ORIGINAL PAPER

Does international trade favor proximity in cultural beliefs?

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Abstract

Cultural proximity has been considered as a crucial determinant of bilateral trade flows. Scant emphasis has, instead, been devoted to the investigation of the opposite direction of causality. International trade eases contacts and increases trust among contracting parties and may, then, promote the spread of cultural beliefs across borders. By using World and European Values Surveys data, we provide evidence on the role of trade flows in favoring countries' cultural convergence for a large sample of countries over the period 1989–2014. Results confirm that international trade narrows differences in cultural beliefs and attitudes, but just when trade partners share some culture-related traits. Common ancestry, religion and legal system as well as high historical bilateral migration flows are necessary conditions for trade reducing cultural distance. Also, the convergence effect turns to be completely driven by trade flows of differentiated goods which entail relationship-specific investments and a deeper commitment between contracting parties.

Keywords Cultural distance · Trade · Trust · Background

JEL classification F10 · Z10 · O10

1 Introduction

The importance of culture as a driver of international economic flows has been extensively studied by the international business literature. Specifically, the role of cultural 'distance' in the international management literature is quite well explored and measured (e.g. Ambos & Hakanson, 2014; Hofstede, 1980) and it

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is considered as one of the main core constructs of this field of research. It is, instead, only recently that the concept has become central in the trade literature. The gravity models of trade have mostly focused on economic variables—such as countries' GDP, transportation costs, tariffs—to explain the pattern of flows of goods across countries. Recently, the literature has also highlighted the role of non-economic variables, and in particular of culturally based variables, as relevant determinants of trade. However, as Alesina and Giuliano (2015) point out, the boundaries of the broad concept of culture remain ambiguous. Culture has a multidimensional nature. Different historical, religious and institutional traits contribute to build countries and regions' cultural ground that turns to be relevant in shaping economic development (Tabellini, 2010) and trade patterns. Studies have, indeed, highlighted that religion (e.g. Helpman et al., 2008; Lee & Park, 2016), language (e.g. Melitz, 2008), common ethnic origin (e.g. Rauch & Trindade, 2002) and a general notion of bilateral trust (e.g. Guiso et al., 2009) can be important to explain trade flows. Works accounting for the existence of a trade-culture nexus have progressively risen. This probably stems both from the availability of new data measuring cultural values, as well as from the growing importance attributed to informal barriers to trade. Heterogeneous cultural values may turn into hidden transaction costs, thus representing a sort of trade barrier that may gain the same importance as tariffs and quotas (e.g. Lee & Park, 2016).

Most contributions to the literature focus on culture as a key driver of trade flows, and, more in general, of economic development (Tabellini, 2010). The interest on the linkage between culture and economic development is not new and dates back, at least, to Max Weber (1930)'s leading contribution where he discussed the role of some religious traits of Calvinism for the spread of ideas supporting growth. Nevertheless, the impact of trade on cultural distance has been scarcely explored so far, with few exceptions (Cyrus, 2012; Maystre et al., 2014). Despite the existence of some deep beliefs which may be hardly eradicated, trade may change people's way of thinking and shape beliefs by promoting personal contacts among people and by building trust. These processes can further reinforce each other in the long run. International trade can then narrow cultural distance between trade partners and drive to changes in countries' culture with potential repercussions on their economic development path. The idea that economic exchanges can shrink cultural distances is, for example, recalled by the concept of MacDonaldization that supports the spread of one unique global culture around the world as a consequence of the fragmented production processes of multinational enterprises.

In this work we study whether bilateral international trade helps to reduce cultural differences among countries by exploiting a fairly large country level sample gathered by merging different waves of the World and the European Values Surveys, thus covering the 1989–2014 period. Our contribution to the scant existing literature is twofold. First, we enrich the trade-culture literature by examining the direction of causality that has been disregarded so far, that is the role of trade on cultural convergence. In particular, our theoretical hypothesis revolves around the idea that for trade to shrink cultural distance, some culture related dimensions, such as traits associated to historical or institutional legacy, represent a fundamental requisite.

The presence of such a common background can favor the role of trade in spreading knowledge and information, and in trust-building. In this respect, we show how religious ties, common ancestry and legal origins, on the one hand, and migration flows, on the other hand, can foster cultural convergence promoted by trade. In the absence of these dimensions, the role of trade is negligible. Second, we provide empirical evidence on a large sample of countries, allowing us to draw generalizable results. Anticipating our results, we find that bilateral flows of goods reduce cultural distance between countries. This result proves robust when we extend the time span of our analysis and we allow trade to influence cultural distance over a 10 or 20 years period. While most of literature investigates the other side of the relationship—from cultural distance to trade—we provide evidence suggesting that trade acts as a diffusion channel of culture. Moreover, we find that the existence of a common background, reflected into historical religious ties, or commonality of ancestry and legal origins, as well as a certain level of bilateral migration, positively influences the role of trade as factor of cultural convergence.

The paper is organized as follows. Section 2 reviews the relevant literature and discusses the theoretical framework, Sect. 3 describes the data used in the empirical analysis and presents the econometric methodology we adopt. Section 4 provides the results of the empirical analysis together with some robustness checks and the investigation of some factors moderating the trade role on culture. Section 5 offers some concluding remarks.

2 Theoretical framework

In the international economics literature, cultural distance has been tested as a relevant factor driving trade flows, as it is associated to asymmetries in several aspects that may turn into informal barriers to inward and outward flows of goods. Indeed, in order to organize and complete a trade deal, partner countries need to "speak" a kind of "common language". This does not refer just to the role of spoken language, but to a wide range of factors that may be ascribed to the concept of culture. As Alesina and Giuliano (2015) point out, it is not easy to find in the literature a commonly accepted definition of culture (see Castellani, 2018, for a survey). The concept has been used in several different fields of research, such as sociology, history, psychology and economics, and each of them has highlighted different elements of the general concept and has used empirically diverse measurements. According to Granato et al. (1996), culture is considered as a "system of common values that help shape the behavior of the people in a given society". These values and beliefs arise from the membership to ethnic, religious, and social groups and are usually believed to be transmitted fairly unchanged from generation to generation (Guiso et al., 2006). Therefore, two countries are defined as culturally close if they share common values and norms (Hofstede, 2001; Inglehart et al., 2004). Even if other scholars have used different definitions of culture, all refer to values and beliefs that are shared among a group of people and are spread through relationships (Castellani, 2018).

Whereas the link between trade and culture has recently drawn the interest of economists, just few contributions have inspected which cultural dimensions may

display stronger enhancing or hampering effects on trade. The disregard of the multidimensional nature of culture may explain the non conclusive existing empirical evidence on the trade-culture nexus. On the one hand, lower cultural distance can induce higher volumes of trade by promoting higher level of trust between trading partners as well as the spread of information and knowledge (e.g. Guiso et al., 2009). On the other hand, higher cultural distance can promote trade rather than FDI as mode of entry in foreign countries. Indeed, producing directly in culturally distant countries can involve higher transaction costs due to the difficulty for foreign affiliates to adapt to different local managerial practices (Larimo, 2003; Linders et al., 2005).

