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Roger White
Whittier College, rwhite1@whittier.edu

Bedassa Tadesse
University of Minnesota - Duluth, btadesse@d.umn.edu

Huang Zhongwen
Beijing Information Science and Technology University

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Bedassa Tadesse[a], Roger White[b] and Huang Zhongwen[c]

[a]Department of Economics, University of Minnesota Duluth, Duluth, MN, USA; [b]Department of Economics, Whittier College, Whittier, CA, USA; [c]School of Economics and Management, Beijing Information Science & Technology University, Beijing, China

ABSTRACT
Using annual data for China and 88 trading partners that span the period 1995–2011, we estimate whether cross-societal cultural differences influence China's external trade flows. Our results, obtained from the estimation of a series of multi-level mixed effect random intercepts and coefficients models, indicate that China's aggregate exports and imports are largely unaffected by the cultural distance between China and its trading partners. Examination of disaggregate trade measures and consideration of the underlying dimensions of our composite cultural distance variable produces a largely similar result. Taken collectively, our results suggest that China's trade is less affected by cultural distance than has been reported for other countries in similar studies.

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1. Introduction

In recent decades, China has emerged as one of the world's top trading countries. In fact, as the sum of its real exports and imports increased by 882% between 1995 and 2011, China moved from being the 11th most active trader in the world to the 2nd most active (World Bank, 2014). The timing of China's economic ascent corresponds with a pronounced increase in both the scale and scope by which developing countries have engaged the international economy. The current period of economic globalization has been particularly marked by a greater inclusion of developing economies – societies that differ, often considerably, in terms of their attitudes, values, behaviors, and norms (i.e. their cultures).

Culture 'influences how people think, communicate, and behave' (Salacuse 2004); thus, there is a potential for cultural differences to affect transaction costs and, hence, to influence the volume of cross-cultural trade. Results from recent empirical studies, for example, indicate that cross-societal cultural differences are negatively related with bilateral trade flows (Linders et al. 2005; Tadesse and White 2010a). These studies assert that greater cultural differences generally reflect social and/or institutional dissimilarity and, thus, are reflective of information asymmetries. However, as there are studies that report a positive relationship, the effect of cultural distance on trade remains an open empirical question. Moreover, in light of the coincidental ascent of China as an economic power and the integration of

CONTACT Roger White rwhite1@whittier.edu

an increased number of developing countries into the world economy, one may wonder whether China's bilateral trade flows have managed to defy cultural barriers.

We contribute to the literature in several ways. First, we examine data for China's trade flows with 88 trading partners (i.e. countries) for which data on cultural distance spanning the time period 1995–2011 are available. Specifically, we employ the gravity model to estimate whether cross-societal cultural differences influence the levels of China's external trade. We then examine the data for potential variation, across several broadly defined product categories, in the effects of cultural distance on bilateral trade flows. Finally, we extend our analysis of the influence of cultural distance on China's external trade by decomposing our composite measure of cultural distance into its component dimensions and employing an estimation methodology that accounts for potential heterogeneity in the bilateral trade structure of the partners.

Our results, obtained from the estimation of a series of multi-level mixed effect random intercepts and coefficients models, indicate that China's aggregate exports and imports are largely unaffected by the cultural distance between China and its trading partners. More specifically, we examine the relationship using a multi-level mixed effects model (random intercepts and coefficients) of the Rabe-Hesketh and Skrondal (2008) framework. In addition to accounting for heterogeneity due to regional clustering in China's bilateral trade flow structure, the model permits country-specific effects of cultural distance to vary from the average. Examination of disaggregate trade measures (i.e. trade in manufactured goods, primary goods, and goods classified by the skill and technology levels involved in their production) and consideration of the underlying dimensions of our composite cultural distance variable produces a largely similar result: In few instances is a statistically significant relationship found between cultural distance and China's external trade. Additional robustness checks support our findings. Taken collectively, our results suggest that China's trade is less affected by cultural distance than has been reported for other countries in similar studies.

The remainder of the paper proceeds as follows. Section 2 provides a review of the related literature. In Section 3, we present the econometric model, data, and estimation methodology. Empirical findings are discussed in Section 4, and Section 5 concludes.

2. Literature review

Perhaps the greatest barrier to examining the influences of cultural differences on bilateral trade flows is the inability to precisely measure national culture. Prior studies have thus used a variety of measures. These measures include dichotomous variables that reflect differences in common or official languages or differences in predominant religions, indices representing linguistic (dis)similarity, and composite measures of national culture based on Hofstede's cultural dimensions (1980) and responses to the World Values Survey (WVS) (Inglehart et al. 2004).

Three relatively early studies employ language similarity as a proxy variable for cultural similarity. Using an index of linguistic distance to represent cultural differences, Boisso and Ferrantino (1997) conclude that greater cultural dissimilarity negatively affects bilateral trade flows. Similarly, Dunlevy (2006) employs common language, represented by a dummy variable, as a proxy measure for the cultural similarity between the US and a cohort of immigrants' home countries. He finds the influence of immigrants on US state-level exports is greater for home countries where English or Spanish is not commonly used as compared to countries in which English or Spanish is commonly spoken. Based on these results, the author posits that while cultural differences hinder trade flows, immigrants act to offset the corresponding trade-inhibiting influences. Of particular relevance to the present study, Guo (2004) reports that common language is positively associated with increases in China's trade flows. To the extent that linguistic dissimilarity correlates with cultural differences between China and its trading partners, the findings of these studies suggest that cultural distance hinders trade flows.

Guiso, Sapienza, and Zingales (2005) employ survey data to construct a measure of relative trust based on respondents' stereotypes of foreign nationals. Examining trade flows between 16 European Union member nations during the 1970–1996 period, the authors report that lower volumes of trade are found where trust levels are lower. As trust is necessary for the initiation and completion of trade deals, especially with regard to informal contracting, the authors' observation suggests that a lack of trust due to cultural differences reduces trade flows.

Employing a four-dimensional measure of cultural differences produced using Hofstede's cultural dimensions data (1980), Linders et al. (2005) examine trade flows between 92 countries during 1999 and report the contrary result that greater cultural differences correspond with higher bilateral trade volumes. Similarly, Larimo (2003) employs a measure of cultural distance based on the Hofstede data along with a composite index produced by Kogut and Singh (1988) and finds that greater cultural differences correspond with greater dissimilarity in organization and management practices. Positing that it is costly to transfer home country business practices to offshore subsidiaries, it is suggested that firms export to more culturally distant foreign markets if doing so is cheaper than establishing production facilities in dissimilar markets. Thus, Larimo (2003) presents results that are consistent with the findings from Linders et al. (2005), suggesting that trade flows and cultural distance are positively related.

While results from Boisso and Ferrantino (1997), Guo (2004), Dunlevy (2006), and Guiso, Sapienza, and Zingales (2005) support the notion of a negative relationship between cultural differences and trade flows, language commonality is an imprecise representation of cultural differences. Similarly, the observations of a positive relationship that are reported in Linders et al. (2005) and in Larimo (2003) may suffer from the use of cultural distance measures that are constructed using Hofstede's data, which dates back to 1967 and 1973. While the data may have been useful in accurately depicting cross-societal cultural differences during the 1970s and even during the 1980s, there likely have been changes in cultures, making the data less representative of differences in national cultures for more recent years. The measure of relative trust employed by Guiso, Sapienza, and Zingales (2005) as a proxy for cultural differences/distance is constructed using data collected in the 1990s; however, it is applied to data from as far back as 1970. Thus, it too may not accurately depict cultural differences for the reference period.

A number of more recent studies that examine the link between cultural differences and trade flows have employed a measure of cultural dissimilarity constructed using WVS data (Inglehart et al. 2004). Tadesse and White (2010a), for example, employ data on US state-level exports to 75 countries for the year 2000 and report that greater cultural differences between the US and its trading partners reduce state-level exports. While variable in the magnitudes of the observed effects, their results remain consistent across various exports measures (i.e. aggregate exports, exports of cultural products, and exports of non-cultural products). Tadesse and White (2010b) examine trade data for 67 countries that span the years 1996 through 2001 and report that cultural differences have a consistent negative effect on aggregate and disaggregated trade flows. The authors also find considerable variation in the magnitudes of the effects of cultural distance on trade across the countries examined.

Adopting the definition of culture proposed by White and Tadesse (2008), we define cultural distance as the cross-societal differences in shared norms, attitudes, beliefs, traditions, and values. Since the WVS questionnaires elicit information from respondents on a wide array of topics, including religion, politics, economics, and social life, the corresponding measure of cultural distance is thus multidimensional and seemingly well suited for our purposes. Even so, due to the difficulties that underlie quantifying national culture, we proceed cautiously with our analysis while keeping the related limitations in mind.

3. Econometric intuition and data

3.1. Econometric intuition and empirical specification

Following the leads of prior studies, we employ an augmented gravity model. Anderson and van Wincoop (2003) and Redding and Venables (2004) show that producers operating under increasing returns in each country produce a variety of goods and ship them, with costs, to consumers in all countries. The total bilateral trade flows $\left(X_{ijt}^{K}\right)$ of good K, between countries i and j during a given year t, thus depends upon the bilateral 'freeness' of the partners $\left(\frac{Y_{it}^{K}Y_{jt}^{K}}{Y^{K}}\right)$ and bilateral trade costs $\left(\tau_{ijt}^{K}\right)$ relative to what Anderson and van Wincoop (2003) describe as the outward $\left(\pi_{it}^{K}\right)$ and the inward $\left(P_{jt}^{K}\right)$ 'multilateral resistance' faced by exporters in country i and by importers in country j, respectively. Thus, in the world of multiple trading partners, a gravity specification that describes the trade flows of each variety (k) between any pair of countries can be described by Equation (1):

$$X_{ijt}^{k} = \frac{Y_{it}^{k}Y_{jt}^{k}}{Y^{k}}\left\{\frac{\tau_{ijt}^{k}}{\pi_{it}^{k}P_{jt}^{k}}\right\}^{(1-\sigma_k)} \quad (1)$$

In Equation (1), Y^k denotes world GDP, Y_{it}^{k} and Y_{jt}^{k} are the GDP values of the exporting country i and the importing country j, and $\sigma_K > 1$ is the elasticity of substitution.[1] The equation describes bilateral trade flows as a function of the product of two ratios: the predicted frictionless (bilateral 'freeness') trade flow and the bilateral preferences (i.e. the preferences of consumers in country j for varieties produced in country (i) given the predicted frictionless trade. Taking logarithms, separating the terms, and using vector notation for each of the terms, Equation (1) can be rewritten as flows:

$$\ln X_{ijt} = \lambda_0 + \beta' \ln\phi_{ijt} + \theta' \ln\psi_{ijt} + \in_{ijt} \quad (2)$$

ϕijt is a vector of variables that determine the volume of the frictionless trade flow as given by the level of incomes, expenditures, and price indices. ψ_{ijt} is a vector that consists of variables that influence bilateral preferences: multilateral resistance terms (often approximated by exporter and importer fixed effects or through the use of an index of economic remoteness) and trade costs (i.e. transportation costs). Following Disdier et al. (2010), we also consider that bilateral preferences are influenced by the cultural proximity of the trading partners and, hence, we include our measure of cultural distance. Equation (3) describes the relationship:

$$\begin{aligned}\psi_{ijt} = {} & \text{GDIST}_{ij}^{\alpha_1} + \text{REMT}_{jt}^{\alpha_2} + \text{OPEN}_{jt}^{\alpha_3} + \text{CDIST}_{ijt_{ijt}}^{\alpha_4} \\ & + \exp\left(\alpha_5 \text{BORD}_{ij} + \alpha_6 \text{LLOCK}_j + \alpha_7 \text{WTO}_{it}\right)\end{aligned} \tag{3}$$

GDIST_{ijt} is the geodesic distance between China and each of its trading partners, calculated as the weighted distance between Beijing and the most populous cities in each of the trading partners in our sample (CEPII 2014). While LLOCK_j and BORD_{ij} are dummy variables that respectively take the value of one if country *j* is landlocked or shares a border with China and are equal to zero otherwise (CEPII 2014), the dummy variable WTO_{it} represents the time since China was granted accession into the World Trade Organization (WTO), assuming a value of one for all years after 2001 and being equal to zero otherwise. We anticipate the estimated coefficients of the geodesic distance and landlocked variables to be negative. On the grounds that international trade agreements broaden the scope of a country's trading opportunities, we expect the coefficients of the WTO variable to be positive. Similarly, as geographically proximate countries tend to have stronger economic ties, we expect the common border dummy variables to have positive coefficients.

