THE JOURNAL OF THE KOREAN ECONOMY, Vol. 9, No. 2 (August 2008), 179-204

The Influence of Cultural Factors on Trade in Agricultural Products*

Kuo-I Chang** · Kazunobu Hayakawa*** · Hyun-Hoon Lee****

The purpose of this paper is to investigate the ways in which cultural factors such as language, religion and colonial ties affect trade in agricultural products, as compared with trade in manufactured goods. Using the augmented gravity model, we find that commonality of language, religion and a colonial relationship between trading countries enhance trade in agricultural products more significantly than trade in manufactured goods. This result implies that trade in agricultural products depends more heavily on cultural ties between the trading partners than trade in manufactured goods. This greater effect of cultural ties on agricultural trade remains, even upon analyzing differentiated agricultural products and manufactured goods.

JEL Classification: N50, Q10, Q17
Keywords: culture, gravity model, agricultural trade

* Received March 10, 2008. Accepted July 20, 2008. We would like to thank two referees of this Journal, Masayoshi Honma, Katsuhiro Saito, Kazunari Tsukada, Arata Kuno, and Chris Wolfe for their helpful comments and suggestions. We also thank Chul Chung and participants in the Asia Pacific Trade Seminars (APTS) Meeting 2006 held at Kobe University. Any errors are ours.

** Department of Applied Economics, National Chung Hsing University, Taiwan.
*** Inter-Disciplinary Studies Center, Institute of Developing Economies, Japan.
**** Author for Correspondence, Division of Economics and International Trade, Kangwon National University, Chuncheon, 200-701, South Korea, Tel: 82-33-250-6186, Fax: 82-33-256-4088, E-mail: hhlee@kangwon.ac.kr

1. INTRODUCTION

Customer tastes or preferences in the sector of agricultural products generally diverge to a far greater extent than is the case for manufactured goods. For example, in some regions of the world people never eat specific types of food for reasons connected with the particular local religion. Thus, the locally preferred types and quality of agricultural products depend heavily on the local environment and food culture.

Cultural differences lead to divergence of tastes and preferences, and this situation may have the effect of discouraging trade. The role of cultural factors, such as language, religion, and colonial history in influencing merchandise trade has been under investigation for a great length of time. A large number of published papers include reports of empirical investigations into the effect of cultural ties on trade in manufactured goods in particular. Scholars have performed econometric studies on the role of cultural ties in trade by introducing dummy variables into a gravity equation, and this technique has proved to be a very successful tool for explaining the volume of bilateral trade under variable conditions (see, for example, Havrylyshyn and Pritchett, 1991; Foroutan and Pritchett, 1993; Boisso and Ferrantino, 1997; Guo, 2004; Noland, 2005). In these studies, a positive relationship has been consistently found between cultural ties and merchandise trade.

The purpose of this paper is to empirically investigate the question of whether trade in agricultural products depends more heavily on cultural ties between trading partners than is the case for trade in manufactured goods. In general, differences in tastes or preferences for products between trading countries strongly discourage international trade between those countries. Therefore, due to the more divergent tastes for agricultural products, similarity of taste would be expected to have a far greater effect on volume of trade in agricultural products than on that in manufactured goods. As a result, since closer cultural ties between countries lead to greater similarity of taste between those countries, cultural ties affect trade in agricultural products far more strongly than trade in manufactured goods.

Indeed, we can find evidence of larger volumes of trade between countries with closer cultural ties. In 1999, European Union countries imported nearly 99.83% of total Moroccan potato exports. In particular, France, which was once a colonizer of Morocco, is by far the largest importer of Moroccan potatoes (World Potato Congress[1)]). Argentina is the second largest exporter of corn in the world and exports a large proportion of the corn to Portugal and Spain, which colonized Argentina from the sixteenth century to the nineteenth century (The World of Corn[2)]). Also, in the opposite direction, Algeria imports a major proportion of its sugar from its former colonizer, France (UN Comtrade). It can certainly be said that this evidence indicates a close relationship between trade in agricultural products and colonial ties.

Using the trade data for 118 countries, we estimate augmented gravity equations for trade in agricultural products and manufactured goods separately. Then, we test whether the estimated coefficients for cultural variables differ between agricultural and manufacturing trade. On applying this procedure, we find that commonality of language, religion and former colonial relationship enhance agricultural trade more than manufacturing trade. Based on Rauch (1999)'s classification, the gravity equation is also regressed for trade only in differentiated agricultural products and manufactured goods. Our finding is that, even in differentiated products, agricultural trade is more sensitive to cultural ties than manufacturing trade.

The remainder of this paper is organized as follows. Section 2 sets out our gravity model and methodology for empirical analysis. In section 3 we outline data issues. In section 4 we set out our empirical results, and section 5 provides the results of robustness checks. Section 6 contains our concluding remarks.

---

1) http://www.potatocongress.org
2) http://www.ncga.com/WorldOfCorn/main/index.htm

2. EMPIRICAL SPECIFICATION

In this section we provide a gravity equation to be employed in regression analysis. Since Tinbergen (1962) and Pöyhönen (1963) it has been well known that the simple gravity equation, in which the volume of trade between two countries is proportional to the product of their masses (GDPs) and inversely related to the distance between them, is empirically highly successful. Recently, with renewed interest among economists in geography, it has again become widely used in the literature. Indeed, many researchers have shown that the gravity equation can be derived from many different models of international trade (Helpman and Krugman, 1985; Bergstrand, 1989; Deardorff, 1998; Evenett and Keller, 1998; Eaton and Kortum, 2002).[3] Thus, it possesses "more theoretical foundation than any other trade model" (Baldwin, 2006).

A standard gravity equation takes the following form

$$\ln T_{ij} = \alpha_0 + \alpha_1 \ln GDP_i + \alpha_2 \ln GDP_j + \alpha_3 \ln Distance_i + \varepsilon_{ij}. \qquad (1)$$

T_{ij} denotes import values of country i from country j,[4] GDP_i denotes Gross Domestic Product of country i, $Distance_{ij}$ is the geographical distance between countries i and j, and ε_{ij} is a disturbance term. In the equation above, as explained later, we include variables such as a relative distance measure, GDP per capita, land area, a dummy variable to capture the country pairs sharing a land border, and dummy variables for countries surrounded by land or sea. Included also are a dummy variable for WTO member countries and a dummy variable for country pairs belonging to a common regional trade arrangement.

In addition, we introduce three kinds of variable to capture the effect of

[3] Harrigan (2001) and Anderson and van Wincoop (2004) provide a comprehensive review of the literature on the theoretical foundations for the gravity model.

