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Migration and Cultural Change*

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Highlights

- This paper examines both theoretically and empirically how migration affects cultural change in home and host countries.
- The theoretical model integrates various compositional and cultural transmission mechanisms of migration-based cultural change for which it delivers distinctive testable predictions.
- The World Value Survey database is then used for the period 1981-2014 to build time-varying measures of cultural similarity for a large number of country pairs and exploit variation over time within country-pair.
- The results are inconsistent with the view that immigrants are a threat to the host country's culture.
- While migrants do act as vectors of cultural diffusion and bring about cultural convergence, this is mostly to disseminate cultural values and norms from host to home countries (cultural remittances).

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Abstract

We examine both theoretically and empirically how migration affects cultural change in home and host countries. Our theoretical model integrates various compositional and cultural transmission mechanisms of migration-based cultural change for which it delivers distinctive testable predictions on the sign and direction of convergence. We then use the World Value Survey for the period 1981-2014 to build time-varying measures of cultural similarity for a large number of country pairs and exploit within country-pair variation over time. Our evidence is inconsistent with the view that immigrants are a threat to the host country's culture. While migrants do act as vectors of cultural diffusion and bring about cultural convergence, this is mostly to disseminate cultural values and norms from host to home countries (i.e., cultural remittances).

Keywords

Migration, Cultural Change, Globalization.

JEL

F22, O15, Z10.

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RESEARCH AND EXPERTISE ON THE WORLD ECONOMY

> Every species of government has its specific principles. Ours perhaps are more peculiar than those of any other in the universe. (...) To these nothing can be more opposed than the maxims of absolute monarchies. Yet from such we are to expect the greatest number of emigrants. They will bring with them the principles of the government they leave, imbibed in their early youth; (...) These principles, with their language, they will transmit to their children. In proportion to their numbers, they will share with us the legislation. They will infuse into it their spirit, warp and bias its directions, and render a heterogeneous, incoherent and distracted mass.
>
> Thomas Jefferson, *Notes on Virginia*, 1785

> [P]arvenue à un degré de décomposition répugnant, l'Europe occidentale n'était plus en état de se sauver elle-même – pas davantage que ne l'avait été la Rome antique au V^{e} siècle de notre ère. L'arrivée massive de populations immigrées empreintes d'une culture traditionnelle encore marquée par les hiérarchies naturelles, la soumission de la femme et le respect dû aux anciens constituait une chance historique pour le réarmement moral et familial de l'Europe (...).
>
> Michel Houellebecq, *Soumission*, 2015

1 Introduction

The idea that immigration leads to the dilution of Western values and institutions is a recurring theme of right-wing nationalists, ranging from outright conspiracy theories of a *Great Replacement* to milder calls for the protection of the besieged native culture and its values.[1] Various versions of this argument have recently made their way into mainstream politics. The Hungarian Prime Minister Orbán expressed in a speech of 2018 that "We must state that we do not want to be diverse (...) We do not want our own color, traditions and national culture to be mixed with those of others." Just a few months later, United States President Trump reaffirmed this concern, saying that European leaders should "better watch themselves" because immigration was "changing the culture" of their societies.[2]

The public debate around migration and cultural change has focused heavily on the cultural dynamics triggered in the receiving countries. However, migration has important implications for the cultural dynamics in the source countries as well and has the potential to alter the cultural architecture worldwide. There is a large body of literature in sociology, political science, and history that analyzes the dynamics of cultural globalization (Norris & Inglehart, 2009). To cite only a few influential works, Pieterse et al. (2015) argue that globalization will lead to a new hybrid world culture, a "global mélange," invoking the notion of the "global village" *à la*

[1] In Western countries, proponents of the *Great Replacement* or *white genocide* argue that white Christian populations are being deliberately replaced through immigration. Both terms originally describe a supposed conspiracy to eliminate white Christian European culture through immigration. The term "white genocide" was popularized by a manifesto published in the United States in 1995, though it originated earlier in the politics of apartheid in Rhodesia and South Africa. The term "Grand Remplacement" was coined by French writer Renaud Camus in 2010 to describe the alleged substitution of native European populations by non-European immigrants. On March 15th 2019, a terrorist attacked two mosques in Christchurch, New Zealand, after publishing a manifesto titled *The Great Replacement*.

[2] Prime Minister Viktor Orbán's speech at the annual general meeting of the Association of Cities with County Rights, February 8th 2018, Veszprem and President Donald Trump at Chequers in Aylesbury, England, on July 13th 2018

McLuhan & Fiore (1968), while others understand cultural globalization as a form of cultural imperialism, characterized by the spread of American consumerism and the "Americanization" of global culture (Bishop, 1990; Kraidy, 2005; Tomlinson, 2012; Ritzer, 2012). Meanwhile, Huntington (1993) and Inglehart & Norris (2003) believe that in an interconnected world, cultural differences will become more salient and lead to global cultural polarization, referring to a "clash of civilizations."

In this paper, we look at the effect of migration on cultural dynamics from a global perspective.[3] The rationale for emphasizing migration is the following: if values and attitudes are embedded in people and therefore carried with and spread through them, then the international diffusion of culture should follow the international mobility of people.

We make a threefold contribution. First, we develop a theoretical model of migration-based cultural change that investigates how migration affects cultural proximity between home and host countries. To the best of our knowledge, this is first to integrate the main channels of migration-based cultural change into a unified theoretical framework, covering both static and dynamic components, including compositional changes in the host and home societies as well as several cultural diffusion mechanisms, such as assimilation, cultural dissemination from migrants to natives, and social remittances. The advantage of our theory-driven approach is that we are able to shed light on the complex mechanisms behind the reduced form empirical results. Indeed, we uncover non-trivial properties of bilateral cultural distance in the presence of migration and make distinctive predictions for each candidate mechanism. Second, using the World Value Survey, we develop three different time-varying bilateral cultural distance measures. These will serve as our outcome variables. And third, we test the predictions of our model for a large number of country pairs between the years 1981 and 2014. We show that migration is associated with an increase in cultural similarity between home and host countries over time (i.e., cultural convergence). We then look at the mechanisms behind such cultural convergence. Our evidence is inconsistent with cultural dissemination from the home to the host country as the main driver of convergence. Rather, we identify cultural remittances as the dominant force in this process, which puts into question the narrative of a Western culture under threat; if anything, this suggests that immigration can promote the diffusion of the host culture abroad. Our results are robust to using various cultural distance measures, to including bilateral as well as country-year fixed effects, and to controlling for important time-varying bilateral variables such as trade or income per capita differences.

The paper belongs to the recent empirical literature in cultural economics, to which it contributes through its focus on the time-varying dimensions of culture (rather than its persistence) and on "relative culture" (i.e., on cultural proximity to others, rather than on culture as an isolated set of preferences and beliefs). This literature emphasizes the deep-rooted determinants of culture (Ashraf & Galor, 2013; Alesina & Giuliano, 2015; Giuliano & Nunn, 2020; Bazzi et al., 2020; Galor & Savitskiy, 2018) and its implications for comparative economic development (Braudel, 1987; Landes, 1998; Guiso et al., 2006; Alesina & Fuchs-Schündeln, 2007; Aghion et al., 2010; Spolaore & Wacziarg, 2009, 2013; Desmet et al., 2017). Most related to our paper, various

[3]Similar to the rest of the economics literature briefly reviewed below, we use the term "culture" in a very broad sense, as a set of attitudes, preferences, beliefs and values that govern individual behavior and determine aggregate social, political and economic outcomes. For an overview of the economics of culture, see Alesina & Giuliano (2015).

contributions have analyzed the recent cultural dynamics within and across countries (Alesina et al., 2017; Desmet & Wacziarg, 2018; Bertrand & Kamenica, 2018; Falk et al., 2018).[4] So far, trade is the only dimension of globalization which has been analyzed from this perspective. Olivier et al. (2008) show in a theoretical model that goods market integration can lead countries to diverge culturally through a mechanism of "cultural specialization." Conversely, Maystre et al. (2014) show both theoretically and empirically that in a world with two cultural goods (one global, one local), opening up to trade will lead to both countries consuming more of the global good and less of the local good; they conclude that trade liberalization can also lead to cultural convergence. Considered jointly, these two papers bring to light the various (and sometimes opposing) mechanisms that may lead cultural convergence or divergence.

The rest of this paper is organized as follows: section 2 presents the evidence on the various channels of migration-based cultural change. Section 3 introduces a theory of migration-driven cultural change. In section 4, we document the data sources and elaborate on the meaning and statistical measurement of bilateral cultural similarity. Section 5 presents our baseline specification and results. Section 6 investigates the mechanisms behind our main findings and section 7 concludes.

2 Channels of migration-based cultural change

This section presents the main channels linking migration and cultural change that have been documented in the literature. We organize them according to their order of introduction in the theoretical model, starting with compositional/static channels and then turning to diffusion/dynamic mechanisms.

We start with the basic observation that migrants are not a random sample of their home country population; rather, they are self-selected along a number of dimensions such as age, gender, education, wealth or ethnic background. For example, it is well known that migrants tend to disproportionately come from the younger and more educated segments of the adult population. A less salient and yet fundamental dimension of self-selection into migration is the cultural dimension, i.e. *Cultural Selection*. In the political realm and following Hirschman (1970, 1978), who finds that migrants are typically positively selected in terms of their support for democracy, this is called the *exit effect*. A well-known historical example of such exit is that of the 48ers, these German political refugees who fled their home country for the US in the aftermath of the failed revolutions of 1848. The political consequences of their arrival are explored in Dippel & Heblich (2020), and those of their departure in Barsbai & Rapoport (2020). Examples of cultural selection on other dimensions include moral values (Casari et al., 2018), fertility (Livi-Bacci, 2012), risk attitudes (Jaeger et al., 2010), religiosity (Docquier et al., 2020), gender discrimination (Ruyssen & Salomone, 2018), or the individualism/collectivism divide (Knudsen, 2019). To the extent that emigrants opt for destinations that are culturally closer to them, emigration will tend to deepen cultural differences across countries; as such, cultural self-selection can be seen as a source of cultural divergence.

[4]For example, Falk et al. (2018) run their own survey on cultural values worldwide, emphasizing trust, reciprocity, risk aversion and altruism as main cultural dimensions. Their cross-sectional results show that within-country differences in culture are as large if not larger than between-country differences.

Second, migration also creates compositional changes in the destination country. As Collier (2013, p. 67) puts it, "Migrants bring not only the human capital generated in their own societies; they also bring the moral codes of their own societies." If immigrants are not a perfect cultural match to the host population but are somewhat representative of the cultural-mix of their home country population, we expect origin and destination countries to become culturally closer by mere *Cultural Mixing*. As such, cultural mixing can be seen as a source of cultural convergence. This is all the more relevant in the absence of assimilation, that is, if immigrants remain loyal to the home country culture. And indeed, there is evidence of intertemporal and intergenerational persistence of cultural traits such as the importance of family ties, women's labor force participation, fertility rates, preferences for redistribution, and more (Giuliano, 2007; Fernandez & Fogli, 2009; Luttmer & Singhal, 2011; Giavazzi et al., 2019). Additionally, Bazzi et al. (2019) show that the relative size of the immigrant v. native groups is an important determinant in maintaining or not ethnic attachments over time.

Third, immigrants may dilute the host country's culture through mere mixing, as we have seen, but also by disseminating their own preferences, norms, and values to the host population. We will call this channel *Cultural Dissemination*. If powerful, such dissemination can lead to cultural convergence between the host and home countries.[5] In spite of its prominence in the public debate, there is little well-identified empirical evidence of such dissemination. In sociology and cultural theory, the concept of cultural dissemination is incorporated within the idea of "hybrid culture," which stipulates that culture is non-static and that both natives and non-natives constantly interact and renegotiate the cultural order (Anthias, 2001; Papastergiadis, 2018). Evidence of cultural dissemination in the economics literature is scarce. A well-known example (but, arguably, limited in scope) is the adoption by New York-based UN diplomats from Western democracies of a relaxed attitude toward parking violations and fines while diplomats coming from countries with high levels of corruption hold on to their low standards (Fisman & Miguel, 2007). Giuliano & Tabellini (2020) show that the historic presence of European immigrants in the United States led to a more liberal political ideology and to stronger preferences for redistribution among US born individuals today. The authors hypothesize that this effect was driven by cultural diffusion from immigrants to natives, showing that the effect is strongest for counties with higher inter-group contact. Jarotschkin & Zhuravskaya (2019) exploit Stalin's ethnic deportations during WWII as a natural experiment. The pattern of deportation 'exogenously' exposed certain local populations of Siberia to deportees of either German or Chechen ethnic background. They find that such exposure and contact significantly altered those populations' attitudes, which diverged with respect to gender equality or women's labor force participation. Similarly, Schmitz & Weinhardt (2019) show that West Germans exposed to East German migrants after reunification adopted some of the latter's attitudes, again with respect to gender roles.

Fourth, we consider the *Cultural Assimilation* of migrants, i.e. their adoption of the host country culture. Assimilation has been observed in various contexts, especially in the United States in the late nineteenth and early twentieth centuries (Abramitzky et al., 2020), during the

[5]To the extent that "immigrants import with them 'bad' organizations, social models, and culture that led to poor economic conditions in the source countries in the first place," then the immigration surplus may be lower than what we think (Borjas, 2015). Borjas was commenting on *Exodus. How Migration is Changing Our World* by Paul Collier (2013).

'Age of Mass Migration.' Assimilation has often been inferred from the adoption of American-sounding names or from inter-marriage (Abramitzky et al., 2014; Fouka et al., 2020; Biavaschi et al., 2017; Saavedra, 2018), as well as from immigrants' adoption of local gender norms such as female labor force participation (Blau et al., 2011). Similar assimilation patterns have been observed for Muslims immigrants in the US and in Germany (Norris & Inglehart, 2012). Assimilation would mitigate the effects of both cultural mixing and cultural dissemination, as the diffusion of culture now takes place from natives to immigrants. In this sense, assimilation can be seen as a source of divergence.

Finally, migrants can affect cultural change by transferring host-country cultural values and norms back to their home communities. Migration has been widely described as a transformative experience for the migrants, an experience along which they are exposed to new cultural, social and institutional norms. Once absorbed, these norms can be transferred back home through family, social and community networks. To describe this process, sociologists have coined the term "social remittances" (Levitt, 1998; Levitt & Lamba-Nieves, 2011), which we relabel *Cultural Remittances* for this paper. Social remittances have been documented in the realm of political preferences (Spilimbergo, 2009; Batista & Vicente, 2011; Chauvet & Mercier, 2014; Barsbai et al., 2017; Tuccio et al., 2019), fertility (Fargues, 2007; Beine et al., 2013; Bertoli & Marchetta, 2015; Daudin et al., 2019) and beyond. For example, Fargues (2007) notes that high-emigration communities exhibit lower birthrates than otherwise similar communities in Morocco or Turkey while the opposite holds for Egypt; he conjectures that this may be due to the fact that preferences for family size are affected differently when a member of a household emigrated to a high fertility (Gulf) versus low fertility (West) destination country. Barsbai et al. (2017) show in the context of Moldova that the emigration wave that started in the aftermath of the Russian crisis of 1998 strongly affected electoral outcomes and political preferences in that country during the following decade, in opposite directions depending on whether people migrated to Russia or to Western democracies. In an experimental setting Batista & Vicente (2011) show that emigrants promote better institutions at home, particularly if they themselves live in countries with better governance. Most recently, Tian et al. (2020) use mobile phone data to uncover transmission of social distancing practices from Mexican immigrants in the US to their social contacts in Mexico. We note that emigrants typically remain part of the cultural narrative in the home country and are often portrayed as role models (Kandel & Massey, 2002). In any event, cultural remittances is an additional force of convergence to be considered; differently from the others (mixing and dissemination), convergence under cultural remittances results from the home country being pulled toward the host country culture.