Some countries may choose to trade more intensively with others simply because they lack environments that are conducive to the facilitation of trading opportunities with other countries. To account for the possibility that some of the countries in our study might be trading with China largely due to the lack of other trading opportunities, we include a measure of economic remoteness $\left(\text{REMT}_{jt}\right)$. Following Head and Ries (1998), we compute the values of the economic index as $1/\sum_{k=1}^{K}\left[\left(Y_{kt}/Y_{wt}\right)/GD_{jk}\right]$ where Y_{wt} is gross world product, *k* identifies potential non-country *i* trading partners for country *j* (World Bank 2014), and GDIST_{jk} represents geodesic distance.[2] Constructed as annual total trade flows divided by GDP, OPEN_{jt} measures the general propensity of a country to trade. The coefficient of the variable is expected to capture the effect of country *j*'s level of economic integration with the world trading system on China's trade flows with the given country. Cultural differences (CDIST_{ijt}) between China and its trading partners are measured along two dimensions identified by Inglehart et al. (2004) as Traditional vs. Secular-rational Authority (TSR) and Survival vs. Self-expression Values (SSE).[3] Equation (4) describes the extended gravity model we use to describe China's bilateral trade flows:

$$\begin{aligned}\ln X_{ijt} = {} & \beta_0 + \beta_1 \ln\text{GDPC}_{jt} + \beta_2 \ln\text{POPN}_{jt} + \beta_3 \Delta\ln\text{XRT}_{ijt} \\ & + \beta_4 \ln\text{GDIST}_{ij} + \beta_5 \text{REMT}_{jt} + \beta_6 \ln\text{OPEN}_{jt} + \beta_7 \text{BORD}_{ij} \\ & + \beta_8 \text{WTO}_{it} + \beta_9 \text{LLOCK}_j + \beta_{10} \ln\text{CDIST}_{ijt} + \beta_{11} \text{YEAR}_t + \epsilon_{ijt}\end{aligned} \tag{4}$$

In specifying Equation (4), we deviate from Equation (1) to include both the population size (POPN_{jt}) and the GDP per capita (GDPC_{jt}) of the partner countries rather than their GDP values (World Bank 2014). Our substitution divides the economic mass of the trading partner into two components: population, which serves as a measure of market size, and GDP per capita, which represents the purchasing power of the average consumer. Both variables are anticipated to have positive coefficients.[4] Defined as country *j*'s currency units per renminbi (RMB, i.e. China's currency), we also include ΔXRT_{ijt} (i.e. the annual change in exchange rate). Increases in the variable, which signal an increased rate of RMB appreciation, are expected to correspond with negative (positive) coefficients when measures of China's exports (imports) are employed as the dependent variable series. Finally, to account for potential non-stationarity associated with a trend in some of the macroeconomic variables (e.g. China's bilateral trade flows, GDP, and population of the trading partners) and heterogeneity in the periodic changes resulting from variations in the trade-related macroeconomic policies not directly accounted for by the control variables, we include a trend variable ($YEAR_t$) in the model.[5] Exchange rate data are from the IMF (2014). Trade flow data are obtained from UNCTAD (2014). Data for all gravity model variables are from the CEPII database (CEPII 2014). Descriptive statistics of the dependent variable series, the explanatory variables, together with their a priori expected signs, are presented as Appendix Tables A1 and A2.

Our variable of primary interest is the measure of cultural distance ($CDIST_{ijt}$). The corresponding coefficient of the variable represents the average effect of cultural distance on trade between China and its trading partners.[6] It is known that China's government has significant influence in the activities of its firms in foreign markets. Further, potential differences may exist in the strategic relevance of regional markets (e.g. Europe vs. Africa) as well as different markets within the same region (e.g. Brazil vs. Venezuela). Thus, China's bilateral trade orientation might vary both across regions and across countries within the same region. Societies in different regions also differ, often considerably, in terms of their attitudes, values, behaviors, and norms (i.e. their cultures). While it is possible to capture the effects of the regional and cross-country variation in the bilateral trade orientation by using region and/or country fixed effects, given the considerable differences in the cultures of societies in different regions and the corresponding heterogeneity of societies in different countries within the same region, we consider that the coefficient of the cultural distance variable in Equation (4) may not equally apply to all countries. Thus, we employ a mixed effects model, which enables us to obtain the country-specific deviations of the coefficient of our main variable of interest, cultural distance, from the average effect.

3.2. Measuring cultural distance

Our measure of cultural distance is constructed using values obtained from interviews conducted as part of the World Value Surveys between the years 1995 and 2006 (WVS 2014).[7] The WVS questionnaires elicit respondents' views on a wide variety of topics. Factor analysis is then employed to categorize responses (and, thus, respondents) along two dimensions of culture: SSE and TSR. Together, the dimensions explain more than 70% of the cross-cultural variance on scores of more specific values/questions (Inglehart and Baker 2000). Table 1 presents the trading partner-specific values for the ordinal measures of SSE and TSR, reflecting the cultural distance of each of the 88 trade partners from China and the values for the corresponding dimensions.[8] Figure 1 plots the differences in SSE and TSR scores between China and each trading partner in our data in *xy* space, with China placed at the origin, to produce a 'cultural map' of the trading partners in our study.

Societies that are characterized as more survival-oriented, including China, commonly emphasize hard work and self-denial and seek to achieve economic and physical security. Often, individuals in these societies hold the perception that foreigners and outsiders are threatening and view ethnic diversity and cultural change very negatively. This corresponds,

Table 1. Cultural distance from China, composite and component dimensions, 2011.

Country	ISO3	CDIST	TSR	SSE	Country	ISO3	CDIST	TSR	SSE
Belarus	BLR	0.11	0.89	−1.23	Iran	IRN	2.14	−1.22	−0.45
Latvia	LVA	0.14	0.72	−1.27	South Africa	ZAF	2.17	−1.09	−0.10
Lithuania	LTU	0.24	0.98	−1.00	Luxemburg	LUX	2.20	0.42	1.13
Armenia	ARM	0.25	0.55	−1.31	Pakistan	PAK	2.22	−1.42	−1.25
Korea, Rep. of	ROK	0.28	0.61	−1.37	Burkina Faso	BFA	2.22	−1.32	−0.49
Moldova	MDA	0.35	0.47	−1.28	Philipines	PHL	2.27	−1.21	−0.11
Bulgaria	BGR	0.36	1.13	−1.01	Finland	FIN	2.28	0.82	1.12
Hungary	HUN	0.40	0.40	−1.22	France	FRA	2.30	0.63	1.13
Russia	RUS	0.40	0.49	−1.42	Belgium	BEL	2.31	0.50	1.13
Hong Kong	HKG	0.44	1.20	−0.98	Mali	MLI	2.32	−1.25	−0.08
Estonia	EST	0.47	1.27	−1.19	Portugal	PRT	2.37	−0.90	0.49
Ukraine	UKR	0.60	0.30	−0.83	Dominican Rep.	DOM	2.41	−1.05	0.33
Bosnia	BIH	0.69	0.34	−0.65	Jordan	JOR	2.41	−1.61	−1.05
Serbia	YUG	0.70	0.35	−0.62	Rwanda	RWA	2.43	−1.57	−0.62
Albania	ALB	0.73	0.07	−1.14	Uruguay	URY	2.45	−0.37	0.99
Slovakia	SVK	0.74	0.67	−0.43	Peru	PER	2.47	−1.36	0.03
Macedonia	MKD	0.81	0.12	−0.72	Brazil	BRA	2.51	−0.98	0.61
Georgia	GEO	0.83	−0.04	−1.31	Netherlands	NLD	2.55	0.71	1.39
Azerbaijan	AZE	0.94	−0.14	−1.38	Malta	MLT	2.59	−1.53	−0.03
Romania	ROM	1.25	−0.39	−1.55	Austria	AUT	2.65	0.25	1.43
Indonesia	IDN	1.32	−0.47	−0.80	Algeria	DZA	2.69	−1.48	−0.74
Kyrgyz Rep.	KGZ	1.35	−0.15	−0.91	Saudi Arabia	SAU	2.73	−1.31	0.15
Vietnam	VNM	1.42	−0.30	−0.26	Zimbabwe	ZWE	2.73	−1.50	−1.36
India	IND	1.50	−0.36	−0.21	Nigeria	NGA	2.74	−1.53	0.28
Slovenia	SVN	1.52	0.73	0.36	Trinidad	TTO	2.78	−1.83	−0.26
Greece	GRC	1.54	0.77	0.55	Iceland	ISL	2.81	0.44	1.63
Israel	ISR	1.60	0.26	0.36	Ghana	GHA	2.87	−1.94	−0.29
Czech	CZE	1.60	1.23	0.38	Venezuela	VEN	2.88	−1.60	0.43
Japan	JPN	1.61	1.96	−0.05	Ireland	IRL	2.90	−0.91	1.18
Croatia	HRV	1.64	0.08	0.31	Egypt	EGY	2.90	−1.69	−0.64
Ethiopia	ETH	1.66	−0.65	−0.36	Great Britain	GBR	2.93	0.06	1.68
Zambia	ZMB	1.66	−0.77	−0.62	Australia	AUS	2.97	0.21	1.75
Spain	ESP	1.84	0.09	0.54	Guatemala	GTM	3.00	−1.70	−0.17
Thailand	THA	1.86	−0.64	0.01	Denmark	DNK	3.05	1.16	1.87
Cyprus	CYP	1.87	−0.56	0.13	Switzerland	CHE	3.06	0.74	1.90
Poland	POL	1.88	−0.78	−0.14	New Zealand	NZL	3.12	0.00	1.86
Turkey	TUR	1.88	−0.89	−0.33	Tanzania	TZA	3.14	−1.84	−0.15
Italy	ITA	1.88	0.13	0.60	Mexico	MEX	3.15	−1.47	1.03
Germany	DEU	1.97	1.31	0.74	Colombia	COL	3.20	−1.87	0.60
Malaysia	MYS	1.98	−0.73	0.09	Canada	CAN	3.25	−0.26	1.91
Bangladesh	BGD	2.02	−1.21	−0.93	United States	USA	3.33	−0.81	1.76
Chile	CHL	2.03	−0.87	0.00	Norway	NOR	3.38	1.39	2.17
Argentina	ARG	2.12	−0.66	0.38	El Salvador	SLV	3.57	−2.06	0.53
Morocco	MAR	2.12	−1.32	−1.04	Sweden	SWE	3.67	1.86	2.35

Note: NTSR and SSE values for China, in the year 2011, are 0.80 and −1.16, respectively.

for example, with an intolerance of homosexuals and minorities as well as an adherence to traditional gender roles. Such societies are often characterized by general authoritarian political outlooks. Societies that place greater emphasis on self-expression values, however, hold opposing views. The rationale is that when economic security and physical security are commonplace cultural diversity begins to be appreciated and sought after. This cultivates tolerance toward deviations from traditional gender roles and sexual norms as well as greater support for equal rights.

More traditional societies tend to show greater deference to the authority of the nation, a god, or family. In fact, such deference is viewed as important or as a general expectation. In these societies, it is thus common for individuals to adhere to family or communal

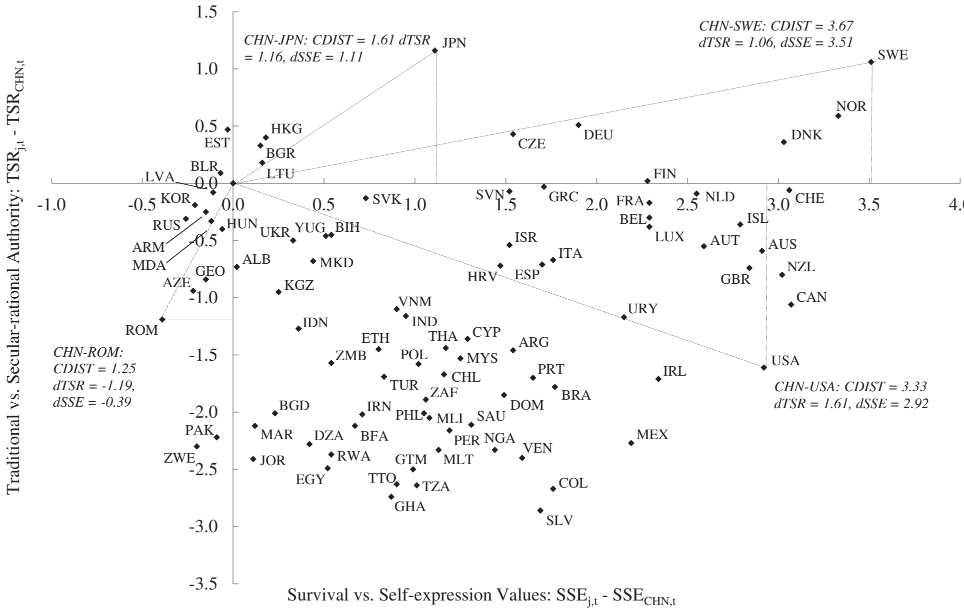

Figure 1. 'Cultural Map' – Distance of 88 Trading Partners from China, 2011.

obligations, to express a high degree of national pride and/or to have a nationalistic outlook, and to show obedience to religious authority. Furthermore, large families are common, as large numbers of children are viewed as a positive or desirable achievement, and fertility rates tend to be high, while divorce, abortion, euthanasia, suicide are all viewed negatively. Societies that are more secular-rational-focused, including China, generally hold opposing views from those of individuals in traditional societies. Often, individuals in secular-rational societies adhere to rational-legal norms and emphasize economic accumulation and individual achievement.

4. Estimation results

4.1. Variation in trade orientation

Our data consist of two dimensions: countries ($j = 1, 2, \ldots, 88$) with which China may trade and the time period ($t = 1995, 1996, \ldots, 2011$) for which the relevant data are available. The 88 trading partners are distributed over 11 regions/sub-regions. Given the differences in the historical and sociopolitical alignment of China with countries in various regions and the relatively active role of its government in the planning and implementation of economic policies, we anticipate that the strategic importance of each of the trading partners in different regions (sub-regions) may vary greatly in terms of influencing bilateral trade flows. To account for such unobserved heterogeneity in the levels of exports and imports due to the collective differences in the regional (sub-regional) locations, the relative importance of trading partners in the same region, and random fluctuations over time, we estimate Equation (4) as a multi-level mixed effects model: Random intercepts for the regions and trading partners within the regions and random slopes for the effect of cultural differences, enabling the effect to vary across countries.

Table 2. Exports and imports, Bare-Bone Model – RI only.

