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Does Cultural Distance Hinder Trade in Goods? A Comparative Study of Nine OECD Member Nations

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RESEARCH ARTICLE

Does Cultural Distance Hinder Trade in Goods? A Comparative Study of Nine OECD Member Nations

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Abstract We examine the effect of cultural distance, a proxy for the lack of a minimum reservoir of trust necessary to initiate and complete trade deals, on bilateral trade flows. Employing data for 67 countries that span the years 1996–2001, we estimate a series of modified gravity specifications and find that cultural dissimilarity between nations has an economically significant and consistently negative effect on aggregate and disaggregated trade flows; however, estimated effects vary in magnitude and economic significance across measures of trade and our cohort of OECD reference countries. The consistently negative influence of cultural distance indicates that policymakers may wish to consider mechanisms that enhance the build-up of trust and commitment when seeking to facilitate the initiation and completion of international trade deals. Our findings also imply that coefficient estimates from related studies that do not account for the trade-inhibiting effect of cultural distance may be biased.

Keywords Cultural distance · Gravity · Immigration · Trade

JEL Classification F14 · F15 · F22

1 Introduction

Using data from the World Values Surveys and the European Values Surveys, we employ a relatively new measure of cultural distance between countries to examine

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the relationship between cultural differences and international trade in goods. Prior studies that have examined the determinants of trade flows have generally given little attention to the effects of cultural differences; having instead treated cultural dissimilarity as a component of a more broadly-defined set of transaction costs, commonly represented by variables that measure geographic distance between trading partners or that identify commonality of language and/or colonial ties. Despite plausible correlations between cultural differences and these variables, common language and colonial ties are, at best, imperfect representations of cultural similarity. Transportation cost—as represented by geographic distance—are also not synonymous with transaction costs. For example, while Mexico and Canada are located at comparable geographic distances from the US, there exists significant disparity in the cultural distance between the US and Mexico as compared to the corresponding distance between the US and Canada, even when accounting for (un)commonality of languages. The resulting implication is that transaction costs that are related to cultural differences between trading partners may not be fully or accurately represented by geographic distance or by variables that represent either prior colonial relationships or linguistic dissimilarity.

Following Deardorff (2004), we argue that observed transaction costs do not fully explain variation in cross-border trade flows and postulate that cultural dissimilarity between nations inhibits international trade. As such, the objective of our research and corresponding contribution to the literature is two-fold: (1) to evaluate the effect of differences in the shared norms and values of people in different countries (i.e., cultural distance) on bilateral trade flows, and (2) to examine potential variation in the effects of cultural distance on trade using data from nations with heterogeneous socio-economic characteristics. To this end, we define a nation's culture as an amalgam of its population's shared habits and traditions, learned beliefs and customs, attitudes, norms and values. Cultural dissimilarity between nations thus corresponds to social and institutional dissimilarity and/or information asymmetries and serves as a proxy for the lack of trust and commitment necessary to initiate trade deals and to complete transactions. Our empirical analysis explores this relationship using data that span the years 1996–2001 for a panel of nine OECD member countries, namely Australia, Canada, Denmark, Germany, Italy, the Netherlands, Norway, Sweden and the US, and 58 other countries for which data on cultural distance are available.[1]

Our study is relevant to the literature for the following reasons. First, a consensus is lacking among studies that consider the effect of cultural distance on trade. Guiso et al. (2005) reports a positive relationship between cultural distance and trade, while Tadesse and White (2007), Linders et al. (2005) and Boisso and Ferrantino (1997) report that greater cultural distance inhibits trade. These studies are discussed in detail in "Section 2". Second, owing to global economic integration and the increased fragmentation of production processes, a large number of firms now rely on production chains that straddle politically-and culturally-dissimilar nations. Understanding how cultural dissimilarities between people in different nations may affect the successful completion of transactions is thus desirable. Third, driven in

[1] "Appendix 1" provides a listing of the countries in our data set.

part by the burgeoning frequency of Internet-based transactions, the volume of international trade is on the rise. Given that parties involved in Internet-based transactions often have little recourse to formal courts of law to enforce obligations (especially when they reside in different countries), understanding the influence of cultural dissimilarity on trade flows is both topical and important.

While our selection of a socio-economically heterogeneous cohort of OECD countries allows evaluation of whether the effect of cultural differences on trade is consistent across countries, it also permits consideration of whether the effect of cultural distance on trade persists when accounting for any pro-trade effects of immigrants. Gould (1994), using data for the US, first documents a positive effect of immigrants on bilateral trade flows, and more recent studies have confirmed an immigrant-trade link for several other immigrant host countries. White and Tadesse (2007) provide a review of the immigrant-trade literature. Our results, obtained from the estimation of a series of modified gravity specifications, consistently indicate that cultural dissimilarities do indeed influence cross-border trade flows. We contend that the observed negative relationship results from a lack of the necessary trust and commitment required for initiating and completing trade deals. In addition to confirming the robustness of our results, the consistency of the observed effect of cultural differences on trade across our group of heterogeneous reference countries indicates a possible need for policymakers to consider mechanisms that enhance the build-up of trust and commitments to facilitate the initiation and completion of international trade deals. We also document that immigrants have economically significant pro-trade effects; however, their ability to offset the trade-inhibiting effects of cultural dissimilarity is limited. Finally, our findings imply that coefficient estimates from related studies that do not account for the effect of cultural distance may be biased.

The paper proceeds as follows. In "Section 2", we outline the plausible relationships between cultural distance and trade while reviewing the relevant literature. In "Section 3", we present the empirical model and data, while placing particular emphasis on the measurement of cultural distance. "Section 4" discusses the econometric results, while "Section 5" concludes.

2 Review of related literature

The literature examining the relationship between cultural distance and trade can be considered sparse. Tadesse and White (2007), Guiso et al. (2005), Linders et al. (2005), and Boisso and Ferrantino (1997) are notable exceptions, yet among these studies there is no consensus regarding the effect of cultural distance on trade. While it is difficult to discern definite reasons for the lack of consensus, the variation in results across the available studies appears to be driven, in part, by the use of different measures of cultural dissimilarity between trading partners and from the examination of different cohorts of trading partners over a variety of time periods. In this section, we summarize the findings of the available literature and, in doing so, illustrate why the effect of cultural distance on trade remains an open empirical question.

Employing Hofstede's (1980) four-dimensional measure of national culture and bilateral trade data between 92 countries for the year 1999, Linders et al. (2005) report

that greater cultural distance corresponds with higher volumes of trade. The authors suggest that their findings may indicate that firms prefer to serve culturally-distant markets via exporting rather than by producing in such countries. Using the measure of cultural distance provided by Hofstede (1980) and a composite index of cultural distance developed by Kogut and Singh (1988), Larimo (2003) also indicates that as greater cultural differences between countries correspond with greater differences in firms' organizational and management practices, firms might find it difficult and costly to transfer home country practices to subsidiaries in culturally-dissimilar locales. Likewise, Barkema et al. (1997), Agarwal (1994) and Anderson and Gatignon (1996) all posit that cultural dissimilarity between firms' home countries and their potential subsidiary locations affects their foreign investment decisions.

Greater cultural distance may also correspond with institutional dissimilarity between nations. Hence, the lack of incentives to invest in culturally-distant environments may have more to do with dissimilarities in institutions that govern firms' operations than with cultural differences. Thus, while the choice of firms to export rather than invest in culturally/institutionally different markets may indicate a plausible positive correlation between exports and cultural distance, by obstructing the initiation and realization of business deals cultural distance may also, ultimately, limit the amount of trade (Neal 1998; Campbell et al. 1988; Graham et al. 1988). Guiso et al. (2005) use survey data to construct a measure of relative trust based on respondents' stereotypes of foreign nationals (a proxy for cultural differences) and examine data for 16 EU member countries during the years 1970–1996. The authors conclude that lower levels of trust between countries diminish the frequency and magnitude of international trade, portfolio investment and foreign direct investment. Thus, when viewed from the perspective of a firms' strategic choice of serving a culturally-different foreign market, it is plausible to say that exports would rise with increases in cultural distance. However, as it may hinder the development of rapport and the creation of trust required to complete trade deals, an increase in cultural distance could also reduce the likelihood that transactions will occur, and subject to their occurrence, the amount of trade taking place.

While not explicitly taking language as representative of cultural similarity, a number of empirical studies have used dummy variables to indicate commonality of language across trading partners and, as such, have indirectly employed linguistic similarity as a measure of cultural similarity (e.g., Dunlevy 2006; Hutchinson 2002). Such studies consistently report a positive relationship between shared languages and trade flows. Somewhat similarly, Boisso and Ferrantino (1997) employ an index of linguistic distance as a proxy for cultural differences and estimate gravity specifications, for each year, during the 1960–1985 period. Supporting the notion of a negative relationship between cultural differences and trade, the authors report that greater linguistic dissimilarity corresponds with decreased trade flows. Further, they also report that the trade-inhibiting effects of cultural distance increased in magnitude until the early 1970s and then began to decrease thereafter, with the trade-inhibiting influence of linguistic dissimilarity remaining negative and significant throughout the period.

Using data from the World Values Surveys (WVS) and the European Values Surveys (EVS), Tadesse and White (2007) construct a measure of cultural distance and examine its effects on US state-level exports to 75 trading partners during the

year 2000. The authors report that greater cultural differences consistently reduce aggregate exports as well as exports of both cultural and non-cultural products; however, the influence of cultural distance is found to vary across goods classifications, with exports of cultural products affected to a greater extent. While we employ the same measure of cultural distance, our study extends the literature in several ways. First, we consider the influence of cultural distance on trade (both imports and exports) for a broader set of countries. Second, we employ data that both represent a more-detailed set of trade measures and that span a lengthier time period. Third, we examine the consistency of the effect of cultural distance on trade across a set of nine OECD reference countries. In the next section, we first present the theoretical framework and empirical specification that permits evaluation of the relationship between cultural distance and trade flows and then discuss the data while placing particular focus on the measurement of cultural distance.

