Cultural Diversity a Barrier to Riches?

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Abstract

We show that cultural dissimilarity dampens bilateral trade. More importantly, this paper is the first study to probe Huntington's *the Clash of Civilizations* hypothesis from an economic perspective. We analyze the dynamics of the effect of cultural heterogeneity on trade and provide evidence that the negative influence of cultural differences on trade is far more accentuated in the post-Cold War era than during the Cold War. For instance, two countries with distinct religious majorities have 35% lower bilateral import flows during the post-Cold War period compared to those countries sharing the same majority religion, whereas this effect is less than half, 16%, during the Cold War. In addition, we provide an explanation for the differential impact of cultural dissimilarity over time. By mapping out the transition of the effects of cultural and ideological dissimilarities, we find that cold-war ideological blocs were the reason for the suppression of cultural differences. Therefore, cultural differences come to the forefront as a trade barrier only in the post-Cold War period, after the demise of ideological rivalries.

Keywords: Cold War, culture, economic clash, trade.

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1 Introduction

Cultural dissimilarity plays an important role in economic interactions between countries (Felbermayr and Toubal, 2010; Guiso et al., 2009; Melitz, 2008; Rauch and Trindade, 2002). In this context, cultural frictions are considered to be a source of informational cost and/or a source of uncertainty that acts as a barrier in bilateral trade relations of countries. We feed into this line of discussion by scrutinizing the impact of cultural dissimilarity on international bilateral trade and how this relationship evolves across time.

We start by verifying whether cultural dissimilarities between countries are, by and large, a trade barrier. We do that by estimating a theory-based gravity model of international trade so that we do not fail to take into account multilateral resistance terms, omission of which leads to biased estimates (Anderson and Van Wincoop, 2003; Baldwin and Taglioni, 2007). We also employ a set of cultural heterogeneity measures that allow us to capture different aspects of culture. Subsequently, using data on bilateral imports over 1950-2006 and Huntington's (1998) typology of civilizations, we provide evidence that when two countries in a dyad are members of different civilizations their import flows are 20% lower than those of two countries from the same civilization. Furthermore, we extend the analysis using Ellingsen's measure of religious, ethnic and linguistic groups within countries and examine whether sharing any of these cultural heritages has an impact on countries' trade relations. We show that when two countries in a dyad have distinct religious majorities, distinct ethnic majorities or distinct linguistic majorities, their trade relations are impeded. For instance, two countries with different dominant ethnicities have 38% lower imports than those sharing the same ethnicity.

Main novelty of this paper, however, lies in a more specific issue. This is the first study to examine Huntington's "The Clash of Civilizations?" hypothesis from an economic point of view. In his much acclaimed thesis, Huntington (1993a, 1993b, 1998, 2000) argues that the great divisions among humankind and the dominating source of clashes in the post-Cold War era will be cultural. He furthers his predictions by stating that the violent struggles among peoples will result as a consequence of the fault lines between cultures at the micro level; at the macro level, however, states from different cultures will compete for economic

and political power (Huntington, 1993). Although the Clash of Civilizations in the post-Cold War hypothesis enticed a number of authors into testing it for militarized disputes and battles between countries (Chiozza, 2002; Gokmen, 2012; Henderson, 1997, 1998; Henderson and Tucker, 2001; Russett et al., 2000), its general implications for economic clashes among cultural groups remained overlooked and no author ever put it into rigorous testing. This is exactly the aim of the present paper. We analyze the dynamics of the effect of cultural heterogeneity on trade and provide evidence that the negative influence of cultural differences on trade is far more accentuated in the post-Cold War era than during the Cold War. For instance, when the two trading partners do not share the same dominant ethnicity, their imports are reduced by 27% during the Cold War; whereas in the post-Cold War epoch they import 51% less than a pair of countries that share these values. Alternatively, in the post-Cold War period, two countries with distinct religious majorities have 35% lower imports than those sharing the same religion, whereas this negative effect is less than half, 16%, during the Cold War. We additionally ask what costs cultural dissimilarity brings about and quantify the tariff equivalent costs of cultural differences for standard levels of elasticities of substitution in the literature. While the tariff equivalent cost of cultural dissimilarity varies between 0.5% to 8.7% during the Cold War, this additional cost is between 5.8% to 30.4% in the post-Cold War.

Furthermore, we provide an explanation for the differential effect of cultural dissimilarity in the Cold War and the post-Cold War periods. We first assign each country to a cold-war bloc to create an indicator of different ideological alignments. Then, we show that belonging to different cold-war blocs significantly hampered bilateral trade relations during the Cold War. Subsequently, by mapping out the transition of the effects of cultural and ideological dissimilarities throughout years, we find that cold-war ideological blocs were the reason for the suppression of cultural differences. That is why, the impact of cultural differences did not matter during the Cold War and were dwarfed by the effect of ideological blocs. Thus, when the Cold War came to end, the influence of separate ideological camps was lifted and cultural differences were unleashed. Cultural differences come to the forefront as a trade barrier only

in the post-Cold War era after the demise of ideological rivalries and these barriers created by cultural cleavages are what matters now.

Our results are robust to alternative procedures of critical evaluation. Unlike some existing studies (Felbermayr and Toubal, 2010; Giuliano et al., 2006; Guiso et al., 2009; Rauch and Trindade, 2002), the data set we use not only contains European countries or a subset of the world, but the entire range of world countries. We are careful to control for a large array of measures of geographic barriers as well as historical and policy-related determinants of trade relations. Moreover, we include time-varying origin and destination-fixed effects to account for the multilateral resistance terms, while standard errors are clustered at the country pair level. In addition, our results hold against the tests of including a very rich set of geographic controls, including genetic distance as an alternative measure of culture, taking into account political proximity and lagged imports and carrying out principal component analysis of cultural difference. Two-step Heckman selection model, hyperbolic sine transformation method and a probit model show that our results are also robust to the omission of zero trade flows.

This study contributes to the literature in political science and international relations on *the Clash of Civilizations* thesis by adding an economic perspective. This strand of literature focused on militarized disputes aspect of the thesis and completely ignored what the economic implications could be. Russett et al. (2000) and Henderson and Tucker (2001) assess the incidents of militarized interstate disputes between countries during the periods 1950-92 and 1816-1992, respectively. They find that such traditional realist influences as contiguity, alliances and relative power as well as liberal influences of joint democracy and interdependence provide a much better account of interstate conflict involvement and that intercivilizational dyads are less conflict prone. However, Huntington (2000) reacted to such studies by criticizing time periods and claiming that his predictions are valid in the post-Cold War era. As such, on a larger data set with a better coverage of the post-Cold War era, Gokmen (2012) provides evidence that even after controlling for geographic, political, military and economic factors, being part of different civilizations in the post-Cold War period brings about 63.6%

higher probability of conflict than belonging to the same civilization, whereas this effect is not different from zero during the Cold War.

In addition, this paper substantially adds to the literature on trade and culture by bringing in the dynamics and showing the evolution of the effect of culture. Felbermayr and Toubal (2010) establish a correlation between culture and trade using scores from the Eurovision Song Contest as a proxy for cultural proximity. Giuliano et al. (2006) question the validity of genetic distance as a proxy for cultural distance in explaining trade relations and show that genetic distance only captures geographic barriers that are reflected in transportation costs across Europe. Guiso et al. (2009), on the other hand, show that bilateral trust between pairs of European countries leads to higher trade between them. Melitz (2008) disentangles the channels of linguistic commonality and finds that ease of communication facilitates trade rather through the ability to communicate directly than through translation. Lastly, on a subset of world countries, Rauch and Trindade (2002) show the importance of ethnic Chinese networks in international trade by expediting matches between buyers and sellers and by generating better contract enforcement for international transactions.

This study is also part of the vast literature attempting to explain bilateral trade flows using gravity models. Gravity equation is one of the most successful in empirical economics. Simply put, it explains bilateral international trade flows with GDP, distance, and other factors that make up trade barriers. Despite several attempts to theoretically justify,[1] the success of gravity equation lies in its strongly consistent empirical findings. There is a wide range of empirical studies investigating the relationship between international trade flows and border effects,[2] internal or/and external conflict,[3] currency unions,[4] General Agreements on Tariffs and Trade (GATT)/ World Trade Organization (WTO),[5] security of property rights and the quality of institutions.[6, 7]

[1] Anderson (1979), Anderson and Van Wincoop (2003), Baldwin and Taglioni (2007), Bergstrand (1985, 1989, 1990).

[2] Anderson and Van Wincoop (2003), McCallum (1995).

[3] Blomberg and Hess (2006), Glick and Taylor (2010), Martin et al. (2008), Rohner et al. (2011).

[4] Glick and Rose (2002), Rose (2000), Rose and van Wincoop (2001).

[5] Rose (2004).

[6] Anderson and Marcouiller (2002), Berkowitz et al. (2006), de Groot et al. (2004), Nunn (2007).

[7] For a recent survey of the literature on trade costs, see Anderson and Van Wincoop (2004). Anderson

Lastly, it is important to note that the recognition of the influence of cultural factors on social and economic phenomena is not new.[8] However, curiosity in the field has been reignited only recently. In that respect, this study belongs to the growing strand of literature on the impact of culture and institutions on social, political and economic outcomes.[9]

The paper proceeds as follows. Section 2 lays out the methodology and describes the data. Section 3 provides main estimation results. Section 4 tests Huntington's "The Clash of Civilizations?" hypothesis. Section 5 presents a possible underlying mechanism. Section 6 challenges the sensitivity and robustness of our results. Finally, Section 7 concludes.

2 Methodology and Data

In this section, we first lay out the theoretical set up, and accordingly, derive the empirical specification to be estimated. Subsequently, we give a description of the data set used in the analysis.

2.1 Methodology

One of the first authors who provided clear microfoundations for the gravity model is Anderson (1979).[10] More recently, Anderson and Van Wincoop (2003) showed that most of the estimated gravity equations do not have a theoretical foundation and the authors reestablished the validity of the theory by providing a theoretical framework that can be easily estimated. With their theoretical framework the authors also facilitated the estimation of key parameters in a theoretical gravity equation relating bilateral trade to size, bilateral trade barriers and

(2011) also provide a review of the recent developments in the gravity model literature.

[8] Early seminal examples are Banfield (1958), Putnam (1993) and Weber (1958).

[9] Alesina et al. (2003), Algan and Cahuc (2007), Barro and McCleary (2003), Botticini and Eckstein (2005), Fernandez and Fogli (2007), Giuliano (2007), Guiso et al. (2003, 2004, 2008a, 2008b), Ichino and Maggi (2000), Knack and Keefer (1997), Spolaore and Wacziarg (2009a, 2009b), Tabellini (2007, 2008a, 2008b). This list is not meant to be exhaustive. See, also, Fernandez (2007) and Guiso et al. (2006) for comprehensive surveys of the literature on the relation between culture and economic outcomes.

[10] Bergstrand (1985) is another early attempt to theoretically justify gravity equations.

Anderson (1979) provides a theoretical foundation for the gravity model under perfect competition based on constant elasticity of substitution (CES) preferences and goods that are unique to their production origin and are imperfectly substitutable with other countries' goods. Further theoretical extensions- for instance, Bergstrand (1989, 1990)- have preserved the CES preference structure and added monopolistic competition or a Heckscher-Ohlin structure.

multilateral resistance terms. In what follows we provide a sketch of the theoretical framework for we want to stay as close to the theory as possible when it comes to estimation. From the following theoretical setup we derive the empirical specification to be estimated. What follows is largely based on Anderson and Van Wincoop (2003, 2004) and Baldwin and Taglioni (2007).

Assume only one single differentiated good is produced in each country. Preferences are of constant elasticity of substitution (CES) functional form. Let m_{ij} be the consumption by country j consumers of goods imported from country i. Accordingly, consumers in country j maximize:

$$\left[\sum_i \beta_i^{(1-\sigma)/\sigma} m_{ij}^{(\sigma-1)/\sigma}\right]^{\sigma/(\sigma-1)} \tag{1}$$

subject to the budget constraint:

$$\sum_i p_{ij} m_{ij} = Y_j \tag{2}$$

where σ is the elasticity of substitution between goods; β_i is a positive distribution parameter, i.e. a preference weight; Y_j is the nominal expenditure of country j on imported goods; and p_{ij} is the price of country i goods inside the importing country j, also called the "landed price".

Then, from the maximization problem, the nominal import expenditure on country i good is given as a function of relative prices and income level:

$$p_{ij} m_{ij} = \left[\frac{\beta_i p_{ij}}{P_j}\right]^{(1-\sigma)} Y_j \tag{3}$$

where P_j is country $j's$ CES price index, that is:

$$P_j = \left[\sum_i \left(\beta_i p_{ij}\right)^{(1-\sigma)}\right]^{1/(1-\sigma)} \tag{4}$$

Prices differ among partner countries due to trade costs. The landed price in country j of country i good is linked to the exporter's supply price, p_i, and bilateral trade costs, τ_{ij}.

