usually represented by geodesic distance ($GD_{ij}$). According to the model, intuitively, higher home country GDP ($Y_{jt}$) implies greater potential export markets for host country $i$ to serve and an increased probability that the host country imports from home country $j$. Likewise, higher host country GDP ($Y_{it}$) signals a greater capacity to both export and import. Geodesic distance ($GD_{ij}$), a proxy for transport costs, is measured as the distance between the capital cities of host country $i$ and each home country $j$ and is expected to

reduce trade. To capture the potential influence of host–home country cultural dissimilarity, and the role immigrants might play in countering the influence, we follow Tadesse and White (2010a) and augment the theoretical model with the ratio of the immigrant stock from country $j$ residing in country $i$ to the cultural distance between the immigrants' host and home countries ($IM_{ijt}/CD_{ijt}$). This ratio is included in $X^{\phi}_{ijt}$, a vector that contains trade-facilitating/inhibiting factors that are often discussed in the literature. Equation (1) illustrates.

$$\tilde{T}_{ijt} = \alpha\left(\frac{Y_{it}^{\beta_1} Y_{jt}^{\beta_2}}{GD_{ij}^{\gamma_1}}\right) X^{\phi}_{ijt} \tag{1}$$

Equation (1) postulates that while both geodesic distance between immigrants' host and home countries negatively affect trade, the extent to which cultural distance affects trade may be influenced by the stock of immigrants from home country $j$ living in host country $i$. Adding an identically and independently distributed and multiplicative error term, $\varepsilon_{ijt}$, makes the equation stochastic:

$$\tilde{T}_{ijt} = \alpha\left(\frac{Y_{it}^{\beta_1} Y_{jt}^{\beta_2}}{GD_{ij}^{\gamma_1}}\right) X^{\phi}_{ijt}\varepsilon_{ijt} \tag{2}$$

Expanding the vector $X^{\phi}_{ijt}$, and allowing $\alpha$ to be the constant of proportionality, taking natural logarithms of the continuous variables on both sides of the Equation (2), and including terms that interact immigrant stock and cultural distance variables to capture the potential variation in the influences of immigrants across relatively more (or less) culturally-distant home countries, results in our empirical specification:

$$\begin{aligned}\ln \tilde{T}_{ijt} = {} & \alpha_0 + \lambda_1 \ln IM_{ijt} + \lambda_2 \ln CD_{ijt} + \lambda_3(\ln IM_{ijt} \times \ln CD_{ijt}) + \gamma_1 \ln GD_{ij} \\ & + \phi_1 \Delta \ln T_{ijt-1} + \phi_2 \ln Y_{jt} + \phi_3 \ln POP_{jt} + \phi_4 \Delta \ln XRATE_{ijt} \\ & + \phi_5\left(\ln \frac{Ydef_{jt}}{Ydef_{it}}\right) + \phi_6 \ln OPEN_{jt} + \phi_7 \ln REM_{jt} + \phi_8 ENG_j \\ & + \phi_9 FTA_{ij} + \phi_{10} PORT_j + \beta_{\Omega}\Omega_t + \varepsilon_{ijt}\end{aligned} \tag{3}$$

We begin our analysis by estimating Equation (3) without distinguishing between refugee and non-refugee immigrants. We then distill the immigrant stock variable into refugee immigrants ($REF\_IM_{ijt}$) and non-refugee immigrants ($NREF\_IM_{ijt}$) and repeat the estimation. Finally, we decompose our cultural distance variable into its component dimensions to facilitate

more detailed analysis. A priori, we hypothesize that $\lambda_1 > 0$, $\lambda_2 < 0$ and $\lambda_3 > 0$, and that once the immigrant stock variable is decomposed into refugees and non-refugee immigrant cohorts, $\lambda_1^{NREF\_IM} > \lambda_1^{REF\_IM} \geq 0$, while the coefficient on the cultural distance coefficient is expected to remain negative.

## 4. Data and variable construction

Our vector of dependent variables includes aggregate US imports, exports and disaggregated (manufacturing and non-manufacturing sectors) import and export values, each of which is regressed, in turn, on the set of explanatory variables. All trade data are from the SourceOECD Database. As the US is country *i*, corresponding GDP values (included in equations (1) and (2)) do not vary across trading partners and their effects are subsumed into coefficients on the time dummy variables. While several of our control variables are standard, two of the variables are of primary interest to us and warrant specific discussion. Next we provide a brief discussion of these two variables before turning to the remaining control variables.



### *4.1. Refugees and non-refugee immigrant stocks*

The US census provides country-level immigrant stock values for the years 1990 and 2000 (Gibson and Lennon 1999; US Census 2006). While immigrant stock data are not available for the intra-census years, annual immigrant inflow data for the years 1991–2001 are available from the US Department of Homeland Security (2004). We generate immigrant stock estimates for intra-census years by treating the census values as accurate and employing the inflow data. Immigrant stocks for the years 1991–1999 are thus estimated as $IM_{ijt} = \hat{IM}_{ijt-1} + \sum_{1991}^{t} INF_{ijt} + \delta_j$, where $\hat{IM}_{ijt-1}$ is the estimated immigrant stock from country *j* residing in the US during the year immediately prior and $\delta_j$ is an adjustment factor accounting for return migration and immigrant deaths that occur during intra-census years. The adjustment factor is equal to the country *j* immigrant stock reported by the 2000 census less the sum of immigrants from that country in the US in 1990 and the inflow from that country during the years 1991–2000, divided by ten: $\delta_j = \left[IM_{ij2000} - \left(IM_{ij1990} + \sum_{t=1991}^{2000} INF_{ijt}\right)\right]/10$. As the most recent population census was taken in 2000, we cannot apply the same interpolation technique to estimate immigrant stock values for the year 2001. We do, however, utilize the benchmark values provided by the 2000 census with the 2001 immigrant inflow data to estimate immigrant stock values for the year 2001. Specifically, immigrant stock values for 2001 are estimated as $(IM_{ij2001} = (IM_{ij2000} + INF_{ij2001})(1 + \delta_j/IM_{ij2000})$. The corresponding proportional adjustment is based on the adjustment factor derived when estimating 1991–1999 immigrant stocks. Specifically, the adjustment is

made using the percentage difference between raw 2000 immigrant stock values and 2000 census values.

To estimate refugee immigrant stocks, we utilize inflow data for refugees ($REF\_INF_{ijt}$) and for other immigrants ($NREF\_IM_{ijt}$) during the years 1946–1990 (DHS 2004; INS 1960–1977, 1978–2001) to first estimate the 1990 refugee stock:

$$REF\_IM_{ij1990} = IM_{ij1990} \times \frac{\sum_{t=1946}^{1990} REF\_IN_{ijt}}{\sum_{t=1946}^{1990} \left(REF\_INF_{ijt} + NREF\_INF_{ijt}\right)}$$

The estimate of the non-refugee immigrant stock is given by $NREF\_IM_{ij1990} = IM_{ij1990} - REF\_IM_{ij1990}$. Estimated refugee and non-refugee immigrant stocks, for each non-census year during the 1991–2001 period, were then constructed as $REF\_IM_{ijt} = (REF\_IM_{ijt-1} + REF\_INF_{ijt}) \times (1 + \delta_j / IM_{ij2000})$ and $NREF\_IM_{ijt} = IM_{ijt} - REF\_IM_{ijt}$, where $\delta_j$ is as described above. A combination of the 1991–1999 and 2001 immigrant stock estimates with the 1990 and 2000 census values results in estimates of the refugee, non-refugee immigrant and total immigrant stocks that span the years 1990–2001. Due to our inability to compile complete series for some of the other control variables for years early in the period, we restrict our study to the years 1996–2001.