3 The theoretical framework, empirical model and the data

In developing our empirical model, we build upon the gravity framework first employed by Tinbergen (1962) and for which Anderson (1979) provides theoretical foundations. In its basic form, the gravity model posits that trade between two countries i and j during year t $\left(\widetilde{T}_{ijt}\right)$ increases with the countries' combined economic mass, which is given as the product of the countries' incomes ($Y_{it}Y_{jt}$). Higher incomes imply greater capacities for both country i and country j to either import or export. Greater geodesic distance (GD_{ij}), which serves as a proxy for transportation costs, is assumed to decrease trade. Adding κ as the constant of proportionality, we can express the basic gravity model as follows:

$$T_{ijt} = \kappa\left(\frac{Y_{it}Y_{jt}}{GD_{ij}}\right) \tag{1}$$

From Eq. 1, we derive our econometric specification by defining T_{ijt} as country i's trade (exports or imports) with country j during year t as a function of the trading partners' incomes, geodesic distance and other factors that may inhibit trade (formal and informal barriers to trade) or facilitate trade (trade agreements, common language, adjacency, immigrant stock, etc.). Given our assumption that observed transaction costs do not fully explain cross-border trade flows (Deardorff, 2004), we augment the theoretical gravity model with a measure of cultural distance (CD_{ij}) that reflects the degree to which shared norms and values among people in each of our OECD reference countries (country i) differ from those in each country j. Effectively, we employ our measure of cultural distance to account for unobserved transaction costs that result from the lack of a minimum reservoir of trust and commitments between trading partners. To account for other trade-facilitating/inhibiting factors that are often discussed in the literature, we also append the vector Z_{ij} to Eq. 1. Equation 2 illustrates.

$$T_{ijt} = \kappa\left(\frac{Y_{it}^{\gamma_1}Y_{jt}^{\gamma_2}}{GD_{ij}^{\gamma_3}}\right) exp\left(CD_{ij}^{-\gamma_4}\beta' Z_{ij}\right) \tag{2}$$

Equation 2 predicts strictly positive realizations of imports and exports; however, trade data often contain cases where values are equal to zero. Following Ranjan and Tobias (2005), Eaton and Tamura (1994) and Head and Ries (1998), we modify Eq. 2 to permit the realization of zero trade values. The result is provided as Eq. 3.

$$\widetilde{T}_{ijt} = \kappa \left(\frac{Y_{it}^{\gamma_1} Y_{jt}^{\gamma_2}}{GD_{ij}^{\gamma_3}} \right) \exp\left(CD_{ij}^{-\gamma_4} \beta' Z_{ij} - \eta \right) \tag{3}$$

η is a fixed amount of trade that is subtracted from the level predicted by Eq. 2. When the latent trade values are negative, observed imports and/or exports will be zero. Thus, the observed data on country i's imports from or exports to country j can be described as $T_{ijt} = \max\left[\widetilde{T}_{ijt}, 0\right]$. Substituting this identity, expanding the variables in the vector Z_{ij}, reintroducing time subscripts where appropriate, taking natural logarithms of the continuous variables on both sides of the resulting equation, and assuming that ε_{ijt} is an identically and independently distributed error term results in our estimation equation:

$$\begin{aligned} \ln\left(T_{ijt} + \eta\right) = {} & \kappa + \alpha_1 \ln CD_{ij} + \alpha_2 \ln IM_{ijt} + \alpha_{3i}\left(\ln IM_{ijt} \times \ln CD_{ij} \times OECD_i\right) + \alpha_{4i} OECD_i \\ & + \alpha_5 Y_{jt} + \alpha_6 \ln GD_{ij} + \alpha_7 \Delta \ln XRATE_{ijt} + \alpha_8 \ln OPEN_{ijt} + \alpha_9 \ln POP_{jt} \\ & + \alpha_{10} \ln REM_{jt} + \alpha_{11} BORDER_{ij} + \alpha_{12} COMLANG_{ij} + \alpha_{13} FTA_{ijt} + \alpha_{14} OPEC_{jt} \\ & + \alpha_{15} SEAPORT_j + \beta_{\Omega t}\, \Omega_t + \varepsilon_{ijt} \end{aligned} \tag{4}$$

Our vector of dependent variables includes aggregate import and export values as well as disaggregated (non-manufactured and manufactured goods and one-digit SITC level) import and export values, each of which is regressed in turn on our set of explanatory variables. All trade data are from the SourceOECD database (OECD 2007) and measure trade in goods.

To capture other possible time-invariant country-specific heterogeneity that yields variation in trade flows, we include a vector of country-specific dummy variables, $OECD_i$, that identify each member of our OECD country cohort. Since a number of studies report that immigrants act to increase their host countries' imports from and exports to their home countries, we also include the immigrant stock variable, IM_{ijt}, and a series of terms that interact the cultural distance, immigrant stock and OECD (i.e., immigrants' host) country dummy variables.[2] Thus, our empirical specification allows for variation in the influences of cultural distance across our reference OECD countries while controlling for the role that immigrants may play in influencing trade flows between their home and host countries through their connections to social and/or business networks, their abilities to offset information asymmetries and via their preferences for home country-produced goods. In Eq. 4, α_1 and α_2 are estimates of the "base effects" of cultural distance and immigrants, respectively, that apply equally across OECD country–country j pairs. The coefficients on the terms that interact the CD_{ij}, IM_{ijt} and variables $OECD_i$ variables, α_{3i}, capture any variation from the corresponding base effect that is specific to each of the reference OECD

[2] "Appendix 2" provides details regarding data sources and the construction of the immigrant stock series.

countries.[3] Thus, the proportional influence of cultural distance on trade for each reference country is given by the sum of the coefficients on the cultural distance variable, $\hat{\alpha}_1$, and the corresponding interaction term, $\hat{\alpha}_{3i}$.

3.1 Measuring cultural distance

Inglehart et al. (2004) defines cultural distance as the degree to which shared norms and values between people in one country differ from those in another country. Using data from the WVS and the EVS (Inglehart et al. 2004; Hagenaars et al. 2003), we calculate the cultural distance between each of the nine OECD reference countries and each of the remaining countries in our sample.[4] Conducted between 1998 and 2001, the surveys provide standardized data from representative national samples for a broad and varying set of topics that relate to 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). Since the surveys were not conducted on an annual basis, our measure of cultural distance is time-invariant. Guiso et al. (2005), Linders et al. (2005) and Boisso and Ferrantino (1997) also employ time-invariant measures of cultural differences. Following the leads of these prior studies, we assume that any relative changes in national cultures that occurred during the 6-year period that our data represents were negligible.

Employing factor analysis, Inglehart et al. (2004) classify survey respondents along two dimensions of culture: traditional vs. secular-rational authority (TSR) and survival vs. self-expression values (SSE). The TSR dimension reflects the contrast between societies in which deference to the authority of a God, the nation or to the family is considered important or an expectation and those societies in which individualism and self-expression are stressed. Traditional authority emphasizes obedience to religious authority, adherence to family or communal obligations, national pride and norms of sharing. It is common for members of such societies to view large families and large numbers of children as positive, or desirable, achievements. Divorce, abortion, euthanasia, and suicide are all viewed in a very negative light. Members of secular-rational societies tend to hold opposing views on these topics. Secular-rational societies adhere to rational-legal norms and tend to emphasize economic accumulation and individual achievement. The SSE dimension of culture, on the other hand, 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 speaking, members of these societies find foreigners and outsiders, ethnic diversity, and cultural change to be threatening. This correlates with an intolerance of homosexuals and minorities, adherence to traditional gender roles, and an

[3] The effect of immigrants on trade between each OECD country–country j pairing can be computed similarly.

[4] The number of trading partners in our analysis is determined by the availability of data on cultural distance. On average, the values surveys provide data for 1,121 residents of each nation in our sample.

authoritarian political outlook. Members of societies in which self-expression values are emphasized tend to hold opposing preferences on these issues.

We employ average TSR and SSE values to calculate the cultural distances between each of our nine OECD reference countries and the remaining countries in our data set. The resulting values, calculated as $CD_{ij} = \sqrt{\left(\overline{TSR}_j - \overline{TSR}_i\right)^2 + \left(\overline{SSE}_j - \overline{SSE}_i\right)^2}$, are presented in Table 1. The greatest reported cultural distance is between Sweden and Morocco (3.96), while the two most culturally-similar countries are Canada and the US (0.25), an indication of the heterogeneity of cultural (dis)similarity among our reference OECD countries. While the US and Canada are the most culturally-similar pair of countries in our sample, the cultural distances of the US and Canada from the remaining countries in our sample are quite different, indicating that any two culturally-similar countries are not necessarily equidistant from a given third country. While the cultural distance rankings generally conform to expectations, it is important to note, however, that the values are estimates and, as such, strict ordinal interpretation of the rankings may prove problematic.