[4] Indeed, we use $\ln(1+T_{ij})$ as the dependent variable in order to deal with zero trade values in logs. As a robustness check, in section 5.3, zero values will be preserved and Tobit model will be employed.

cultural ties. First, in order to examine effect of linguistic similarity on trade, we introduce a linguistic dummy variable, *Language*, that takes one if a language is spoken by at least 9% of the population in both countries and zero otherwise. Since Havrylyshyn and Pritchett (1991) and Foroutan and Pritchett (1993), the similar language dummy variable has been widely used as a proxy for linguistic similarity. Helliwell (1999) makes a comprehensive survey of earlier findings and concludes that bilateral merchandise trade flows are higher between pairs of countries that share a common language.[5)]

Second, in order to capture the effect of religious similarity on trade, we introduce a dummy variable *Religion*, which takes one if the two countries have the same representative religion and zero otherwise. The representative religion in each country is a religion which covers the majority of the country (see table A1).[6)]

Third, we add two different dummy variables to capture colonial ties in history: *ImColonizer* and *ExColonizer*. *ImColonizer* (*ExColonizer*) is a binary variable which takes one if an importer (an exporter) was ever a colonizer of an exporter (an importer) and zero otherwise. The effect of colonial ties on trade has been under examination for a long time, and particularly since the 1970s (see, for example, Kleiman, 1976, 1977, 1978; Livingstone, 1976). Recently, scholars have increasingly performed quantitative studies on the role of colonial ties in trade by adding colonial-ties-related dummy variables into a gravity equation, and they have found a positive relationship between colonial ties and trade (see, for example, Rauch, 1999; Estevaderorada *et al*., 2002; Rauch and Trindade, 2002; Bhattacharjea, 2004).

[5)] More comprehensive measures of linguistic similarity have been introduced in some studies (see, for example, Boisso and Ferrantino, 1997; Guo, 2004; Noland, 2005). Unlike other studies using a comprehensive measure, we cover many countries (118) in our sample and construction of a comprehensive measure of linguistic similarity for the pairs of 13,806 (=118 X 117) is a very difficult task.

[6)] From the same reason as in linguistic similarity, comprehensive measures of religious similarity are not employed in this paper, though such measures have been introduced in the above-listed studies; Guo (2004), Hwang and Guo (2004), and Noland (2005).

Consequently, we estimate the following gravity equation[7)]

$$\begin{aligned}\ln T_{ij} = {} & \beta_0 + \beta_1 \ln GDP_i + \beta_2 \ln GDP_j + \beta_3 \ln perCapita_i + \beta_4 \ln perCapita_j \\ & + \beta_5 \ln Area_i + \beta_6 \ln Area_j + \beta_7 \ln Remoteness_i + \beta_8 \ln Remoteness_j \\ & + \beta_9 Contig_{ij} + \beta_{10} Island_{ij} + \beta_{11} \ln Distance_{ij} + \beta_{12} Religion_{ij} \\ & + \beta_{13} Language_{ij} + \beta_{14} ImColonizer_{ij} + \beta_{15} ExColonizer_{ij} \\ & + \beta_{16} WTO_i + \beta_{17} WTO_j + \beta_{18} RTA_{ij} + \varepsilon_{ij}.\end{aligned} \tag{2}$$

The dependent variable is import value of agricultural products or manufactured goods. *perCapita*, *Area*, and *Remoteness* are GDP per capita, total land area (in square kilometers), and relative distance, respectively. *perCapita* plays a role in controlling the stage of economic development. The role of total land area is to take into consideration differences in resource endowment among countries to some extent. Large *Area* may also reflect an expensive charge in domestic transportation. $Remoteness_j$ is calculated as

$$\log\left[1/\sum_{i=1}^{n}(GDP_i / GDP_w)/(Distances_{ij})\right], \text{ where } GDP_w = \text{world } GDP. \tag{3}$$

This variable is often called relative distance or multilateral resistance. The following three variables are expected to control differences in transport modes such as land transportation: *Contig* is a binary variable which takes one if the two countries share a common land border and zero otherwise. *Island* is the number of island countries and takes zero, one, or two. Last, we introduce two policy variables relating to trade facilitation, *WTO* and *RTA*. *WTO* is a binary variable which takes one if the country is a member of the World Trade Organization and zero otherwise, and a binary variable *RTA* takes one if the partner countries belong to a common regional trade

[7)] More justification and discussion of the gravity model can be found in Feenstra (2004).

arrangement and zero otherwise.

In addition to these variables, further independent variables are introduced. First, as in Paiva (2005), we add each country's share of agricultural products in GDP and rural population density to take the specific importance of agricultural activity into consideration. In the equation applicable for manufactured goods, the share of manufactures in GDP is added. *ExShare* (*ImShare*) and *ExRural* (*ImRural*) denote the share of the exporter's (importer's) manufactured goods/agricultural products sector in GDP and the exporter's (importer's) rural population density, respectively. Second, we add intra-regional dummy variables (*Africa*, *America*, *Asia*, *Europe*, and *Pacific*), which take one if the trading partners belong to the same region and zero otherwise. Such regional dummy variables have a certain role in representing differences in region-specific preferences.

3. DATA

The total number of countries included in our dataset is 118 for which all of our variables are available from 2002 to 2004. This paper uses the UN Comtrade Database for bilateral trade on CIF imports in current US dollars. The agricultural products investigated in this paper are defined as the products classified in 0 (food and live animals) and 1 (beverages (11) and tobacco (12)), and manufactured goods as the goods categorized in 6 (manufactured goods classified chiefly by material), 7 (machinery and transport equipment), and 8 (miscellaneous manufactured articles), in SITC Rev. 3. Our sample countries are listed in table A2.

The data sources of independent variables are as follows. Data on area, GDP, and GDP per capita are obtained from World Development Indicators. The religion for each country is taken from World Fact Book produced by the United States Central Intelligence Agency (CIA).[8] Rural population density and the shares of the manufacturing and agricultural sectors in GDP

[8] http://www.odci.gov/cia/publications/factbook/index.html

Table 1 Descriptive Statistics

Variable	Obs.	Mean	Std. Dev.	Min	Max
ln *Manu*	13,806	10.13	7.32	0	25.77
ln *Agri*	13,806	8.12	7.30	0	23.30
ln *Distance*	13,806	8.70	0.78	4.39	9.89
ln *GDP*	13,806	23.82	2.35	17.77	29.96
ln *Remoteness*	13,806	8.55	0.53	7.13	9.39
ln *perCapita*	13,806	7.68	1.55	4.66	10.55
ln *Area*	13,806	12.02	2.28	5.70	16.64
Contig	13,806	0.02	0.14	0	1
Island	13,806	0.32	0.52	0	2
WTO	13,806	0.88	0.32	0	1
RTA	13,806	0.17	0.37	0	1
ln *Share* (Manu)	13,806	2.61	0.48	1.26	3.55
ln *Share* (Agri)	13,806	2.25	1.02	–0.01	4.10
ln *Rural*	13,806	5.38	1.24	1.22	8.63
ImColonizer	13,806	0.01	0.09	0	1
ExColonizer	13,806	0.01	0.09	0	1
Religion	13,806	0.39	0.49	0	1
Language	13,806	0.14	0.35	0	1

are taken from World Development Indicators. Information on WTO and RTA[9] is taken from the WTO website.[10] The source of all other variables, including the distance, language, and the colonial relationship between countries, is CEPII website.[11] Our distance is measured by great circle between the two countries' respective most important cities/agglomerations in terms of population. The basic statistics of these variables are reported in table 1.

[9] For more detail contents of RTAs, see http://www.wto.org/english/tratop_e/region_e/type_e.xls
[10] http://www.wto.org
[11] http://www.cepii.fr/anglaisgraph/bdd/distances.htm#

Table 2 Cultural Ties and the Mean Value of Trade

(unit: US$)

		Agri	Manu
Language	Different	31,068,033 (11,888)	308,232,762 (11,888)
	Same	65,079,862 (1,918)	482,041,751 (1,918)
ExColonizer	Different	34,990,044 (13,692)	322,465,074 (13,692)
	Same	132,247,948 (114)	1,523,117,269 (114)
ImColonizer	Different	34,375,379 (13,692)	324,702,263 (13,692)
	Same	206,072,451 (114)	1,254,419,040 (114)
Religion	Different	17,101,531 (8,396)	222,108,932 (8,396)
	Same	64,801,386 (5,410)	503,512,119 (5,410)

Note: The number of observations is shown in parentheses.