### 4.2. US–home country cultural distances

Following Tadesse and White (2010a), we estimate US–home country cultural distances using data from the World Values Surveys (WVS) and the European Values Surveys (EVS) (Inglehart et al. 2004; Hagenaars et al. 2003). The surveys provide data from representative national samples and pertain to a broad and varying set of topics that includes economics, politics, religion, sexual behavior, gender roles, family values, communal identities, civic engagement, ethical concerns, environmental protection, and scientific and technological progress (Inglehart et al. 2004). Given the broad coverage of the topics on which the measure of cultural distance is based, as mentioned, the variable also potentially reflects institutional (dis)similarities between the US and the immigrants' home countries. Factor analysis is applied to classify respondents along two dimensions of culture: Traditional authority versus Secular-Rational authority (*TSR*) and Survival values versus Self-Expression values (*SSE*) (Inglehart et al. 2004).[3] We construct average *TSR* and *SSE* values for each home country and estimate the US–home country cultural distance as

$CD_{ijt} = \sqrt{\left(\overline{TSR}_{jt} - \overline{TSR}_{it}\right)^2 + \left(\overline{SSE}_{jt} - \overline{SSE}_{it}\right)^2}$.[4] Figure 1 illustrates differences across *TSR* and *SSE* dimensions and cultural distances for several home countries.[5]

The *TSR* dimension of culture (vertical axis) reflects the contrast between societies in which deference to the authority of a God, a nation or the family is viewed as important or as an expectation (i.e. Traditional societies) and those societies in which the individual and self-expression are stressed (i.e. Secular-rational societies). Higher *TSR* values correspond to greater emphasis on obedience to religious authority, national pride, adherence to family/communal obligations, and norms of sharing. Members of such societies tend to view large families and large numbers of children as positive, or desirable, while divorce, abortion, euthanasia, and suicide are viewed in a very negative light. Members of Secular-rational societies tend to hold opposing views on these topics, adhere to rational-legal norms, and emphasize economic accumulation and individual achievement.

The *SSE* dimension of culture (horizontal axis) reflects differences between societies that emphasize hard work and self-denial (Survival values) and those that place greater emphasis on quality of life issues, such as women's emancipation and equal status for racial and sexual minorities (Self-expression values). Societies in which individuals focus more on survival tend to emphasize economic and physical security more than autonomy. Generally, members of these societies find foreigners/outsiders, ethnic diversity and cultural change to be threatening. This corresponds with an intolerance of homosexuals and minorities, adherence to traditional gender roles, and an authoritarian political outlook. Members of societies in which Self-Expression values are emphasized tend to hold opposing preferences on these issues.

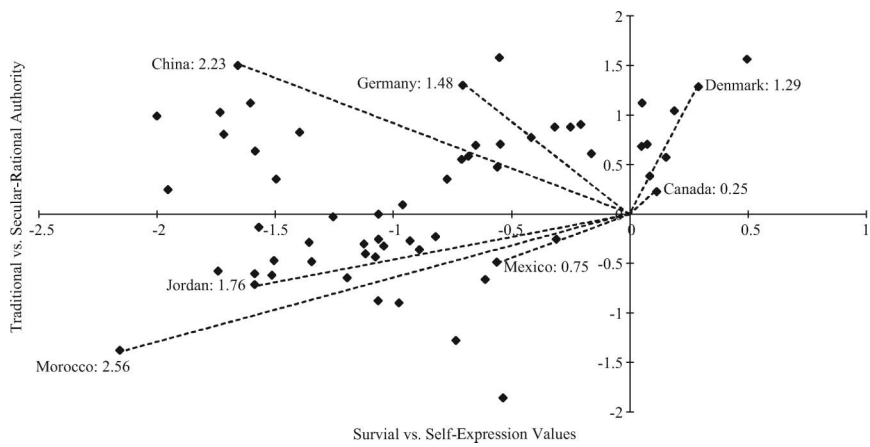


Figure 1. Relative cultural distance from the United States, select countries listed.

### 4.3. Additional control variables

The remaining explanatory variables in our empirical model include the lagged first-difference of the dependent variable, and several other variables (the change in the US–home country exchange rate, the US and immigrants' home country GDP deflators, measures of economic remoteness and of openness to trade) often included in the modified gravity model.[6] While Gould (1994) and Eichengreen and Irwin (1996) use one-year lagged values of the dependent variable as an explanatory variable, interpreting their specifications as partial adjustment models, following Wooldridge (2002), we test for autocorrelation in similar specifications and find evidence of first-order autocorrelation for each of our dependent variables. In the presence of AR(1) in the data, inclusion of the lagged dependent variable would bias estimated coefficients downward and potentially obscure any meaningful effects of changes in explanatory variables, including those of immigrants, on trade. Thus, to control for the influence of trade inertia, we include the lagged first-difference of the dependent variable (given as $\Delta \ln T_{ijt-1} = \ln T_{ijt-1} - \ln T_{ijt-2}$) and employ the method of Random Effects Generalized Least Squares. As changes in dependent variables are related to trends in bilateral trade flows, rather than size or distance, the inclusion of this variable does not violate the theoretical gravity equation in Equation (1), nor bias the coefficient estimates downward.

We use annual changes in the US–home country exchange rate ($XRATE_{ijt}$), given as home country currency units per US dollar, to represent potential terms of trade effects (IMF, 2007). An increase in the variable signals a depreciation of the home country currency vis-à-vis the dollar and, thus, an expected increase (decrease) in US imports (exports). Also controlling for the influences of relative prices, we include the ratio of home country-to-US GDP deflators ($Ydef_{jt}/Ydef_{it}$). While Gould (1994) employs US and home country GDP deflators, separately, we follow the methodology of Head and Ries (1998) as we believe this measure of relative prices is better-suited, as compared to including the GDP deflators separately, to capturing the expected positive influences of relatively higher (lower) home country prices on US imports (exports).

Since immigrant home countries' trade with the US may also depend on the availability of non-US trading opportunities, we include a measure of the economic remoteness of each home country, constructed following Wagner et al. (2002) as $REM_{jt} = 1/\sum_{k=1}^{K}\left[(Y_{kt}/Y_{wt})/GD_{jk}\right]$ where $Y_{wt}$ is gross global product and $k$ identifies potential non-US trading partners for country $j$.[7] The pro-trade influences of immigrants arguably results from recent trade liberalization or from greater trading infrastructure; for example, access to airports, seaports, rail lines and highway systems. To control for such possibilities, we include a measure of trade openness ($OPEN_{jt}$), given as the sum of imports and exports divided by GDP (Head

and Ries 1998). We also include the population of each home country ($POP_{jt}$) to serve as a proxy for market size. All monetary values, trade flows and otherwise, wherever necessary have been normalized to constant 1995 US dollars.