3.2 Additional variables in the empirical model

The remaining explanatory variables in Eq. 4 are standard in most studies that apply the gravity specification to trade flows.[5] The annual change in the exchange rate, $XRATE_{ijt}$, captures terms of trade effects. Expressed for each OECD member country–country j pairing, as foreign currency units per unit of the OECD country's currency, an increase in the variable is expected to decrease the OECD member's exports to country j and increase that country's imports from country j. $OPEN_{jt}$, the sum of each country's imports and exports divided by its GDP, measures the general propensity to trade. To represent market size, we include a variable that indicates the population of each country j (POP_{jt}). Controlling for each country's relative lack of trading opportunities, we follow Wagner et al. (2002) and include a measure of economic remoteness, given as $REM_{jt} = 1 \Big/ \sum_{k=1}^{K} \left[\left(Y_{kt}/Y_{wt}\right)/GD_{jk}\right]$, where Y_{wt} represents gross global product and k identifies the availability of potential trading partners for country j other than our nine reference OECD countries. As the annual GDP values (included in Eq. 3) for the reference OECD countries do not vary across trading partners, in our estimation equation the related effects are subsumed into the coefficients on the $OECD_i$ dummy variables.

A number of dummy variables are also included in our regression specification. As common language has been identified as an important determinant of trade flows (Dunlevy 2006; Hutchinson 2002), we include a dummy variable which is equal to one if the predominant language used in the respective OECD country is also commonly used in country j (CIA 2006). As being landlocked is an important geographic impediment to trade, we include a dummy variable, $SEAPORT_j$, which is equal to one if country j has direct access to international waters. Similarly, $BORDER_{ij}$ is equal to one for OECD country–country j pairs that are geographically adjacent. Capturing the effects of trade agreements FTA_{ijt} is equal to one if the

[5] "Appendix 3" lists the variables, corresponding data sources and additional notes.

Table 1 Cultural distances between country pairs

	Cultural distance between OECD member and								
Country	Australia	Canada	Denmark	Germany	Italy	Netherlands	Norway	Sweden	US
Albania	1.58	1.61	2.02	1.24	0.94	1.82	1.73	2.33	1.54
Algeria	1.89	1.83	2.63	2.09	1.45	2.38	2.34	2.97	1.64
Argentina	1.09	1.04	1.88	1.54	0.75	1.62	1.61	2.22	0.85
Armenia	1.77	1.83	2.06	1.16	1.12	1.90	1.78	2.35	1.79
Australia	0.00	0.16	0.93	1.21	0.65	0.67	0.74	1.25	0.39
Austria	0.34	0.48	0.81	0.88	0.42	0.56	0.55	1.16	0.63
Azerbaijan	1.87	1.89	2.35	1.56	1.26	2.15	2.07	2.67	1.79
Bangladesh	1.80	1.76	2.51	1.95	1.34	2.27	2.23	2.85	1.58
Belgium	0.63	0.77	0.87	0.60	0.33	0.66	0.58	1.21	0.88
Brazil	1.42	1.36	2.20	1.78	1.05	1.95	1.92	2.54	1.16
Bulgaria	1.93	2.01	2.04	1.06	1.30	1.92	1.79	2.29	2.01
Canada	0.16	0.00	1.08	1.36	0.72	0.82	0.90	1.39	0.25
Chile	1.21	1.16	1.98	1.59	0.83	1.73	1.70	2.32	0.97
China	2.07	2.18	1.96	0.97	1.50	1.90	1.75	2.15	2.23
Colombia	1.85	1.73	2.76	2.58	1.76	2.50	2.53	3.10	1.48
Croatia	1.00	1.05	1.48	0.90	0.36	1.27	1.19	1.81	1.01
Czech Republic	1.27	1.42	1.04	0.06	0.89	0.99	0.83	1.27	1.54
Denmark	0.93	1.08	0.00	1.00	1.18	0.26	0.29	0.34	1.32
Dominican Republic	1.23	1.16	2.03	1.67	0.90	1.77	1.76	2.37	0.96
Egypt	1.64	1.57	2.44	2.01	1.28	2.18	2.16	2.78	1.36
El Salvador	2.33	2.18	3.25	3.17	2.33	2.99	3.04	3.57	1.94
Estonia	1.84	1.94	1.90	0.92	1.23	1.80	1.66	2.15	1.96
Finland	0.60	0.75	0.68	0.62	0.51	0.47	0.39	1.01	0.91
France	0.71	0.82	1.02	0.62	0.23	0.81	0.73	1.35	0.89
Germany	1.21	1.36	1.00	0.00	0.84	0.93	0.78	1.23	1.48
Greece	0.80	0.90	1.11	0.61	0.24	0.91	0.83	1.44	0.95
Hungary	1.69	1.75	1.98	1.10	1.04	1.82	1.71	2.28	1.71
Iceland	0.30	0.47	0.65	0.98	0.65	0.38	0.44	0.99	0.69
India	1.09	1.08	1.73	1.24	0.55	1.49	1.44	2.07	0.97
Indonesia	1.59	1.56	2.28	1.72	1.10	2.04	1.99	2.62	1.39
Ireland	0.75	0.64	1.65	1.60	0.77	1.39	1.42	1.99	0.40
Israel	0.79	0.87	1.20	0.72	0.16	0.99	0.91	1.53	0.90
Italy	0.65	0.72	1.18	0.84	0.00	0.94	0.89	1.52	0.73
Japan	1.35	1.51	0.89	0.31	1.10	0.91	0.76	1.05	1.67
Jordan	2.00	1.94	2.74	2.20	1.57	2.50	2.46	3.09	1.74
Korea, Republic of	1.55	1.63	1.75	0.84	0.91	1.60	1.48	2.03	1.62
Latvia	1.85	1.92	2.06	1.13	1.20	1.92	1.80	2.34	1.90
Lithuania	1.68	1.76	1.84	0.90	1.04	1.71	1.58	2.11	1.76
Luxembourg	0.64	0.79	0.73	0.57	0.47	0.53	0.44	1.06	0.93
Macedonia, FYR	2.20	2.25	2.50	1.58	1.55	2.34	2.23	2.78	2.18
Mexico	1.08	0.98	1.97	1.80	0.96	1.70	1.72	2.31	0.75
Morocco	2.85	2.78	3.62	3.05	2.45	3.37	3.34	3.96	2.56
Netherlands	0.67	0.82	0.26	0.93	0.94	0.00	0.16	0.60	1.06
New Zealand	0.32	0.48	0.62	0.98	0.67	0.36	0.42	0.96	0.71
Nigeria	1.66	1.56	2.52	2.21	1.43	2.26	2.26	2.87	1.33
Norway	0.74	0.90	0.29	0.78	0.89	0.16	0.00	0.63	1.12
Pakistan	1.94	1.89	2.66	2.10	1.48	2.42	2.38	3.00	1.70
Peru	1.44	1.38	2.20	1.76	1.04	1.95	1.92	2.54	1.19
Philippines	1.39	1.35	2.13	1.66	0.96	1.88	1.85	2.47	1.16
Poland	1.40	1.39	2.03	1.44	0.86	1.80	1.74	2.37	1.26
Portugal	1.21	1.20	1.87	1.35	0.69	1.63	1.58	2.21	1.06
Romania	2.04	2.07	2.47	1.63	1.41	2.29	2.19	2.78	1.97
Russian Federation	2.17	2.25	2.31	1.33	1.53	2.19	2.06	2.56	2.23

Table 1 (continued)

Country	Cultural distance between OECD member and								
	Australia	Canada	Denmark	Germany	Italy	Netherlands	Norway	Sweden	US
Slovak Republic	1.26	1.36	1.45	0.60	0.65	1.30	1.18	1.75	1.38
Slovenia	1.14	1.27	1.14	0.27	0.65	1.02	0.88	1.41	1.35
South Africa	1.33	1.28	2.09	1.66	0.93	1.84	1.81	2.43	1.09
Spain	0.81	0.89	1.24	0.75	0.17	1.03	0.95	1.58	0.90
Sweden	1.25	1.39	0.34	1.23	1.52	0.60	0.63	0.00	1.64
Switzerland	0.60	0.75	0.63	0.64	0.56	0.42	0.34	0.96	0.93
Tanzania	1.70	1.61	2.55	2.21	1.44	2.29	2.29	2.89	1.38
Turkey	1.73	1.72	2.34	1.68	1.18	2.12	2.05	2.67	1.57
Uganda	1.67	1.62	2.41	1.89	1.24	2.16	2.13	2.75	1.43
Ukraine	2.08	2.15	2.26	1.30	1.44	2.13	2.00	2.53	2.13
UK	0.20	0.35	0.73	1.13	0.72	0.47	0.56	1.05	0.59
US	0.39	0.25	1.32	1.48	0.73	1.06	1.12	1.64	0.00
Uruguay	0.86	0.90	1.42	0.95	0.25	1.19	1.13	1.76	0.85
Venezuela	1.25	1.14	2.14	1.96	1.13	1.88	1.90	2.48	0.90
Vietnam	1.31	1.27	2.05	1.60	0.88	1.80	1.77	2.39	1.09
Zimbabwe	2.06	2.02	2.76	2.15	1.58	2.52	2.47	3.10	1.84

See text for details regarding calculation of cultural distances

OECD member and country *j* are parties to the same trade agreement during year t. $OPEC_{jt}$ controls for petroleum imports and is equal to one if country *j* was an OPEC member for at least 6 months during year *t*. Coefficients on the year dummy variables, Ω_t, represent the effects of changes in country-specific economic policies that may influence levels of trade.

We expect the signs of the coefficient estimates for geodesic distance and cultural distance to be negative. With the exception of the coefficients on the annual changes in the OECD member country–country *j* exchange rate, OPEC membership and the economic remoteness of each country, which could take either positive or negative values depending on the measure of trade employed as the dependent variable, following the standard literature *a priori* we expect all other coefficients to be positive.