	Aggregate exports	Primary commodities	Manufactured goods	Labor-intensive manufactured goods	Low skill and technology-intensive manufactures	Medium skill and technology-intensive manufactures	High skill and technology-intensive manufactures
	(a)	(b)	(c)	(d)	(e)	(f)	(g)
a) Exports							
Constant	13.50***	10.28***	13.40***	12.24***	11.10***	11.64***	11.90***
	(0.392)	(0.477)	(0.389)	(0.376)	(0.410)	(0.380)	(0.467)
Random intercepts:							
Number of regions ($j=11$)							
Std. dev. (Constant)	0.974***	0.330	0.809***	0.126	0.633**	0.629**	0.299
	(0.293)	(0.272)	(0.298)	(0.321)	(0.299)	(0.307)	(0.279)
Number of partners ($i=88$)							
Std. dev. (Constant)	0.598***	0.675***	0.609***	0.663***	0.656***	0.615***	0.690***
	(0.083)	(0.083)	(0.083)	(0.082)	(0.084)	(0.084)	(0.084)
Std. dev. (Residual)	0.304***	0.323***	0.324***	0.199***	0.482***	0.502***	0.488***
	(0.019)	(0.019)	(0.019)	(0.019)	(0.019)	(0.019)	(0.019)
No. of observations	1441	1423	1441	1441	1432	1439	1435
Log-likelihood	−2612	−2623	−2640	−2477	−2849	−2877	−2863
LL ratio test vs. LR model	1066	1977	1042	1446	907.0	863.7	823.6
b) Imports:							
Constant	12.54***	11.30***	11.11***	8.699***	7.602***	8.477***	9.846***
	(0.561)	(0.539)	(0.790)	(0.698)	(0.851)	(1.061)	(0.918)
Random intercepts:							
Number of Regions ($j=11$)							
Std. dev. (Constant)	0.493*	0.439	0.867***	0.719***	0.902***	1.182***	1.025***
	(0.279)	(0.295)	(0.254)	(0.273)	(0.277)	(0.246)	(0.249)
Number of partners (i=88)							
Std. dev. (Constant)	0.839***	0.848***	1.047***	1.028***	1.286***	1.236***	1.160***
	(0.083)	(0.084)	(0.083)	(0.083)	(0.083)	(0.082)	(0.082)
Std. Dev. (Residual)	0.476***	0.560***	0.541***	0.508***	0.700***	0.545***	0.514***
	(0.019)	(0.019)	(0.019)	(0.020)	(0.021)	(0.021)	(0.020)
N observations	1426	1395	1403	1336	1230	1281	1325
Log-likelihood	−2865	−2915	−2923	−2747	−2779	−2703	−2746
LL ratio test vs. LR model	1053	431.3	1248	2559	1215	919.0	1177

Note: Standard errors in parentheses.
*$p < 0.1$; **$p < 0.05$; ***$p < 0.01$.

To examine the bilateral trade flow structure of the partners in our study, we first estimate a bare-bone version of our model without including the gravity variables. The corresponding results are presented in Table 2. The values in the table present the structure of China's bilateral trade flows with its partners while also depicting its variation across the sub-regions, the trading partners within the regions. Accordingly, results in the table indicate that, during a given year, the average levels of China's exports and imports across the countries in our sample are equal to $7.08 billion and $4.66 billion, respectively. Ninety-two percent of its exports, and 66% of its imports were manufactured goods, with primary goods accounting for just 5.4 and 33.7% of the aggregate exports and imports, respectively. High skill and technology-intensive goods account for about 39% of China's manufactured goods exports and a significantly larger proportion (53.3%) of its imports. Medium skill and technology-intensive goods constitute about 19.1% of manufactured goods exports and 38.3% of manufactured goods imports. Low skill and technology-intensive products accounted for 10.0% of the manufactured goods exports, while the share of such goods in China's imports of manufactured goods from its typical partner accounted for about 7.7%.

Interestingly, as is depicted by the relatively larger variances of the sub-regions and the trading partner-specific random intercepts relative to their corresponding standard errors (i.e. the lower section of each panel of Table 2), significant variation exists in China's bilateral trade flows (i.e. both exports as well as imports) across the sub-regional clusters and among trading partners within each sub-region. Based on these estimates, we find that 18.9 and 25.2% of the total residual variances of China's aggregate bilateral exports and imports, respectively, are due to differences in the country's trade orientation across the sub-regions. Variations in the average annual exports and imports across the countries within each region account for 52.7 and 50.4% of the total residual variance of China's aggregate bilateral exports and imports, respectively. A strong justification for the use of the multi-level mixed effects model, these observations clearly indicate that, on average, nearly 80% (for exports) and 75% (for imports) of the total variances of China's aggregate annual bilateral trade flows can be attributed to differences in its trade orientations across the sub-regions and the countries within each sub-region.

4.2. Does China's trade defy gravity? Results from the random intercepts model

Tables 3a (for exports) and 3b (for imports) present coefficient estimates of the variables often included in the augmented gravity model that are derived from the random intercept-only version of our estimation equation where we account for sub-regional and, within each region, for country-specific variations in China's bilateral trade flows. Effectively, the results in the tables can be used to examine whether China's trade pattern, after accounting for differences in its regional and country-specific orientations, falls within the bounds of results from similar studies that use the gravity model.

We find that, regardless of whether export measures or import measures are employed as the dependent variable series, the coefficients of population size, GDP per capita, and common border are statistically significant and positive, implying that China's bilateral trade flows (both exports and imports) increase with a rise in the market size (population) or the purchasing power (GDP per capita) of its trading partners, and is larger among trading partners that share common border with China as compared to partners that do not. Likewise, with a rise in the economic remoteness (i.e. a lack of alternative trading opportunities) of the partners, we find increases in China's bilateral export and import flows, indicating stronger than usual affiliation of China's trade with economically remote countries. Similarly, while greater economic openness of the trading partners is largely associated with a rise in China's aggregate imports, specifically the imports of both labor-intensive and high skill technology-intensive manufactures, the corresponding effect on China's bilateral exports (aggregate or disaggregate) is not statistically discernible.

Among the gravity variables that are anticipated to have negative influence on bilateral trade flows, we find the geodesic distance variable retains a statistically significant and consistently negative coefficient when imports as well as exports, whether aggregate or disaggregate, are employed as the dependent variable series. This is taken as evidence of the sensitivity of China's bilateral trade flows to increases in the costs of transportation. To this end, we find that a one percent increase in the geodesic distance between China and its typical trading partner reduces China's aggregate exports and imports to/from that country

Table 3a. Exports – AGM variables, random intercepts-only model.

	ln aggregate $exports_{ijt}$	ln primary $commodities_{ijt}$	ln manf. $goods_{ijt}$	ln labor-intensive manf. $goods_{ijt}$	ln low skill & technology-intensive $manf._{ijt}$	ln medium skill & technology-intensive $manf._{ijt}$	ln high skill & technology-intensive $manf._{ijt}$
	(a)	(b)	(c)	(d)	(e)	(f)	(g)
ln GDP Per $capita_{jt}$	2.221***	1.240***	2.216***	1.612***	3.035***	2.768***	2.749***
	(0.0908)	(0.0935)	(0.0913)	(0.0911)	(0.145)	(0.127)	(0.125)
ln $pozpulation_{jt}$	0.681***	1.015***	0.678***	0.839***	0.370**	0.160	0.782***
	(0.104)	(0.0827)	(0.104)	(0.0855)	(0.163)	(0.160)	(0.140)
ln trade $openness_{jt}$	0.0376	0.128	0.00876	−0.0433	−0.243*	−0.0244	0.0813
	(0.0886)	(0.148)	(0.0896)	(0.110)	(0.137)	(0.118)	(0.120)
Δ ln exchange $rate_{ijt}$	−0.217***	−0.186	−0.216***	−0.341***	−0.211***	−0.409***	−0.151**
	(0.0505)	(0.131)	(0.0511)	(0.0644)	(0.0778)	(0.0669)	(0.0685)
ln geodesic $distance_{ij}$	−1.541**	−1.118***	−1.525**	−0.647	−2.066**	−2.563***	−2.285***
	(0.602)	(0.336)	(0.596)	(0.437)	(0.973)	(0.957)	(0.785)
Common $border_{ij}$	2.039***	1.586***	2.029***	2.158***	2.422**	2.088**	1.632*
	(0.657)	(0.471)	(0.652)	(0.504)	(1.022)	(1.041)	(0.882)
$Landlocked_j$	−0.417	−1.011***	−0.418	−0.758**	−0.980	−0.856	0.0458
	(0.440)	(0.303)	(0.437)	(0.334)	(0.688)	(0.698)	(0.590)
ln economic $remoteness_{jt}$	2.388***	0.394	2.321***	0.328	3.973***	4.274***	4.099***
	(0.404)	(0.314)	(0.404)	(0.357)	(0.639)	(0.587)	(0.541)
Accession to WTO_{it}	0.183***	0.100	0.186***	0.144**	0.182***	0.150**	0.352***
	(0.0451)	(0.0842)	(0.0457)	(0.0578)	(0.0695)	(0.0598)	(0.0612)
Trend (Centered)	0.158***	0.166***	0.164***	0.142***	0.175***	0.196***	0.170***
	(0.00582)	(0.00925)	(0.00587)	(0.00688)	(0.00905)	(0.00792)	(0.00790)
Constant	−18.22***	−3.661	−17.71***	−6.102	−31.85***	−26.01***	−33.34***
	(6.222)	(4.044)	(6.178)	(4.750)	(10.04)	(9.762)	(8.178)
Random Intercepts:							
Number of regions ($j = 11$)							
Std. dev. (Constant)	0.210	0.875*	0.198	0.251	0.761***	0.697**	0.425
	(0.292)	(0.483)	(0.293)	(0.335)	(0.286)	(0.294)	(0.333)
Number of recipients ($i = 88$)							
Std. dev. (Constant)	0.283**	0.0831	0.275**	4.12e-05	0.724***	0.748***	0.578***
	(0.113)	(0.102)	(0.113)	(0.102)	(0.130)	(0.140)	(0.121)
Std. dev. (Residual)	0.841***	0.236***	0.828***	0.592***	0.409***	0.560***	0.536***
	(0.0200)	(0.0199)	(0.0200)	(0.0199)	(0.0204)	(0.0206)	(0.0203)
No. of observations	1441	1423	1441	1441	1432	1439	1435
Log-likelihood	−1056	−1813	−1072	−1362	−1669	−1472	−1486
Wald χ^2	11,932	3075	12,139	5404	6588	9810	9051
LL ratio test vs. LR model	1317	668.5	1348	1317	1041	868.7	932.2

Note: See Table 2 notes.

by 1.54 and 1.19%, respectively. Evaluating the relative sensitivity of China's exports to a rise in transportation costs, we find that medium skill and technology-intensive manufactures, with an elasticity estimate of 2.563%, as the most sensitive classification to a rise in geodesic distance. Similarly, with an elasticity estimate of 2.351%, we find imports of labor-intensive manufactures as the most sensitive product categories to a rise in transportation costs.

We also find negative and statistically significant coefficients of the exchange rate variable when exports are employed as the dependent variable series. Representing the rate of change in the units of trading partners' currencies required to purchase RMB, all else

Table 3b. Imports – AGM variables, random intercepts-only model.

	ln aggregate $imports_{ijt}$	ln primary commodi-$ties_{ijt}$	ln manf. $goods_{ijt}$	ln labor-intensive manf. $goods_{ijt}$	ln low skill & technology -intensive $manf._{ijt}$	ln medium skill & technology -intensive $manf._{ijt}$	ln high skill & technology -intensive $manf._{ijt}$
	(a)	(b)	(c)	(d)	(e)	(f)	(g)
ln GDP per $capita_{jt}$	1.662***	1.496***	1.853***	1.935***	1.744***	2.538***	2.177***
	(0.101)	(0.120)	(0.136)	(0.157)	(0.239)	(0.185)	(0.157)
ln $population_{jt}$	1.328***	1.318***	1.562***	1.552***	1.864***	1.700***	1.626***
	(0.086)	(0.106)	(0.118)	(0.133)	(0.201)	(0.153)	(0.140)
ln trade $openness_{jt}$	0.368**	0.0886	0.693***	0.449*	0.586	0.300	1.127***
	(0.176)	(0.199)	(0.221)	(0.236)	(0.384)	(0.283)	(0.245)
Δ ln exchange $rate_{ijt}$	0.316**	−0.442***	0.238*	0.423***	0.510	0.701***	0.236
	(0.115)	(0.125)	(0.140)	(0.143)	(0.337)	(0.241)	(0.211)
ln geodesic $distance_{ij}$	−1.190***	−0.682	−2.052***	−2.351***	−1.885**	−1.511*	−2.116***
	(0.420)	(0.430)	(0.548)	(0.624)	(0.937)	(0.826)	(0.541)
Common $border_{ij}$	0.972**	1.438**	0.717	2.152***	0.355	0.452	0.642
	(0.469)	(0.595)	(0.649)	(0.739)	(1.092)	(0.835)	(0.802)
$Landlocked_{j}$	−0.683**	0.537	0.260	0.686	0.969	0.784	−0.847*
	(0.309)	(0.384)	(0.427)	(0.487)	(0.728)	(0.561)	(0.515)
ln economic Remote-$ness_{jt}$	2.117***	3.038***	1.338***	2.281***	1.098	1.385**	1.026**
	(0.366)	(0.403)	(0.485)	(0.551)	(0.831)	(0.689)	(0.516)
Accession to WTO_{it}	0.374***	0.0478	0.750***	0.385***	1.001***	0.465***	0.284**
	(0.104)	(0.114)	(0.127)	(0.131)	(0.217)	(0.158)	(0.137)
Time (Trend)	0.146***	0.205***	0.0984***	0.118***	−0.0143	0.0752***	0.108***
	(0.011)	(0.012)	(0.014)	(0.014)	(0.023)	(0.017)	(0.015)
Constant	−23.28***	−34.01***	−15.81**	−23.09***	−20.71*	−29.16***	−18.63***
	(4.808)	(5.219)	(6.309)	(7.147)	(10.84)	(9.125)	(6.629)
Random intercepts:							
Number of regions ($j=11$)							
Std. dev. (Constant)	0.329	0.614	0.134	0.0114	0.425	0.542*	−0.493
	(0.280)	(0.376)	(0.372)	(0.365)	(0.348)	(0.295)	(0.556)
Number of recipients ($i=88$)							
Std. dev. (Constant)	0.115	0.145	0.225**	0.361***	0.746***	0.475***	0.457***
	(0.091)	(0.088)	(0.0919)	(0.092)	(0.089)	(0.088)	(0.089)
Std. dev. (Residual)	0.0060	0.0747***	0.184***	0.189***	0.635***	0.336***	0.210***
	(0.019)	(0.019)	(0.019)	(0.020)	(0.0210)	(0.0205)	(0.0202)
No. of observations	1426	1395	1402	1336	1230	1281	1325
Log-likelihood	−2139	−2218	−2382	−2291	−2660	−2389	−2303
Wald χ^2	2633	2431	1738	1353	314.9	910.2	1394
LL ratio test vs. LR model	794.3	878.9	771.6	875.9	709.9	978.3	958.5