With respect to the multidimensionality of the concept of culture, Alesina and Giuliano (2015) discuss about the boundaries between institutions and culture trying to uncover whether there can be any relationship between them. They focus on some dimensions that they identify as main building blocks of the concept of culture and that we will consider as a point of reference for our framework: trust, family ties, the degree of individualism, the generalized morality and the attitude towards work and poverty. In particular, we try to understand whether other factors related to these dimensions can help in building a common cultural layer that promotes the positive influence of trade on the spread of beliefs and attitudes. For example, trade literature considers religion as one of the relevant determinants engendering trust between contracting parties. According to Helble (2007), sharing the same religion may lead up to sharing some common way of behavior. The resulting higher level of trust among people of trading countries reduces transaction costs. Moreover, Helble (2007) shows how different religions have a heterogeneous effect on economic outcomes, and so also on trade. This heterogeneity in the trade effect of religion is supported by Lewer and Van den Berg (2007). Lee and Park (2016) extend the evidence on the trade-religion nexus to the trade in services. As services are not standard goods, but rather they are a sort of 'experience' goods that consumers are not able to test before consumption, religion helps to reduce transaction costs associated to the exchange of services. Other contributions in the trade-culture literature devote special attention to the trust dimension. Accounting for endogeneity issues, Guiso et al. (2009) find a positive effect of bilateral trust on trade. Spring and Grossmann (2016) enlarge this view by testing whether bilateral trust affects migration. However, using different instruments they do not succeed in confirming the positive trade effect of trust highlighted in Guiso et al. (2009). In line with the latter is, instead, the study by Yu et al. (2015) who corroborate that trust turns to be a crucial determinant of trade flows, but its importance depends on the quality of the formal legal institutions—such as the rule of law—of the trade partners, acting as substitute if trust is weak or lacking.[1] The literature on the relationship between institutions and trade is quite well developed, and it seems to confirm the importance of both directions of causality, thus supporting their co-evolution. While Hochman et al. (2013) provide theoretical and empirical evidence showing the positive impact of trade on institutions, Berkowitz et al. (2006) find that

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[1] This is in line with the theoretical model by Tabellini (2008), who finds that institutions may affect culture through the displacement of personal preferences.

countries (both exporters and importers) with higher quality of institutions can positively affect trade especially with regard to complex products. Furthermore, Tabellini (2010), by focusing on the cultural traits referring to generalized morality, shows that institutions and culture influence each other in fostering the level of development of eight European regions. Common legal origins can therefore be part of the common layer of cultural background, that can facilitate the impact of trade on cultural convergence.

Besides the focus on trust, the literature on the relationship between trade and culture has shed light on the importance of information flows and similarity in preferences as further mechanisms underlying the nexus. Higher cultural distance may indeed prevent information flows among trade partners as well as it may reflect different attitudes and consumer preferences, that would explain the negative effect on trade. Migration can act as a key factor supporting information flows as well as familiarity with different attitudes, and may promote a convergence in preferences. In particular, Tadesse and White (2010a), by focusing on nine OECD countries and 58 trade partner countries over the period 1996–2001, find that cultural distance lowers the flows of trade. However, they detect for some countries a positive effect of migrations flows in counterbalancing the negative effect of cultural distance on trade. This effect is further corroborated in Tadesse and White (2010b) for the relations between US and 75 export partners. This empirical evidence turns to be important in our framework as migration may represent an element that help building common values and beliefs by indirectly enhancing trust.

Genetics is a further dimension that may be considered as a building block of culture. As Desmet et al. (2011) point out, literature supports a strict linkage between indicators of genetic distance and cultural distance. Ancestry matters for culture and Spolaore and Wacziarg (2016) find a strict linkage between genetic distance and cultural traits transmitted intergenerationally. However, the linkage between genetic distance and trade is not clear-cut. Giuliano et al. (2014), for example, find that when controlling for geographic distance by using a more complete measure of geography the role of genetic distance is no longer relevant.[2]

Despite the different definitions of culture and its diverse dimensions, in the existing literature we have reviewed that most effort has been devoted in explaining whether culture can shape economic outcomes and trade. We instead aim at offering a complementary view, by focusing on the role of trade in driving cultural convergence between partners. Yet, we believe that a common layer of cultural background is needed as a starting point to facilitate cultural convergence driven by trade flows. To our knowledge, only two papers consider this reverse point of view. Cyrus

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[2] Even if language has not been directly considered as a cultural trait, its role in promoting trade by supporting trust-building among countries is recognized by recent literature. Melitz (2008) identifies two channels driving the role of language on trade, direct communication and translation. He finds that communication is more important than translation in explaining the positive effect of language. Furthermore, as most of market information is not transmitted through common language, network language externalities seem not to play a role. In this line of research, Felbermayr and Toubal (2010) develop a complex measure of language commonality trying to isolate the ability to communicate in a shared language from trust and ethnicity which are entailed by the language commonality.

(2012), beside studying the nexus running from culture to trade, also argues that higher volumes of trade (in particular exports) can reduce cultural distance as they turn into higher contacts between exporting and importing countries. Findings partially confirm this point of view, even if the evidence is not corroborated for all the dimensions of culture. While trust and respect are increasing in trade, obedience and control decrease when trade increases. The second contribution dealing with the trade impact on culture is by Maystre et al. (2014) who build on the view that culture and economic variables are co-determined. They use World Values Surveys questions to measure cultural distance and present a descriptive evidence supporting cultural convergence following an increase in trade. In their econometric analysis, they find that bilateral cultural distance is negatively influenced by higher trade volumes, and this effect is mainly associated to trade in differentiated goods.

3 Data, variables and methodology

3.1 Data sources

The dataset we exploit in the empirical analysis has been assembled by using different sources of data. To measure cultural distance we combine the longitudinal versions of both the World Values Survey (Inglehart et al. 2014) and the European Values Survey (EVS, 2011). These two data sources have been extensively used in economics literature to capture cultural beliefs, people's opinions, habits and social values. More specifically, we consider five waves of the WVS and three waves of the EVS, thus covering the years 1989–2014.[3] The dataset we create allows us to measure different cultural traits of nearly 100 countries over time. The amount of bilateral trade flows between countries is retrieved from the Comtrade-WITS database.

We then recover information on a number of country level and country pairs level control variables from the Geodist CEPII database (Head et al., 2010).

By crossing information on countries' cultural traits coming from both WVS and EVS and matching them with trade data, we are able to study an unbalanced panel of country pairs covering the years from 1989 to 2014. However, we are not able to analyse all possible country pairs in the time span under investigation as for the computation of cultural distance we take the information for each country partner from the same EVS or WVS wave and the same survey year. It is worth mentioning that within each wave, the survey year can change across countries. In our analysis, for each country we build cultural traits by exploiting EVS/WVS questions and assign them to the survey year.

Table 7 in the Appendix reports the list of countries included in our analysis.

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[3] The WVS waves are 1989–1993, 1994–1998, 1999–2004, 2005–2009, 2010–2014. The EVS waves are 1990–1993, 1999–2001 and 2008–2010.

3.2 Measuring cultural distance

Culture is a multidimensional concept and its measurement is not univocal. As already discussed, the heterogeneous results found in the literature may, at least in part, be attributed to diverse exploited indicators and measures. In building our indicator of cultural distance, which represents our dependent variable, we consider those cultural traits which have been highlighted by Tabellini (2010) as potential drivers of countries' development. This choice stems from our aim to understand how trade may shape those beliefs which bear economic growth, thus shedding light on a further channel through which trade affects development. Alesina and Giuliano (2015) refer to these traits as those measuring a sort of 'generalized morality' concept, even though, as they underline, the concept of trust is also encompassed. We then focus on the following cultural traits:

- Level of trust spread among people
- Importance of obedience as children's quality
- Importance of tolerance and respect as children's quality
- Level of personal self-determination and control

In order to measure the level of trust spread among people in the country we take the percentage of people answering the question *"Generally speaking, would you say that most people can be trusted or that you can't be too careful in dealing with people?"* with "most people can be trusted". The importance attached to obedience and tolerance is measured as the percentage of people mentioning these two qualities when answering at the following question: *"Here is a list of qualities that children can be encouraged to learn at home. Which, if any, do you consider to be especially important? Please choose up to five"*. Finally, the level of personal self-determination and control of a country's people is obtained as the average rate—from 1 (no control) to 10 (highest rate)—mentioned in replying to the following question *"Some people feel they have completely free choice and control over their lives, while other people feel that what we do has no real effect on what happens to them. Please use the scale to indicate how much freedom of choice and control in life you feel you have over the way your life turns out"*. In order to measure the cultural distance between two countries we follow existing literature (Cyrus, 2012) and we take the Euclidian distance between the vectors containing the four cultural traits, mentioned above, of each country pair. Our indicator of cultural distance is, thus, computed as $cult\_distance_{ij} = \sqrt{\sum_{z=1}^{4}(X_i^z - X_j^z)^2}$ where z = 1,..4 represents the cultural traits included in the measure of a country's culture and X_i^z and X_j^z are the values of these traits in the country *i* and *j*, respectively.

