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MEASURING THE EFFECT OF REVEALED CULTURAL PREFERENCES ON TOURISM EXPORTS

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ABSTRACT (JEL: C33, F14, L83)

The aim of this article is to propose a novel method for measuring the effect of cultural preference on bilateral tourism receipts. The method applied is inspired from Disdier et al. (2010). Using the UNESCO classification and data on bilateral trade in cultural product, a proxy for cultural preferences is constructed. The variable is used in a gravity model for tourism trade, which is estimated using a two-step procedure to avoid issues of endogeneity. The dataset used is a panel of 12 OECD countries for the period of 11 years. The variable for cultural preferences eliminates the problems with traditional methods, which by using dummy variables to account for cultural preferences, assume that the latter are time invariant and symmetrical. The cultural variable constructed is found to be significant in explaining bilateral tourism exports with an elasticity of 0.39.

Keywords: gravity model, cultural preferences, bilateral tourism trade, two steps estimation.

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1. Introduction

That geographical distance between trading partners has an impact on trade is clearly established in the literature. It is fairly highly correlated to transportation costs, which act as trade barriers. Empirical evidence to this effect is provided by Isard and Peck as early as 1954. There are, however, factors other than physical distance that account for the economic cost of moving goods and services from one location to another. These are mode of transports, market concentration and resource endowment (Berkerman, 1956). In Berkerman's words, "*the concept of 'economic cost' relates to the cost of traversing distance rather than the actual mileage covered*" (Berkerman, 1956, pg. 32).

In the trade literature, the concept of distance has since transcended the notion of geographical distance to encompass economic and cultural distances. Such distances influence trade through different channels. Membership in common markets, in currency unions, historical links, common ancestries and languages may reduce the transaction cost and cultural barriers that would otherwise have a negative influence on trade. According to Kónya (2006), there is the need to differentiate between the effects of geographical and cultural barriers to trade. Kónya argues that countries have '*idiosyncratic cultural aspects that separate them from other nations*' and this needs to be considered when estimating determinants of bilateral trade. Countries that share distinctive cultural traits may not only be more inclined to trade with one another, as it reduces barriers to trade, but actually develop a preference for each other's products (Felbermayr and Toubal, 2010). It is argued in this article that countries may have a higher preference for the tourism products of destinations with which they share cultural similarities.

Problems, however, arise in empirical studies that seek to quantify the relationship between cultural proximities, preferences and bilateral trade. Empirical studies of trade, often applied the gravity model framework to analyse trade patterns, particularly after the earlier criticisms of their lack of theoretical underpinning were addressed in Anderson (1979). Anderson (1979) provides strong microeconomic foundations for gravity models by proving that they may be derived from the properties of expenditure systems that are obtainable by maximizing individual's preferences for traded goods subject to budget constraints involving the level of expenditure on these goods.

In gravity models, the geographical distance between trading partners is used as a proxy for transportation cost while the question of the economic and cultural distance is considered through the inclusion of dummy variables that measure the level of cultural distance or proximity and preferences between the home and host countries. This method has been largely employed in the tourism economics literature (see Matias, 2004; Garin-Munoz, 2006; Durbarry, 2008; Khadaroo & Seetanah, 2008; Vietze, 2012, Fourie et al. 2015; Santana-Gallego et al., 2016; Balli et al., 2016) to explain international tourism flows.

To assess the effect of culture, the traditional approach is to include dummy variables in econometric models and they have been shown to have strong explanatory powers. It is argued that the effect of culture on trade can be decomposed into the effects of cultural distance/proximity and that of cultural preferences and that the dummy variables used measure cultural proximities between two nations fairly effectively although not without flaws, but they fail to measure the effect of cultural preferences adequately. The two main criticisms for using dummy variables are that first they are time invariant, which is a strong assumption for both cultural proximities and preferences of trading nations, as both can change overtime. Second, they assume symmetry in proximities and in preferences of trading partners. While cultural

proximities can be symmetric, cultural preferences are more likely to differ. Take for example two trading partners, France and Canada. Dummies for language and colonial links are used to measure the effect of cultural proximities on their bilateral trade under the assumption that because the two countries share a common language, history and other cultural similarities emanating from past colonial links, transactions costs are reduced and give a boost to their international trade. This assumption is rational. However, this method combines the effect of cultural proximities and preferences and assumes that the preferences of French and Canadian citizens for each other's products do not change overtime and that French preferences for Canadian products are exactly the same as Canadian preferences for French products. This assumption is unlikely to be accurate because preferences are more likely to be asymmetric and vary over time. The effect of cultural preferences is likely to be absorbed by the coefficient of the dummies and combined with those of cultural proximities.

The aim of the present article is to provide an improved measure of cultural preferences that distinguishes between the effect of cultural proximities and cultural preferences on bilateral tourism trade. More precisely, it is argued that the dummy variables reflect a form of cultural proximity whereas there is a need to develop a measure for the cultural preferences of the tourists. The methodology is inspired from the contribution of Disdier et al. (2010), who use the value of trade of cultural goods and services as a proxy for cultural preferences in a gravity model to explain bilateral trade among 239 countries over the period 1989-2005. To calculate the value of trade in culture, the total value of the trade in cultural products is used. The products included are based on the UNESCO classification of cultural goods and services. This method is adapted for the tourism trade between 12 OECD countries for the period 2002-2012. To account for potential endogeneity in the model used, the latter is estimated using the two-step

OLS. The robustness of the results is tested by comparing estimates to a Pseudo Poisson Maximum Likelihood (PPML) regression.