We include several dummy variables in our estimation equation. As common language has been identified as a determinant of trade flows in gravity specifications (Dunlevy 2006; Hutchinson 2002; Girma and Yu 2002), we include a dummy variable that is equal to one if English is commonly used in the host country ($ENG_j$) (United States CIA 2006). Capturing the effects of trade agreements, $FTA_{jt}$ is equal to one if the home country is party to a trade agreement with the US for more than six months during year $t$. To capture related geographic effects on trade, we include a dummy variable ($PORT_j$) that is equal to one if the home country is not landlocked. Finally, we append a vector of time dummy variables, $\Omega_t$, to our estimation equation to ensure that contemporaneous growth in immigrant population stocks and trade values does not distort our results. A complete listing of variables and associated descriptive statistics is provided as Table 1.



## 5. Discussion of estimation results

We estimate three variants of Equation (3). First, we estimate our empirical model by utilizing the standard immigrant stock variable (i.e. not differentiating refugees from non-refugee immigrants). Then we consider variation in the immigrant–trade relationship across refugees and non-refugee immigrants. Finally, we decompose the cultural distance variable into its component dimensions, interact each component, separately, with the refugee and non-refugee immigrant stock variables, and estimate our model. To garner the economic significance of our results, we follow Millimet and Osang (2007) and provide estimates of geodesic distance offset per immigrant, an indication of the extent to which the pro-trade effects immigrants may counter the cost of transportation.

### *5.1. Immigrants, cultural distance and US–home country trade*

Results presented in Table 2 confirm the findings of prior studies. With the single exception of when imports of non-manufactured goods are employed as the dependent variable (column (e)), immigrants are found to exert positive influences on US imports from and exports to their respective home countries. The coefficients on the immigrant stock variables range in magnitude from 0.1309 to 0.3188. Regardless of the specification used, we also see that geodesic distance (a proxy for transport costs) acts to reduce trade flows. As expected, the coefficient on the cultural distance variable is negative in all estimations and is significantly different from zero when

Table 1. Descriptive statistics.

| Variable | Description | Mean | Std. Dev. | *N* |
|---|---|---|---|---|
| $T_{ijt}$ | Exports | 9,253,632.83 | (22,246,859.51) | 354 |
| ‘ ‘ | Non-Manufactured Exports | 1,201,932.99 | (2,849,937.35) | 354 |
| ‘ ‘ | Manufactured Exports | 8,050,578.93 | (19,774,826.93) | 354 |
| ‘ ‘ | Imports | 13,554,553.75 | (31,297,864.13) | 354 |
| ‘ ‘ | Non-Manufactured Imports | 1,998,869.43 | (5,703,052.45) | 354 |
| ‘ ‘ | Manufactured Imports | 11,552,345.40 | (27,211,705.49) | 354 |
| $IM_{ijt}$ | Immigrants | 382,998 | (1,101,439) | 354 |
| $REF\_IM_{ijt}$ | Refugees/Asylees | 25,757 | (83,910) | 354 |
| $NREF\_IM_{ijt}$ | Non-Refugee Immigrants | 357,241 | (1,096,015 | 354 |
| $CD_{ijt}$ | Cultural Distance | 1.2594 | (0.4949) | 59 |
| $SSE_{jt}$ | Survival vs. Self-expression Values | 0.0772 | (0.649) | 59 |
| $TSR_{jt}$ | Traditional vs. Secular-rational Authority | −0.1908 | (0.7788) | 59 |
| $GD_{ij}$ | Geodesic Distance (in kilometers) | 8,271.49 | (3,406.21) | 59 |
| $GDP_{jt}$ | Gross Domestic Product (GDP) | 296,461,463.27 | (627,384,282.03) | 354 |
| $Ydef_{jt}$ | GDP Deflator | 2,703.49 | (14,984.84) | 354 |
| $POP_{jt}$ | Population | 77,014,900 | (202,159,489) | 354 |
| $\Delta\ lnXRATE_{ijt}$ | Δ ln *Exchange Rate* | 0.1093 | (0.2065) | 354 |
| $REM_{jt}$ | Economic Remoteness | 19,661.90 | (30,995.84) | 354 |
| $OPEN_{jt}$ | Trade Openness | 0.7113 | (0.4123) | 354 |
| $ENG_j$ | English | 0.4407 | (0.4972) | 59 |
| $FTA_{ijt}$ | Free Trade Agreement | 0.0508 | (0.22) | 354 |
| $PORT_j$ | Seaport | 0.8644 | (0.3428) | 59 |

Note: Trade and GDP values are in thousands of US dollars. All monetary values have been converted to 1995 US dollars.

Table 2. Immigrants, cultural distance and trade.

| | Dependent variables | | | | | |
|---|---|---|---|---|---|---|
| Explanatory variables | ln $Exports_{ijt}$ (a) | ln *Non-Manu.* $Exports_{ijt}$ (b) | ln *Manu.* $Exports_{ijt}$ (c) | ln $Imports_{ijt}$ (d) | ln *Non-Manu.* $Imports_{ijt}$ (e) | ln *Manu.* $Imports_{ijt}$ (f) |
| ln $Immigrants_{ijt}$ | 0.2731*** | 0.1875*** | 0.2988*** | 0.1309** | −0.0306 | 0.3188*** |
| | (0.0425) | (0.0439) | (0.0416) | (0.053) | (0.0637) | (0.0579) |
| ln $Immigrants_{ijt}$ × ln $Cultural\ Distance_{ijt}$ | 0.2118*** | 0.1438* | 0.2911*** | 0.3951*** | 0.00001 | 0.2377*** |
| | (0.0673) | (0.0788) | (0.0648) | (0.0846) | (0.0941) | (0.0857) |
| ln $Cultural\ Distance_{ijt}$ | −2.3759*** | −1.2189 | −3.4847*** | −4.512*** | −0.9235 | −2.3713** |
| | (0.8143) | (0.9802) | (0.7895) | (1.0446) | (1.1486) | (1.0319) |
| ln $Geodesic\ Distance_{ij}$ | −0.699*** | −0.6894*** | −0.7476*** | −0.6746*** | −1.0432*** | −0.3471*** |
| | (0.1049) | (0.0893) | (0.1052) | (0.1201) | (0.15) | (0.1052) |
| ln $GDP_{jt}$ | 1.1365*** | 0.8414*** | 1.2077*** | 1.2735*** | 0.8717*** | 1.3785*** |
| | (0.0858) | (0.1078) | (0.0816) | (0.0969) | (0.1313) | (0.0994) |
| ln $Population_{jt}$ | −0.1425*** | 0.1718*** | −0.191*** | 0.1116* | 0.3904*** | −0.1048 |
| | (0.0482) | (0.0602) | (0.0454) | (0.0633) | (0.08) | (0.0663) |
| Δ ln $Exchange\ Rate_{ijt}$ | −0.2034*** | −0.1746** | −0.2047*** | −0.1499*** | −0.0931 | −0.0453 |
| | (0.0614) | (0.071) | (0.0586) | (0.0563) | (0.0814) | (0.0647) |
| ln ($GDP\ Deflator_{jt}$/ $GDP\ Deflator_{it}$) | 0.1064*** | −0.0059 | 0.1305*** | 0.0605 | −0.0049 | 0.0438 |
| | (0.0232) | (0.0282) | (0.0228) | (0.04) | (0.0496) | (0.0343) |
| ln $Trade\ Openness_{jt}$ | 0.3988*** | 0.5915*** | 0.3908*** | 0.6432*** | 0.2293* | 0.6029*** |
| | (0.0909) | (0.12) | (0.0858) | (0.1056) | (0.1286) | (0.1187) |
| ln $Economic\ Remoteness_{jt}$ | 0.1487** | 0.1383* | 0.148** | 0.3378*** | 0.4635*** | 0.2095** |
| | (0.0694) | (0.0838) | (0.0664) | (0.0772) | (0.1006) | (0.0821) |
| $English_j$ | 0.6315*** | 0.3386*** | 0.6661*** | 0.3047*** | 0.176 | 0.4639*** |
| | (0.0959) | (0.1001) | (0.0926) | (0.1108) | (0.1342) | (0.1111) |