4 Empirical results and discussion

4.1 Heterogeneity of the reference countries

Table 2 presents descriptive statistics for the full sample and for each of the reference OECD countries, ordered by average cultural distance from the trading partners in our data set. We find that Italy, followed by the US and Australia, are the least culturally-distant countries with average cultural distance values varying from 0.998 (Italy) to 1.316 (Australia). All three countries have values that are significantly less than the average for the full sample. With cultural distance values of 2.062 and 1.749, Sweden and Denmark, respectively, are the most culturally-distant from the trading partners considered. Average cultural distance values for Canada, Germany, Norway and the Netherlands are not significantly different from that of the full

Table 2 Descriptive statistics

Variable	All countries	Italy	US	Australia	Canada	Germany	Norway	Netherlands	Denmark	Sweden
Aggregate $exports_{ijt}$	2,846,355 (11,516,076)	2,929,166 (6,181,892)	8,067,804[a] (20,963,739)	600,654[a] (1,606,299)	3,064,109 (21,953,655)	6,651,118[a] (11,630,257)	655,787[a] (1,568,748)	2,062,156[b] (5,722,386)	585,827[a] (1,368,579)	1,060,742[a] (1,919,262)
Non-manufactured goods $exports_{ijt}$	472,863 (2,181,436)	259,109[a] (619,761)	1,048,455[a] (2,685,990)	285,681[a] (939,424)	816,843 (5,142,456)	487,733 (1,017,709)	434,358 (1,169,514)	634,652 (2,160,012)	178,673[a] (426,613)	117,701[a] (268,817)
Manufactured goods $exports_{ijt}$	2,373,484 (9,685,055)	2,670,057 (5,574,322)	7,019,242[a] (18,627,374)	314,973[a] (770,635)	2,247,306 (16,866,301)	6,163,385[a] (10,768,369)	221,429[a] (482,451)	1,427,504[a] (3,623,542)	407,154[a] (959,798)	941,041[a] (1,670,911)
Aggregate $imports_{ijt}$	3,043,045 (12,303,484)	2,679,597 (5,814,895)	11,818,257[a] (29,514,658)	707,249[a] (1,864,083)	2,667,156 (15,264,857)	5,760,861[a] (9,615,832)	449,139[a] (944,642)	1,925,247[a] (4,369,482)	577,183[a] (1,363,921)	867,773[a] (1,900,474)
Non-manufactured goods $imports_{ijt}$	489,580 (2,077,562)	539,025 (981,210)	1,741,481[a] (5,358,722)	67,709[a] (172,680)	316,021[b] (1,485,276)	987,378[a] (1,912,395)	72,337[a] (154,674)	434,755 (880,029)	112,269[a] (247,036)	145,813[a] (348,530)
Manufactured goods $imports_{ijt}$	2,553,470 (10,743,097)	2,140,572 (4,956,609)	10,077,052[a] (25,659,622)	639,539[a] (1,782,487)	2,350,911 (13,816,945)	4,773,483[a] (8,328,884)	376,801[a] (824,098)	1,490,492[a] (3,609,111)	464,913[a] (1,156,805)	721,960[a] (1,657,528)
Cultural $distance_{ij}$	1.4645 (0.7022)	0.9979[a] (0.4646)	1.3055[a] (0.4983)	1.3162[c] (0.5877)	1.3461 (0.5561)	1.3504 (0.6208)	1.5030 (0.72)	1.5510 (0.7256)	1.7492[a] (0.7535)	2.0617[a] (0.7686)
$Immigrants_{ijt}$	60,715 (328,645.9)	12,520[a] (22,072.93)	314,454[a] (891,510.1)	48,521 (137,592.2)	59,749 (105,116.8)	83,170 (260,396.5)	1,510[a] (3,926.5)	13,370[a] (34,134.62)	2,693[a] (4,968.08)	10,445[a] (27,574.15)
Geodesic $distance_{ij}$	7,073.57 (4,921.81)	8,735.95[a] (3,766.16)	8,227.89[a] (3,216.87)	13,744.87[a] (3,470.61)	7,917.84[a] (3,148.05)	4,869.25[a] (4,590.94)	5,142.00[a] (4,389.39)	4,970.56[a] (4,557.85)	4,960.51[a] (4,524.67)	5,093.30[a] (4,419.64)
GDP_{jt}	362,039.96 (1,096,381)	369,814.26 (1,145,425)	260,035.15[a] (592,571)	377,963.00 (1,146,323)	374,928.02 (1,147,248)	359,116.23 (1,136,473)	381,709.84 (1,147,244)	379,151.12 (1,147,571)	381,824.09 (1,147,220)	380,836.13 (1,147,400)
$Population_{jt}$	71,387.40 (190,910.49)	71,525.55 (191,587.39)	68,284.84 (189,924.10)	71,935.06 (191,279.93)	71,926.72 (191,529.13)	71,164.06 (191,590.22)	72,308.97 (191,419.66)	72,142.10 (191,473.94)	72,296.23 (191,424.16)	72,243.90 (191,442.02)
Trade $openness_{jt}$	0.7422 (0.409)	0.7445 (0.4099)	0.7487 (0.4061)	0.7457 (0.4091)	0.7402 (0.4107)	0.7433 (0.4103)	0.741 (0.4108)	0.7342 (0.4066)	0.7413 (0.4107)	0.7405 (0.4107)
Economic $remoteness_{jt}$	25,705.47 (45,322.26)	25,719.44 (45,365.2)	25,730.15 (45,359.23)	25,671.99 (45,389.6)	25,708.94 (45,370.9)	25,728.81 (45,359.99)	25,681.55 (45,384.97)	25,715.61 (45,367.3)	25,691.11 (45,380.18)	25,701.65 (45,374.75)
Δ ln Exchange $rate_{ijt}$	0.0556 (0.2039)	0.0590 (0.2048)	0.1069[a] (0.1969)	0.0460 (0.2136)	0.0865[a] (0.1993)	0.0356[c] (0.2012)	0.0477 (0.1988)	0.0347[b] (0.2012)	0.0400 (0.2014)	0.0443 (0.2071)
Common $language_{ij}$	0.2255 (0.418)	0.1642[a] (0.3709)	0.3881[a] (0.4879)	0.4179[a] (0.4938)	0.3881[a] (0.4879)	0.1493[a] (0.3568)	0.00[a] (0.00)	0.0299[a] (0.1704)	0.4925[a] (0.5006)	0.00[a] (0.00)

Table 2 (continued)

Variable	All countries	Italy	US	Australia	Canada	Germany	Norway	Netherlands	Denmark	Sweden
FTA_{ijt}	0.2054	0.2786[a]	0.0448[a]	0.0149[a]	0.0522[a]	0.2786[a]	0.3134[a]	0.2786[a]	0.2786[a]	0.3085[a]
	(0.404)	(0.4489)	(0.2071)	(0.1214)	(0.2228)	(0.4489)	(0.4645)	(0.4489)	(0.4489)	(0.4624)
Shared $border_{ij}$	0.0381	0.0597[c]	0.0299	0.00[a]	0.0149[a]	0.1194[a]	0.0448	0.0299	0.0149[a]	0.0299
	(0.1916)	(0.2372)	(0.1704)	(0.00)	(0.1214)	(0.3247)	(0.2071)	(0.1704)	(0.1214)	(0.1704)
$OPEC_j$	0.0597	0.0597	0.0597	0.0597	0.0597	0.0597	0.0597	0.0597	0.0597	0.0597
	(0.237)	(0.2372)	(0.2372)	(0.2372)	(0.2372)	(0.2372)	(0.2372)	(0.2372)	(0.2372)	(0.2372)
$Seaport_j$	0.8209	0.8209	0.8209	0.8209	0.8209	0.8209	0.8209	0.8209	0.8209	0.8209
	(0.3835)	(0.3839)	(0.3839)	(0.3839)	(0.3839)	(0.3839)	(0.3839)	(0.3839)	(0.3839)	(0.3839)

Sample sizes for individual host countries equal 402 observations. The "all hosts" sample is equal to 3,618 observations. Population and trade values in 1,000s. GDP values in 100,000s. All monetary values are in 1995 US dollars

[a] Statistical significance from the "all hosts" mean at the 1% level

[b] Statistical significance from the "all hosts" mean at the 5% level

[c] Statistical significance from the "all hosts" mean at the 10% level

sample. Based on this ordering and the corresponding incidence of significance from the full sample average, we can say that Canada, Germany, Norway and the Netherlands are culturally closer to the remaining countries in our data set than are Denmark and Sweden, while Italy, the US and Australia are culturally closer to the remaining countries than are Canada, Germany, Norway and the Netherlands.

We also observe that while the average geodesic distances of both the US (8,228 km) and Italy (8,736 km) from the remaining countries are not significantly different from one another, the US and Australia both trade (import as well as export) more with the countries in our sample than do relatively culturally-distant countries such as Sweden and Denmark. With respect to the number of immigrants residing in each of the reference OECD countries, the US is home to significantly more immigrants while Italy and the more culturally-distant countries (i.e., Norway, the Netherlands, Denmark and Sweden) have significantly fewer immigrants compared to the overall average value. Not surprisingly, the US is also an outlier in terms of its average GDP value. In addition to examining whether or not cultural differences affect trade flows, heterogeneities such as these permit us to test the consistency of the influences of cultural distance on trade across our reference countries.