An overview of the relationship between cultural variables and the mean values of trade is presented in table 2. Cultural dummy variables, *ExColonizer*, *ImColonizer*, *Religion*, and *Language*, are indicated in the first column. Each variable takes unity if trading partners share the same cultural attribute and zero otherwise. Mean values for manufacturing and agricultural trade are reported in the second and the third column, respectively.

We readily note the larger mean values for trade between countries with the same language in both manufacturing and agricultural trade. In manufactured goods, the mean value for trade in pairs with the same language is US$ 482 million, while that in pairs with different languages is US$ 308 million. On the other hand, in agricultural products these mean values are US$ 65 million and US$ 31 million, respectively. Thus, country pairs with the same language trade about twice larger amount than country pairs with different languages. Therefore, we can say that both manufacturing

trade and agricultural trade are sensitive to linguistic ties between trading countries.

The table also shows that both manufacturing trade and agricultural trade are greater between the country pairs with the same representative religion. In the case of the *Religion* dummy variable, the mean value for manufacturing trade in pairs with the same representative religion is US$ 503.5 million, while the corresponding value in pairs with different religion is US$ 222.1 million. On the other hand, in agricultural products, the corresponding mean values are US$ 64 million and US$ 17 million. We also find a similar trade pattern in the cases of *ExColonizer* and *ImColonizer* dummy variables.

In sum, we find larger mean values for trade between countries having the same cultural attribute in both manufacturing and agricultural trade. However, this table does not show with certainty the magnitude of the difference in the effect of cultural ties between manufacturing and agricultural trade and whether the effect is statistically different between the two commodities after controlling for the natural factors that promote or impede trade.

4. REGRESSION RESULTS

Using the method of ordinary least squares (OLS), we regress the gravity equations set out above and conduct the Wald test with the null hypothesis that respective coefficients for cultural variables are identical in both equations for manufacturing and agricultural trade.[12)] The regression results are listed in table 3. Equation (1) shows baseline results for trade in manufactured goods and agricultural products, and equation (2) shows the results after adding each country's share of manufactured goods/agricultural products in GDP and rural population density. Lastly, equation (3) shows the results when the regional dummy variables *Africa*, *America*, *Asia*, *Europe*, and *Pacific* have been included.

[12)] That is, we obtain the covariances between the estimates from different equations by performing generalized least squares estimation, i.e., seemingly unrelated regressions (SUR).

Table 3 Regression Results in 2003

	Eq. (1)			Eq. (2)			Eq. (3)		
	Manu		Agri	Manu		Agri	Manu		Agri
IMColonizer_ij	1.414***	8	2.625***	1.512***	5.94	2.553***	1.635***	5.09	2.601***
	[0.530]	***	[0.515]	[0.527]	**	[0.513]	[0.528]	**	[0.514]
EXColonizer_ij	0.679	5.37	1.668***	0.870*	4.54	1.779***	0.993*	3.80	1.827***
	[0.530]	**	[0.515]	[0.527]	**	[0.513]	[0.528]	*	[0.514]
Religion_ij	0.395***	9.48	0.650***	0.410***	7.54	0.637***	0.450***	8.25	0.692***
	[0.103]	***	[0.100]	[0.102]	***	[0.099]	[0.104]	***	[0.101]
Language_ij	0.514***	4.19	0.756***	0.590***	2.41	0.774***	0.532***	3.80	0.771***
	[0.147]	**	[0.143]	[0.146]		[0.142]	[0.151]	*	[0.147]
ln Distance_ij	-1.480***		-1.561***	-1.519***		-1.555***	-1.316***		-1.471***
	[0.079]		[0.077]	[0.079]		[0.077]	[0.100]		[0.097]
ln GDP_i	1.337***		0.960***	1.340***		1.020***	1.364***		1.045***
	[0.046]		[0.045]	[0.053]		[0.050]	[0.053]		[0.051]
ln GDP_j	1.481***		1.545***	1.390***		1.645***	1.414***		1.670***
	[0.046]		[0.045]	[0.053]		[0.050]	[0.053]		[0.051]
ln Remoteness_i	-0.789***		-1.769***	-0.600***		-1.645***	-0.475***		-1.470***
	[0.130]		[0.126]	[0.133]		[0.130]	[0.140]		[0.137]
ln Remoteness_j	-0.343***		1.425***	-0.241*		1.420***	-0.116		1.595***
	[0.130]		[0.126]	[0.133]		[0.130]	[0.140]		[0.137]
ln perCapita_i	0.474***		0.640***	0.396***		0.439***	0.399***		0.437***
	[0.053]		[0.051]	[0.061]		[0.074]	[0.061]		[0.074]
ln perCapita_j	0.061		-0.004	0.085		0.288***	0.088		0.286***
	[0.053]		[0.051]	[0.061]		[0.074]	[0.061]		[0.074]
ln Area_i	-0.115***		0.01	-0.195***		-0.078	-0.198***		-0.081*
	[0.038]		[0.037]	[0.049]		[0.048]	[0.049]		[0.048]
ln Area_j	-0.139***		-0.218***	-0.113**		-0.334***	-0.116**		-0.337***
	[0.038]		[0.037]	[0.049]		[0.048]	[0.049]		[0.048]
Contig_ij	0.678*		1.099***	0.548		1.094***	0.728**		1.215***
	[0.362]		[0.351]	[0.360]		[0.350]	[0.361]		[0.351]
Island	-0.082		-0.211**	-0.124		-0.221**	-0.123		-0.223**
	[0.102]		[0.099]	[0.102]		[0.100]	[0.102]		[0.100]
WTO_i	2.041***		0.789***	1.792***		0.822***	1.766***		0.807***
	[0.150]		[0.145]	[0.153]		[0.147]	[0.153]		[0.147]
WTO_j	0.903***		1.311***	0.612***		1.102***	0.586***		1.087***
	[0.150]		[0.145]	[0.153]		[0.147]	[0.153]		[0.147]
RTA_ij	1.201***		0.900***	1.166***		0.892***	0.871***		0.655***
	[0.141]		[0.137]	[0.140]		[0.137]	[0.147]		[0.143]
ln ExShare				0.753***		0.711***	0.766***		0.707***
				[0.092]		[0.082]	[0.093]		[0.082]
ln ImShare				0.588***		-0.203**	0.602***		-0.207**
				[0.092]		[0.082]	[0.093]		[0.082]
ln ExRural				-0.173***		-0.169***	-0.145***		-0.141***
				[0.054]		[0.053]	[0.055]		[0.053]
ln ImRural				-0.001		-0.137***	0.027		-0.109**
				[0.054]		[0.053]	[0.055]		[0.053]
Africa							1.033***		0.544**
							[0.219]		[0.214]
America							-0.178		-0.501*
							[0.279]		[0.272]
Asia							-0.296		-0.492**
							[0.229]		[0.222]
Europe							1.450***		1.165***
							[0.272]		[0.265]
Pacific							-0.657		-0.325
							[2.237]		[2.181]
constant	-40.110***		-41.014***	-35.828***		-42.552***	-40.893***		-47.442***
	[2.139]		[2.077]	[2.186]		[2.086]	[2.321]		[2.222]
Obs.	13,806		13,806	13,806		13,806	13,806		13,806
R-sq	0.5138		0.4901	0.5200		0.4935	0.5222		0.4951

Notes: ***, **, and * show 1%, 5%, and 10% levels of significance, respectively. Standard errors are given in parentheses. The column between "Manu" and "Agri" reports the result of the Wald test with the null hypothesis that each coefficient (only for cultural variables) is identical in the manufacturing and agricultural trade equations.

