Migration and the Great Cultural Replacement*

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Abstract

We examine both theoretically and empirically whether migration creates cultural divergence or convergence between home and host countries, who converges to or diverges from whom, and why. We model five candidate mechanisms including the static forces of self-selection and mixing and the dynamic forces of assimilation and of cultural transmission (in both directions). The model yields distinctive predictions which we then test empirically, using the World Value Survey for the period 1981-2014 to build time-varying measures of bilateral cultural similarity for over one thousand country pairs. Exploiting within country-pair variation over time, we find that migration leads to increased cultural similarity between host and home countries (i.e., convergence) and we provide evidence pointing to cultural transmission from host to home countries (i.e., cultural remittances) as being the dominant mechanism behind the results.

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> 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.
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> Thomas Jefferson, Notes on Virginia

> Parvenue à un degré de décomposition répugnant, l'Europe occidentale n'était plus en état de se sauver elle-même - pas d'avantage que ne l'avait été la Rome antique au 5ème siècle avant 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.
>
> Houellebecq, *Soumission*

1 Introduction

Is immigration a threat to native culture? This is a recurring theme of right-wing nationalists, that ranges from outright conspiracy theories of a *Great Replacement*[1] to milder calls for the

[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 a French writer in 2010, to describe a supposed intent by European institutions to substitute 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*.

protection of the besieged native culture and their values. Various versions of this argument have found 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 "better watch themselves" because immigration was "changing the culture" of their societies.[2] The idea that migration leads to the dilution of Western values and institutions is not only put forth by politicians but by a variety of thinkers, including writers like Raspail (1975) and Houellebecq (2015).

The underlying assumption is rather intuitive: values and attitudes are embedded in people and therefore carried with and spread through them. Some economists have utilized the idea of "immutable and portable" culture for a variety of analyses. In his book *Exodus. How Migration is Changing Our World*, Collier (2013) argues that Western countries are surpassing a "sustainable level of diversity" and proposes to curtail immigration to Western countries. Similarly, Borjas (2015) is concerned 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." A few econometric approaches that attempt to identify the causal effects of culture use a similar concept, the so-called "epidemiological approach". Looking at the outcomes of immigrants, who are exposed to the same institutions in the host country but have different norms and values (as proxied by the cultural environment at origin) allows to differentiate between the effect of culture versus the effect of institutions (Giuliano, 2007; Fernandez & Fogli, 2009; Giavazzi et al., 2019). If values are indeed portable, migrants may dilute the host country's culture in two ways: through their mere presence but also through the diffusion of their values and norms to natives.

Overall, the discussion on migration and cultural change focuses heavily on cultural dynamics at destination. But migration also has important implications for the cultural dynamics in the source countries. In this paper, we look at the effect of migration on both the home and the host country. We develop a theoretical model of migration-based cultural change that incorporates the effects at destination, such as cultural mixing, dissemination, and assimilation but also the effects at origin, such as cultural remittances or cultural selection into migration. Specifically, we look at how migration affects cultural similarity between home and host country. We test the predictions of the model empirically to uncover the underlying mechanisms that lead to cultural convergence or divergence.

Our paper relates to the empirical literature on cultural economics, that has shed light on the determinants of culture (Ashraf & Galor, 2013; Alesina & Giuliano, 2015; Giuliano & Nunn, 2017; Bazzi et al., 2017; 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). There are various papers that look at more recent cultural dynamics within and across countries, largely for the United States or Europe (Alesina et al., 2017; Desmet & Wacziarg, 2018; Bertrand & Kamenica, 2018; Falk et al., 2018). There is also a large body of literature in sociology, political

[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

science and history that analyzes the dynamics of cultural globalization (Norris & Inglehart, 2009). To cite only a few influential works, Pieterse et al. (2015) argues that globalization will lead to a new hybrid world culture, a "global mélange," invoking the notion of the "global village" coined by McLuhan & Fiore (1997), while other sociologists understand cultural globalization as a form of cultural imperialism, oftentimes pointing at the spread of American consumerism or the "Americanization" of global culture (Bishop, 1990; Kraidy, 2005; Tomlinson, 2012; Ritzer, 2012). Meanwhile, political scientists Huntington (2000) 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."

There are also two theoretical papers on trade-based cultural change that closely relate to our work. Olivier et al. (2008) show that goods market integration can lead countries to diverge culturally through a mechanism of "cultural specialization". Conversely, Maystre et al. (2014) show 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 idiosyncratic good. They conclude that trade liberalization can also lead to cultural convergence. Each of these two papers provides important intuitions. Considered jointly, they bring to light the various (and sometimes opposing) mechanisms that may lead cultural convergence or divergence. The complexity of mechanisms and forces driving either convergence or divergence extend to migration-based cultural change as well. We bring together these mechanisms in a unified theoretical framework, where we explore the link between migration and cultural formation. Let us start with a few basic observations that will motivate our theoretical model and the subsequent empirical analysis.

First, migrants are not a random sample of their home country population; rather, they are self-selected on a number of dimensions (e.g., age, gender, education, wealth, ethnic background), including culture (Hirschman, 1978; Docquier et al., 2017; Bacci, 2018; Casari et al., 2018; Knudsen, 2019). If migrants leave their home country to live at a destination that is culturally closer to them, they will leave behind a more dissimilar population. for instance, Docquier et al. (2017) show for the MENA region that those who intend to emigrate to OECD countries exhibit significantly lower levels of religiosity and share more gender-egalitarian views. Ruyssen & Salomone (2018) find for 148 countries between 2009 and 2013 that women's intention and preparation to migrate depends on their perception of gender discrimination at origin. Similarly, Knudsen (2019) finds that emigration in Scandinavia during the Age of Mass Migration contributed to substantial cultural change at origin through the self-selection of migrants. We call the effect of a non-random and self-selected set of migrants on the cultural composition of sending and receiving countries **Cultural Selection**.[3] This implies a compositional change for the remaining population and would lead to divergence through cultural sorting. This effect is likely to be minor except where relatively small numbers can make a difference, as is the case, arguably, in domains such as scientific or political innovation.

Second, with the compositional change at the home population also comes a change in cultural composition in the destination country. If immigrants are not a perfect cultural match to the host population, but culturally similar to the home population, we expect origin and destination countries to converge culturally by mere cultural mixing. This assumes that culture is embedded

[3]Hirschman (1978) introduced a similar *exit-effect* to refer to self-selection along political attitudes. In particular, he finds that migrants are typically positively selected in terms of their support for democracy.

in people and thus carried with them, introducing their values into the host society. The mixing of different cultures, or what we call **Cultural Mixing** phenomenon, will bring the two countries closer together. However, there is little evidence that most immigrant communities are sizable enough to have a significant impact on the average cultural stance in the host country.

Third and related to the cultural mixing idea is that migrants may also affect the preferences, norms, and values of the host population. This means that even with smaller migrant groups, the cultural formation of natives can be substantially influenced and therefore lead to cultural convergence between the host and home countries. Natives enjoying ethnic cuisine is often used as an illustrative example for how preferences can be transferred from the migrant to the host population. However, champions of cultural integrity lament the deterioration of more fundamental Western ideals, such as religious norms, democratic or family values caused by the **Dissemination** of culture from migrants to natives. Despite its prominence in the public debate, there is very little to no empirical (non-anecdotal) evidence of this. In Sociology and cultural theory, the concept of cultural dissemination is incorporated in 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). In the field of economics, Jarotschkin & Zhuravskaya (2019) exploit Stalin's ethnic deportations during WWII as a natural experiment and find that both the norms of gender equality and of gender discrimination were diffused to the local population exposed to deportee groups with these norms, manifesting itself in changes of attitudes and behavior.

Fourth, we consider the **Assimilation** or acculturation of migrants to the host country's culture. This is observed in various contexts. Abramitzky et al. (2014); Diehl & Schnell (2006) observes cultural assimilation as proxied by the adoption of American-sounding names during the age of mass migration. Similar effects are observed in the assimilation of Muslims in the US and Germany over time (Norris & Inglehart, 2012) or gender norms and female labor force participation of immigrants (Blau et al., 2011). This effect would counterbalance the longer-run effects of cultural mixing and dissemination as the diffusion of culture happens from natives to immigrants. With assimilation, the host population becomes culturally more homogeneous, but there is little we can say on the cultural convergence or divergence between countries.

Lastly, even abroad, the diaspora plays a role in the cultural formation in their home country. Migrants contribute to the diffusion of values as they carry with them home-country knowledge and social norms and remit back new values, preferences or beliefs to their home communities (Levitt & Lamba-Nieves, 2011; Fargues, 2011; Batista & Vicente, 2011; Barsbai et al., 2017). For instance, in Morocco, Egypt, and Turkey, Fargues (2006) shows birth rates are affected differently when a member of a household emigrated to a high fertility (Gulf) versus low fertility (West) destination country. Exposure to new norms shapes the preferences of migrants and are then passed on to friends and family back home through so called **Cultural Remittances**. Barsbai et al. (2017) show in the context of political remittances that the emigration wave that started in the aftermath of the Russian crisis of 1998 strongly affected electoral outcomes and political preferences in Moldova during the following decade, eventually contributing to the fall of the last Communist government in Europe. 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. Additionally, emigrants typically remain part of the cultural

narrative and are often even portrayed as success stories and role models. For instance, Kandel & Massey (2002) show that young Mexicans consider migration as a "marker in the transition to manhood." Similarly, the 2013 Country Migration Report of the Philippine government mentions that "a culture of migration has settled in, particularly in some regions, where the aspirations of youngsters are molded by the examples of migrants." European institutions have also long recognized the role of migrants in shaping aspirations, norms, and values in their home countries and has established the Entrepreneurship 2020 Action Plan for migrants, based on the idea that migrants serve as role models and facilitate outreach to specific groups. More anecdotally, the French language has an expression to describe the migrant, glorified by successes overseas, and becoming a role model: l'oncle d'Amérique. Here, the diffusion of culture occurs between the diaspora and the home community.

This paper incorporates and formalizes all of these intuitions in a unified theoretical model. In this unified model, migration can either lead to cultural convergence or divergence between home and host countries. The model consists of two parts: a static/compositional component and a dynamic/diffusion component. The static part starts with the decision to migrate, which is motivated by both cultural homophily and a universal quest to improve one's material situation. If cultural self-selection is the primary motive, we predict that migration should lead to cultural divergence. Conversely, if economic gain dominates, then migration leads to social mixing and cultural convergence. Then, we consider cultural dynamics, analyzing how culture diffuses from migrants to natives, natives to migrants, and migrants to their home communities.

The model yields distinctive predictions which we bring to the data. Similar to the aforementioned papers we use the term culture in a very broad sense, as a set of attitudes, preferences, beliefs and values that govern individual behavior and thereby determine aggregate social, political and economic outcomes (see Alesina & Giuliano, 2015, for an overview of the economics of culture). We use the World Value Survey, which covers issues of beliefs, family values, religiosity, in a cross-section of almost 100 countries over six waves. We develop three different time-varying bilateral distance measures. These statistic measures are similar to the ones used in computer science and applied maths (Cha, 2007) as well as other papers in cultural economics (De Santis et al., 2016; Desmet & Wacziarg, 2018).

The empirical analysis of over one thousand country pairs between 1981 and 2014 shows that migration leads to cultural convergence between sending and receiving countries. Cultural convergence is in line with social mixing, dissemination and cultural remittances. We then dive deeper into the mechanisms and provide evidence consistent with cultural convergence being driven by cultural diffusion not at destination but in the sending country. The results are robust to using various cultural distance measures, including bilateral as well as destination-year and origin-year fixed effects and the inclusion of other time-varying bilateral determinants of cultural similarity, such as trade or economic distance. They results are consistent with the primacy of cultural remittance, and inconsistent with the narrative of a Western culture under threat. On the contrary, it suggests that immigration may be a tool of soft power and cultural influence abroad.