Exporter in country i passes the bilateral trade costs on to the importer via the following pass-through equation:

$$p_{ij} = p_i \tau_{ij} \tag{5}$$

which renders the price index as: $P_j = \left[\sum_i \left(\beta_i p_i \tau_{ij}\right)^{(1-\sigma)}\right]^{1/(1-\sigma)}$. τ_{ij} reflects all trade costs, natural and man-made, between country i and country j. In addition to the transportation costs, these trade costs might reflect information costs, legal costs, regulatory and institutional costs, cost of business norms and all the remaining costs that altogether accrue up to bilateral trade barriers. This is where we see our measures of cultural difference come into play as one of the bilateral trade barriers.

Denoting M_{ij} the value of imports, equation (3) combined with the pass-through equation of exporter's cost, (5), yields:

$$M_{ij} = \left[\frac{\beta_i p_i \tau_{ij}}{P_j}\right]^{(1-\sigma)} Y_j \tag{6}$$

Imposing market clearance guarantees that the total income from exports of country i should be equal to the sum of import expenditure on good i in each and every market j. In symbols:

$$Y_i = \sum_j M_{ij} \tag{7}$$

which we can express as follows using the import expenditure equation, (6), for each country j :

$$Y_i = \left(\beta_i p_i\right)^{(1-\sigma)} \sum_j \left(\frac{\tau_{ij}}{P_j}\right)^{(1-\sigma)} Y_j, \forall i \tag{8}$$

If we solve for $\left\{\beta_i p_i\right\}^{(1-\sigma)}$, after multiplying both sides of equation (8) by world nominal income $\overline{Y} = \sum_i Y_i$, we get:

$$\{\beta_i p_i\}^{(1-\sigma)} = \frac{Y_i}{\overline{Y}\Omega_i^{1-\sigma}} \tag{9}$$

where $\Omega_i \equiv \left[\sum_j \left(\frac{\tau_{ij}}{P_j}\right)^{(1-\sigma)} \lambda_j\right]^{1/(1-\sigma)}$ and $\lambda_j \equiv \frac{Y_j}{\overline{Y}}$.

Using above equation (9) and substituting it into equation (6) we can acquire the value of imports as:

$$M_{ij} = \frac{Y_i Y_j}{\overline{Y}} \left(\frac{\tau_{ij}}{\Omega_i P_j}\right)^{(1-\sigma)} \tag{10}$$

This is our first-pass gravity equation. We can rearrange terms to make our gravity equation look similar to the gravitational force equation:[11]

$$M_{ij} = G\frac{Y_i Y_j}{\tau_{ij}^{\sigma-1}} \tag{11}$$

where $G \equiv \frac{1}{\overline{Y}} \left(\frac{1}{\Omega_i P_j}\right)^{(1-\sigma)}$.

Our final expression of the gravity equation relates bilateral imports positively to the size of the countries and negatively to the trade barriers between countries (since $\sigma > 1$). Bilateral trade barriers, τ_{ij}, are also referred to as "bilateral resistance" terms and, as mentioned previously, one of the bilateral resistance terms is our variables of cultural dissimilarity between countries. Moreover, it is important to notice that the G term bears the price indices of the two countries. Although, Ω_i and P_j could be interpreted as price indices in the model, they cannot be interpreted as price levels in general.[12] These unobservable variables should be better thought of as nonpecuniary trade costs a country has with all its trading partners. Hence, Ω_i and P_j represent average trade barriers of country i and country j, respectively, which we refer to as "multilateral resistance" terms following Anderson and Van Wincoop

[11] A reminder for the reader of the law of gravity:

$$Gravitational\ Force = G\frac{M_i M_j}{distance_{ij}^2}$$

where M_i and M_j are the masses of the two objects; $distance_{ij}$ is the distance between them and G is the gravitational constant.

[12] Under the assumption of symmetric trade costs, ($\tau_{ij} = \tau_{ji}$), Ω_i will be equal to P_i.

(2003).[13]

As derived from the theory, we work with unidirectional trade flows.[14] Therefore, a log-linearized version of equation (11) gives us the empirical counterpart of the gravity equation that we are going to use throughout:

$$\log M_{ij} = -\log \overline{Y} + \log Y_i Y_j + (1-\sigma)\log \tau_{ij} + (\sigma - 1)\log \Omega_i P_j \tag{12}$$

Bilateral import flows and income variables are measured in current US Dollars (millions). Usage of real income variables, instead, would require us to deflate nominal trade values as well. Unfortunately, good price indices for bilateral trade flows are often unavailable. Hence, what most authors do is to deflate the nominal trade values using some price index for the U.S. This inappropriate deflation of nominal trade values is a common mistake that biases the results (Baldwin and Taglioni, 2007). As suggested by Baldwin and Taglioni (2007), this problem can be overcome by including time dummies. Time dummies will account for some of the proper conversion factor between U.S. dollars in different years, and hence, will reduce the bias. Moreover, time-fixed effects allow the intercept to vary across periods to account for different distributions in different time periods, which takes care of time-varying trends.

One last pending issue before we can carry out estimations is how to treat multilateral resistance terms. Multilateral resistance terms are unobservable, however, their omission might lead to biased estimates as they are a function of bilateral resistance terms (Anderson and Van Wincoop, 2003). To remedy this problem, Anderson and Van Wincoop (2003) suggest that multilateral resistance terms can be accounted for with country-specific dummies in order

[13] Some empirical papers try to account for multilateral resistance by including a remoteness variable that is intended to reflect the average distance of country i from all trading partners other than country j. Anderson and Van Wincoop (2003) completely discard remoteness variables as they are entirely disconnected from the theory.

[14] A common practice in the empirical literature is to work with the average of the two-way imports, the average of country i imports to country j and country j imports to country i. With no reference to the theory, averaging is done before log-linearizing, instead of after. This is a simple, though common, error, and, as shown by Baldwin and Taglioni (2007), it leads to biased estimates, especially so for countries with unbalanced trade.

Fortunately, it is easy to see what theory has to suggest. Let us multiply both sides of equation (11) by the value of imports from j to i, M_{ji}. Taking the geometric average of both sides, together with the symmetry of bilateral trade barriers assumption ($\tau_{ij} = \tau_{ji}$), yields: $\sqrt{M_{ij}M_{ji}} = \frac{Y_i Y_j}{\overline{Y}} \tau_{ij}^{1-\sigma} (P_i P_j)^{\sigma-1}$. It is important to notice that theoretical gravity equation requires estimation of the average of the logs of unidirectional flows, rather than the log of the average.

to get consistent estimates. Subsequently, Feenstra (2002) show that an estimation strategy with exporting and importing country fixed effects produces consistent estimates.[15] Hence, our estimation strategy is to replace multilateral resistance terms with country fixed effects. It is important to note that the gravitational constant of the physical gravity equation, G, is an unconstant in economics and it varies over time (Baldwin and Taglioni, 2007). Therefore, with panels such importing and exporting country fixed effects should be time-varying as well. Finally, we have our empirical specification that is a log-linearized version of equation (11) together with time-varying importing and exporting country fixed effects.[16]

Although it is well acknowledged in the literature that time-varying country fixed effects are required to obtain consistent estimates of the gravity model, execution of such an estimation strategy has proved difficult due to the very high dimensionality of the problem.[17] Depending on the time period and the number of countries covered, the number of dummies can go up to twenty thousand.[18] In a recent paper, Guimarães and Portugal (2010) propose an alternative iterative procedure to estimate linear models with high dimensional fixed effects. This procedure, dubbed "cyclic-ascent" or "zigzag" algorithm, requires running regressions with k explanatory variables in a first step, and then, computing means of residuals in a second step to acquire the fixed effect estimates that are to be used to estimate again the coefficients of the k explanatory variables. Same steps are repeated until convergence.[19] Consequently, "zigzag" algorithm allows us to estimate the gravity model with high dimensional time-varying importer and exporter fixed effects and get consistent estimates.

Our focus in estimation is on the cultural barriers to trade, among others, for we deem such barriers as one of the most important trade barriers for the question at hand. Cultural variables reflect, among other things, business norms, customs, beliefs, trust and information costs. They accrue up to bilateral barriers to trade and, in turn, might impede trade relations of countries. For expository simplicity, we disaggregate the bilateral trade barriers term and

[15] Baier and Bergstrand (2009) propose an alternative direct estimator of multilateral resistance based on a Taylor series approximation.

[16] Notice that time-fixed effects are absorbed in the time-varying country fixed effects.

[17] See, for instance, Head et al. (2010) and Anderson (2011).

[18] One might try to overcome this problem via demeaning the variables by importer-year and exporter-year averages. Nonetheless, this strategy might suffer when the panel is unbalanced.

[19] See Guimarães and Portugal (2010) for more details.

write our variable of interest -namely, cultural dissimilarity- separately from other bilateral trade barriers. Hence, we restate our empirical specification in the following final form:

$$\log Imports_{ijt} = a + \gamma C_{ij} + \alpha_k \tau_{kijt} + R_i * Year_t + R_j * Year_t + \epsilon_{ijt} \tag{13}$$

where $Imports_{ijt}$ is imports from country i to j; a is a constant; C_{ij} is our variable of interest, that is a binary variable that captures cultural heterogeneity across country dyads; τ_{kijt} represents all of the k control variables we account for as bilateral trade barriers other than culture; R_i is exporting country fixed effects; R_j is importing country fixed effects; $Year_t$ is yearly time fixed effects; and ϵ_{ijt} is the unaccounted-for error term.[20]

Note that a more befitting estimation strategy should also allow for, when appropriate, dyad fixed effects. Nevertheless, we cannot make use of dyad fixed effects as our variable of interest is either entirely time-invariant or has very little time variation. In order to be able to apply first-differencing or fixed-effects estimation methods we need each explanatory variable to change over time. Given that our main variable of interest is time-invariant, this methodology is not applicable and using dyad fixed effects would wash away our variables of interest or would yield misleading estimates (Baltagi and Khanti-Akom, 1990).

2.2 Data

Measure of Trade. Measures of dyadic imports from country i to country j as well as imports from country j into country i are acquired from Correlates of War Project International Trade Data Set Version 2.01.[21] Within this data set, the majority of the post-WWII data were obtained from the International Monetary Fund's Direction of Trade Statistics.[22] These data were supplemented with data from Barbieri, Keshk and Pollins (2005), Barbieri's International Trade Dataset, Version 1.0 (Barbieri, 2002), and data from the Republic of China (ROC), Bureau of Foreign Trade.[23]

[20] Monadic variables, such as importing country's GDP or exporting country's GDP, are absorbed in time-varying multilateral resistance terms.

[21] This data set is available at http://www.correlatesofwar.org/.

[22] From 2007 CD-ROM Subscription and hard copy versions for various years.

[23] For more details, see Barbieri et al. (2008, 2009). This data set runs between 1870-2006, though with a considerable number of missing values for early years. This is not a source of concern for us as we use the part

Measures of Culture. 179 countries are classified as members of various civilizations. As described in Huntington (1998) and Gokmen (2012), these civilizations are Western, Sinic, Islamic, Hindu, Orthodox, Latin American, African, Buddhist and "Lone" States. The classification and the construction of civilization membership is based on Huntington (1998). Accordingly, each country is assigned to a civilization.[24]

Furthermore, country dyads are formed by pairing each country with one another, which results in 15931 dyads. To indicate civilizational heterogeneity within a dyad we construct a variable labeled "Different Civilizations" denoting whether a pair of countries belong to different civilizations. This variable is coded as one if in a dyad the two countries i and j belong to different civilizations and as zero if both countries belong to the same civilization. Out of 15931 country-pairs, 2875 pairs are formed of countries belonging to the same civilization and 13056 pairs belonging to different civilizations.

As a further measure of cultural cleavages we use Tanja Ellingsen's "Ethnic Witches' Brew Data Set" that provide us with data on religious, linguistic and ethnic fragmentation within countries between 1945-2001.[25] Ellingsen (2000) collected data on the size, the name and the number of the linguistic, religious, and ethnic dominant groups; the size and the name of the linguistic, religious, and ethnic minority groups as well as ethnic affinities.[26] What is particularly important for our purpose in this data set is the information on the name and proportional size of the largest linguistic, religious, and ethnic groups. Similar to Gartzke and Gleditsch (2006), we have indicator variables for whether the two countries in a dyad have the same dominant religion, language and ethnicity. However, we recode these variables so that they take value one when two countries have different majority religion or different majority ethnicity or different majority language.