We shall now examine the results shown by equation (1). The estimated coefficients for all of the standard gravity variables in $Distance_{ij}$, GDP_i and GDP_j are highly significant and in line with expected signs for both products: for both manufactured and agricultural products, trade is positively correlated with GDPs of both exporter and importer and is adversely affected by increasing geographical distance between the trading partners. Moreover, some other independent variables are estimated to be significant with the expected signs. The importing countries' remoteness is found to have a negative effect. The per capita income is found to have a positive impact on both manufacturing and agricultural imports. Coefficients for *Area* are negatively estimated in both goods. Combining this result with estimates of *Contig* and *Island*, we may say that sea/air transportation and long domestic transportation deteriorate international transactions. In particular, coefficients for *Contig* and *Island* are higher in agricultural goods. This result may be due to the perishability of agricultural products. Membership of the WTO and the common regional trade arrangement seems to have a positive effect for both manufacturing and agricultural trade.

Our main interest in this paper lies in the coefficients for cultural variables, i.e., *Language*, *Religion*, *ImColonizer*, and *ExColonizer*. The results with respect to those variables can be summarized as follows.

First, the coefficient for *Language* is slightly larger for agricultural trade than for manufacturing trade: the coefficients for the *Language* dummy variable are 0.51 and 0.76 for manufacturing trade and agricultural trade, respectively. Thus, countries using the same language trade 67% and 114% more of manufacturing product and agricultural product, respectively, ceteris paribus.[13] In this case, however, the Wald test does not reject the hypothesis that the coefficient is the same in each instance. Therefore, in this particular specification, the effect of linguistic commonality does not show a statistical difference between agricultural trade and manufacturing trade.

Second, the coefficient for *Religion* is statistically greater in agricultural

[13] $100 \cdot [\exp(0.51) - 1.0] = 67$ percent; $100 \cdot [\exp(0.76) - 1.0] = 114$ percent.

trade than in manufacturing trade.[14] The estimated coefficients for the *Religion* dummy variable are 0.395 and 0.65 in manufacturing trade and agricultural trade, respectively, and the coefficient in the equation for agricultural trade is significant at the one percent level. Thus, the country pairs with the same representative religion trade 92% more of agricultural products than the country pairs with different religions. It is also shown that at the 1% level, the Wald test rejects the hypothesis that the coefficient is the same in both cases. This result indicates that similarity of religion affects agricultural trade more strongly than manufacturing trade.

Third, we find that the coefficients for the colonizer dummy variables (*ImColonizer* and *ExColonizer*) for agricultural trade are larger than those for manufacturing trade. The estimated coefficients for *ImColonizer* (*ExColonizer*) in the equation for manufacturing trade are 1.414 and 0.679, respectively, while those in the equation for agricultural trade are 2.625 and 1.668, respectively. Thus the country pairs with the colonial ties trade 97% to 310% more of manufacturing products and 430% to 1280% more of agricultural products than the countries pairs with no such ties. The Wald test rejects the hypothesis that the respective coefficients are the same. This result indicates that a colonial relationship plays a more critical role in agricultural trade than in manufacturing trade.

Equation (2) introduces the share of manufactured goods/agricultural products in GDP and rural population density, as compared with equation (1). The independent variables included previously are well estimated. Estimates of these newly added variables indicate that a higher share of agricultural products (manufactured products) in GDP is associated with higher exports of agricultural products (manufactured products). Moreover, a higher rural population density tends to reduce agricultural (manufacturing) exports, as reported by Paiva (2005), reflecting the fact that less modern agricultural methods and equipment are employed in countries with a large

[14] One may think that religion dummy is closely related with distance variable because countries in the neighborhood seem to have the similar religion. But, the correlation between the two variables is extremely low (–0.08) in our sample, and thus coefficients for religion are insensitive to the inclusion of distance variable.

rural population. The results for cultural variables are the same as the previous results: similarity of religion and a colonial relationship enhance agricultural trade more significantly than manufacturing trade.

The results shown by equation (3) are obtained with the inclusion of regional dummy variables (*Africa*, *America*, *Asia*, *Europe*, and *Pacific*). The coefficient for the intra-European dummy variable is positively significant in both manufacturing trade and agricultural trade, although most of the coefficients for intra-regional dummy variables are estimated as insignificant. As in the previous two sets of results, cultural ties are more critical for agricultural trade than for manufacturing trade, although we again cannot find a statistical difference in the effect of linguistic commonality between the two types of trade.

In sum, the results set out above can be summarized as follows. Commonality of language, religion and a colonial relationship in history enhance agricultural trade more significantly than manufacturing trade. Thus, we can state that trade in agricultural products depends more heavily on cultural ties between trading partners than trade in manufactured goods.

5. ROBUSTNESS CHECKS

This section reports the results from three different alternative specifications: smoothing our possible instability of trade, controlling products' characteristics, and dealing with zero trade values-issues in gravities.

5.1. Using the Three Year Average of the Imports Value

To check the robustness of our results set out above, we again estimate the same equation with a 3-year (2002, 2003, and 2004) average of the imports value. This averaging is performed, as in Paiva (2005), in order to smooth out possible instability of agricultural production due to factors such as a bad harvest. OLS results for this estimation are reported in table 4. The results