The paper is organized as follows: section 2 introduces a theory of migration-driven cultural change. In section 3, we document the data sources and elaborate on the meaning and statistical measurement of bilateral cultural similarity. Section 4 shows the results from our empirical analysis, comparative statics, and some robustness checks. Section 5 concludes.

2 A theory 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**).

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3.1 A compositional model of migration and cultural change

We consider two countries A and B. We assume that only the nationals of country A (the home country) are considering migrating to B (the host country). For simplicity, we only consider one-directional migration but the model can be accommodated to account for migration in both directions (A to B and B to A). 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_i^A and q_i^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 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 (CDF) $\mathcal{G}$ with support on $\mathbb{R}$. Assuming quasi-linear preferences,[4] the pool of type-i country A nationals who wish to migrate is composed of anyone such that

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

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. β characterizes the relative weight of the economic motive in the migration decision, and $1-\beta$ the weight of the cultural motive. In other words, each individual is facing a migration choice that involves economic and cultural gains or losses. Economic gain is the additional (lifetime) income that an individual can expect when migrating to another country. It can possibly be negative. Cultural homophily is a property of the utility function, assumed to increase when a larger fraction of the population is of the same cultural type as the individual. Individuals derive utility from living with people that have the same cultural type. 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. The balance between the two components is captured in β.

When $\beta = 0$, only homophily matters in the decision to migrate: potential migrants are attracted by a higher share of same-type individuals in the destination country. 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. Potential migrants compare the cost of migration to the prospect of economic gains, but do not consider the cultural change involved. As a result, assuming that expected economic gain and cultural types are not correlated,[5] the pool of potential migrants is a culturally representative sample of the home country population.

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. 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. To simplify the notations, let us introduce $\mathcal{G}_i \equiv \mathcal{G}((1-\beta)(f(q_i^A) - f(q_i^B))/\beta)$ the fraction of type-i individuals not interested in moving, and similarly $\mathcal{G}_j \equiv \mathcal{G}((1-\beta)(f(1-q_i^A) - f(1-q_i^B))/\beta)$. $1-\mathcal{G}_i$ (resp. $1-\mathcal{G}_j$) is the fraction of type-i (resp. type-j) individuals who wish to migrate. To further simplify notations, let us also take i as the generic

[4] 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.

[5] If we do not make this assumption, the prospect of economic gains is unevenly distributed between the two types. A paradox may arise at the extreme, if the majority-type has a greater overall incentive to migrate, despite a cultural reluctance to do so. How would this affect the model? Even with anti-selection into migration, 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. As a result, we prefer to simplify the exposition of the model by assuming cultural types and economic gains uncorrelated.

cultural type. For instance, we will write $q \equiv q_i$. As a result, $q_j = 1 - q$. At each successive draw of a new migrant, the probability that her type is i is

$$\pi \equiv \pi_i(q^A, q^B) = \frac{q^A(1 - \mathcal{G}_i)}{q^A(1 - \mathcal{G}_i) + (1 - q^A)(1 - \mathcal{G}_j)} \tag{2}$$

Within each period, the cultural composition of the two country evolves according to dynamics which can be simply written:

$$\begin{cases} \dot{q}^A = q^A - \pi \\ n\dot{q}^B = \pi - q^B. \end{cases} \tag{3}$$

The game reaches its equilibrium when the pool of potential migrants is empty, that is, when $\mathcal{G}_i = \mathcal{G}_j = 1$. The system thus displays intuitive features. Let us first examine separately the two motives for migration: cultural homophily and the prospect of economic gain. To simplify the discussion, we may assume that type-i individuals are more frequent in country B, and scarcer in country A: $q^A < q^B$ (from now on, we maintain this assumption).

If $\beta = 0$, individuals only rely on cultural homophily when deciding to migrate. In this case, the pool of potential migrants is composed of all individuals of the relatively scarce type i, who wish to move to country B, where their type is relatively abundant, and no abundant-type individual (**cultural self-selection**). Then $\mathcal{G}_i = 0, \mathcal{G}_j = 1$, 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. In that case, the cultural selection effect dominates, which leads mechanically to cultural divergence between the two countries.

If $\beta = 1$, individuals only consider their prospect of economic gain. In that case, $\mathcal{G}_i = \mathcal{G}_j$, 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 social mixing effect dominates, which leads mechanically to cultural convergence between the two countries.

Finally, in the more interesting case, $\beta \in]0, 1[$: individuals take both motives into consideration. $\mathcal{G}_i < \mathcal{G}_j$ and finally, $\pi > q^A$: with cultural homophily, the scarce cultural type is over-represented in the migrant population. Thanks to Eq. (3), it is straightforward that $\dot{q}^A < 0$: the scarce cultural type becomes progressively scarcer in the home country. In the host country, we must consider two cases, as π may be larger or smaller than q^B. If $\pi > q^B$, that is if the cultural homophily largely dominates the decision to migrate, then the relatively abundant type becomes progressively more abundant. As type-i become scarcer in country A and more abundant in country B, the pool of type-i migrants expands (up to a point which may or may not encompass the whole type-i population), while the pool of type-j migrants shrinks. In equilibrium, the two countries have diverged culturally. Conversely, if $\pi < q^B$, the prospects of economic gains are prominent (for high values of β). The share of type-i individuals decreases in both countries. This suggests the possibility of cultural convergence between countries A and B for high enough values of β, when the economic motive is the principal driver of migration.

Formally, in continuous time, we define divergence as $(q^A - q^B)(\dot{q}^A - \dot{q}^B) > 0$, and convergence otherwise. As a reminder, in the generic situation, i is the relatively scarce-type in home

country A, so that $q^A < q^B$. Convergence thus corresponds to $\dot{q}^B < \dot{q}^A$. In discrete time, this translates into $q^B_{t+1} - q^B_t < q^A_{t+1} - q^A_t$, which rearranges into: $q^B_{t+1} - q^A_{t+1} < q^B_t - q^A_t$. This is very straightforward: the distance between countries A and B decreases between t and $t+1$.

This compositional model (COM) brings together cultural mixing, arguably the most intuitive mechanism that links migration to cultural composition, and cultural self-selection, another rather intuitive argument. The model suggests a set of clear empirical predictions, and would help interpret the data. For instance, empirical support for COM with cultural convergence would be interpreted to imply the domination of the economic motive of migration.

We make a practical distinction between the host *population*, which does not include migrants and the host *country*, which comprises both the native and the migrant population. As its name indicates, the compositional model offers a mechanistic view of migration, one in which preferences are not affected through social interactions or active policy. The compositional model does not incorporate assimilation of migrants in the host population, i.e. migrants core beliefs are sticky and not impacted by the host population. Nor does it feature dissemination of migrant values to either the native host population and transmission to the origin community. In general, there are no cultural spillovers across group boundaries. We will relax these assumptions in section 2.2. and allow for mutual influence between the host and the migrant populations, as well as influence of the migrants on the cultural mix in their home country. But for now, let us examine the predictions of this mechanistic model.

If economic incentives are not the only driver of migration (i.e. $\beta < 1$), we predict that the scarce type becomes scarcer at home. We thus obtain a first prediction:

COM prediction 1

- 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*

Migration in the compositional model can lead to both convergence and divergence between home and host countries. However, once we exclude migrants, we rule out cultural mixing and therefore must have cultural divergence if the compositional model holds.

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 $\mathcal{G}_i(q^A, q^B, \Delta g) = \mathcal{G}\left(-\Delta g + (1-\beta)/\beta\left(f(q^A_i) - f(q^B_i)\right)\right)$ among type-i individuals and $\mathcal{G}_i(q^A, q^B, \Delta g) = \mathcal{G}\left(-\Delta g + (1-\beta)/\beta\left(f(1-q^A_i) - f(1-q^B_i)\right)\right)$ among type-j ones. For distribution functions $\mathcal{G}$ without fat tails, the ratio $(1-\mathcal{G}_j)/(1-\mathcal{G}_i)$ decreases with Δg, and so does π. There are more candidates to migration in both subpopulations but the cultural selection effect becomes less important relative to the economic motive. Therefore, the cultural mixing effect dominates.

COM prediction 2

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

Now, consider what happens for countries that are initially closer or further apart culturally speaking. For country pairs that are further apart, that is, for lower (negative) values of $f(q^A) - f(q^B)$ and, correspondingly, larger (positive) values of $f(1-q^A) - f(1-q^B)$, we have a large $1-\mathcal{G}_i$, a smaller $1-\mathcal{G}_j$, and a high π, possibly close to 1. The cultural selection effect is strengthened and we would expect stronger divergence or weaker cultural convergence. In sum, initial cultural proximity favors cultural convergence, but initial cultural distance deters it, to the point where we might observe divergence.

COM prediction 3

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

Finally, to simplify the discussion, we have described migrants as drawn in succession before the process reaches its equilibrium. This does not mean that the mechanism is dynamic: each migrant immediately contributes to changing the cultural composition at home and at destination. We showed that 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. In other words, cultural selection into migration now would increase cultural selection into migration in the future (until the pool of potential migrants is depleted): the cultural selection effect becomes more powerful as time grows.

COM prediction 4

Past migration should result in weaker convergence, or stronger divergence, than present migration.

The compositional model offers the potential for various extensions and an even larger set of predictions.[6] 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

[6]There is another parameter of the model that we have not discussed yet. Eq. (3) 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

and immigrants in the host society. Overall, COM prediction 1 captures the core implication of the model. Predictions 2 and 3 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 Intergenerational Cultural Formation

The model of cultural transmission proposed by Bisin & Verdier (2000) illustrates how different cultural types can coexist in equilibrium. Individuals socialize their offspring with a probability of success directly linked to the costly socialization effort they provide. Bisin and Verdier suggest that a type-i individual would rather have a type-i 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. The proportion of type-j individuals who can become role models is therefore $1 - \chi$. With socialization costs $H(\tau_i)$, the program of the type-i individual is

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

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 $H(\tau) = \frac{1}{2}\tau^2$. 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 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. We get the following characterization of the cultural equilibrium q^*:

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

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

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.

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 timeframe of successive generations. For a number of theoretical and empirical reasons (in particular, that generations overlap), we are agnostic as to the exact timeframe in which we should expect cultural formation to roll out. Nevertheless, the dynamic nature of these three mechanisms matters empirically.

3.2.1 An 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. η^B is the probability that a role model will be picked from within the native population. With probability $1-\eta^B$, the offspring picks a migrant role model. 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 sign 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:

$\partial q^{B*}/\partial \pi > 0$. The values and norms carried by migrants affect cultural formation at destination. At one extreme, 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. This brings countries closer together. At the other extreme, cultural selection into migration means a shrinking presence of the minority type at home (as per 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. Qualitatively, migrants representative of their home culture means cultural convergence, while enough self-selection into migration means divergence.

$\partial q^{B*}/\partial \eta^B$ 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.

DSM prediction 1

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.

DSM prediction 2

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

DSM prediction 3

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

Both COM and DSM paint the picture of clusters of countries. Countries within clusters are brought together closer by migration, but clusters are growing apart from one another. Time has two main effects in this model. First, past migrants continue to play a role in cultural formation at destination, and the natives they influence compound this influence with time. Second, as predicted by the compositional model, selection into migration might increase over time. In the logic of the model, the home population converges back to its former cultural equilibrium, in the timeframe predicted by the dynamic model. This attenuates the logic of the compositional model, which suggests that past migration should weaken convergence or emphasize divergence, but does not suppress it: selection into migration still emphasizes selection into migration in the short run, pushing the home country away from the cultural mix at destination. The first effect, however, is ambiguous. Focusing on the host country, it suggests that migrant 'pull in' the native population, either away from the cultural mix at home if $\pi > q^B$ (adding to the divergence), or towards the cultural mix at home if $\pi < q^B$ (limiting divergence, and possibly emphasizing convergence). The overall dynamic aspect of DSM is ambiguous.