4.2 Cross-border trade-inhibiting and facilitating factors

Table 3 presents coefficients (marginal effects) for estimations that employ, as dependent variables, aggregate and disaggregated (manufactured and non-manufactured goods) trade values.[6] We derive the estimates using a Tobit specification as in Eaton and Tamura (1994) and Head and Ries (1998). Results indicate that the signs of most coefficients correspond with our *a priori* expectations. Accordingly, increased geodesic distance and depreciation of each country's currency vis-à-vis each respective OECD reference countries' currency corresponds to declines in exports and increases in the aggregate as well as disaggregated (manufactured and non-manufactured goods) imports of the OECD countries considered. Consistent with the predictions of the theoretical gravity model, with increases in the incomes of trading partners we observe increases in the level of trade, with estimated coefficients lying below unity across all estimations. We also find that shared borders, larger populations (a proxy for market size), sharing a common language, having access to international waters, and being parties to a free trade agreement increase our reference countries' exports and imports at both the aggregate level and for the disaggregated measures of trade. Coefficients on the trade openness variable are generally positive and are significant with respect to aggregate imports and imports of non-manufactured goods. On the other hand, our OECD reference countries tend to trade less with countries that are more economically remote and those that are OPEC members. The notable exception is the case where trade in non-manufactured goods is considered; however, this is intuitive as our OECD countries' primary import from OPEC members is petroleum, which is classified as part of the SITC-3 (mineral fuels, lubricants and related materials) industry classification.

[6] We also estimate the relationship using the Random Effects Generalized Least Squares approach. The results do not differ from those presented here.

Table 3 Aggregate, non-manufactured and manufactured goods imports and exports-tobit coefficients

Dep. variable:	ln $imports_{ijt}$	ln non-manuf. $imports_{ijt}$	ln manuf. $imports_{ijt}$	ln $exports_{ijt}$	ln non-manuf. $exports_{ijt}$	ln manuf. $exports_{ijt}$
ln cultural $distance_{ij}$	−0.7758[a]	−0.6172[b]	−1.2148[a]	−0.1655	−1.235[a]	−0.1035
	(0.2313)	(0.2739)	(0.2467)	(0.1978)	(0.2308)	(0.196)
ln $immigrants_{ijt}$	0.2107[a]	0.2758[a]	0.222[a]	0.2443[a]	0.1454[a]	0.2673[a]
	(0.0258)	(0.0306)	(0.0275)	(0.0221)	(0.0257)	(0.0219)
ln $immigrants_{ijt}$ × ln cultural $distance_{ij}$ × host country: Australia	0.0607	0.1066[b]	0.0498	0.1101[a]	0.2592[a]	0.0614[c]
	(0.0376)	(0.0446)	(0.0401)	(0.0322)	(0.0375)	(0.0319)
ln $immigrants_{ijt}$ × ln cultural $distance_{ij}$ × host country: Canada	0.062[c]	0.0015	0.1082[a]	−0.0543[c]	−.1742[a]	−0.1129[a]
	(0.0371)	(0.0439)	(0.0396)	(0.0317)	(0.037)	(0.0315)
ln $immigrants_{ijt}$ × ln cultural $distance_{ij}$ × host country: Denmark	−0.0867[b]	−0.1183[b]	−0.0232	−0.1248[a]	0.0166	−0.1259[a]
	(0.0409)	(0.0484)	(0.0436)	(0.0349)	(0.0408)	(0.0346)
ln $immigrants_{ijt}$ × ln cultural $distance_{ij}$ × host country: Germany	0.0375	0.0735[c]	0.0495	0.0091	0.1276[a]	0.0007
	(0.0375)	(0.0444)	(0.04)	(0.032)	(0.0374)	(0.0318)
ln $immigrants_{ijt}$ × ln cultural $distance_{ij}$ × host country: The Netherlands	0.0231	−0.013	0.071[c]	−0.0892[a]	0.0572[c]	−0.1052[a]
	(0.0349)	(0.0413)	(0.0372)	(0.0298)	(0.0348)	(0.0296)
ln $immigrants_{ijt}$ × ln cultural $distance_{ij}$ × host country: Norway	−0.0865[b]	−0.1499[a]	−0.0941[b]	−0.2444[a]	−0.0661[c]	−0.2596[a]
	(0.0364)	(0.0431)	(0.0388)	(0.0311)	(0.0363)	(0.0309)
ln $immigrants_{ijt}$ × ln cultural $distance_{ij}$ × host country: Sweden	−0.0167	−0.0099	−0.0307	−0.0435	0.0655[c]	−0.0543
	(0.0393)	(0.0466)	(0.0419)	(0.0336)	(0.0392)	(0.0333)
ln $immigrants_{ijt}$ × ln cultural $distance_{ij}$ × host country: US	0.0861[b]	−0.0154	0.1468[a]	−0.0362	0.2222[a]	−0.0728[b]
	(0.0352)	(0.0417)	(0.0376)	(0.0301)	(0.0352)	(0.0299)
Δ ln exchange $rate_{ijt}$	0.4108[a]	0.4469[a]	0.5933[a]	−0.342[a]	−0.6029[a]	−0.1892
	(0.1434)	(0.1697)	(0.153)	(0.1227)	(0.1432)	(0.1216)
ln geodesic $distance_{ij}$	−0.3989[a]	−0.0796	−0.5593[a]	−0.4641[a]	−0.6899[a]	−0.4411[a]
	(0.042)	(0.0497)	(0.0448)	(0.0359)	(0.0419)	(0.0356)
ln GDP_{jt}	0.8615[a]	0.8558[a]	0.9671[a]	0.6104[a]	0.6428[a]	0.5983[a]
	(0.0562)	(0.0665)	(0.06)	(0.0481)	(0.0561)	(0.0476)
ln trade $openness_{jt}$	0.3635[a]	−0.0275	0.9783[a]	0.047	0.1078	0.0584
	(0.0727)	(0.0861)	(0.0776)	(0.0622)	(0.0726)	(0.0616)
ln $population_{jt}$	0.0631[c]	−0.0801[b]	0.119[a]	0.0546[c]	0.029	0.0484[c]
	(0.034)	(0.0403)	(0.0363)	(0.0291)	(0.034)	(0.0288)
ln economic $remoteness_{jt}$	−0.078	0.1274[b]	−0.1452[a]	−0.1688[a]	−0.1421[a]	−0.2011[a]
	(0.0492)	(0.0582)	(0.0525)	(0.0421)	(0.0491)	(0.0417)
Shared $border_{ij}$	0.7473[a]	1.2788[a]	0.4321[b]	0.8551[a]	0.9957[a]	0.7551[a]
	(0.1621)	(0.1918)	(0.1729)	(0.1386)	(0.1617)	(0.1373)
Common $language_{ij}$	0.2724[a]	0.3915[a]	0.195[b]	0.3032[a]	0.2664[a]	0.4306[a]
	(0.0783)	(0.0927)	(0.0835)	(0.0669)	(0.0781)	(0.0663)
FTA_{ijt}	0.2273[b]	0.4192[a]	0.2436[b]	0.2241[a]	0.4639[a]	0.1524[b]
	(0.09)	(0.1065)	(0.096)	(0.077)	(0.0898)	(0.0763)
$OPEC_j$	−0.2795[b]	0.9305[a]	−2.2475[a]	−0.1036	0.3211[b]	−0.2759[a]
	(0.1267)	(0.15)	(0.1352)	(0.1084)	(0.1264)	(0.1074)
$Seaport_j$	0.9291[a]	1.2957[a]	1.0264[a]	0.7254[a]	0.9805[a]	0.6387[a]
	(0.0813)	(0.0964)	(0.0867)	(0.0695)	(0.0811)	(0.0689)
Constant	−7.1652[a]	−11.9943[a]	−8.765[a]	0.3432	0.2197	0.6089
	(1.7233)	(2.0398)	(1.8382)	(1.474)	(1.7191)	(1.4605)
N	3,618	3,618	3,618	3,618	3,618	3,618
Pseudo-R^2	0.25	0.19	0.26	0.27	0.22	0.28
Adjusted R^2	0.73	0.67	0.68	0.74	0.65	0.73

Table 3 (continued)

Dep. variable:	ln $imports_{ijt}$	ln non-manuf. $imports_{ijt}$	ln manuf. $imports_{ijt}$	ln $exports_{ijt}$	ln non-manuf. $exports_{ijt}$	ln manuf. $exports_{ijt}$
Log-likelihood	−6,984	−7,551	−7,207	−6,433	−6,973	−6,399
LR statistic	4,606[a]	3,506[a]	5,008[a]	4,758[a]	4,005[a]	5,098[a]

Coefficients on dummy variables representing years and host countries not reported
[a] Statistical significance from the zero at the 1% level
[b] Statistical significance from the zero at the 5% level
[c] Statistical significance from the zero at the 10% level

4.3 Does cultural distance influence trade?

To determine whether cultural distance affects trade flows, we refer to the coefficients on the cultural distance variables. The signs of the corresponding coefficients, presented in Table 3, indicate that a rise in the degree to which the shared norms and values of people in one country differ from those in another country, a proxy for the lack of a minimum reservoir of trust and commitments required to complete cross-border trade deals, diminish our OECD countries' imports to a significant degree; however, for exports, while coefficients are negative across all estimations, cultural distance appears to only inhibit trade in non-manufactured goods. Given that we employ the Tobit technique when estimating our model, resulting coefficients are not true elasticities. However, as the corresponding proportionality coefficients (κ) are small relative to the median exports or imports of each country, following Head and Ries (1998), we can heuristically interpret the coefficients as elasticity estimates. Accordingly, a 1% increase in the cultural distance between our reference OECD countries and their respective trading partners would reduce aggregate imports of the typical OECD country by 0.7758%. When disaggregated imports are considered, the trade-inhibiting influence of cultural distance is estimated to be 1.215% for imports of manufactured goods and 0.617% for imports of non-manufactured goods. Typically, however, our reference countries are heterogeneous in terms of their respective cultural distances from the trading partners considered and their socio-economic characteristics that facilitate or inhibit their trade flows; hence, the conclusion that cultural distance will have influences similar to that reflected by the "base effect" on country-specific trade (as indicated above) is erroneous. Below we highlight the variation in and quantify the effects of cultural distance on trade across our reference countries and disaggregated measures of trade.