In Table 1 we show how cultural distance changes along the distribution of bilateral trade flows. It is straightforward to observe that higher trade flows are associated with a higher proximity in cultural beliefs and attitudes that support economic development.

Figure 1 displays the distribution of cultural distance and trade flows across country pairs and in different periods of time. In particular, we compare the measure of

Table 1 Cultural distance along the bilateral trade distribution

$trade^{5y}$ deciles	cult_distance
1	1.028228
2	1.022513
3	1.047715
4	0.99326
5	0.915051
6	0.967853
7	0.914396
8	0.889239
9	0.871431
10	0.803693

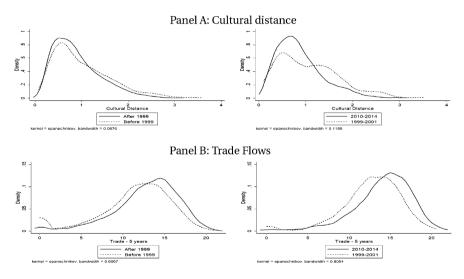$trade^{5y}$ denotes the total bilateral trade flows recorded for each pair of countries over a 5-year time window

Fig. 1 Distribution of cultural distance and trade across country pairs and over time

cultural distance obtained from the waves before 1999 with the one based on waves after 1999. Also, we focus on a small panel made up of those country pairs that are present in both waves, the 2010–2014 WVS and the 1999–2001 EVS waves, and we analyze how cultural distance changed over time. The same applies to trade flows. While cultural distance reduced over time, trade flows increased. By implementing the Kolmogorov-Smirnov test, we find that the distribution of cultural distance associated to less recent years stochastically dominates the distribution for more recent years, while for trade flows the opposite is true.[4]

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[4] These tests are available from the authors upon request.

Table 8 in the Appendix shows some descriptive statistics on our variables of interest, cultural distance and trade flows, as well as on the control variables we will use in our analysis.

3.3 Empirical model

We estimate the following empirical model by means of OLS:

$$cult\_distance_{ijt} = \alpha + \beta trade_{ij\tau} + \Gamma X'_{ij} + \Lambda Z'_{ij\ t-1} + \eta_{it} + \lambda_{jt} + \epsilon_{ijt} \qquad (1)$$

$cult\_distance_{ijt}$ represents the measure of distance in cultural beliefs and attitudes for each country pair ij at time t, described in the data section. More specifically, our measure of cultural distance is built considering country pairs for which we have information on their cultural traits for the same survey year. It follows that for each wave and country pair we can compute cultural distance once, at most.

Our interest rests on the coefficient associated to the variable $trade_{ij\tau}$, which represents the log of the amount of trade between country i and j, obtained as the sum of exports of country i to j and exports of country j to i, over the period τ. In our view, trade flows may increase trust among contracting parties, thus promoting the spread of ideas, beliefs and cultural values. The importance of this channel would increase with the number of business contacts among people belonging to the two different countries. We then proxy the number of business contacts with the total trade between two countries, regardless of the direction of the flows. We consider all trade flows taking place in the period τ which precedes the year t when we observe countries' cultural distance. In particular we consider trade flows recorded, alternatively, in the previous year $t-1$, $trade_{ij\ t-1}$, in the previous 3-year window between $t-1$ and $t-3$, $trade_{ij}^{3y}$, or in the previous 5-year window between $t-1$ and $t-5$, $trade_{ij}^{5y}$. Trade, indeed, may take some time to exert its positive effect in the spread of beliefs and values. As a robustness check to further account this delay in the trade effect, we will account for 10-year and 20-year windows.

As a falsification test, we also show that trade flows of the two countries i and j with other partners ($other\_trade_{ij\tau}$) do not affect the cultural distance between i and j.

We then add a number of time-invariant country pair level control variables, X'_{ij}, and time-varying controls at time $t-1$, $Z'_{ij\ t-1}$. More specifically, X'_{ij} is a vector including geographical indicators, which are the geographical distance between countries ($geo\_distance_{ij}$) and a dummy variable indicating whether the countries in the pair share a common border ($contiguity_{ij}$). It also includes some indicators capturing historical linkages between countries. In particular, we consider a dummy indicating whether countries i and j have ever been in colonial relationship ($colonial_{ij}$), have been in a colonial relationship after 1945 ($colonial45_{ij}$) and if they have ever been the same country ($same\_country_{ij}$). We also introduce a variable that accounts for the fact that countries i and j share a common colonizer ($colonizer45_{ij}$).

Further, we control for a dummy identifying whether country i and j share the same official primary language ($common\_lang_{ij}$). The latter follows literature

arguing that language can influence thought and shape people's perception of the world, beliefs and also economic choices and behavior (Whorf, 1956). All these variables are retrieved from the CEPII database. Furthermore, we test for a variable denoting the belonging to the same geographical region ($common\_reg_{ij}$).[5]

The literature has documented a strict linkage between indicators of genetic distance and cultural distance (Desmet et al., 2011). It then follows the need to polish our effect from all intergenerationally transmitted human traits that genetic distance may capture. Even if ancestry matters for culture, "cultural traits are transmitted with variation across generations over time" (Spolaore & Wacziarg, 2016, p. 206) and trade may play an important role in creating a break in this path dependence of culture. We thus add the measure of genetic distance of countries, $genetic\_distance_{ij}$ exploiting the one built by Spolaore and Wacziarg (2009) for countries in 1500. We account also for the role of religious proximity, $common\_religion_{ij}$ using an indicator that reflects the overlap in religious confessions among countries' populations and it is provided by the CEPII. As genetic heritage, religion is strictly related to culture and may especially favor the rise and development of beliefs which are deeply-rooted and difficult to eradicate.

Common regulations and laws between two countries ($legal\_origin_{ij}$) may also give rise to similar values and may shape people's behaviors, thus reducing cultural distance among them. We consider the similarity in laws and regulations by using a dummy denoting the commonality of legal origin between countries sourced from La Porta et al. (2008). Moreover, historical migration flows may importantly shape the beliefs system of a country and, in particular, may create an environment that is a fertile ground for new values brought from outside. To our knowledge, it does not exist detailed time-varying information on bilateral migration flows for a large set of countries. We then exploit the data made available by Ortega and Peri (2014) on bilateral migration stocks in 1990 and 2000. We get the sum of the number of migrants from country i to country j and the number of migrants from country j to country i and we normalize it by the total population of country i and country j, $migrants\_pop\_ij$. We impute the 1990 values to all the 1990–1999 period and the 2000 values to all the 2000–2014 period.

Finally, $Z'_{ij\,t-1}$ includes the absolute value of the difference between the gross domestic product (GDP) per capita of country i and country j, $diff\_gdp_{ij\,t-1}$. We may indeed expect that countries at the same level of development share similar preferences. Data on the GDP per capita are retrieved from the World Development Indicators, collected by the World Bank.

We estimate the model by OLS with standard errors clustered at country pair level.

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[5] We define the following geographical regions: Africa, Asia, Australia and New Zealand, Central and Southern America, Europe, North America.

4 The trade effect on cultural convergence

4.1 Baseline results

Estimations of our baseline model are reported in Table 2. Results show that international trade narrows cultural distance between countries but this effect becomes more significant and slightly increases in magnitude when we focus on trade flows recorded in wider time windows. Indeed, personal contacts arising from trade relationships may take some time to exert their positive impact on the spread of beliefs and values, which, in turn, would affect cultural distance. While trade effect is weakly significant when we focus on flows recorded in the previous year, our hypothesis is instead corroborated when we focus on 3 and 5 years windows.

As explained above, in order to prove that our variable of interest is indeed capturing the role of business contacts resulting from bilateral trade flows and it is not proxying for a general process of countries' economic integration, for each country pair ij we include in our estimation all trade flows that country i and country j record with any other trade partner in the previous year, $other\_trade_{ijt-1}$, in the previous 3-year, $other\_trade_{ij}^{3y}$, and 5-year window, $other\_trade_{ij}^{5y}$. Results show that these flows do not bear a significant coefficient, thus confirming that our coefficient of interest is actually capturing the role of business relationships in trade.