3 A model of migration-based cultural change

Migration contributes to cultural change both in the origin and in the destination countries. We envisage a number of mechanisms, which we can broadly regroup in a compositional model of migration (migrants carry values and norms from the origin to the destination country) and various diffusion effects (intergroup exchange of values and norms). We start with the compositional effect of migration. We assume that there are two components to the migration decision: a cultural and an economic component. If the economic motive dominates, migrants

reflect the cultural mix of their origin country, which brings countries closer together. Conversely, if cultural homophily dominates, **cultural self-selection** into migration pulls countries apart.

In a second step, we introduce a dynamic component to cultural formation. The process of intergenerational transmission of cultural norms and values features diffusion across group boundaries. We use a framework inspired from Bisin & Verdier (2000) to consider diffusion of values from natives to migrants (**assimilation**), from migrants to natives (**dissemination**, for want of a better term), and from migrants to their origin community (**cultural remittances**).

3.1 A compositional model of migration and cultural change

We consider two countries A and B and (for simplicity) unidirectional migration from A (the home country) to B (the host country). The relative size of country B is n. Individuals in both countries can be characterized by their cultural type i or j. The share of type-i individuals in each country is given by q^A and q^B. To simplify the discussion, we may assume that type-i individuals are more frequent in country B, and scarcer in country A: $q^A < q^B$.

Migration has two effects on an individual's utility: a change in economic opportunities, and a change in the cultural environment. We assume that individuals from country A who contemplate migrating have heterogeneous expectations of economic gain (net of costs) of migration. Let g be the typical net (lifetime) economic gain of an individual when migrating. At the start of the stage game, g is distributed in the population according to a cumulative distribution function $\mathcal{G}$ with support on $\mathbb{R}$. Assuming quasi-linear preferences,[6] the pool of type-i country A nationals who wish to migrate is composed of anyone such that

$$\beta g + (1-\beta)(f(q^B) - f(q^A)) \geq 0, \tag{1}$$

with f the function by which cultural preferences are translated into utility units. We assume that individuals are *homophilic*, so that their utility increases in the share of same-type individuals in the country where they live: f is an increasing function. An individual would only emigrate to a foreign country where there are fewer people of the same cultural type if the economic gains can compensate him or her for it. And vice versa, individuals may be willing to incur an economic loss if their cultural benefits are high enough.

β characterizes the relative weight of the economic motive in the migration decision, and $1-\beta$ the weight of the cultural motive. If $\beta = 0$, only homophily matters in the decision to migrate: potential migrants are attracted by a higher share of same-type individuals in the destination country (*cultural self-selection*). In that case, only one type of individuals is likely to move. Conversely, if $\beta = 1$, only the expectation of economic gains counts in the decision to migrate. In that case, the pool of potential migrants is a culturally representative sample of the home country population (*cultural mixing*).[7]

[6] We use quasi-linear preferences for their analytical convenience and clarity of interpretation. This assumption is not crucial to the model's interpretation: in particular, the absence of a wealth effect is irrelevant here.

[7] To simplify the exposition, we assume that that expected economic gain and cultural types are not correlated. If they were correlated, we would have to envisage a situation where the majority-type has a greater overall incentive to migrate, despite a cultural reluctance to do so. Even then, our comparative statics would remain unaffected. With notations that we introduce later, the distinctive Predictions 2 and 3 of the various mechanisms would remain the same. Predictions 1 would be reversed. The paradox is interesting, but it is not supported by the data.

We model the migration process as follows. At the start of the period, individuals discover their net economic gain from migrating g. Condition (1) then defines the pool of potential migrants. In the pool of migrants, the share of type-i individuals is given by π. From this pool, one individual is randomly selected to migrate. Each individual who migrates changes the cultural composition of both countries. This updates the pool of potential migrants dynamically. Within each period, the cultural composition of the two country evolves according to dynamics which can be simply written:

$$\begin{cases} \dot{q}^A = q^A - \pi \\ n\dot{q}^B = \pi - q^B. \end{cases} \tag{2}$$

The game reaches its equilibrium when the pool of potential migrants is empty.

The cultural composition of the pool of migrants comes from Condition (1). To simplify the notations, let us introduce $\mathcal{G}_i \equiv \mathcal{G}((1-\beta)(f(q^A) - f(q^B))/\beta)$ the fraction of type-i individuals not interested in moving, and similarly $\mathcal{G}_j \equiv \mathcal{G}((1-\beta)(f(1-q^A) - f(1-q^B))/\beta)$. $1-\mathcal{G}_i$ (resp. $1-\mathcal{G}_j$) is the fraction of type-i (resp. type-j) individuals who wish to migrate. The equilibrium is characterized by $\mathcal{G}_i = \mathcal{G}_j = 1$.

At each successive draw of a new migrant, the probability that her type is i is

$$\pi = \frac{q^A(1-\mathcal{G}_i)}{q^A(1-\mathcal{G}_i) + (1-q^A)(1-\mathcal{G}_j)}. \tag{3}$$

Notice that if $\beta = 0$, $\mathcal{G}_i = 0$, $\mathcal{G}_j = 1$, and $\pi = 1$. As scarce-type individuals leave, the incentive to migrate becomes stronger for each remaining scarce-type individual, and weaker for abundant-type individuals, so that the pool of potential migrants remains the same. In equilibrium, country A keeps only other-type individuals, and the share of same-type individuals has increased in country B. The two countries diverge mechanically. Conversely, if $\beta = 1$, $\mathcal{G}_i = \mathcal{G}_j$, and $\pi = q^A$. The pool of potential migrants is a culturally representative sample of the home country population. q^B decreases as migrants start arriving. The two countries converge mechanically. Finally, if $\beta \in]0,1[$, $\mathcal{G}_i < \mathcal{G}_j$ and $\pi > q^A$. The scarce cultural type is over-represented in the migrant population.

This compositional model of migration (COM) is heavily tilted towards predicting that migration results in cultural divergence between countries, but it does leave some place for doubt. Thanks to Eq. (2), if we have even a little homophily (ie. $\beta < 1$), $\dot{q}^A < 0$: the scarce cultural type becomes progressively scarcer in the home country (thus, the home country moves away from the host country). In the host country, π may be larger or smaller than q^B. If cultural homophily is strong enough, $\pi > q^B$, and the relatively abundant type becomes progressively more abundant (thus, the host country also moves away from the home country). In that case, unambiguously, the model predicts that the two countries will diverge. Conversely, if cultural homophily is weaker, $\pi < q^B$, the relatively abundant types become scarcer. If cultural homophily is weak enough (ie. β high enough), we may even possibly find cultural convergence between countries A and B.

COM does predict, without ambiguity, that migration results in cultural divergence between the home population / country and the *native population* in the host country. We will incorporate assimilation of migrants in the host population, and dissemination of migrant values to both the

native host population and to the origin community, but let us first take stock of this mechanistic view of migration.

Prediction COM1

- Migration can both lead to cultural convergence (through cultural mixing) or divergence (if cultural self-selection is powerful enough) between home and host *countries*.
- Migration should lead to cultural divergence between home and host *populations*

COM may be combined with standard economic intuitions to make further predictions. Consider, for instance, a uniform increase in the economic gain of migration by a fixed amount Δg relative to the baseline. Again, to fix ideas, we assume $q^A < q^B$. A type-i individual wishes to emigrate iff $\beta(g + \Delta g) \geq (1 - \beta)(f(q^A) - f(q^B))$. The fraction of individuals not interested in emigrating is now given by $\mathcal{G}_i(q^A, q^B, \Delta g) = \mathcal{G}\left(-\Delta g + (1 - \beta)/\beta\left(f(q^A) - f(q^B)\right)\right)$ among type-i individuals and $\mathcal{G}_j(q^A, q^B, \Delta g) = \mathcal{G}\left(-\Delta g + (1 - \beta)/\beta\left(f(1 - q^A) - f(1 - q^B)\right)\right)$ among type-j ones. For a log-concave distribution function $\mathcal{G}$, the ratio $(1 - \mathcal{G}_j)/(1 - \mathcal{G}_i)$ increases with Δg, and π decreases. There are more candidates to migration of both cultural types but the cultural selection effect becomes less important relative to the economic motive. Therefore, the cultural mixing effect dominates.

Prediction COM2

- Uniformly higher economic gains from migration should result in stronger convergence, or weaker divergence.

Now, consider the magnitude of the convergence for culturally distant or near countries. If two countries are farther apart, corresponding to a lower (negative) value of $f(q^A) - f(q^B)$ and a higher (positive) value of $f(1 - q^A) - f(1 - q^B)$, $1 - \mathcal{G}_i$ is larger and $1 - \mathcal{G}_j$ smaller. The cultural selection effect is strengthened and we would expect stronger divergence or weaker cultural convergence (π increases). This paints the picture of cultural clusters of countries that converge inside the clusters and possibly grow farther apart between clusters.

Prediction COM3

- Cultural convergence should be stronger for relatively similar countries. Large cultural divides between countries should widen even further.

The compositional model offers the potential for various extensions and an even larger set of predictions.[8] For the purpose of this analysis, we stick to the most simple set-up of the model, where we focus on unilateral migration, and neglect—for now—any spillovers between locals and immigrants in the host society. Overall, Prediction COM1 captures the core implication of the model. Predictions COM2, and COM3 rely on comparative statics that essentially come down to the effect of cultural selection on the magnitude of convergence or divergence. Cultural selection increases with initial cultural distance, and decreases with a uniform (positive) shock to the economics gains of migration. In COM, cultural selection should increase the magnitude of divergence, or reduce the magnitude of convergence.

3.2 Cultural influence between groups

The model of cultural transmission proposed by Bisin & Verdier (2000) illustrates how different cultural types can coexist in equilibrium. Bisin and Verdier suggest that an individual would rather have a same-type offspring: this is another manifestation of their homophily. To that effect, they may invest in the socialization of their offspring, at a cost. A larger effort increases the chances of a successful socialization. If the effort fails, the offspring picks a role model at random in the population. In equilibrium, the effort decreases with the frequency of your own type. This yields a structural expression of the cultural equilibrium q^*.

With probability τ_i, a type-i individual successfully socializes her offspring as a type-i. With probability $1 - \tau_i$, her offspring chooses a role model from the relevant population. In that population, let us write the proportion of type-i individuals as χ. With socialization costs $H(\tau_i)$, the program of the type-i individual is

[8] In particular, we have based COM on the description of migrants drawn in succession before the process reaches its equilibrium. Each migrant contributes to changing the cultural composition at home and at destination. As the minority types select into migration, other minority types at home might join the pool of potential migrants, while majority types may drop out of it. To the extent that we can derive a dynamic argument from this mechanism, cultural selection into migration now would increase cultural selection into migration in the future (until the pool of potential migrants is possibly depleted): the cultural selection effect becomes more powerful as time grows. The simultaneous development of network effects, however, may also affect the gain of migration, and limits the pertinence of pushing too far the logic of the mechanism in that direction. There is another parameter of the model that we have not discussed yet. Eq. (2) suggests that social mixing is more powerful for a smaller destination country (small n). This looks intuitive: it reflects the relative importance of the immigrants in the cultural mix at destination. Unfortunately, this does not transform into a clear testable prediction on the effect on cultural distance. When cultural homophily dominates (β low enough for $\pi > q^B$), divergence will be stronger in smaller destination countries. When the economic incentive dominates ($\pi < q^B$), divergence is stifled, or convergence emphasized, for smaller destination countries. Strictly speaking, we need to distinguish between three situations: destination size dampens convergence when $\dot{q}^B < \dot{q}^A < 0$, emphasizes divergence when $\dot{q}^A < \dot{q}^B < 0$, and dampens divergence when $\dot{q}^A < 0 < \dot{q}^B$. In the data, we observe that migration is associated with cultural convergence. Per COM, this means that the most frequent situation would the first one. Both the first and the second situations imply a negative relationship between the size of the destination country and the effect of migration on cultural convergence. How to check this in the data? In a regression of cultural distance on migration (with country-pair fixed effects), a negative coefficient means that migration brings countries closer together. In that case, if we add migration×destination country size as a regressor, COM implies that its coefficient must be positive. Even if we admit this interpretation of the model, we still need to take into account a second difficulty: n may well be correlated with crucial parameters of the model, such as the economic gain of migration, the size of the migrant community in the destination country, etc.

$$\max_{\tau_i} (\tau_i + (1-\tau_i)\chi) V_{ii} + (1-\tau_i)(1-\chi)V_{ij} - H(\tau_i) \tag{4}$$

where V_{ii} is the benefit for the individual of her offspring being of the same type, and V_{ij} of the other type. Under homophily, $V_{ii} > V_{ij}$, and we introduce the notation $\Delta V_i = V_{ii} - V_{ij} > 0$. We also assume quadratic costs $H(\tau) = \tau^2/2$. The problem is adequately concave: a type-i individual provides effort $\tau_i = (1-\chi)\Delta V_i$, and a type-$j$ $\tau_j = \chi \Delta V_j$ (for the problem to be well-defined, we assume that $\Delta V_i < 1/(1-\chi)$ and $\Delta V_j < 1/\chi$). In the population under consideration, with a cultural mix generically denoted q, the cultural equilibrium q^* is reached when the flow of type-i offspring socialized as type-j is equal to the flow of type-j offspring socialized as type-i, ie.

$$g(q,\chi) \equiv \frac{q(1-\chi)(1-\tau_i(\chi))}{(1-q)\chi(1-\tau_j(\chi))} = 1 \tag{5}$$

where χ is a function of q and also of the cultural mix of any other group with influence over the socialization of the offspring. Bisin & Verdier (2000) propose a model of within-country cultural change. We extend their model to accommodate changing population boundaries, and in particular, migration in and out of a country. With two countries, we need to make assumptions on who influences whom. Contact seems to be a natural condition to pick a role model. It is likely to derive from living in the same country and also from sharing a common nationality. Role models are picked among neighbors, and as shown in the introduction, there is ample evidence that emigrants continue to play a role in cultural change at home. As a result, there are three principal mechanisms of cultural diffusion that we wish to consider: migrants disseminating norms and values to natives (DSM), migrants assimilating into native culture (ASM), and cultural remittances from migrants to their home community (REM). Intergenerational cultural formation is intrinsically dynamic in nature. Taken at face value, the Bisin & Verdier model of cultural formation occurs in the time-frame of successive generations. For a number of theoretical and empirical reasons (in particular, that generations overlap), we are agnostic as to the exact time-frame in which we should expect cultural formation to occur. Nevertheless, the dynamic nature of these three mechanisms matters empirically.