To improve the estimation further, the paper uses bilateral tourism expenditures data as the dependent variable unlike the majority of the models that use data on arrivals or departures. Hanna et al. (2015) state that the size and the nature of the tourism flows have to be analysed at the bilateral level and using expenditures data because tourists' expenses reflect the preferences for the tourism product better than data on arrivals. The structure of this paper proceeds as follows: the related literature is surveyed in Section 2. Section 3 explains the econometric model and the data. In Section 4, presents the empirical results and their interpretations. Section 5 concludes the paper.

2. Survey of the literature

2.1 The trade literature

The contemporary literature on the link between trade and culture approaches the subject from two different angles. The first is based on the marketing theories and the pioneering study of Hofstede (1980), who introduces the concept of cultural dimension in business decision-making. This is measured across IBM subsidiaries in 64 countries using four cultural scores: individualism, masculinity, power distance, and uncertainty avoidance. This approach is adopted by Kogut and Singh (1988), who calculate an index of cultural distance (CD) based on weighted average of these dimensions. The literature has since evolved through the development of other approaches (see, for example, Gomez-Mejia and Palich, 1997, Clark and Pugh, 2001; Jackson, 2000) who seek to explain trade according to the CD but have been criticized by Shenkar (2001), who purports that they do not take into account the asymmetry in

the cultural preference between two countries, the temporal variability and the non-linearity of these preferences.

The second angle of analysis applies the gravity model. Until the theoretical underpinning proposed by Anderson (1979) and Bergstrand (1985, 1989), the gravitational model was used as an ad hoc model to test new international trade theories (see Krugman 1979, Krugman and Helpman 1985, Krugman 1991). The framework developed Anderson (1979) and Bergstrand (1985, 1989) relies on the assumption of monopolistic competition and consumers are represented by preferences subject to constant elasticity of substitution. In the model, each firm in a given country produces a differentiated product and production is subject to economies of scale. In this article, it is assumed that each country supplies a differentiated bundle of tourism products that is unique to the country providing it with the opportunity for achieving economic rent. The size of the domestic market reflects the capacity for internal economies of scale, which is further expanded with trade. The firms that are able compete internationally, reap the benefit of economies of scale allowing them to stay in the market and compete for market share. As each firm produces a unique bundle of products, the outcome is that a number of varieties are available on the international market at competitive prices. From the import side, the higher the demand for import, the higher the expenditure on import. Therefore, export revenue needs to be high enough to finance the import bill.

From the demand side of the model, the representative consumer seeks to maximize his/her utility subject to his/her budget constraint, which is a function of his/her income; prices of the tourism products and trade cost (physical or institutional). The utility function of the consumer, as indicated by Disier et al. (2010), Felbermayr and Toubal (2010), and Carrère and Masood (2018), includes a parameter that indicates the preferences of the consumer for the products of the exporting country. Transportation costs are approximated by the geographical distance

between the countries, and dummy variables are introduced at the estimation stage to account for factors such as preferential trading arrangements, sharing a common border or belonging to a common market or trade region (see, for example, Hummels and Levinsohn, 1995, Durkin and Krygier, 2000). The majority of studies have progressively included other dummy variables: common language or colonial links. This inclusion is carried out without any theoretical explanation with the exception of Kónya (2006). The interpretation of the distance variable had been a subject of many articles (see, for example, Boisso and Ferrantino, 1997 and Buch et al., 2004). The critics of Shenkar (2001) can also be addressed to these studies as the distance, and the dummy variables are symmetric, linear and time invariant.

More recently, authors have sought to fill this gap by capturing the cultural dimension in models of international trade. Disdier and Mayer (2007) use bilateral preferences; Guiso et al. (2009) bilateral trust; Melitz (2008) linguistic proximity; Rose (2008) colonial links; Wagner et al. (2002) immigration; Lewer and Van De Berg (2007) religious proximity and immigration. Felbermayr and Toubal (2010) provide an estimation of the effect of cultural proximity on bilateral trade by constructing an index using the scores from the Eurovision Song Contest and a panel database between 1975 and 2003. The underlying assumption is that the scores reveal the preferences of the consumers of one country for the culture of another. The index is shown to be positively affecting trade volumes.

The more conclusive work has been done by Disdier et al. (2010), who develops a method using the revealed preferences of trading nations. They assume that the country's consumption of imported culture is a more accurate measure of its preferences for the culture of its trading partner. The authors, therefore, use the volume of bilateral trade of cultural goods and services as exogenous variables to explain total bilateral trade. They use the BACI database developed by the *Centre d'Etudes Prospectives et d'Informations Internationales* (CEPII), which included

239 countries over the period 1989-2005. They follow the UNESCO classification of cultural goods and services and extract from the balance of payments the information concerning these items. They demonstrate that the trade in cultural products variable is a good proxy of cultural preferences, as it varies over the time and it does not suffer from a problem of availability and coverage. Their results clearly indicate that this variable has a higher power of explanation than all the other proxies traditionally used in the literature.