The sign and significance of control variables included mainly confirm our expectations. Geographical proximity favors the sharing of similar beliefs and cultural traits. The dummy denoting the existence of a common border, *contiguity*, instead, is not significant. Its beneficial impact on cultural similarity may be, indeed, absorbed by the inclusion of the indicator of geographical distance. Being in a colonial relationship after 1945 is negatively associated with the cultural distance, while we do not find a significant linkage between cultural distance and having a common colonizer. The use of a common official language is weakly significant. More than having a direct impact in narrowing differences in beliefs and values, may ease economic and non-economic interactions among people from different countries, thus favoring trade, tourism and migration flows. As expected, the variable measuring the distance in economic development between countries confirms that higher difference between countries in the development level leads to differences in culture. Concerning genetic distance, we find a positive and significant coefficient thus confirming that ancestry matters for culture. Nonetheless, evidence suggests that "cultural traits are transmitted with variation across generations over time" (Spolaore & Wacziarg, 2016, p. 206) and trade plays an important role in breaking with the cultural path dependence. The measure of commonality in religion, as expected, emerges to be an important explanatory variable of sharing similar cultural traits, but this linkage does not undermine the trade-culture nexus. Instead, the variable relative to common legal origin does not bear a significant coefficient. Finally, we find a significant, even if not robust, association between migration flows and cultural distance. Migration may contribute to spread cultural beliefs, ideas and behaviors across national borders as trade does. From our evidence, migration emerges as a vehicle of culture, even if its role is not precisely estimated.

Table 2 Baseline results—dependent variable: $cult\_distance_{ijt}$

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]
$trade_{ij\,t-1}$	− 0.005 [0.004]		− 0.008* [0.005]						
$other\_trade_{ij\,t-1}$		0.001 [0.002]	0.004 [0.003]						
$trade_{ij}^{3y}$				− 0.008** [0.004]		− 0.011** [0.005]			
$other\_trade_{ij}^{3y}$					− 0.001 [0.003]	0.003 [0.003]			
$trade_{ij}^{5y}$							− 0.009** [0.004]		− 0.010** [0.005]
$other\_trade_{ij}^{5y}$								− 0.003 [0.003]	0.002 [0.004]
$geo\_distance_{ij}$	0.112*** [0.020]	0.119*** [0.020]	0.109*** [0.020]	0.108*** [0.020]	0.118*** [0.020]	0.105*** [0.020]	0.109*** [0.020]	0.119*** [0.020]	0.107*** [0.020]
$contiguity$	− 0.006 [0.048]	− 0.005 [0.048]	− 0.005 [0.048]	− 0.006 [0.048]	− 0.006 [0.048]	− 0.005 [0.048]	0.002 [0.049]	0.001 [0.050]	0.003 [0.049]
$colonial_{ij}$	0.022 [0.064]	0.02 [0.064]	0.022 [0.064]	0.023 [0.064]	0.02 [0.064]	0.024 [0.064]	0.014 [0.066]	0.011 [0.066]	0.014 [0.066]
$colonial45_{ij}$	− 0.272*** [0.095]	− 0.275*** [0.095]	− 0.269*** [0.095]	− 0.270*** [0.095]	− 0.276*** [0.095]	− 0.267*** [0.096]	− 0.268*** [0.098]	− 0.275*** [0.097]	− 0.266*** [0.098]
$colonizer45_{ij}$	− 0.016 [0.042]	− 0.023 [0.042]	− 0.014 [0.042]	− 0.01 [0.043]	− 0.022 [0.042]	− 0.009 [0.042]	− 0.012 [0.042]	− 0.023 [0.042]	− 0.011 [0.042]
$same\_country_{ij}$	0.037 [0.060]	0.034 [0.060]	0.036 [0.060]	0.039 [0.061]	0.035 [0.060]	0.038 [0.061]	0.038 [0.061]	0.035 [0.061]	0.037 [0.061]
$common\_lang_{ij}$	0.058* [0.033]	0.053 [0.033]	0.057* [0.033]	0.059* [0.033]	0.054* [0.033]	0.060* [0.033]	0.065** [0.033]	0.060* [0.033]	0.065** [0.033]

Table 2 (continued)

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]
$common\_reg_{ij}$	0.072*** [0.026]	0.072*** [0.026]	0.072*** [0.026]	0.073*** [0.026]	0.072*** [0.026]	0.073*** [0.026]	0.073*** [0.026]	0.073*** [0.026]	0.073*** [0.026]
$diff\_gdp_{ij\ t-1}$	0.057*** [0.008]	0.056*** [0.008]	0.056*** [0.008]	0.057*** [0.008]	0.056*** [0.008]	0.056*** [0.008]	0.057*** [0.008]	0.057*** [0.008]	0.057*** [0.008]
$genetic\_distance_{ij}$	0.000*** [0.000]	0.000*** [0.000]	0.000*** [0.000]	0.000*** [0.000]	0.000*** [0.000]	0.000*** [0.000]	0.000*** [0.000]	0.000*** [0.000]	0.000*** [0.000]
$common\_religion_{ij}$	− 0.217*** [0.037]	− 0.218*** [0.037]	− 0.217*** [0.037]	− 0.217*** [0.037]	− 0.218*** [0.037]	− 0.217*** [0.037]	− 0.222*** [0.038]	− 0.223*** [0.038]	− 0.221*** [0.038]
$legal\_origin_{ij}$	− 0.008 [0.018]	− 0.008 [0.018]	− 0.007 [0.018]	− 0.008 [0.018]	− 0.008 [0.018]	− 0.007 [0.018]	− 0.005 [0.018]	− 0.006 [0.018]	− 0.005 [0.018]
$migrants\_pop_{ij\ t-1}$	− 10.913* [6.298]	− 10.998* [6.196]	− 10.525* [6.313]	− 10.838* [6.350]	− 11.130* [6.217]	− 10.502* [6.362]	− 10.43 [6.370]	− 10.880* [6.253]	− 10.272 [6.376]
Fixed effects									
Country *i*-year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country *j*-year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	6069	6069	6069	6069	6,069	6069	5918	5918	5918
R^2	0.483	0.483	0.483	0.483	0.483	0.484	0.478	0.477	0.478

Robust standard errors clustered by country pair are reported in brackets. All estimations include country *i*-year and country *j*-year fixed effects