4.3.1 Proportional effects of cultural distance on trade across OECD countries

As our objective is to examine whether cultural distance affects trade flows and, if so, to quantify any variation in the effects across countries and thereby evaluate the consistency of the effects, we derive country-specific sensitivities (elasticities) of trade measures with respect to changes in the cultural distance variable by using the sum of the coefficients on the cultural distance variable (CD_{ij}) and the terms that

interact the cultural distance variable with the stock of immigrants from each home country (IM_{ijt}) and the reference OECD country-specific dummy ($OECD_i$) variables. As mentioned, the coefficient on the cultural distance variable captures the base effects of cultural distance on the trade measures employed, while the coefficients on the interaction terms capture variation from the base effect. The sum of the estimated base effect and the coefficients on the interaction terms thus gives the proportional effects of each country's cultural distance on the respective measures of trade. Table 4 presents estimated country-specific proportional effects of cultural distance on imports of aggregate, manufactured and non-manufactured goods, as well as for each of the SITC one-digit industry sub-classifications of aggregate imports by our country of reference, computed and presented in the increasing order of each country's average cultural distance from the trading partners in our data set.

For each case, the proportional country-specific marginal effects of cultural distance are presented, starting with aggregate imports, followed by imports of non-manufactured goods and corresponding industry sub-classifications (SITC-0 to SITC-4), and ending with the effect on imports of manufactured goods and its sub-classifications (SITC-5 to SITC-9). Comparing proportional effects across reference countries and industry categories, we observe an interesting contrast: First, with increasing cultural distance, each country's aggregate and disaggregated imports of manufactured as well as non-manufactured goods significantly diminishes. Second, we observe that the trade-inhibiting effects of cultural distance appear to vary with the degree of the differences in shared norms and values between reference countries' and their trading partners; however, the effect does not always follow the increasing/decreasing order of average cultural distance. For example, while a 10% increase in cultural distance is estimated to decrease aggregate imports from 6.897% for the US, 7.138% for Canada and 7.15% for Australia, a similar 10% increase in the degree to which shared norms and values among people in each of Denmark, Sweden and Norway differ from those in other trading partners, would lead to an 8.6% fall in the imports of both Denmark and Norway and decrease Sweden's imports by 7.9%. Third, while the proportional effect of cultural distance appears to be larger and more elastic with respect to imports of manufactured goods than of non-manufactured goods, the sensitivity of the effect is, in general, estimated to be near unity (i.e., unitary elastic). Among non-manufactured goods, we find that imports of SITC-4 industries (animal and vegetable oils, fats and waxes) followed by SITC-2 industries (crude materials, inedible, except fuels) and SITC-0 industries (food and live animals) exhibit the highest sensitivity to equal percentage increases in cultural distance.

Table 5 presents the corresponding effects of cultural distance on each of the export measures employed in our estimations. Despite the insignificant coefficient on the cultural distance variable in the aggregate exports regression, computation of proportional country-specific and one-digit SITC industry-specific effects reveals that the degree to which shared norms and values among people in one country differ from those in other nations have substantial export-inhibiting effects, although with varying magnitudes. While the trade-inhibiting effect of cultural dissimilarity between nations is significant only with respect to the aggregate exports of Norway, we observe that it has significant negative effects, for each of the reference countries, on exports of manufactured goods in general, for the corresponding industry sub-classifications and for three (SITC-2, SITC-3, and SITC-4) of the non-manufactured

Table 4 Proportional cultural distance effects, imports

	Average	Italy	US	Australia	Canada	Germany	Norway	Netherlands	Denmark	Sweden
Aggregate Imports	−0.7659	−0.7758[a]	−0.6897[a]	−0.7151[a]	−0.7138[a]	−0.7383[a]	−0.8623[a]	−0.7527[a]	−0.8625[a]	−0.7925[a]
	(0.0627)	(3.354)	(3.148)	(3.309)	(3.285)	(3.414)	(3.973)	(3.496)	(4.007)	(3.663)
Non-manufactured goods imports	−0.6328	−0.6172[a]	−0.6326[a]	−0.5106[b]	−0.6157[b]	−0.5437[b]	−0.7671[a]	−0.6302[b]	−0.7355[a]	−0.6271[b]
	(0.0806)	(2.253)	(2.439)	(1.996)	(2.393)	(2.124)	(2.985)	(2.472)	(2.886)	(2.448)
SITC-0: food and live animals	−1.3194	−1.3077[a]	−1.363[a]	−1.1783[a]	−1.2525[a]	−1.2072[a]	−1.5458[a]	−1.2705[a]	−1.3829[a]	−1.3552[a]
	(0.1107)	(4.424)	(4.558)	(3.934)	(4.183)	(4.03)	(5.163)	(4.249)	(4.607)	(4.52)
SITC-1: beverages and tobacco	−0.2174	0.0283	−0.1726[a]	−0.1005	−0.0461	−0.0514	−0.5775	−0.0862	−0.3906	−0.3145
	(0.1977)	(0.07)	(0.454)	(0.268)	(0.122)	(0.137)	(1.538)	(0.231)	(1.047)	(0.839)
SITC-2: crude materials, inedible,except fuels	−1.3148	−1.3243[a]	−1.2897[a]	−1.2005[a]	−1.2622[a]	−1.264[a]	−1.5214[a]	−1.2851[a]	−1.381[a]	−1.3147[a]
	(0.0916)	(4.022)	(4.135)	(3.9)	(4.08)	(4.106)	(4.926)	(4.193)	(4.506)	(4.269)
SITC-3: mineral fuels, lubricantsand related materials	−0.6956	−0.6266	−0.4622	−0.5987	−0.6073	−0.4864	−0.8807	−0.6519	−1.075	−0.8026
	(0.1972)	(0.888)	(0.694)	(0.906)	(0.918)	(0.74)	(1.341)	(0.997)	(1.642)	(1.221)
SITC-4: animal and vegetableoils, fats and waxes	−4.9343	−5.064[a]	−4.9317[a]	−4.8207[a]	−4.7231[a]	−4.7862[a]	−5.199[a]	−4.8806[a]	−5.07[a]	−5.0636[a]
	(0.1591)	(9.551)	(9.862)	(9.735)	(9.518)	(9.7)	(10.582)	(9.955)	(10.329)	(10.258)
Manufactured goods imports	−1.1801	−1.2148[a]	−1.068[a]	−1.165[a]	−1.1066[a]	−1.1653[a]	−1.3089[a]	−1.1438[a]	−1.238[a]	−1.2455[a]
	(0.075)	(4.924)	(4.57)	(5.054)	(4.774)	(5.052)	(5.653)	(4.98)	(5.391)	(5.397)
SITC-5: chemicals and relatedproducts, n.e.s.	−1.3823	−1.3951[a]	−1.2725[a]	−1.287[a]	−1.2806[a]	−1.3241[a]	−1.5607[a]	−1.2888[a]	−1.5407[a]	−1.5037[a]
	(0.1201)	(4.852)	(4.415)	(4.526)	(4.479)	(4.655)	(5.475)	(4.551)	(5.444)	(5.286)
SITC-6: manufactured goodsclassified by material	−2.0584	−2.1478[a]	−1.9978[a]	−1.9886[a]	−1.9869[a]	−2.0718[a]	−2.1719[b]	−2.0204[a]	−2.1349[a]	−2.0953[a]
	(0.0729)	(7.592)	(7.455)	(7.524)	(7.476)	(7.834)	(8.182)	(7.673)	(8.109)	(7.919)
SITC-7: machinery andtransport equipment	−0.8841	−0.8882[a]	−0.8258[a]	−0.8916[a]	−0.761[a]	−0.8799[a]	−1.0439[a]	−0.8116[a]	−0.9791[a]	−0.8794[a]
	(0.0855)	(3.184)	(3.125)	(3.421)	(2.904)	(3.374)	(3.989)	(3.126)	(3.772)	(3.371)
SITC-8: miscellaneousmanufactured articles	−1.4478	−1.504[a]	−1.3123[a]	−1.5291[a]	−1.3683[a]	−1.3738[a]	−1.6614[a]	−1.3824[a]	−1.4475[a]	−1.5076[a]
	(0.1078)	(5.459)	(5.028)	(5.94)	(5.286)	(5.334)	(6.426)	(5.39)	(5.645)	(5.85)
SITC-9: commodities andtransactions, n.e.c.	−0.5889	−0.4503	−0.4531	−0.6379[c]	−0.4391	−0.6771[b]	−0.4955	−0.5126	−0.5134	−0.983[a]
	(0.1745)	(1.219)	(1.296)	(1.848)	(1.267)	(1.963)	(1.435)	(1.493)	(1.496)	(2.847)

Values presented in parentheses below average effects are standard deviations. Values presented below proportional immigrant effects are *z*-statistics. *Z*-statistics are constructed as $Z = \frac{\widehat{\beta}_{CD}+\widehat{\beta}_{INTER}}{\sqrt{VAR\left(\widehat{\beta}_{CD}\right)+VAR\left(\widehat{\beta}_{INTER}\right)+2\times COVAR\left(\widehat{\beta}_{CD},\widehat{\beta}_{INTER}\right)}}$ where "CD" and "INTER" represent the cultural distance and interaction terms, respectively