2.2 The tourism literature

The tourism literature also addresses the relationship between tourism and culture broadly from two angles. The first looks at the application of marketing literature to explain the tourism attractiveness of a destination. The second takes an economic modelling approach and that use dummy variables in gravity models to study the concept of cultural proximity and preference. Crotts (2004) constructs a cultural index based on Hofstede's scores for the uncertainty avoidance with a sample composed of 302 US residents travelling abroad for the first time for leisure purposes in 26 different countries. He considers the cultural orientations of the visitor's home country and of the destination. However, in his conclusion, he admits that the results of logistic regressions do not provide very robust results. This can be explained by the fact that from the tourist's perspective, cultural distance is a more complex phenomenon, which cannot be captured only by the difference in the uncertainty avoidance index.

Ng et al. (2007) obtained more conclusive results by using five CD measurements (Kogut and Singh's cultural distance index, Clark and Pugh's cultural clusters, West and Graham's linguistic distance, Jackson's cultural diversity index and perceived cultural distance) in a survey of Australian residents, and they compared the results of these indexes with the intention to visit 11 destinations. They conclude that perceived cultural distance and Clark and Pugh's index are the most strongly related to the consumer's intention of visiting a holiday destination.

The literature continues to provide empirical studies that apply this type of analysis (see, for example, Ahn and McKercher, 2015 on the international visitors to Hong Kong; Esiyok et al., 2017 on medical tourism in Turkey).

The second type of analysis, based on the gravity model, is also well developed in the tourism literature. Morley et al. (2014) discuss the theoretical foundations of the gravity model in the tourism context. Their model is derived from consumer choice theories and supports the use of this framework to analyse tourism demand in a destination and the understanding of the consequence of public policies for the destination attractiveness.

Most of the empirical studies that use the gravity model in tourism economics introduce exogenous variables that are not integral to this framework. For example, based on a sample that includes 2,420 FDI projects carried out by 50 parent countries in 104 host countries from 2005 to 2011, Falk (2016) finds that the geographic distance has no influence on tourism arrivals. Most studies, however, add dummy variables to distinguish between the effects of cultural affinities, information costs and geographic distance, which are then interpreted as the transport cost of travel. Seetaram (2010) discusses the limitations of using distance as a proxy for transportation cost. The distance variable incorporates the effect of all other distance-related variables and becomes problematic to interpret. For example, Seetanah et al. (2010) integrate two dummy variables (common border and common language) for a panel data analysis of South Africa's inbound tourism. Vietze (2012) uses a dummy variable to capture the religious proximity between host country (USA) and sources countries. He finds that the USA is more attractive for tourists who come from countries with a large share of Christians, and more precisely with a large share of Protestants. A similar variable is used by Hanna et al. (2015) to explain the intra-tourism trade in EU. There is a growing body of literature which analyses the effect of immigration on tourism claiming that the existence of a community of immigrants

from the home country at the destination is likely to increase the cultural proximity between the home and host countries. This has a positive effect on tourism trade. This effect is explained and analysed in details in studies such as Dwyer et al. (2014), Forsyth et al. (2012) and Seetaram (2012a,b).

With a cross-section of 195 countries for 2012, Santana-Gallego et al. (2016) uses dummy variables representing common border, colonial links, common language, common religion or free trade agreement with the objective of testing for different indicators of cultural proximity. These variables are also used by Balli et al. (2016). However, it can be noted that the primary focus of these studies is not to estimate the effect of cultural proximity. The dummy serves only as a control variable in the estimation. The inclusion is more often than not for econometric correctness, with the exception of Zhang et al. (2017). They estimate a gravity equation for a sample of 81 origin countries and 32 destinations for the period 1995-2008. The role of the cultural distance on tourism arrivals is tested by using the 4 Hofstede's indexes. Their results indicate that controlling for the effects of distance, population, and GDP per capita, international tourism increases when the host and the destination share the same cultural values (higher individualism and higher indulgence notably). However, the criticisms from Shenkar (2001) are still valid here. It is important to understand that while the use of dummy variables in the tourism literature serves the purpose of measuring cultural, political and institutional proximity, to some extent, it does not measure the effect of cultural preferences on tourism trade. Hence, this article develops a method that will capture the latter.

3. Econometric Model and Data

3.1 Sample

This study investigates the bilateral international tourism flows of 12 OECD countries (Australia, Austria, Canada, France, Germany, Italy, Japan, the Netherlands, Portugal, Spain,

the United Kingdom and the United States) for the period 2002-2012. The choice of countries and year are motivated by the availability of data and the need to include the main tourism destinations from the OECD for which data exist. This exercise is constrained by the change in the methodology in accounting for trade in services. The definitions applied changed from the (Extended Balance of Payments Services classification) EBOPS 2002 to that of 2010. However, not all OECD countries have moved to the 2010 definition, and the data from the two definitions are not strictly comparable. Hence, to obtain the largest sample that the available data allow for, it is decided to include the aforementioned 12 countries and the 2002 definition. This allows for the construction of a three-dimensional balanced panel dataset comprising 12 countries, 11 trading partners and 11 years yielding a large sample of 1,452 data points. The advantage of using a balanced panel dataset is the guarantee that it will be not over-estimate or under-estimate marginal effects due to the under or over-representation of at least one country or year in the sample.