(*continued*)

Table 2. (*Continued*).

| | Dependent variables | | | | | |
|---|---|---|---|---|---|---|
| | ln $Exports_{ijt}$ | ln *Non-Manu.* $Exports_{ijt}$ | ln *Manu.* $Exports_{ijt}$ | ln $Imports_{ijt}$ | ln *Non-Manu.* $Imports_{ijt}$ | ln *Manu.* $Imports_{ijt}$ |
| Explanatory variables | (a) | (b) | (c) | (d) | (e) | (f) |
| $FTA_{ijt}$ | 0.7858*** | 0.9212*** | 0.7508*** | 1.2403*** | −0.1041 | 1.5315*** |
| | (0.1929) | (0.1754) | (0.191) | (0.2713) | (0.2809) | (0.2489) |
| $Seaport_j$ | 0.2492* | 1.6785*** | 0.1021 | −0.0109 | 1.2936*** | −0.4868** |
| | (0.1479) | (0.1453) | (0.1294) | (0.2359) | (0.2477) | (0.24) |
| Lagged (one-year) change in Dep. Var. | 1.2E-08 | 1.3E-08 | 9.8E-09 | 1.3E-08 | −9.9E-09 | 1.4E-08* |
| | (8.6E-09) | (1.2E-08) | (8E-09) | (8.3E-09) | (1.2E-08) | (8.3E-09) |
| Constant | −10.3317*** | −9.9396*** | −11.3396*** | −17.5934*** | −11.056*** | −20.871*** |
| | (2.67) | (2.9904) | (2.5509) | (2.9743) | (3.9495) | (3.0976) |
| $N$ | 354 | 354 | 354 | 354 | 354 | 354 |
| Pseudo $R^2$ | 0.7151 | 0.7048 | 0.7376 | 0.7066 | 0.6216 | 0.7004 |
| Wald $chi^2$ | 2,521*** | 1,903*** | 4,009*** | 1,435*** | 626*** | 1,939*** |
| Log likelihood | 40.75 | −46.26 | 23.22 | 94.82 | −10.96 | 46.16 |

Note: Standard errors in parentheses. '***', '**' and '*' denote significance at the 1%, 5% and 10% levels, respectively. Coefficients on time dummy variables not reported.

aggregate and manufacturing exports and imports are employed as dependent variables. The coefficient on the term which interacts the immigrant stock variable and the cultural distance variable is positive and significant in all estimations except when imports of non-manufactured goods are considered. The pattern of significance and the signs/magnitudes of the coefficient estimates suggest that immigrants offset, at least in part, the effects of cultural distance.

Turning to the estimated coefficients on the remaining explanatory variables in Table 2, we observe that most coefficients bear the expected signs. Higher GDP values for immigrants' home countries correlate with increased US trade. Elasticity values are near or below unity, which is consistent with findings from prior gravity-based studies. A proxy for market size, higher home country population is expected to be positively related to trade flows; however, while the US tends to trade more intensively in non-manufactured products, it trades less-intensively in manufactured products with relatively larger population home countries. Depreciation of immigrants' home country currencies vis-à-vis the US dollar correspond, respectively, to decreases in home countries' imports from the US, the effect being less magnified on US imports. The ratio of home country-to-US GDP deflators is included to control for relative prices between the US and each home country. The positive and significant coefficients on this variable when aggregate exports and exports of manufactured products are used as dependent variables suggest that home countries that receive relatively higher prices for their exports, an indication of increased competitiveness, tend to import more from the US. Similarly, the positive and significant coefficients on the index of trade openness indicate that the US trades more with home countries that are relatively more open to trade. Home countries facing relatively fewer non-US trading opportunities tend to trade more intensively with the US. We also observe more trade between the US and home countries that commonly use English, indicating the importance of a shared language for facilitating transactions. Finally, the US trades more with home countries if they are parties to trade agreements with them and with home countries that are not landlocked.

### *5.2. Refugee and non-refugee immigrants, cultural distance and US trade*

In Table 3, we provide results from a modified version of Equation (3), where we distill the immigrant stock variable into refugee and non-refugee immigrants, again interacting each with the cultural distance variable. In Table 4, we present results from similar specification where we use both refugee and non-refugee immigrants separately while also decomposing the cultural distance variable into its component dimensions, *SSE* and *TSR*. Beginning with the results presented in Table 3, we find considerable variation in the coefficient estimates of the variables denoting immigrant

Table 3. Refugees/asylees, other immigrants, cultural distance and trade.