*Significant at 10% level; **significant at 5% level; ***significant at 1% level

Table 3 Robustness tests

	Alternative cultural distance		Longer time-span		IV	
	[1]	[2]	[3]	[4]	[5]	[6]
$trade_{ij}^{3y}$	− 0.003** [0.001]					
$other\_trade_{ij}^{3y}$	0.000 [0.001]					
$trade_{ij}^{5y}$		−0.003** [0.001]				
$other\_trade_{ij}^{5y}$		0.000 [0.001]				
$trade_{ij}^{10y}$			− 0.010* [0.005]		− 0.202*** [0.055]	
$other\_trade_{ij}^{10y}$			0.004 [0.004]		0.09 [0.147]	
$trade_{ij}^{20y}$				− 0.011* [0.007]		− 0.215*** [0.058]
$other\_trade_{ij}^{20y}$				0.006 [0.007]		0.145 [0.157]
$geo\_distance_{ij}$	0.019*** [0.006]	0.019*** [0.006]	0.076*** [0.019]	0.03 [0.020]	− 0.115* [0.063]	− 0.119*** [0.067]
$contiguity_{ij}$	− 0.028 [0.019]	− 0.029 [0.019]	0.003 [0.046]	− 0.02 [0.047]	0.01 [0.071]	0.04 [0.071]
$colonial_{ij}$	− 0.006 [0.025]	− 0.005 [0.026]	0.023 [0.055]	0.022 [0.078]	0.079 [0.077]	0.056 [0.081]
$colonial95_{ij}$	− 0.122*** [0.035]	− 0.125*** [0.036]	− 0.192** [0.084]	− 0.218* [0.123]	− 0.115 [0.137]	− 0.076 [0.143]
$colonizer45_{ij}$	− 0.049*** [0.014]	− 0.050*** [0.014]	0.006 [0.040]	0.055 [0.041]	0.2 [0.126]	0.169 [0.126]
$same\_country_{ij}$	0.051* [0.031]	0.048 [0.031]	0.029 [0.062]	0.051 [0.063]	0.089 [0.134]	0.047 [0.144]
$common\_lang_{ij}$	− 0.017* [0.010]	− 0.018* [0.010]	0.052 [0.033]	0.092*** [0.035]	0.140* [0.083]	0.134* [0.081]
$common\_reg_{ij}$	− 0.017*** [0.008]	− 0.017*** [0.008]	0.049* [0.025]	− 0.04 [0.028]	0.078* [0.044]	0.065* [0.039]
$diff\_gdp_{ij\,t-1}$	0.056*** [0.002]	0.056*** [0.002]	0.057*** [0.008]	0.044*** [0.010]	0.05 [0.048]	0.038 [0.046]
$genetic\_distance_{ij}$	0 [0.000]	0 [0.000]	0.000*** [0.000]	0.000*** [0.000]	0.000 [0.000]	0.000 [0.000]
$common\_religion_{ij}$	− 0.051*** [0.011]	− 0.046*** [0.012]	− 0.173*** [0.038]	− 0.126*** [0.044]	− 0.191*** [0.044]	− 0.196*** [0.045]
$legal\_origin_{ij}$	− 0.025*** [0.006]	− 0.024*** [0.006]	− 0.014 [0.018]	− 0.047* [0.021]	0.015 [0.034]	0.018 [0.029]
$migrants\_pop_{ij\,t-1}$	− 7.452*** [2.544]	− 7.059*** [2.553]	− 8.916 [5.571]	− 8.750** [4.326]	1.02 [16.018]	6.214 [15.738]
Observations	6093	5940	5290	2126	6069	5918

Table 3 (continued)

	Alternative cultural distance		Longer time-span		IV	
	[1]	[2]	[3]	[4]	[5]	[6]
R^2	0.708	0.704	0.463	0.489	− 0.268	− 0.386
Ftest					12.26	11.31

Robust standard errors clustered by country pair are reported in brackets. All estimations include country i-year and country j-year fixed effects

*Significant at 10% level; **significant at 5% level; ***significant at 1% level

4.2 Robustness

In Table 3 we test the robustness of our baseline. We exploit an alternative definition of countries' cultural distance, we test for longer time spans in order to accommodate a delayed trade effect and we account for potential endogeneity issues.

In column 1 and 2, we adopt the same empirical approach for the computation of cultural distance we used for our preferred indicator, but we change the set of variables proxying for cultural beliefs and attitudes. More specifically, the measure of countries' culture is obtained by looking at a larger set of qualities that people mention a child is encouraged to learn: obedience, unselfishness, perseverance, imagination, tolerance and respect, independence, hard work, feeling of responsibility, thrift saving money and things; furthermore we consider the responses about the importance in people's life of family, politics, friends, leisure time and work.[6] Results on this alternative measure of cultural distance, $cult\_distance_{ijt}^{B}$, mimic the baseline ones.[7]

Since evidence reported in Table 2 suggests that trade can take some time to display its effect, we therefore prove the robustness of our evidence when we extend our focus to longer time lags, especially 10 years and 20 years. Results, which are reported in Table 3 (Columns 3 and 4), confirm the benchmark estimates as we find a negative sign even if the significance gets lower. The decrease in the significance may be related to the small sample we can analyze when we focus on wider time-spans. Bilateral trade data from WITS are available from 1980 and, for this reason, we lose less recent waves (in particular, all waves before 1995) in our analysis.

As reported in the literature review most of the previous works focus on the investigation of the other side of the relationship between culture and trade, that is whether cultural proximity can generate trade. Even though the novelty of the paper is to add a contribution to the scant literature searching for a possible effect in the other direction, we adopt an Instrumental Variable approach to account for potential endogeneity. In particular, we instrument trade flows for the country pair under analysis, as well as trade flows with other partners, by exploiting some policy related variables that may directly affect trade. More specifically, we consider the information on adoption of a common currency over the relevant time span (either $t-1$-$t-3$ or $t-1$-$t-5$, $common\_currency_{ij\tau}$) and which is retrieved from CEPII and the time zone difference between the two countries, $diff\_time_{ij}$. In Table 3 (columns 5–6) we show the results of the second stage of IV estimates. F-test reported at the bottom of the table confirms the significance of the instrument. IV estimates corroborate the benchmark findings: the coefficient of trade flows is negative and significant even if its magnitude (in absolute value) increases. While due to reverse causality we expected a reduction in the IV coefficient's magnitude in absolute value, the increase

[6] These four latter variables may assume a value from 1 *"Very Important"* to 0 *"Not at all "*, we create a dummy for each one assuming value 1 if people report the rate 1 and 2, and value 0 if people report rate 3 and 4.

[7] We test for further definitions of cultural distance by selecting different sub-samples of questions contained in the WVS and EVS. Results are available from the authors upon request.

that we observe may suggest that the IV approach also allows to control for omitted variables and for the endogeneity of trade flows with other partners. If there exists some complementarity among trade flows with different trade partners, this complementarity could bias the OLS estimates under analysis. An increase of trade flows with other countries might be associated with both an increase in trade flows and cultural distance for the pair under analysis. These results, however, need to be taken with caution as they may be also driven by a weak identification problem.

5 The trade effect on cultural convergence: the importance of a common background

5.1 Which role for a common background?

While contacts among people and economic exchanges may dismantle cultural barriers and favor the convergence in cultural habits, there exist some beliefs at a deeper level that may be more difficult to eradicate and that persist and stay fairly stable over time. We, thus, test whether the positive effect of trade on cultural proximity calls for the presence of a common historical background which can enable it. In particular, we consider four dimensions. First, religion is at the basis of highly persistent cultural norms and values and is one of the main sources of social identification which promotes reciprocal trust and eases cooperation. In this respect, religious affiliation may engender distrust and suspicion in members of different religious denominations. The affiliation to different religious denominations may then represent a major obstacle that is hard to blow down. In such circumstances, social and economic interactions associated with trade relationships are then expected to be ineffective in promoting cultural convergence. Thus, a common religious background may represent a necessary condition for the positive role that trade plays in narrowing cultural differences among trade partners. We measure religious proximity by means of an indicator that reflects the overlap in religious denominations among countries' populations and it is provided by the CEPII, $common\_religion_{ij}$.

Second, sharing the same institutional context delivers the commonality of some traits and behaviors which sustain the effectiveness of trade in reducing cultural distance. As adults' attitudes and values are importantly affected by the environment where she/he grew up and by the rules her/his parents set up, the attitudes and values of a country's population are significantly shaped by the surrounding institutional context and by the regulations they are subject to. The co-evolution of culture and institutions is well established in literature (Alesina & Giuliano, 2015), and, in this respect, the historical legal system may have spurred the emergence of some deep traits that may be hardly modified. It then follows that economic exchanges are expected to be fruitful in promoting cultural proximity, at least in a relatively short run, just when people already share these deep beliefs. We consider the similarity in laws and regulations by using a dummy denoting the commonality of legal origin between countries sourced from La Porta et al. (2008), $legal\_origin_{ij}$.

Third, literature has shown that ancestry and genetics contribute to shape beliefs and values (Spolaore & Wacziarg, 2016) and may create a common

cultural layer that is transmitted fairly unchanged from generation to generation. If this is the case, then a certain degree of genetic similarity should complement trade in further favoring a reduction of cultural distance. We exploit the measure of genetic distance of countries in 1500 made available by Spolaore and Wacziarg ([2009](#)), *genetic_distance$_{ij}$*.