3.2.1 A model of cultural dissemination (DSM)

First, migrants may disseminate norms and values to the native population of the host country B. Keeping the notations from the compositional model, let us write q^B as the share of type-i individuals in the native population, and π the share in the migrant population. A native offspring picks a role model from within the native population with probability η^B, and from the migrants with probability $1-\eta^B$. Overall, the offspring chooses a type-i role model with probability $\chi(q^B, \pi, \eta^B) \equiv (1-\eta^B)\pi + \eta^B q^B$. The cultural equilibrium q^{B*} is characterized by the equation $g(q^{B*}, \chi(q^{B*}, \pi, \eta^B)) = 1$. With a slight shift of notation, and without ambiguity, we rewrite this condition as $g(q^{B*}, \pi, \eta^B) = 1$.

To determine the comparative statics of q^{B*}, we need to determine the sign of the partial derivatives of g. The computations are relatively cumbersome and do not bring any insight to the economic analysis: we relegate them to the appendix. We show that $\partial g/\partial q > 0$, $\partial g/\partial \pi < 0$,

and that $\partial g/\partial \eta$ has the same sign as $\pi - q$. Since g is continuously differentiable, we can apply the implicit function theorem. q^{B*} can be written as a function of π and η^B, and:

- $\partial q^{B*}/\partial \pi > 0$. If migrants reflect their home culture faithfully, their departure does not change the cultural composition at home. However, their arrival pulls on the native culture at destination, leading to cultural convergence between the two countries. Conversely, cultural self-selection into migration means a shrinking presence of the minority type at home (as in COM). If the migrants are so selected that the minority is overrepresented, even relative to the host population ($\pi > q^B$), it draws the native culture at destination further away. This suggests cultural divergence. Overall, this pattern reminds us of the predictions of COM.
- $\partial q^{B*}/\partial \eta^B$ has the same sign as $q^{B*} - \pi$. If migrants are assumed to be inspirational to natives, the culture of the host society is drawn towards the culture of the migrant group. If we interpret η^B as an inverse proxy for the magnitude of immigration into B, the larger the flow of immigrants, the stronger the effect on the destination culture.

Prediction DSM1

- Migration may lead to cultural convergence between home and host populations (cultural mixing with dissemination) or divergence (if cultural self-selection is powerful enough).

We combine DSM with standard economic intuitions to make further predictions. Since the thrust of DSM is that cultural selection is associated with divergence, its predictions are hard to distinguish from the predictions of COM. Contrary to COM, DSM does not preclude cultural convergence between host and home populations. Other predictions, however, are common to the two mechanisms.

Prediction DSM2

- Uniformly higher economic gains from migration should result in stronger convergence, or weaker divergence.

Prediction DSM3

- Cultural convergence should be stronger for relatively similar countries. Large cultural divides between countries should widen even further.

In the logic of the model, the home population converges back eventually to the same equilibrium cultural mix (except in the extreme case where all type-i individuals have emigrated). This feature distinguishes COM and DSM: if the effect of migration was purely compositional, the home country would be left with permanently fewer scarce types after emigration. Unfortunately, we only know the relative position of countries, and the comparative statics of DSM match those of COM. In our empirical analysis, we will generally analyze their predictions jointly.

3.2.2 A model of migrant assimilation (ASM)

Second, immigrants may adopt norms and values from natives. An immigrant offspring picks a role model from within the migrant community with probabilty η^m, and from the native population with probability $1 - \eta^m$. Overall, the offspring chooses a type-i role model with probability $\chi(\pi, q^B, \eta^m) = (1 - \eta^m)q^B + \eta^m\pi$. The cultural equilibrium π^* is characterized by the equation $g(\pi^*, q^B, \eta^m) = 1$.[9] As in the epidemiological model, we can write π^* as a function of q^B and η^m, and:

- $\partial\pi^*/\partial q^B > 0$. The intuition closely resembles that of DSM. Native culture contributes to cultural formation among migrants. Assimilation may thus increase the representation of the minority type among migrants (for $q^B > \pi$) or decrease it, when migrants are highly selected. For our purpose, this is not very insightful: self-selection into migration already ensures that the scarcer type at home is over-represented among migrants ($\pi > q^A$). If anything, ASM provides a second reason for this over-representation;
- $\partial\pi^*/\partial\eta^m$ has the same sign as $\pi^* - q^B$. If natives are assumed to be inspirational to migrants, they pull the cultural mix among migrants closer to destination: migrants are assimilated into native culture.

While ASM does not yield predictions that match or contradict the predictions of COM or DSM, it is the occasion of mentioning a modeling assumption that we have kept implicit until now. In the exposition of COM, DSM, and ASM, we have implicitly assumed that the decision to migrate was made without taking into consideration the socialization costs in either countries. Since taking them into consideration would reinforce self-selection into migration, and would not affect our comparative statics, we prefer to keep the exposition simpler.[10]

3.2.3 A model of cultural remittances (REM)

Third, we consider how migrants may 'remit' values and norms back to their home community. An offspring in the home community picks a role model from the home community with probability η^A, and from the emigrant populatino with probability $1 - \eta^A$. Overall, the offspring chooses a type-i role model with probability $\chi^A \equiv (1-\eta^A)\pi + \eta^A q^A$, and a type-$j$ role model with

[9] It may seem like we would characterize the full cultural equilibrium in the host country, with both assimilation and dissemination, by the joint conditions $g(q^{B*}, \pi^*, \eta^B) = 1$ and $g(\pi^*, q^{B*}, \eta^m) = 1$. We do not believe that our model is well-suited for that purpose. Indeed, initial differences across countries point to differences in homophily, as measured by ΔV_i and ΔV_j, between migrants and natives. Characterizing the full cultural equilibrium would also require a careful discussion of the intergenerational transmission of homophily. This goes beyond our purpose here.

[10] The optimal socialization effort of a type-i individual when i's offspring finds a type-i role model with probability χ is $\tau_i^*(\chi)$, as defined by Eq. (4). τ_i^* is a decreasing function. Since the same-type potential role models are more abundant in the destination country and in the migrant population (in other words, $q^B > q^A$ and $\pi > q^A$, the socialization cost of the scarce-type individual would be lower after migration. Conversely, the socialization cost of the abundant-type would be higher. Effectively, this is an indirect effect of homophily. It is less costly to socialize an offspring in an environment that resembles the parent. There are now three motivations to migrate: an economic gain, direct homophily, which favors cultural selection, and indirect homophily, whereby you want to socialize your offspring in the right environment. Direct and indirect homophily have complementary effects on the decision to migrate: endogenizing socializing costs in the decision to migrate would reinforce the mechanism exposed here.

probability $1 - \chi^A$. The cultural equilibrium q^{A*} is characterized by the equation $g(q^{A*}, \pi, \eta^A) = 1$. One more time, we can write q^{A*} as a function of π and η^A, and:

- $\partial q^{A*}/\partial \pi > 0$. The norms and values of of migrants affect cultural formation at home. In line with the intuition of COM and ASM, we expect the scarcer cultural type to be over-represented among migrants, and to remain so ($q^A < \pi$) whether they assimilate (ASM) or not. According to this new mechanism, the share of the relatively scarce type-i individuals would increase in the home country A. This pattern is opposed to the predictions of COM and DSM.
- $\partial q^{A*}/\partial \eta^A < 0$. If migrants are assumed to be inspirational to those who stayed, they pull the cultural mix at home closer to the cultural mix of the migrant group. The more inspirational they are, the stronger the effect in the home country. If we interpret η^A as an inverse proxy for the magnitude of emigration, the larger the flow of migrants, the stronger the effect on the home culture.

In line with COM and ASM, $q^A < \chi^A < \pi$: cultural formation at home is drawn in the direction of host country culture. In contrast with COM and DSM, REM predicts convergence between the home and host populations, even once we exclude the migrants from the cultural mix at destination. This is a first prediction of REM that distinguishes it starkly from COM and DSM.

Prediction REM1

- Migration should lead to cultural convergence between home and host *populations*.

Notice that this prediction is unconditional: we always expect convergence if transmission is indeed the dominant mechanism. Identically, we may combine REM with standard economic intuitions to make further predictions. Contrary to COM and DSM, the thrust of REM is that cultural selection helps cultural convergence. Here, stronger cultural homophily increases cultural self-selection into migration, π, which results is stronger diffusion of the cultural norms and values from the host country to the home country. We also expect this effect to increase with time. As a result, it yields predictions opposed to the ones mentioned above.

Prediction REM2

- Uniformly higher economic gains from migration should result in stronger divergence, or weaker convergence.

In REM, cultural selection into migration acts as a magnifying force of convergence between countries, instead of divergence, as was suggested by COM or DSM. In contrast with the image of cultural clusters that they paint, REM suggests that convergence is stronger between countries further apart. This paints a different picture that COM and DSM: not that of cultural clusters of countries, but of universal cultural convergence.

Prediction REM3

- Cultural convergence should be stronger for dissimilar countries. Relatively similar countries also converge but at a lower rate.

Finally, we believe that all of the mechanisms (COM, DSM, ASM, and REM) are at play. We expect that they unravel at different speeds in the data. While the compositional model hints at more short term effects of migration, the transmission mechanisms may reflect how the cultural technology of migration materializes in the longer term. In the very short run, selection into migration may push the home country away from the cultural mix at destination, but that effect is soon overrun by cultural remittances from successful migrants. We may not be able to see the cultural equilibrium described by REM in the relatively short span of our data; what we do capture is the dynamics toward the equilibrium. The influence of emigrants compounds the effect over time, pulling the home country closer to destination.

As hinted upon previously, we do not consider these four mechanisms as separate models but rather as a system of incentives and dynamics that unravel at the same time (although not necessarily in the same time frame). The empirical analysis will serve as a way to inspect which of the mechanisms dominates. Since the predictions of REM vs. COM and DSM are diametrically opposed (see Table 1), we have the possibility to discriminate between them through our empirical analysis.

Table 1: Comparison of Empirical Predictions

	Composition	**Dissemination**	**Cult. Remittances**
Between populations	Divergence (COM1)		Convergence (REM1)
Economic gains	++ (COM2)[1]	++ (DSM2)	−− (REM2)
Cultural distance	−− (COM3)	−− (DSM3)	++ (REM3)

[1] By ++ we mean that the row element should be associated positively with more cultural convergence, or less divergence, and −− negatively.

4 Data and the measurement of cultural similarity

This section describes the main data sources and focuses on the measurement of our main dependent variable, bilateral cultural similarity. In particular, we outline the reasoning behind the selection of questions, statistical distance (or similarity) measures and explain how we apply them to the cultural space. We do not have strict priors about the importance of different cultural

dimensions, and we have no a priori preference for one statistical measure over others. Rather, we take a data-driven approach that ensures consistency and comparability across country pairs over time and choose a broad set of statistical measures to establish the robustness of our estimates.

4.1 Data on migration, trade and GDP

Migration data comes from the joint OECD and World Bank's Extended Bilateral Migration Database (Özden et al., 2011), which covers bilateral migrant stocks for each decade between 1960 and 2010.[11] Since we do not have data on migrant flows, changes in the migrant stock over time have to be interpreted as net migration. If from one year to the next there is the same amount of migrants returning to their home country and new migrants entering the destination country, we would not be able to observe this in the data. Therefore, the change in the migrant stock will likely underestimate the back and forth migration between two countries and the cultural diffusion associated with it.

In addition, we make use of data from Brücker et al. (2013) [thereafter, IAB] who collected data on migration into 20 OECD countries by gender, country of origin and educational level, for the years 1980-2010 in 5 years intervals. The authors distinguish between three levels of skill in their data: lower secondary, primary and no schooling (low skilled), high-school leaving certificate or equivalent (medium skilled) and higher than high-school leaving certificate or equivalent (high skilled). We will make use of heterogeneity of skills across migrants to shed light on the mechanisms behind the effects of migration on cultural change.

Our main time-varying bilateral control variables include bilateral trade and bilateral GDP differences. The United Nations ComTrade Database provides yearly bilateral trade flows around the globe, which we average over the time periods corresponding to the World Value Survey waves. We benefit from the efforts of the Center for International Data (CID), an organization within the Department of Economics at UC Davis that collects, enhances, creates, and disseminates international economic data, from which we draw harmonized yearly bilateral trade matrices for thousands of country pairs. Data on GDP per capita are taken from the World Bank and used to calculate a bilateral measure of economic distance. Summary statistics for all bilateral measures are presented in Table 2. We do not use country specific time-varying control variables or any bilateral control variables since we will successively introduce fixed effects that will capture these controls (as well as unobserved heterogeneity). Our variables of interest, i.e. migration, trade and GDP gap enter the regression in logs but are presented as volumes in Table 2[12].

4.2 Data on values, norms and preferences

We make use of one of the main sources for values, norms and preferences across the globe: the World Value Survey [WVS], which consists of nationally representative surveys among 400,000 respondents in 6 waves between 1981 and 2014 includes questions on political beliefs, family values, religiosity, attitudes, and other dimensions of culture in a repeated cross-section of almost

[11] `https://finances.worldbank.org/Other/Bilateral-Migration-In-2010/hc8y-24bu` for the 2010 data.

[12] The list of countries that we use in our main empirical specification as well as their availability are presented in Appendix Tables A1 and A2

100 countries. Additionally, we draw from questions of the European Social Survey [ESS], which is also a cross-national representative survey on attitudes, beliefs and behavior patterns of diverse populations conducted every two years since 2001 in more than thirty countries of the European Union and some of its neighbors. Some questions being identical in the WVS and the ESS, we can combine the databases in later years. For instance, the question on generalized trust is available in both WVS and ESS: in that instance we can increase the number country pairs for which we have bilateral cultural similarity indexes from about 6,700 to over 7,800. In order to match the bilateral migration data with the WVS waves, we interpolate bilateral migration in five-year increments, assuming a linear growth rate. As the WVS are carried out over the course of 3 to 5 years for each wave, we use the stock of bilateral migrants before the roll out of the next WVS wave, creating a lag of up to five years.

4.3 Selection of questions

There is a vast number of cultural dimensions along which countries can be differentiated from each other, including family values, generalized trust, religiosity, or political or economic ideologies. Maystre et al. (2014), Desmet et al. (2017), and De Santis et al. (2016) include a vast set of questions with highly imbalanced coverage in terms of WVS waves or set of countries. This paper is concerned with the dynamic process behind the formation of attitudes, norms, and values over time with a particular focus on migration as a main driver in the cultural approximation between countries. This makes a consistent measure over time more important than in other studies. Naturally, this requirement will limit the scope of questions that we can include in our cultural distance measure. For our purpose, we include the cultural dimensions of the WVS that are available in at least the 4 waves between 1994 and 2014 (most of them cover all 6 waves; selected questions are listed in Table 3). In doing so, we avoid compositional effects that can come either from the selection of questions or from countries missing in a given wave.