International tourism flows can be captured either through volume (i.e., arrivals/departures) or through value (receipts/expenditures). Monetary data are employed to be consistent with the cultural variable and because Hanna et al. (2015) state that tourism receipts are a better approximation of the preferences of tourists, and this is supported by the UNWTO. The tourism receipts/expenditures are in millions of US dollars and are compiled from the OECD database (2010, 2014). The data on tourism exports are chosen instead of tourism imports because as explained in Nowak et al. (2013), the value of international trade flows can differ largely between the national accounts of the two countries. Export data are generally more reliable than imports. However, in the case of the USA, a lack of data on exports led to the use of the relevant import data from the host country.

3.2 A gravity model for trade in tourism

Tourism imports, i.e., the demand of the tourists from j for the product of destination i, are obtained from the maximization of the consumer's utility under the budget constrain and can be summarized by the following expression:

$$M_{ijt} = {Y_{it}}^{\alpha} {Y_{jt}}^{\beta} P_{ijt}^{\delta}\, a_{ijt}^{\sigma} {d_{ij}}^{\gamma} \quad (1)$$

where Y_i and Y_j are the respective mass of the countries *i* and *j*. d_{ij} are trade barriers, P_{ij} are the prices of the products of country *i* for the consumers of country *j* and a_{ij} are the preferences of the consumers of the country *j* for the products of the country *i* (in terms of variety purposed). In the context of this research Equation (1) may be rewritten as:

$$XT_{ijt} = f\left(RP_{ijt};\ GDP_{it};\ GDP_{jt};\ dist_{ij}; lang_{ij}; col_{ij}; cult_{ijt}\right) \quad (2)$$

XT_{ijt} is the tourism receipts of country *i* (destination) from the country *j* (home), at the time *t* in millions of US $ (OECD database, 2010, 2014). The control variables are:

RP_{ijt}, the relative price index of the country *i* to country *j*. This index encapsulates the competitiveness of the trading partner in relation to the home country. This method is proposed and explained in detail in Seetaram et al. (2016) and Nowak et al. (2013). The price index of country *i* is obtained as follows: $100 \times \frac{Current\ GDP\ (in\ US\ \$) of\ i}{PPP\ GDP\ (in\ US\ \$) of\ i}$ to obtain the cost of living of the country *i* relatively to its trading partner *j*, the price index of country *i* is divided by those of country *j*. This index provides a good approximation of the price of the destination *i* for tourist from the country *j*.

GDP_{it} and GDP_{jt} are respectively the current GDP (in US $) of country *i* and *j*. These variables are traditionally used in the gravitational models to represent the "mass" effect (see Bergstrand, 1989). The bigger the country is, the more important is the volume of trade between them. The

coefficients of these variables are expected to be positive. The mass effect is obtained by summing the coefficients of these two variables.

$dist_{ij}$ is the geographical distance between countries *i* and *j* weighted by the population distributions (see Mayer and Zignago, 2006). This variable is traditionally added in the gravitational models to capture the costs of transport and the transaction costs between the countries. The coefficient of this variable is expected to have a negative sign.

$lang_{ij}$ and col_{ij} are dummy variables, which are coded 1 if *i* and *j* have, respectively, a common official language and a colonial link. Initially, 4 standard dummy variables are included for common border; common religion; common language and colonial links. Following the preliminary estimations and to avoid problems associated with multicollinearity, only the dummies for common official language and a colonial link are retained. It is common in the trade literature to find that countries that share colonial links and a common language tend to engage in higher volumes of trade. Similar results are expected for trade in tourism. Therefore, the coefficients of these variables are expected to be positive. The data for the control variables are collected from the *Comptes Harmonisés sur les Echanges et L'Economie Mondiale* (CHELEM) database and the distance database from the CEPII (CEPII; 2016). The specification chosen is the traditional log-log specification, as it generates elasticities that are straightforward to interpret.

3.3 Constructing a proxy for cultural preferences

The methodology proposed by Disdier et al. (2010) is applied to construct a variable for measuring the revealed preferences for the culture of the destination by tourists from the home country. $cult_{ijt}$ is defined as the cultural preferences for the country *i* by country *j* at time *t*. It is assumed that the value of trade in cultural products from country *i* by country *j* reveals the

preference of the consumers in country *j* for the culture of country *i* and is a good proxy for measuring the latter. The full list of products that are classified as cultural products by UNESCO is used. Data on international trade are obtained from the International Trade Statistics (Comtrade) of the United Nation (harmonized system 2002 and 2012, UN Comtrade database, 2016). To extract the relevant export data, Comtrade classifications that best match the UNESCO list of cultural good and services are obtained. Table 1 gives the list of good and services classified as cultural products by UNESCO and the corresponding Comtrade classifications.

Table 1. Cultural goods and services according to the UNESCO classification

Items	**Details**	**Comtrade codes (HS2012 or EBOPS 2002)**
Core cultural goods		
Heritage goods	Collections and collectors' pieces, Antiques of an age exceeding 100 years.	9705, 9706
Books	Printed books, brochures leaflets, Children's picture books, Children drawings books, and Colouring books.	490191, 490199, 49011, 4903
Newspapers and periodicals		49021, 49029
Other printed matter	Printed music, postcards, pictures and design.	4904, 490591, 490599, 4909, 491191
Recorded Media	Gramophone records, laser discs, reading systems for reproducing sounds only. Recorded magnetic tapes, over recorded media for sounds.	85241, 852421, 852422, 852423, 85249
Visual Arts	Paintings, sculptures, lithographs.	97011, 97011, 97019, 9702, 9703
Audio visual media	Video games used with a televisions receiver – Photographic and cinematographic film exposed and developed.	95041, 37051, 37052, 37059, 37061, 37069