Table 4 Regression Results for Average of 3 Years

	Eq. (1)		Eq. (2)		Eq. (3)	
	Manu	Agri	Manu	Agri	Manu	Agri
IMColonizer_ij	0.283	1.453***	0.216	1.356***	0.286	1.287***
	[0.360]	[0.425]	[0.358]	[0.423]	[0.358]	[0.424]
EXColonizer_ij	0.576	1.590***	0.868**	1.696***	0.938***	1.628***
	[0.360]	[0.425]	[0.358]	[0.423]	[0.358]	[0.424]
Religion_ij	0.032	0.311***	0.046	0.290***	0.035	0.299***
	[0.070]	[0.082]	[0.069]	[0.082]	[0.070]	[0.084]
Language_ij	1.099***	1.371***	1.159***	1.373***	0.924***	1.263***
	[0.100]	[0.118]	[0.099]	[0.117]	[0.102]	[0.121]
ln Distance_ij	-1.826***	-2.050***	-1.857***	-2.038***	-1.777***	-2.151***
	[0.054]	[0.063]	[0.053]	[0.063]	[0.068]	[0.080]
ln GDP_i	1.396***	1.080***	1.404***	1.128***	1.403***	1.126***
	[0.032]	[0.037]	[0.037]	[0.042]	[0.036]	[0.042]
ln GDP_j	1.894***	1.913***	1.804***	2.066***	1.803***	2.063***
	[0.032]	[0.037]	[0.037]	[0.042]	[0.036]	[0.042]
ln Remoteness_i	-0.092	-1.274***	-0.081	-1.129***	-0.242**	-1.235***
	[0.088]	[0.104]	[0.091]	[0.107]	[0.095]	[0.113]
ln Remoteness_j	0.273***	2.086***	0.465***	2.150***	0.305***	2.044***
	[0.088]	[0.104]	[0.091]	[0.107]	[0.095]	[0.113]
ln perCapita_i	-0.033	0.236***	-0.045	-0.071	-0.007	-0.039
	[0.036]	[0.042]	[0.042]	[0.067]	[0.042]	[0.067]
ln perCapita_j	0.032	0.076*	0.024	0.313***	0.061	0.345***
	[0.036]	[0.042]	[0.042]	[0.067]	[0.042]	[0.067]
ln Area_i	-0.134***	-0.019	-0.141***	-0.099**	-0.146***	-0.105***
	[0.026]	[0.030]	[0.033]	[0.039]	[0.033]	[0.039]
ln Area_j	-0.304***	-0.282***	-0.317***	-0.471***	-0.322***	-0.477***
	[0.026]	[0.030]	[0.033]	[0.039]	[0.033]	[0.039]
Contig_ij	0.706***	0.975***	0.605**	0.975***	0.656***	0.909***
	[0.246]	[0.290]	[0.244]	[0.288]	[0.244]	[0.289]
Island	-0.375***	-0.566***	-0.402***	-0.605***	-0.395***	-0.607***
	[0.069]	[0.082]	[0.069]	[0.082]	[0.069]	[0.082]
WTO_i	0.906***	0.086	0.907***	0.173	0.900***	0.198
	[0.102]	[0.120]	[0.105]	[0.122]	[0.105]	[0.122]
WTO_j	1.228***	1.535***	0.816***	1.303***	0.809***	1.328***
	[0.102]	[0.120]	[0.105]	[0.122]	[0.105]	[0.122]
RTA_ij	0.590***	0.332***	0.562***	0.337***	0.589***	0.495***
	[0.096]	[0.113]	[0.095]	[0.113]	[0.100]	[0.118]
ln ExShare			1.037***	0.740***	1.091***	0.748***
			[0.078]	[0.085]	[0.078]	[0.085]
ln ImShare			-0.006	-0.396***	0.048	-0.389***
			[0.078]	[0.085]	[0.078]	[0.085]
ln ExRural			-0.015	-0.176***	-0.02	-0.192***
			[0.037]	[0.044]	[0.037]	[0.044]
ln ImRural			-0.082**	-0.261***	-0.087**	-0.277***
			[0.037]	[0.044]	[0.037]	[0.044]
Africa					1.299***	0.315*
					[0.149]	[0.176]
America					0.327*	-0.17
					[0.189]	[0.224]
Asia					0.047	0.002
					[0.156]	[0.183]
Europe					-0.626***	-1.170***
					[0.184]	[0.218]
Pacific					2.689*	2.419
					[1.515]	[1.797]
constant	-49.717***	-51.861***	-46.333***	-53.474***	-44.490***	-50.851***
	[1.454]	[1.715]	[1.502]	[1.721]	[1.590]	[1.834]
Obs.	13,806	13,806	13,806	13,806	13,806	13,806
R-sq	0.6885	0.6052	0.6938	0.6098	0.6962	0.6109

Note: See notes on table 3.

with respect to most variables are qualitatively the same as those in the previous sets of results. A striking difference from the previous results is that the effect of linguistic similarity turns out to be statistically different between agricultural trade and manufacturing trade. This is confirmed at the ten to one percent level by the Wald test. In equation (1), the coefficients for the *Language* dummy variable are 1.10 and 1.37 in manufacturing trade and agricultural trade, respectively. More precisely, manufacturing trade is 200% and agricultural trade is 294% larger between countries using the same language, ceteris paribus. Similar patterns are shown in equations (2) and (3). Thus, we now have evidence that linguistic similarity has a greater effect on trade in agricultural products than on trade in manufactured goods.

5.2. Using Differentiated Products

As noted in the previous sections, one may argue that we must control the role of cultural proximity as information costs. Following the Rauch (1999)'s finding, therefore, we restrict our sample only to trade in differentiated products. This enables us to control heterogeneous impacts of reduction of information costs among traded products. Thus, the remaining differences in coefficients for cultural variables between goods would reflect differences in impacts of cultural proximity. Information on such product characteristics is drawn from Rauch (1999).

In Rauch (1999), two definitions are proposed in order to account for ambiguities arising in classification: a conservative definition (minimizing the number of homogeneous goods) and a liberal definition (maximizing this number). In the classification, for example, meat extracts and juices (SITC 0141), macaroni, spaghetti and similar products (0483), vegetables prepared or preserved (0565), sugars and syrups (0619), coffee extracts, essences or concentrates (0712), and chocolate and other preparations containing cocoa (0730) are classified as differentiated products, although these products are not classified as differentiated products in a liberal classification. Employing both classifications separately, we regress the gravity equations

specified above for trade in differentiated agricultural products and manufactured goods.

The results with the use of a conservative classification and with the use of a liberal classification are reported in tables 5 and 6, respectively. We see that the results do not differ substantially between the two tables. The magnitudes of all the coefficients for cultural variables are larger for agricultural trade than for manufacturing trade. On the other hand, the coefficients for *ExColonizer* in tables 5 and 6 notably increase in both manufacturing trade and agricultural trade, compared with those in table 3. In manufacturing trade, as well as for *ExColonizer*, the coefficients for *ImColonizer* become larger in tables 5 and 6. These increases in cultural coefficients in tables 5 and 6 may be considered to be due to Rauch's claim: higher search costs for differentiated products. In spite of such increases in cultural coefficients for manufacturing trade, we still find statistically greater coefficients for cultural variables for agricultural trade than for manufacturing trade. This finding shows more strongly that preferential similarity has been a more important driver for agricultural trade.

5.3. Addressing the Issue of Zero Trade Values

In this subsection, we address the issue of zero values of the dependent variable (see footnote 4). That is, following Eaton and Tamura (1994) and Rauch (1999), we estimate the gravity equations by maximum likelihood where likelihood function is constructed applying Tobit estimation.

The Tobit results are reported in table 7. The estimated coefficients for almost all of the standard gravity variables are significant and in line with expected signs for both products. The results show that all cultural variables are positively significant in the equations for agricultural trade, as in the case of the OLS results reported in table 3. It is also noted that the estimates for these cultural variables are greater in the equations for agricultural trade than in the equations for manufacturing trade.