The selection of cultural dimensions used for our analysis is purely driven by our coverage criterion (i.e., coverage for as many country pairs over the longest span of time) and presented in Table 3. We have no prior on which norms and values are most important for the migration decision and which values are more or less easy to assimilate to, diffuse or transmit. Nevertheless, all of the cultural dimensions we use for this analysis, such as the importance of religion, trust in other people, or women's ability to acquire education, are quite fundamental in their implications for everyday life.

4.4 A global cultural map

For the purpose of illustrating the 'global cultural map,' we turn to a question in the WVS that closely relates to the concept of intergenerational cultural transmission used in our theoretical framework. The third wave of the WVS asked what the most important value is that individuals would like to pass on to their children, choosing between thrift, obedience, determination, or religious faith. Figure 1 shows that in both Germany and Japan, an overwhelming majority of the population declares they want to pass on thrift and determination to their children, while a large share of Spanish people declares they want their children to be obedient. This is a reminder against stereotypical geographical categorizations of cultural preferences. The same question

has been extended to account for multiple responses starting with wave 3, where respondents can choose five out of eleven possibilities (listed in Table 3).

In Figure 2, we conduct a principal components of answers to this question to analyze the cultural proximity of countries. We identify two dimensions (linear combinations of the average shares of respondents choosing one of the eleven options in the most recent WVS waves of 2010 to 2014) to draw a map of cultural proximity across countries. Unsurprisingly, Northern European countries, such as Sweden, the Netherlands, and Germany, seem to share common educational values. So do several Middle Eastern countries: Kuwait, Iraq, Qatar, Libya, Palestine, and Egypt. However, we can also identify country pairs (such as Poland and Uruguay or South Korea and Azerbaijan) which (based on economic or geographic proximity) we would not have expected to strongly overlap on their attitudes towards values transmitted to children.

In Figure 3, we repeat the exercise with the WVS respondents' priorities in life. Respondents can rate the importance of family, friends, leisure, work, politics or religion in the life of respondents. There are some overlaps in the cultural proximity between countries for values transmitted to children and priorities in life, but there remains substantial heterogeneity between the two questions.

To account for the multidimensional dimension of culture, and for the varied motivations of emigrants to migrate, we construct an 'agnostic' measure that incorporates all the dimensions of culture available for the whole set of countries and waves, including values that migrants want to pass on to their children, priorities in life, generalized trust, preferences for gender equality, and control over one's life.

4.5 Statistical distance measures

The appropriate choice and careful interpretation of statistical distance measures is central to the empirical analysis of cultural convergence. In this section, we introduce different examples of distance and entropy measures that we will use to compare national distributions of cultural values (which we will call P and Q in the following). With regards to statistical inference, different statistical measures highlight certain aspects of the underlying distributions and let us draw different conclusions about their properties (see Table 4 for a complete list of statistical distance measures discussed in this section).

We mainly mobilize three distance measures: Euclidean, Canberra, and a measure of overlap. The most well-known group of distance measures are derivatives of the Minkowski norms, which is written as $M_p = (\sum_{i=1}^{d} |P_i - Q_i|^p)^{1/p}$. The Canberra, the Euclidean, and the Chebyshev distances correspond respectively to M_0, M_2, and M_∞. How to interpret these three distances, when applied to cultural differences? A thorough discussion of the different distance / entropy / divergence measures can be found in Cha (2007). For now, it is sufficient to have a few intuitions in mind. With M_2, we get one of the most commonly used distance measures: the Euclidean norm, also known as the Pythagorean metric or geometric distance. It is based on the idea that the shortest distance between two points is a straight line. In this specific case, the Euclidean distance would capture the square root of the sum of squared differences in responses between two countries across multiple dimensions. For intuitions on edge cases with M_0 for the Canberra norm and M_∞ for the Chebyshev, we can consider two almost identical countries that differ significantly along one cultural dimension. These countries will be characterized as far apart by

the Chebyshev distance, but very similar by the Canberra norm. Conversely, two countries which differ a bit according to every dimension will be characterized as further apart by the Canberra norm than by the Chebyshev distance. We refer to the Euclidean distance measure because it is one of the most frequently used distance measures, and we also include the Canberra measure because it dampens the influence of outliers in the results. We also consider statistical measures of *overlap*, also known as *inner product*. Measures of overlap give an idea about the number of matches in two distributions. In the context of cultural values, this measure would capture the idea that two people, one in country A and the other in country B, picked at random would give the same answer to a question in the WVS.

In Figure 4 and 5, we present the relationship between the Euclidean Distance and the Herfindahl Index, which is one form of the overlap measures. Both measures are standardized to normal ($\mu = 0$ and $\sigma = 1$) and use questions on priorities in life and desired qualities of character for children. Pearson's correlation is highly significant at the 1% level but only lies at 0.45 and 0.20 for priorities and child qualities respectively. The two measures capture two different aspects of cultural distance: the inverse of the Euclidean distance tells us how close on average the responses to a question in the WVS was, whereas the Herfindahl index tells us how probable it is that the same response to a question was given. Although these two interpretations may overlap in some cases, the analysis of very similar and dissimilar country pairs reveals some differences. For example, whereas the Euclidean measure ranks the United States and South Africa as the most similar in choice of child qualities and China and Argentina as the most dissimilar, the Herfindahl Index identifies Germany and Switzerland as the most similar country pair and Great Britain and Poland as the most dissimilar one.

It is important to note that these distance measures are by construction symmetric. The distance from point A to point B is the same as the distance from point B to point A. Similarly, the overlap between the distribution A and the distribution B is the same as the overlap between distribution B and distribution A. This creates a difficulty for our empirical analysis: our model characterizes cultural change at home and at destination, but we can only measure relative cultural change (ie. changes in the cultural distance between countries A and B). This is why our analysis relies on the distinctive theoretical predictions of each mechanism to infer the source of the convergence.

4.6 Application to the cultural space

We illustrate the construction of the cultural proximity measure with the help of the following example: the Euclidean distance along the cultural dimension of *Values desired to inherit to Children*. Respondents of the WVS can choose to pick 5 out of 11 possible character traits that they would like to pass on to their children (see Table 3 for a complete list of character traits) which yields a set of 11 binary responses (0 or 1) to each characteristic listed. For two randomly picked individuals, the response matrix would look like this:

$$\mathbf{I1} : 0\,0\,1\,1\,0\,1\,0\,1\,1\,0\,0$$
$$\mathbf{I2} : 1\,0\,1\,1\,0\,0\,0\,1\,1\,0\,1$$

For each wave, we consider the vector of the shares of people who have picked each charac-

teristic in a country in the Euclidean space with eleven dimensions. To characterize the distance between two countries, we consider the (Euclidean, Canberra, Herfindahl) distance between their respective vectors. Within each wave, we normalize the distribution and multiply it by -1 in order to get a measure of cultural similarity rather than of distance. Notice that because of the normalization, dissimilar countries will be characterized by a negative measure of similarity, and similar countries by a positive one. Normalization also allows to compare the distance between two countries according to various cultural dimensions: we need to correct for the dimensionality of the corresponding sub-spaces. We present the distribution of all three measures in Figure 6 (summary statistics on the Cultural Similarity Indexes are also presented in Table 2).

We are agnostic towards the choice of the best distance measure, but we do emphasize that the choice of a single statistical distance measure is associated with a choice in statistical inference that needs to be carefully interpreted. Our empirical analysis will make use of three different distance measures (Euclidean, Herfindahl, Canberra) to highlight various forms of cultural convergence or divergence. In addition, several questions have ordinal, rather than binary responses. None of the distances we consider suggests an easy way to treat such answers. In particular, how far apart do we believe people who answered *very important* are from others who answered *important*, vs. people who answered *not very important* from others who answered *not important at all*? To address that issue, we choose to consider people who pick any different answers as equally dissimilar from each other. Any other approach would require equally strong assumptions on the relative distances between answers. In doing so we follow the economic literature in quantitatively measuring cultural distance based on on qualitative information (Desmet et al., 2017; De Santis et al., 2016).

Figure 7 documents the distribution of the Cultural Similarity Index [CSI], measured as the Euclidean distance, for 21 countries over the course of 20 years. In these countries the WVS question on "Priorities in Life" was asked in all waves between 1995 and 2010, which ensures that our comparison is consistent over time. A first glance at the distribution of the CSI reveals a tightening over time. Negative values represent culturally distant country pairs, positive values represent culturally close countries. The distribution of the CSI tightens for values larger zero, indicating that more countries become more similar and that there does not seem to be a polarization over time (e.g. a lot of very similar and many very dissimilar country pairs). All of this is a first hint towards a convergence of values across countries. In our empirical analysis, we explore migration as a factor of this convergence.

5 Empirical analysis

We are interested in the effect of bilateral migration on the change in cultural proximity over time. In the first step of our empirical analysis, we show that migration increases cultural proximity between sending and receiving countries. In a second step, we investigate the mechanisms through which migration leads to cultural convergence. Before we present the results, we discuss our baseline specification and some identification issues.

5.1 Empirical specification

In our baseline specification we follow Egger (2000) in including sending country-time and receiving country-time fixed effects [FE] to account for time specific shocks (economic, political, environmental etc.) to sending and receiving countries. We also include bilateral FE to control for time-invariant characteristics of country pairs, accounting for standard gravity controls (contiguity, geographical distance etc.). This way, we track changes within country pairs over time. The equation writes as follows:

$$CS_{ijt} = \beta_0 + \beta_1 Mig_{ij,t-\Delta} + \beta_2 X'_{ij,t-\Delta} + \theta_{ij} + \theta_{it} + \theta_{jt} + \varepsilon_{ijt}$$

CS_{ijt} is the bilateral cultural similarity between countries i and j over time. Our main coefficient of interest is β_1. Both migration $Mig_{ij,t-\Delta}$ and the vector of time-varying control variables (including bilateral trade flows and GDP per capita differences) $X'_{ij,t-\Delta}$ are lagged. As explained above, when the WVS wave starts in the middle of the decade, we use bilateral migration and trade data from the previous point in time for which we have an observation. For instance, if the WVS wave starts in 1994, we take data from 1990 with a $\Delta = 1$ lag; for $\Delta = 2$ we use data from 1985 etc.

As mentioned in the previous section, migration is measured in stocks whereas trade is measured in flows. Consequently, in the specification with the full set of fixed effects the variation for migration comes from the change in the bilateral stock of migrants (or net migration) and variation for trade comes from a change in the flow of goods between countries. A 1% increase in the bilateral stock of migrants will affect cultural proximity by β_1. Similarly, a 1% increase in the flow of goods will impact cultural proximity by β_2 with the dependent variable standardized to a mean of zero and the standard deviation set to one.

The dependent variable, cultural similarity, is by construction symmetric for both the sending and receiving countries. The main explanatory variable, migration, is an asymmetric measure that captures the number of migrants from j living in i. Consequently, in our data set each country pair is going to appear twice, where i and j switch roles as receiving or sending country. In other words, cultural similarity between Mexico and the US is going to be the same for a specific year but we will observe Mexican migrants in the US and American migrants in Mexico separately. This is how we are able to closely relate our empirical analysis to our theoretical model. Since we want to know how *immigrants* affect cultural similarity through the proposed mechanisms, we rely on immigrant stocks rather than aggregate migration flows or any other symmetric measure of migration.

We show the raw conditional correlation between migration and cultural similarity first, then we include fixed effects in our OLS regression. For the baseline regressions we use the aggregate measures of cultural similarity, later differentiating between various cultural dimensions. In a next step, we construct two balanced panels of different time frames and country coverage (24 countries in 3 waves; 12 countries in 4 waves) to rule out that the overall effect is driven by sample selection[13]. The coefficient β_1 is the net overall effect of all five mechanisms.

[13]The imputation methodology for the bilateral migration data set changes between 2000 and 2010, leaving us with more missing values and zeros for the 2010 migration data set (see Özden et al. (2011) for an overview on the

5.2 A discussion of identification

Typically, studies about the impact of migration on any outcome are concerned with endogeneity. Classic examples range from the effect of migration on economic prosperity (Felbermayr et al., 2010; Andersen & Dalgaard, 2011; Bellini et al., 2013; Ortega & Peri, 2014; Alesina et al., 2016), wages (De Silva et al., 2010; Card & Peri, 2016; Borjas, 2017), or social capital (Luttmer & Singhal, 2011; Dahlberg et al., 2012; Algan et al., 2016). The concern is that regions with different economic or social characteristics will attract more or less migrants: migrants will move to richer countries rather than migrants making countries richer. Conceptually this is an argument the endogenous determination of the *size* of migration depending on destination country characteristics. Many of the macro-level analyses then rely on 'shift-share,' or 'Bartik' instruments, to predict the exogenous share of migration with prior migrant networks at destination, despite their limits (Jaeger et al., 2018; Goldsmith-Pinkham et al., 2020).

These types of instruments are not suitable for our context. We are not so much concerned about the *size* of migration, since neither empirically nor theoretically this would tell us anything about its effects on cultural convergence or divergence. All of the described mechanisms (cultural selection, cultural mixing, dissemination, assimilation, cultural remittances) would only be attenuated by the size of migration. What matters in our context is the cultural *composition* of the migrant pool and its implications for the cultural dynamics at origin and destination. In other words, the size of the migrant stock is more relevant to the magnitude of the coefficient; the composition of the migrant stock determines the sign of the coefficient. Exogenously predicting the *size* of migration would therefore not yield any insights on the dominant mechanisms. It would be interesting to exogenously predict the time-varying cultural *composition* of the migrant pool and see whether the size and/or sign of the coefficient changes when we look at a fully selected migrant pool or a culturally representative migrant pool. Since we are not able to observe the actual cultural composition, we cannot fall back on an IV strategy. Instead, we have to rely on comparative statics and sub-sample analyses to predict how a presumably more or less culturally selected migrant pool will affect cultural similarity over time.

Additionally, our baseline specification lags bilateral migration by 5-years. This is primarily to let both static and dynamic components of migration-based cultural change to unfold. However, this also implies that we partially mitigate reverse causality concerns. We argue that contemporaneous cultural similarity plays a larger role in the decision to migrate than future similarity (which would have to be predicted 5-years in advance). We use different time lags to show the sensitivity of our results to contexts where reverse causality is more or less likely.