Core cultural services	Audio-visuals and related services, copyrights and licenses fees.	891, 892, 894
Related cultural goods and services	Musical instruments - Sound player recorder and recorded sound media - Cinematographic and photographic supplies - Television and radio receivers - Architecture plans and drawing trade and trade advertisement material - Information services, news agency services - Advertising and architecture services - Other personal, cultural and recreational services	9201, 85238, 85258, 8527 287, 288, 289

There are several advantages of using $cult_{ijt}$ as a proxy for cultural preferences over the traditional variables such as common official language, colonial links, common religion or common border. First, since the traditional variables are mostly included in econometric models in the form of dummies, they are binary and time invariant. The degree of cultural preferences and their changes over time are not observable. Take for example trade from the bilateral trade between the UK, Canada and Australia. The use of common language and colonial links assume that British consumers are indifferent between goods and services imported from Australia or Canada. Similarly, Canadian consumers are indifferent between good and services from the UK or France as they share common language and colonial link with both countries. Furthermore, these preferences are symmetric meaning that the British consumer's preferences for Canadian product is exactly the same as Canadian preferences for British products and do not change over time. These are strong and unrealistic assumptions. The application of $cult_{ijt}$ solves these problems.

The data in Table 2 illustrate this point. For each of these country pairs, the values of the common language and colonial links dummies are equal to 1 irrespective of the year and direction of trade indicating their cultural proximities. However, the data clearly shows that the intensity of cultural preferences are asymmetric. For example, the export of cultural products from Australia to the UK is clearly much lower than the import of cultural products from the UK to Australia yielding a trade deficit of $174 million in 2002. Moreover, this value changes to $338.3 million in 2012. The preferences change overtime when the notable increase in import of cultural goods from the UK raises the trade deficit by 94%. In both cases, not only the preferences are asymmetric with negative trade balance but they also alter over the period of 10 years.

Table 2: Trade in Cultural Products ($million) for selected country pairs, 2002 and 2012.

	Australia - UK	**Canada - UK**	**Canada – France**
Export 2002	66	25.1	12.6
Import 2002	240	102.7	104.1
Trade Balance 2002	**-174**	**-77.6**	**-91.5**
Export 2012	30.1	47.3	24.5
Import 2002	368.4	128	154.7
Trade Balance 2012	**-338.3**	**-80.7**	**-130.2**
Change in trade balance (2002-2012)	*94.4%*	*4.0%*	*42.3%*

Second, from a technical point of view, $cult_{ijt}$ allows for the further decomposition of the influence of culture on international trade. The exclusion of $cult_{ijt}$ from a trade model implies two major consequences. On the one hand, if found correlated with colonial links, common official language religion or border, its effect will be embedded in the coefficient of these variables leading to an over estimation of the relative effect of the latter. On the other hand, if unrelated, the effect of $cult_{ijt}$ will be incorporated in the error term of the model, which will then generate estimators that do not have optimum properties. By including this variable in the model, its effect is isolated. The added benefit is that it provides policymakers with an additional tool to use in devising and implementing policies.

3.4 Model Estimation

The proxy for cultural preferences is calculated using trade data, implying that it is not independent but endogenous to the model. Treating it as exogenous will lead to misspecifications of the model. Moreover, it may be highly correlated with the other control variables. To avoid this problem, Equation (2) is estimated in two steps using the 2-Step OLS method. First, the bilateral cultural exports of country *i* to country *j* at time *t*, XC_{ijt}, is estimated using Equation (3).

$$\ln XC_{ijt} = \alpha_0 + \alpha_1 \ln RP_{ijt} + \alpha_2 \ln GDP_{it} + \alpha_3 \ln GDP_{jt} + \alpha_4 \ln dist_{ij} + \alpha_5 \ln lang_{ij} + \alpha_6 \ln col_{ij} + \varepsilon_{ijt} \quad (3)$$

where XC_{ijt} is the export in cultural products. The residuals from Equation 3 (ε_{ijt}) are extracted and used as a proxy for $cult_{ijt}$ yielding Equation (4) below:

$$\ln XT_{ijt} = \beta_0 + \beta_1 \ln RP_{ijt} + \beta_2 \ln GDP_{it} + \beta_3 \ln GDP_{jt} + \beta_4 \ln dist_{ij} + \beta_5 \ln lang_{ij} + \beta_6 \ln col_{ij} + \beta_7 \ln cult_{ijt} + \eta_{ijt}$$ [i] (4)

with $\ln cult_{ijt} = \varepsilon_{ijt}$

Table 3 summarizes the key descriptive statistics of the variables from Equation (4) and the expected signs of their coefficients. The model is estimated using temporal fixed effects, as country fixed effect will be perfectly collinear with the distance, common language and colonial link variables. Hummels (1999) and Redding and Venables (2004) have suggested the incorporation of exporter and importer fixed effects (in interaction with time fixed effects) in order to take into account the effect of the size, price and number of varieties. However, as the estimation already includes variables for the size effects and for the price effect, the recommendation is deemed redundant here.

Initial estimations expose the presence of heteroscedasticity in the model. The econometric estimations are performed using two alternative methods. The most common way to address heteroscedasticity is the application of the OLS method on a model in the log-linear form using a robust estimator of the covariance matrix along the lines of Eicker–White (Eicker, 1963; White, 1980). The second approach used is the Pseudo Poisson Maximum Likelihood estimator. This method is recommended by Santos Silva and Tenreyro (2005, 2006) for gravity models that suffer from heteroscedasticity.