3.2.2 A model of migrant assimilation (ASM)

Second, immigrants may adopt norms and values from natives. η^m is the probability that a role model will be picked from within the migrant community. With probability $1 - \eta^m$, the immigrant offspring picks a native role model. Overall, the offspring chooses a type-i role model with probability $\chi(\pi, q^B, \eta^m) = (1 - \eta^m)q^B + \eta^m\pi$. With the same notations as in DSM,

the cultural equilibrium π^* is characterized by the equation $g(\pi^*, q^B, \eta^m) = 1$.[7] 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 overrepresented among migrants ($\pi > q^A$). If anything, ASM provides a second reason for this overrepresentation:

$\partial\pi^*/\partial\eta^m$ 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 leads to an important discussion of a modeling assumption. In the exposition of COM, DSM, and ASM, we have implicitly assumed that the decision to migrate was made without taking into consideration the alternative socialization costs in both countries. 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. At no cost to the generality of the model, we can therefore dispense with it in the name of simplicity.

3.2.3 A model of cultural remittances (REM)

Third, we consider how migrants may "remit" values and norms back to their home community. η^A is the probability that an offspring at home picks a local role model. With probability $1 - \eta^A$, the offspring chooses a role model from the emigrant population. Overall, the offspring chooses a type-i role model with probability $\chi^A \equiv (1-\eta^)\pi + \eta^A q^A$, and a type-$j$ role model with probability $1 - \chi^A$. The cultural equilibrium q^{A*} is characterized by the equation $g(q^{A*}, \pi, \eta^A) = 1$. Again, 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 overrepresented

[7] It seems 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, however. 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 in this paper.

among migrants, and to remain so ($q^A < \pi$). According to this new mechanism, and contrary to what COM predicts, the share of the relatively scarce type-*i* individuals may actually increase in the home country A.

$\partial q^{A*}/\partial \eta^A < 0$. 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.

REM prediction 1

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. We believe that there is a kernel of truth in all mechanisms, COM, DSM, ASM, and REM. We expect that they unravel at different speeds in the data. While the compositional model hints at immediate effects of emigration, e.g. the mechanics of migration, the transmission may reflect how the cultural technology of migration materializes in the longer term. Contrary to COM, REM does not provide such a clear time frame for the effect of migration. Migration from A to B between times t and $t + 1$ might have an impact on the cultural mix of country A before $t + 1$, and the effect may persist after $t + 1$.

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.

REM prediction 2

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

REM prediction 3

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

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.

Again, time has two effects in this model. 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. The compatriots they influence then compound this influence over time, pulling the home country closer to destination.

REM prediction 4

Past migration should result in stronger convergence than present migration.

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 below), 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)	
Past migration	−− (COM4)		++ (REM3)	

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

4 Cultural Distance Measures

4.1 Data

One of the main sources for cultural values in a society is the World Value Survey (WVS), which consists of nationally representative surveys among 400,000 respondents in 6 waves between

1981 and 2014. The WVS includes questions on political beliefs, family values, religiosity, attitudes, and other dimensions of culture in a repeated cross-section of almost 100 countries (we elaborate on the different dimensions of culture in more detail in section 4.1). 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.

Migration data comes from the joint OECD and World Bank's Extended Bilateral Migration Database, which covers migration flows for each decade between 1960 and 2010. Bilateral migration is measured in stocks (bilateral migration flows are not available). Consequently, 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. 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). The IAB dataset can help us tease out the varying impact of migration, depending on the educational level of migrants, on cultural proximity. The United Nation ComTrade Database provides yearly bilateral trade flows around the globe, which we average over the time periods corresponding to the WVS waves. Trade is a useful control and comparison point to measure the effect of migration on cultural proximity. 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.

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. To rule out classical concerns about unbalanced panel data sets and to facilitate the interpretation of our coefficients, we construct a balanced panel which consists of 24 countries for which we have both migration, trade, and WVS data in the years 1995, 2005 and 2010. Additionally, we construct another panel that covers 12 countries for which we have the corresponding data for 4 consecutive waves in 1995, 2000, 2005, and 2010. In addition to the analysis of the unbalanced panel with the full set of countries, this will allow us to estimate more precisely how an increase in bilateral migration is associated with

a change in the bilateral cultural distance.

4.2 Cultural Dimensions

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. (2015), and De Santis et al. (2016) include a vast set of questions with highly imbalanced coverages 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 World Value Survey that are available in at least the 4 waves between 1994 and 2014 (most of them cover all 6 waves). In doing so, we avoid compositional effects that can either come from the selection of questions or countries that are missing in a given wave.

Most important for our purpose, the third wave of the World Value Survey 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 simple geographical categorization of cultural preferences. The same question has been extended to account for multiple responses in wave 3 and all subsequent waves, where respondents can choose five out of eleven possibilities (good manners, independence, hard work, feeling of responsibility, imagination, tolerance and respect for other people, thrift saving money and things, determination perseverance, religious faith, unselfishness, obedience). This set of questions is most appropriate to test our model of intergenerational cultural transmission.

In Figure 2, we analyze the cultural proximity of countries using the values that individuals would like to pass on to their offspring. We conduct a principal component analysis, which identifies 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 discriminate 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. The apparent proximity between Taiwan, Japan, and Northern European countries may come across as more of a surprise, and sheds new light on the perception of cultural distance across countries.

The WVS captures other dimensions of culture. One question concerns the importance of family, friends, leisure, work, politics or religion in the life of respondents (for each item, they can choose between very important, rather important, not very important, not at all important). We use this question in addition to the "values to children" question to highlight the difference of cultural values in the intensive margin. In Figure 3, we replicate the principal component analysis on this question. A simple comparison between Figure 2 and 3 reveals that broadly

similar groupings of countries, whether we consider the values passed on to children or priorities in life.

The theoretical analysis is founded upon the idea of self-selection into migration and cultural homophily. We have no reason to expect that all cultural dimensions are equivalent in that regard. Our analysis includes other dimensions of cultural preferences captured in the WVS (a comprehensive summary of the WVS questions used is given in Table 3). First, while attitudes about religion and family are persistent, trust can change quite dramatically (Putnam, 2001). The WVS asks: *Do you think people can generally be trusted or you cannot be too careful?*, a question which has been widely used to characterize social capital (Knack & Keefer, 1997; Alesina & La Ferrara, 2002; Portes, 2014). Trust differs qualitatively from personal beliefs, such as religiosity for instance, in that it is highly dependent on reciprocity and the environment. Finally, our analysis covers views on gender equality and the feeling of control over one's life.

For most of the empirical analysis, we create aggregate measures of cultural proximity for all questions that meet our coverage criterion. To shed light on the sources of cultural convergence and possible heterogeneity in cultural dimensions, we also consider thematic clusters of cultural questions.

4.3 Statistical dissimilarity

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).

The most well-known group of distance measures are derivatives of the Minkowski norms, which is written as $M_p = \sqrt[p]{\sum_{i=1}^{d} |P_i - Q_i|^p}$. 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. Two almost identical countries that differ significantly along one cultural dimension 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. The Euclidean norm is the usual Pythagorean metric. In a statistical analysis, the Chebyshev distance increases the weight of outliers, while the Canberra distance decreases it. Joint consideration of the three measures alleviates possible concerns as to the interpretation of a cultural distance.

We also consider statistical measures of *overlap*, also known as *inner product*. These 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 in country A and county B would give the same answer to a question in the World Value Survey. 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.

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:

$$\mathbf{A} : 0\,0\,1\,1\,0\,1\,0\,1\,1\,0\,0$$
$$\mathbf{B} : 1\,0\,1\,1\,0\,0\,0\,1\,1\,0\,1$$

We calculate the share of people that have chosen the first characteristic for each country and wave and do the same for all of the possible answers (this yields the shares of people by characteristic, country and wave). We then calculate the Euclidean distance by taking the squared difference of the share of people in country i that have picked the first character trait and the share of people in country j. We repeat and sum this for all 11 dimensions. We then take the square root of this term, standardize it to normal for each wave, and multiply it by -1 in order to turn the distance measure to a proximity measure. The normalization of the measures has two advantages. First, it gives an easy way to interpret the sign of the measure, that is more similar countries have a positive distance measure, more dissimilar ones have a negative sign. Second, it makes them more comparable across cultural dimensions (note that the number of questions available for each cultural dimension varies largely), as these measures are sensitive to the number of questions included. This problem can be remedied by taking the overall standard deviation and mean for each wave for all countries into account. We present the distribution of all three measures in Figure 6 (summary stats on the Cultural Similarity Indexes are also presented in Table 2).

In this paper, we are agnostic towards the choice of the best distance measure. However, 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 (the Euclidean, the Herfindahl Index, and the Canberra relative distance) 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., 2015; 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 maximum value is 1). 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 a second step, we try to establish which of the mechanisms is likely to drive cultural convergence or divergence through comparative statics and other analyses. In our most demanding specification we include fixed effects for each country pair, home-time and destination-time fixed effects, which allows us to track changes within country pairs over time, irrespective of non-time varying bilateral determinants as well as time specific shocks (economic, political, environmental etc.) to sending and receiving countries. The equation writes as follows:

$$CS_{ijt} = \beta_0 + \beta_1 Mig_{ij,t-\Delta} + \beta_2 Trade_{ij,t-\Delta} + \theta_{ij} + \theta_{it} + \theta_{jt} + \varepsilon_{ijt}$$

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 trade $Trade_{ij,t-\Delta}$ 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 at 1994, we take data from 1990 with a $\Delta = 1$ lag; for $\Delta = 2$ we use data from 1985 etc. We follow Egger (2000) in including sending country-time and receiving country-time fixed effects, as well as bilateral fixed effects to control for non-time-varying characteristics of country pairs, accounting for above-mentioned traditional gravity controls (contiguity, geographical distance 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.

We show the raw conditional correlation between migration and cultural similarity first, then including fixed effects in our OLS regression. For the OLS regressions we use the aggregate measure 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 changes in the sample of countries. The coefficient β_1 is an aggregate effect of all of the mechanisms. The sign of the coefficient will tell us which mechanism are dominant in the framework of migration-based cultural change.

5.1 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, e.g. migrants will move to richer countries rather than migrants making countries richer. Conceptually this is an argument for endogeneity with regards to the *size* of migration in response to destination country characteristics. Many of the macro-level analyses rely on the "shift-share," or Bartik instruments, which predict the exogenous share of migration with prior migrant networks at destination. This and other classical types of IV approaches are not suitable in the context of our study for several reasons:

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, cultural remittances) would only be attenuated by the size of migration. 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. What matters in our context is the cultural *composition* of the migrant pool and its implications for the cultural dynamics at origin and destination. Exogenously predicting the *size* of migration would 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 but have to rely on sub-sample analyses and comparative statics to test how a presumably more or less culturally selected migrant pool will affect cultural similarity over time.

Still, one might be worried about omitted variable bias: for instance, that well known and deeply rooted cultural similarity or that conditions at destination or origin at a certain point in time will simultaneously drive migration and cultural change between countries. 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, 2017; Galor & Savitskiy, 2018). These fundamentals of cultural similarity are typically also the ones that drive individual migration decisions (Mayda, 2010; Belot & Ederveen, 2012). Additionally, general trends at destination or origin are captured 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 the concern that time-variant cultural dimensions that are specific to the country pair in question could drive migration. For instance, a head of state declaring that migrants from a specific source country are particularly welcome or a cultural shift at destination that is particularly relevant for a certain source country could impact the individual migration decision.

Additionally, even if the *size* of the migrant stock is not our primary concern, one might still worry about instantaneous responses of migration to cultural similarity, where we cannot distinguish between the effect of the cultural composition of the migrant pool on cultural similarity but where the cultural similarity impacts the composition of our migrant pool. In fact, the latter is already part of our theoretical framework, namely within the compositional model, where we theorize the effect of cultural selection (and then later test them in predictions 3). Nevertheless, in the baseline we want to account for instantaneous responses (and associated measurement error) by lagging migration by 5 years. For endogeneous cultural selection to occur, this means that migrants would be able to anticipate changes in bilateral cultural similarity in 5 years from now and adjust their migration decision accordingly. Since this foresight seems unlikely, we hope that this will partially account for migration as an immediate response to a change in cultural similarity.