Finally, we are concerned about omitted variables bias. For instance, deeply rooted cultural similarity or conditions at destination or at origin may drive migration and cultural change simultaneously. To address this, in our baseline specification we exploit within-country pair variation over time, which means that fundamental cultural similarities between sending and receiving countries are captured in the bilateral fixed-effects. This includes common or similar language, ethnicity, religious majorities, and deep-rooted determinants of culture, such as geography or genetic diversity (Ashraf & Galor, 2013; Alesina & Giuliano, 2015; Giuliano & Nunn, 2020;

methodology). We therefore repeat the analysis, dropping all country pairs for which we observe zeros in 2010 from the analysis. For the whole observation period, this reduces our sample by about 300 observations. The results hold with this modified sample. Results are presented in Appendix Table A4

Galor & Savitskiy, 2018). These fundamentals of cultural similarity are typically also the ones that drive individual migration decisions (Mayda, 2010; Belot & Ederveen, 2012). Additionally, we capture general trends at destination or origin with the country-time fixed effects. Consequently, a generally more migration hostile or inviting cultural environment at destination or other overall changes would be captured as well. Still, there may be a concern that time-variant cultural dimensions that are country-pair specific could drive migration. In our estimations, we include bilateral trade and GDP differences to at least partially control for bilateral time-varying factors that simultaneously determine migration and cultural similarity.

5.3 Convergence or divergence?

The first aim of the paper is to estimate the net effect of migration on cultural proximity (convergence or divergence). For this we will proceed with a reduced form analysis, using various sets of fixed effects, different sample compositions, and three different distance measures.

5.3.1 Baseline results

Table 5 presents the main results for the full sample. The results are presented for the Euclidean, the Herfindahl, and the Canberra measure of cultural similarity aggregated over all cultural dimensions, including values parents want to transfer to their children, priorities in life, attitudes toward gender equality, generalized trust, and freedom of choice. Column 1 presents the raw correlation between lagged bilateral migration and cultural similarity. We then successively introduce different types of FE. In Column 2 we control for time-varying characteristics of the host and home country in defining cultural similarity. This is particularly important if we want to control for unilateral changes and cultural shifts in the respective countries that are not related to migration. This set of fixed effects also 'anchors' the countries position in the overall cultural space, as it captures the aggregate of their respective distances to all other countries. In Column 3, we introduce bilateral FE, and the full set of FE in Column 4. Finally, in Column 5, we introduce time-varying bilateral control variables, including bilateral trade flows and the GDP per capita difference between the origin and destination country. We take column 5 as our preferred specification.

We find a consistent positive association between changes in bilateral migration at time $t-1$ and changes in cultural similarity at time t. This is true unconditionally, and it is also robust to including various sets of fixed-effects, to using various measures of cultural proximity, and to controlling for potentially important confounders, namely, bilateral trade and income differences. When we control for time-varying characteristics of the two countries, the variation explained by our model increases substantially, as expected. Bilateral FE reduce the magnitude of the correlation and the power of the estimation, capturing (and ridding us of) time-invariant determinants of both migration and cultural shifts.[14] With the full set of FE, the magnitude of

[14]We attribute the negative sign for the Herfindahl index in Column 3 to the fact that we do not account for overall cultural shifts at origin and destination countries at time t. The Herfindahl index measures the overlap between two populations (the likelihood that two people picked at random respond in the same way) and is therefore more sensitive to overall shifts in the respective cultural compositions of the countries at hand than the other measures we use.

the correlation is reduced, but the precision of our estimation is improved. Finally, the inclusion of our controls does not change our results substantially.

In our preferred specifications we include trade (in addition to income differences) as a control variable, situating our results in the literature on trade and cultural convergence. Maystre et al. (2014) find a positive association of trade on cultural similarity. In Appendix Table A3, we include trade in the estimation from the beginning successively introducing different fixed effects. In our most demanding specification in column 5, the effect of bilateral trade on cultural convergence disappears. Maystre et al. (2014) only use data from the 2nd and 4th wave of the WVS, selecting a set of 30 questions and building an index of fractionalization, akin to the Herfindahl Index. They do not include country-time FE and differentiate between different types of trade, which may explain the differing results. Exploiting a larger sample, including all waves of the WVS, using several distance measures as well as adding income differences and migration as additional controls, the coefficient of trade vanishes.

How should we interpret the magnitude of the effect? Focusing on the specification with the full set of FE and on the Euclidean distance, we estimate that a 10% increase in migration is associated with an increase in cultural similarity of 0.2, i.e. one fifth of a standard deviation in the following period. An increase in migration from Italy to the United States by 10% would make the United States and Italy as similar as the United States and the United Kingdom. Similarly, in order for Mexico and the United States to become as similar as the United States and Canada, the United States would have to experience an eight-fold increase in migration from Mexico.[15] This average treatment effect, of course, masks substantial heterogeneity across country pairs.

5.3.2 Balanced panel

In order to rule out concerns about results being potentially driven by changes in the WVS sample over time, we construct a balanced panel. The sample will help reduce the noise due to unit heterogeneity. For instance, there may be endogenous reasons for which countries have not participated in different rounds of the WVS, or there are systematic differences in lags in observations that are correlated with cultural proximity. We can alleviate these concerns by picking the three WVS waves with the highest country coverage (wave 3 with 53 countries, wave 5 with 58, and wave 6 with 59). The largest 3-wave balanced panel we can construct is composed of 24 countries over the third (1995-1998), fifth (2005-2009) and sixth (2010-2014) waves of the WVS.

The results of the balanced panel regressions are presented in Table 6. We present our preferred baseline specification with the full set of fixed effects and time-varying controls. The magnitude of the effect is much larger than the one we find for the unbalanced panel, suggesting that compositional effects introduce a downward bias, underestimating the role of migration in cultural convergence. Additionally, the magnitude of the coefficient for the Canberra measure is more than six times higher and is now statistically significant at the 5% level. Overall, the standard errors between the unbalanced and balanced panel remain relatively stable while the magnitude of the effect increases, delivering higher statistical significance overall.

[15]This is taken from the Euclidean distance measured in 2005, where the CS between the US and Italy is 1.2, between the US and the UK 1.4, between the US and Canada 1.76, and between the US and Mexico 0.05

6 Mechanisms

The results above show that migration is associated with cultural convergence between countries. As already mentioned, this is consistent with both the cultural mixing effect at destination (COM), with or without dissemination (DSM), and with cultural remittances (REM). In this section, we discriminate between these mechanisms based on the distinctive predictions of the theoretical model.

6.1 Static or dynamic convergence?

We start with a general look at the timing of convergence relative to migration, as a way to discriminate between static and dynamic drivers. Compositional effects (self-selection and cultural mixing), should be immediate, happening at the time of migration. Diffusion effects (dissemination, assimilation, and cultural remittances) should magnify over time (up to some point). We then examine COM1 vs. REM1 directly, excluding migrants from the population of the destination country.

6.1.1 Timing of migration

In Table 7, we report the results of the main specification with different lags for the migration variables. Above, we had envisaged a five-year lag. The reasoning behind the five-year lag of migration was to let both compositional and diffusion mechanisms unfold. Using instantaneous migration or migration with a longer lag would dilute either the static or the dynamic effects, which compels us to use an intermediate lag for both of these mechanisms to be captured in out estimates[16]. In columns one to three of Table 7, we consider a ten-year lag, and in columns four to six, we include instantaneous migration (e.g., migration is measured at the same point in time t as our dependent variable). All of the specifications include bilateral control variables with the corresponding lag.

We find that with a longer lag, the effect of migration on cultural similarity remains positive and strongly significant. With contemporaneous migration, the coefficient for migration remains positive but loses statistical significance. Overall, we conclude that the effect of migration magnifies as time passes. COM cannot explain these results, though they are still consistent with both cultural remittances (REM1) and dissemination (DSM1). What we gain from this first test, however, is that convergence is likely driven by the dynamic rather than the compositional elements of migration-based cultural change.

6.1.2 Excluding immigrants

As we have established in the baseline regression, we find that migration is associated with bilateral cultural convergence. COM suggests that the driving force behind cultural convergence should be should be cultural mixing (i.e., more immigrants in the destination country mechanically making home and host countries more similar). Table 7 showed first evidence that

[16]Note that bilateral migration is interpolated between decades so that for instantaneous migration WVS waves may not exactly correspond to the year of interpolation.

compositional effects are likely to not play a major role. Excluding migrants from the host population, however, should allow us to move further from the cultural mixing effect. COM, reduced to self-selection into migration, predicts divergence (COM1). REM1 predicts convergence, while DSM1 remains indeterminate.

In Table 8, we report the results of our main specification on the two waves of the WVS for which we have information about the birthplace of respondents. For 10 countries in wave 2 and 46 countries in wave 3, we can infer the migratory status of respondents. About 5.5% of respondents are born in a different country. We replicate our analysis for this subset of countries excluding the foreign-born from the construction of the aggregate Euclidean distance (the results hold for the Herfindahl and Canberra measure of cultural distance). As in Table 5, we successively introduce fixed effects and time varying controls.

We find that excluding the foreign-born from the analysis does not alter our baseline results. The use of information on respondents' birthplace cuts our sample substantially. The magnitude of our estimates remains virtually identical, but with only 9 countries covered in both waves with information on the country of origin of the respondent, the results lose significance when adding country pairs fixed effects (and the R^2 is close to one). To the extent that we can interpret this result, it supports Prediction REM1 against COM1.

6.2 Economic vs. cultural gains from migration

In the previous section, we have established that compositional effects are not a likely driver of migration-based cultural convergence. In this section we look more closely at predictions 2 and 3 (specifically DSM2 and DSM3 versus REM2 and REM3) which are the mirror image one of the other and address the economic versus cultural gains from migration. The combination of cultural and economic gains from migration gives us insight into the cultural selection of the migrant pool.

In our theoretical model, we have shown that relatively larger economic gains from migration are associated with a less culturally selected migrant pool. Cultural distance between sending and receiving countries is associated with a more selected migrant pool (as cultural gains from migration increase with cultural distance). DSM2/DSM3 and REM2/REM3 yield opposite predictions as to how the cultural selection of the migrant pool will affect cultural convergence. This allows us to distinguish between the two mechanisms empirically. The dissemination mechanism (i.e., the diffusion of norms from migrants to natives) predicts that less culturally selected migrants will bring more convergence; the cultural remittance mechanism predicts instead that more cultural selection will boost convergence.

To disentangle the two effects, we start by exploiting information on skills at the individual level and look at the effect of a change in the skill pattern of bilateral migration on bilateral cultural similarity. At the country-level, we identify country pairs that are at the same time economically distant *and* culturally similar (i.e., where we expect the migrant pool to be less culturally selected). Since culturally dissimilar countries may also offer the largest economic gains from migration, we cannot look at these two elements separately. Rather we use the combination of the two to unambiguously test the theoretical predictions.

6.2.1 Cultural selection at the individual level

Skilled labor is scarcer in developing countries and more abundant in developed countries. In international migration economics, this basic observation translates into an expectation of higher economic incentives to migrate for low-skilled migrants than for high-skilled migrants (Borjas, 1987; Chiquiar & Hanson, 2005; McKenzie & Rapoport, 2010): we expect less cultural sorting at lower skill levels. According to COM and DSM, low-skill migration would boost cultural convergence, while REM predicts that it would dampen convergence (and conversely for highly skilled migrants).

In Table 9, we report the results of our main specification where we have decomposed migrant stocks by skill level. To obtain this decomposition, we use the IAB dataset, where migrants are defined as highly-skilled if they have a college degree or above, and low-skill otherwise. The IAB data set covers 20 OECD destinations, which yields a limited sample of about 1,700 observations of immigration to OECD countries from both non-OECD and other OECD countries. In all columns, we use the full set of fixed effects and time-varying controls.

We find a consistently negative relationship between low-skill migration and cultural similarity (significant for the Euclidean and Herfindahl index) and a consistently positive relationship between high-skill migration and cultural similarity. While we can only make limited inference from these results, we take them as suggestive evidence in support of REM2 and against COM2/DSM2.

6.2.2 Cultural selection at the country level

In Table 10, we report the results of our main specification, using the balanced panel of countries constructed for Table 6, and distinguishing country pairs that are economically distant and culturally similar. We compute the median economic distance (as difference in GDP per capita) as well as the median cultural similarity of all three measures for all country pairs in that sample. We use the panel data set to make sure that the cut-off calculated at the beginning of the observation period (1995) holds for all country pairs consistently afterwards. We create a dummy variable called *CSED* to characterize country pairs that are both culturally similar (above the median) and economically distant (above the median). A dummy equal to one captures country pairs for which we expect *less* cultural selection into migration.

We find that convergence is dampened when migration is less culturally selected (and the Canberra norm even finds divergence for the subset of countries identified as being culturally similar and economically distant). In line with the results of the previous section and Table 9, cultural convergence is stronger when there is cultural self-selection into migration, in support for predictions REM2/3, against predictions COM2/3 and DSM2/3.

6.3 Plausibility checks

In the previous sections, we have used predictions of our theoretical model to step wise exclude possible mechanisms that would yield the same reduced form result of migration-based cultural convergence. We have focused on the compositional versus dynamic components first and then turned to the mechanism behind the dynamic convergence, which led us to favor cultural

remittances and transmission of values form the host to home country as a major source of cultural convergence.We now move away from the stricter model predictions and move to common sense/plausibility checks of the remittance mechanism. We first use financial remittances as a proxy for ties to the home community to see whether the result is driven by these country pairs. We then test a conjecture of the model, namely the expectation that cultural remittances are particularly powerful and sizable if emigrants concentrate in very few destination countries.

6.3.1 Financial remittances

We cannot directly observe directly the influence of emigrants in the cultural formation in their home communities. One link that we do observe between migrants and their home communities is the remittances they send home. Financial remittances are a plausible proxy for the intensity of this interaction. Naturally, financial transfers are not equivalent to the transfer of norms or values, but individuals may take after the relative whose remittances help support the family. Moreover, the affluence of the family may extend the cultural influence of the migrant beyond the family. We also interpret remittances as a sign that migrants still have strong family or business ties in their home community.

To characterize financial remittances, we draw from the World Bank Data Set for bilateral remittances. This data set has one important drawback: remittances at a disaggregated bilateral level have only been available since 2010. This will not allow for a dynamic analysis of remittances for the complete observation period in our analysis. However, we are able to split the sample into country pairs that have recorded remittance flows and country pairs that do not. About 48% of countries have immigrants that send money back to their home countries in 2010. Figure 9 illustrates the relationship between the size of the immigrant community and size of remittances flows in 2010. There is a strong correlation between the size of the diaspora and the volume of remittances that flow back to their home countries. There are still some outliers. Some country pairs have over proportionally high levels of remittances (above the gray line) and country pairs that remit less money than their total migrant stocks would indicate (below the gray line). This can be illustrated at the case of Mexico and the United States (upper right of the graph) with both high levels of migration and remittances but the size of remittances is still comparatively high.

In Table 11, we report the results of our main specification on country pairs with recorded flows of remittances and country pairs without such flows. The split sample is based on a static analysis of bilateral remittances in 2010 and consequently does not adequately represent the actual split in the 1980s. As the size of remittances has increased quite substantially over the last decades,[17] we will be overestimating the number of country pairs with remittances in previous decades, attributing a higher level of interaction between diaspora and home community to some country pairs. Detecting a stronger effect of migration on cultural proximity for this subset of countries will consequently be a conservative (lower bound) estimate, as we overestimate the level of interaction between country pairs in the subset of remittance country pairs. We control for the full set of fixed effects.