Table 5 Regression Results for Differentiated Products: Conservative Definition

	Eq. (1)			Eq. (2)			Eq. (3)		
	Manu		Agri	Manu		Agri	Manu		Agri
IMColonizer_ij	1.085**	2.74	1.984***	1.065**	2.41	1.908***	1.143***	2.57	2.015***
	[0.435]	*	[0.459]	[0.433]		[0.457]	[0.434]		[0.458]
EXColonizer_ij	1.942***	5.60	3.227***	2.207***	3.49	3.220***	2.285***	3.68	3.328***
	[0.435]	**	[0.459]	[0.433]	*	[0.457]	[0.434]	*	[0.458]
Religion_ij	-0.084	12.83	0.292***	-0.082	10.22	0.253***	-0.102	8.11	0.204**
	[0.084]	***	[0.089]	[0.084]	***	[0.089]	[0.085]	***	[0.090]
Language_ij	1.076***	5.20	1.418***	1.135***	2.58	1.377***	1.185***	1.13	1.351***
	[0.120]	**	[0.127]	[0.120]		[0.127]	[0.124]		[0.131]
ln Distance_ij	-2.461***		-1.658***	-2.488***		-1.629***	-2.240***		-1.360***
	[0.065]		[0.068]	[0.065]		[0.068]	[0.082]		[0.086]
ln GDP_i	1.325***		0.679***	1.340***		0.714***	1.349***		0.717***
	[0.038]		[0.040]	[0.044]		[0.045]	[0.044]		[0.045]
ln GDP_j	1.916***		1.357***	1.910***		1.587***	1.919***		1.590***
	[0.038]		[0.040]	[0.044]		[0.045]	[0.044]		[0.045]
ln Remoteness_i	0.518***		-0.768***	0.584***		-0.630***	0.632***		-0.664***
	[0.106]		[0.112]	[0.110]		[0.116]	[0.115]		[0.122]
ln Remoteness_j	0.247**		0.579***	0.567***		0.853***	0.615***		0.819***
	[0.106]		[0.112]	[0.110]		[0.116]	[0.115]		[0.122]
ln perCapita_i	-0.191***		0.459***	-0.238***		0.108	-0.269***		0.076
	[0.043]		[0.046]	[0.050]		[0.073]	[0.051]		[0.074]
ln perCapita_j	0.101**		0.418***	-0.027		0.247***	-0.058		0.215***
	[0.043]		[0.046]	[0.050]		[0.073]	[0.051]		[0.074]
ln Area_i	-0.227***		-0.019	-0.269***		-0.091**	-0.267***		-0.087**
	[0.031]		[0.033]	[0.040]		[0.042]	[0.040]		[0.042]
ln Area_j	-0.272***		-0.173***	-0.407***		-0.486***	-0.405***		-0.483***
	[0.031]		[0.033]	[0.040]		[0.042]	[0.040]		[0.042]
Contig_ij	1.536***		1.638***	1.421***		1.653***	1.591***		1.830***
	[0.297]		[0.314]	[0.295]		[0.312]	[0.296]		[0.313]
Island	-0.264***		0.043	-0.334***		-0.072	-0.332***		-0.06
	[0.084]		[0.088]	[0.084]		[0.089]	[0.084]		[0.089]
WTO_i	0.369***		-0.031	0.303**		0.083	0.285**		0.054
	[0.123]		[0.130]	[0.128]		[0.132]	[0.128]		[0.132]
WTO_j	1.354***		0.865***	0.905***		0.738***	0.888***		0.709***
	[0.123]		[0.130]	[0.128]		[0.132]	[0.128]		[0.132]
RTA_ij	0.798***		0.544***	0.776***		0.587***	0.536***		0.383***
	[0.116]		[0.122]	[0.115]		[0.122]	[0.121]		[0.128]
ln ExShare				1.066***		0.249***	1.033***		0.238**
				[0.098]		[0.095]	[0.098]		[0.095]
ln ImShare				0.152		-0.477***	0.118		-0.487***
				[0.098]		[0.095]	[0.098]		[0.095]
ln ExRural				-0.085*		-0.174***	-0.071		-0.160***
				[0.045]		[0.047]	[0.045]		[0.047]
ln ImRural				-0.294***		-0.524***	-0.279***		-0.510***
				[0.045]		[0.047]	[0.045]		[0.047]
Africa							0.207		0.427**
							[0.180]		[0.190]
America							0.401*		0.799***
							[0.229]		[0.242]
Asia							0.229		0.208
							[0.189]		[0.198]
Europe							1.530***		1.220***
							[0.223]		[0.236]
Pacific							3.139*		4.920**
							[1.837]		[1.942]
constant	-51.234***		-33.200***	-47.894***		-34.587***	-51.080***		-36.201***
	[1.756]		[1.854]	[1.822]		[1.861]	[1.931]		[1.982]
Obs.	13,806		13,806	13,806		13,806	13,806		13,806
R-sq	0.6038		0.4726	0.6092		0.4789	0.6105		0.4804

Note: See notes on table 3.

Table 6 Regression Results for Differentiated Products: Liberal Definition

	Eq. (1)		Eq. (2)		Eq. (3)	
	Manu	Agri	Manu	Agri	Manu	Agri
IMColonizer_ij	1.274***	2.205***	1.251***	2.119***	1.327***	2.256***
	[0.423]	[0.447]	[0.421]	[0.445]	[0.421]	[0.445]
EXColonizer_ij	1.467***	3.420***	1.769***	3.408***	1.845***	3.545***
	[0.423]	[0.447]	[0.421]	[0.445]	[0.421]	[0.445]
Religion_ij	-0.067	0.289***	-0.058	0.252***	-0.075	0.195**
	[0.082]	[0.087]	[0.081]	[0.086]	[0.083]	[0.088]
Language_ij	1.040***	1.434***	1.111***	1.386***	1.112***	1.345***
	[0.117]	[0.124]	[0.117]	[0.123]	[0.120]	[0.127]
ln Distance_ij	-2.333***	-1.690***	-2.368***	-1.662***	-2.145***	-1.330***
	[0.063]	[0.067]	[0.063]	[0.066]	[0.080]	[0.084]
ln GDP_i	1.247***	0.646***	1.251***	0.682***	1.256***	0.683***
	[0.037]	[0.039]	[0.043]	[0.044]	[0.043]	[0.044]
ln GDP_j	2.012***	1.384***	1.968***	1.580***	1.973***	1.581***
	[0.037]	[0.039]	[0.043]	[0.044]	[0.043]	[0.044]
ln Remoteness_i	0.395***	-0.799***	0.450***	-0.648***	0.452***	-0.705***
	[0.103]	[0.109]	[0.106]	[0.113]	[0.112]	[0.119]
ln Remoteness_j	0.172*	0.648***	0.470***	0.896***	0.472***	0.838***
	[0.103]	[0.109]	[0.106]	[0.113]	[0.112]	[0.119]
ln perCapita_i	-0.125***	0.507***	-0.156***	0.122*	-0.173***	0.089
	[0.042]	[0.044]	[0.049]	[0.071]	[0.049]	[0.072]
ln perCapita_j	0.171***	0.391***	0.083*	0.200***	0.065	0.167**
	[0.042]	[0.044]	[0.049]	[0.071]	[0.049]	[0.072]
ln Area_i	-0.155***	-0.018	-0.180***	-0.092**	-0.180***	-0.088**
	[0.030]	[0.032]	[0.039]	[0.041]	[0.039]	[0.041]
ln Area_j	-0.312***	-0.208***	-0.406***	-0.479***	-0.405***	-0.475***
	[0.030]	[0.032]	[0.039]	[0.041]	[0.039]	[0.041]
Contig_ij	1.598***	1.671***	1.470***	1.688***	1.616***	1.893***
	[0.288]	[0.305]	[0.287]	[0.303]	[0.288]	[0.304]
Island	-0.235***	0.084	-0.293***	-0.034	-0.293***	-0.023
	[0.081]	[0.086]	[0.081]	[0.087]	[0.081]	[0.087]
WTO_i	0.331***	0.106	0.262**	0.234*	0.248**	0.204
	[0.119]	[0.126]	[0.124]	[0.128]	[0.124]	[0.128]
WTO_j	1.224***	0.862***	0.742***	0.772***	0.728***	0.741***
	[0.119]	[0.126]	[0.124]	[0.128]	[0.124]	[0.128]
RTA_ij	0.765***	0.507***	0.735***	0.555***	0.549***	0.323***
	[0.113]	[0.119]	[0.112]	[0.119]	[0.117]	[0.124]
ln ExShare			1.174***	0.141	1.157***	0.129
			[0.095]	[0.092]	[0.096]	[0.092]
ln ImShare			0.165*	-0.532***	0.149	-0.543***
			[0.095]	[0.092]	[0.096]	[0.092]
ln ExRural			-0.057	-0.184***	-0.049	-0.171***
			[0.043]	[0.046]	[0.044]	[0.046]
ln ImRural			-0.230***	-0.461***	-0.222***	-0.448***
			[0.043]	[0.046]	[0.044]	[0.046]
Africa					0.414**	0.615***
					[0.175]	[0.185]
America					0.388*	0.948***
					[0.223]	[0.236]
Asia					0.272	0.363*
					[0.184]	[0.193]
Europe					1.121***	1.392***
					[0.217]	[0.229]
Pacific					2.998*	4.883***
					[1.785]	[1.890]
constant	-51.944***	-33.198***	-47.950***	-34.203***	-50.056***	-35.902***
	[1.706]	[1.804]	[1.769]	[1.811]	[1.876]	[1.928]
Obs.	13,806	13,806	13,806	13,806	13,806	13,806
R-sq	0.6313	0.4856	0.6367	0.4913	0.6375	0.4933