[a] Statistical significance from the zero at the 1% level

[b] Statistical significance from the zero at the 5% level

[c] Statistical significance from the zero at the 10% level

Table 5 Proportional cultural distance effects, exports

	Average	Italy	US	Australia	Canada	Germany	Norway	Netherlands	Denmark	Sweden
Aggregate exports	−0.2247	−0.1655	−0.2017	−0.0554	−0.2198	−0.1564	−0.4099[b]	−0.2547	−0.2903	−0.209
	(0.0979)	(0.837)	(1.076)	(0.3)	(1.183)	(0.846)	(2.208)	(1.383)	(1.577)	(1.13)
Non-manufactured goods exports	−1.1280	−1.235[a]	−1.0128[a]	−0.9758[a]	−1.0608[a]	−1.1074[a]	−1.3011[a]	−1.1778[a]	−1.2184[a]	−1.1695[a]
	(0.1083)	(5.351)	(5.455)	(5.329)	(5.76)	(6.043)	(7.074)	(6.455)	(6.679)	(6.379)
SITC-0: food and live animals	−0.3944	−0.4822[c]	−0.2609	−0.2314	−0.3107	−0.3891	−0.551[b]	−0.4412[c]	−0.494[b]	−0.4773[b]
	(0.1128)	(1.854)	(1.059)	(0.952)	(1.271)	(1.6)	(2.257)	(1.822)	(2.04)	(1.962)
SITC-1: beverages and tobacco	−0.0117	0.1293	0.2453	−0.1816	0.1886	0.0778	−0.2369	−0.0435	−0.1441	0.0006
	(0.1696)	(0.397)	(0.796)	(0.597)	(0.616)	(0.256)	(0.777)	(0.144)	(0.476)	(0.002)
SITC-2: crude materials, inedible, except fuels	−2.2341	−2.397[a]	−2.2262[a]	−1.9814[a]	−2.1972[a]	−2.1965[a]	−2.4168[a]	−2.3173[a]	−2.277[a]	−2.2606[a]
	(0.129)	(8.878)	(8.706)	(7.855)	(8.663)	(8.704)	(9.551)	(9.223)	(9.068)	(8.955)
SITC-3: mineral fuels, lubricants and related materials	−2.3078	−2.4185[a]	−2.257[a]	−2.1053[a]	−2.1692[a]	−2.1571[a]	−2.6505[a]	−2.3727[a]	−2.3839[a]	−2.3668[a]
	(0.1686)	(5.593)	(5.518)	(5.206)	(5.343)	(5.345)	(6.558)	(5.905)	(5.945)	(5.865)
SITC-4: animal and vegetable oils, fats and waxes	−2.2011	−2.4207[a]	−2.0629[a]	−1.9116[a]	−1.9406[a]	−2.1325[a]	−2.5521[a]	−2.2634[a]	−2.3872[a]	−2.3582[a]
	(0.2249)	(6.205)	(5.739)	(5.369)	(5.428)	(6.012)	(7.181)	(6.408)	(6.768)	(6.65)
Manufactured goods exports	−0.1871	−0.1035	−0.1763	−0.0421[c]	−0.2164	−0.1028	−0.3631[c]	−0.2087	−0.2294	−0.1578
	(0.0931)	(0.528)	(0.807)	(0.195)	(0.998)	(0.476)	(1.677)	(0.972)	(1.068)	(0.731)
SITC-5: chemicals and related products, n.e.s.	−0.7783	−0.7413[a]	−0.7831[a]	−0.7062[a]	−0.6845[a]	−0.6846[a]	−0.973[a]	−0.7761[a]	−0.7936[a]	−0.8253[a]
	(0.0897)	(3.535)	(3.942)	(3.605)	(3.474)	(3.492)	(4.945)	(3.976)	(4.067)	(4.208)
SITC-6: manufactured goods classified by material	-0.7338	-0.702[a]	-0.7136[a]	-0.6611[a]	-0.697[a]	-0.6173[a]	-0.9065[a]	-0.7424[a]	-0.8307[a]	-0.7017[a]
	(0.0879)	(3.28)	(3.52)	(3.306)	(3.466)	(3.085)	(4.513)	(3.726)	(4.17)	(3.505)
SITC-7: machinery and transport equipment	−0.2523	−0.164	−0.2496	−0.1821	−0.2957	−0.1722	−0.4072[b]	−0.2764	−0.2528	−0.1825
	(0.0788)	(0.832)	(1.337)	(0.989)	(1.596)	(0.934)	(2.201)	(1.506)	(1.378)	(0.99)
SITC-8: miscellaneous manufactured articles	−0.7592	−0.7216[a]	−0.716[a]	−0.6747[a]	−0.7246[a]	−0.6528[a]	−0.9368[a]	−0.7872[a]	−0.8299[a]	−0.7516[a]
	(0.0867)	(3.832)	(4.014)	(3.836)	(4.096)	(3.708)	(5.302)	(4.491)	(4.736)	(4.268)
SITC-9: commodities and transactions, n.e.c.	0.2220	0.3475	0.2362	0.4688[c]	0.2014	0.2540	0.0541	0.1709	0.1804	0.2099
	(0.1169)	(1.349)	(0.968)	(1.948)	(0.832)	(1.055)	(0.224)	(0.713)	(0.753)	(0.871)

See Table 4 notes

Table 6 Estimated aggregate effects (in US$) of cultural distance on trade

	Average	Italy	US	Australia	Canada	Germany	Norway	Netherlands	Denmark	Sweden
Aggregate exports$_{ijt}$	−7,707,204	−4,837,590	−21,244,089	−437,982	−9,065,865	−14,047,331	**−4,040,171**	−8,146,335	−2,974,787	−4,570,687
	(0.27)	(0.17)	(0.26)	(0.07)	(0.30)	(0.21)	**(0.62)**	(0.40)	(0.51)	(0.43)
Non-manufactured goods exports$_{ijt}$	−7,379,619	**−3,193,276**	**−13,862,781**	**−3,669,138**	**−11,664,051**	**−7,293,725**	**−8,494,103**	**−11,593,616**	**−3,807,924**	**−2,837,957**
	(1.56)	(1.23)	(1.32)	(1.28)	(1.43)	(1.50)	(1.96)	(1.83)	(2.13)	(2.41)
Manufactured goods exports$_{ijt}$	−4,968,287	−2,757,705	−16,155,463	**−174,533**	−6,546,313	−8,556,080	**−1,208,425**	−4,620,741	−1,633,773	−3,061,548
	(0.21)	(0.10)	(0.23)	**(0.06)**	(0.29)	(0.14)	**(0.55)**	(0.32)	(0.40)	(0.33)
Aggregate imports$_{ijt}$	−29,784,434	**−20,744,661**	**−106,411,982**	**−6,656,731**	**−25,627,270**	**−57,435,803**	**−5,821,007**	**−22,476,059**	**−8,707,873**	**−14,178,519**
	(0.98)	**(0.77)**	**(0.90)**	**(0.94)**	**(0.96)**	**(1.00)**	**(1.30)**	**(1.17)**	**(1.51)**	**(1.63)**
Non-manufactured goods imports$_{ijt}$	−4,048,754	**−3,319,878**	**−14,382,183**	**−455,039**	**−2,619,162**	**−7,249,453**	**−834,010**	**−4,249,472**	**−1,444,382**	**−1,885,205**
	(0.83)	(0.62)	(0.83)	(0.67)	(0.83)	(0.73)	(1.15)	(0.98)	(1.29)	(1.29)
Manufactured goods imports$_{ijt}$	−38,761,554	**−25,949,061**	**−140,501,716**	**−9,806,518**	**−35,019,034**	**−75,116,537**	**−7,412,718**	**−26,441,832**	**−10,067,736**	**−18,538,831**
	(1.52)	(1.21)	(1.39)	(1.53)	(1.49)	(1.57)	(1.97)	(1.77)	(2.17)	(2.57)

Estimates are based on an assumed 1% increase in average cultural distance values and are derived using mean values presented in Table 2 and estimated proportional cultural distance effects presented in Tables 4 and 5. Figures in parentheses are percentages that indicate the size of estimated aggregate effects of cultural distance relative to corresponding average annual values of each trade measure (presented in Table 2). Values in bold font correspond to significant proportional effects. Average values, presented in column (a), are non-weighted arithmetic averages

goods sub-classifications. We also find that the effects of cultural distance are more pronounced for exports of manufactured goods.

In Tables 4 and 5, we observe negative and significant effects of cultural distance on imports regardless of the trade measure employed as the dependent variable; however, the same pattern of significance is not found when we consider the influence of cultural distance on exports. Across all OECD reference countries, the estimated effects of cultural distance are negative for aggregate, non-manufactured and manufactured goods exports, yet we find consistent statistical significance, across our cohort of OECD countries, only when exports of non-manufactured goods are employed as the dependent variable. Considering the effects reported for each one-digit SITC classification provides greater insight into the lack of a consistent negative and significant cultural distance effect. In Table 5, we see a consistently negative and significant influence of cultural distance among manufactured goods (i.e., SITC-5, SITC-6 and SITC-8 levels of detail). Aggregation to include exports of all manufactured goods (i.e. SITC-5 through SITC-9) results in much of the statistical significance being lost. Similarly, aggregation across all SITC classifications, to the aggregate exports level of detail, results in a general loss of statistical significance.

Our results suggest that the effects of cultural distance vary across countries and, at times, across a given country's exports and imports, whether at the aggregate or disaggregated levels of detail. While empirically verifiable accounts of the reasons for the variation in such effects across product types is not possible based on our current analysis, plausible reasons for the differences in the sensitivity of different goods to cultural distance may include differences in the responsiveness of consumers of different products to transaction costs that may be attributed to cultural differences and demonstration effects as well as to variation in the importance of each product classification relative to the corresponding aggregate export and import demand functions. Similarly, differences in the sensitivity of imports and exports to cultural distance across the one-digit SITC sub-classifications may result from differences in the cultural values and attitudes embedded in the different products. From the results reported, we can conclude that cultural distance does inhibit both imports and exports; however, the effects appear to be more consistent for imports than for exports.