Note: See Table 2 notes.

equal, the results indicate that faster RMB appreciations against the trading partner's currency correspond with lower levels of exports from China to the given country. Similarly, imports of primary commodities aside, which tend to fall with depreciations of the trading partner's currency against the RMB, China's bilateral imports tend to rise with an increase in the pace at which the RMB appreciates against the currencies of the trading partners. Accordingly, we find that a one percent rise in the rate of depreciation of the typical trading partner's currency against the RMB is associated with a 0.316% increase in China's aggregate imports and a 0.217% decrease in China's exports to the typical country. With the exception of primary commodities and labor-intensive manufactures (for exports) and aggregate and high skill and technology-intensive manufactures (for imports), while China's exports to landlocked trading partners are not significantly different from those that have access to the sea, as the gravity model predicts, China's imports from landlocked countries tend to be significantly lower.

Lastly, indicating the unprecedented pace of growth at which China's bilateral trade flows have grown over the last two decades in general, and specifically with the accession of China's into the WTO in December 2001, the coefficients of the centered trend variable remain positive and statistically significant across all product categories for both exports and imports.[9] Similarly, with the exception of the estimations where exports and imports of primary commodities are employed as the dependent variable series, China's accession into the WTO has had a statistically significant and positive effect on its bilateral trade flows. Accordingly, using the coefficients of the WTO variable for the aggregate exports and imports regression as an example, compared to its average trade flows prior to joining the WTO, all else constant, China's accession to the WTO has enabled its aggregate imports to increase by 45.35%, more than double the amount by which it increased China exports (20.01%).

Finally, looking at the variance structure of the China's bilateral trade flows presented at the bottom of both tables, it is interesting to note that even after controlling for the effects of the standard augmented gravity variables, its accession to the WTO, and the time trend, a significant amount of the total residual variance of China's bilateral trade flows is accounted for by the region-to-region and partner-to-partner variations. To sum up, examination of the signs and statistical significances of the traditional augmented gravity model variables included in the model indicate that, despite its unprecedented expansions, China's bilateral trade flow falls within the bounds of the general predictions from the standard gravity model.

4.3. Does China's trade defy cultural barriers? Results from the random coefficients model

Having shown that the bilateral trade flows of China conform to the predictions of the standard gravity model, we now consider whether China's trade is sensitive to information asymmetries that arise due to cultural differences. Given the number of countries with which China trades, their diversity, and the proactive desire of China's government to establish economic cooperation often through non-traditional and new approaches, this would appear to be a particularly important question. To address this question, we augment our estimation equation with two separate yet related measures of cultural difference: the composite measure of cultural distance (CDIST_{ijt}) and differences in its component dimensions: TSR $\left(\mathrm{dTSR}_{ijt} = \left|\mathrm{TSR}_{it} - \mathrm{TSR}_{jt}\right|\right)$ and SSE $\left(\mathrm{dSSE}_{ijt} = \left|\mathrm{SSE}_{it} - \mathrm{SSE}_{jt}\right|\right)$.

In both of the specifications, we maintain the random intercepts model to account for sub-regional and, within each region, trading partner-specific fixed effects; however, we permit the influence of cultural distance to vary across the trading partners (i.e. we estimate a random intercepts and random coefficients model on our variable of interest, cultural distance – hence, the name mixed effects). The corresponding estimates obtained from the mixed effects model are presented in Tables 4a and 4b for exports and in Tables 5a and 5b for imports.

4.3.1. Cultural differences and China's bilateral exports

Focusing first on the effects of the composite cultural distance between China and its trading partners, when measures of exports are employed as the dependent variable series (Tables 4a and 4b) we find that the composite measure of cultural distance variable bears a statistically significant coefficient of 0.957 only for exports of high skill and technology-intensive manufactures. In this instance, the results show that a hypothesized one percent increase in cultural distance between China and its typical trading partner, all else equal, is associated with 0.957% reduction in China's exports of high skill and technology-intensive manufactures to a typical trading partner. For all other export measures, we fail to find any statistically discernible effect.

Given that the cultural distance variable is a composite index that is derived from two separate but related dimensions in which the cultures of China and its trading partners may differ, on the assumption that the effect (or lack thereof) of the composite measure might be due to aggregation, we estimate a modified version of Equation (4) by substituting the component dimensions of our measure ($CDIST_{ijt}$) for the composite measure: cultural differences measured along the TSR $\left(dTSR_{ijt} = \left|TSR_{it} - TSR_{jt}\right|\right)$ and the Survival vs. Self expression $\left(dSSE_{ijt} = \left|SSE_{it} - SSE_{jt}\right|\right)$ dimensions. Results obtained when using the component dimensions are presented in Table 4b.

We find that the coefficients of the $dTSR_{ijt}$ variable are negative and statistically significant in the regressions involving China's aggregate exports (–0.762), the exports of aggregate manufactured goods (–0.782), labor-intensive, (–0.703), and low (–0.721) and medium (–0.526) skill and technology-intensive manufactures. The estimates imply that a one percent increase in cultural differences between China and its trading partners, measured along the TSR dimension, is associated with declines of 0.762, 0.782, 0.703, and 0.526%, respectively, in China's exports of aggregate, manufactured goods, labor-intensive, and low skill and technology-intensive, and medium skill technology-intensive manufactured goods to a typical trading partner. Given that exports of manufactured goods, a larger proportion of which are labor-intensive, account for a relatively larger share of China's aggregate exports, the consistency of the observed effects makes sense.

Referring to the effect of cultural differences between China and its trading partners as measured along the Survival vs. Self-expression ($dSSE_{ijt}$) dimension, we find statistically significant and positive coefficients in the regressions that involve exports of labor-intensive manufactures (0.703). The result implies that, contrary to the effect of cultural differences measured along the TSR dimension, greater SSE distance between China and its trading partners correlates with a 0.703% increase in the exports labor-intensive manufactures.

Given that $CDIST_{ijt}$ is a composite index of component dimensions which appear to have contradictory effects, the observation that, on average, its lack of statistically discernible effects on China's exports to a typical trading partner remaining muted should not be surprising. It should also be noted that despite a few instances, the estimated coefficients of the component dimension, specifically that of the $dSSE_{ijt}$ variable remains statistically insignificant in most of the export regressions. Given that a rise in cultural distance along each of the component dimensions affects China's exports of goods in the corresponding classifications differently, we can infer that the sensitivity of China's exports to information asymmetries due to cultural differences is less pronounced than has been reported for other countries in most prior studies.

Table 4a. Exports, composite cultural distance measure-random intercepts and random coeffients.

	ln aggregate exports$_{ijt}$	ln primary commodities$_{ijt}$	ln manf. goods$_{ijt}$	ln labor-intensive manf. goods$_{ijt}$	ln low skill & technology-intensive manf.$_{ijt}$	ln medium skill & technology-intensive manf.$_{ijt}$	ln high skill & technology-intensive manf.$_{ijt}$
	(a)	(b)	(c)	(d)	(e)	(f)	(g)
(a) Exports							
ln cultural distance$_{ijt}$	−0.352	0.177	−0.418	0.272	−0.634	−0.465	−0.957**
	(0.315)	(0.322)	(0.317)	(0.335)	(0.509)	(0.493)	(0.475)
ln GDP Per capita$_{jt}$	2.196***	1.290***	2.207***	1.785***	3.054***	2.673***	2.900***
	(0.0893)	(0.101)	(0.0898)	(0.0986)	(0.146)	(0.124)	(0.128)
ln population$_{jt}$	0.754***	0.972***	0.763***	0.856***	0.433**	0.293*	0.804***
	(0.102)	(0.0902)	(0.103)	(0.0974)	(0.168)	(0.159)	(0.155)
ln trade openness$_{jt}$	0.131	0.0350	0.109	0.0274	−0.130	0.0655	0.132
	(0.0867)	(0.149)	(0.0871)	(0.109)	(0.134)	(0.113)	(0.117)
D ln exchange rate$_{ijt}$	−0.229***	−0.113	−0.226***	−0.332***	−0.230***	−0.423***	−0.154**
	(0.0486)	(0.131)	(0.0488)	(0.0621)	(0.0747)	(0.0626)	(0.0650)
ln geodesic distance$_{jt}$	−1.594***	−1.254***	−1.567**	−0.880*	−2.286**	−2.562**	−2.378***
	(0.616)	(0.357)	(0.621)	(0.534)	(1.074)	(1.005)	(0.908)
Common border$_{jt}$	1.969***	1.804***	1.971***	2.440***	2.128*	1.945*	1.467
	(0.638)	(0.462)	(0.648)	(0.586)	(1.153)	(1.040)	(0.973)
Landlocked$_j$	−0.254	−0.826***	−0.255	−0.333	−0.793	−0.838	0.226
	(0.428)	(0.296)	(0.433)	(0.393)	(0.737)	(0.694)	(0.656)
ln economic remoteness$_{jt}$	2.504***	0.606*	2.434***	0.369	3.793***	4.072***	5.049***
	(0.406)	(0.354)	(0.408)	(0.407)	(0.658)	(0.593)	(0.587)
Accession to WTO$_{it}$	0.187***	0.0869	0.195***	0.146***	0.201***	0.145***	0.349***
	(0.0431)	(0.0822)	(0.0433)	(0.0553)	(0.0663)	(0.0555)	(0.0576)
Time (Trend)	0.154***	0.167***	0.158***	0.133***	0.167***	0.191***	0.164***
	(0.0056)	(0.0092)	(0.0056)	(0.0068)	(0.0088)	(0.0075)	(0.0077)
Constant	−19.34***	−4.090	−19.10***	−6.693	−29.00***	−24.77**	−41.28***
	(6.327)	(4.307)	(6.386)	(5.661)	(11.08)	(10.17)	(9.258)
Random intercepts:							
Number of regions ($j = 11$)							
St. dev. (Constant)	0.197	1.004*	0.199	0.0721	0.765***	0.702**	0.523
	(0.295)	(0.544)	(0.294)	(0.339)	(0.279)	(0.293)	(0.343)
Number of partners ($i = 88$)							
Std. dev. (Constant)	0.632***	0.517***	0.641***	0.634***	1.117***	1.154***	1.104***
	(0.155)	(0.172)	(0.154)	(0.176)	(0.166)	(0.132)	(0.141)
Random coefficents:							
Std. dev. (ln cultural distance$_{ijt}$)	0.764***	0.219	0.792***	0.749***	1.463***	1.279***	1.121***
	(0.170)	(0.274)	(0.171)	(0.200)	(0.169)	(0.154)	(0.164)
Std. dev. (Residual)	0.897***	0.264***	0.892***	0.645***	0.468***	0.647***	0.609***
	(0.0204)	(0.0208)	(0.0204)	(0.0204)	(0.0207)	(0.0210)	(0.0207)
No. of observations	1441	1423	1441	1441	1432	1439	1435
Log-likelihood	−1009	−1798	−1016	−1329	−1627	−1395	−1437
Wald χ^2	11,222	3020	11,570	5169	6138	9179	8779
LL ratio test vs LR model	1364.00	704.10	1415.00	1359.00	975.9	1000.00	1024.00

Notes: Standard errors in parentheses. The number of groups in each estimation is 88. Each estimation includes country x time (year) fixed effect terms. Due to space constraints, corresponding coefficients not reported. ***, **, and * indicate statistical significance from zero at the 1, 5, and 10% levels, respectively.