Other Determinants of Trade. Geographic barriers are proxies for transportation as

of the data for the period 1950 on given the data on control variables mostly start from the year 1950.

[24] See Gokmen (2012) for the details of country specific civilizational memberships and a more detailed discussion on Huntington's thesis of clash of civilizations. Table 1A in the appendix presents the list of countries together with the corresponding civilizations.

[25] The original data by Tanja Ellingsen runs from 1945 to 1994. We use the version of the data by Gartzke and Gleditsch (2006). For more details, see Ellingsen (2000) and Gartzke and Gleditsch (2006).

[26] She has obtained information from three reference books: Handbook of the Nations, Britannica Book of the Year and Demographic Yearbook.

well as information costs. Correspondingly, we have a range of geographic metrics such as contiguity variable that takes value one if there is any sort of land or water contiguity between two countries in a pair, zero otherwise.[27] Additional geographic distance metrics such as the measure of the great circle (geodesic) distance between the major cities of the countries are also taken into account.[28]

To control for historical, political and institutional links we include dummy variables for whether a dyad ever had a colonial relationship, i.e. whether one was a colony of the other at some point in time; had a common colonizer after 1945, i.e. whether the two countries have been colonized by the same third country, and whether the two countries have been part of the same polity.[29] In addition, a dummy variable for whether two countries in a pair have same legal origins is created. Same legal origin in a pair of countries might reduce information costs related to legal and regulatory systems. Moreover, sharing same legal origins might enhance trust between interacting parties (Guiso et al., 2009). Hence, we have a binary variable that takes value one if the two countries in a dyad have the same legal origins, zero otherwise [30]

We also take into account policy related dyadic variables. As such, free trade area (FTA), GATT/WTO membership, common currency and generalized system of preferences (GSP) data are from Martin, Mayer and Thoenig (2008) and Thierry Mayer's webpage.[31,32]

Summary statistics are provided in Table 2A in the Appendix.

[27] For contiguity data we use Correlates of War Project, Direct Contiguity Data, 1816-2006, Version 3.1 (Stinnett et al., 2002). See also Gochman (1991) for additional details.

[28] See Head and Mayer (2002) for details.

[29] These data come from CEPII. The data are available at http://www.cepii.fr/anglaisgraph/bdd/distances.htm.

[30] Legal origin indicators (common law, French civil law, German civil law, Scandinavian law, and Socialist law) are from La Porta et al. (1999).

[31] Available at http://econ.sciences-po.fr/node/131.

[32] As noted by Anderson and van Wincoop (2004), regional trade agreements may not be exogenous, and therefore, FTA included contemporaneously may suffer from reverse causality. A reasoning for this is that countries might have agreed on a trade agreement since they already have been trading lots for many reasons that are not observed by the econometrician. Consequently, we tried lagging FTA variable to overcome reverse causality up to four-period lags. The results concerning our variables of interest carry over.

3 Results

We start off with simple correlation coefficients between log imports and our measures of culture. We observe in Table 1 that all of the variables of culture indicate towards a negative relationship between trade flows and dissimilar cultural heritages. Moreover, different civilizations indicator is highly correlated with different religion and different language. We also observe a high correlation between different language and different ethnicity.

Next we carry out regression analysis of gravity equations.

3.1 Baseline Results

Standard "gravity" model of bilateral trade explains the natural logarithm of trade with the joint income of the countries and the logs of the distance between them together with border effects (see Anderson and van Wincoop, 2003 and Rose, 2004). We extend this analysis by counting for dyadic trade barriers and time-varying country fixed effects.

Table 2 provides the estimation output. In column (1) of Table 2 we look at how different civilizational memberships alone impact trade in a gravity equation regression controlling for other determinants of trade flows and time-varying importing and exporting country fixed effects. We extend the basic specification by accounting for a full set of geographical barriers to trade. Distance decreases trade, while contiguity increases trade. The effect of different civilizations indicator is both economically and statistically significant. If two countries in a dyad belong to different civilizations their import flows drop by 20%.[33]

Colonial links and common history are commonly considered to be reflecting historical and institutional backgrounds (Blomberg and Hess, 2006; Glick and Taylor, 2005; Rose, 2004). Since they might be capturing an element of culture as well, the coefficient on different civilizations variable is reduced with the inclusion of colonial links, common colonizer and same country dummies, though still large and statistically significant. Colonial links and common history increase trade relations.

As discussed by Guiso et al. (2009), sharing same legal origin might proxy for informational

[33] Since $[exp(-0.227) - 1] * 100 \simeq -20\%$

costs as well as norms of dealing with property rights. A quick look at Table 2 tells us that countries that have the same legal origin trade significantly more. Their import flows are approximately 40% higher.

We also take into account policy related variables such as free trade agreements (FTA), GATT/WTO membership, common currency and GSP. As expected, FTAs, common GATT/WTO memberships, common currency and GSP positively affect trade flows. Even in our full specification with an entire set of controls, our different civilizations indicator is statistically very significant and has a considerably large economic effect. Two countries of different civilizations trade 20% less than two countries of the same civilization.

To reiterate our findings further we now investigate the effect of other measures of cultural cleavages. Using *Ellingsen's Measure* of majority religions, ethnicities and languages within countries we probe the relationship between trade flows and sharing dominant religious, ethnic and linguistic heritages. To this end, we bring in new indicator variables for when the two countries in a dyad have different majority religion or different majority ethnicity or different majority language.

Second column of Table 2 shows that having different dominant religion negatively affects trade relations. Columns (3) and (4) do the same exercise when the two countries have different majority ethnicity and different majority language, respectively. When the two countries in a dyad have different dominant ethnicity they have about 38% lower import flows than the two countries that have the same dominant ethnicity. On the other hand, two countries with different majority language have 46% less imports. Columns (5), (6) and (7) look at the effects of three indicators of cultural difference when language is controlled for. We do that in order to show that cultural difference variables on civilizations, religion and ethnicity do not capture the effect coming from communication channel. As such, we show that even when the communication channel is taken into account previous results carry over. In column (8), we include all of the measures of cultural dissimilarity together, and observe that only different civilizations variable does not survive, and hence, all the variation in cultural dissimilarity can be explained by religion, ethnicity and language.

From the analysis of this section we can conclude that cultural differences negatively affect countries' bilateral trade relations and countries of different cultures trade a lot less than those of the same culture.

4 Economic Clash of Civilizations?

When Samuel Huntington put his "The Clash of Civilizations?" hypothesis forward and hypothesized that "the great divisions among humankind and the dominating source of conflict in the post-Cold War era will be cultural" (Huntington, 1993), he did not only have military clashes in mind but also economic and political clashes. At the micro level, the violent struggles among peoples will result as a consequence of the fault lines between civilizations, however, at the macro level, states from different civilizations will compete for economic and political power (Huntington, 1993). Differences in culture and religion engender differences over policy issues, ranging from human rights to immigration, and, more importantly in this paper's context, to trade and commerce. Huntington's "The Clash of Civilizations?" hypothesis drew a lot of attention to military conflicts between countries and some authors have tried testing it from different angles (Chiozza, 2002; Gokmen, 2011; Henderson, 1997, 1998; Henderson and Tucker, 2001; Russett et al., 2000). Nevertheless, to our knowledge, the economic clash aspect has never been put to rigorous econometric testing. Therefore, we take the challenge and test whether there has been an amplification in economic clash in the post-Cold War era as Huntington suggested.

Huntington takes civilizations as the main unit of his analyses. A civilization is defined as "a cultural entity, the highest cultural grouping of people and the broadest level of cultural identity people have short of what distinguishes humans from other species. It is defined both by common objective elements, such as language, history, religion, customs, institutions, and by the subjective self-identification of people" (Huntington, 1993a, p.23-24). Huntington takes the central defining characteristic of a civilization as its religion; hence, the major civilizations in human history have been closely identified with the world's great religions. These civilizations outlined include the Sinic, Japanese, Hindu, Islamic, Orthodox, Western,

Latin American, Buddhist and possibly African civilizations plus "Lone" countries that do not belong to any of the major civilizations.

According to Huntington, inter-civilizational differences stand out in the way individuals comprehend the relations between God and man, the individual and the group, the citizen and the state, parents and children, husband and wife as well as in the weight of importance they put in matters of responsibility and rights, freedom and authority, and equality and hierarchy. He further claims that these differences are largely irresolvable; they are the product of centuries and are far more fundamental than differences among political ideologies and political regimes as they concern the very self-identification of man. The fact that people identify themselves with a civilization inevitably implies that they think of themselves separately from other civilizations and differentiate themselves from the members of other civilizations. To highlight this point, Huntington argues that identity at any level - personal, tribal, racial, civilizational - can only be defined in relation to an "other", a different person, tribe, race, or civilization. This brings about a group identity in the simple form of "us" and "them" which nurtures clashes with those that are different.

Huntington (1993, 1998), viewing culture as the "cause," suggests that civilizations tend to clash with other civilizations that do not share their culture, world view and values. Such vehement tendencies, he argues, long held in check by the Cold War, have been unleashed by the end of the Cold War and, from then onwards, form the dominant pattern of global conflict. One theorem that logically devolves from Huntington's cultural realist rendering of clashing civilizations is that the degree of cultural dissimilarity between states should predict the likelihood of clashes between them. In this view, culturally dissimilar dyads, ceteris paribus, should be more inclined to conflict than culturally similar dyads. As such, Huntington claims that in the post-Cold War world the most important distinctions among peoples are not ideological, political, or economic, but they are cultural, and therefore, he prophesies that in the post-Cold War[34] era, compared to the Cold War era, we are to witness a surge in the clash of civilizations. By the end of the Cold War, the demise of ideology will accentuate the differences between civilizations and the clashes between civilizations will be

[34]By most, Cold War is considered to have lasted between 1945-1991.

unleashed. Not only militarized clashes between civilizations will ensue but also economic ones. For instance, the economic issues between the United States and Europe are no less serious than those between the United States and Japan, but they do not have the same political salience and emotional intensity because the differences between American culture and European culture are so much less than those between American civilization and Japanese civilization (Huntington, 1993a, p.34). This is to say that cultural differences exacerbate economic conflict, especially so in the post-Cold War world. This is what we test from an economic clash standpoint in what follows.

Before carrying out regressions, to see whether there is seemingly an economic clash of different culture pairs we plot mean log imports calculated for different and same ethnicity dyads and their ratios over the Cold War and the post-Cold War periods. As such, Figure 1 delivers a first-pass understanding of how trade relations of countries from different and same ethnicities evolved over these two time periods. We observe average imports have increased from the Cold War to post-Cold War period for both same ethnicity and different ethnicity dyads. This is not very informative as the two seem to evolve in a similar pattern. However, if we look at the evolution of the ratio of the mean imports of the same ethnicity and different ethnicity countries, we notice a rather different story. The ratio of same ethnicity trade to different ethnicity trade is larger in the post-Cold War era than in the Cold War era, which means that the increase in average trade of same ethnicity dyads is more than the increase in mean trade of different ethnicity dyads. This analysis from Figure 1 indicates that same ethnicity dyads have more improved trade relations in the post-Cold War than in the Cold War.

Next, we carry on regression analysis. A cursory look at Table 3 would convince one that there is a surge in economic clash in the post-Cold War era as Huntington hypothesized. Each cell of a row reports the coefficient of a cultural variable of interest from a separate regression in the two respective time periods. The effect of belonging to two different civilizations on bilateral trade is much bigger in the post-Cold War era. Although different civilizations membership negatively impacts trade in the Cold War, it is statistically insignificant. On the

other hand, in the post-Cold War era, two countries that belong to different civilizations have about 40% less imports than two countries that share the same civilization. This finding is very robust and is not subject to the definition of culture. In the following rows of the Table 3 we repeat the same exercise with our various measures of culture. Both economic significance and statistical significance is much stronger in the post-Cold War era than in the Cold War era. For instance, when the two trading partners do not share the same dominant ethnicity, their imports is reduced by 27% during the Cold War; whereas in the post-Cold War epoch they import 51% less than a pair of countries that share these values. Alternatively, in the post-Cold War period, two countries with distinct religious majorities have 35% lower imports than those sharing the same religion, whereas this negative effect is less than half, 16%, during the Cold War.[35]

These findings are very strong. In the post-Cold War period countries of different cultural heritage have shown to display a much stronger economic clash than in the Cold War era. May the cultural heritage be having the same civilization as Huntington classified or a more concrete definition of dominant religious, ethnic and linguistic populations, the results do not change. We observe that these results show us the end of the Cold War brought about more conflictual economic relations among countries of heterogeneous cultural backgrounds. In Table 4 we carry out the same analysis with a difference-in-difference approach instead of splitting the sample. Previous results and interpretations carry over.