Then, religious ties, common legal systems and genetic similarity establish a common background that eases and supports the convergence of cultural beliefs induced by international economic exchanges. In the lack of such historical linkages, migration flows may substitute for the three elements mentioned above as they allow to spread information and knowledge about trade partners and increase the level of trust. So, migration is the fourth dimension we will consider. To our knowledge, there does not exist detailed time-varying information on bilateral migration flows for a large set of countries. We then exploit the data made available by Ortega and Peri ([2014](#)) on bilateral migration stocks in 1990 and 2000. We get the sum of the number of migrants from country *i* to country *j* and the number of migrants from country *j* to country *i* and we normalize it by the total population of country *i* and country *j*, *migrants_pop$_{ij}$*. We impute the 1990 values to all the 1990–1999 period and the 2000 values to all the 2000–2014 period.

By applying a principal component analysis, we extract a synthetic indicator, *pca$_{ij}$*, which summarizes the four factors, which are associated with countries' deeply rooted values. This indicator identifies whether two countries share a common background. We then split the sample between country pairs characterized by a value of *pca$_{ij}$* above the median, that is country pairs that are more likely to share a common background, and country pairs characterized by a value of *pca$_{ij}$* below the median. Table [4](#) reports the estimates for the two groups of country pairs when we test for trade flows recorded in different time spans. We find a significant and robust trade effect on cultural convergence conditional on sharing a similar background.

When we test for the role of single factors which define the presence of a common background, evidence confirms our expectations. Sharing the same religious denomination, common ancestry and legal system as well as high historical bilateral migration flows are significant factors supporting the positive role of trade in stimulating cultural convergence. Specifically, they do not simply emerge as moderator variables, but they are necessary conditions for the trade effect being at work. These estimates are not shown, but they are available from the authors upon request.

This suggests that economic exchanges alone cannot sensitively modify those traits and attitudes which are deeply rooted in individuals, at least not in a relatively short time span. However, conditional on the existence of some common background, trade matters.

In the remaining of the paper, we will focus on those pairs of countries that share a common background and for which trade linkages effectively help in driving cultural convergence. We will then consider just the group of countries pairs with a *pca$_{ij}$* above the median.

Table 4 The importance of a common background

	Similar background			Different background		
	High pca_{ij}			Low pca_{ij}		
$trade_{ij\,t-1}$	−0.024*** [0.006]			0.007 [0.007]		
$other\_trade_{ij\,t-1}$	0.009** [0.004]			0 [0.004]		
$trade_{ij}^{3y}$		−0.028*** [0.006]			0.007 [0.007]	
$other\_trade_{ij}^{3y}$		0.012** [0.005]			−0.003 [0.004]	
$trade_{ij}^{5y}$			−0.030*** [0.007]			0.01 [0.007]
$other\_trade_{ij}^{5y}$			0.011* [0.006]			−0.007 [0.005]
$geo\_distance_{ij}$	0.068*** [0.026]	0.062** [0.027]	0.063** [0.027]	0.165*** [0.037]	0.164*** [0.036]	0.167*** [0.036]
$contiguity_{ij}$	0.006 [0.055]	0.006 [0.055]	0.016 [0.057]	0.135 [0.093]	0.135 [0.093]	0.132 [0.093]
$colonial_{ij}$	0.001 [0.062]	0.002 [0.062]	−0.013 [0.065]	0.043 [0.116]	0.044 [0.114]	0.043 [0.113]
$colonial45_{ij}$	−0.236** [0.096]	−0.231** [0.096]	−0.225** [0.099]	−0.291 [0.199]	−0.29 [0.198]	−0.292 [0.197]
$colonizer45_{ij}$	−0.138* [0.070]	−0.130* [0.070]	−0.129* [0.070]	0.052 [0.059]	0.054 [0.059]	0.055 [0.059]
$same\_country_{ij}$	0.05 [0.068]	0.05 [0.068]	0.052 [0.070]	−0.082 [0.261]	−0.07 [0.272]	−0.089 [0.274]
$common\_lang_{ij}$	0.037 [0.044]	0.039 [0.044]	0.053 [0.044]	0.034 [0.056]	0.035 [0.056]	0.034 [0.056]
$common\_reg_{ij}$	−0.017 [0.036]	−0.017 [0.036]	−0.019 [0.036]	0.091* [0.049]	0.092* [0.049]	0.093* [0.049]
$diff\_gdp_{ij\,t-1}$	0.099*** [0.012]	0.099*** [0.012]	0.101*** [0.012]	0.025** [0.012]	0.026** [0.012]	0.027** [0.012]
$genetic\_distance_{ij}$	0.000*** [0.000]	0.000*** [0.000]	0.000*** [0.000]	−0.000* [0.000]	−0.000* [0.000]	−0.000* [0.000]
$common\_religion_{ij}$	−0.138*** [0.049]	−0.135*** [0.049]	−0.140*** [0.052]	−0.339*** [0.096]	−0.342*** [0.097]	−0.342*** [0.097]
$legal\_origin_{ij}$	−0.113*** [0.026]	−0.113*** [0.026]	−0.110*** [0.026]	0.036 [0.034]	0.035 [0.034]	0.035 [0.034]
$migrants\_pop_{ij\,t-1}$	−5.426 [5.528]	−5.091 [5.556]	−4.86 [5.488]	144.392 [109.953]	141.267 [109.852]	137.835 [109.826]
Observations	3093	3093	2945	2935	2935	2935
R^2	0.529	0.53	0.522	0.561	0.561	0.561

Robust standard errors clustered by country pair are reported in brackets. All estimations include country i-year and country j-year fixed effects

*Significant at 10% level; **significant at 5% level; ***significant at 1% level

5.2 Heterogeneous trade effects across components of cultural distance

So far, we have discovered that in the presence of a common background, trade relationships reduce cultural differences among countries. We now want to disentangle this effect and investigate whether trade linkages have a heterogeneous effect across cultural components that enter the computation of our measure of cultural distance. We then re-estimate our baseline model by analyzing as dependent variable the distance in the level of trust spread among people in the countries, the importance of obedience and the importance of tolerance and respect as children's quality and, finally, the level of personal self-determination and control in the countries. Results, reported in Table 5, show that trade flows have an important and robust negative effect on the distance in the level of trust, and the level of personal self-determination. Also, significant effects are displayed for the distance in the importance of tolerance and respect, which however seems to call for more persistent trade flows among countries. No effect is, instead, found on the distance in the importance that obedience has as children's quality. The latter is probably the cultural trait that is less affected by personal interactions and exchange of ideas and opinions arising from trade flows.

This analysis reveals that the trade effect on cultural convergence is general and influences values pertaining to different fields.

5.3 Trade in differentiated versus homogeneous goods

In this sub-section, we test whether the role of trade on cultural convergence differs according to the type of traded goods. By following existing literature (Felbermayr & Toubal, 2010; Maystre et al., 2014), we distinguish between trade in differentiated and homogeneous goods.

In order to identify the two types of goods, we rest on the Rauch (1999) classification and we exploit both the liberal and conservative definition. The distinction between differentiated and homogeneous goods is useful and interesting in our context as Rauch (1999) has highlighted a linkage between cultural distance and different types of trade. Indeed, he has found that more similar countries in terms of common language or colonial ties are characterized by a higher trade flow in differentiated products. Again, we explore, instead, whether the experience collected in trading one specific type of goods affects the cultural distance among trade partners.

Results of this analysis are reported in Table 6 (for the conservative definition[8]) and points at the key role of trade in differentiated goods. We find that both the sign and significance of the coefficients are relevant only when we consider the 3 and 5 years windows. Convergence in culture is associated just with trade flows that involve differentiated goods which could also bear stricter interactions, contacts, exchange of ideas among partners. Once both kinds of flows are tested, trade in homogeneous goods loses its significance. These findings confirm the

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[8] Results for the liberal definition mimic the ones reported in the paper and are available upon request.