[17]The World Bank's Migration and Development Brief (No. 26) has estimated the increase in remittances by a 20-fold since 1990 reaching USD 432 Billion in 2015 and this is expected to rise in the future.

We find that country pairs with recorded remittance flows in 2010 are driving our results: migration has an effect on cultural convergence when it is accompanied by financial remittances. Columns 1,3, and 5 in Table 11 show a positive and significant effect of migration on cultural convergence in countries where there are remittances. Meanwhile, in countries without remittances, the effect is smaller, and not significant. This supports the general intuition of REM.

6.3.2 Concentrated destinations

Conditional on observing convergence, the effect of cultural remittances (REM) suggests that a diversity of destinations for emigration would dilute the effect of migration on convergence.[18] In the spirit of REM, countries that have concentrated migration flows to a limited set of destination countries (such as Mexico or Albania for instance, who mainly emigrate to the United States and Germany respectively) should experience—on average—a stronger convergence effect than countries with a very diverse set of destination countries.

In Table 12, we report the results of the main specification where we have split the sample between origin countries with concentrated destinations and origin countries with diverse destinations. We calculate the share of emigration to each destination country over total emigration for each origin country and take the sum of squares of these shares (this corresponds to the Herfindahl-Hirschman Index [HHI] of concentration), and we split the sample along the median HHI value, which lies at 0.57. We present the density plot for this index in Figure 8.

We find that the standard errors for the sub sample of diverse destination countries are significantly higher and the size of the coefficient is substantially smaller. The effect of migration on cultural similarity is only significant for the sub sample of countries with concentrated destinations. This is in line with our interpretation of the REM mechanism.

7 Conclusion

Migrants are agents of cultural change. They affect the cultural dynamics of the societies they join as immigrants and of the societies they leave as emigrants. Immigrants change the cultural composition of host societies through mere mixing and dissemination (or "infusion," in the words of Jefferson) of the values and norms they absorbed during their childhood. When those values and norms are seen as inferior, or simply as a source of erosion of a local culture valued for itself, then immigration creates cultural tensions. Such tensions have resurfaced very prominently in many Western democracies facing increased immigration and have been associated with the recent rise of populism in some of them (Guriev & Papaioannou, 2020; Rodrik, 2020).

This papers starts by acknowledging the complexity of factors that determine migration-based cultural change: mixing and dissemination, but also other factors that have received less attention. In particular, the fact that cultural attraction to the destination plays a significant role in the decision to migrate (i.e., cultural selection), or that migrants, more often than not, tend to export the host country culture back home (i.e., cultural remittances), appear as essential ingredients to understand the global dynamics of cultural change. In any event, addressing this

[18]The cultural mixing (COM) and dissemination (DSM) effects suggest that a diversity of immigration origins would dilute the effect of migration on convergence. We do not find support for this in the data.

complexity requires a strong theoretical framework first to structure ideas and then to formulate distinctive testable predictions that can be taken to the data. When we do so, the empirical analysis first establishes that migration generates cultural convergence between home and host countries. Given that this could result from various channels, we then examine various candidate mechanisms under the guidance of our theoretical model, first disqualifying purely compositional effects and then pointing to cultural remittances (rather than dissemination) as the dominant dynamic force driving global cultural convergence. In other words, we find that it is the home country that is converging toward the host-country culture.

Our work can be extended in multiple directions. First, here the analysis focuses on the bilateral dimension of cultural convergence. However, the finding of an average bilateral convergence is compatible with different global patterns of cultural change. For instance, we can imagine that countries jointly converge to a global hybrid culture, to a benchmark culture (e.g., 'Americanization') or to two or more cultural poles (by which we would observe global cultural polarization *à la* Huntington). These global patterns may be co-determined by international migration flows, inviting more theoretical and empirical explorations on this topic. Second, we identify the average effect of immigration and emigration on cultural proximity between countries, but we are silent on their effects on within-country cultural heterogeneity (Desmet & Wacziarg, 2018; Bertrand & Kamenica, 2018). Arguably, immigration can bring about more (e.g., through hybridization) or less (e.g., through polarization arising from a native cultural backlash against immigration) within-country cultural homogeneity. Together with the effects of migration on global cultural change, this is clearly a fundamental question to be addressed in future research.

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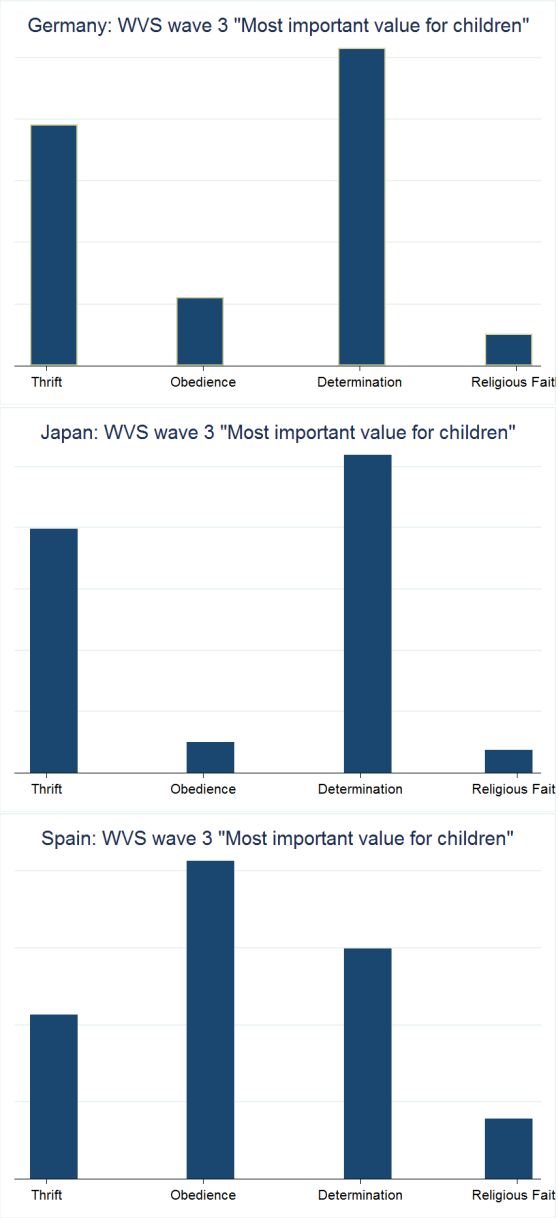
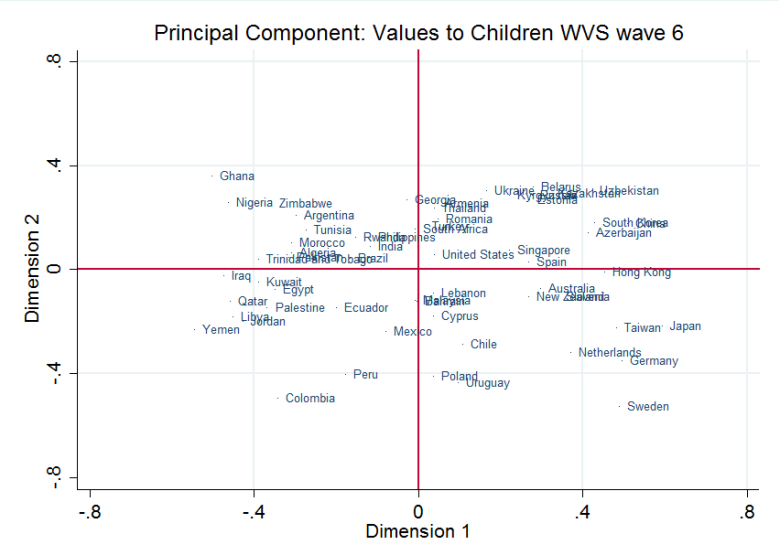
8 Figures and Tables

Figure 1: Distribution - Values to Children



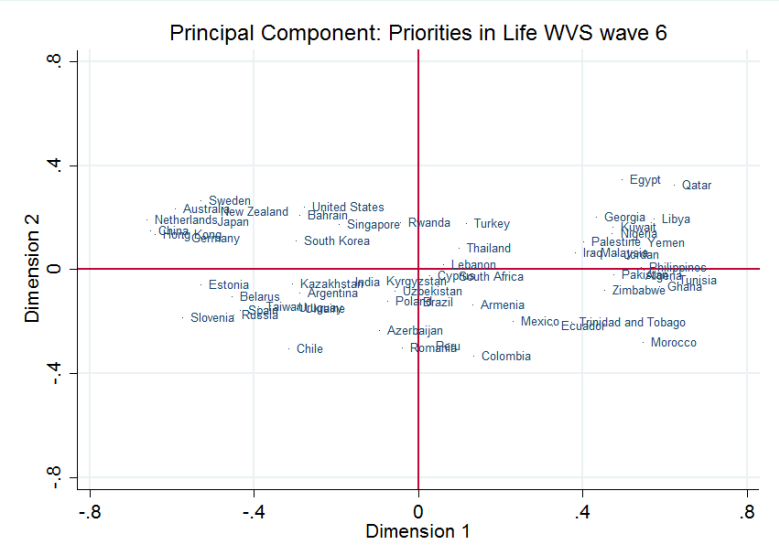
Responses to Values to Children Question (see Table 3) in Wave 3 of the WVS for Germany, Japan, and Spain

Figure 2: Principal Component Analysis - Values to Children



Principle Component Analysis of WVS question on values desired to inherit to children, including independence, hard work, feeling of responsibility, imagination, tolerance and respect for others, thrift saving money and things, determination/perseverance, religious faith, unselfishness, and obedience (see Table 3)

Figure 3: Principal Component Analysis - Priorities in Life



Principal Component Analysis of WVS question on priorities in life,including family, friends, leisure time, politics, work, and religion (see Table 3)

Figure 4: Scatterplot of standardized values for the Herfindahl Index and weighted Euclidean Distance

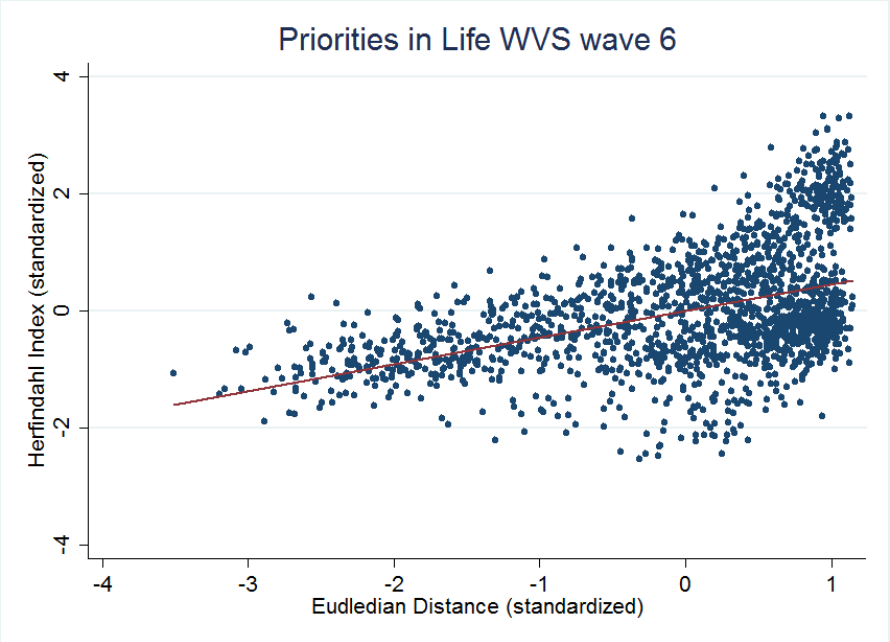


Figure 5: Scatterplot of standardized values for the Herfindahl Index and weighted Euclidean Distance