In Table 5, we ask what if cultural difference was a tariff and we run an exercise on how the tariff equivalent costs of cultural dissimilarity would be for different elasticities in the two time periods we consider.[36] The coefficients from regressions correspond to the estimates of $[(1-\sigma)\ln\tau]$, where $(\tau-1)$ would be the tariff equivalent of the cultural barriers to trade. In line with the literature, we calculate tariff equivalent of cultural trade barriers for elasticities

[35] These findings are not inflated due to the time-invariant nature of our variables of interest. On the contrary, they are closer to the lower bound estimates. When we collapse the data to a cross-section by taking the mean imports as dependent variable, the results are qualitatively the same, and in some cases the coefficients on cultural difference variables are even bigger. This is because when we run the regressions in a panel setup we control for many dyadic time-varying determinants of trade as well as time-varying importer and exporter fixed effects.

[36] See, for instance, Blomberg and Hess (2006) and Rose and van Wincoop (2001) for examples on the tariff equivalent costs of trade barriers.

of $\sigma = 5$, $\sigma = 8$, $\sigma = 10$ (see Anderson and van Wincoop, 2004).

We observe in Table 5 that the minimum tariff equivalent cost of culture is 0.42% during the Cold War, whereas this lower bound estimate is about 5% in the post-Cold War. On the other hand, the maximum tariff equivalent cost of culture during the Cold War is about 9%, while this upper bound estimate is about 31% in the post-Cold War. For example, if we consider an elasticity of 5, tariff equivalent cost of different ethnicity is 8% during the Cold War, whereas its counterpart in the post-Cold War is about 20%. Anderson and van Wincoop (2003), for instance, calculate a maximum of tariff equivalent cost of national borders as 48% (for $\sigma = 5$). In our case, in the post-Cold War period, different language accounts for more than half of the estimate of the national border barrier. Different religion and different ethnicity in the post-Cold War period are equal to one forth and forty percent of the estimate of the national border barrier, respectively.

5 Underlying Mechanism

A possible explanation for the mechanism that lies beneath the differential effect of cultural dissimilarity in the Cold War and the post-Cold War is the role ideology plays during these two times periods. Cultural differences have always been present, however, during the Cold War cultural differences were suppressed by ideology. Once the Cold War is over, cultural differences are not suppressed by ideology anymore and they are unleashed (Huntington, 1998).

Thus, to analyze how the effect of ideology on bilateral trade evolves we construct a different blocs dummy. First, based on Huntington (1998), each and every country is assigned to either the first world or the second world or the third world as they were in the heights of the Cold War. The first world is composed of United States and its allies, the second world is composed of Soviet Union and its allies, and the third world is composed of unaligned countries.[37] Then, we create an indicator variable, labelled "Different Blocs", that takes one if the two countries in a dyad belong to two different superpower camps. In other words, this

[37] For a complete list of blocs and countries, see Table 3A in the Appendix.

variable is equal to one if a country in the pair belongs to the first world and the other one belongs to the second world, zero otherwise.

Results are presented in Table 6. A pair of countries that are in different blocs during the Cold War have much lower import flows than those of the same bloc. The effect of belonging to different blocs during the Cold War is so strong that it dwarfs the effect of cultural dissimilarity. However, in the post-Cold War period, the country pairs that were formerly in different blocs start trading and making up for their low levels of prior trade.

One explanation that logically derives from Table 6 is that the impact of ideological differences were so great during the Cold War that suppressed cultural dissimilarities did not play such an important role in trade relations. In fact, if we compare the impact of being in different blocs to belonging to different cultures during the Cold War, the impact of blocs is at least four times greater than the impact of any measure of culture, and this effect is even more than eight times bigger when we contrast ideological blocs with religion (see Table 6, column (2)).

To track the evolution of the impact of cultural dissimilarity and the impact of different blocs, we carry out a further exercise. In estimating the gravity model of imports, we include the interactions of different culture variables and different blocs variables with year dummies. This way, we can calculate the coefficients of different culture and different blocs for every year from 1950 to 2006. In Figure 2, we plot the coefficients of different religion and different blocs together with 95% confidence interval in each year from a regression of log imports on different religion-year interactions, different blocs-year interactions together with all the control variables and time-varying country fixed effects.[38] The results are striking. Being part of different blocs hugely dampens trade relations during the Cold War. This effect is sizeable both economically and statistically. The impact of different ideological blocs displays itself strongly starting from 1955. This is because in 1955 Warsaw Pact was formed and communist bloc countries started acting in unison, which can be, thus, pointed out as the initiation of two separate camps. From 1955 on this effect remains negative and significant. Towards the

[38] We carry out the same exercise for different civilizations, different ethnicity and different language variables. The results are similar and available upon request.

final years of the Cold War, however, we observe a decreasing trend (in absolute values) in the negative effect of ideological differences. This effect is less and less negative and after the demise of the Cold War it is not significant anymore.

On the other hand, throughout most of the Cold War the effect of having different religious backgrounds on bilateral trade lingers around zero and is mostly insignificant. However, towards the end of the Cold War the impact of different religion variable exhibits a jump and almost doubles. This jump is in the year 1986. In 1985 the coefficient of different religion variable is about -0.18, whereas in 1986 this coefficient is about -0.35, significant in both cases. This evidence in the data overlaps with the first signs of the end of the Cold War. In 1985, Mikhail Gorbachev assumed power in the Soviet Union. Immediately after coming to power, liberal-minded Gorbachev started implementing reforms. Consequently, both economic (*Perestroika*) and political (*Glasnost*) liberalization packages were put into effect. At the same time, the relations with the leaders of the U.S. and the U.K. at the time -Ronald Reagan and Margaret Thatcher, respectively- improved considerably.[39] All of these developments, signalled the *de facto* end of the Cold War, which led to a surge in the impact of cultural dissimilarity on trade relations. Therefore, we argue that by the demise of the Cold War, ideological blocs are gone and cultural differences are unleashed. Any country can trade with any country and former ideological foes turn into friends now with an increased trend in their bilateral imports. What matters now is the barriers created by cultural differences, and, as such, cultural dissimilarities are at the forefront of the trade fault lines. As a matter of fact, the impact of cultural differences on economic exchange in the post-Cold War period is much more enhanced. Therefore, what distinguishes a group of persons from another is just their most inherent and salient cultural identities.

Another interpretation of these findings could be that we are just observing a normalization of trade relations. Cultural differences have always been at the core of inter-group struggle, and this, in turn, plays a role in trade relations. However, Cold War was just an ideological shock that subdued cultural dissimilarity and pacified the salience of the influence of culture.

[39] For example, the Reykjavík Summit between Ronald Reagan and Mikhail Gorbachev led to the eventual Intermediate-Range Nuclear Forces Treaty between the U.S. and the Soviet Union in 1987. Another example, Margaret Thatcher addressed Mikhail Gorbachev as a man she can do business with.

Once the ideological shock of Cold War is over, a normalization process starts and what is of importance now for inter-group face-off is the cultural cleavages and propinquities between nations that go back long in history.

6 Sensitivity Analysis

In this section we challenge the sensitivity of our results. We do that, first, by controlling for a very rich set of geographic variables. Second, we probe a popular measure of cultural distance -namely, genetic distance variable- and test whether our measures of culture survive the inclusion of genetic distance. Third, we investigate whether the impact of culture might actually be capturing the influence of political proximity on trade. Fourth, we test the robustness of our results to the omission of zero trade flows. Fifth, we take lagged patterns of trade into consideration. Finally, we run a principal component analysis.

6.1 Culture vs. Geography

In this subsection we aim at isolating the effect geography on trade from that of culture. This way we can fend off concerns that what our measures of cultural difference might actually be capturing is the differences in geography and climate.

We start off by creating continental pair dummies among partners. These dummies capture the interaction between and within continents for trading countries. For instance, if both countries in a pair are in Europe that would be captured by a Europe-Europe dummy or if one country is in Europe and the other one is in Asia that would be captured by an Asia-Europe dummy. All in all, this makes up a total of 21 continental pair dummies.[40]

In addition, we control for a very rich set of variables on geographic and climatic differences between countries. These are log of absolute difference in mean elevation of countries (meters above sea level), log of absolute difference in latitudes, log of absolute difference in

[40] The whole list of continental pair dummies for trade partner countries is as follows: Africa-Africa, Africa-Asia, Africa-Europe, Africa-Oceania, Africa-North America, Africa-South America, Asia-Asia, Asia-Europe, Asia-Oceania, Asia-North America, Asia-South America, Europe-Europe, Europe-Oceania, Europe-North America, Europe-South America, Oceania-Oceania, Oceania-North America, Oceania-South America, North America-North America, North America-South America and South America-South America.

longitudes, number of landlocked countries, number of island countries, log of absolute difference in mean distance to nearest coastline or navigable river (km), absolute difference in percentage of land area in geographical tropics, absolute difference in percentage of land area in geographical subtropics, absolute difference in percentage of land area in geographical polar regions, absolute difference in percentage of land area in geographical boreal regions, absolute difference in percentage of land area in temperate deserts, absolute difference in percentage of land area in tropical deserts, absolute difference in percentage of land area in dry regions, absolute difference in percentage of land area in wet regions and absolute difference in log of hydrocarbons per capita.[41]

Inclusion of geographic and climatic controls would allow us to take into account geographic similarities and this way we better isolate the effect of cultural differences. The results are presented in Table 7. Very persistent negative effect of cultural differences on bilateral trade in the post-Cold War era holds even when we control for a rich set geographic variables. This way we can conclude that our measures of cultural difference do not capture any effect coming from geographical differences.

6.2 Our Measures of Culture vs. Genetic Distance

Genetic distance variable as a proxy for culture has recently attracted a myriad of researchers (Giuliano, Spilimbergo and Tonon, 2006; Guiso, Sapienza and Zingales, 2009; Spolaore and Wacziarg, 2009a, 2009b). Moreover, Desmet et al. (2006) provide empirical support for choosing genetic distance as a proxy for cultural differences measured by World Values Survey. To that end, we would like to test the sensitivity of our measures of culture against genetic distance variable and see how they fare in comparison.

Genetic distance is a summary measure of differences in allele frequencies across a range of neutral genes (or chromosomal loci). Correspondingly, the index constructed measures the genetic variance between populations as a fraction of the total genetic variance. Given genetic characteristics are transmitted throughout generations at a regular pace, genetic distance is closely linked to the times when two populations shared common ancestors. It is argued that

[41] Data on geography and climate come from Gallup, Mellinger and Sachs (1999, 2010).

the degree of genetic distance also reflects cultural distance for culture can be transmitted across genetically related individuals, and therefore, populations that are farther apart genealogically tend to be, on average, more different in characteristics that are transmitted with variations from parents to children.[42]

In this strand of the literature, for instance, using genetic distance as a measure of cultural similarity/dissimilarity, researchers tried to explain the differences in the level of development across countries (Spolaore and Wacziarg, 2009a), the effect of culture on the likelihood of conflict involvement of country dyads (Spolaore and Wacziarg, 2009b) or the level of trust populations have for each other (Guiso, Sapienza and Zingales, 2009).

Given the above discussion and the importance of genetic distance in recent times we deem it necessary to establish the robustness of our results to the inclusion of this variable. The genetic distance data we use are from Spolaore and Wacziarg (2009a) as the genetic distance information on populations is mapped onto countries.

We present the results in Table 8. Before contrasting our measures of culture with genetic distance we, first, would like to consider whether genetic distance has any explanatory power in trade relations when we take into account basic determinants of trade barriers and how it changes after the demise of the Cold War. Giuliano, Spilimbergo and Tonon (2006) suggest that the effect captured by genetic distance is geographic barriers, not cultural ones. The authors show that the same geographic determinants that explain transportation costs also explain genetic distance. In addition, they provide evidence that genetic distance in a gravity equation of bilateral trade has no significance once one controls for transportation costs. Having said that, in the first column of Table 8, without including our measures of culture, we regress import flows on genetic distance, its interaction with post-Cold War dummy and the entire set of control variables. Genetic distance appears as statistically significant, has a negative effect on imports and this impact is much stronger in the post-Cold War period, a finding that supports our previous results.

[42] For more details and the discussion on the construction of genetic distance between populations, its corresponding mapping onto countries and its cultural implications, interested reader should see Cavalli-Sforza and Feldman (1981), Cavalli-Sforza et al. (1994), Giuliano, Spilimbergo and Tonon (2006) and Spolaore and Wacziarg (2009a).

Subsequently, we carry on with our tests of whether our measures of culture survive genetic distance. In column (2) of Table 8 we observe that our binary indicator of different civilizations not only maintains its negative sign and high statistical significance, but it also has a sizeable economic magnitude. When two countries in a dyad belong to different civilizations, the change in the negative impact of different civilization on imports in the post-Cold War period is about 48%.