Note: See notes on table 3.

Table 7 Results of Tobit Estimation in 2003

Equation	Eq. (1)		Eq. (2)		Eq. (3)	
Estimation	Tobit	Tobit	Tobit	Tobit	Tobit	Tobit
Sector	Manu	Agri	Manu	Agri	Manu	Agri
IMColonizer_ij	1.008	2.225**	1.591**	2.146**	1.687**	2.064**
	[0.807]	[0.888]	[0.799]	[0.884]	[0.800]	[0.887]
EXColonizer_ij	0.284	1.593*	0.751	1.885**	0.848	1.797**
	[0.822]	[0.906]	[0.814]	[0.902]	[0.815]	[0.905]
Religion_ij	0.624***	1.067***	0.720***	1.045***	0.805***	1.155***
	[0.171]	[0.197]	[0.169]	[0.196]	[0.173]	[0.200]
Language_ij	0.719***	1.320***	1.024***	1.427***	0.756***	1.323***
	[0.244]	[0.279]	[0.243]	[0.279]	[0.252]	[0.291]
Distance_ij	-2.234***	-2.881***	-2.395***	-2.894***	-2.498***	-3.158***
	[0.130]	[0.149]	[0.129]	[0.148]	[0.163]	[0.186]
ln GDP_i	2.027***	1.662***	1.834***	1.892***	1.860***	1.923***
	[0.079]	[0.091]	[0.092]	[0.103]	[0.092]	[0.104]
ln GDP_j	2.131***	2.870***	1.870***	3.058***	1.896***	3.092***
	[0.078]	[0.092]	[0.090]	[0.103]	[0.091]	[0.104]
ln Remoteness_i	-0.903***	-2.603***	-0.360*	-2.348***	-0.28	-2.233***
	[0.212]	[0.243]	[0.217]	[0.250]	[0.229]	[0.265]
ln Remoteness_j	-0.366*	2.772***	-0.077	2.555***	0.011	2.677***
	[0.215]	[0.250]	[0.219]	[0.257]	[0.232]	[0.271]
ln perCapita_i	0.661***	1.195***	0.589***	1.051***	0.646***	1.110***
	[0.087]	[0.101]	[0.102]	[0.164]	[0.103]	[0.165]
ln perCapita_j	0.029	-0.171*	0.109	0.842***	0.167	0.899***
	[0.087]	[0.099]	[0.101]	[0.165]	[0.102]	[0.166]
ln Area_i	-0.111*	0.130*	-0.179**	-0.157	-0.189**	-0.176*
	[0.065]	[0.075]	[0.085]	[0.098]	[0.085]	[0.098]
ln Area_j	-0.089	-0.362***	0.007	-0.538***	-0.005	-0.558***
	[0.064]	[0.076]	[0.084]	[0.098]	[0.084]	[0.098]
Contig_ij	0.144	0.451	-0.363	0.415	-0.39	0.288
	[0.566]	[0.629]	[0.561]	[0.625]	[0.562]	[0.628]
Island	-0.460***	-0.747***	-0.596***	-0.646***	-0.604***	-0.666***
	[0.173]	[0.203]	[0.172]	[0.205]	[0.173]	[0.205]
WTO_i	4.001***	1.781***	2.915***	1.670***	2.826***	1.670***
	[0.271]	[0.308]	[0.279]	[0.311]	[0.279]	[0.312]
WTO_j	1.638***	3.120***	0.760***	2.635***	0.691**	2.651***
	[0.259]	[0.314]	[0.269]	[0.317]	[0.269]	[0.317]
RTA_ij	1.263***	0.941***	1.091***	0.838***	1.028***	0.922***
	[0.224]	[0.253]	[0.221]	[0.253]	[0.232]	[0.266]
ln ExShare			2.225***	2.085***	2.392***	2.105***
			[0.205]	[0.220]	[0.207]	[0.220]
ln ImShare			2.831***	0.229	2.991***	0.25
			[0.208]	[0.216]	[0.210]	[0.216]
ln ExRural			-0.279***	-0.438***	-0.257***	-0.440***
			[0.089]	[0.102]	[0.090]	[0.103]
ln ImRural			0.024	-0.113	0.047	-0.113
			[0.089]	[0.102]	[0.090]	[0.103]
Africa					1.741***	0.711
					[0.382]	[0.452]
America					-0.641	-1.216**
					[0.451]	[0.515]
Asia					-0.978***	-0.743*
					[0.374]	[0.427]
Europe					-0.501	-0.959**
					[0.425]	[0.480]
Pacific					-2.103	-2.772
					[3.521]	[3.898]
constant	-71.486***	-92.153***	-54.775***	-97.055***	-56.378***	-98.623***
	[3.560]	[4.125]	[3.664]	[4.157]	[3.891]	[4.444]
Obs.	13,806	13,806	13,806	13,806	13,806	13,806
Pseudo R2	0.1143	0.1240	0.1186	0.1257	0.1192	0.1259

Note: See notes on table 3.

6. CONCLUDING REMARKS

We have investigated the relationship between trade and cultural ties, and we have found that commonality of religion and a colonial relationship enhance agricultural trade more than manufacturing trade. That is, we can draw the conclusion that trade in agricultural products depends more heavily on cultural ties between the trading partners than trade in manufactured goods.

Throughout history, the intercultural exchange of crops and livestock breeds has revolutionized diets all over the world. The recently initiated phenomenon of "globalization," which refers to ever-increasing mobility of goods, services, labor, information, technology, and capital throughout the world, is indeed continuing to accelerate the harmonization of diets between various cultures. Therefore, trade in agricultural products may increase very noticeably in the future.