4.3.2. *Cultural differences and China's bilateral imports*

Tables 5a and 5b present the effects of the composite measure of cultural distance (Table 5a) and its component dimensions (Table 5b) obtained from estimations of models that employ measures of China's bilateral imports as the dependent variable series. None of the

Table 4b. Exports, decomposed cultural distance measure-random intercepts and random coeffients.

	ln Aggregate Exports$_{ijt}$	ln Primary Commodities$_{ijt}$	ln Manf. Goods$_{ijt}$	ln Labor-Intensive Manf. Goods$_{ijt}$	ln Low Skill & Technology-Intensive Manf.$_{ijt}$	ln Medium Skill & Technology-Intensive Manf.$_{ijt}$	ln High Skill & Technology-Intensive Manf.$_{ijt}$
	(a)	(b)	(c)	(d)	(e)	(f)	(g)
(b) Imports							
ln | $SSE_{it} - SSE_{jt}$ |	0.343	0.131	0.348	0.703*	0.691	0.150	0.219
	(0.289)	(0.318)	(0.291)	(0.382)	(0.497)	(0.424)	(0.389)
ln | $TSR_{it} - TSR_{jt}$ |	−0.762***	−0.402	−0.782***	−0.728**	−0.721*	−0.526*	−0.534
	(0.260)	(0.305)	(0.263)	(0.336)	(0.381)	(0.317)	(0.345)
ln GDP Per capita$_{jt}$	2.249***	1.635***	2.246***	2.126***	3.184***	2.575***	2.785***
	(0.090)	(0.126)	(0.091)	(0.108)	(0.149)	(0.122)	(0.126)
ln population$_{jt}$	0.658***	0.995***	0.686***	0.775***	0.392**	0.183	0.871***
	(0.119)	(0.115)	(0.120)	(0.132)	(0.193)	(0.171)	(0.160)
ln trade openness$_{jt}$	0.198**	0.0244	0.160*	0.129	−0.0724	0.0866	0.125
	(0.085)	(0.155)	(0.085)	(0.106)	(0.134)	(0.113)	(0.117)
Δ ln exchange rate$_{ijt}$	−0.253***	−0.131	−0.252***	−0.337***	−0.262***	−0.441***	−0.162***
	(0.044)	(0.126)	(0.044)	(0.055)	(0.071)	(0.059)	(0.062)
ln geodesic distance$_{ij}$	−1.842**	−1.317***	−1.852**	−1.167	−2.539**	−2.436**	−2.343***
	(0.735)	(0.500)	(0.735)	(0.823)	(1.283)	(1.027)	(0.884)
Common border$_{ij}$	1.968**	2.341***	1.903**	1.776**	2.353*	2.693**	1.840*
	(0.792)	(0.657)	(0.806)	(0.902)	(1.340)	(1.075)	(1.027)
Landlocked$_j$	−0.327	−0.503	−0.324	−0.241	−0.738	−0.498	0.861
	(0.517)	(0.426)	(0.520)	(0.565)	(0.858)	(0.716)	(0.672)
ln economic remoteness$_{jt}$	2.850***	1.241***	2.787***	0.726	4.515***	3.995***	4.440***
	(0.447)	(0.454)	(0.444)	(0.517)	(0.726)	(0.618)	(0.589)
Accession to WTO$_{it}$	0.265***	0.136*	0.274***	0.222***	0.265***	0.206***	0.409***
	(0.039)	(0.079)	(0.039)	(0.049)	(0.062)	(0.052)	(0.054)
Time (Trend)	0.144***	0.150***	0.148***	0.112***	0.154***	0.186***	0.161***
	(0.005)	(0.009)	(0.005)	(0.006)	(0.008)	(0.007)	(0.007)
Constant	−19.87***	−11.68**	−19.43***	−9.422	−34.56***	−23.90**	−36.94***
	(7.335)	(5.604)	(7.332)	(8.239)	(12.69)	(10.22)	(8.927)
Random intercepts:							
Number of regions ($j = 11$)							
Std. dev. (Constant)	0.336	−0.476	0.314	0.424	0.924***	0.679**	0.374
	(0.304)	(0.772)	(0.306)	(0.306)	(0.284)	(0.312)	(0.385)
Number of recipients ($i = 88$)							
Std. dev. (Constant)	0.712***	0.609**	0.724***	1.020***	1.314***	1.175***	1.015***
	(0.139)	(0.277)	(0.139)	(0.132)	(0.140)	(0.122)	(0.138)
Random coefficents:							
Std. dev. (ln ΔSSE_{ijt})	0.575***	0.640***	0.591***	0.851***	0.915***	0.745***	0.860***
	(0.157)	(0.179)	(0.158)	(0.168)	(0.163)	(0.137)	(0.130)
Std. dev. (ln ΔTSR_{ijt})	1.018***	0.576	1.084***	1.347***	1.678***	1.203***	1.233***
	(0.176)	(0.437)	(0.170)	(0.181)	(0.153)	(0.161)	(0.162)
Std. Dev. (Residual):	1.014***	0.328***	1.013***	0.806***	0.563***	0.736***	0.695***
	(0.0220)	(0.0296)	(0.0218)	(0.0227)	(0.0223)	(0.0226)	(0.0218)
No. of observations	1441	1423	1441	1441	1432	1439	1435
Log-likelihood	−939.6	−1780	−938.4	−1235	−1578	−1343	−1383
Wald χ^2	11,264	2848	11,732	5303	5991	8848	8557
LL ratio test vs. LR model	1514	747.1	1573	1555	1133	1116	1133

Note: See Table 4a notes.

coefficients of the composite measure of cultural distance ($CDIST_{ijt}$) presented in Table 5a are statistically significant, indicating that, on average, China's bilateral imports are not sensitive to the composite measure of its cultural differences with the typical trading partner. Results obtained when decomposing the aggregate measure of cultural distance into

Table 5a. Imports, composite cultural distance measure-random intercepts and random coeffients.

Variables	ln aggregate $imports_{ijt}$ (a)	ln primary $commodities_{ijt}$ (b)	ln manf. $goods_{ijt}$ (c)	ln labor-intensive manf. $goods_{ijt}$ (d)	ln low skill & technology-intensive $manf._{ijt}$ (e)	ln medium skill & technology-intensive $manf._{ijt}$ (f)	ln high skill & technology-intensive $manf._{ijt}$ (g)
ln cultural $distance_{ijt}$	−0.0213	−0.544	0.173	−0.587	0.989	−0.238	−0.151
	(0.310)	(0.421)	(0.342)	(0.572)	(0.714)	(0.595)	(0.528)
ln GDP Per $capita_{jt}$	1.630***	1.586***	1.799***	2.105***	1.429***	2.542***	2.162***
	(0.103)	(0.128)	(0.134)	(0.165)	(0.255)	(0.191)	(0.160)
ln $population_{jt}$	1.291***	1.357***	1.539***	1.624***	1.645***	1.630***	1.608***
	(0.0892)	(0.113)	(0.117)	(0.137)	(0.218)	(0.157)	(0.143)
ln trade $openness_{jt}$	0.293*	0.0237	0.685***	0.423*	0.505	0.298	1.090***
	(0.176)	(0.201)	(0.220)	(0.235)	(0.388)	(0.283)	(0.244)
Δ ln exchange $rate_{ijt}$	0.317**	−0.426***	0.241*	0.482***	0.483	0.706***	0.247
	(0.115)	(0.124)	(0.140)	(0.141)	(0.337)	(0.242)	(0.212)
ln geodesic $distance_{ij}$	−1.258***	−0.530	−2.066***	−2.443***	−2.202**	−1.716**	−2.214***
	(0.433)	(0.415)	(0.568)	(0.649)	(1.009)	(0.846)	(0.500)
Common $border_{ij}$	1.003**	1.645***	0.428	2.513***	0.439	0.668	1.017
	(0.423)	(0.605)	(0.569)	(0.843)	(1.047)	(0.832)	(0.840)
$Landlocked_{j}$	0.494*	0.607	0.356	0.539	0.332	0.334	−1.217**
	(0.279)	(0.391)	(0.376)	(0.545)	(0.701)	(0.575)	(0.531)
ln economic remote-$ness_{jt}$	2.153***	3.326***	1.385***	2.475***	0.649	1.397**	0.655
	(0.390)	(0.417)	(0.504)	(0.555)	(0.937)	(0.712)	(0.493)
Accession to WTO_{it}	0.379***	0.077	0.748***	0.398***	0.970***	0.451***	0.288**
	(0.103)	(0.112)	(0.127)	(0.129)	(0.213)	(0.157)	(0.135)
Time (Trend)	0.149***	0.200***	0.100***	0.113***	0.0039	0.0742***	0.110***
	(0.011)	(0.012)	(0.014)	(0.014)	(0.023)	(0.017)	(0.014)
Constant	−21.95***	−38.09***	−15.57**	−25.21***	−9.805	−26.41***	−14.03**
	(4.822)	(5.277)	(6.344)	(7.491)	(11.43)	(9.241)	(6.413)
Random intercepts:							
Number of regions ($j=11$)							
Std. dev. (Constant)	0.347	1.113	0.0324	0.0529	0.445	0.478	1.278
	(0.303)	(0.943)	(0.329)	(0.425)	(0.354)	(0.308)	(1.801)
Number of partners ($i=88$)							
Std. Dev. (Constant)	0.227	0.709***	0.218	1.029***	1.115***	1.020***	0.894***
	(0.273)	(0.205)	(0.749)	(0.237)	(0.203)	(0.234)	(0.227)
Random coefficents:							
Std. dev. (ln cultural $distance_{ijt}$)	0.0813	0.591**	0.328	1.275***	0.777**	1.038***	1.025***
	(0.284)	(0.238)	(0.548)	(0.227)	(0.322)	(0.219)	(0.234)
Std. dev. (Residual)	0.0147	0.0546***	0.183***	0.166***	0.612***	0.319***	0.192***
	(0.019)	(0.020)	(0.019)	(0.021)	(0.021)	(0.021)	(0.021)
No. of observations	1426	1395	1402	1336	1230	1281	1325
Log-likelihood	−2136	−2209	−2380	−2282	−2649	−2383	−2295
Wald χ^2	2616	2417	1734	1331	286.6	858.6	1414
LL ratio test vs. LR model	1364	704.1	1415	1359	975.9	1000	1024

Note: See Table 4a notes.

its component dimensions ($dTSR_{ijt}$ and $dSSE_{ijt}$) reported in Table 5b, however, reveal that with the exception of the regression involving the imports of high skill technology-intensive manufactures, the estimated coefficients of the $dTSR_{ijt}$ variable are negative and significantly different from zero in all of the import regressions. The observed effects range from as low as −0.450 for aggregate imports to as high as −1.414 on imports of low skill and

Table 5b. Imports, decomposed cultural distance measurerandom intercepts and random coeffients.

	ln aggregate imports$_{ijt}$	ln primary commodities$_{ijt}$	ln manf. goods$_{ijt}$	ln labor-intensive manf. goods$_{ijt}$	ln low skill & technology-intensive manf.$_{ijt}$	ln medium skill & technology-intensive manf.$_{ijt}$	ln high skill & technology-intensive manf.$_{ijt}$
	(a)	(b)	(c)	(d)	(e)	(f)	(g)
ln $\mid SSE_{it} - SSE_{jt} \mid$	0.0811	0.135	0.952**	1.131**	1.544**	1.746***	−0.260
	(0.293)	(0.316)	(0.378)	(0.535)	(0.639)	(0.506)	(0.386)
ln $\mid TSR_{it} - TSR_{jt} \mid$	−0.450*	−0.720**	−0.680**	−0.709*	−1.414***	−1.399***	−0.436
	(0.266)	(0.312)	(0.340)	(0.421)	(0.547)	(0.435)	(0.378)
ln GDP per capita$_{jt}$	1.609***	1.468***	1.672***	1.802***	1.066***	2.015***	2.202***
	(0.113)	(0.127)	(0.134)	(0.165)	(0.251)	(0.171)	(0.135)
ln population$_{jt}$	1.303***	1.334***	1.393***	1.303***	1.512***	1.474***	1.632***
	(0.0977)	(0.109)	(0.116)	(0.142)	(0.203)	(0.136)	(0.108)
ln trade openness$_{jt}$	0.217	0.0596	0.629***	0.597**	0.593	0.405	1.346***
	(0.182)	(0.202)	(0.220)	(0.238)	(0.387)	(0.273)	(0.232)
Δ ln exchange rate$_{ijt}$	−0.108	−0.426***	0.210	0.596***	0.375	0.548**	0.190
	(0.114)	(0.124)	(0.137)	(0.137)	(0.333)	(0.235)	(0.209)
ln geodesic distance$_{ij}$	−1.109***	−0.501	−2.002***	−1.597***	−2.111**	−2.152***	−1.960***
	(0.422)	(0.369)	(0.502)	(0.465)	(0.902)	(0.592)	(0.372)
Common border$_{ij}$	1.038**	1.633***	0.665	2.319***	0.531	0.539	0.219
	(0.457)	(0.592)	(0.570)	(0.839)	(1.012)	(0.769)	(0.776)
Landlocked$_j$	0.565*	0.402	0.402	0.593	−0.296	0.924*	−1.057**
	(0.292)	(0.358)	(0.377)	(0.527)	(0.647)	(0.485)	(0.437)
ln economic remoteness$_{jt}$	2.122***	3.309***	1.305***	1.726***	0.484	0.278	0.835**
	(0.409)	(0.391)	(0.480)	(0.498)	(0.835)	(0.552)	(0.348)
Accession to WTO$_{it}$	0.399***	0.117	0.802***	0.475***	1.115***	0.536***	0.269**
	(0.103)	(0.113)	(0.124)	(0.124)	(0.213)	(0.154)	(0.136)
Time (Trend)	0.149***	0.198***	0.104***	0.111***	−0.00283	0.0824***	0.108***
	(-0.011)	(0.012)	(0.013)	(0.014)	(0.023)	(0.017)	(0.014)
Constant	−22.40***	−37.23***	−12.73**	−22.27***	−4.354	−8.068	−19.06***
	(4.928)	(5.003)	(5.838)	(6.193)	(10.59)	(6.984)	(4.940)
Random intercepts:							
Number of regions ($j = 11$)							
Std. dev. (Constant)	0.601	15.20	0.419	14.42	0.164	0.321	2.533
	(0.380)	(13.611)	(0.460)	(13.45)	(0.460)	(0.571)	(10.11)
Number of recipients ($i = 88$)							
Std. dev. (Constant)	0.409	0.322	0.750**	1.259***	1.163***	1.053***	0.537
	(0.296)	(0.329)	(0.300)	(0.334)	(0.233)	(0.195)	(0.327)
Random coefficents:							
Std. dev. (ln ΔSSE_{ijt})	0.196	0.542***	0.584***	0.905***	0.906***	0.869***	0.784***
	(0.229)	(0.177)	(0.197)	(0.186)	(0.286)	(0.199)	(0.240)
Std. dev. (ln ΔTSR_{ijt})	0.154	0.348	0.182	1.101***	1.000***	0.899***	0.838***
	(0.219)	(0.225)	(0.326)	(0.305)	(0.261)	(0.201)	(0.234)
Std. dev. (Residual):	0.038*	0.039*	0.137***	0.101***	0.595***	0.283***	0.181***
	(0.022)	(0.021)	(0.023)	(0.026)	(0.022)	(0.022)	(0.022)
No. of observations	1426	1395	1402	1336	1230	1281	1325
Log-likelihood	−2127	−2201	−2351	−2244	−2637	−2352	−2280
Wald χ^2	2546***	2442***	1780***	1269***	309.2***	979.1***	1657***
LL ratio test vs. LR model	784.7	867.2	791.5	864.1	646.2	849.0	980.9

Note: See Table 4a notes.

technology-intensive manufactures. Thus, we can infer that a one percent increase in the $dTSR_{ijt}$ component of cultural difference between China and its typical trading partner is associated with, on average, a 0.45%, 0.72, 0.68, 0.709, 1.414 and 1.399% respective decrease in China's aggregate imports, imports of primary products, of aggregate manufactures, labor-intensive, low skill and technology-intensive manufactures, and medium skill and technology-intensive manufactures.