| | Dependent variables | | | | | |
|---|---|---|---|---|---|---|
| | ln $Exports_{ijt}$ | ln *Non-Manu.* $Exports_{ijt}$ | ln *Manu.* $Exports_{ijt}$ | ln $Imports_{ijt}$ | ln *Non-Manu.* $Imports_{ijt}$ | ln *Manu.* $Imports_{ijt}$ |
| Explanatory variables | (a) | (b) | (c) | (d) | (e) | (f) |
| ln $Refugees/Asylees_{ijt}$ | −0.0015 | 0.0618*** | −0.013 | −0.0508** | 0.03 | −0.0763*** |
| | (0.0171) | (0.0168) | (0.0169) | (0.0205) | (0.0213) | (0.0178) |
| ln $Refugees/Asylees_{ijt}$ × ln $Cultural\ Distance_{ijt}$ | 0.0416 | 0.0059 | 0.0329 | 0.0676* | 0.0174 | 0.1191*** |
| | (0.0294) | (0.03) | (0.0275) | (0.0378) | (0.034) | (0.0337) |
| ln $Non\text{-}Refugee\ Immigrants_{ijt}$ | 0.2396*** | 0.1395*** | 0.2851*** | 0.1836*** | −0.0931 | 0.406*** |
| | (0.0445) | (0.042) | (0.0422) | (0.0576) | (0.0605) | (0.0555) |
| ln $Non\text{-}Refugee\ Immigrants_{ijt}$ × ln $Cultural\ Distance_{ijt}$ | 0.0862 | 0.0618 | 0.1237** | 0.2139** | −0.0188 | −0.0941 |
| | (0.0668) | (0.0683) | (0.0599) | (0.0918) | (0.0886) | (0.0851) |
| ln $Cultural\ Distance_{ijt}$ | −1.105 | −0.1937 | −1.6012** | −2.6595*** | −0.7722 | 0.9252 |
| | (0.7649) | (0.8047) | (0.6888) | (1.0311) | (0.9575) | (0.9619) |
| ln $Geodesic\ Distance_{ij}$ | −0.6845*** | −0.7785*** | −0.6999*** | −0.5361*** | −1.1399*** | −0.087 |
| | (0.1156) | (0.0902) | (0.1124) | (0.1322) | (0.1486) | (0.0997) |
| ln $GDP_{jt}$ | 1.156*** | 0.8803*** | 1.2545*** | 1.2654*** | 0.9853*** | 1.4669*** |
| | (0.0864) | (0.1018) | (0.0809) | (0.0943) | (0.1123) | (0.0936) |
| ln $Population_{jt}$ | −0.1415*** | 0.1206** | −0.2083*** | 0.1039* | 0.3576*** | −0.1684*** |
| | (0.0474) | (0.0528) | (0.0409) | (0.0623) | (0.0692) | (0.0617) |
| Δ ln $Exchange\ Rate_{ijt}$ | −0.2082*** | −0.2*** | −0.2249*** | −0.1422** | −0.11 | −0.0285 |
| | (0.0633) | (0.0746) | (0.0671) | (0.0562) | (0.0909) | (0.065) |
| ln ($GDP\ Deflator_{jt}/GDP\ Deflator_{it}$) | 0.0909*** | 0.001 | 0.1284*** | 0.044 | 0.0284 | 0.02 |
| | (0.0227) | (0.0256) | (0.023) | (0.0392) | (0.048) | (0.0332) |
| ln $Trade\ Openness_{jt}$ | 0.3923*** | 0.5101*** | 0.4171*** | 0.7247*** | 0.247** | 0.7664*** |
| | (0.0916) | (0.1177) | (0.0826) | (0.1058) | (0.1136) | (0.1173) |

(*continued*)

Table 3. (*Continued*).

| | Dependent variables | | | | | |
|---|---|---|---|---|---|---|
| | ln $Exports_{ijt}$ | ln *Non-Manu.* $Exports_{ijt}$ | ln *Manu.* $Exports_{ijt}$ | ln $Imports_{ijt}$ | ln *Non-Manu.* $Imports_{ijt}$ | ln *Manu.* $Imports_{ijt}$ |
| Explanatory variables | (a) | (b) | (c) | (d) | (e) | (f) |
| ln *Economic Remoteness*$_{jt}$ | 0.1586** | 0.1728** | 0.1702** | 0.3078*** | 0.5107*** | 0.2038*** |
| | (0.0711) | (0.0813) | (0.0707) | (0.0755) | (0.0881) | (0.0776) |
| *English*$_j$ | 0.5694*** | 0.5135*** | 0.5868*** | 0.1457 | 0.3386** | 0.1767* |
| | (0.1075) | (0.1094) | (0.1001) | (0.1207) | (0.1353) | (0.1034) |
| $FTA_{ijt}$ | 0.7678*** | 0.9466*** | 0.6548*** | 0.917*** | −0.2278 | 1.1064*** |
| | (0.207) | (0.1637) | (0.1975) | (0.2952) | (0.213) | (0.3051) |
| *Seaport*$_j$ | 0.2467 | 1.7574*** | 0.1044 | −0.0597 | 1.4723*** | −0.5255** |
| | (0.1601) | (0.1557) | (0.136) | (0.2402) | (0.2076) | (0.2328) |
| Lagged (one-year) change in Dep. Var. | 1.4E-08 | 0.032* | 0.0137 | 3.1E-05 | −0.0047 | 0.0137 |
| | (8.8E-09) | (0.0185) | (0.0117) | (8.2E-09) | (0.0126) | (0.0087) |
| Constant | −10.6208*** | −9.5996*** | −12.5644*** | −18.3491*** | −12.6745*** | −24.5878*** |
| | (2.7055) | (2.8529) | (2.6246) | (2.9292) | (3.4622) | (2.9236) |
| *N* | 354 | 354 | 354 | 354 | 354 | 354 |
| Pseudo $R^2$ | 0.7064 | 0.7123 | 0.7306 | 0.6913 | 0.6294 | 0.7087 |
| Wald $chi^2$ | 2,615*** | 2,613*** | 5,206*** | 1,542*** | 980*** | 2,570*** |
| Log likelihood | 25.28 | −72.14 | −18.73 | 81.28 | −78.91 | −10.33 |

Note: Standard errors in parentheses. '***', '**' and '*' denote significance at the 1%, 5% and 10% levels, respectively. Coefficients on time dummy variables not reported.

types. Accordingly, mirroring the pattern of significance and consistency of the magnitudes of the coefficients reported in Table 2, coefficients on the non-refugee immigrant stock variable indicate that non-refugee immigrants have significant pro-trade influences on US trade with their home countries. Given the results reported in Table 2, as the large majority of immigrants to the US did not enter the country as refugees, this result is not surprising.

Again, while negative across all estimations, the coefficients on the cultural distance variables are significant in the regressions where aggregate imports and exports of manufactured products are used as dependent variables. Suggesting that non-refugee immigrants counter the trade-inhibiting influence of cultural distance, the coefficients on the variable that interacts the non-refugee immigrant stock with the cultural distance variable is both positive and significant in both estimations where the coefficients on the cultural distance variable are negative and significant. Refugee immigrants, however, counter the inhibiting influence of cultural distance on imports of aggregate and manufactured products. Yet, in contrast to the proportional influences of non-refugee immigrants, the associated estimated effects of refugees are not strong enough to yield significant effects. Thus, while refugees do exert relatively weak, yet positive, influences on trade, non-refugee immigrants exert much stronger influences. This is consistent with the notion of refugees, compared with non-refugee immigrants, being less connected to or less able to exploit, build and/or maintain connections with partners or networks in their home countries.

Results presented in Table 4 also support the findings reported thus far, with the coefficients on the variables representing refugees and non-refugee immigrants following the patterns depicted in Table 3. As the results in the table were estimated with the cultural distance variable decomposed into its component dimensions, the results more clearly depict the influence of cultural distance on trade. We see that, across specifications, the trade-inhibiting effects of the cultural differences between the US and immigrant home countries, measured along the *TSR* dimension are consistently negative and significant. To the contrary, the coefficient on the cultural distance between the US and immigrant home countries measured along the *SSE* dimension is negative, yet insignificant, in all estimations except when imports of manufactured products are employed as the dependent variable; in which case, the coefficient is both positive and significant. This pattern is largely consistent with the findings reported in White and Tadesse (2008), who also report similar estimates without differentiating immigrants by their entry classifications.