In columns (3), (4) and (5) we carry out similar exercises for the robustness of different religious, different ethnic and different linguistic heritage variables to the inclusion of genetic distance variable. In all three cases our measures of culture do not suffer from the inclusion of genetic distance and they are significant. That is to say that even after controlling for genetic distance, countries that have different dominant religion or different dominant ethnicity or different dominant language trade less with one another than country pairs that share the same values and this effect is much stronger in the post-Cold War period.

All in all, we can confidently conclude from the above analysis that our measures of culture are not sensitive to the inclusion of genetic distance as a proxy for culture. Therefore, if we believe that genetic distance captures an element of culture, our measures of culture explain some additional constituent of culture which is not explained by genetic distance.

6.3 Political Proximity or Cultural Proximity?

Political factors and political interests might be an influential constituent of trade flows between countries. Political proximity might facilitate trade agreements and GSP grants or political tension might ignite economic sanctions and protests of consumers. For instance, Michaels and Zhi (2007) show that American-French relations soured due to the opposition of France to the Iraq War in the United Nations Security Council, and this, in turn, led to a reduction in American imports from France by about 15% and a reduction in French imports from US by about 8%.[43] Moreover, Umana Dajud (2012), in a rigorous econometric study, demonstrates that political differences, measured in various ways, have an impact on

[43] Another example is the repudiation of GSP (generalized system of preferences) grants to Laos, Myanmar and Sudan by the US due to political accounts (Sekkel, 2009).

economic exchange and politically proximate countries trade more. Given the aforementioned findings in the literature on political proximity and trade, in this section we would like to test whether the effect our measures of cultural dissimilarity capture is due to political proximity or political distance.

Political proximity, measured as correlations of votes at the United Nations General Assembly, has shown to positively impact bilateral trade (Dixon and Moon, 1993; Umana Dajud, 2012). On the other hand, it is well established that democratic countries trade more, as promoted by the liberal peace argument (see, for instance, Bliss and Russett, 1998; Decker and Lim, 2009; Yu, 2010).[44] Umana Dajud (2012) also shows that more distant countries on the democracy/autocracy axis trade less. Furthermore, Long (2003) and Morrow et al. (1998) provide evidence that countries that are in mutual security alliances and defense pacts have an increased level of trade. On these grounds, we bring United Nations voting correlations, regime distance and security alliances into the analysis.

Erik Gartzke created The Affinity of Nations Index based on the United Nations General Assembly roll-call data collected by Erik Voetan.[45] This index takes values between -1 and 1 for the correlation of votes between countries at the United Nations General Assembly over the period 1948-2006.[46] In addition, we create a variable of political distance based on the democracy scores from Polity IV project. We measure the extent of democracy using the 21-point institutionalized democracy scale in a modified version of the Polity IV data where -10 means a hereditary monarchy and +10 a consolidated democracy.[47] As in Umana Dajud (2012), we generate a variable labelled "Regime Difference" that equals the absolute value of the difference between two countries' Polity IV democracy/autocracy scores. Lastly, we control for the security alliances of countries as allied states often have political and economic interests in common (Russet et al., 2000). To control for the influence of alliances on trade,

[44] Rosendorff (2005), on the other hand, shows theoretically that democracies trade more due to frequent trade agreements and higher propensity to liberalization.

[45] Available at http://dss.ucsd.edu/~egartzke/htmlpages/data.html
and at http://www9.georgetown.edu/faculty/ev42/UNVoting.htm.

[46] -1 corresponds to least similar interests and 1 corresponds to most similar interests.

[47] The suggested way of categorization and interpretation of these scores by the project authors is as follows. Scores from -10 to -6 correspond to "autocracies", from -5 to +5 to "anocracies" and from +6 to +10 to "democracies". The data are available at http://www.systemicpeace.org/polity/polity4.htm.

we include a dummy variable for whether a pair of countries are in an alliance.[48]

In Table 9, we present results when UN vote correlations, regime differences and security alliances are taken into account as a measure of political proximity/ political distance. Previous findings on the effect of cultural dissimilarity on trade carry over. Negative effect of cultural dissimilarity on trade is much stronger in the post-Cold War period and the negative impact of cultural dissimilarity on trade during the Cold War seems to disappear when political variables are controlled for. Moreover, political proximity promotes trade and politically more distant regimes trade less, a finding that confirms Umana Dajud (2012).

6.4 Zero Flows

Omission of zero trade flows in the gravity equation might be a source of concern for it might alter the results. For that reason, in this section we test the robustness of the results to the exclusion of zero trade flows.[49]

6.4.1 Heckman Procedure

How to deal with zero trade flows is an on-going debate in the literature. The most common strategy to bypass zero-flow problem is to drop all zero-flow observations. For instance, Linders and de Groot (2006) show that such a simple solution often leads to acceptable results. Alternatively, many researchers opt to add some arbitrary number to trade flows so that the logarithm of zero-flows is included in the sample. However, this approach might lead to biased results as the choice of constant-to-be-added is not justified neither theoretically nor empirically (Linders and de Groot, 2006). In fact, King (1988) shows that you can produce any estimate you prefer by playing around with the constant-to-be-added. Recently, some researchers moved away from OLS to non-linear estimators. Most commonly suggested ones in this family are Poisson Pseudo-Maximum-Likelihood (PPML) estimator and modified PPML estimators (Burger et al., 2009; Santos Silva and Tenreyro, 2006; Westerlund and

[48] Alliances data are Version 3.03 from Correlates of War Project (Gibler, 2009; Gibler and Sarkees, 2004). These data originally date back to Singer and Small (1966) and Small and Singer (1969).

[49] The ratio of zero-flows in our sample is about 10%.

Wilhelmsson, 2009).[50] Furthermore, Martin and Pham (2008) show that PPML might result in biased estimates in the presence of frequent zero flows and propose that threshold Tobit estimator á la Eaton and Tamura (1994) and Heckman selection model perform better. So far in this debate, Heckman selection model seems to be leading the stage, especially after the contribution by Helpman et al. (2008).

Therefore, as in Helpman et al. (2008), we apply the Heckman two-step selection method. Heckman model introduces in the specification the inverse of the so-called Mills ratio in order to account for possible biases due to omission of zero trade flows (Heckman, 1979).[51] In a first step selection equation, a Probit model is estimated to identify trading and non-trading countries. In the second step, the inverse of the Mills ratio from the first stage is included into the estimation so as to correct for selection bias.

We present the results from the Heckman model both with and without exclusion restrictions in Table 10. In Panel A of Table 10, the Heckman procedure with no exclusion restrictions are provided (as in Linders and de Groot, 2006). In Panel B of Table 10, on the other hand, we use the number of islands in the pair as an exclusion restriction (as in Martínez-Zarzoso, 2013). Results show that, both with and without exclusion restrictions, our previous findings hold. Trade dampening impact of cultural dissimilarity is much more pronounced in the post-Cold War era compared to the Cold War era, although, now the magnitudes are smaller than the baseline case.

6.4.2 Inverse Hyperbolic Sine Transformation

Adding an ad hoc constant to imports in the log function is a common practice that renders each observation positive. Instead, in this subsection we opt for an alternative transformation function, namely inverse hyperbolic sine transformation. Although this method is widely used in household literature, its benefits remained rather underutilized in the empirical gravity literature.[52] Inverse hyperbolic sine transformation is an easy-to-apply method that is defined

[50] Two other alternatives promoted by Martínez-Zarzoso (2013) are Gamma Pseudo-Maximum-Likelihood and Feasible Generalized Least Squares.

[51] The inverse Mills ratio is the ratio of the probability density function over the cumulative distribution function of a distribution.

[52] For instance, see Pence (2001, 2006), Yen and Jones (1997).

for any real number and formally defined as: $\sinh^{-1}(x) = \log(x + (x^2 + 1)^{1/2})$ (see Burbidge et al., 1988).[53] Burbidge et al. (1988) shows that inverse hyperbolic sine transformation is a viable alternative to log transformation when the dependent variable can take on zero values. We apply this transformation to import flows so that the log function is defined for the zero values of the dependent variable as well.[54] Moreover, by this way we refrain from adding the same ad hoc constant to each observation of import flows, instead, each value to be added to the dependent variable changes and is determined by the dependent variable itself. The beauty of the inverse hyperbolic sine transformation is that it behaves exactly like log-transformation, while it is also defined at zero values.

Results with the new transformed dependent variable that includes also zero import flows are presented in Table 11. Qualitatively the previous findings are confirmed. Although in most cases the magnitudes are reduced now with respect to the baseline results in Table 4, the direction of the results do not change and they still are economically significant. The negative impact of cultural dissimilarity on bilateral trade flows is much more punctuated in the post-Cold War period compared to the Cold War period itself.

6.4.3 Extensive Margin

Now we look at whether cultural variables affect the extensive margin of trade rather than the intensive margin of trade. We use a positive trade indicator as dependent variable, which takes one whenever imports from i to j are positive and zero if there is no trade. This way we take into account all zero-trade flow observations. Table 12 presents the results from a probit model for three time periods: entire sample period of 1950-2006, the Cold War period and the post-Cold War period. We observe that, for any measure of, cultural differences reduce the probability of trade. Therefore, cultural differences do not only impact the intensive margin of trade but also the extensive margin of trade. Moreover, the reduction in the likelihood of trade due to cultural dissimilarity is much larger in the post-Cold War era in contrast to the Cold War era. As such, our results on the more negative effect of culture on trade in the

[53] Originally proposed by Johnson (1949).

[54] For examples of papers that employ inverse hyperbolic sine transformation, see Christelis et al. (2008), Kristjánsdóttir (2008, 2012) which are also in the context of gravity models.

post-Cold War period are confirmed also on the extensive margin of trade.

We incorporated the two-step Heckman procedure, inverse hyperbolic sine transformation and a probit model of positive trade into the analysis in order to account for zero trade flows. Consequently, we can conclude that our results are robust and are not driven by the omission of zero trade flows from the estimation analysis.

6.5 Dynamic Gravity Equation

In this subsection we include lagged imports as an independent variable in the regressions. Countries with historically strong trade relations can be expected to continue trading in the following periods for reasons that are not captured by the explanatory variables and these unobserved dyadic linkages would end up in the error term.[55] Therefore, we incorporate lagged imports into the estimation analysis so that slowly-evolving unobserved elements that impact trade relations are controlled for. The results are in Table 13. We see that lagged values of log imports have a big and significant impact on current imports with a coefficient of about 0.8 and the size of this coefficient is consistent with Head et al. (2010) and Umana Dajud (2012).[56] The interpretation of the coefficients on the cultural difference variables is analogous to previous findings. The impact of cultural differences on trade is adversary and this influence is much greater in the post-Cold War period than in the Cold War period. Notice that the coefficients are much smaller now, although the interpretations remain the same.

[55] For instance, sunk costs of entering a particular market and consumers' habits and tastes for products from past trade partners could be examples of such unobserved terms (Martínez-Zarzoso et al. 2009).

[56] By including a lagged endogenous variable on the right-hand side one also brings about endogeneity problems as the lagged endogenous variable is going to be correlated with the error terms. We run an alternative exercise to cure such problems, as in Martínez-Zarzoso et al. (2009), and carry dynamic panel system GMM estimations using second to fourth lags of the dependent variable as instruments (see Blundell and Bond, 1998; Roodman, 2006). Previous results carry over and are consistent with those in Martínez-Zarzoso et al. (2009). These estimations are available upon request.

6.6 Principal Component Analysis

Finally, we construct a synthetic measure of cultural difference from the principal components of the underlying determinants of a latent variable of cultural difference.[57] One might think that when all of the measures of cultural difference are included together the estimates are not very precise since all four measures are correlated. On the other hand, if they are included in the regression separately, then other elements of culture are ignored; and the estimates might be capturing these other element and again are not very precise. In either case, the precision might be questionable. Thus, to improve precision we create a variable labelled "Cultural Difference" from the largest principal component as a linear combination of our four measures of cultural difference.[58] First principal component is taken as it explains the largest ratio of the variance in the underlying data. Then, the new variable of cultural difference is created as a weighted average of four variables of cultural difference with the loadings of the first principal component as weights:

$$\begin{aligned} Cultural\ Difference &= 0.5416 \cdot N(Different\ \text{Ci}vilizations) \\ &\quad +0.4351 \cdot N(Different\ \text{Re}ligion) \\ &\quad +0.4642 \cdot N(Different\ Ethnicity) \\ &\quad +0.5495 \cdot N(Different\ Language) \end{aligned}$$

where $N(\cdot)$ is a function of standard normalization. Cultural difference variable will be lowest when the two countries belong to the same civilization, same religion, same ethnicity and same language.[59] Cultural difference variables will be highest when the two countries have different civilization, religion, ethnicity and language.[60] The correlation coefficients of cultural

[57] For an example of principal component analysis in the context of gravity models of trade, see Blomberg and Hess (2006).