To the contrary, in four of the seven import regressions – namely, imports of all manufactured goods (0.952), the labor-intensive (1.131), low skill and technology-intensive (1.544) and medium skill and technology-intensive (1.746) manufactures – we observe statistically significant, but positive, coefficient estimates of the $dSSE_{ijt}$ variable. This indicates that while China's imports of the corresponding products decrease with greater distance along the traditional vs. secular-rationale dimension of culture, its imports increase with greater distance along the survival vs. self-expression dimension. These results indicate a one percent increase in the $dSSE_{ijt}$ distance from China for the typical trading partner is associated with, on average, respective increases of 0.952, 1.131, 1.54 and 1.746% in China's imports of manufactures in general, and specifically labor-intensive, low skill and technology-intensive, and medium skill and technology-intensive manufactures.

Given the opposite nature of the influences of the component dimensions of our cultural distance variable on China's bilateral imports, the largely muted sensitivity of China's imports to increases in the composite measure of cultural distance is, therefore, natural. Finally, besides the four cases in which we observe a clearly defined effect of the $dSSE_{ijt}$ variable, we fail to observe any effect of the variable in remaining three of the import regressions, meaning that in several instances China's bilateral imports remain less sensitive to cultural differences along the SSE ($dSSE_{ijt}$) dimension than has been reported in the literature for other countries.

4.3.3. Country-specific effects (BLUPs)

Our observations thus far suggest that China's bilateral trade flows are largely unaffected by cultural differences, especially when we consider the composite measure of cultural distance. To ascertain whether or not the observed average effects are found at the country level, given the random coefficients model we estimate, we examine the country-specific deviations from the general effects by computing the best linear unbiased predictions (BLUPs). In addition to informing us of the direction of the effects (i.e. positive or negative) for a given country's trade with China, these estimates enable us to identify whether or not the deviations from the average effect are large enough to make the country-specific effects of cultural distance statistically significant. On the condition that the corresponding average effects of the given measure reported in any of the prior tables are negative (indicating a rise in cultural distance is associated with a fall in China's bilateral trade flows), a statistically significant BLUP value reported in Tables 6a or 6b implies that the effect of cultural distance on China's trade with the given country is significantly higher (when the BLUP coefficient is negative) than what is implied by the average effect. A positive BLUP coefficient, on the other hand, implies that the effect of cultural distance on China's trade flows with the given country is significantly lower than what is implied by the average effect. Thus, if any statistically discernible effect of cultural distance has been masked by data pooling, we expect – possibly for a considerable number of trading partners – the corresponding country-specific effects to be statistically significant.

Table 6a and 6b report the corresponding country-specific deviations for the composite as well as the component dimensions together with their respective standard errors, obtained from estimations that examine aggregate exports (Table 6a) and imports (Table 6b), respectively.[10] Results presented in column (a) of Table 6a indicate that the country-specific effects

Table 6a. BLUPs (Aggregate exports of China).

	CDIST	DTSR	DSSE		CDIST	DTSR	DSSE
ISO3	(a)	(b)	(c)	ISO3	(a)	(b)	(c)
ALB	**−1.145(0.574)**	−0.39(0.448)	0.906(0.785)	JOR	0.563(1.166)	1.149(1.278)	0.771(1.467)
ARG	−1.147(1.357)	−0.382(1.025)	0.743(1.258)	JPN	**4.613(1.494)**	**1.956(0.963)**	**4.857(1.081)**
ARM	0.901(1.392)	−1.351(0.913)	−0.597(1.136)	KGZ	−0.292(2.010)	−4.082(1.642)	−0.668(1.392)
AUS	0.075(1.437)	0.444(0.503)	0.315(1.353)	LTU	−1.890(1.346)	**−0.654(1.443)**	**−2.522(1.182)**
AUT	−2.115(1.143)	**0.344(0.734)**	**−2.588(1.018)**	LUX	−0.483(1.884)	−1.536(0.938)	−2.472(1.883)
AZE	0.373(1.887)	**1.876(1.068)**	**3.699(1.009)**	LVA	**−1.781(0.557)**	−1.387(0.799)	−0.561(1.296)
BEL	−0.423(1.586)	0.290(0.791)	−0.855(1.543)	MAR	0.964(1.906)	1.485(1.305)	0.049(1.707)
BFA	−0.139(1.875)	−0.037(1.730)	−0.856(1.514)	MDA	**−2.369(0.527)**	**3.182(0.909)**	**−4.260(0.553)**
BGD	−0.166(1.291)	−2.622(1.724)	**−3.032(1.378)**	MEX	**3.199(0.794)**	**2.695(0.585)**	1.831(0.688)
BGR	−0.173(0.626)	0.034(0.809)	**−0.880(0.485)**	MKD	**2.976(0.753)**	**3.293(0.645)**	1.688(0.949)
BIH	**−4.581(1.16)**	**−4.036(0.879)**	**−4.997(0.855)**	MLI	1.053(1.845)	**0.863(1.594)**	2.985(1.662)
BLR	0.644(0.670)	−1.296(0.873)	0.816(0.622)	MLT	0.138(1.752)	−1.159(1.507)	−1.894(1.588)
BRA	−1.211(1.598)	−0.011(1.553)	0.858(1.123)	MYS	−0.030(1.947)	0.154(1.546)	−0.298(1.839)
CAN	−0.785(1.156)	−0.063(0.644)	**−0.530(1.061)**	NGA	1.522(1.195)	1.282(1.092)	**0.061(0.456)**
CHE	−0.474(0.965)	**−2.084(0.897)**	**−3.662(1.230)**	NLD	1.939(1.094)	0.285(0.675)	1.264(1.017)
CHL	−1.335(1.401)	−0.975(1.189)	−0.396(2.067)	NOR	0.085(0.722)	1.897(0.655)	**−1.360(0.838)**
COL	2.267(1.403)	**2.220(1.187)**	**4.351(1.528)**	NZL	−0.468(1.569)	−1.006(1.029)	−1.485(1.607)
CYP	−0.861(1.972)	−1.494(1.532)	−1.118(1.895)	PAK	−0.565(1.297)	−0.368(1.064)	0.174(0.482)
CZE	0.541(1.349)	0.701(0.645)	0.624(1.446)	PER	−0.965(1.335)	−0.427(1.197)	0.496(1.607)
DEU	**1.187(0.497)**	0.129(0.719)	1.313(0.873)	PHL	1.305(1.539)	2.185(1.453)	2.268(1.454)
DNK	0.541(1.171)	1.010(0.602)	0.211(1.084)	POL	−2.206(1.361)	−2.465(1.134)	−0.2470(0.53)
DOM	0.378(1.825)	0.462(1.451)	0.948(1.732)	PRT	−0.067(0.508)	−0.754(0.694)	0.880(0.775)
DZA	1.097(1.727)	−0.584(1.742)	−1.001(1.318)	ROK	1.664(1.445)	1.214(1.474)	1.436(1.639)
EGY	1.052(1.658)	1.510(1.675)	1.709(1.337)	ROM	−0.109(0.392)	0.278(0.853)	−0.499(0.995)
ESP	1.229(1.586)	0.813(0.840)	1.627(1.406)	RUS	0.522(0.661)	−1.334(1.199)	**−0.949(0.666)**
EST	**−2.949(1.016)**	−2.087(0.907)	−1.811(1.401)	RWA	−0.627(1.808)	0.069(1.695)	2.059(1.376)
ETH	0.303(2.008)	0.720(1.714)	1.046(1.770)	SAU	−1.633(1.712)	−1.823(1.480)	−0.920(1.659)
FIN	−0.481(1.304)	0.396(1.183)	−1.261(2.013)	SLV	1.175(1.489)	1.451(1.290)	**0.323(1.498)**
FRA	−0.25(1.422)	0.123(0.916)	−1.204(1.849)	SVK	−0.471(1.101)	−1.785(0.683)	−0.592(0.822)
GBR	0.291(1.200)	−1.315(1.521)	−1.023(1.218)	SVN	**2.695(1.334)**	0.227(1.048)	2.076(1.304)
GEO	0.362(1.829)	−2.578(1.062)	−0.153(0.990)	SWE	−0.270(1.135)	0.442(0.646)	−0.243(1.236)
GHA	0.791(1.507)	0.917(1.488)	**0.802(1.406)**	THA	0.219(1.975)	0.320(1.576)	0.650(1.866)

GRC	−0.057(2.017)	0.695(0.844)	0.192(2.055)	TTO	−0.971(1.710)	−0.589(1.554)	−0.052(1.482)
GTM	1.794(1.644)	1.661(1.543)	0.191(1.531)	TUR	−0.316(1.131)	−0.776(1.136)	−0.215(0.473)
HKG	0.723(1.543)	**0.199(0.690)**	2.497(1.304)	TZA	0.111(1.585)	0.451(1.496)	1.748(1.497)
HRV	**3.556(0.493)**	**1.139(0.464)**	**3.459(0.844)**	UKR	−0.730(1.119)	2.203(0.663)	**−1.278(0.760)**
HUN	0.513(0.721)	0.760(0.397)	0.237(0.681)	URY	0.030(1.160)	−0.658(1.099)	−0.526(0.827)
IDN	0.082(2.006)	0.624(1.769)	−0.193(1.483)	USA	−0.245(1.418)	0.392(1.589)	−0.291(1.245)
IND	−1.211(1.384)	−0.071(1.589)	**0.191(1.060)**	VEN	−1.731(1.510)	−1.821(1.324)	−1.070(1.583)
IRL	0.727(1.627)	1.347(1.239)	−0.036(1.637)	VNM	−0.090(2.016)	0.706(1.620)	1.604(1.902)
IRN	−0.107(1.610)	0.375(1.485)	0.470(0.987)	YUG	−1.766(1.738)	−1.288(1.667)	−1.443(1.912)
ISL	−0.829(1.364)	2.614(0.817)	0.062(1.319)	ZAF	−2.029(1.473)	−1.938(1.314)	**−1.654(1.359)**
ISR	−0.271(2.014)	0.415(1.195)	−1.268(2.069)	ZMB	−0.047(2.008)	−0.421(1.790)	−0.350(1.581)
ITA	−0.937(1.741)	−0.502(0.881)	−0.400(1.776)	ZWE	−0.404(1.709)	−1.845(1.14)	−0.776(0.835)

Note: Bold font indicates that corresponding BLUP is statistically different from zero at $p < 0.05$.

Table 6b. BLUPs (Aggregate imports of China).