Table 5 Heterogeneous trade effects across components of cultural distance

	Distance in:											
	Trust			Obedience			Tolerance and respect			Self-determination		
$trade_{ij\,t-1}$	−0.001* [0.001]			−0.001 [0.001]			0 [0.000]			−0.068*** [0.016]		
$other\_trade_{ij\,t-1}$	0.001** [0.000]			0 [0.001]			0 [0.000]			0.020* [0.010]		
$trade_{ij}^{3y}$		−0.001** [0.001]			−0.001 [0.001]			−0.001* [0.000]			−0.075*** [0.016]	
$other\_trade_{ij}^{3y}$		0.001** [0.000]			0 [0.001]			0 [0.000]			0.022* [0.012]	
$trade_{ij}^{5y}$			−0.002** [0.001]			−0.001 [0.001]			−0.001** [0.000]			−0.077*** [0.017]
$other\_trade_{ij}^{5y}$			0.001*** [0.001]			0 [0.001]			0 [0.000]			0.022 [0.015]
$geo\_distance_{ij}$	0.001 [0.003]	0.001 [0.003]	0 [0.003]	−0.005* [0.003]	−0.005* [0.003]	−0.004* [0.003]	0.003* [0.002]	0.002 [0.002]	0.001 [0.002]	0.161** [0.063]	0.152** [0.063]	0.158** [0.065]
$contiguity$	−0.003 [0.007]	−0.002 [0.007]	−0.003 [0.007]	0 [0.005]	0 [0.005]	0 [0.005]	0.005* [0.003]	0.005* [0.003]	0.004 [0.003]	0.079 [0.122]	0.08 [0.122]	0.089 [0.126]
$colonial_{ij}$	0.002 [0.008]	0.002 [0.008]	0 [0.008]	−0.006 [0.008]	−0.006 [0.008]	−0.008 [0.009]	−0.005* [0.003]	−0.005* [0.003]	−0.005 [0.003]	−0.129 [0.140]	−0.128 [0.141]	−0.152 [0.147]
$colonial45_{ij}$	−0.007 [0.012]	−0.005 [0.012]	−0.005 [0.012]	−0.01 [0.010]	−0.01 [0.010]	−0.009 [0.010]	0.007 [0.005]	0.008 [0.005]	0.008 [0.005]	−0.297 [0.211]	−0.29 [0.212]	−0.273 [0.217]
$colonizer45_{ij}$	0.011** [0.005]	0.011** [0.005]	0.011** [0.005]	−0.001 [0.006]	−0.001 [0.006]	−0.002 [0.006]	0.001 [0.003]	0.001 [0.003]	0.002 [0.003]	−0.260* [0.157]	−0.246 [0.156]	−0.243 [0.156]
$same\_country_{ij}$	0.006 [0.007]	0.006 [0.007]	0.005 [0.007]	−0.008 [0.007]	−0.008 [0.007]	−0.009 [0.007]	0 [0.005]	0.001 [0.005]	0 [0.005]	0.173 [0.167]	0.175 [0.168]	0.192 [0.171]
$common\_lang_{ij}$	0.015*** [0.005]	0.015*** [0.005]	0.014*** [0.005]	−0.011** [0.005]	−0.011** [0.005]	−0.012** [0.005]	0.007*** [0.002]	0.007*** [0.002]	0.007*** [0.003]	0.107 [0.102]	0.112 [0.101]	0.144 [0.103]
$common\_reg_{ij}$	0.001 [0.004]	0.001 [0.004]	0 [0.004]	−0.013*** [0.004]	−0.013*** [0.004]	−0.013*** [0.004]	−0.002 [0.002]	−0.002 [0.002]	−0.002 [0.002]	−0.018 [0.087]	−0.017 [0.088]	−0.015 [0.089]

Table 5 (continued)

	Distance in:											
	Trust			Obedience			Tolerance and respect			Self-determination		
$diff\_gdp_{ij\,t-1}$	0.013*** [0.002]	0.013*** [0.002]	0.013*** [0.002]	0.001 [0.001]	0.001 [0.001]	0.001 [0.001]	0.008*** [0.001]	0.008*** [0.001]	0.008*** [0.001]	0.190*** [0.028]	0.191*** [0.028]	0.192*** [0.028]
$genetic\_distance_{ij}$	0 [0.000]	0 [0.000]	0 [0.000]	0.000*** [0.000]	0.000*** [0.000]	0.000*** [0.000]	−0.000** [0.000]	−0.000** [0.000]	−0.000** [0.000]	0.000** [0.000]	0.000** [0.000]	0.000** [0.000]
$common\_religion_{ij}$	−0.033*** [0.007]	−0.033*** [0.006]	−0.032*** [0.007]	−0.022*** [0.004]	−0.022*** [0.004]	−0.024*** [0.005]	−0.002 [0.003]	−0.002 [0.003]	−0.001 [0.003]	−0.304*** [0.118]	−0.299** [0.117]	−0.328*** [0.124]
$legal\_origin_{ij}$	−0.014*** [0.004]	−0.014*** [0.004]	−0.013*** [0.004]	−0.004 [0.002]	−0.004 [0.002]	−0.004* [0.003]	−0.002 [0.002]	−0.002 [0.002]	−0.002 [0.002]	−0.145*** [0.054]	−0.146*** [0.054]	−0.149*** [0.055]
$migrants\_pop_{ij\,t-1}$	−1.161 [0.853]	−1.129 [0.858]	−1.029 [0.851]	1.130* [0.634]	1.128* [0.636]	1.215* [0.658]	−0.814*** [0.283]	−0.768*** [0.287]	−0.790*** [0.289]	−3.715 [11.683]	−3.315 [11.695]	−3.572 [11.797]
Observations	3204	3204	3056	3194	3194	3046	3194	3194	3046	3115	3115	2967
R^2	0.625	0.625	0.626	0.668	0.668	0.668	0.613	0.614	0.607	0.559	0.56	0.554

Robust standard errors clustered by country pair are reported in brackets. All estimations include country i-year and country j-year fixed effects

*Significant at 10% level; **significant at 5% level; ***significant at 1% level

Table 6 Heterogeneous trade effects: differentiated versus homogeneous goods

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]
$trade_{ij\,t-1}^{DIFF}$	− 0.011 [0.008]								
$trade_{ij\,t-1}^{HOM}$	0.002 [0.004]	0.002 [0.004]	0.003 [0.004]						
$other\_trade_{ij\,t-1}$		− 0.01 [0.006]	− 0.007 [0.007]						
$trade_{ij}^{DIFF,3y}$				− 0.038*** [0.012]		− 0.033*** [0.013]			
$trade_{ij}^{HOM,3y}$				0.014* [0.008]	0.01 [0.008]	0.015* [0.008]			
$other\_trade_{ij}^{3y}$					− 0.018** [0.008]	− 0.007 [0.009]			
$trade_{ij}^{DIFF,5y}$							− 0.038*** [0.013]		− 0.035** [0.014]
$trade_{ij}^{HOM,5y}$							0.021 [0.014]	0.016 [0.014]	0.022 [0.014]
$other\_trade_{ij}^{5y}$								− 0.017* [0.009]	− 0.005 [0.010]
$geo\_distance_{ij}$	0.065** [0.027]	0.064** [0.027]	0.061** [0.028]	− 0.012 [0.029]	0.008 [0.028]	− 0.015 [0.030]	− 0.011 [0.030]	0.01 [0.029]	− 0.013 [0.031]
$contiguity$	0.03 [0.056]	0.029 [0.056]	0.03 [0.056]	0.049 [0.060]	0.044 [0.061]	0.049 [0.061]	0.047 [0.060]	0.044 [0.060]	0.048 [0.060]
$colonial_{ij}$	0.003 [0.066]	0.003 [0.066]	0.004 [0.066]	0.04 [0.076]	0.035 [0.077]	0.04 [0.076]	0.041 [0.076]	0.034 [0.076]	0.041 [0.076]
$colonial45_{ij}$	− 0.209** [0.098]	− 0.214** [0.098]	− 0.209** [0.098]	− 0.121 [0.107]	− 0.155 [0.106]	− 0.123 [0.107]	− 0.125 [0.106]	− 0.157 [0.106]	− 0.126 [0.106]
$colonizer45_{ij}$	− 0.143** [0.063]	− 0.145** [0.063]	− 0.141** [0.064]	− 0.059 [0.062]	− 0.08 [0.061]	− 0.056 [0.063]	− 0.063 [0.062]	− 0.086 [0.061]	− 0.061 [0.062]