Coefficients on the terms that interact the *TSR* and refugee immigrant stock variables are typically positive and significant, indicating a pro-trade (export and import) influence of refugee immigrants that acts to offset the influences of the *TSR* dimension of cultural differences between the US and immigrants' home countries. A similar pattern is found, albeit with

Table 4. Refugees/asylees, other immigrants, dimensions of cultural distance and trade.

| | Dependent variables | | | | | |
|---|---|---|---|---|---|---|
| | ln $Exports_{ijt}$ | ln *Non-Manu.* $Exports_{ijt}$ | ln *Manu.* $Exports_{ijt}$ | ln $Imports_{ijt}$ | ln *Non-Manu.* $Imports_{ijt}$ | ln *Manu.* $Imports_{ijt}$ |
| Explanatory variables | (a) | (b) | (c) | (d) | (e) | (f) |
| ln $Refugees/Asylees_{ijt}$ | 0.0114 | 0.0467** | 0.0149 | −0.0179 | 0.029 | −0.0214 |
| | (0.0205) | (0.0218) | (0.0187) | (0.0237) | (0.0207) | (0.0196) |
| ln $Refugees/Asylees_{ijt}$ × ln $SSE\ Distance_{ijt}$ | −0.0218 | 0.0081 | −0.0266** | 0.0358** | 0.028** | 0.0392*** |
| | (0.0142) | (0.0167) | (0.0125) | (0.0183) | (0.0134) | (0.0139) |
| ln $Refugees/Asylees_{ijt}$ × ln $TSR\ Distance_{ijt}$ | 0.0349** | 0.0294** | 0.0464*** | 0.0321** | −0.0423*** | 0.0844*** |
| | (0.0142) | (0.0175) | (0.0134) | (0.0158) | (0.0163) | (0.0149) |
| ln *Non-Refugee Immigrants*$_{ijt}$ | 0.3406*** | 0.228*** | 0.406*** | 0.3764*** | −0.015 | 0.468*** |
| | (0.0421) | (0.0468) | (0.0343) | (0.0496) | (0.0617) | (0.0439) |
| ln *Non-Refugee Immigrants*$_{ijt}$ × ln $SSE\ Distance_{ijt}$ | −0.0133 | −0.0116 | 0.0024 | −0.0065 | −0.0689 | −0.1079*** |
| | (0.0415) | (0.046) | (0.0341) | (0.0512) | (0.0432) | (0.04) |
| ln *Non-Refugee Immigrants*$_{ijt}$ × ln $TSR\ Distance_{ijt}$ | 0.1964*** | 0.2142*** | 0.1483*** | 0.2425*** | 0.0451 | 0.1824*** |
| | (0.0542) | (0.0628) | (0.0485) | (0.0612) | (0.0694) | (0.0627) |
| ln $SSE\ Distance_{ijt}$ | 0.1885 | 0.1747 | 0.0092 | −0.2549 | −0.2589 | 1.2293*** |
| | (0.4261) | (0.4843) | (0.3436) | (0.5199) | (0.433) | (0.4158) |
| ln $TSR\ Distance_{ijt}$ | −2.5277*** | −2.7637*** | −2.0169*** | −3.0523*** | −0.1871 | −2.7615*** |
| | (0.661) | (0.7625) | (0.5893) | (0.7342) | (0.8036) | (0.7254) |
| ln $Geodesic\ Distance_{ij}$ | −0.4857*** | −0.6709*** | −0.4416*** | −0.3265** | −1.0867*** | −0.0139 |
| | (0.1148) | (0.0993) | (0.1065) | (0.1349) | (0.1262) | (0.0872) |
| ln $GDP_{jt}$ | 0.9077*** | 0.6423*** | 0.9621*** | 0.955*** | 0.7652*** | 1.1974*** |
| | (0.0818) | (0.096) | (0.077) | (0.0856) | (0.1091) | (0.0765) |
| ln $Population_{jt}$ | −0.1058* | 0.2123*** | −0.2149*** | 0.162** | 0.6719*** | −0.2625*** |
| | (0.0549) | (0.0609) | (0.0443) | (0.067) | (0.0726) | (0.0652) |

(*continued*)

Table 4. (*Continued*).

| | Dependent variables | | | | | |
|---|---|---|---|---|---|---|
| | ln $Exports_{ijt}$ | ln *Non-Manu.* $Exports_{ijt}$ | ln *Manu.* $Exports_{ijt}$ | ln $Imports_{ijt}$ | ln *Non-Manu.* $Imports_{ijt}$ | ln *Manu.* $Imports_{ijt}$ |
| Explanatory variables | (a) | (b) | (c) | (d) | (e) | (f) |
| ln (*GDP Deflator*$_{jt}$/*GDP Deflator*$_{it}$) | 0.0581** | −0.07** | 0.1034*** | 0.0072 | 0.1093** | −0.0432 |
| | (0.0251) | (0.0311) | (0.0219) | (0.0389) | (0.0427) | (0.0409) |
| Δ ln *Exchange Rate*$_{ijt}$ | −0.169*** | −0.197*** | −0.2007*** | −0.0768 | −0.1182 | 0.067 |
| | (0.0627) | (0.0666) | (0.0727) | (0.0527) | (0.0884) | (0.0622) |
| ln *Trade Openness*$_{jt}$ | 0.485*** | 0.6011*** | 0.4481*** | 0.7113*** | 0.3335*** | 0.6827*** |
| | (0.0937) | (0.1237) | (0.0807) | (0.0997) | (0.1237) | (0.1042) |
| ln *Economic Remoteness*$_{jt}$ | −0.0171 | 0.0113 | −0.0375 | 0.0986 | 0.4555*** | −0.0591 |
| | (0.0685) | (0.0802) | (0.0678) | (0.0696) | (0.0805) | (0.062) |
| *English*$_j$ | 0.4393*** | 0.2205* | 0.5024*** | 0.0442 | 0.2426** | 0.0411 |
| | (0.1095) | (0.1195) | (0.0949) | (0.1205) | (0.1233) | (0.0938) |
| $FTA_{ijt}$ | 0.767*** | 0.8143*** | 0.7306*** | 0.7749*** | 0.2771 | 0.9005*** |
| | (0.1733) | (0.1495) | (0.16) | (0.2608) | (0.2549) | (0.1781) |
| *Seaport*$_j$ | 0.5748*** | 1.9641*** | 0.4612*** | 0.0485 | 1.5384*** | −0.3165 |
| | (0.1581) | (0.2012) | (0.133) | (0.2422) | (0.1611) | (0.2368) |
| Lagged (one-year) change in Dep. Var. | 1.3E-08 | 0.0221 | 0.0091 | 2.9E-09 | -0.0041 | 0.0104 |
| | (9.3E-09) | (0.0169) | (0.0111) | (8.2E-09) | (0.0125) | (0.0093) |
| Constant | −6.5687** | −5.5371** | −7.3694*** | −14.0538*** | −13.7698*** | −15.5807*** |
| | (2.572) | (2.6657) | (2.4665) | (2.688) | (3.1314) | (2.432) |
| *N* | 354 | 354 | 354 | 354 | 354 | 354 |
| Pseudo $R^2$ | 0.7232 | 0.7123 | 0.7471 | 0.7087 | 0.6760 | 0.7172 |
| Wald chi$^2$ | 2,102*** | 1,791*** | 4,426*** | 1,603*** | 1,224*** | 3,852*** |
| Log likelihood | 53.28 | −29.51 | −5.53 | 104.72 | −67.18 | −12.17 |