	CDIST	DTSR	DSSE		CDIST	DTSR	DSSE
ISO3	(a)	(b)	(c)	ISO3	(a)	(b)	(c)
ALB	**−2.9(1.025)**	**−3.688(0.921)**	**−4.951(1.129)**	JOR	0.903(0.785)	1.348(0.834)	1.087(1.446)
ARG	−0.349(0.839)	−0.158(0.691)	−0.47(0.941)	JPN	−0.074(0.976)	−0.32(0.855)	0.155(1.017)
ARM	0.417(1.114)	0.544(0.904)	1.453(1.029)	KGZ	1.632(1.102)	1.233(1.155)	−0.223(1.364)
AUS	−0.151(0.79)	−0.245(0.763)	−0.299(0.754)	LTU	0.953(1.107)	0.856(1.081)	1.047(1.101)
AUT	−0.657(0.801)	−0.206(0.881)	−0.52(0.789)	LUX	0.424(0.873)	−0.232(0.915)	0.839(0.853)
AZE	−0.342(1.226)	0.312(0.896)	1.555(1.131)	LVA	1.416(0.919)	1.377(0.842)	1.422(1.043)
BEL	1.067(0.871)	0.969(0.936)	1.471(0.883)	MAR	0.819(0.885)	0.861(0.894)	0.319(1.486)
BFA	0.694(0.882)	0.604(0.711)	−0.227(1.316)	MDA	1.511(0.911)	0.964(0.897)	**1.724(0.837)**
BGD	−1.432(0.848)	−1.142(0.918)	−0.11(1.396)	MEX	0.458(0.729)	0.135(0.625)	−0.046(0.891)
BGR	−0.398(0.952)	−0.199(0.989)	−0.545(0.883)	MKD	1.027(1.074)	1.67(1.022)	**2.734(1.308)**
BIH	−1.313(1.186)	−1.634(1.101)	−1.491(1.343)	MLI	0.981(0.845)	0.646(0.64)	1.751(1.155)
BLR	0.175(0.971)	0.062(0.977)	0.19(0.976)	MLT	**2.334(0.764)**	**2.437(0.578)**	0.926(1.115)
BRA	−0.257(0.808)	−0.218(0.651)	0.199(0.913)	MYS	0.791(0.913)	0.851(0.709)	0.757(1.097)
CAN	0.721(0.737)	−0.062(0.798)	0.272(0.747)	NGA	−0.168(0.747)	−0.085(0.598)	0.225(0.853)
CHE	0.355(0.756)	0.061(1.003)	0.339(0.838)	NLD	0.687(0.733)	0.125(0.97)	0.773(0.772)
CHL	0.996(0.886)	0.962(0.709)	0.954(1.17)	NOR	−0.271(0.699)	0.038(0.827)	−0.259(0.681)
COL	−1.21(0.711)	**−0.875(0.611)**	−0.423(1.015)	NZL	−0.311(0.811)	−0.469(0.891)	−0.454(0.764)
CYP	**−2.06(0.939)**	**−2.116(0.735)**	−1.237(1.086)	PAK	−0.743(0.813)	−0.124(0.687)	1.532(0.973)
CZE	0.064(1.016)	0.308(0.913)	0.129(1.057)	PER	1.166(0.805)	1.108(0.641)	1.006(1.157)
DEU	0.573(0.744)	0.288(0.737)	0.752(0.753)	PHL	0.456(0.807)	0.595(0.635)	0.086(1.151)
DNK	0.395(0.729)	0.438(0.907)	0.43(0.746)	POL	−0.694(0.961)	−0.431(0.77)	−0.226(0.969)
DOM	−1.181(0.845)	**−1.24(0.679)**	−1.485(1.039)	PRT	−0.296(0.72)	−0.095(0.652)	0.089(0.9)
DZA	−0.557(0.772)	**−1.107(0.745)**	**−3.082(1.306)**	ROK	0.1(1.204)	0.094(1.159)	0.164(1.364)
EGY	−0.831(0.736)	−0.756(0.673)	−0.794(1.278)	ROM	−0.173(0.744)	0.159(0.66)	−0.069(0.844)
ESP	0.07(0.913)	0.229(0.82)	0.156(0.956)	RUS	0.547(1.011)	−0.069(1.127)	0.621(1.071)
EST	−0.211(1.12)	−0.203(1.008)	−0.651(1.142)	RWA	−0.379(0.814)	−0.408(0.685)	−1.136(1.281)
ETH	−1.466(1.009)	**−1.607(0.791)**	−1.501(1.271)	SAU	0.404(0.763)	0.434(0.624)	0.286(1.075)
FIN	0.522(0.854)	0.866(1.041)	0.826(0.973)	SLV	**−1.426(0.674)**	**−0.97(0.581)**	−1.997(1.007)
FRA	−0.543(0.885)	0.176(0.913)	−0.463(0.925)	SVK	−0.844(1.167)	**−1.628(1.032)**	−1.287(1.267)
GBR	−0.07(0.753)	−0.013(0.914)	−0.087(0.74)	SVN	0.705(1.059)	0.441(1.142)	0.962(1.24)
GEO	0.117(1.246)	0.625(0.918)	0.441(1.095)	SWE	0.296(0.658)	−0.285(0.825)	0.429(0.647)
GHA	0.759(0.735)	0.769(0.579)	0.252(1.146)	THA	0.625(0.945)	0.686(0.732)	0.649(1.128)

GRC	−1.344(1.029)	−0.675(0.984)	−1.805(1.125)	TTO	−1.244(0.785)	**−1.251(0.61)**	−1.449(1.209)
GTM	−0.439(0.745)	−0.683(0.612)	−0.563(1.17)	TUR	−1.236(0.854)	**−1.043(0.686)**	−0.806(0.887)
HKG	−0.01(1.207)	−0.016(0.837)	0.235(1.018)	TZA	−0.495(0.699)	−0.379(0.571)	0.429(1.154)
HRV	−0.855(0.815)	−0.6(0.645)	−0.284(0.938)	UKR	0.058(1.182)	−1.295(1.022)	−0.095(1.229)
HUN	−0.222(1.043)	0.379(0.798)	−0.708(1.062)	URY	0.306(0.866)	0.003(0.813)	0.461(0.881)
IDN	−0.569(1.114)	−0.483(1.015)	0.06(1.386)	USA	−0.025(0.711)	−0.277(0.775)	−0.446(0.778)
IND	0.121(1.005)	−0.112(0.869)	−0.396(1.117)	VEN	−0.621(0.732)	−0.354(0.609)	−0.13(1.034)
IRL	0.7(0.729)	0.681(0.702)	0.74(0.859)	VNM	−0.155(1.08)	−0.027(0.858)	−0.188(1.267)
IRN	1.134(0.832)	1.071(0.673)	0.249(1.182)	YUG	−0.002(1.255)	0.09(1.214)	−0.142(1.502)
ISL	−0.93(0.759)	0.156(0.913)	−0.93(0.749)	ZAF	−0.402(0.838)	−0.232(0.661)	−0.157(1.187)
ISR	−0.153(1.03)	−0.008(0.928)	−0.428(1.076)	ZMB	1.19(1.007)	1.081(0.847)	0.221(1.339)
ITA	0.579(0.904)	0.379(0.879)	0.726(0.925)	ZWE	0.762(0.761)	0.91(0.706)	0.434(1.191)

Note: Bold font indicates that corresponding BLUP is statistically different from zero at $p < 0.05$.

Table 7. Summary of the statistical significance and signs of the coefficients of the variables in the model as observed from alternative estimation methods.

					Exports[d]														Imports[d]														
					Silva and Tenreyro (2006): PPML							Random effects panel (with year dummies)							Silva and Tenreyro (2006): PPML							Random effects panel (with year dummies)						
Variable	Exp. Sign	% Obs. = Exp. Sign and Signif.	% of Obs. != Exp. Sign and Signif.	% Obs. insig.	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(a)	(b)	(c)	(d)	(e)	(f)	(g)
ln cultural distance$_{ijt}$	–	7.1%	3.6%	89.3%	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	–	.	.	–	.	+	.	.	.	.	.	.	.
ln ΔSSE$_{ijt}$	–	7.1%	14.3%	78.6%	.	+	.	.	.	–	.	.	.	.	.	.	.	.	.	–	+	.	.	.	+	.	.	.	.	.	+	.
ln ΔTSR$_{ijt}$	–	25.0%	0.0%	75.0%	.	.	.	.	.	.	.	.	.	.	.	.	.	.	–	.	.	.	–	–	.	–	–	.	.	–	–	.
ln GDP per capita$_{jt}$	+	100.0%	0.0%	0.0%	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
ln population$_{jt}$	+	100.0%	0.0%	0.0%	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
ln geodesic distance$_{ij}$	–	96.4%	0.0%	3.6%	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	.	–	–	–	–	–	–	–	–	–	–	–	–
Δ ln exchange rate$_{ijt}$	+/–[a]	39.3%	3.6%	57.1%	–	.	–	.	.	.	–	–	–	.	–	–	–	–	.	.	.	.	.	.	.	.	+	–	.	.	+	.
ln economic remoteness$_{jt}$	+	64.3%	0.0%	35.7%	+	.	+	+	+	+	+	+	+	.	.	+	+	+	+	+	.	+	.	.	+	+	.	+	+	.	.	.
ln trade openness$_{jt}$	+	57.1%	0.0%	42.9%	+	+	+	+	+	+	+	.	.	.	.	.	.	.	+	+	+	+	.	+	+	.	+	.	.	+	.	+
Accession to WTO$_{it}$	+	75.0%	7.1%	17.9%	+	–	+	.	.	+	+	+	+	+	+	+	+	+	.	.	+	–	+	.	+	+	+	+	+	+	+	+
Common border$_{ij}$	+	67.9%	10.7%	21.4%	+	+	+	+	+	+	+	+	+	+	+	+	+	+	.	.	–	+	.	–	–	+	+	+	+	.	.	.
Landlocked$_{j}$	–	14.3%	10.7%	75.0%	.	–	.	.	–	.	.	.	.	–	.	–	.	.	.	.	.	.	.	+	.	+	.	+	.	.	.	.
Cultural distance measures		13.1%	6.0%	81.0%																												
Core gravity variables[b]		85.7%	2.1%	12.1%																												
Augmenting variables[c]		46.4%	5.4%	48.2%																												
Overall (all variables)		54.5%	4.2%	41.4%																												

Notes: '.' denotes that corresponding coefficient is not statistically different from zero. [a] Expected signs are negative (positive) when export (import) measures are employed as the dependent variable series. [b]Core gravity variables are GDP per capita and Population, Geodesic distance, Economic remoteness, and Common border. [c] Augmenting variables are Δ Exchange Rate, Trade Openness, and Landlocked. Column headings (a) through (g) are the the same set of dependent variable series used in Tables 3a and 3b. [d] With the exception of the spefication involving the component dimensions of cultural distance, which has the same variables as in Table 5b, all the specifications used for the robustness checks of our results have the same set of control variables reported in Table 5a.

significantly deviate from the average effects of the composite measure of cultural distance reported in Tables 4a for only 11 of the 88 countries in our sample (12.50%). In the remaining 77 countries (i.e. 87.50% of the cases), the country-specific deviation is not large enough to be statistically different from the average effect. Of the 11 countries for which the deviations are statistically significant, we find that the composite measure of cultural distance has a negative effect on China's exports only in five countries. In the remaining six countries, the effect is positive, implying that a rise in the cultural distance is associated with a relatively low effect on China's exports to the given countries than implied by the average effects.

Similarly, when examining China's imports (Table 6b), country-specific deviations are statistically significant for only four of the 88 countries in our study (4.5%): negative for three trading partners, and positive for only one country. Of the 11 trading partners (for exports) and four trading partners (for imports) in which the composite measure of cultural difference has a statistically significant effect, the effects are significant on both bilateral imports and exports for only one country (Albania), effectively indicating that even among trading partners where we observe statistically significant effects of cultural differences, the effects are neither consistent nor bidirectional (i.e. applicable to both exports and imports).

Combined with the lack of statistically significant deviations of the country-specific effects for a number of countries, given that the average effect is not statistically significant, the inconsistency in the observed effects of cultural distance across exports and imports suggests that while consistent with the predictions from the gravity model, China's trade flows are not as sensitive to the influence of cultural differences as observed in other countries.[11] Two important generalizations can be made from these findings. First, as described earlier, the observation that in 77 of the countries included in the present study (87.5%), the country-specific deviations are not statistically significant lends strong support to the notion that China's bilateral trade flows are broadly less sensitive to cultural differences than what has been reported for OECD countries. Second, our observation of statistically significant country-specific deviation in more countries for exports (11 countries) than imports (four countries) implies that China's imports tend to be less sensitive to cultural barriers than its exports.

4.4. Robustness checks

We estimate an augmented gravity specification using a mixed effects model to examine the determinants of China's bilateral trade flows with 88 trading partners from 11 sub-regions for which relevant data on cultural distance are available. Our econometric model and estimation procedure accounts for the variation in the structure of China's bilateral trade flows due to regional trade orientation and, within each regional cluster, for the differences across trading partners. Accounting for unobserved heterogeneity due to regional and country-specific fixed effects, results obtained from the random coefficient model estimation of our specification reveal that while the pattern of China's bilateral trade flows typically falls within the bounds of the standard gravity model's predictions, it is less sensitive to and/or generally unaffected by cultural differences between China and its trading partners.

Given the estimation approach we employ, our results are rigorous and more detailed than similar studies that have examined the link between trade flows and cultural differences; however, as we use the gravity model of trade, our results may be subject to the limitations of the gravity model estimation. Silva and Tenreyro (2006), for example, argue that even after controlling for fixed effects, the presence of heteroskedasticity can generate strikingly different estimates when the variables are log-linearized rather than estimated in levels. Hence, the use of Pseudo-Maximum Likelihood estimation method is suggested. With this critique in mind, we check the robustness of our results by estimating our empirical model of China's bilateral trade flows using the Poisson Pseudo-Maximum Likelihood (PPML) as well as the traditional two-way error component panel data models, in which we include time fixed effects.

Table 7 presents summaries of the signs and statistical significances of the variables in our model obtained from these alternative estimations.[11] The figures in the table indicate that when the alternative estimation approaches are used the composite measure of the cultural distance variable bears a statistically significant and positive coefficient for only 7.1% of the regressions and has negative coefficients in 3.6% of the estimated regressions. In an overwhelmingly large proportion (85.7%) of the estimations, the coefficient of composite measure of cultural distance remains statistically insignificant. Indeed, this is the case for 100% of the regressions estimated using the PPML method. A near uniform result is also found when the component dimensions of our composite cultural distance variable are employed. With the exception of two instances, all estimated coefficients are found to have statistically insignificant coefficients.

On the contrary, a number of the standard gravity variables as well as the augmented gravity variables that are included in our specification not only have coefficients that are both statistically significant and consistent with the results obtained from estimation of the mixed effects model but also bear the theoretically expected a priori signs. For example, while the coefficient of distance variable remains statistically significant and negative in all regressions except one, the coefficient of the exchange rate variable is significant and of the expected sign in 39.3% of the regressions obtained from the PPML and the typical random effects panel data model techniques, respectively. The effects of both market size and purchasing power remain positive and statistically significant across all estimations, indicating the robustness of our findings.