[58] As a rule of thumb (also dubbed as minimum eigenvalue criterion), the convention is to take the principal components with an eigenvalue greater than one. In our case, only the first principal component is great than one, so we base our analysis on the first principal component. Components with an eigenvalue of less than one account for less variance than the original variable which had a variance of one once standardized, and so are of little use.

[59] For example, United States-United Kingdom dyad or Guatemala-Bolivia dyad or Sierra Leone-Tanzania dyad.

[60] For example, Kenya-Japan dyad or Bulgaria-Libya dyad or Israel-Sri Lanka dyad.

difference variable are as follows: with different civilizations 0.76, with different religion 0.61, with different ethnicity 0.65 and with different language 0.78.

The results with the new variable of cultural difference are in Table 14. In the first column, we show the negative impact of cultural difference on trade over the entire sample period. In the second column, we show how this effect changes in the post-Cold War period and becomes much stronger. In column (3), we additionally control for language indicator, though correlated, to show that even when the communication channel is controlled for the effect of cultural difference is still persistent. In the last column, we again contrast the evolution of cultural difference with that of different blocs and results and previous interpretations carry over.

7 Conclusion

We contribute to the literature on the relation between culture and bilateral trade flows of countries. This paper first establishes the link between cultural dissimilarity and bilateral imports of countries. However, the main novelty of this study is to test Huntington's the *Clash of Civilizations* hypothesis from an economic perspective. We study the dynamics of the effect of cultural dissimilarity on trade and show how it evolves over time.

To be more specific, this paper first shows whether cultural dissimilarity between countries is, by and large, a barrier to trade. We do that by estimating a theory based gravity model of international trade and by using a set of cultural heterogeneity measures that allow us to look at different aspects of culture. Based on Huntington's classification and categorization of civilizational membership of countries, we provide evidence that when two countries in a dyad are members of different civilizations their import flows are up to 20% lower than that of two countries of the same civilization over the period of 1950 to 2006. We also show that when two countries in a dyad do not share the same ethnicity or the same language or the same religion their trade relations are strongly worsened. While two countries with different dominant ethnicity have 38% lower imports, two countries with different dominant language have 46% lower imports.

More importantly, we examine Huntington's "The Clash of Civilizations?" hypothesis from an economic clash point of view. We provide evidence suggesting that there is a very strong surge in economic clash (in terms of trade relations) across countries in the post-Cold War era compared to the Cold War era. For instance, two countries with distinct religious majorities have 35% lower bilateral import flows during the post-Cold War period compared to those countries sharing the same majority religion, whereas this effect is less than half, 16%, during the Cold War. Alternatively, when the two trading partners do not share the same dominant ethnicity, their imports is reduced by 27% during the Cold War; whereas in the post-Cold War epoch they trade 51% less than a pair of countries that share these values.

Finally, we provide an explanation for the differential impact of cultural dissimilarity over time. By mapping out the transition of the effects of cultural and ideological dissimilarities, we find that cold-war ideological blocs were the reason for the suppression of cultural differences. Therefore, cultural differences come to the forefront as a trade barrier only in the post-Cold War period, after the demise of ideological rivalries.

Unstable trade relations might be source of concern for policy makers. This paper highlights a threat to the world trade system as found in cultural cleavages. Clashes are generated by psychological notions of in-group/out-group and notions of identity, especially group identity.[61] If this is an emergent phenomenon, then we might observe a shift in the behavior in the mass of individual economic actors via considerations of cultural and ideological identity.

Such a destabilizing occurrence at a global scale needs more heed and a better understanding. A natural line of further investigation would be to look in more detail at the causes underneath the evolution of the impact of cultural dissimilarity. More disaggregated trade flows data, for example, could shed some more light on this question by showing which components of trade and what types of goods drive the findings.

[61] This interacts also with notions of self-image or social-image.

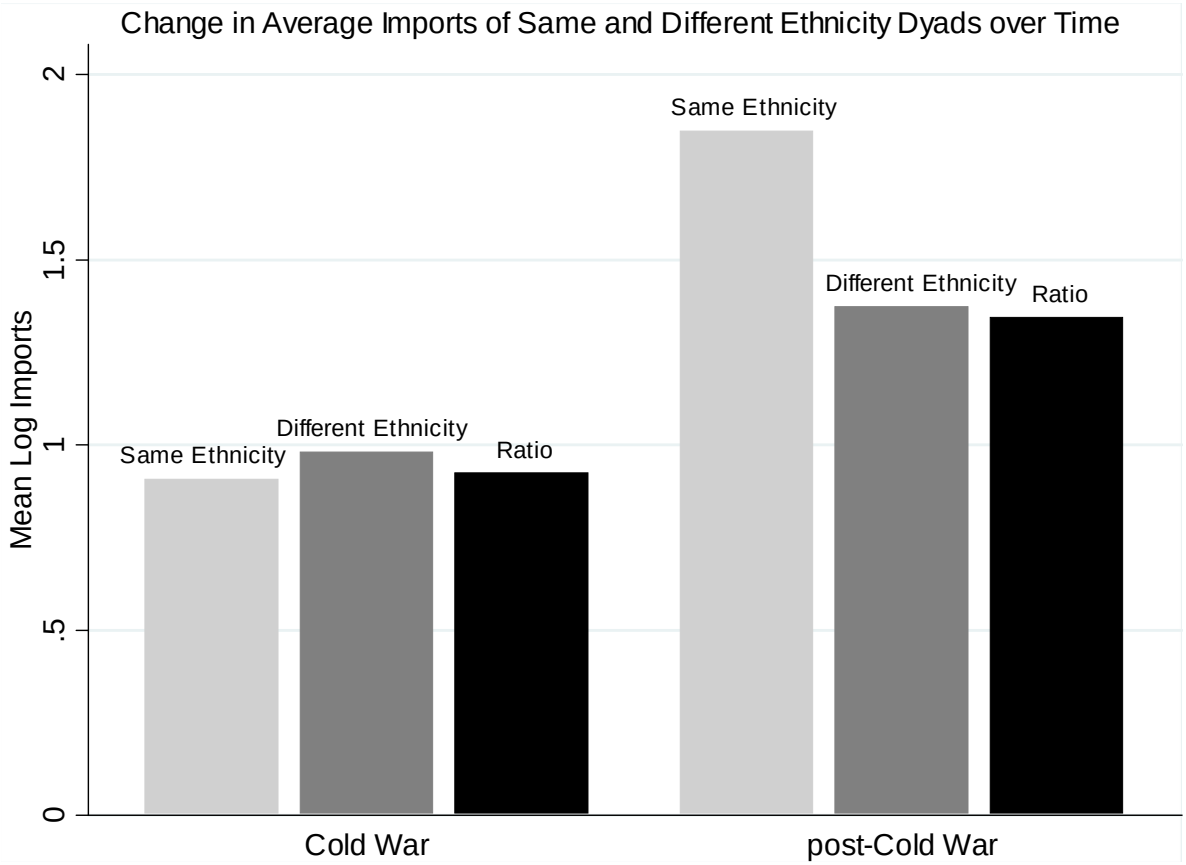

Figure 1: Evolution of Mean Log Imports over the Cold War and the post-Cold War Periods for Different and Same Ethnicity Country Dyads. Ratio is the ratio of mean log imports of same ethnicity dyads to that of different ethnicity dyads. Mean of log imports for same ethnicity dyads over the Cold War=0.907. Mean of log imports for different ethnicity dyads over the Cold War=0.981. Mean of log imports for same ethnicity dyads over the post-Cold War=1.848. Mean of log imports for different ethnicity dyads over the post-Cold War=1.373.

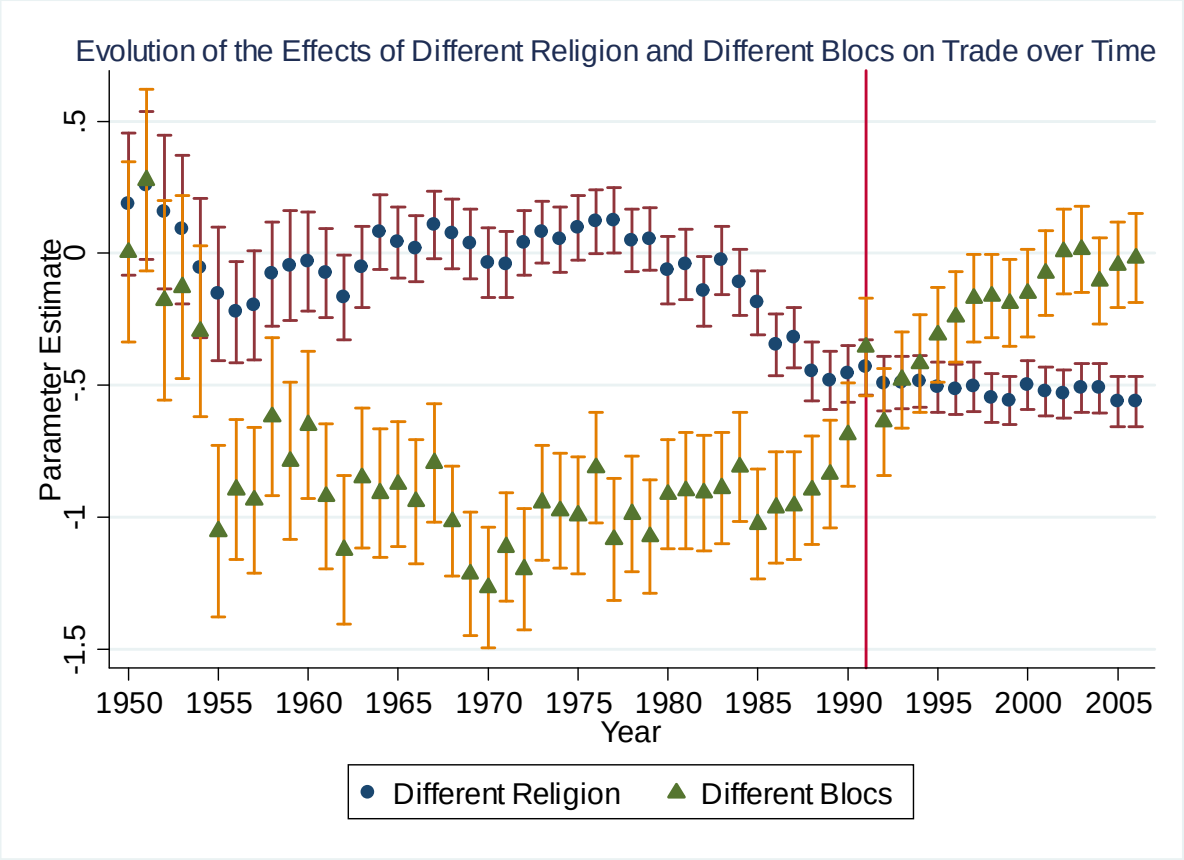

Figure 2: Parameter Estimates and 95% Confidence Bands of Different Religion and Different Blocs Variables Throughout Years. The values are from the following regression specification. Regressand: log Imports. Other Regressors: ln Distance, Contiguity, Colonial Link, Same Country, Common Colonizer, Same Legal Origin, FTA, Both in WTO, Common Currency, GSP and time-varying importing country and exporting country fixed effects.

Table 1: Correlation Coefficients

	Log Imports	Different Civilizations	Different Religion	Different Ethnicity
Different Civilizations	-0.106*			
Different Religion	-0.052*	0.393*		
Different Ethnicity	-0.008*	0.237*	0.124*	
Different Language	-0.041*	0.400*	0.207*	0.404*

* Significant at the 5% level or better.