Note: Standard errors in parentheses. '***', '**' and '*' denote significance at the 1%, 5% and 10% levels, respectively. Coefficients on time dummy variables not reported.

coefficients on greater magnitude, when evaluating the role of non-refugee immigrants in offsetting the influences of cultural differences measured along the *TSR* dimension. Additionally, the coefficient estimate of the interaction term between refugee immigrant stock variable and the *SSE* dimension of cultural distance suggests that refugee immigrants offset related cultural differences on aggregate US imports and that of manufactured goods. However, the coefficient is negative and significant for aggregate US exports in general and those of manufacturing goods. This implies that given their relationship with their home countries, while refugees may act to overcome the negative effect of cultural differences measured along the SSE dimension in promoting US imports, their abilities to offset, fully or partially, a similar effect of cultural differences between the US and their home countries is constrained to an extent that the trade-inhibiting effect of the *SSE* dimension of cultural difference overrides their potential contribution.



### *5.3. Estimated per-immigrant trade effects and geodesic distance offsets*

Our results so far indicate that, albeit there are differences in the extent to which refugee and non-refugee immigrants affect their home–host country trade flows across different products, immigrants have pro-trade effects that also partially offset the trade-inhibiting effect of cultural distances, whether measured along combined or separate dimensions, while geodesic distance significantly reduces the amount of trade taking place. In order to garner a better understanding of the economic significance of the observed proportional pro-trade effect of each class of immigrants reported, in this section, we follow Millimet and Osang (2007) and estimate the extent to which immigrants may offset the amount of trade that would be lost due to the geodesic distance (and thus, transportation costs) between the US and immigrant home countries.[8]

Table 5 presents the estimated distance offset based on significant coefficients reported in Tables 2 through 4. When using coefficients on immigrant stock variables where we do not differentiate between refugee and non-refugee immigrants, we derive the per-immigrant distance offset, measured in kilometers, as $\overline{GD} \times \exp\{(-\lambda_1/\gamma_1) \times \ln[IM/(IM+1)] + (-\lambda_2/\gamma_1) \times \ln \overline{CD} \times \ln[IM/(IM+1)] - 1\}$.[9] When we decompose the immigrant stock variable into refugee and non-refugee immigrants, we modify the derivation of the distance offset accordingly. Dividing the average geodesic distance between the US and a typical immigrant's home country in our data, 8271 km, by the estimated distance offset per immigrant produces a further estimate of the number of immigrants necessary to completely counteract the negative effect of geodesic distance (transport costs) on trade between the US and the typical immigrant's home country. While our estimation method assumes constant returns to immigration, we understand that the pro-trade effect of immigrants may not be proportional to the size of

Table 5. Per-immigrant offsets of geodesic distance (in meters).

| | Trade Measure | | | | | |
|---|---|---|---|---|---|---|
| | Exports | Non-Manu. Exports | Manu. Exports | Imports | Non-Manu. Imports | Manu. Imports |
| Immigrant Type | (a) | (b) | (c) | (d) | (e) | (f) |
| Immigrants[a] | 451.55 | 220.75 | 498.25 | 176.40 | – | 10,644.80 |
| | (18,317) | (37,468) | (16,600) | (46,887) | – | (777) |
| Refugees/Asylees[b] | – | 636.89 | – | 312.37 | – | [d] |
| | – | (12,987) | – | (26,478) | – | [d] |
| Non-Refugee Immigrants[b] | 319.28 | 123.64 | 484.25 | 382.22 | – | [d] |
| | (25,905) | (66,895) | (17,080) | (21,639) | – | [d] |
| Refugees/Asylees[c] | – | 2.64 | 1.86 | 1.87 | 2.06 | – |
| | – | (3,133,845) | (4,455,402) | (4,433,425) | (4,009,797) | – |
| Non-Refugee Immigrants[c] | 2.21 | 0.32 | 7.89 | 19.82 | – | [d] |
| | (3,750,387) | (25,800,236) | (1,048,602) | (417,275) | – | [d] |

Note: Values in parentheses are the numbers of immigrants needed to completely offset average distance of 8,271 kilometers. See text for explanation of offset values. [a,b,c]Values calculated using coefficients presented in Table 2, Table 3 and Table 4, respectively. [d]While the proportional immigrant effect is positive and significant, the estimated geodesic distance coefficient is not significant from zero.

the immigrant population. Thus, although our estimates might be exaggerated, the estimates do provide an indication of the relative strength of immigrant–trade links across the different trade measures and immigrant types.

Focusing first on the effect of immigrants, generally speaking, in offsetting the negative effect of geodesic distance on trade, the estimates indicate that the extent to which a typical immigrant counters the negative effect of geodesic distance on US exports to – and imports from – her home country varies by 452 meters and 176 meters, respectively. Given that these values are estimates of the amount of geographic distance that a typical immigrant offsets for transporting the average US exports or imports in a given year to the immigrant's home country, it is straightforward to infer the substantial economic significance of the pro-trade effect of immigrants. Using these estimates as a benchmark, we find that fully offsetting the effect of transport costs on US exports to a typical home country requires an additional 18,317 immigrants from that home country, while a greater number of immigrants, 46,887, is required to completely offset the transport costs associated with US imports.

The asymmetry in the distances offset indicates that the extent to which immigrants are capable of offsetting the cost of transportation on US exports to their home countries tends to outweigh the extent to which they can influence the cost of transportation on US imports from their home countries. If the pro-import effect of immigrants is largely due to their 'transplanted home bias' preferences and the pro-export influence is driven by their 'cultural' and 'enforcement' bridge effects, the observed ability of immigrants to offset a greater geodesic distance for exports than imports would not be surprising. Similarly, comparing the effects across product categories, we find that the extent to which immigrants can offset the costs of transportation on US trade with their home countries is generally greater for manufactured products than for non-manufactured products, plausibly because of differences in the bulkiness of products in the latter category or complexities associated with standardization of different goods and thus differences in the ability of immigrants to offset the associated cost of transportation across different products. Lastly, distilling the immigrant stock variable into refugee and non-refugee stocks, along with decomposition of the cultural distance variable into its component dimensions, reveals that while non-refugee immigrants typically offset a significant and large amount of the cost of transportation on US trade with their home countries, refugee immigrants are estimated to exert weaker effects in terms of offsetting distance.