5. Conclusion

Often referred to as 'the world's manufacturing hub', China has emerged as one of the world's top trading countries, moving from being the 11th most active trader in the world in 1995 to the 2nd most active in 2011 (World Bank 2014). The most recent decade of globalization has also been a time period of a pronounced rise of the scope and scale of involvement of other developing economies – societies that differ, often considerably, in terms of their attitudes, values, behaviors, and norms (i.e. their cultures). Only a few studies, however, have examined the determinants of China's external trade flows. Given that China's economic ascent has corresponded with increased integration of other developing countries into the global economy, we examine the extent to which information asymmetries associated with cultural differences influence China's bilateral trade flows.

Using data that span the period from 1995 to 2011 for 88 trading partners from 11 sub-regions across the word, and employing the standard gravity model, we examine the relationship by estimating a random coefficients and random intercept mixed effects model. In addition to accounting for differences across regions as well as, within each region, cross-country variations, our model permits us to control for unobserved heterogeneity in

China's bilateral trade flow structure with its trading partners across time periods. Results obtained from our estimations indicate that despite its very impressive and sharp growth, China's bilateral exports and imports consistently fall with the bounds of predictions from the standard gravity model: that China's bilateral exports and imports increase with the purchasing power and market size of its trading partners, and decrease with a rise in costs of transportation (geodesic distance), partner's lack of access to the sea, and a rise in the pace at which RMB appreciates (for exports) and or depreciates (for imports) against the trading partners' national currencies.

Nonetheless, both at the aggregate and disaggregate trade levels, and across the composite and component dimensions of cultural distance measures, we find consistent and econometrically robust estimates that indicate China's bilateral trade flows (i.e. its exports as well as imports) are largely less sensitive and/or unaffected by cultural differences than is reported for other countries. While we observe instances where cultural distance does appear to influence China's bilateral trade flows, particularly when decomposing the composite measure of cultural difference into its component dimensions, the effects vary across the dimensions and fail to persist across export and/or import categories. On the assumption that heterogeneity in the trade margins across trading partners could dampen the average effects, resulting in statistically insignificant coefficients, we also examine country-specific deviations of the observed effects by estimating the Best Linear Unbiased Predictors (BLUPs) for each of the countries included in our study. Results from the corresponding estimates show statistically significant effects of cultural distance in only 15 (for exports) and six (for imports) of the 88 partners in the study, implying that China's bilateral trade flows are sensitive to cultural differences only in a few exceptional instances. Comparing the relative sensitivity of the exports and import sectors, however, we observe that the export sector depicts relatively high sensitivity to cultural barriers than the import sector.

Finally, given our research objective and data, as we cannot attribute the outcome to any particular factor, the observation that China's bilateral trade flows remains within the bounds of the standard gravity model predictions but is less sensitive to information asymmetries arising from cultural distance needs further explanation. Whether it is perhaps the result of China's government playing an active role in setting the playing fields for the firms involved in exporting or importing and/or the inter-governmental efforts to promote cultural communication and enhancing economic cooperation, and, consequently, lowering the costs of information asymmetry should be a subject of future research interest.

Disclosure Statement

In accordance with Taylor & Francis policy and our ethical obligations as researchers, we are reporting that we have no financial and/or business interests in, are consultants to, or receive funding from any company that may be affected by the research reported in the enclosed paper.

Notes

1. In Equation (1), $\pi_i^{(1-\sigma_k)} = \sum_i \frac{Y_j}{Y}\left(\frac{\tau_{ij}}{P_i}\right)^{1-\sigma_k}$ and $P_j^{(1-k)} = \sum_i \frac{Y_i}{Y}\left(\frac{\tau_{ij}}{\pi_i}\right)^{1-\sigma_k}$.

$$+ \exp\left(\alpha_5 BORD_{ij} + \alpha_6 LLOCK_j + \alpha_7 WTO_{it}\right)$$

2. Internal distance, when $k = j$, is calculated as $0.4 \times \sqrt{\text{Land Mass}_i}$ (Head and Mayer 2000).
3. Since we provide a detailed overview of the cultural distance variable in Section 3.2, we refrain from adding duplicate detail here.
4. Given that country i (i.e. China) is the reference country, its economic mass is subsumed into the time/year variable.
5. A panel unit root test of each of the trade flow variables, population and GDP variables rejects (at $p < 0.001$) the null hypothesis of that the panels contain unit root against the alternative that the panels are trend stationary. Our use of the centered measure of trend computed as the number of years prior to or since 2003, thus permits to make a meaningful inference of the predicted values of the dependent variable series at the mean of control variables.
6. We also estimate Equation (4) by substituting the composite cultural distance measure with its component dimensions, dTSR and dSSE.
7. When constructing our measure of cultural distance for the years 1995–1999, we employ data from Wave 3 (conducted during 1995–1998) of the WVS. Similarly, data from Wave 4 (1999–2004) of the WVS are used to construct our cultural distance measure for years 2000 through 2005, and data from Wave 5 (2005–2009) are used when constructing our cultural distance measure for years 2006–2011.
8. Cultural distance is calculated as $CDIST_{ijt} = \sqrt{\left(\text{SSE}_{jt} - \text{SSE}_{it}\right)^2 + \left(\text{TSR}_{jt} - \text{TSR}_{it}\right)^2}$.
9. Given the tendency of the macroeconomic variables to increase overtime, we conduct panel unit root tests of the respective variables using two different methods: the Levin, Lin, and Chu (2002) approach and the Im, Pesaran, and Shin (2003) approach. The Levin, Lin, and Chu (2002) approach imposes a more restrictive assumption that all panels have a common autoregressive parameter and, hence, requires a strongly balanced data-set. Thus, we restrict our data to include only the 81 countries (of the 88 in our full data-set) for which the data-set is balanced. The Im, Pesaran, and Shin (2003) approach permits each panel to have its own autoregressive parameter to evaluate the null hypothesis that all panels have a unit root against the alternative that only a fraction of the panels are stationary. When employing this approach, we utilize the full unbalanced data-set.
10. While the same could be done for product categories, we restrict our analysis of the country-specific deviations to aggregate exports and imports for brevity.
11. Tadesse and White (2010b) for example, report cultural distance imposes negative and statistically significant effects on bilateral trade flows of nine OECD member countries with 67 other countries.
11. Tables with detailed results obtained from using aggregate bilateral exports and imports as the dependent variable series for each of the estimations used in the robustness checks are available upon request.

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Appendix

Table A1. Panel descriptive statistics, dependent variable series.

Variable		Mean	Std. Dev.	Min.	Max.	Observations
Exports_{ijt}						
Aggregate_{ijt}	Overall	7084.23	24,900.00	0.09	330.00	$N = 1426$
	Between		21,000.00	9.18	131.00	$n = 88$
	Within		15,100.00	−99,300.00	206.00	T-bar = 16.2045
Primary commodities_{ijt}	Overall	383.87	1,271.49	1.90	14,000.00	$N = 1413$
	Between		1,347.90	0.17	8.38	$n = 88$
	Within		538.66	−2,698.49	6.00	T-bar = 16.0568
Manufactured goods_{ijt}	Overall	6549.94	23,400.00	94,952.00	310.00	$N = 1426$
	Between		19,400.00	8191.17	126,000.00	$n = 88$
	Within		14,300.00	−96,600.00	190,000.00	T-bar = 16.2045
Labor-intensive $\text{manufactures}_{ijt}$	Overall	1924.29	6,406.39	0.04	93,000.00	$N = 1426$
	Between		5,464.35	1.22	40,100.00	$n = 88$
	Within		3,363.59	−26,100.00	54,900.00	T-bar = 16.2045
Low skill & tech.-intensive manf._{ijt}	Overall	654.23	1,989.63	0.72	26,000.00	$N = 1422$
	Between		2,120.90	1.67	15,000.00	$n = 88$
	Within		1,261.33	−8,798.72	15,100.00	T-bar = 16.1591
Med skill & tech.-intensive manf._{ijt}	Overall	1,252.24	4,315.34	0.01	62,000.00	$N = 1425$
	Between		3,394.26	1.69	23,000.00	$n = 88$
	Within		2,828.44	−18,400.00	40,200.00	T-bar = 16.1932
High skill & tech.-intensive manf._{ijt}	Overall	2,543.59	10,700.00	3.18	140,000.00	$N = 1423$
	Between		8,454.18	0.68	51,900.00	$n = 88$
	Within		7,098.96	−42,700.00	90,700.00	T-bar = 16.1705
Imports_{ijt}				0.00	0.00	
Aggregate_{ijt}	Overall	4,662.46	15,000.00	0.00	190,000.00	$N = 1426$
	Between		20,000.00	3.30	160,000.00	$n = 88$
	Within		8,848.91	−52,900.00	109,000.00	T-bar = 16.2045
Primary commodities_{ijt}	Overall	1,571.05	5,105.51	0.00	79,000.00	$N = 1395$
	Between		3,658.32	0.41	19,000.00	$n = 88$
	Within		3,935.31	-14,600.00	62,300.00	T-bar = 15.8523
Manufactured goods_{ijt}	Overall	3,080.86	12,700.00	0.00	180,000.00	N = 1403
	Between		17,600.00	0.01	140,000.00	n = 88
	Within		6,867.07	-50,600.00	103,000.00	T-bar = 15.9432
Labor-intensive $\text{manufactures}_{ijt}$	Overall	210.50	666.37	0.00	7,200.00	$N = 1336$
	Between		744.63	0.00	4,805.88	$n = 88$
	Within		210.17	−1295.39	2,604.61	T-bar = 15.1818
Low skill & tech.-intensive manf._{ijt}	Overall	236.83	1,066.72	0.00	15,000.00	$N = 1230$
	Between		1,080.97	0.00	7,382.35	$n = 88$
	Within		549.65	−4,245.52	7,854.48	T-bar = 13.9773
Med skill & tech.-intensive manf._{ijt}	Overall	1181.82	5,530.18	0.00	83,000.00	$N = 1281$
	Between		5,034.68	0.00	31,800.00	$n = 88$
	Within		3,340.69	−21,300.00	52,400.00	T-bar = 14.5568
High skill & tech.-intensive manf._{ijt}	Overall	1643.25	6,498.15	0.00	100,000.00	$N = 1325$
	Between		11,500.00	0.00	100,000.00	$n = 88$
	Within		3,430.05	−23,800.00	39,900.00	T-bar = 15.0568

Trade flow values are in millions of current USD.

Table A2. Panel descriptive statistics, control variables.

Variable	*A priori* expected sign		Mean	Std. dev.	Min.	Max.	Observations
Cultural distance$_{ijt}$	–	Overall	1.99	0.88	0.11	3.67	$N = 1426$
		Between		0.88	0.25	3.57	$n = 88$
		Within		0.19	1.16	2.82	T-bar = 16.2045
$\lvert SSE_{it} - SSE_{jt} \rvert$	–	Overall	1.19	0.88	0.00	3.51	$N = 1426$
		Between		0.86	0.12	3.25	$n = 88$
		Within		0.20	0.60	1.98	T-bar = 16.2045
$\lvert TSR_{it} - TSR_{jt} \rvert$	–	Overall	1.31	0.90	0.00	3.26	$N = 1426$
		Between		0.88	0.14	3.00	$n = 88$
		Within		0.21	0.67	1.78	T-bar = 16.2045
Population (Millions)$_{jt}$	+	Overall	49.50	127.00	267.46	1200.00	$N = 1441$
		Between		125.00	0.29	1100.00	$n = 88$
		Within		10.20	−92.80	147.00	T-bar = 16.375
GDP per capita$_{jt}$	+	Overall	9880.87	11,794.38	114.84	56,389.00	$N = 1426$
		Between		11,656.76	152.45	47,716.20	$n = 88$
		Within		1493.87	−996.03	19,016.95	T-bar = 16.2045
Economic remoteness$_{jt}$	+	Overall	5085.50	2621.50	1395.77	12,365.20	$N = 1426$
		Between		2605.28	1460.59	12,310.68	$n = 88$
		Within		89.94	4593.43	5361.52	T-bar = 16.2045
Trade openness$_{jt}$	+	Overall	84.94	51.93	14.93	447.00	$N = 1426$
		Between		49.58	22.78	338.17	$n = 88$
		Within		14.19	−4.75	193.77	T-bar = 16.2045
ln exchange rate$_{ijt}$	+/–[a]	Overall	0.06	0.25	−0.33	6.45	$N = 1426$
		Between		0.08	−0.03	0.45	$n = 88$
		Within		0.24	−0.49	6.07	T-bar = 16.2045
Common border$_{ij}$	+	Overall	0.07	0.26	0.00	1.00	$N = 1426$
		Between		0.25	0.00	1.00	$n = 88$
		Within		0.00	0.07	0.07	T-bar = 16.2045
Geodesic distance$_{ij}$	–	Overall		3763.62	1168.17	19,110.10	$N = 1426$
		Between		3808.79	1168.17	19,110.10	$n = 88$
		Within		0.00	8786.47	8786.47	T-bar = 16.2045
Landlocked$_{j}$	–	Overall	0.20	0.40	0.00	1.00	$N = 1426$
		Between		0.41	0.00	1.00	$n = 88$
		Within		0.00	0.20	0.20	T-bar = 16.2045
Accession to WTO	–	Overall	0.59	0.49	0.00	1.00	$N = 1426$
		Between		0.07	0.46	1.00	$n = 88$
		Within		0.49	−0.24	1.13	T-bar = 16.2045

[a]Expected signs are negative (positive) when export (import) measures are employed as the dependent variable series. The descriptive stats were generated by restricting the observations to countries with a balanced panel.