Overall, the aim of the paper is to first establish a reduced form effect (convergence versus divergence) and then try to distinguish between mechanisms as best we can. For the reduced form we use the full set of fixed effects, different compositions of our sample, and three different distance measures to establish a first result. Then we dig into the potential mechanism by varying the timing of migration (different lags), excluding migrants from the respondent pool, incorporate economic factors and skill differences between migrants, look at initial cultural distances, diversity of destinations and more.

5.2 Convergence or Divergence?

The baseline results serve as a first look at the net effect of migration on cultural proximity. The reduced form analysis first establishes whether we observe overall convergence or divergence. In the theoretical discussion, we have shown that overall unqualified convergence could be the result of cultural mixing at destination, with or without dissemination of migrant values to natives, or of cultural remittances from migrants to their origin communities.

5.2.1 OLS Analysis

Table 5 presents the results of the OLS regression. Overall, we find that migration in the previous period (i.e. 5 years prior) is associated with cultural convergence, controlling for

the full set of fixed effects. The results are presented for the Euclidean, the Herfindahl, and the Canberra measure of cultural similarity aggregated over all cultural dimensions, including values desired to inherit to children, priorities in life, ideas about gender equality, generalized trust, and freedom of choice. Column 1 presents the raw correlation between bilateral migration and cultural similarity. The first column shows a positive and strongly significant correlation at the 1% significance, indicating that culturally similar countries also experience high levels of bilateral migration (in the previous period). We successively introduce different types of fixed effects. First, we want to 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 movements 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. As expected, the variation explained by our model increases substantially. In a second step, we introduce only bilateral fixed effects. These reduce the magnitude of the correlation, as well as the power of the estimation, as expected if they capture (and rid us of) time-invariant determinants of both migrations and cultural shifts. Adding the full set of fixed effects reduces the magnitude of the correlation further, but it also improves the precision of the estimation, as expected if country-specific shocks had introduced a systematic bias in our initial specification, because they affected either migration flows or cultural shifts, but not both at the same time. Nevertheless, the result holds when we introduce these fixed effects. It is tempting to interpret this as evidence that a change in bilateral migration in $t-1$ leads to an increase in cultural similarity in t, but we still need to keep in mind two alternative interpretations. First, the positive correlations could reflect on time-varying bilateral determinants of both migrations and cultural proximity. Second, the anticipation of cultural convergence may be a driver of migration. While we remain cautious about the causal interpretation, we note that the positive correlation of migration and cultural convergence is overall consistent for the three different statistical measures of cultural similarity.

In terms of the magnitude of the effect, for the specification with the full set of fixed effects and the Euclidean distance measure, we estimate that a 10% increase in migration is associated with an increase in cultural similarity of 0.2, e.g. 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[8]. Or an alternative interpretation would be: 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[9]. This average treatment effect, of course, masks substantial heterogeneity across country pairs. However, these examples help to illustrate that the effect sizes are non-negligible.

In all our specifications we include trade as an important control variable, situating our results in the literature on trade and cultural convergence. Although we can partially replicate the results of (Maystre et al., 2014), in our most demanding specification with the full set of

[8]This is taken from the Euclidean distance measured in 2005, where the CS between the US and Italy is approximately 1.2 and the CS between the US and the UK is at approximately at 1.4

[9]We have used the same year (2005) to make this comparison with Cultural Similarity between the US and Canada at approximately 1.76 and Cultural Similarity between the US and Mexico at approximately 0.05

fixed effects, the effect of bilateral trade on cultural convergence disappears. Maystre et al. (2014) only use data from the 2nd and 4th wave of the World Value Survey, selecting a set of 30 questions and building an index of fractionalization, akin to the *Inner Product*. They do not include country-time fixed effects and differentiate between different types of trade, which may explain the differing results. Exploiting a larger sample, including all waves of the WVS and using several distance measures, the coefficient of trade switches sign and ultimately loses statistical significance once we introduce bilateral fixed effects.

5.2.2 Balanced Panel

In order to rule out concerns about results being potentially driven by changes in the WVS sample over time, we construct two balanced panel data sets. The balanced panel regression reduces 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 through the construction of a balanced panel. In our constructed balanced panel we pick the three WVS waves with the highest country coverage (wave 3 with 53 countries, wave 5 with 58, and wave 6 with 59) such that we can track 24 countries for the period between 1994 and 2014. 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 largest 4-wave balanced panel we can construct is composed of 12 countries.

The results of the balanced panel regressions are presented in Table 6. 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.[10] In Table 7, we present the panel regression results for the disaggregated measures. Splitting the measure into its thematic subcomponents gets rid of a significant share of the variation explained through the model despite the inclusion of a large set of fixed effects. In fact, the R-squared drops from over 90% to an average 60% and even down to 35% in some cases. This shows that the aggregation of the different thematic dimensions of the cultural similarity index has an explanatory value in itself by showing that cultural convergence cannot easily be reduced to a single dimension of culture. All of the panel specifications find positive and significant effects of migration of the convergence relative to gender attitudes and the feeling of having choice and control over ones life. In the majority of cases, the sign of the migration coefficient is positive and consistent.

Our reduced-form analysis exploits within country-pair variation over time and distinguishes between different measures of cultural proximity. We consistently find that migration is associated cultural convergence between countries. As we have already mentioned, this result is consistent

[10]In both unbalanced and balanced panel regressions the coefficient on the Herfindahl measure of Cultural Similarity turns negative when controlling for bilateral fixed effects indicating that the *Measure of Overlap* is affected differently by origin and destination time-specific shocks than our Minkowski-type distance measures (Euclidean and Canberra). This uncovers some of the conceptual differences between the statistical measures and illustrates how important the inclusion of a complete set of measures and fixed effects is in order to draw conclusions about the empirical relationship of our two variables of interest. We are somewhat confident in our finding of cultural convergence, as the inclusion of all fixed effects leaves us with consistently strong and positive coefficients for bilateral migration.

with both the cultural mixing effect at destination (COM), with or without dissemination (DSM), and with cultural remittances (REM). In the following section, we will try to discriminate between the various mechanisms.

5.3 Static or Dynamic Convergence?

In this section we try to distinguish between COM1 and REM1. The baseline regression shows that migration is associated with bilateral cultural convergence. We can now focus on disentangling the potential mechanisms that could drive convergence in our model: cultural mixing at destination, with or without dissemination, or cultural remittances from migrants to their origin community. Since the data does not allow us to test these mechanisms directly, we rely on a comparative analysis, which we base on implications that we derive from the model. First, we look at the timing of convergence relative to migration. Second, we examine directly COM1 and REM1, excluding migrants from the population of the destination country.

5.3.1 Timing of Migration

Compositional effects, self-selection and cultural mixing, should be instantaneous, happening at the time of migration. Diffusion effects, dissemination, assimilation, and cultural remittances, should magnify over time.

The bottom half of Table 8 replicates the baseline results for which we lagged migration by 5 years. The top half reports the results when lagging migration and trade by 5 additional years, increasing the overall lag to 10 years. We have fewer observations, which increases the standard deviation accordingly. However, the magnitude of the effect increases substantially (almost doubles for the Herfindahl Index), and overall more statistically significant. These results do not contradict the existence of compositional effects, but they support the existence and relative strength of diffusion effects. We illustrate this result in Figure 8, where we plot the coefficients including the full set of fixed effects for all distance measures. The middle panel shows our baseline estimation with the usual lag of migration of five years, the bottom panel shows the coefficients for the estimation in Table 8, and the top panel shows the effect of migration on cultural similarity when its instantaneous[11]. The effect of migration on cultural similarity is magnified as time passes. Cultural remittances (REM1), or dissemination (DSM1, with cultural mixing) progressively gain traction. According to REM1, the migrant has had time to learn the language, become more familiar with the local culture and eventually transmits these values to the home community. According to DSM1, a native at destination has had time to learn about the values and norms about the immigrant culture and adopt them. These are very different mechanisms, but predictions 1 are not enough to discriminate between them.

5.3.2 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 is cultural mixing, i.e.

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

more immigrants in the destination country, mechanically making home and host countries more similar. Excluding migrants from the host population, however, should allow us to abstract from the cultural mixing effect. COM, reduced to self-selection into migration, predicts divergence (COM1). REM1 predicts convergence, and DSM1 remains indeterminate.

We focus on the two waves of the World Value Survey 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 measure and report the results in Table 9 (the results hold for the Herfindahl and Canberra measure of cultural distance). Excluding the foreign-born from the analysis does not alter our baseline results: we still observe convergence, in support of REM1, and against COM1. The size and significance of the coefficient are virtually identical. 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. We take these results as further evidence for an effect of international migration on cultural convergence that goes beyond a simple re-allocation of cultural types.

5.4 Economic Gains from Migration

In this section we will look more closely at predictions 2, specifically COM2 and DSM2 vs. REM2. In the exposition of COM, we have shown why we think that an increase in economic gains from migration should correspond to a less culturally selected pool of migrants. Both COM and DSM predict that a less selected pool of migrants favors convergence. REM, meanwhile, yields the surprising opposite prediction that more selection into migration should eventually bring countries closer together. In the absence of individual level data on the economic returns from migration, we rely on (imperfect) proxies to approach this question. First, we control for bilateral income gaps to account for the fact that increases in economic distance between countries will also have an impact on the economic gains from migration. Second, we contrast skilled versus unskilled migration, using a classical insight from international economics: unskilled migrants have a greater economic incentive to migrate than skilled ones.

5.4.1 Bilateral Income Differences

Ideally, to discriminate between COM and DSM on the one hand, and REM on the other, we would control for economic gains from migration constant and see how the coefficient for migration changes. In the absence of individual data, we control for the GDP gap, as a proxy of aggregate economic gains from migration. This has several flaws. First, the GDP gap captures the economic gain from migrating net of costs. With a higher GDP gap, we also expect migration costs to be higher. Second, even in the absence of individual data, we would prefer to have a sector-specific proxy of economic gains. With such a proxy, we could use fluctuations in high-employment sectors of the home country. Unfortunately, the GDP gap is even more aggregated. We cannot make an argument about how the volume of bilateral migration changes once economic factor are controlled for. We simply suggest that once we control for economic distance, the cultural composition of the migrant pool changes (the migrant pool becomes more culturally selected)

and thus its effect on cultural proximity. Also note that we are interested in how the coefficient of migration changes in the medium and long-run, including the full set of fixed effects and GDP gap. This means that we exploit the bilateral changes in economic distance on cultural distance, which in itself is interesting.

We first use GDP gap as a control in our main specification, and we present the results in Table 10. The income gap is negatively correlated with cultural distance in all specifications: countries tend to converge both economically and culturally, or to diverge along both dimensions. The interesting and relevant comparison is the size of the coefficient for migration in this table versus in our baseline results (Table 5). Controlling for the income gap does not change our qualitative results on the effect of migration on cultural distance. Comparing columns 3, 6, and 9 of the first panel of Table 10 with Table 5, we see that in the short term, controlling for GDP gap reduces the effect of migration but this effect is quite small. However, in the medium run (lagging migration by 10 years), we see a significant increase in the coefficient for migration. If we believe that we can capture parts of the economics gains from migration by controlling for the GDP gap between countries, then we expect the migrant pool to be more culturally selected. A culturally more selected pool of migrants indicates *less* cultural convergence in COM and DSM and *more* cultural convergence in REM. We find that in the short-term the coefficient is slightly smaller, but larger in the longer run: this suggests both the overall dominance of cultural remittances (REM) over compositional and dissemination effects (COM and DSM), and a time frame consistent with the dynamic effect of REM.