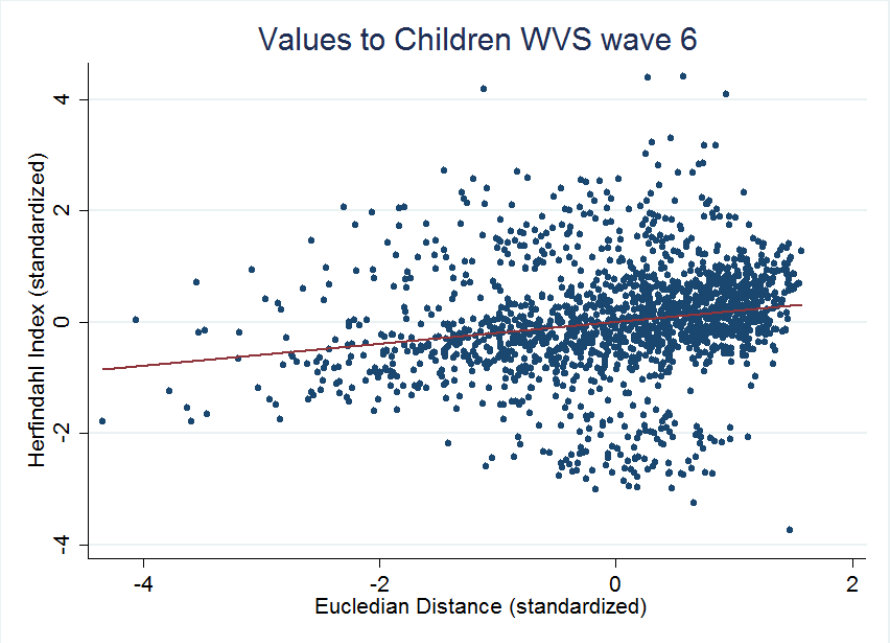


Figure 6: Kernel Density of Standardized Cultural Similarity Indexes

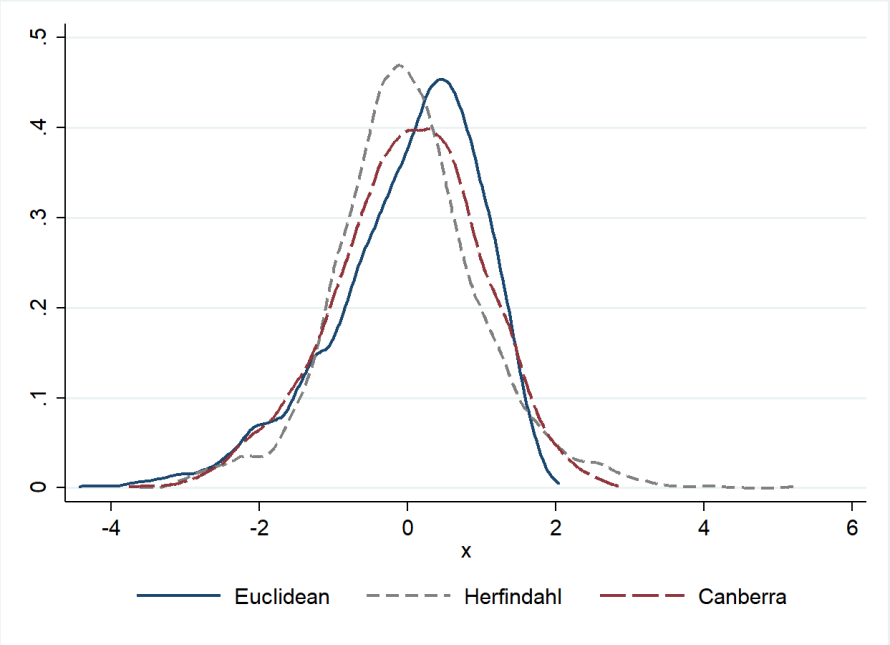
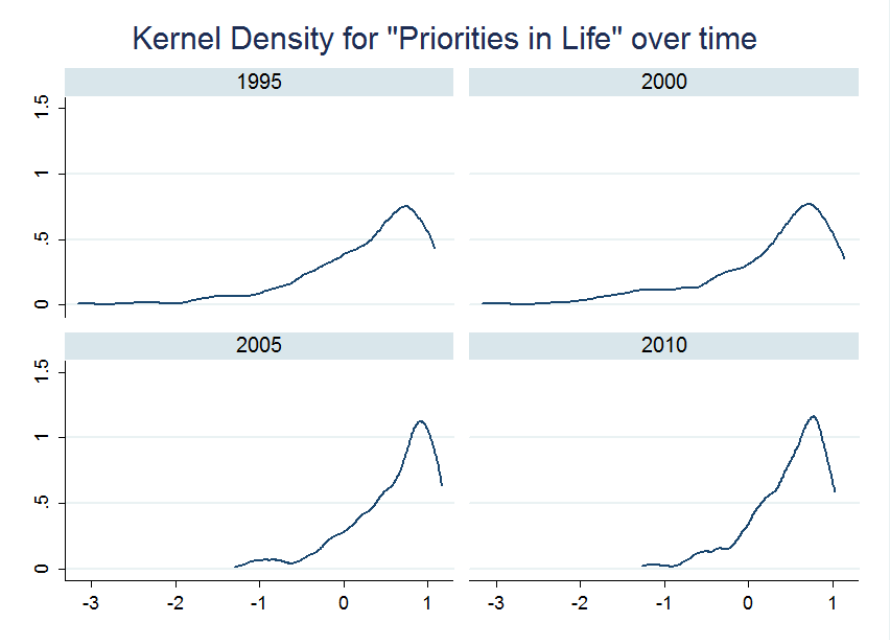


Figure 7: Kernel Density - Priorities in Life



Kernel Density of WVS question on priorities in life over time for 21 countries with observations between 1995 and 2010, showing that the distribution of cultural norms becomes more compact

Figure 8: Kernel Density Plot for the Emigration Concentration Index (HHI)

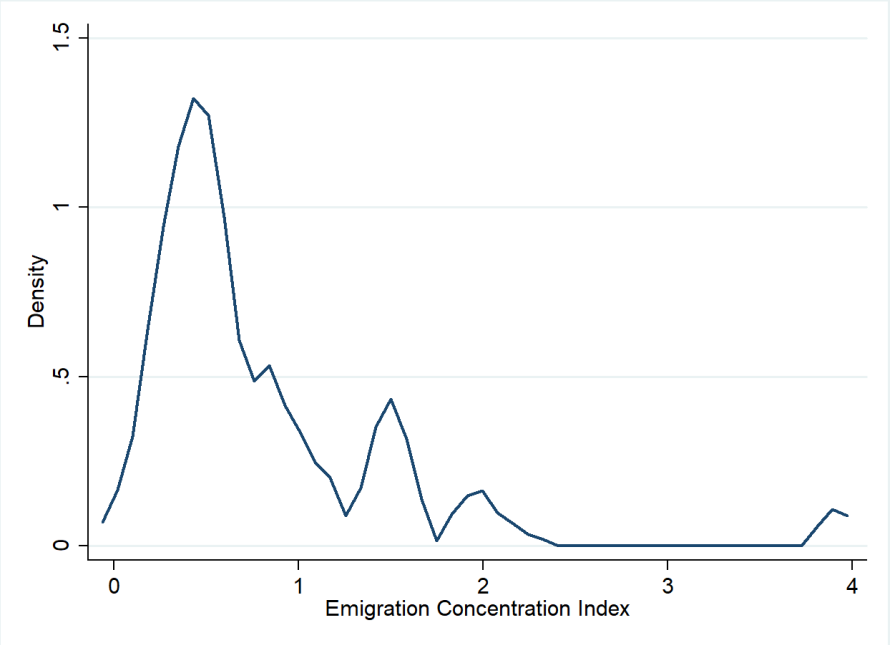


Figure 9: Scatterplot: Log of Remittances and Log of Stock of Migrants in 2010

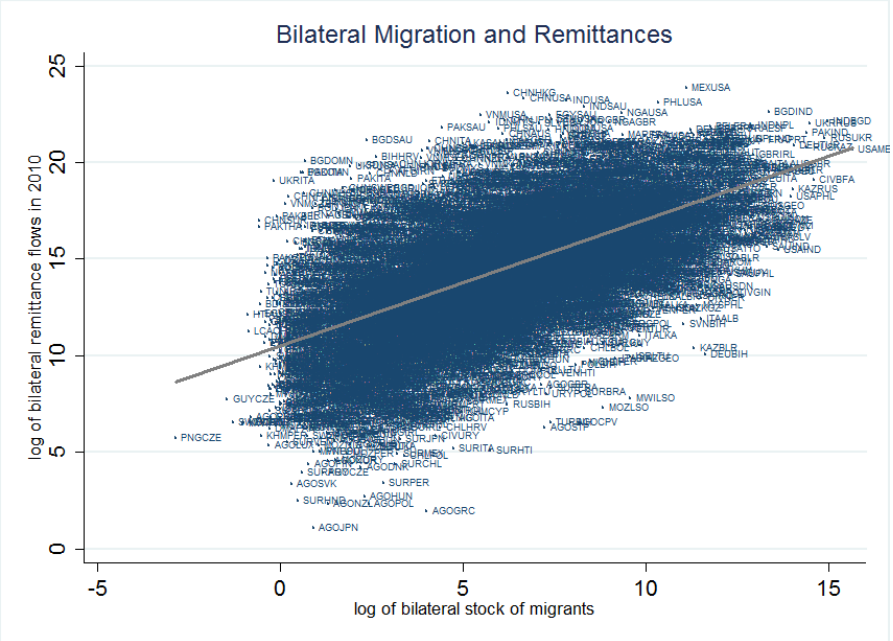


Table 2: Summary statistics

		mean	sd	min	max
Source	Independent Variables				
World Bank bilateral migration matrix	migrant stock	27,632	265,395	0	12,950,828
IAB data on migration to OECD countries	low skilled migrant stock	17,560	185,640	0	5,292,107
	medium skilled migrant stock	15,031	95,086	0	2,626,342
	high skilled migrant stock	19,312	79,525	0	1,315,891
UN Comtrade & Feenstra	bilateral trade volume (1000 USD)	1,539,392	9,380,120	0	338,934,848
World Bank development indicators	GDP per capita gap (1000 USD)	13,343	13,518	15	64,965
Cultural Similarity Indexes (standardized)					
	Euclidean	0	1	-4.43	2.03
	Herfindahl	0	1	-3.61	5.28
	Canberra	0	1	-3.76	2.90

Table 3: Selected WVS Questions along Cultural Dimensions

Dimension	**WVS Question**	**Options**	**Response Scale**
Values to Children	*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!*	Independence Hard work Feeling responsibility Imagination Tolerance Thrift Determination Religious faith Unselfishness Obedience Self-expression	binary
Priorities in Life	*For each of the following, indicate how important it is in your life.*	Family Friends Leisure Time Politics Work Religion	Very important Rather important Not very important Not at all important
Generalized Trust	*Generally speaking, would you say that most people can be trusted or that you need to be very careful in dealing with people?*	Most ppl can be trusted Need to be very careful	binary
Gender Equality	*Do you agree with the following statement?*	When jobs are scarce, men should have more right to a job than women (i)Being a housewife is just as fulfilling as working for pay (ii) On the whole, men make better political leaders than women do (iii)A university education is more important for a boy than for a girl	Agree Neither Disagree Strongly Agree Agree Disagree Strongly Disagree
Control over Life	*How much freedom of choice and control you feel you have over the way your life turns out*	No Choice at all A great deal of Choice	Scale 1 to 10

Table 4: Selected Statistical Distance Measures

Minkowski	$D_M = \sqrt[p]{\sum_{i=1}^{d} \lvert P_i - Q_i \rvert^p}$
Euclidean	$D_E = \sqrt{\sum_{i=1}^{d} (P_i - Q_i)^2}$
Canberra	$D_{Ca} = \sum_{i=1}^{d} \frac{\lvert P_i - Q_i \rvert}{P_i + Q_i}$
Chebyshev	$D_{Ch} = \max_i \lvert P_i - Q_i \rvert$
Inner Product	$D_I = \sum_{i=1}^{d} P_i * Q_i$

Table 5: Baseline - migration and cultural similarity

	(1)	(2)	(3)	(4)	(5)
Euclidean					
Migration	0.054***	0.083***	0.083***	0.022**	0.029**
	(0.004)	(0.004)	(0.010)	(0.009)	(0.012)
R2	0.03	0.52	0.91	0.97	0.97
N	7,486	7,486	7,486	7,486	5,875 3
Herfindahl					
Migration	0.030***	0.066***	-0.048***	0.017**	0.023**
	(0.004)	(0.003)	(0.013)	(0.007)	(0.010)
R2	0.01	0.70	0.86	0.98	0.98
N	7,486	7,486	7,486	7,486	5,875
Canberra					
Migration	0.052***	0.084***	0.056***	0.017	0.006
	(0.004)	(0.004)	(0.013)	(0.011)	(0.013)
R2	0.03	0.60	0.86	0.95	0.96
N	7,486	7,486	7,486	7,486	5,875
Dest.-year FE		X		X	X
Orig.-year FE		X		X	X
Bilateral FE			X	X	X
Controls					X

Table 5 shows the main results of this analysis. Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. All three cultural similarity measures are reported, successively introducing all fixed effects. First column of each measure shows results with no fixed effects, second column introduces origin and destination fixed effects, column three shows specification with only bilateral fixed effects, and the the fourth column shows results with country-pair, destination-time and origin-time fixed effects. Column 5 includes time-varying bilateral control variables, Trade and GDP Gap. Constant is not reported. Migration is the log of the migrant stock at time $t - \Delta$ and Trade is the bilateral trade flow at time $t - \Delta$, GDP Gap is bilateral per capita difference at $t - \Delta$. In our baseline regression Δ represents a five year lag. Observations are reduced by about 2,400 observations since there is no information for some country pairs on bilateral trade and gdp per capita.

Table 6: Balanced panel - migration and cultural similarity

	(1) **Euclidean**	(2) **Herfindahl**	(3) **Canberra**
Migration	0.058***	0.040***	0.038**
	(0.015)	(0.012)	(0.019)
R2	0.93	0.96	0.91
N	1,359	1,359	1,359
Destination-year FE	X	X	X
Origin-year FE	X	X	X
Bilateral FE	X	X	X
Controls	X	X	X

Table 6 selects country pairs that remain in the data set for the same three waves of the WVS. In particular, we only include country pairs that were in the waves of 1995, 2005, and 2010. We choose these specific waves to maximize the number of country pairs that appear repeatedly and at least in three waves. All three cultural similarity measures are reported, introducing all fixed effects and time-varying controls. Countries in the panel include: Argentina, Australia, Chile, China, Colombia, Georgia, Germany, India, Japan, Korea, Mexico, New Zealand, Peru, Poland, Romania, Russian Federation, Slovenia, South Africa, Spain, Sweden, Turkey, Ukraine, United States, and Uruguay. Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 7: Timing of migration and cultural similarity

	10-year lag			*no lag*		
	(1)	(2)	(3)	(4)	(5)	(6)
	Euclidean	**Herfindahl**	**Canberra**	**Euclidean**	**Herfindahl**	**Canberra**
Migration	0.024*	0.027**	0.040***	0.011	0.006	0.016
	(0.013)	(0.011)	(0.014)	(0.011)	(0.009)	(0.012)
R2	0.97	0.98	0.96	0.97	0.98	0.95
N	5,873	5,873	5,873	6,022	6,022	6,022
Dest.-year FE	X	X	X	X	X	X
Orig.-year FE	X	X	X	X	X	X
Bilateral FE	X	X	X	X	X	X
Controls	X	X	X	X	X	X

Table 7 shows the results for different lags of our main dependent variable: the log bilateral migrant stock. Our baseline specification uses the 5-year lag for migration and for the control variables trade and gdp gap. In columns one to three, use the ten-year lag of migration for all three cultural similarity measures, including the full set of fixed effects (destination-year, origin-year, bilateral) and time-varying control variables with the respective lags (ten-year lag for trade and gdp gap). In columns four to six, we repeat the same exercise with no lag, that is the instantaneous bilateral migrant stock, e.g. the dependent variable (cultural similarity) is measured in the same period as the independent variable (again with trade and gdp gap in the same year). Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 8: Excluding foreign-born respondents

	(1)	(2)	(3)	(4)	(5)
Euclidean cultural similarity with migrants					
Migration	0.064***	0.074***	-0.020	0.032	0.007
	(0.009)	(0.007)	(0.074)	(0.084)	(0.148)
R2	0.04	0.63	0.99	1.00	1.00
N	1,475	1,475	1,475	1,475	838
Euclidean cultural similarity without migrants					
Migration	0.064***	0.074***	-0.012	0.031	0.003
	(0.008)	(0.007)	(0.073)	(0.084)	(0.147)
R2	0.04	0.63	0.99	1.00	1.00
N	1,475	1,475	1,475	1,475	838
Dest.-year FE		X		X	X
Orig.-year FE		X		X	X
Bilateral FE			X	X	X
Controls					X

Table 8 Analysis includes only countries and WVS waves (two and three) for which information on respondent's country of birth was available. Only nine countries have information on respondents country of birth for two waves. Therefore, the analysis is limited to a rather small subsample for a short period of time (losing about 80% of our observations). We limit this analysis to one similarity measure, the Euclidean similarity measure and successively introduce all fixed effects and control variables, following the baseline regression in Table 5. Countries in this sample include: Argentina, Armenia, Australia, Azerbaijan, Belarus, Bosnia and Herzegovina, Brazil, Bulgaria, Chile, China, Croatia, Czech Republic, Dominican Republic, Estonia, Finlan,d Georgia, Germany, Hungary, India, Japan, Latvia, Lithuania, Macedonia, Mexico, Moldova, Montenegro, New Zealand, Nigeria, Norway, Pakistan, Peru, Philippines, Puerto Rico, Romania, Russian Federation, Serbia, Slovak Republic, Slovenia, South Africa, Spain, Sweden, Switzerland, Taiwan, China, Turkey, Ukraine, United States, Uruguay Venezuela. Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 9: Economic vs. cultural gains from migration - skilled migration and cultural similarity