Table 3. Descriptive statistics of all variables and expected signs for the estimated coefficients

Variables	N[1]	Mean	Std. Dev.	Min	Max	Expected sign for the coefficient
Tourism exports (XC_{ijt})	1452	1683.325	2693.94	3.96	21570	-
Cultural exports (XT_{ijt})	1452	170.7927	406.9597	0.0202797	3754.777	-
Overall exports (X_{ijt})	1452	1799821	3274707	784.855	2.96e+07	-
Relative prices (RP_t)	1452	1.015705	0.1814255	0.4776913	2.093402	Negative
GDP of country i (GDP_{it})	1452	2.79e+12	3.60e+12	1.34e+11	1.62e+13	Positive
GDP of country j (GDP_{jt})	1452	2.79e+12	3.60e+12	1.34e+11	1.62e+13	Positive
Distance ($dist_{ij}$)	1452	6180.081	5357.474	281.7572	17572.81	Negative
Common language ($lang_{ij}$)	1452	0.1212121	0.3264861	0	1	Positive
Colonial links (col_{ij})	1452	0.0909091	0.2875788	0	1	Positive
Cultural preference ($cult_{ijt}$)*	1452	-0.6586456	1.372592	-5.598629	2.867341	Positive

[1]Sample size. * indicates that this variable is extracted from the first step regression, with PPML estimator, without fixed effect (Column (3), Table A.2)

To avoid problems resulting from multicollinearity, a variance inflation factor (VIF) was used. the VIF for variable *h* is given by $VIF(j) = \frac{1}{1-R^2(j)}$, where R(j) is the coefficient of the multiple correlation between the *h* variable and the other explanatory or independent variables. A higher value of VIF represents a higher degree of correlation. All the final estimations present VIF values less than 10.

4. Estimation Results

The results of the first step estimation are in Table A1 in the appendix. The results of the second step performed using OLS are in Table A2. The results that are retained for interpretation are given in Table 4. These are obtained by estimating Equation 4 using the PPLM technique and tourism receipts as the dependant variable. The results using the traditional method with dummy variables only are in Columns 1 and 2. The findings from the proposed method are given in Columns 3 and 4. Overall, neither the choice of estimators used nor the inclusion of fixed effect significantly alter the results obtained. This demonstrates that the results are robust and reliable.

To compare the effect of $cult_{ijt}$on tourism receipts to that of total receipts, Equation 4 is estimated using the latter as the dependant variable. These results are available on request.

Table 4. Estimation Results Using Pseudo Poisson Maximum Likelihood (PPML) Technique

DEPENDENT VARIABLE	**TOURISM EXPORT**			
MODEL	(1)	(2)	(3)	(4)
Constant	-18.134***	-18.878***	-16.557***	-17.049***
	(11.92)	(11.95)	(10.93)	(10.76)
Relative prices (RP_t)	-1.789***	-1.851***	-1.740***	-1.742***
	(8.07)	(8.26)	(8.33)	(8.18)
GDP of country i (GDP_{it})	0.580***	0.598***	0.602***	0.613***
	(21.01)	(20.86)	(24.51)	(24.36)
GDP of country j (GDP_{jt})	0.468***	0.482***	0.381***	0.391***
	(11.50)	(11.40)	(8.96)	(8.78)
Distance ($dist_{ij}$)	-0.539***	-0.546***	-0.495***	-0.503***
	(16.47)	(16.45)	(15.00)	(15.21)
Common language ($lang_{ij}$)	0.518***	0.513***	0.567***	0.570***
	(6.26)	(6.23)	(7.36)	(7.52)
Colonial links (col_{ij})	0.151*	0.140*	0.069	0.060
	(1.83)	(1.70)	(0.78)	(0.67)
Cultural preference ($cult_{ijt}$)	-	-	**0.359*** **	**0.391*** **
			(11.38)	**(11.88)**
Time FE	No	Yes	No	Yes
R^2	44.07%	45.03%	49.78%	50.11%
Pseudo log-likelihood	-1013977.2	-1005914.9	-874639.92	-867617.79

Notes: ***, ** and * indicate that coefficients are significantly different from 0 at the 1%, 5% and 10% levels, respectively. T-Statistics are in parentheses.

All coefficients have the expected signs and are statistically significant irrespective of the estimation technique with the exception of colonial links, which is significant only when the model is estimated with OLS and loses its significance when the model is estimated using PPML with the cultural preferences. The coefficient of cultural links is highly significant irrespective of the estimation technique. The coefficient of relative price is highly significant

and negative, as expected. It reveals that tourism trade is highly elastic and sensitive to changes in prices, confirming the results of the literature. The estimations, however, are higher than those of Vietze (2012), whose results are closer to -1, whereas here, they range between -1.740 and -1.864. Note that Vietze only considered one destination, the USA, while this study includes several home and destination (OD) pairs. The results from these estimates point to the competitive nature of the business, which offers a range of choices to customers and suggests that tourism exports are more responsive to changes in prices compared to total exports.