APPENDIX

Table A1 Representative Religion

	Country
Buddhist	Cambodia, China (Macao SAR), China (Honkong SAR), Japan, Mongolia, Myanmar, Sri Lanka, Thailand, Viet Nam
Christian	Argentina, Armenia, Australia, Austria, Belgium, Bolivia, Brazil, Burundi, Canada, Cape Verde, Chile, Colombia, Costa Rica, Croatia, Czech Rep., Denmark, Dominica, Ecuador, El Salvador, Estonia, Finland, France, Gabon, Georgia, Germany, Ghana, Grenada, Guatemala, Guyana, Honduras, Hungary, Iceland, Ireland, Italy, Kenya, Latvia, Lithuania, Malawi, Mexico, Namibia, Netherlands, New Zealand, Nicaragua, Norway, Panama, Papua New Guinea, Peru, Philippines, Poland, Portugal, Rep. of Korea, Rwanda, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Sao Tome and Principe, Seychelles, Slovenia, South Africa, Spain, Sweden, Trinidad and Tobago, Uganda, United Kingdom, Uruguay, USA, Venezuela, Zambia
Daoist	China
Hindu	India, Mauritius, Nepal
Jewish	Israel
Muslim	Albania, Algeria, Azerbaijan, Bangladesh, Bosnia Herzegovina, Burkina Faso, Cote d'Ivoire, Egypt, Eritrea, Ethiopia, Gambia, Indonesia, Iran, Jordan, Kazakhstan, Kyrgyzstan, Lebanon, Malaysia, Maldives, Morocco, Niger, Nigeria, Oman, Pakistan, Saudi Arabia, Senegal, Sudan, Tunisia, Turkey, United Rep. of Tanzania, Yemen
Orthodox	Belarus, Bulgaria, Greece, Russian Federation, Ukraine
Indigenous Beliefs	Cameroon, Central African Rep., Madagascar, Togo

Note: We specified as a representative religion in each country a religion that covers the majority of the country.
Source: Authors' specification based on World Factbook (CIA).

Table A2 Country List

	Country
Africa	Algeria, Burkina Faso, Burundi, Cameroon, Cape Verde, Central African Rep., Cote d'Ivoire, Egypt, Eritrea, Ethiopia, Gabon, Gambia, Ghana, Kenya, Madagascar, Malawi, Mauritius, Morocco, Namibia, Niger, Nigeria, Rwanda, Sao Tome and Principe, Senegal, Seychelles, South Africa, Sudan, Togo, Tunisia, Uganda, Zambia
America	Argentina, Bolivia, Brazil, Canada, Chile, Colombia, Costa Rica, Dominica, Ecuador, El Salvador, Grenada, Guatemala, Guyana, Honduras, Mexico, Nicaragua, Panama, Peru, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Trinidad and Tobago, Uruguay, USA, Venezuela
Asia	Armenia, Azerbaijan, Bangladesh, Cambodia, China, Georgia, India, Indonesia, Iran, Japan, Jordan, Kazakhstan, Kyrgyzstan, Lebanon, Malaysia, Maldives, Mongolia, Nepal, Pakistan, Philippines, Russian Federation, Saudi Arabia, Sri Lanka, Thailand, Viet Nam, Yemen
Europe	Albania, Austria, Belarus, Belgium, Bosnia Herzegovina, Bulgaria, Croatia, Czech Rep., Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Turkey, Ukraine, United Kingdom
Pacific	Australia, New Zealand, Papua New Guinea

REFERENCES

Anderson, J. E. and E. van Wincoop, "Trade Costs," *Journal of Economic Literature*, 62(3), 2004, pp. 691-751.

Baldwin, R., "The Euro's Trade Effects," ECB Working Paper No. 594, European Central Bank, 2006.

Bergstrand, J. H., "The Generalized Gravity Equation, Monopolistic Competition, and the Factor-proportions Theory in International Trade," *Review of Economics and Statistics*, 71(1), 1989, pp. 143-153.

Bhattacharjea, A., "IMPERIAL LEGACY The Persistence of Colonial Trade Patterns," Department of Economics, Delhi School of Economics, Working Paper, No. 126, 2004.

Boisso, D. and M. Ferrantino, "Economic Distance, Cultural Distance, and Openness in International Trade: Empirical Puzzles," *Journal of Economic Integration*, 12(4), 1997, pp. 456-484.

Cassing, J. and S. Husted, "Trade Pattern Persistence," in M. Plummer, ed., *Empirical Methods in International Trade: Essays in Honor of Mordechai Kreinin*, Edward Elgar, 2004, pp. 91-109.

Deardorff, A. V., "Determinants of Bilateral Trade: Does Gravity Work in a Neoclassic World?," in J. A. Frankel, ed., *The Regionalization of Economy*, Chicago: University of Chicago Press, 1998.

Eaton, J. and S. Kortum, "Technology, Geography, and Trade," *Econometrica*, 70(5), 2002, pp. 1741-1779.

Eaton, J. and A. Tamura, "Bilateralism and regionalism in Japanese and U.S. trade and direct foreign investment patterns," *Journal of the Japanese and International Economics*, 8, 1994, pp. 478-510.

Estevaderorada A., B. Frantz, and A. M. Taylor, "The Rise and Fall of World Trade, 1870-1939," NBER Working Paper Series, No. 9318, 2002.

Evenett, S. J. and W. Keller, "On Theories Explaining the Success of the Gravity Equation," NBER Working Paper Series, No. 6925, 1998.

Feenstra, R. C., *Advanced International Trade: Theory and Evidence*,

Princeton University Press, 2004.

Foroutan, F. and L. Pritchett, "Intra-Sub-Saharan African Trade: Is It Too Little?," *Journal of African Economics*, 2, 1993, pp. 74-105.

Guo, R., "How culture influences foreign trade: evidence from the U.S. and China," *The Journal of Socio-Economics*, 33, 2004, pp.785-812.

Harrigan, J., "Specialization and the Volume of Trade: Do the Data Obey the Laws?," in K. Choi and J. Harrigan, eds., *The Handbook of International Trade*, London: Basil Blackwell, 2001.

Havrylyshyn, O. and L. Pritchett, "European Trade Patterns after the Transition," Policy, Research and External Affairs Working Paper Series, No. 74, Washington, DC: World Bank, 1991.

Helliwell, J. F., "Language and Trade," in A. Breton, ed., *Exploring the Economics of Language*, Canada: Canadian Heritage, 1999.

Helpman, E. and P. R. Krugman, *Market Structure and Foreign Trade*, Cambridge, Mass.: MIT Press, 1985.

Hwang, E. and R. Guo, "The Effects of Cultural Similarity on International Trade," mimeo, 2004.

Kleiman, E., "Trade and the Decline of Colonialism," *Economic Journal*, 86, 1976, pp. 459-480.

_____, "Heirs to Colonial Trade," *Journal of Development Economics*, 4, 1977, pp. 93-103.

_____, "Cultural Ties and Trade: Spain's Role in Latin America," *Kyklos*, 31, 1978, pp. 275-290.

Livingstone, L., "The Impact of Colonialism on Export Growth in Britain and France," *Oxford Bulletin of Economics and Statistics*, 38, 1976, pp. 211-218.

Noland, M., "Affinity and International Trade," Peterson Institute for International Economics Working Paper, No. 05-3, 2005.

Paiva, C., "Addressing Protectionism and Subsidies in Agriculture: A Gravity Approach," IMF Working Paper, WP/05/21, 2005.

Pöyhönen, P., "A Tentative Model for the Volume of Trade between Countries," *Weltwirtschaftliches Archiv*, 90, 1963, pp. 93-100.

Rauch, J. E., “Networks versus Markets in International Trade,” *Journal of International Economics*, 48, 1999, pp. 7-35.

Rauch, J. E. and V. Trindade, “Ethnic Chinese Networks in International Trade,” *Review of Economics and Statistics*, 84(1), 2002, pp. 116-130.

Tinbergen, J., *Shaping the World Economy - Suggestions for an International Economic Policy*, The Twentieth Century Fund, 1962.