5.4.2 Lower and High Skilled Migration

In international economics, it is a common intuition that skilled labor is scarcer in developing countries and more abundant in developed countries. We therefore expect a higher gain of migration for low-skilled migrants than for high-skilled migrants, and therefore less cultural sorting between the unskilled. Connecting this to our theoretical model, COM and DSM would both predict *more* cultural convergence through the emigration of the lower skilled and REM would predict *less* cultural convergence. The opposite holds true for high skilled migrants.

We are able decompose the migrant pool into low and high skill, using the IAB dataset (we define high skilled migrants as those migrants who attended college or received any degree above and lower skilled as any education below a college degree). In terms of data coverage we are limited by two restrictions: coverage through the IAB data set and coverage of both sending and receiving country in the WVS. Those restrictions leave us with about 1,800 observations for immigration to OECD countries from both non-OECD and other OECD countries but rather few longitudinal observations by country-pairs.

Table 11 presents the results of the OLS regression by skill level. We replicate the specifications from the baseline model but have to rely on a substantially smaller sub-sample, which weakens statistical power with the full set of fixed effects. Where the coefficient is significant, we find a consistently negative relationship between low skilled migration and cultural similarity and a positive relationship between high skilled migration and cultural similarity. While we can only make very limited inferences from this, we take this as indicative evidence in favor of REM, and against COM and DSM. The pool of high skilled migrants is more culturally selected, which emphasizes the transmission of values from host to home society and therefore increases cultural

convergence.

5.5 Initial Cultural Distance

In this section, we will look more closely at predictions 3, in particular COM3 and DSM3 vs. REM3. In the exposition of COM, we have shown why we think that the pool of migrants is more culturally selected are further apart initially. According to COM and DSM, this favors divergence. Again, REM yields a surprising opposite prediction that convergence should be stronger for countries initially further apart. To discriminate between these contradictory predictions, we use subsample analyses where we look at different types of country pairs. First, we will split the sample based on our similarity indexes at the beginning of our observation period to see whether those country pairs classify as culturally similar or not. Second, we divide country pairs geographically, into the global South and North (differentiating between OECD and non OECD countries) and look at migration and cultural convergence within these sub-samples.

5.5.1 Similar Country-Pairs

We split the sample in similar and dissimilar country pairs. We create a dummy variable called *Similar* that takes the value 1 if a country pair belongs to the top 10% of most similar countries in 1995 in Panel A. Table 12 reports the results of the regression for all three measures, including the demanding set of fixed effects. Migration has the expected positive and significant coefficient, confirming that bilateral migration accelerates cultural convergence, but it does so at a lower intensity for country pairs that were already similar in the first place, as suggested by the negative sign of the interaction term. This supports REM3, against COM3 and DSM3. In the case of the Euclidean measure, the cultural self-selection effect even outweighs the effect of cultural remittances for culturally similar country pairs (adding the coefficient of migration and the interaction term leaves a negative overall coefficient of migration for culturally similar countries) and is almost canceled out for the Canberra measure.

5.5.2 South-North Migration

We continue our sub-sample analysis and focus now on the division of our sample according to what is typically classified as North-North, South-North, and South-South migration. We define as North countries all countries that were member states of the OECD at the end of our observation period (2014). The large majority of observations for bilateral migration in our data are South-North and South-South (together about N=6,200) with a minority of observations for North-North (N=700). We can interpret the migration between South and North in various ways. First, South-North country pairs typically have a clear sending and a clear receiving country, which matches more closely the suggested framework: in our model country A corresponds to the sending non-OECD country and country B is the receiving OECD country. This is a more direct test of the transmission mechanism since convergence through social mixing in both countries (emigrants from A in B and emigrants from B in A) is reduced. Second, we expect that the diaspora from a developing country living in a developed country may potentially keep closer social ties to their host societies or conversely that emigrants from developing countries are more

likely to remain in the intergenerational cultural transmission of the home society (i.e. emigrants are more likely to act as role models). Third, we expect that the cultural distance between OECD countries and non-OECD countries may be larger than between OECD countries.

Table 13 reports the results of the sub-sample analysis for each of the cultural distance measures. All of the results come from the specification with the full set of fixed effects. Interestingly, our observed bilateral convergence comes from South-North migration. The coefficient for this sub-sample is three times the size of our baseline results (see Table 5). For the North-North sample, we find a negative coefficient for migration. This would be in line with the overall cultural sorting mechanism. We find no effect of migration on cultural convergence between Southern countries. The large and positive effect of migration in the South-North sample confirms our expectations. With i) a clear sending and a clear receiving countries, ii) migrants being more likely to be picked as role models and iii) large initial cultural distance, we observe stronger cultural convergence. We consider this as further evidence supporting REM3 against COM3 and DSM3.

5.6 Plausibility Checks

5.6.1 Financial Remittances

REM is founded on the idea that migrants remain a vital part of the cultural formation in their home communities. This implies that there should be some link with their countries of origin and there remains a certain level of interaction. Since we cannot directly observe interactions between emigrants and their home society (especially difficult for changes over time), we propose bilateral remittances as a proxy for the intensity of interactions. Naturally, financial transfers are not equivalent to the transfer of norms or values ("cultural remittances"). However, there are various reasons to consider remittances as a proxy for the intensity of cultural transmission. As discussed in the theoretical exposition of REM, cultural transmission is driven by emigrants remaining a part of the intergenerational cultural transmission. This means that the offspring can pick an emigrant as a role model. Within families, individuals may take after the relative whose remittances help support the family. Their influence can even extend beyond the family, whose affluence might advertise a cultural type in neighboring families. We also interpret remittances as a sign that migrants still have strong family or business ties in their home community. Therefore, remittances are an interesting proxy for the cultural interaction between the diaspora and their home community.

We draw from the World Bank Data Set for bilateral remittances. This data set has one important drawback as remittances on a disaggregate 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. 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,[12] we will be overestimating the number of country pairs with remittances in previous

[12]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.

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.

About 48% of countries have immigrants that send money back to their home countries in 2010. Figure 14 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. Table 14 confirms REM's intuition that countries with stronger social ties between diaspora and home community tend to converge culturally. Columns 1,3, and 5 show a positive and significant effect of migration on cultural convergence in countries where there are remittances. We control for the full set of fixed effects, with no impact on the magnitude of the effect. Meanwhile, in countries without remittances, the effect is not significant. This does not necessarily mean that migration does not have an effect on cultural convergence in those countries but that cultural divergence through selection may play a significant role and even outweigh convergence through transmission.

5.6.2 Concentrated Destinations

The baseline results in Table 5 and 6 look at how migration affects cultural similarity for all country pairs in our data. In our theoretical model, we only consider a 2 country setting. While the model predictions are generalizable to a multi-country setting, empirically the diversity of destinations and origins qualifies our predictions. Conditional on observing convergence, the cultural mixing (COM) and dissemination (DSM) effects suggest that a diversity of immigration origins would dilute the effect of migration on convergence. The effect of cultural remittances (REM), meanwhile, suggests that a diversity of destinations for emigration would dilute the effect of migration on convergence. 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. We test the latter hypothesis.

For this purpose we create a emigration concentration index that captures how diverse the set of destination countries is. 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). We present the density plot for this index if Figure 9. In Table 15 we split the sample along the median HHI value, which lies at 0.57, and run the baseline regression with the full set of fixed effects and all three measures. As expected, 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, in line with REM.

6 Conclusion

In this paper, we propose a model to formalize five intuitions of how migration affects culture in both the sending and in the receiving countries. Self-selection of migrants along cultural values leaves a more homogeneous, more dissimilar population behind, but cultural remittances pull the origin population in the direction of the receiving culture. Meanwhile, migrants bring pieces of their own culture over to the receiving country. They influence, and get influenced by natives.

The model yields a rich set of distinctive predictions. Using panel data from the World Value Survey and bilateral migration data for the period 1981-2014, we discriminate between these predictions. This analysis suggests that migration tends to foster cultural convergence between countries. We show that within-country pair variation in migration is positively associated with changes in cultural proximity. The magnitude of this correlation increases when we lag migration, and survives when we shut down the cultural mixing channel. These first results point towards cultural remittances as the principal effect of migrations on cultural change.

In the absence of a smoking gun to identify the causal effect of migration, we turn to secondary predictions of the various mechanisms. Cultural convergence, if it were explained by cultural mixing or dissemination, should be stronger when self-selection is weaker, and if by cultural remittances, stronger when self-selection is stronger. A variety of tests show that convergence is associated with stronger cultural incentives, and weaker economic incentives to migrate, in line with cultural remittances as the principal effect. Finally, we find suggestive evidence to corroborate the idea of cultural remittances: convergence is stronger for countries in which migrants keep a stronger link with their origin community (as characterized by remittances), and for countries with concentrated flows of migrants.

Interestingly, international migration appears as a stronger and more robust driver of cultural convergence than trade. The results hold for a large set of time-varying cultural distance measures along different statistical and topical dimensions.

Our work can be extended in several direction. First, the cultural remittances mechanism predicts that the sending country converges towards the receiving country. Our evidence is in line with the mechanism, but with our data, we cannot disentangle directly the co-movements of the two countries. Second, our model does not accommodate a possible taste of migrants for diversity, nor network effects at destination. Third, our framework is ill-suited to discuss the assimilation mechanism, and therefore, the full cultural dynamics at destination. Ultimately, our work allows us to argue that the principal cultural effect of migration is cultural remittances, and yet all five mechanisms may play a role. This remains an important topic for future research.

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7 Appendix

7.1 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.

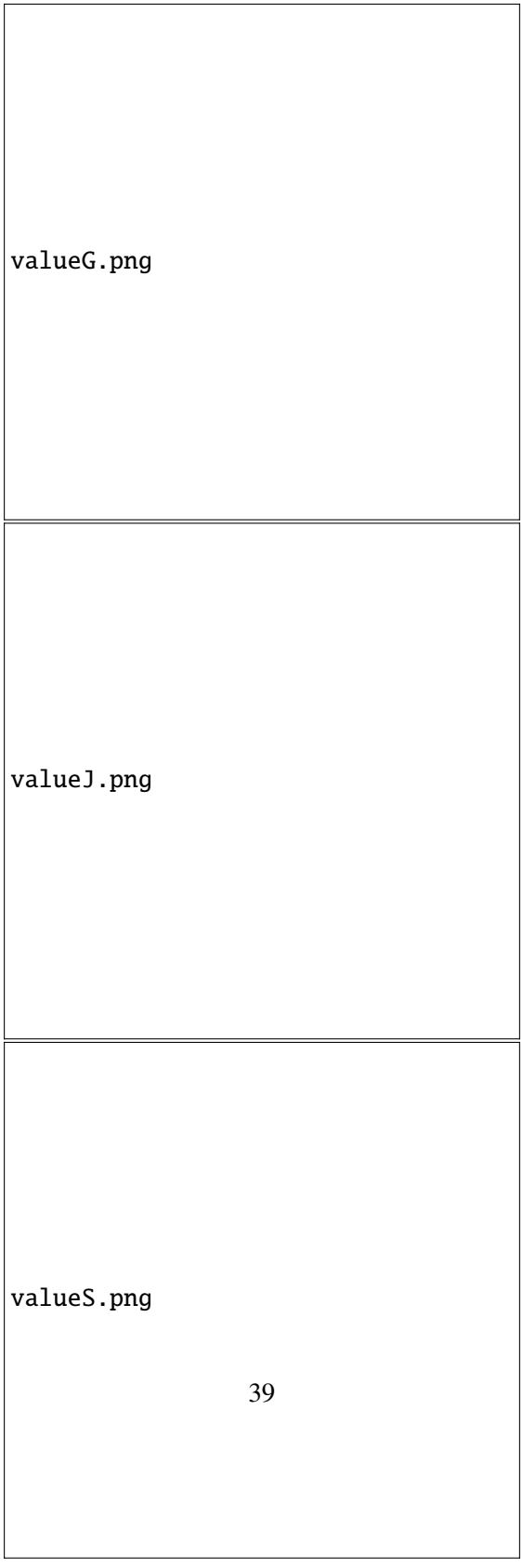
We proceed in the same way to sign $\partial_\eta g$:

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

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 $\partial_\pi g$.