Table 2: Impact of Culture on Bilateral Trade, Alternative Measures of Culture

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Different Civilizations	-0.227***				-0.111***			-0.004
	(0.035)				(0.037)			(0.040)
Different Religion		-0.293***				-0.233***		-0.231***
		(0.031)				(0.032)		(0.035)
Different Ethnicity			-0.491***				-0.256***	-0.252***
			(0.080)				(0.080)	(0.080)
Different Language				-0.626***	-0.561***	-0.550***	-0.541***	-0.465***
				(0.064)	(0.068)	(0.066)	(0.066)	(0.070)
ln Distance	-0.980***	-1.000***	-0.999***	-0.978***	-0.961***	-0.965***	-0.971***	-0.958***
	(0.024)	(0.022)	(0.023)	(0.023)	(0.024)	(0.023)	(0.023)	(0.024)
Contiguity	0.399***	0.390***	0.396***	0.397***	0.392***	0.381***	0.390***	0.374***
	(0.071)	(0.072)	(0.070)	(0.069)	(0.069)	(0.070)	(0.069)	(0.069)
Colonial Link	1.166***	1.149***	1.171***	1.066***	1.077***	1.065***	1.082***	1.081***
	(0.077)	(0.076)	(0.076)	(0.077)	(0.077)	(0.077)	(0.077)	(0.077)
Same Country	0.794***	0.807***	0.807***	0.752***	0.757***	0.768***	0.765***	0.781***
	(0.119)	(0.120)	(0.121)	(0.119)	(0.119)	(0.120)	(0.121)	(0.121)
Common Colonizer	0.540***	0.515***	0.531***	0.537***	0.532***	0.508***	0.527***	0.499***
	(0.063)	(0.063)	(0.063)	(0.062)	(0.062)	(0.062)	(0.062)	(0.062)
Same Legal Origin	0.335***	0.348***	0.341***	0.304***	0.303***	0.311***	0.308***	0.315***
	(0.028)	(0.028)	(0.028)	(0.028)	(0.028)	(0.028)	(0.028)	(0.027)
FTA	0.362***	0.392***	0.415***	0.410***	0.386***	0.395***	0.412***	0.397***
	(0.062)	(0.063)	(0.062)	(0.061)	(0.062)	(0.062)	(0.061)	(0.062)
Both in WTO	0.264***	0.261***	0.259***	0.226***	0.206***	0.186***	0.204***	0.165***
	(0.056)	(0.057)	(0.055)	(0.055)	(0.055)	(0.055)	(0.054)	(0.054)
Common Currency	0.643***	0.638***	0.665***	0.697***	0.689***	0.682***	0.699***	0.683***
	(0.086)	(0.086)	(0.086)	(0.087)	(0.087)	(0.087)	(0.087)	(0.087)
GSP	0.600***	0.546***	0.536***	0.568***	0.597***	0.574***	0.564***	0.572***
	(0.042)	(0.042)	(0.042)	(0.042)	(0.042)	(0.041)	(0.042)	(0.042)
Importer-Year Effects	YES	YES	YES	YES	YES	YES	YES	YES
Exporter-Year Effects	YES	YES	YES	YES	YES	YES	YES	YES
N	385379	385379	385379	385379	385379	385379	385379	385379
R^2	0.717	0.718	0.718	0.718	0.719	0.719	0.719	0.719

Regressand: log Imports. Robust standard errors (clustered at the dyad level) are in parentheses.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 3: Impact of Culture on Trade: Cold War vs. post-Cold War Comparisons

	(1) Cold War	(2) post-Cold War	(3) Chow P-value
Different Civilizations	-0.038	-0.514***	0.000
	(0.040)	(0.040)	
Different Religion	-0.177***	-0.435***	0.000
	(0.037)	(0.037)	
Different Ethnicity	-0.324***	-0.715***	0.000
	(0.090)	(0.086)	
Different Language	-0.336	-1.062***	0.000
	(0.072)	(0.070)	
Additional Controls	YES	YES	
Importer-Year Effects	YES	YES	
Exporter-Year Effects	YES	YES	

Each cell of a row reports the coefficient of a cultural variable of interest from a separate regression in the two respective time periods. Regressand: log Imports. Regressors included but with unrecorded coefficients: ln Distance, Contiguity, Colonial Link, Same Country, Common Colonizer, Same Legal Origin, FTA, Both in WTO, Common Currency, GSP and time-varying importing and exporting country fixed effects. Robust standard errors (clustered at the dyad level) are in parentheses. Number of observations: Cold War=226292; post-Cold War=159087.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 4: Impact of Culture in the post-Cold War

	(1)	(2)	(3)	(4)
Different Civilizations	0.064			
	(0.038)			
Different Civilizations×Post-Cold War	-0.690***			
	(0.033)			
Different Religion		-0.104***		
		(0.036)		
Different Religion×Post-Cold War		-0.421***		
		(0.040)		
Different Ethnicity			-0.187**	
			(0.089)	
Different Ethnicity×Post-Cold War			-0.746***	
			(0.076)	
Different Language				-0.207***
				(0.071)
Different Language×Post-Cold War				-1.040***
				(0.060)
Additional Controls	YES	YES	YES	YES
Importer-Year Effects	YES	YES	YES	YES
Exporter-Year Effects	YES	YES	YES	YES
N	385379	385379	385379	385379
R^2	0.719	0.718	0.718	0.719

Regressand: log Imports. Regressors included but with unrecorded coefficients: ln Distance, Contiguity, Colonial Link, Same Country, Common Colonizer, Same Legal Origin, FTA, Both in WTO, Common Currency, GSP and time-varying importing and exporting country fixed effects. Robust standard errors (clustered at the dyad level) are in parentheses.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 5: Tariff Equivalent Costs of Cultural Barriers to Trade

	Cold War			post-Cold War		
	(1)	(2)	(3)	(4)	(5)	(6)
	σ=5	σ=8	σ=10	σ=5	σ=8	σ=10
Different Civilizations	0.95	0.54	0.42	13.71	7.61	5.87
Different Religion	4.52	2.56	1.98	11.48	6.41	4.95
Different Ethnicity	8.43	4.73	3.66	19.57	10.75	8.26
Different Language	8.76	4.91	3.80	30.40	16.38	12.52

See Table 4. The results in this table are based on the estimates from Table 4.

Table 6: Culture vs. Ideology

	(1)	(2)	(3)	(4)
Different Civilizations	0.047			
	(0.038)			
Different Civilizations×Post-Cold War	-0.671***			
	(0.033)			
Different Religion		-0.103***		
		(0.036)		
Different Religion×Post-Cold War		-0.418***		
		(0.039)		
Different Ethnicity			-0.225**	
			(0.089)	
Different Ethnicity×Post-Cold War			-0.709***	
			(0.077)	
Different Language				-0.242***
				(0.071)
Different Language×Post-Cold War				-1.011***
				(0.059)
Different Blocs	-0.868***	-0.883***	-0.892***	-0.894***
	(0.067)	(0.068)	(0.067)	(0.067)
Different Blocs×Post-Cold War	0.653***	0.699**	0.669***	0.649***
	(0.076)	(0.078)	(0.078)	(0.078)
Additional Controls	YES	YES	YES	YES
Importer-Year Effects	YES	YES	YES	YES
Exporter-Year Effects	YES	YES	YES	YES
N	385379	385379	385379	385379
R^2	0.720	0.719	0.719	0.721
$F-Stat$ Culture=Blocs in CW	140.68	101.73	34.95	43.93
$F-Stat$ Culture=Blocs in post-CW	258.11	163.81	161.48	287.80

Regressand: log Imports. Regressors included but with unrecorded coefficients: ln Distance, Contiguity, Colonial Link, Same Country, Common Colonizer, Same Legal Origin, FTA, Both in WTO, Common Currency, GSP and time-varying importing and exporting country fixed effects. Robust standard errors (clustered at the dyad level) are in parentheses.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 7: Culture vs. Geography

	(1)	(2)	(3)	(4)
Different Civilizations	0.165			
	(0.046)			
Different Civilizations×Post-Cold War	-0.673***			
	(0.035)			
Different Religion		-0.040		
		(0.045)		
Different Religion×Post-Cold War		-0.429***		
		(0.042)		
Different Ethnicity			-0.055	
			(0.087)	
Different Ethnicity×Post-Cold War			-0.732***	
			(0.081)	
Different Language				-0.091
				(0.079)
Different Language×Post-Cold War				-1.003***
				(0.065)
Continental Pair Dummies	YES	YES	YES	YES
Log Abs. Diff. in Elevation	YES	YES	YES	YES
Log Abs. Diff. in Latitudes	YES	YES	YES	YES
Log Abs. Diff. in Longitudes	YES	YES	YES	YES
# Landlocked Countries	YES	YES	YES	YES
# Island Countries	YES	YES	YES	YES
Log Abs. Diff. in Distance to Coast	YES	YES	YES	YES
Abs. Dif. in Tropical Land Percentage	YES	YES	YES	YES
Abs. Dif. in Subtropical Land Percentage	YES	YES	YES	YES
Abs. Dif. in Polar Land Percentage	YES	YES	YES	YES
Abs. Dif. in Boreal Land Percentage	YES	YES	YES	YES
Abs. Dif. in Temperate Desert Percentage	YES	YES	YES	YES
Abs. Dif. in Tropical Desert Percentage	YES	YES	YES	YES
Abs. Dif. in Dry Land Percentage	YES	YES	YES	YES
Abs. Dif. in Wet Land Percentage	YES	YES	YES	YES
Abs. Dif. in Log Hydrocarbons Per Capita	YES	YES	YES	YES
Additional Controls	YES	YES	YES	YES
Importer-Year Effects	YES	YES	YES	YES
Exporter-Year Effects	YES	YES	YES	YES
N	330136	330136	330136	330136
R^2	0.740	0.739	0.739	0.740

Regressand: log Imports. Additional Controls: ln Distance, Contiguity, Colonial Link, Same Country, Common Colonizer, Same Legal Origin, FTA, Both in WTO, Common Currency, GSP and time-varying importing and exporting country fixed effects. Robust standard errors (clustered at the dyad level) are in parentheses.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 8: Do Our Measures of Culture Survive Genetic Distance?

	(1)	(2)	(3)	(4)	(5)
Different Civilizations		0.083**			
		(0.039)			
Different Civilizations×Post-Cold War		-0.661***			
		(0.035)			
Different Religion			-0.121***		
			(0.037)		
Different Religion×Post-Cold War			-0.414***		
			(0.041)		
Different Ethnicity				-0.173*	
				(0.090)	
Different Ethnicity×Post-Cold War				-0.607***	
				(0.080)	
Different Language					-0.228***
					(0.071)
Different Language×Post-Cold War					-0.952***
					(0.061)
Genetic Distance	-0.00009***	-0.00012***	-0.00010***	-0.00008***	-0.00010***
	(0.00002)	(0.00002)	(0.00002)	(0.00002)	(0.00002)
Genetic Distance×Post-Cold War	-0.00018***	-0.00005**	-0.00017***	-0.00014***	-0.00013***
	(0.00002)	(0.00002)	(0.00002)	(0.00002)	(0.00002)
Additional Controls	YES	YES	YES	YES	YES
Importer-Year Effects	YES	YES	YES	YES	YES
Exporter-Year Effects	YES	YES	YES	YES	YES
N	382002	382002	382002	382002	382002
R^2	0.718	0.720	0.720	0.719	0.721

Regressand: log Imports. Regressors included but with unrecorded coefficients: ln Distance, Contiguity, Colonial Link, Same Country, Common Colonizer, Same Legal Origin, FTA, Both in WTO, Common Currency, GSP and time-varying importing and exporting country fixed effects. Robust standard errors (clustered at the dyad level) are in parentheses.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 9: Culture vs. Political Proximity

	(1)	(2)	(3)	(4)
Different Civilizations	0.190***			
	(0.041)			
Different Civilizations×Post-Cold War	-0.739***			
	(0.035)			
Different Religion		-0.042		
		(0.038)		
Different Religion×Post-Cold War		-0.367***		
		(0.039)		
Different Ethnicity			-0.018	
			(0.091)	
Different Ethnicity×Post-Cold War			-0.756***	
			(0.083)	
Different Language				0.029
				(0.078)
Different Language×Post-Cold War				-0.973***
				(0.064)
UN Correlation	0.152***	0.178***	0.218***	0.230***
	(0.053)	(0.053)	(0.053)	(0.053)
Regime Difference	-0.005***	-0.002*	-0.004***	-0.003**
	(0.001)	(0.001)	(0.001)	(0.001)
Alliance	0.425***	0.391***	0.412***	0.337***
	(0.049)	(0.049)	(0.049)	(0.052)
Additional Controls	YES	YES	YES	YES
Importer-Year Effects	YES	YES	YES	YES
Exporter-Year Effects	YES	YES	YES	YES
N	355227	355227	355227	355227
R^2	0.726	0.725	0.724	0.725

Regressand: log Imports. Regressors included but with unrecorded coefficients: ln Distance, Contiguity, Colonial Link, Same Country, Common Colonizer, Same Legal Origin, FTA, Both in WTO, Common Currency, GSP and time-varying importing and exporting country fixed effects. Robust standard errors (clustered at the dyad level) are in parentheses.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 10: Zero Trade Flows, Heckman Two-Step Selection Model, Cold War vs. post-Cold War Comparisons