The mass effect of the gravity model is obtained from the sum of the coefficient of the GDP variables. The bigger the economic mass of the OD pairs, the higher is the magnitude of the flows between the two countries. Traditionally, in the gravity model of international trade, the mass effect is approximately 1.5. In this study, the values obtained for total exports range from 1.66 to 1.74 and from 0.9 to 1.09 for tourism trade. The empirical results confirm that on average, the closer the development levels between the two countries are, the more likely it is that these two countries will engage in bilateral trade and tourism trade. However, the effect on tourism trade is lower, indicating that to some extent, the developmental level may be a less important criterion for choosing a destination and its products and services than it is for conducting international trade. A certain category of tourists may choose to travel to destinations that are of a different developmental level from their home country, as they visit places to experience a different lifestyle and pace of life and experience the exotic. This may account for the lower mass effect than for total exports.

Furthermore, β_2 is a fairly good proxy for the development level of the destination. A higher GDP may lead to the expectation of better provision of both quality and the range of goods and services at the destination; for example, the availability of communication, health, safety and other infrastructure at the destination and a higher GDP can be expected to be highly correlated

to the provision of these services. In this study, β_2 is positive but less than 1, indicating that while the development level of the destination is an important criterion, consumers are nevertheless not highly sensitive to changes in this variable. To some extent, this may be driven by the fact that the sample comprises OECD countries, where the provision of the expected facilities is already of a high quality that subsequent improvement in the development level will only marginally affect demand.

The coefficient β_3 can be interpreted as the income elasticity of demand. The GDP of the home country is a fairly good proxy for the income level of the travellers. The values, which are positive but less than 1, indicate that international travels are normal products and necessities. This indicates the changing perception of international travel over the years. A few decades ago, international travel was a luxury of the few, but it has now become a necessity in the consumption bundle of consumers from the OECD.

Geographic distance between the OD pairs produces a push effect on the bilateral trade. The push effect is greater for total trade, with an elasticity value of approximately -0.8, than for tourism trade, with an elasticity value of -0.5. This can be because for some tourists, a greater distance and remoteness is part of the attraction of a destination, mitigating part of the negative effect from the inconvenience of long distance travel and associated economic costs. This shows that while distance has a negative effect on tourism demand, that effect is smaller on average than for total trade. On the other hand, it can be said that having a common language and colonial links which demonstrates a degree of cultural proximity between the two countries, which has the effect of reducing transaction costs of trading and therefore, has a positive effect on trade. The coefficient of language, which is positive, clearly indicates that cultural proximity is beneficial for the tourism trade as well. The limitations, however, as stated earlier, are that the two coefficients may absorb the effect of cultural preferences. The underlying assumption

here is that the effect of cultural preference is symmetric, time invariant, and linear, which are very strong assumptions. This study differs from others in the tourism trade literature, in that the coefficients of these variables are isolated from the effect of preference for the culture of the destination, which is encapsulated by the $cult_{ijt}$ variable. It may, therefore, be argued that the coefficient of language, 0.57, is a more accurate measure of the effect of cultural proximity on tourism trade.

The partial coefficient of determination for the revealed cultural variable between Columns (1) and (3) and between Columns (2) and (4) for the two specifications (PPML and OLS) ranges between 10.2% and 17.9%[ii]. These rates are highly significant. The t-statistics of this variable is more important than those of the relative price, the common border and GDP of the home country. Furthermore, the introduction of the cultural variable makes the colonial variable statistically insignificant. This result cannot be explained by correlation of the two variables because the potential correlation has been neutralized through the two-step estimation technique. It simply means that the cultural preference is better at explaining the preference of consumers and that the tourism trade literature has, thus far, missed an important factor in explaining the size of bilateral tourism trade. If the cultural preferences for country *i* from country *j* increase by 1%, then the tourism receipts of this country will increase on average by 0.39%, ceteris paribus (from Column 4 of the Table 4). That is, if two countries become culturally closer, the tourism trade between these two countries can be expected to flourish. The results are smaller for total trade, with a coefficient of 0.1, which is comparable to the results from Disdier et *al*. (2010), who find the cultural preferences variable close to 0.2. In this study, it is concluded that the effect of cultural preferences is almost 4 times larger on international tourism exports than on total exports.

5. Conclusion

This paper supports the idea that tourist choice of destination is not only guided by economic factors but also by other non-economic factors such as culture that add to the attractiveness of the destination. For this reason, the link between cultural preferences and tourism recripts is investigated within the framework of gravity models and using a panel dataset. The literature has provided different ways of capturing the effect of cultural preferences on tourism receipts, and it is clear that there is a need to distinguish between the cultural distance/proximity and cultural preferences. A growing body of literature is investigating the channels through which culture affects trade. For example, cultural proximity has been proven to reduce the transaction cost of trading by cutting down on the cost of gathering information. However, culture itself is an item of consumption, and the volume/value of bilateral trade in cultural products reveals consumer preferences. Disdier et *al*. (2010) propose that the volume of trade in cultural products can be used to determine the level of cultural preferences between two trading partners. Regarding tourism trade, it can be said that additionally, culture is one of the attributes of the destination that adds to its attractiveness. Sharing similar culture or preferring the culture of a destination encourages tourism expenses. A tourist may choose to visit a destination more often and spend more money when he/she shares an affinity with the culture of the destination. While this is not a new idea and several authors have sought to measure the effect of cultural preference, the methods that have been applied may be flawed.