Table 6 (continued)

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]
$same\_country_{ij}$	0.051 [0.076]	0.051 [0.076]	0.053 [0.077]	0.037 [0.076]	0.03 [0.078]	0.038 [0.076]	0.034 [0.076]	0.027 [0.078]	0.034 [0.076]
$common\_lang_{ij}$	0.033 [0.050]	0.027 [0.049]	0.031 [0.050]	0.049 [0.054]	0.029 [0.052]	0.047 [0.054]	0.045 [0.054]	0.028 [0.052]	0.044 [0.054]
$common\_reg_{ij}$	−0.061 [0.037]	−0.059 [0.037]	−0.061 [0.037]	−0.115*** [0.040]	−0.109*** [0.040]	−0.115*** [0.040]	−0.116*** [0.040]	−0.110*** [0.040]	−0.117*** [0.041]
$diff\_gdp_{ij\,t-1}$	0.105*** [0.013]	0.104*** [0.013]	0.105*** [0.013]	0.067*** [0.014]	0.065*** [0.014]	0.066*** [0.014]	0.067*** [0.014]	0.066*** [0.014]	0.067*** [0.014]
$genetic\_distance_{ij}$	0.000** [0.000]	0.000** [0.000]	0.000** [0.000]	0.000*** [0.000]	0.000*** [0.000]	0.000*** [0.000]	0.000*** [0.000]	0.000*** [0.000]	0.000*** [0.000]
$common\_religion_{ij}$	−0.078 [0.057]	−0.082 [0.056]	−0.079 [0.057]	−0.041 [0.065]	−0.056 [0.065]	−0.042 [0.065]	−0.04 [0.066]	−0.055 [0.064]	−0.04 [0.066]
$legal\_origin_{ij}$	−0.123*** [0.028]	−0.121*** [0.028]	−0.121*** [0.028]	−0.145*** [0.031]	−0.144*** [0.031]	−0.144*** [0.031]	−0.144*** [0.031]	−0.144*** [0.031]	−0.144*** [0.031]
$migrants\_pop_{ij\,t-1}$	−6.187 [5.180]	−6.034 [5.202]	−5.986 [5.219]	−4.478 [4.585]	−4.903 [4.500]	−4.287 [4.619]	−4.181 [4.583]	−4.955 [4.484]	−4.062 [4.613]
Observations	2535	2535	2535	1660	1660	1660	1660	1660	1660
R^2	0.492	0.493	0.493	0.516	0.513	0.517	0.516	0.513	0.516

Robust standard errors clustered by country pair are reported in brackets. All estimations include country i-year and country j-year fixed effects

*Significant at 10% level; **significant at 5% level; ***significant at 1% level

previous evidence by Maystre et al. (2014). The latter argue that differentiated goods, by conveying symbolic and cultural markers, are able to reduce differences in cultural beliefs and values among trade partners.

It is worth noting that differentiated goods are more likely to be found among manufacturing goods rather than among primary goods, which are also less influenced by the specific background culture which characterizes a country. Therefore, trade in primary goods is not coupled with a trade in cultural values. In general, trading differentiated goods often involve relationship-specific investments and a deeper commitment between the two contracting parties. Stricter relationships that result from these trade flows may ease the exchange of ideas, opinions and, ultimately, promote a reciprocal convergence in beliefs and values.

6 Conclusions

Culture has gained a central role in the economics literature, and this is in part attributable to the evidence supporting the importance of cultural beliefs and attitudes in predicting economic outcomes (Tabellini, 2010). Despite the growing interest of economists on the nexus between culture and economic performance, scant attention has been devoted to studying the economic drivers of culture. While different contributions have investigated the role of culture in favoring trade by reaching mixed evidence, the reverse causal relationship stayed mostly unexplored.

Trade flows between country pairs can give rise to social contacts among people, thus favoring the transmission of information, knowledge and cultural traits. To our knowledge, only two papers (Cyrus, 2012; Maystre et al., 2014) have dealt with this nexus, both finding that higher trade flows can contribute to decrease cultural distance. In this paper, we adopt a similar perspective and we build a measure of cultural distance that mainly reflects the dimensions of generalized morality and trust, thus following Tabellini (2010). We provide empirical evidence on the nexus running from trade to culture for a large time span and for a dataset made up of 100 countries.

In addition to confirm the findings by Cyrus (2012) and Maystre et al. (2014), we provide original evidence suggesting that trade relationships, alone, cannot promote cultural convergence. Our benchmark estimates confirm that higher volumes of international trade significantly affect cultural distance by shrinking it. The empirical analysis that confirm the impact of trade not only for 3 years or 5 years lags but also for longer time spans such as 10 or 20 years spans, is robust to the control for the omitted variable bias and to IV estimates. Our findings, indeed, show that the trade effect on cultural convergence calls for the existence of a layer of common background. We identify four factors—religion, legal origin, genetic distance and migration flows—that either contribute to develop deeply rooted values or ease the absorption of externally driven values and which emerge as necessary conditions for the effectiveness of the trade effect.

Appendix

See Appendix Tables 7 and 8.

Table 7 List of Countries

Albania	Finland	Lithuania	Spain
Algeria	France	Luxembourg	Sweden
Andorra	Georgia	Macedonia	Switzerland
Argentina	Germany	Malaysia	Tanzania
Armenia	Ghana	Mali	Thailand
Australia	Greece	Malta	Trinidad and Tobago
Azerbaijan	Guatemala	Mexico	Tunisia
Bahrain	Hong Kong	Moldova	Turkey
Bangladesh	Hungary	Morocco	Uganda
Belarus	Iceland	Netherlands	Ukraine
Belgium	India	New Zealand	United Kingdom
Bosnia and Herz.	Indonesia	Nigeria	United States
Brazil	Iran, Islamic Rep.	Norway	Uruguay
Bulgaria	Iraq	Pakistan	Venezuela
Burkina Faso	Ireland	Peru	Vietnam
Canada	Italy	Philippines	Yemen
Chile	Japan	Poland	
China	Jordan	Portugal	
Colombia	Kazakhstan	Qatar	
Czech Republic	Korea, Rep.	Russian Federation	
Denmark	Kuwait	Rwanda	
Ecuador	Kyrgyz Republic	Saudi Arabia	
Egypt	Latvia	Singapore	
El Salvador	Lebanon	Slovenia	
Estonia	Libya	South Africa	

Table 8 Descriptive statistics

	Obs	Mean	SD	Min	Max
$cult\_distance_{ijt}$	6198	0.939	0.562	0.050	3.594
$trade_{ij\ t-1}$	6198	10.350	4.536	0	19.789
$other\_trade_{ij\ t-1}$	6198	16.347	5.159	0	21.548
$trade_{ij}^{3y}$	6198	11.392	4.589	0	20.802
$other\_trade_{ij}^{3y}$	6198	17.485	5.034	0	22.828
$trade_{ij}^{5y}$	5979	11.732	4.575	0	21.305
$other\_trade_{ij}^{5y}$	5979	17.936	4.937	0	23.317
$geo\_distance_{ij}$	6198	8.407	0.975	4.394	9.892
$contiguity$	6198	0.042	0.201	0	1
$colonial_{ij}$	6198	0.028	0.166	0	1
$colonial45_{ij}$	6198	0.010	0.100	0	1
$same\_country_{ij}$	6198	0.010	0.097	0	1
$common\_lang_{ij}$	6198	0.091	0.287	0	1
$common\_reg_{ij}$	6198	0.338	0.473	0	1
$diff\_gdp_{ij\ t-1}$	6198	1.553	1.129	0.001	5.368

Availability of data and materials The authors cannot make the final dataset available as some data exploited in the analysis are not publicly available and cannot be redistributed, i.e. WVS data and the Geodist CEPII dataset. However, under the presentation of a research project, any researcher can access the same data sources that have been used in the paper and replicate the analysis by using the program files that will be provided.

Code availability The authors will provide any program file developed and used in the empirical analysis if the paper will be accepted for publication.

Declarations

Conflict of interest The authors have no relevant or material financial interests that relate to the research described in this paper.

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