## 6. Concluding comments

Prior studies of the immigrant–trade relationship provide a general understanding of the role that immigrants play in enhancing trade between

their host and home countries. Although, historically, the US has accepted relatively diverse and large numbers of refugee and non-refugee immigrants alike, whether or not the effect of immigrants on US–home country trade varies across immigrants' entry classifications has not been examined. Employing data that span the years 1996–2001 for the US and 59 home countries, we provide the first examination of variation in the US immigrant–trade link across immigrant entry classifications. Our results indicate that immigrants generally exert positive influences on US trade with their home countries; however, the influence of refugees, while positive, is of considerably lesser magnitude as compared with that of non-refugee immigrants. Furthermore, for both immigrant types, our results indicate that immigrants offset the trade-inhibiting effects of cultural distance, a measure of cultural and institutional dissimilarity between the US and immigrants' home countries, with the related effects of non-refugee immigrants being stronger than those of refugee immigrants.

The relatively weak influences of refugee immigrants on US trade with their home countries may be the result of such immigrants having more tenuous ties to their home countries relative to the ties of non-refugee immigrants. Moreover, constraints on refugees' abilities to maintain/foster connections with home country-based trading partners would correspond to a diminished likelihood of refugees increasing US exports via either the cultural or enforcement bridges. Similarly, as refugee immigrants have limited connections to their home country business and/or social networks, they are also less influential in promoting their host countries exports to their home countries. Finally, that the pro-import influence of refugee immigrants is of low magnitude may be the result of a transplanted home bias effect that is not found in conjunction with an information bridge or network effect. While the findings presented here clearly suggest the existence of differences in the extent to which refugee and non-refugee immigrants affect US–home country trade, they also suggest the need for additional research, using more disaggregated trade measures while considering more detailed immigrant characteristics that we cannot account for. Although we have treated all immigrants as being equally capable of influencing trade flows, some immigrants may be better-equipped, in terms of education and their human capital levels or access to host country networks resulting from occupational choice, etc., to exert pro-trade effects than are other immigrants. Likewise, as immigrants' assimilation may affect their abilities to influence host–home country trade flows, it is reasonable to expect that the ability of immigrants to influence host–home country trade varies based on the length of time that immigrants (refugees and non-refugees, alike) have resided in the US. Given the data we employ, we are unable to control for the durations of immigrants' stays in the US. Thus, further exploration of the immigrant–trade relationship that affords a greater emphasis on these and other immigrant characteristics is merited.

## Acknowledgments

The authors thank the editor and two anonymous referees for helpful comments and suggestions.

## Notes

1. Other important pieces of legislation that influenced the level and composition of both total immigrant inflows and refugee/asylee inflows during this period include the Refugee Relief Act of 1953, the Migration and Refugee Assistance Act of 1962 and the Refugee Act of 1980.
2. Tinbergen (1962) first applies the gravity specification to trade, and more recent research has established theoretical foundations for the model. See, for example, Anderson and van Wincoop (2003) and Feenstra (2004).
3. Detailed information regarding the WVS/EVS, including a description of the data collection methodology and additional country-specific examples can be found at www.worldvaluessurvey.org. While the WVS/EVS provides data for 81 countries, incomplete data restricts our sample to only 59 nations. A listing of the nations in our data set is provided in the appendix.
4. On average, the Values Surveys provide TSR and SSE values for 1190 residents of each nation in our sample. For the US, 1117 residents were surveyed. Mean values are un-weighted arithmetic averages.
5. Estimated cultural distances depicted in Figure 1 and all other data used in this study are available upon request.
6. Unless noted, data for explanatory variables are from the World Bank (2006).
7. Internal distance, when $k = j$, is derived as $0.4 \times \sqrt{Land\,Mass_j}$ (Head and Mayer, 2000).
8. Using the Iceberg trade model, these estimates indicate the reduction in the cost of transporting goods to and from the immigrants' home countries that is attributable to the presence of each type of immigrant in the US.
9. Since geodesic distance is measured in kilometers, multiplying the resulting offset estimates by 1000 converts the estimates into meters of geodesic distance offset by a typical immigrant.

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**Appendix. Country listing, with estimated refugee/asylee and other immigrant stocks.**

| Country | Avg. Refugee/ Asylee stock | Avg. Non-Refugee Immigrant stock | Country | Avg. Refugee/ Asylee stock | Avg. Non-Refugee Immigrant stock |
|---|---|---|---|---|---|
| Albania | 12,181 | 17,640 | Jordan | 26 | 46,808 |
| Algeria | 51 | 10,770 | Korea, Rep. | 4,624 | 812,085 |
| Argentina | 107 | 122,675 | Latvia | 24,619 | 2,105 |
| Australia | 24 | 58,696 | Luxembourg | 0 | 2,114 |
| Austria | 25,672 | 37,341 | Mexico | 451 | 8,360,978 |
| Bangladesh | 0 | 77,359 | Morocco | 20 | 29,645 |
| Belgium | 110 | 33,888 | Netherlands | 21,445 | 73,567 |
| Brazil | 32 | 165,119 | New Zealand | 6 | 21,830 |
| Bulgaria | 8,989 | 17,210 | Nigeria | 859 | 121,291 |
| Canada | 157 | 794,709 | Norway | 15 | 31,940 |
| Chile | 1,146 | 77,119 | Pakistan | 30 | 197,572 |
| China | 42,123 | 983,489 | Peru | 500 | 264,958 |
| Colombia | 720 | 466,332 | Philippines | 211 | 1,333,326 |
| Denmark | 0 | 31,623 | Poland | 164,170 | 311,420 |
| Dominican Rep. | 105 | 669,441 | Portugal | 3,977 | 198,433 |
| Egypt | 7,119 | 98,588 | Romania | 55,330 | 87,055 |
| El Salvador | 3,430 | 789,894 | Russian Fed. | 211,979 | 165,594 |
| Estonia | 9,269 | 226 | South Africa | 830 | 57,272 |
| Finland | 11 | 21,438 | Spain | 8,565 | 74,267 |
| France | 657 | 145,598 | Sweden | 4 | 49,785 |
| Germany | 147,505 | 560,980 | Switzerland | 9 | 44,340 |
| Greece | 19,908 | 147,970 | Tanzania | 0 | 10,085 |
| Hungary | 54,715 | 38,024 | Turkey | 5,867 | 69,221 |
| Iceland | 0 | 5,356 | Uganda | 1,336 | 9,877 |
| India | 8 | 880,765 | UK | 381 | 659,036 |
| Indonesia | 18,371 | 51,315 | Uruguay | 53 | 25,164 |
| Ireland | 18 | 161,331 | Venezuela | 837 | 83,411 |
| Israel | 82 | 109,353 | Vietnam | 584,511 | 611,557 |
| Italy | 66,404 | 410,140 | Zimbabwe | 134 | 7,358 |
| Japan | 9,965 | 330,723 | | | |