	A: Heckman without exclusion restrictions	
	(1)	(2)
	Cold War	post-Cold War
Different Civilizations	0.083	-0.285***
	(0.050)	(0.053)
Different Religion	-0.075*	-0.310***
	(0.044)	(0.046)
Different Ethnicity	-0.298***	-0.680***
	(0.090)	(0.086)
Different Language	-0.238***	-0.892***
	(0.082)	(0.079)
	B: Heckman with exclusion restrictions	
	(1)	(2)
	Cold War	post-Cold War
Different Civilizations	0.081	-0.288***
	(0.050)	(0.052)
Different Religion	-0.076*	-0.313***
	(0.044)	(0.046)
Different Ethnicity	-0.299***	-0.682***
	(0.090)	(0.086)
Different Language	-0.238***	-0.897***
	(0.082)	(0.080)
Additional Controls	YES	YES
Importer-Year Effects	YES	YES
Exporter-Year Effects	YES	YES

Regressand: Log Imports. Regressors included but with unrecorded coefficients: ln Distance, Contiguity, Colonial Link, Same Country, Common Colonizer, Same Legal Origin, FTA, Both in WTO, Common Currency, GSP and time-varying importing and exporting country fixed effects. Exclusion restriction is the number of islands in the pair. Robust standard errors (clustered at the dyad level) are in parentheses. Number of observations: Cold War=226292; post-Cold War=159087.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 11: Zero Trade Flows, Inverse Hyperbolic Sine Transformation

	(1)	(2)	(3)	(4)
Different Civilizations	-0.018			
	(0.028)			
Different Civilizations×Post-Cold War	-0.517***			
	(0.024)			
Different Religion		-0.042		
		(0.027)		
Different Religion×Post-Cold War		-0.319***		
		(0.029)		
Different Ethnicity			-0.144**	
			(0.068)	
Different Ethnicity×Post-Cold War			-0.583***	
			(0.061)	
Different Language				-0.105**
				(0.053)
Different Language×Post-Cold War				-0.832***
				(0.047)
Additional Controls	YES	YES	YES	YES
Importer-Year Effects	YES	YES	YES	YES
Exporter-Year Effects	YES	YES	YES	YES
N	425240	425240	425240	425240
R^2	0.749	0.748	0.748	0.749

Regressand: Inverse Hyperbolic Sine Transformation of Imports. Regressors included but with unrecorded coefficients: ln Distance, Contiguity, Colonial Link, Same Country, Common Colonizer, Same Legal Origin, FTA, Both in WTO, Common Currency, GSP and time-varying importing and exporting country fixed effects. Robust standard errors (clustered at the dyad level) are in parentheses.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 12: Zero Trade Flows: Extensive Margin of Trade and Culture, Probit

	(1) Entire Sample	(2) Cold War	(3) post-Cold War
Different Civilizations	-0.0085***	-0.0063***	-0.0105***
	(0.0008)	(0.0009)	(0.001)
Different Religion	-0.0027***	-0.0002	-0.0060***
	(0.0009)	(0.002)	(0.001)
Different Ethnicity	-0.0060***	-0.0038**	-0.0069***
	(0.001)	(0.0015)	(0.001)
Different Language	-0.0096***	-0.0052***	-0.0123***
	(0.001)	(0.001)	(0.001)

Each cell of a row reports the coefficient of a cultural variable of interest from a separate regression in the respective time period. Regressand: Imports Dummy. Regressors included but with unrecorded coefficients: ln Distance, Contiguity, Colonial Link, Same Country, Common Colonizer, Same Legal Origin, FTA, Both in WTO, Common Currency, GSP, importer fixed effects, exporter fixed effects and time fixed effects. Marginal effects are reported. Robust standard errors (clustered at the dyad level) are in parentheses. Number of observations: Entire Sample=425240; Cold War=233856; post-Cold War=170439.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 13: Dynamic Panel Estimation

	(1)	(2)	(3)	(4)
Different Civilizations	0.012			
	(0.008)			
Different Civilizations×Post-Cold War	-0.140***			
	(0.008)			
Different Religion		-0.010		
		(0.008)		
Different Religion×Post-Cold War		-0.093***		
		(0.010)		
Different Ethnicity			-0.038**	
			(0.018)	
Different Ethnicity×Post-Cold War			-0.147***	
			(0.017)	
Different Language				-0.055***
				(0.015)
Different Language×Post-Cold War				-0.189***
				(0.014)
Log Imports $(t-1)$	0.801***	0.802***	0.802***	0.801***
	(0.002)	(0.002)	(0.002)	(0.002)
Additional Controls	YES	YES	YES	YES
Importer-Year Effects	YES	YES	YES	YES
Exporter-Year Effects	YES	YES	YES	YES
N	352755	352755	352755	352755
R^2	0.900	0.900	0.900	0.900

Regressand: log Imports. Regressors included but with unrecorded coefficients: ln Distance, Contiguity, Colonial Link, Same Country, Common Colonizer, Same Legal Origin, FTA, Both in WTO, Common Currency, GSP and time-varying importing and exporting country fixed effects. Robust standard errors (clustered at the dyad level) are in parentheses.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 14: Principal Component Analysis of Cultural Difference

	(1)	(2)	(3)	(4)
Cultural Difference	-0.131***	-0.037***	-0.004	-0.044***
	(0.011)	(0.013)	(0.017)	(0.013)
Cultural Difference×Post-Cold War		-0.220***	-0.222***	-0.214***
		(0.010)	(0.010)	(0.010)
Different Blocs				-0.886***
				(0.067)
Different Blocs×Post-Cold War				0.643***
				(0.077)
Different Language			-0.239***	
			(0.089)	
Additional Controls	YES	YES	YES	YES
Importer-Year Effects	YES	YES	YES	YES
Exporter-Year Effects	YES	YES	YES	YES
N	385379	385379	385379	385379
R^2	0.719	0.720	0.721	0.722

Regressand: log Imports. Regressors included but with unrecorded coefficients: ln Distance, Contiguity, Colonial Link, Same Country, Common Colonizer, Same Legal Origin, FTA, Both in WTO, Common Currency, GSP and time-varying importing and exporting country fixed effects. In column (3), different language indicator is additionally controlled for. Robust standard errors (clustered at the dyad level) are in parentheses.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Appendix

TABLE 1A. Civilization Membership

Civilization	Country
Western	Andorra, Australia, Austria, Barbados, Belgium, Canada, Croatia, Czech Rep., Denmark, Dominica, Estonia, Finland, France, French Guiana, Germany, Greenland, Grenada, Hungary, Iceland, Ireland, Israel, Italy, Jamaica, Latvia, Liechtenstein, Lithuania, Luxembourg, Malta, Monaco, Netherlands, New Zealand, Norway, Papua New Guinea, Philippines, Poland, Portugal, San Marino, Slovakia, Slovenia, Solomon Islands, Spain, Sweden, Switzerland, Trinidad and Tobago, United Kingdom, United States, Vanuatu.
Sinic	China, Hong Kong, North Korea, South Korea, Taiwan, Vietnam.
Islamic	Afghanistan, Albania, Algeria, Azerbaijan, Bahrain, Bangladesh, Bosnia and Herzegovina, Brunei, Burkina Faso, Chad, Djibouti, Egypt, Eritrea, Gambia, Guinea, Guinea-Bissau, Indonesia, Iran, Iraq, Jordan, Kyrgyzstan, Kuwait, Lebanon, Libya, Malaysia, Mali, Mauritania, Morocco, Niger, Oman, Pakistan, Qatar, Saudi Arabia, Senegal, Somalia, Sudan, Syria, Tajikistan, Tunisia, Turkey, Turkmenistan, United Arab Emirates, Uzbekistan, Yemen.
Hindu	Guyana, India, Nepal.
Orthodox	Armenia, Belarus, Bulgaria, Cyprus, Georgia, Greece, Kazakhstan, Macedonia, Moldova, Romania, Russia, Serbia, Ukraine.
Latin American	Antigua and Barbuda, Argentina, Bahamas, Belize, Bolivia, Brazil, Chile, Colombia, Costa Rica, Cuba, Dominican Rep., Ecuador, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru, Puerto Rico, Saint Lucia, St.Vincent & Grenadines, Uruguay, Venezuela.
African	Angola, Benin, Botswana, Burundi, Cameroon, Cape Verde, Central African Republic, Comoros, Congo, Congo Dem. Rep. (Zaire), Equatorial Guinea, Gabon, Ghana, Ivory Coast, Kenya, Lesotho, Liberia, Madagascar, Malawi, Mauritius, Mozambique, Namibia, Nigeria, Rwanda, Sao Tome and Principe, Sierra Leone, South Africa, Suriname, Swaziland, Tanzania, Togo, Uganda, Zambia, Zimbabwe.
Buddhist	Bhutan, Cambodia, Lao People's Dem. Rep., Mongolia, Myanmar, Singapore, Sri Lanka, Thailand.
"Lone" States	Ethiopia, Haiti, Japan.

Source: Author's own construction based on Huntington (1998).

TABLE 2A: Summary Statistics

	Mean	Std.	Min	Max	Observations
Log Imports	1.49	3.00	-4.67	12.66	385379
Different Civilizations	0.78	0.41	0	1	385379
Different Religion	0.54	0.49	0	1	385379
Different Ethnicity	0.96	0.19	0	1	385379
Different Language	0.93	0.24	0	1	385379
Log Distance	8.59	0.84	4.65	9.89	385379
Contiguity	0.06	0.24	0	1	385379
Colonial Link	0.03	0.17	0	1	385379
Same Country	0.01	0.12	0	1	385379
Common Colonizer	0.07	0.25	0	1	385379
Same Legal Origin	0.36	0.48	0	1	385379
FTA	0.03	0.17	0	1	385379
Both in WTO	0.56	0.49	0	1	385379
Common Currency	0.01	0.13	0	1	385379
GSP	0.15	0.35	0	1	385379
Different Blocs	0.04	0.21	0	1	385379
Genetic Distance	962.93	785.74	0	3375	382002
UN Correlation	0.57	0.31	-1	1	385379
Regime Difference	8.52	6.80	0	20	355227
Alliance	0.12	0.32	0	1	385379
Inverse Hyperbolic Sine	2.43	2.38	0	13.35	425240
Cultural Difference	2.30e-09	1.42	-5.90	0.91	385379

TABLE 3A. Blocs of Countries

Bloc	Country
1st World	Andorra, Australia, Belgium, Canada, Denmark, France, Germany, Greece, Iceland, Israel, Italy, Japan, Luxembourg, Malta, Monaco, Netherlands, New Zealand, Norway, Philippines, Portugal, San Marino, South Korea, Spain, Taiwan, Thailand, Turkey, United Kingdom, United States.
2nd World	Albania, Armenia, Azerbaijan, Belarus, Bulgaria, China, Cuba, Czech Rep., Estonia, Georgia, Hungary, Kazakhstan, Kyrgyzstan, Lao People's Dem. Rep., Latvia, Lithuania, Moldova, Mongolia, North Korea, Poland, Romania, Russia, Slovakia, Turkmenistan, Ukraine, Uzbekistan, Vietnam.
3rd World	Afghanistan, Algeria, Angola, Antigua and Barbuda, Argentina, Austria, Bahamas, Bahrain, Bangladesh, Barbados, Belize, Benin, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, Brunei, Burkina Faso, Burundi, Cambodia, Cameroon, Cape Verde, Central African Republic, Chad, Chile, Colombia, Comoros, Congo, Costa Rica, Croatia, Cyprus, Congo Dem. Rep. (Zaire), Djibouti, Dominica, Dominican Rep., Ecuador, Egypt, El Salvador, Equatorial Guinea, Eritrea, Ethiopia, Fiji, Finland, Gabon, Gambia, Ghana, Grenada, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, India, Indonesia, Iran, Iraq, Ireland, Ivory Coast, Jamaica, Jordan, Kenya, Kuwait, Lebanon, Lesotho, Liberia, Libya, Liechtenstein, Macedonia, Madagascar, Malawi, Malaysia, Mali, Mauritania, Mauritius, Mexico, Morocco, Mozambique, Myanmar, Namibia, Nepal, Nicaragua, Niger, Nigeria, Oman, Pakistan, Panama, Papua New Guinea, Paraguay, Peru, Puerto Rico, Qatar, Rwanda, Saint Lucia, St.Vincent and Grenadines, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia, Sierra Leone, Singapore, Slovenia, Solomon Islands, Somalia, South Africa, Sri Lanka, Sudan, Suriname, Swaziland, Sweden, Switzerland, Syria, Tajikistan, Tanzania, Togo, Trinidad and Tobago, Tunisia, Uganda, United Arab Emirates, Uruguay, Vanuatu, Venezuela, Yemen, Zambia, Zimbabwe.

Source: Author's own construction based on Huntington (1998).

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