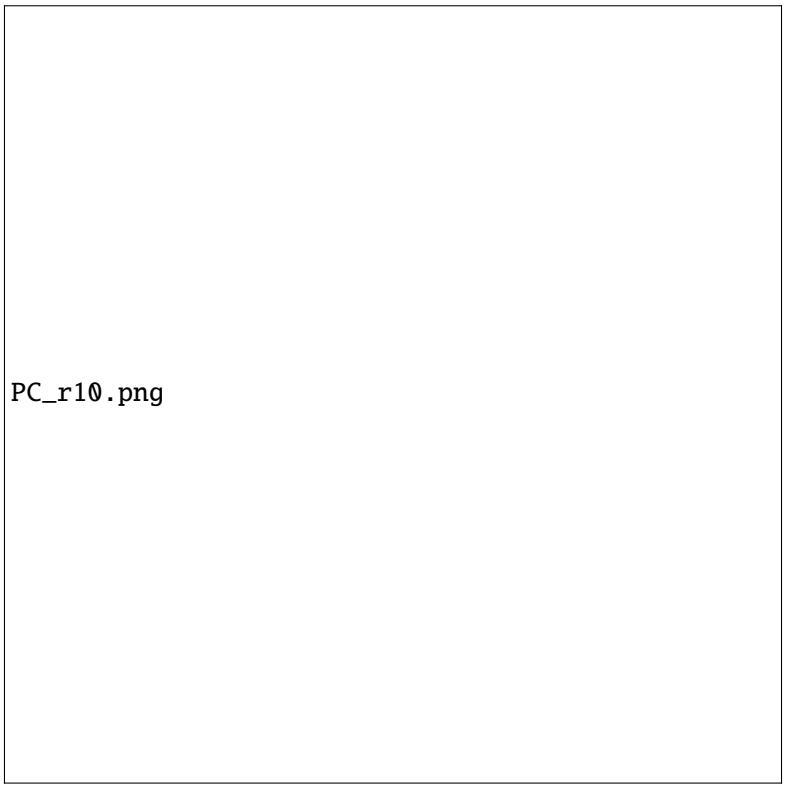
7.2 Figures

Figure 1: Distribution - Values to Children



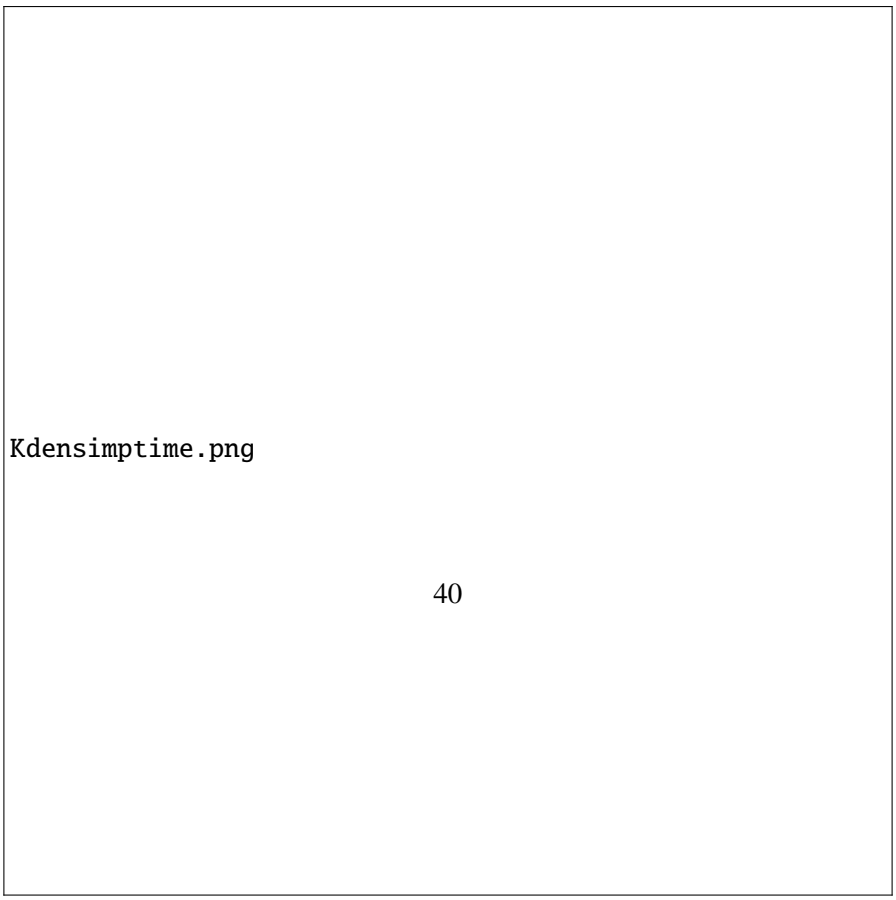
Responses to Values to Children Question (see Table 3) in Wave 3 of the WVS for Germany, Japan, and Spain

Figure 2: Principal Component Analysis - Values to Children



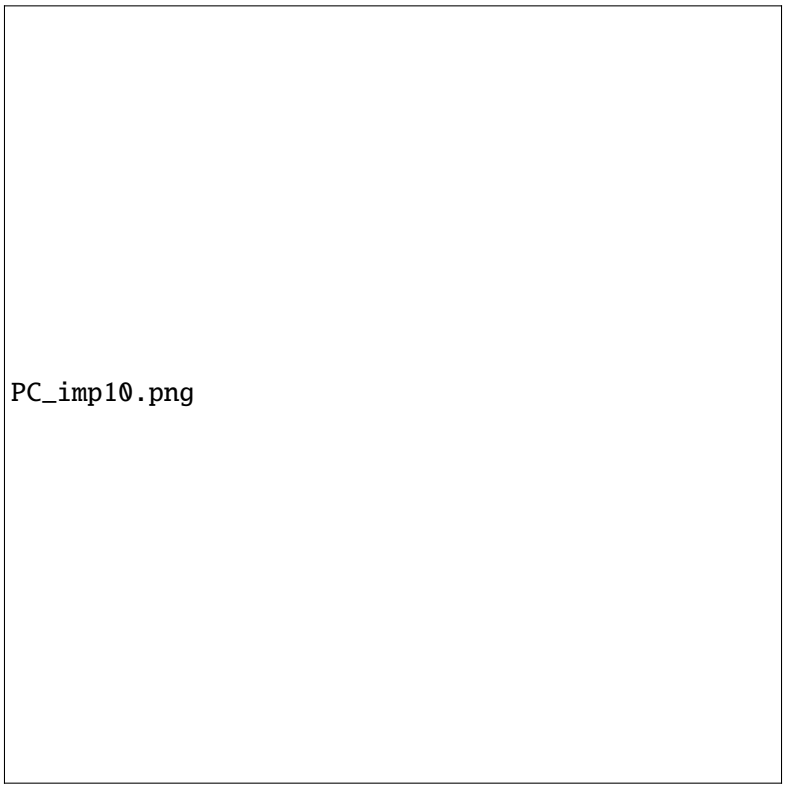
Principle Component Analysis of WVS question on values desired to inherit to children, including independence, hard work, feeling of responsibility, imagination, tolerance and respect for others, thrift saving money and things, determination/perseverance, religious faith, unselfishness, and obedience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

Figure 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

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

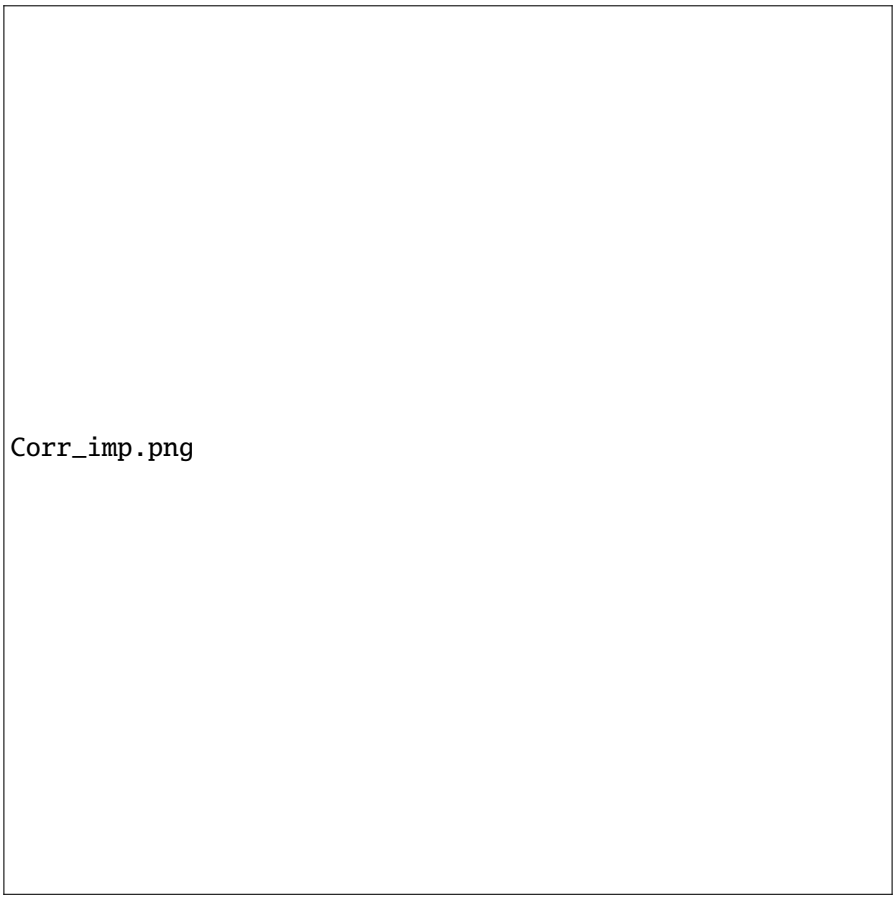


Figure 5: Scatterplot of standardized values for the Herfindahl Index and weighted Euclidean Distance