	(1) **Euclidean**	(2) **Herfindahl**	(3) **Canberra**
low skilled	-0.085**	-0.065*	-0.069
	(0.043)	(0.037)	(0.065)
high skilled	0.082*	0.058^{+}	0.032
	(0.044)	(0.038)	(0.067)
R2	0.99	0.99	0.96
N	1,717	1,717	1,717
Dest.-year FE	X	X	X
Orig.-year FE	X	X	X
Bilateral FE	X	X	X
Controls	X	X	X

Table 9 shows results from our baseline specification by skill level, including all fixed effects and time-varying controls. We distinguish between skilled and unskilled labor, categorized as high-school degree and above from the IAB data set, which contains information on education levels of the migrant stock in 14 OECD destination countries for the years 1980 to 2010 in five-year intervals. Since we use a different migration data set (smaller time frame and fewer countries) our number of observation reduce substantially. Standard errors in parentheses. + $p < 0.15$; * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

Table 10: Economic vs. cultural gains from migration - culturally close and economically distant

	(1) **Euclidean**	(2) **Herfindahl**	(3) **Canberra**
Migration	0.068***	0.043***	0.058***
	(0.017)	(0.013)	(0.020)
Migration**CSED**	-0.041^{+}	-0.014	-0.129***
	(0.028)	(0.021)	(0.041)
R2	0.93	0.96	0.91
N	1,359	1,359	1,359
Dest.-year FE	X	X	X
Orig.-year FE	X	X	X
Bilateral FE	X	X	X
Controls	X	X	X

Table 10 shows results from our baseline specification by initial cultural similarity and economic distance, including all fixed effects and time-varying controls. *CSED* is a bilateral dummy variable that indicates whether a country pair is part of the sample of country pair for which we expect a less culturally selected migrant pool (e.g. above median culturally similar for the respective measures and simultaneously above median economically distant as gdp per capita difference, both measured in the year 1995). We use the panel sample constructed for Table 6 to ensure coherence in the median cut-off for all country pairs.Standard errors in parentheses. + $p < 0.15$; * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

Table 11: Plausibility checks - intensity of interaction proxied by remittances

	Remittances			*No remittances*		
	(1)	(2)	(3)	(4)	(5)	(6)
	Euclidean	**Herfindahl**	**Canberra**	**Euclidean**	**Herfindahl**	**Canberra**
Migration	0.044***	0.037***	0.027^{+}	0.016	0.020	0.012
	(0.015)	(0.013)	(0.018)	(0.019)	(0.016)	(0.021)
R2	0.97	0.98	0.95	0.98	0.98	0.97
N	2,975	2,975	2,975	2,297	2,297	2,297
Dest.-year FE	X	X	X	X	X	X
Orig.-year FE	X	X	X	X	X	X
Bilateral FE	X	X	X	X	X	X
Controls	X	X	X	X	X	X

Table 11 hows results from our baseline specification, including all fixed effects and time-varying controls. We split the sample into country pairs that have remittance flows and those that do not have recorded remittance flows to proxy intensity of interaction between diaspora and home community. Standard errors in parentheses. + $p < 0.15$; * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

Table 12: Plausibility checks - diverse and concentrated emigration destinations

	Diverse destinations			*Concentrated destinations*		
	(1)	(2)	(3)	(4)	(5)	(6)
	Euclidean	**Herfindahl**	**Canberra**	**Euclidean**	**Herfindahl**	**Canberra**
Migration	-0.004	-0.009	-0.026	0.050***	0.040***	0.022
	(0.023)	(0.019)	(0.026)	(0.014)	(0.012)	(0.016)
R2	0.98	0.99	0.97	0.96	0.97	0.95
N	2,876	2,876	2,876	2,999	2,999	2,999
Dest.-year FE	X	X	X	X	X	X
Orig.-year FE	X	X	X	X	X	X
Bilateral FE	X	X	X	X	X	X
Controls	X	X	X	X	X	X

Table 12 shows results from our baseline specification, including all fixed effects and time-varying controls. We split the sample along the median value of an emigration concentration index specifically created for this analysis. The index measures for each source country the overall concentration of destination countries. Source countries with a large share of their emigrants residing in only few destination countries will receive a high score (Mexico's score is at 3.88) and countries that have a very diverse set of destination countries receive a low score (the US's score is at 0.60, France's 0.09, the median concentration index lies at 0.53). Standard errors in parentheses. + $p < 0.15$; * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

Appendix

A Cultural diffusion across group boundaries

The purpose of the following appendix is purely computational. It brings no economic insight. We provide it for the reader who wishes to check the computations of the main text. In the main text, we have defined:

$$g(q,\pi,\eta) = \frac{q}{1-q}\frac{1-(1-\eta)\pi-\eta q}{(1-\eta)\pi+\eta q}\frac{1-(1-(1-\eta)\pi-\eta q)\Delta V_i}{1-((1-\eta)\pi+\eta q)\Delta V_j},$$

where q is interpreted as the cultural mix of the group under consideration, π the out-group that influences cultural formation in the in-group, and η the strength of within-group cultural socialization. $1-\eta$ characterizes the influence of the out-group, and we have sometimes taken the relative size of the out-group as a proxy for $1-\eta$. We introduce the notation $\partial_x g$ to denote the partial derivative of g with respect to variable x. We get

$$\partial_q g/g = \frac{1}{q(1-q)} - \frac{\eta}{\chi(1-\chi)} + \eta\frac{\Delta V_i + \Delta V_j - \Delta V_i \Delta V_j}{(1-\tau_i)(1-\tau_j)}$$

For a well-defined economic problem, $\Delta V_{i,j} < \min\{1/\chi, 1/(1-\chi)\}$, which cannot be larger than 2. For $\Delta V_{i,j} \in [0,2]$, the third term is nonnegative. We consider the first two terms together. Their sign is the same as $(\chi(1-\chi) - \eta q(1-q)/(1-\eta)$, which we can write as a second-order polynomial of π as $-(1-\eta)\pi^2 + (1-2q\eta)\pi + q^2\eta$. To show that $\partial_q g$ is positive, it is enough to show that this polynomial is positive. Its discriminant $1-4\eta q(1-q)$ is nonnegative, and therefore the polynomial has two roots. Between these two roots, the polynomial is positive. The product of the roots is negative, so one is negative and the other one positive. The expression of the positive root taken at $\eta = 0$ is 1, and increases with η, meaning that the positive root is larger than 1. As a conclusion, for any $\pi \in [0,1]$, the polynomial, and $\partial_q g$, are positive.

We proceed in the same way to sign $\partial_\eta g$:

$$\frac{\partial_\eta g}{(\pi-q)g} = \frac{1}{\chi(1-\chi)} - \frac{\Delta V_i(1-\tau_j) + \Delta V_j(1-\tau_i)}{(1-\tau_i)(1-\tau_j)}$$

This expression has the same sign as a second-order polynomial in χ. Proceeding in the same way, we can show that for any $\Delta V_{i,j} \in (0,2]$, this polynomial is negative. The same reasoning holds for $\partial_\pi g$.

B Appendix Tables

Table A1: List of countries - Part 1

country	1980	1990	2000	2010
Albania	0	0	1	0
Algeria	0	0	1	1
Andorra	0	0	0	0
Argentina	1	1	1	1
Armenia	0	0	0	1
Australia	1	0	0	1
Azerbaijan	0	0	0	1
Bahrain	0	0	0	1
Bangladesh	0	0	1	0
Belarus	0	0	0	1
Brazil	0	1	0	1
Bulgaria	0	0	0	0
Burkina Faso	0	0	0	0
Canada	0	0	1	0
Chile	0	1	1	1
China	0	1	1	1
Colombia	0	0	0	1
Cyprus	0	0	0	1
Czech Republic	0	0	0	0
Dominican Republic	0	0	0	0
Ecuador	0	0	0	1
Egypt, Arab Rep.	0	0	1	1
El Salvador	0	0	0	0
Estonia	0	0	0	1
Ethiopia	0	0	0	0
Finland	1	0	0	0
France	0	0	0	0
Georgia	0	0	0	1
Germany	0	0	0	1
Ghana	0	0	0	1
Guatemala	0	0	0	0
Hungary	0	0	0	0
India	0	1	1	1
Indonesia	0	0	1	0
Iran, Islamic Rep.	0	0	1	0
Iraq	0	0	0	1
Israel	0	0	1	0
Italy	0	0	0	0

Table A1 lists the countries used in our analysis (specifically, the sample that is used in our baseline specification). Year refers to the year of the migration data. Zeros and ones indicates whether all variables (WVS, migration, trade, GDP) are available for that year.

Table A2: List of countries - Part 2

country	1980	1990	2000	2010
Japan	1	1	1	1
Jordan	0	0	1	1
Kazakhstan	0	0	0	1
Korea, Rep.	1	0	0	0
Kuwait	0	0	0	1
Kyrgyz Republic	0	0	1	1
Lebanon	0	0	0	1
Libya	0	0	0	1
Malaysia	0	0	0	1
Mali	0	0	0	0
Mexico	1	1	1	1
Morocco	0	0	1	1
Netherlands	0	0	0	1
New Zealand	0	0	0	1
Nigeria	0	1	1	1
Norway	0	0	0	0
Pakistan	0	0	1	1
Peru	0	0	1	1
Philippines	0	0	1	1
Poland	0	0	0	1
Qatar	0	0	0	1
Romania	0	0	0	1
Russian Federation	0	0	0	1
Rwanda	0	0	0	1
Saudi Arabia	0	0	1	0
Singapore	0	0	1	1
Slovak Republic	0	0	0	0
Slovenia	0	0	0	1
South Africa	1	0	1	1
Spain	0	1	1	1
Sweden	0	0	0	1
Switzerland	0	1	0	0
Thailand	0	0	0	1
Trinidad and Tobago	0	0	0	1
Tunisia	0	0	0	1
Turkey	0	1	1	1
Uganda	0	0	1	0
Ukraine	0	0	0	1
United Kingdom	0	0	0	0
United States	0	0	1	1
Uruguay	0	0	0	1
Uzbekistan	0	0	0	1
Venezuela, RB	0	0	1	0
Vietnam	0	0	1	0
Yemen, Rep.	0	0	0	1
Zambia	0	0	0	0
Zimbabwe	0	0	1	1

Table A2 lists the countries used in our analysis (specifically, the sample that is used in our baseline specification). Year refers to the year of the migration data. Zeros and ones indicates whether all variables (WVS, migration, trade, GDP) are available for that year.

Table A3: Baseline - migration and cultural similarity including controls

	(1)	(2)	(3)	(4)
Euclidean				
Migration	0.066***	0.059***	0.064***	0.029**
	(0.005)	(0.005)	(0.013)	(0.012)
Trade	0.014***	0.032***	0.022*	-0.003
	(0.005)	(0.007)	(0.013)	(0.013)
GDP Gap	-0.235***	-0.270***	0.037	-0.012
	(0.009)	(0.009)	(0.027)	(0.023)
R2	0.13	0.57	0.92	0.97
N	5,875	5,875	5,875	5,875
Herfindahl				
Migration	0.035***	0.049***	-0.028*	0.023**
	(0.006)	(0.004)	(0.017)	(0.010)
Trade	0.001	0.027***	-0.041**	-0.011
	(0.005)	(0.005)	(0.016)	(0.011)
GDP Gap	-0.109***	-0.220***	0.021	0.003
	(0.009)	(0.007)	(0.033)	(0.019)
R2	0.03	0.73	0.87	0.98
N	5,875	5,875	5,875	5,875
Canberra				
Migration	0.060***	0.065***	0.042***	0.006
	(0.005)	(0.005)	(0.016)	(0.013)
Trade	0.009*	0.030***	-0.009	-0.015
	(0.005)	(0.006)	(0.016)	(0.015)
GDP Gap	-0.172***	-0.221***	0.027	0.020
	(0.009)	(0.008)	(0.032)	(0.026)
R2	0.08	0.63	0.87	0.96
N	5,875	5,875	5,875	5,875
Dest.-year FE		X		X
Orig.-year FE		X		X
Bilateral FE			X	X
Controls	X	X	X	X

Table 5 shows the main results of this analysis. Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. All three cultural similarity measures are reported, successively introducing all fixed effects. First column of each measure shows results with no fixed effects, second column introduces origin and destination fixed effects, column three shows specification with only bilateral fixed effects, and the the fourth column shows results with country-pair, destination-time and origin-time fixed effects. All models include time-varying bilateral control variables, Trade and GDP Gap. Constant is not reported. Migration is the log of the migrant stock at time $t - \Delta$ and Trade is the bilateral trade flow at time $t - \Delta$, GDP Gap is bilateral per capita difference at $t - \Delta$. In our baseline regression Δ represents a five year lag. Observations are reduced by about 2,400 observations since there is no information for some country pairs on bilateral trade and gdp per capita.

Table A4: Accounting for methodology change in migration data

	(1)	(2)	(3)
	Euclidean	**Herfindahl**	**Canberra**
Migration	0.033***	0.024**	0.003
	(0.012)	(0.010)	(0.014)
R2	0.97	0.98	0.96
N	5,588	5,588	5,588
Dest.-year FE	X	X	X
Orig.-year FE	X	X	X
Bilateral FE	X	X	X
Controls	X	X	X

Table A4 shows our baseline specification with all time-varying controls and the full set of fixed effects for the sub-sample of countries for which we observe non-zero migration in 2010. We lose about 300 observations. This number of observations lost is relatively small since the data set is comprised of countries for which we have information on beliefs and preferences from the World Value Survey and for which bilateral trade and GDP data is available. This already restrict our sample and therefore limits the number of country pairs for which the change in methodology from 2000 to 2010 was relevant.

Table A5: Plausibility checks - diverse and concentrated origin countries

	Diverse origins			*Concentrated origins*		
	(1)	(2)	(3)	(4)	(5)	(6)
	Euclidean	**Herfindahl**	**Canberra**	**Euclidean**	**Herfindahl**	**Canberra**
Migration	0.026	0.024+	-0.008	0.024+	0.018+	0.008
	(0.019)	(0.016)	(0.023)	(0.016)	(0.013)	(0.017)
R2	0.98	0.98	0.96	0.96	0.98	0.96
N	3,215	3,215	3,215	2,660	2,660	2,660
Dest.-year FE	X	X	X	X	X	X
Orig.-year FE	X	X	X	X	X	X
Bilateral FE	X	X	X	X	X	X
Controls	X	X	X	X	X	X

Table A5 shows results from our baseline specification, including all fixed effects and time-varying controls. We split the sample along the median value of an immigration concentration index similar to the index in Table 12. The index measures for each source country the overall concentration of origin countries. Standard errors in parentheses. + $p < 0.15$; * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.