Cultural proximity in a trade model is usually accounted for by the introduction of dummy variables. The limitations of this technique are twofold. It presupposes that cultural proximity between 2 nations is symmetrical and that it does not vary over time. These are very strong and limiting assumptions. In this paper it is argued that there is the need to separate the effect of cultural proximity from that of cultural preference by including a variable to measure the latter. The methodology applied in this study is inspired from Disdier *et* al. (2010). The UNESCO

classification of cultural products is used to construct a variable of cultural preferences based on bilateral trade data for cultural products. By using the two-step estimation technique with a gravity model and a database that contains bilateral trade of 12 OECD countries for the period 2002-2012, a positive and significant impact of cultural preferences on tourism receipts is clearly identified.

Following the estimations, it is concluded that if the revealed preferences of cultural goods and services measured by export f cultural good from country *j* to country *i* increases by 1%, then the tourism receipts of *j* increases by 0.39%. The proposed measure for preferences has the advantage of being time variant and asymmetric and is not linear, which overcomes the limitations from previous studies. By using data of culture and services trade, this article proposes a new way of distinguishing between the effect of cultural distance/proximity and cultural preferences on tourism receipts. The application of the two-step econometric procedure ensures that the variable is not co-related with any other in the model. Because the dummy variables representing language and the proposed variable for cultural preferences are statistically significant, it reinforces the case for disaggregating the effect into two separate components, each of which can be analysed in isolation. This allows for a more accurate understanding of the effect of each. It leads to the conclusion that the model developed is also justifiable from a purely statistical point of view.

However, these results have to be taken with some caution. First, the database used includes only developed countries, and the size of the effects may differ when the tourism flows between developed and developing countries are considered. As is explained in the methodology section, due to a number of constraints, the sample could not be extended to include more destinations. Second, the value of the trade of good and services listed as cultural goods by UNESCO are the key data used for the measurement of the preference for the culture of the destination by home

country consumers. It is likely that changes in the initial classification and measurement errors that normally exist in macroeconomic data due to aggregation misclassification means that other aspects of cultures have not been captured by the variable. The latter, however, remains a good and more reliable measure of cultural preferences.

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Appendix

Table A1. Results of first step estimation to eliminate the endogeneity

Variables	(1)	(2)	(3)	(4)
Constant	-44.402***	-48.024***	-41.611***	-45.027***
	(32.02)	(34.80)	(26.91)	(28.53)
Relative prices (RP_t)	-0.459*	-0.459**	0.361*	0.305*
	(1.85)	(2.06)	(1.69)	(1.78)
GDP of country i (GDP_{it})	0.828***	0.909***	0.971***	1.044***
	(21.94)	(24.20)	(30.76)	(34.23)
GDP of country j (GDP_{jt})	1.124***	1.205***	0.845***	0.929***
	(39.35)	(42.92)	(22.02)	(24.56)
Distance ($dist_{ij}$)	-0.907***	-0.906***	-0.693***	-0.742***
	(31.66)	(32.88)	(24.72)	(25.92)
Common language ($lang_{ij}$)	1.432***	1.444***	1.096***	1.062***
	(16.09)	(18.14)	(14.33)	(15.42)
Colonial links (col_{ij})	1.090***	0.982***	0.883***	0.871***
	(8.71)	(8.18)	(9.91)	(10.55)
Time FE	No	Yes	No	Yes
Method	OLS	OLS	PPML	PPML
R^2	70.73%	74.28%	80.83%	83.51%
Pseudo log-likelihood	-	-	-62374.86	-54220.345

Notes: ***, ** and * indicate that coefficients are significantly different from 0 at the 1%, 5% and 10% levels, respectively. T-Statistic is in parentheses.

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Table A2. Estimations results using OLS on Tourism Trade

Variables	(1)	(2)	(3)	(4)
Constant	-18.488***	-18.805***	-18.488***	-18.805***
	(17.14)	(17.08)	(18.59)	(18.18)
Relative prices (RP_{ijt})	-1.864***	-1.864***	-1.864***	-1.864***
	(9.60)	(9.56)	(10.74)	(10.70)
GDP of country i (GDP_{it})	0.546***	0.553***	0.546***	0.553***
	(19.99)	(19.95)	(22.52)	(22.23)
GDP of country j (GDP_{jt})	0.535***	0.542***	0.535***	0.542***
	(18.92)	(18.66)	(20.11)	(19.81)
Distance ($dist_{ij}$)	-0.699***	-0.699***	-0.699***	-0.699***
	(27.42)	(17.20)	(29.97)	(28.99)
Common language ($lang_{ij}$)	0.909***	0.910***	0.909***	0.910***
	(8.58)	(8.52)	(9.08)	(9.15)
Colonial links (col_{ij})	0.319**	0.310**	0.319**	0.310**
	(2.29)	(2.21)	(2.46)	(2.37)
Cultural preference ($cult_{ijt}$)	-	-	0.347***	0.383***
			(15.34)	(15.78)
Time FE	No	Yes	No	Yes
R^2	53.06%	53.12%	59.71%	60.25%

Notes: ***, ** and * indicate that coefficients are significantly different from 0 at the 1%, 5% and 10% levels, respectively. T-Statistics are in parentheses.

[i] Note that we also estimate the model with a lag variable for the cultural affinity. The results are identical and available upon request.

[ii] Note R_1^2 and R_2^2, the respective r-squared for the regression without and with the cultural variable. The partial coefficient of determination is the following: $\frac{R_2^2 - R_1^2}{1 - R_1^2}$. The results of the tests are available upon request.