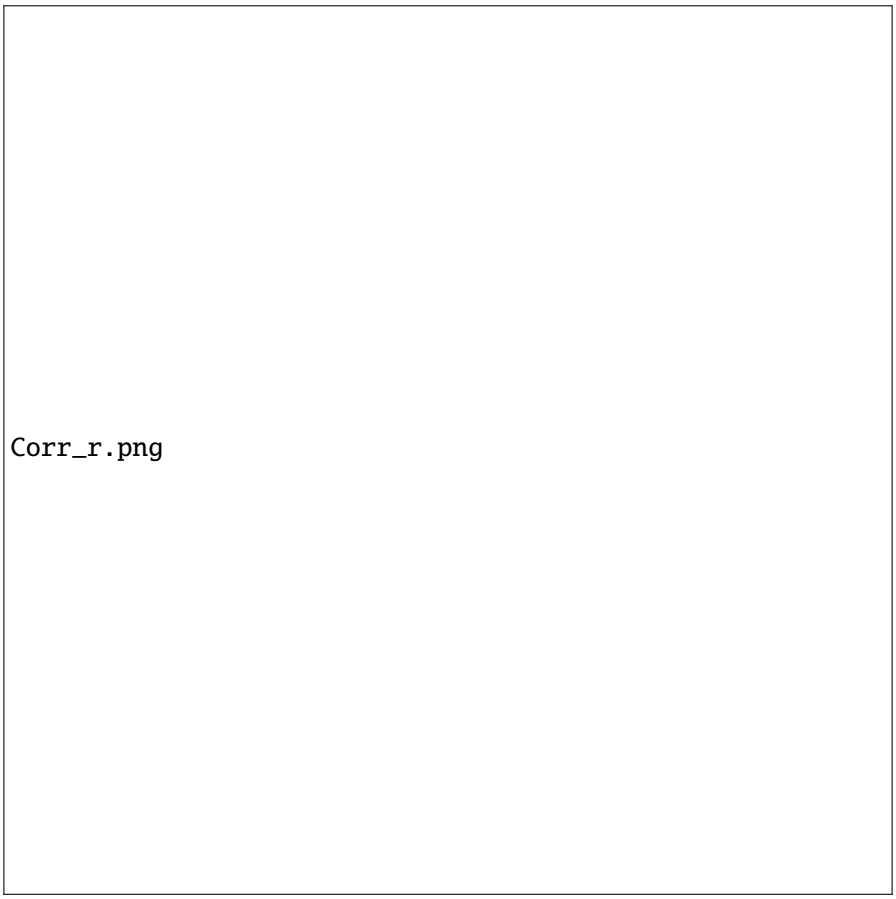


Figure 6: Kernel Density of Standardized Cultural Similarity Indexes

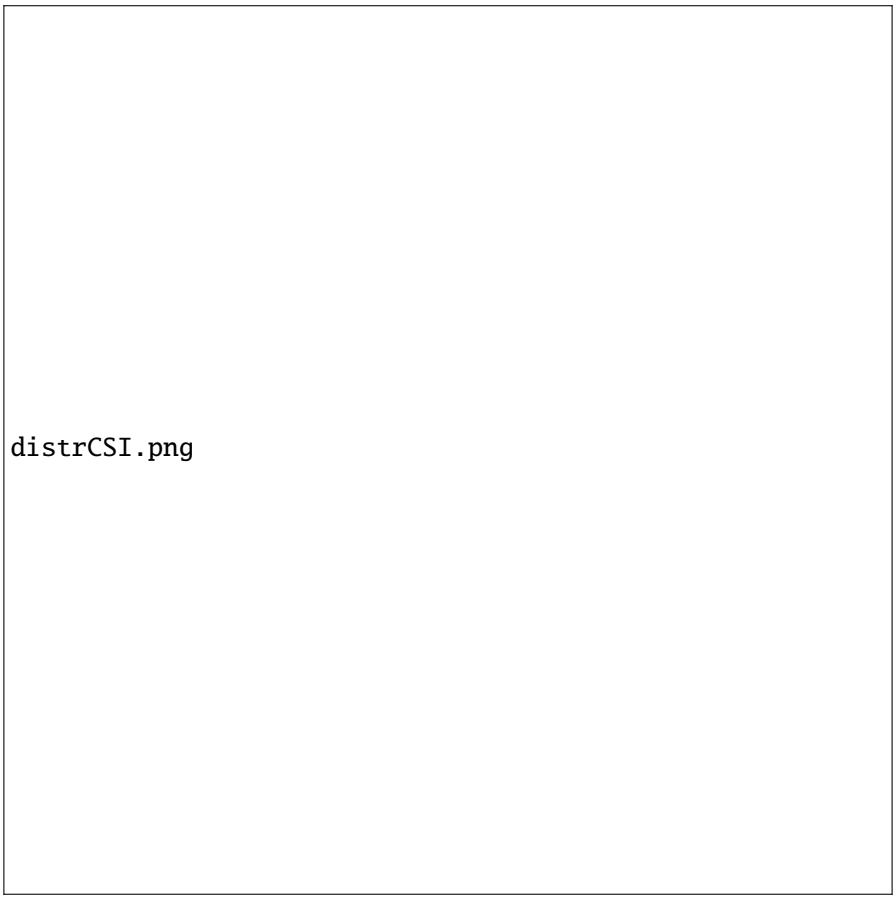
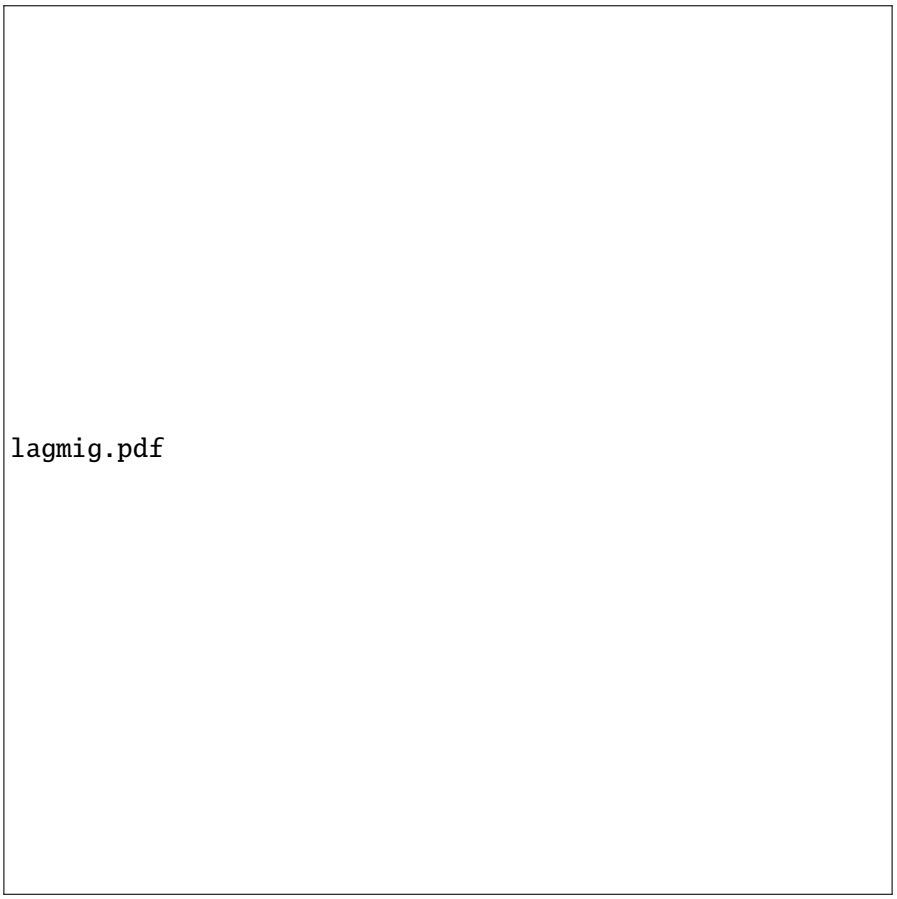


Figure 8: Baseline Regression with different lags of migration



Coefficient plot for baseline regression with full set of fixed effects, instantaneous migration with no lag, migration with five year lag (as in baseline regression) and lagged migration with ten year lag. Dependent variables are the three different cultural similarity measures.

Figure 9: Kernel Density Plot for the Emigration Concentration Index (HHI)

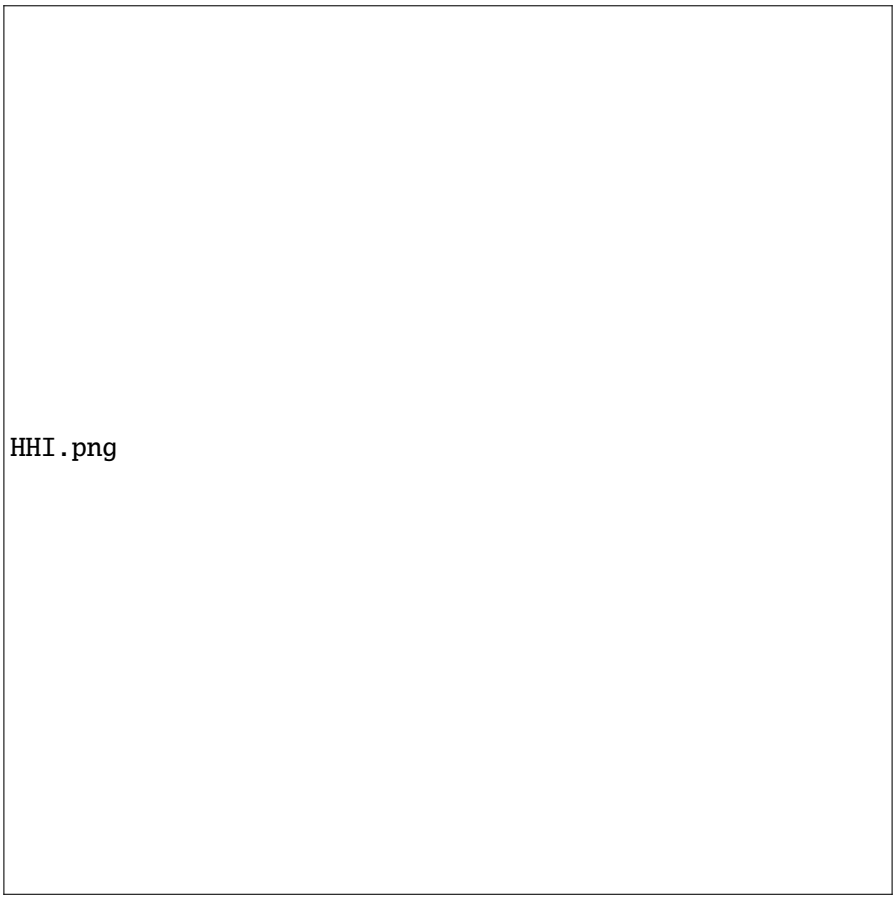
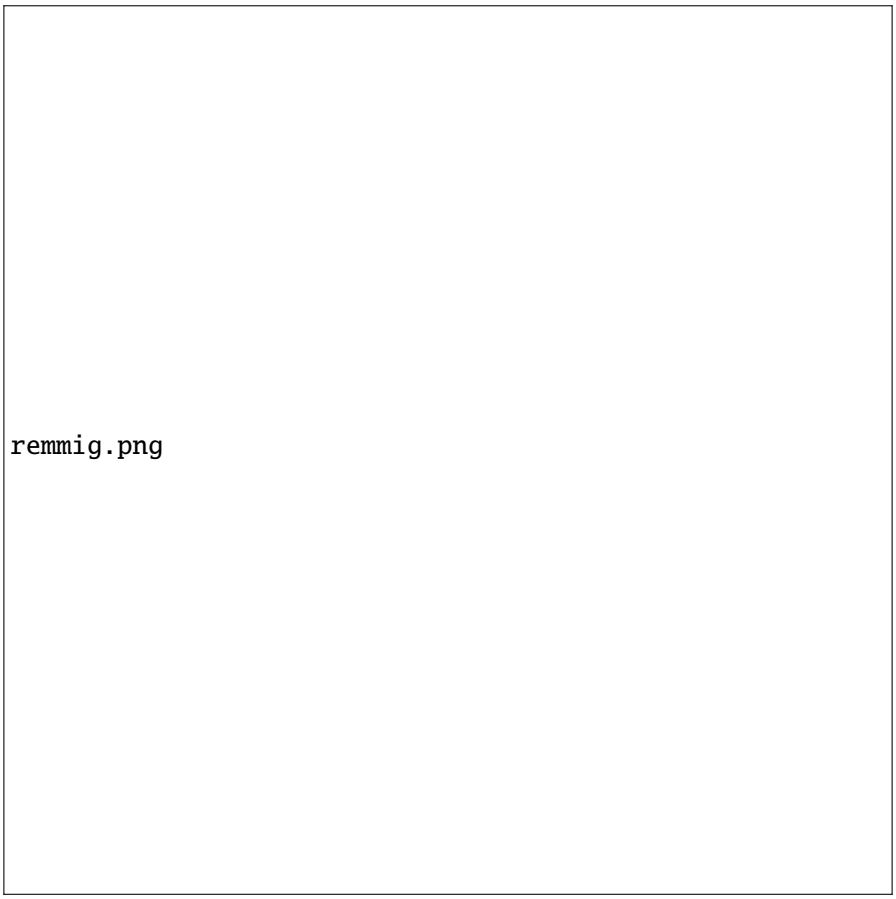


Figure 10: Scatterplot: Log of Remittances and Log of Stock of Migrants in 2010



7.3 Tables

Table 2: Summary statistics

		mean	sd	min	max
Source	Independent Variables				
OECD DIOC	Migrant stock	260,416	2,534,034	0	129,508,280
IAB	Low skilled	18,254	191,109	0	5,292,107
IAB	Medium skilled	15,765	97,855	0	2,626,342
IAB	High skilled	20,479	81,869	0	1,315,891
COMTRADE	Trade volume (in 1000 USD)	3,636,560	19,680,664	0	495,916,224
World Bank	GDP gap (per capita, USD)	16,510	17,192	0	88,800
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 2 shows basic summary statistics of the main exogenous variables, including the total bilateral migrant stock from the OECD data base, bilateral migrant stocks for a subset of country pairs from the IAB, bilateral trade flows measured in total exports and imports from UN COMTRADE, as well as the bilateral per capita GDP gap based on data from the World Bank. The three cultural similarity indexes are standardized and therefore have zero mean and a standard deviation of one, min and max values are reported as well.