Given the observed heterogeneities in the socio-economic characteristics of our cohort of OECD members, particularly in terms of their economic sizes, highlighting the economic significance of the effects of cultural distance on trade is warranted. In Table 6, we present the effect (in dollar terms) of an assumed 1% increase in the average cultural distance value for each reference country on the corresponding measures of trade. The effects are derived using the average annual values of each country's trade, presented in Table 2, and estimated proportional cultural distance coefficients that are presented in Tables 4 and 5. In order to facilitate comparison across countries that vary in their economic size, we also present the percentage values of the effects of cultural distance computed relative to the average annual values of each country's corresponding measure of trade. The figures in the table indicate that a 1% increase in the average cultural distance of each reference country reduces their respective annual average trade values by an amount that varies from as low as $174,533 for Australia's exports of manufactured goods to as high as $140.5 million for US average annual imports of manufactured goods. Comparing these values to each country's observed average annual trade, we find that cultural dissimilarities between nations reduces the level of

trade by as much as 2.57% (Sweden's imports of manufactured goods), clearly indicating that differences in shared norms and values among people in different countries have statistically significant economic effects on trade flows.

4.4 Immigrants, cultural distance and trade

While the US and Italy are, on average, the least culturally-distant OECD countries in our data, they are also hosts to significantly different sizes of immigrant populations. Values presented in Table 2 indicate that, with an average immigrant stock of 314,454, the US immigrant population exceeds, by far, the full sample average and thus that of Italy (12,520). Although it is not the principle objective of this paper, our analysis permits us to ask whether, and to what extent, immigrants act to offset the trade-inhibiting effects of cultural distance. The coefficients on the immigrant stock variables are positive and significant in all estimations. The implication is that through the use of their superior knowledge about their host and home countries, business and network connections, which help to reduce lax contract enforcement and to satisfy preferences for home goods, especially when substitutes are not available in their host countries, immigrants exert pro-export and pro-import effects in nearly all of our reference countries. The degree to which the pro-trade effects of immigrants offset the trade-inhibiting effects of cultural distance can be observed from the signs and magnitudes of the coefficients on the interaction terms: $\hat{\alpha}_{3i}$. From Table 3, while the negative sign of $\hat{\alpha}_1$ indicates the trade-inhibiting effect of cultural distance, the positive sign of $\hat{\alpha}_2$ indicates the pro-trade effect of immigrants. Wherever $\hat{\alpha}_{3i}$ is positive and significant, we can conclude that the pro-trade effects of immigrants offset the trade-inhibiting effects of cultural distance observed in the particular reference country. Accordingly, we find that immigrants are able to offset the trade-inhibiting effects of cultural distance in Australia (on imports of non-manufactured goods and exports of aggregate, manufactured and non-manufactured goods), Canada (on imports of aggregate and manufactured goods), Germany (on exports as well as imports of non-manufactured goods), and the US (for aggregate and manufactured goods imports as well as exports of non-manufactured goods). In all other countries and for all other measures of trade, the trade-inhibiting effects of cultural distance are so large that corresponding coefficients on the interaction terms are consistently negative, indicating an inability of immigrants to offset the trade-inhibiting effects of differences in shared norms and values among people in different countries.

5 Conclusions

Driven in part by the increased integration of economies, the fragmentation of production processes often designed to take advantage of differences in resource endowments, the development of new technologies, variation in comparative advantage across stages of production, and increased use of the Internet, the volume of trade that involves individuals from politically- and culturally-distinct nations has been on the rise. Using bilateral trade data that span the years 1996–2001 for nine OECD reference countries and 58 other countries for which cultural distances can be calculated, and after accounting for standard trade facilitating/inhibiting variables often included in

empirical trade studies, we show that cultural dissimilarity has a statistically significant and economically considerable negative influence on the volume of trade flows. While varying in magnitudes, observed effects are consistent across our set of OECD reference countries for aggregate, manufactured, and non-manufactured goods as well as for one-digit SITC-level disaggregated measures of trade. We also document that immigrants exert economically significant pro-trade effects; however, their ability to offset the trade-inhibiting effects of cultural dissimilarity is limited.

Our findings have important policy implications: First, econometrically, estimates from prior studies, in which the effect of cultural distance on trade is not accounted for may be biased. Second, the consistently negative influence of cultural distance on trade in goods across our heterogonous cohort of OECD countries indicates that, while attempting to increase the volume of international trade undertaken by their constituencies, policymakers may wish to seek ways and means for reducing the costs associated with the building the trust and commitments necessary to initiate and complete trade deals. Lastly, immigrants play greater roles in facilitating trade than is usually discussed in the literature: often fully or partially offsetting the influences of cultural dissimilarities between people in their host and home nations. Given these implications, we believe that our findings will initiate further interest in this subject among researchers in international trade, sociologists, and economic geographers. While considering alternative measures of cultural distance, future research needs to assess the effects at two levels: on the likelihood of trade to occur and on the intensification of the existing level of trade.

Appendix 1: country listing

Albania, Algeria, Argentina, Armenia, Australia, Austria, Azerbaijan, Bangladesh, Belgium, Brazil, Bulgaria, Canada, Chile, China, Colombia, Croatia, Czech Republic, Denmark, Dominican Republic, Egypt, El Salvador, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, India, Indonesia, Ireland, Israel, Italy, Japan, Jordan, Korea (Rep.), Latvia, Luxembourg, Macedonia, Mexico, Morocco, Netherlands, New Zealand, Nigeria, Norway, Pakistan, Peru, Philippines, Poland, Portugal, Romania, Russian Federation, Slovak Republic, Slovenia, South Africa, Spain, Sweden, Switzerland, Tanzania, Turkey, Uganda, Ukraine, United Kingdom, United States, Uruguay, Venezuela, Vietnam, Zimbabwe.

Appendix 2: immigrant stock data and estimate construction

Data for Australia, Canada, Denmark, the Netherlands, Norway, Sweden and the US represent foreign-born populations by country of birth, while data for Germany and Italy represent foreign-born populations by country of nationality. Immigrant stock data are from national statistic agencies and have been compiled by the Migration Policy Institute (2007). For six of the nine host countries in our data set, Denmark (Danmarks Statistik), Germany (Statistiches Bundesamt), Italy (Istituto Nazionale di Statistica), Norway (Statistisk Sentralbyrå), the Netherlands (Centraal Bureau voor de Statistiek) and the US (US Census Bureau), immigrant stock data are complete to

the extent that the statistical agency provides annual immigrant stock values for the years 1996–2001. Due to a lack of data, immigrant stock values are estimated for 1997–2000, for Australia (Australian Bureau of Statistics) and Canada (Statistics Canada), and for 1996–1998 for Sweden (Statistiska Centralbyrån). Available immigrant stock values are accepted as correct and are employed as benchmark values. Inflow data (reported along with available stock data by the noted statistical agencies) is used to estimate stocks for all other years. For example, immigrant stocks for Canada, for the years 1997–2000, are constructed as $IM_{ijt} = IM_{ij1996} + \sum_{1997}^{t} IN_{ijt} + \rho_j$. IN_{ijt} is the immigrant inflow from country j to country i (in this case, Canada) during year t. is an adjustment factor accounting for return migration and deaths of immigrants during non-benchmark years. The adjustment factor is the immigrant stock from country *j* in Canada during 2001 less the sum of immigrants from country *j* in Canada in 1996 and the inflow from country *j* during the years 1997–2001 divided by five: $\rho_j = \frac{IM_{ij2001} - \left(IM_{ij1996} + \sum_{y=1997}^{2001} IN_{ijt} \right)}{5}$. Immigrant stock variables for Australia and Sweden are estimated similarly.

Appendix 3

Table 7 Data sources/notes

Variables	Sources/notes
Import/export series	Source OECD STAN database (OECD 2007): Trade data (in 1,000s of 1995 US dollars) represent trade in goods and are at the aggregate, non-manufactured, manufactured, and one-digit SITC industry levels of detail
Cultural distance	Author's calculations based on data from the World Values Survey and European Values Survey (Inglehart et al. 2004 and Hagenaars et al. 2003)
Immigrants	Migration Policy Institute (MPI 2007): See "Appendix 2" for a listing of host country national statistical agencies that provided data to the MPI and for additional detail regarding construction of the data series
Geodesic distance	Authors' calculations using great circle method; distances are measured in kilometers between capital cities
Gross domestic product	World Development Indicators (World Bank 2006): data are measured in 100,000s of 1995 US dollars
Population	World Development Indicators (World Bank 2006): data are measured in 1,000s
Trade openness	Authors' calculations based on data from the World Development Indicators (World Bank 2006)
Economic remoteness	Authors' calculations based on derived great circle distances and data from the World Development Indicators (World Bank 2006)
Exchange rate	International Financial Statistics (IMF 2007) and www.oanda.com
Common language	CIA World Factbook (CIA 2006)
FTA (free trade agreements)	Trade agreements considered include ANZCERTA, APEC, EFTA, EU/EEC and NAFTA (Ghosh and Yamarik 2004) as well as Canada-Israel FTA, Europe Agreements between EU members and candidates for EU membership (Bulgaria, Hungary, Poland and Romania), EU–Israel FTA, EU–Mexico FTA and US–Israel FTA
OPEC	www.opec.org
Seaport	n.a.
Border	n.a.

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