Table 3: Selected World Value Survey 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: OLS Regression - Aggregate Cultural Similarity

	(1)	(2)	(3)	(4)
Dependent Variable: ***Euclidean*** *CSI*				
Migration	0.0730***	0.0706***	0.0503***	0.0237**
	(0.00489)	(0.00507)	(0.0118)	(0.00982)
Trade	-0.0374***	0.0395***	0.0855***	0.00263
	(0.00518)	(0.00788)	(0.0119)	(0.0164)
Observations	6983	6983	6983	6983
R^2	0.032	0.522	0.910	0.966
Dependent Variable: ***Herfindahl*** *CSI*				
Migration	0.0370***	0.0556***	-0.0290*	0.0175**
	(0.00499)	(0.00404)	(0.0149)	(0.00776)
Trade	-0.00997*	0.0333***	-0.0339**	0.0000827
	(0.00528)	(0.00628)	(0.0150)	(0.0130)
Observations	6983	6983	6983	6983
R^2	0.010	0.701	0.859	0.979
Dependent Variable: ***Canberra*** *CSI*				
Migration	0.0689***	0.0685***	0.0359**	0.0213*
	(0.00490)	(0.00465)	(0.0150)	(0.0118)
Trade	-0.0334***	0.0503***	0.0515***	0.00192
	(0.00519)	(0.00723)	(0.0151)	(0.0196)
Observations	6983	6983	6983	6983
R^2	0.029	0.598	0.855	0.952
Fixed Effects				
Bilateral	no	no	yes	yes
Origin-time	no	yes	no	yes
Destination-time	no	yes	no	yes

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 (CSI stands for Cultural Similarity Index), 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 last column shows results with country-pair, destination-time and origin-time fixed effects. Constant is not reported. Migration is the log of the migrant stock at time $t - \Delta$ and Trade is the trade flow at time $t - \Delta$.

Table 6: Panel Regression - Aggregate Cultural Similarity Measures

	(1) **Euclidean**	(2) **Herfindahl**	(3) **Canberra**
Panel A: 24 countries in 3 Waves			
Migration	0.0523***	0.0384***	0.0377**
	(0.0139)	(0.0117)	(0.0183)
Trade	-0.0234	-0.0385	-0.0736
	(0.0371)	(0.0311)	(0.0487)
Observations	1259	1259	1259
R^2	0.929	0.963	0.906
Panel B: 12 countries in 4 Waves			
Migration	0.0246	0.0307	0.147***
	(0.0472)	(0.0374)	(0.0491)
Trade	-0.202**	-0.179**	-0.0113
	(0.0921)	(0.0729)	(0.0958)
Observations	454	454	454
R^2	0.906	0.939	0.931
Fixed Effects	all	all	all

Table 6 selects country pairs that remain in the data set for the same three (Panel A) or four (Panel B) waves of the WVS. Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. All three cultural similarity measures are reported, introducing all fixed effects. Panel Regression includes 24 countries for which we have WVS observations in waves 3,5, and 6. Countries in Panel A include: ARG AUS CHL CHN COL DEU ESP GEO IND JPN KOR MEX NZL PER POL ROM RUS SVN SWE TUR UKR URY USA ZAF. Countries in Panel B include: ARG CHL CHN ESP IND JPN KOR MEX PER TUR USA ZAF

Table 7: Panel Regression - Disaggregate Cultural Similarity

	(1) VtC	(2) PiL	(3) Trust	(4) Gender	(5) Freedom
Dependent Variable: ***Euclidean*** *CSI*					
Migration	0.0280*	0.00858	0.0278	0.0405**	0.0620**
	(0.0166)	(0.0102)	(0.0191)	(0.0176)	(0.0251)
Trade	0.00539	0.00729	0.0327	-0.109**	0.0103
	(0.0440)	(0.0274)	(0.0508)	(0.0467)	(0.0668)
Observations	1259	1221	1219	1259	1259
R^2	0.911	0.940	0.917	0.889	0.858
Dependent Variable: ***Herfindahl*** *CSI*					
Migration	0.0152	0.00600	0.00271	0.0321**	0.0427**
	(0.0102)	(0.00769)	(0.00985)	(0.0156)	(0.0176)
Trade	0.0276	0.00535	-0.0116	-0.0991**	0.00678
	(0.0271)	(0.0206)	(0.0262)	(0.0414)	(0.0467)
Observations	1259	1221	1259	1259	1259
R^2	0.953	0.965	0.982	0.951	0.938
Dependent Variable: ***Canberra*** *CSI*					
Migration	-0.000831	0.0172	-0.0287	0.0332**	0.0499**
	(0.0192)	(0.0144)	(0.0193)	(0.0166)	(0.0233)
Trade	-0.0634	0.0579	-0.00999	-0.0828*	-0.0509
	(0.0511)	(0.0388)	(0.0513)	(0.0441)	(0.0614)
Observations	1259	1221	1219	1259	1257
R^2	0.904	0.934	0.916	0.900	0.903
Fixed Effects	all	all	all	all	all

Table 7 looks at individual items included in the Cultural Similarity Index, e.g. Values to Children (VtC), Priorities in Life (PiL), Generalized Trust (Trust), Gender Norms and Equality (Gender), and Control over Life (Freedom). See Table 3 for precise questions. Constant is not reported. Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1, Panel Regression (with country-pair FE, destination-time, origin-time FE) includes 24 countries for which we have WVS observations in waves 3,5, and 6. These countries include: ARG AUS CHL CHN COL DEU ESP GEO IND JPN KOR MEX NZL PER POL ROM RUS SVN SWE TUR UKR URY USA ZAF

Table 8: OLS regression - Lagged Migration

	(1) **Euclidean**	(2) **Herfindahl**	(3) **Canberra**
Lag of exogenous variables: $\Delta = 2$			
Migration	0.0398***	0.0337***	0.0364**
	(0.0146)	(0.0125)	(0.0167)
Trade	-0.00633	-0.0189	-0.0516*
	(0.0258)	(0.0221)	(0.0295)
Observations	2843	2843	2843
R^2	0.971	0.979	0.965
Lag of exogenous variables: $\Delta = 1$			
Migration	0.0237**	0.0175**	0.0213*
	(0.00982)	(0.00776)	(0.0118)
Fixed Effects	all	all	all

Table 8 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, introducing all fixed effects. Lag: $\Delta = 1$ is a migration lag of five years (we report the results of the baseline regression to serve as comparison) and Lag: $\Delta = 2$ is a lag of 10 years.

Table 9: OLS Regression With and Without Foreign-Born

	(1)	(2)	(3)	(4)
Dependent Variable: ***Euclidean*** *CSI with foreign-born*				
Migration	0.0896***	0.0364***	0.000861	0.0344
	(0.0113)	(0.0104)	(0.0781)	(0.0855)
Trade	-0.0572***	0.101***	-0.0926	-0.0286
	(0.0125)	(0.0161)	(0.110)	(0.117)
Observations	1308	1308	1308	1308
R^2	0.046	0.656	0.990	0.995
Dependent Variable: ***Euclidean*** *CSI without foreign-born*				
Migration	0.0873***	0.0353***	0.00739	0.0335
	(0.0112)	(0.0105)	(0.0770)	(0.0854)
Trade	-0.0534***	0.102***	-0.0837	-0.0348
	(0.0124)	(0.0161)	(0.108)	(0.117)
Observations	1308	1308	1308	1308
R^2	0.044	0.653	0.990	0.995
Fixed Effects				
Bilateral	no	no	yes	yes
Origin-time	no	yes	no	yes
Destination-time	no	yes	no	yes

Table 9 Analysis includes only countries and WVS waves for which information on respondent's country of birth was available. Countries for wave 2 include: BRA CHL CHN CZE IND JPN MEX NGA SVK TUR Countries for wave 3 include: ARG ARM AUS AZE BGR BIH BLR CHE CHL CHN CZE DEU DOM ESP EST FIN GEO HRV HUN IND JPN LTU LVA MDA MEX MKD MNE NGA NOR NZL PAK PER PHL PRI ROM RUS SRB SVK SVN SWE TUR TWN UKR URY USA VEN ZAF. Because there are only 2 waves, we include different pairings of fixed effects. Results reported only for Euclidean distance but hold for the other two measures as well.

Table 10: OLS regression - Income Differences

	Lag: $\Delta = 1$			Lag: $\Delta = 2$		
	Euclidean	**Herfindahl**	**Canberra**	**Euclidean**	**Herfindahl**	**Canberra**
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: ***Specification with GDP Gap***						
Migration	0.0247**	0.0209***	0.0238**	0.0399***	0.0338***	0.0365**
	0.00981)	(0.00768)	(0.0117)	(0.0146)	(0.0124)	(0.0165)
Trade	-0.00270	-0.00535	-0.00364	-0.00831	-0.0223	-0.0566*
	(0.0164)	(0.0128)	(0.0196)	(0.0257)	(0.0219)	(0.0291)
GDP Gap	-0.00728***	-0.0121***	-0.0126***	-0.00867**	-0.0150***	-0.0220***
	(0.00206)	(0.00161)	(0.00246)	(0.00403)	(0.00343)	(0.00456)
N	6977	6977	6977	2843	2843	2843
R^2	0.967	0.980	0.953	0.972	0.980	0.966
Panel B: ***Baseline Specification***						
Migration	0.0237**	0.0175**	0.0213*	0.0554**	0.0408**	0.0690***
	(0.00982)	(0.00776)	(0.0118)	(0.0233)	(0.0191)	(0.0253)
Fixed effects	all	all	all	all	all	all

Table 10 shows the main results of this analysis. Constant not reported. Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. All three cultural similarity measures are reported. Specification includes all fixed effects, origin-time, destination-time, and bilateral FE. Lag: $\Delta = 1$ is a migration lag of five years (as in baseline) and Lag: $\Delta = 2$ is a lag of 10 years. This table also includes an additional exogenous variable which is the lagged GDP per capita gap as a measure of economic distance. We report the coefficients for migration from the baseline specification without GDP gap. Note that we are interested in comparing the coefficients with and without controlling for GDP gap. We assume that once controlling for GDP gap the cultural selection of the migrant pool will be stronger and thus affect the results for migration across specifications. We are not interested in the interaction term between migration and GDP gap, as this will not be predictive of the cultural composition of the migrant pool.

Table 11: OLS Regression - Skill Level

	(1)	(2)	(3)	(4)
Dependent Variable: ***Euclidean*** *CSI*				
Low Skilled	0.0214	0.0260	-0.377***	-0.0225
	(0.0294)	(0.0239)	(0.0501)	(0.0401)
High Skilled	0.0677**	0.00664	0.438***	0.00188
	(0.0281)	(0.0274)	(0.0495)	(0.0415)
Observations	1764	1764	1764	1764
R^2	0.083	0.821	0.921	0.984
Dependent Variable: ***Herfindahl*** *CSI*				
Low Skilled	-0.223***	0.0278	-0.733***	-0.0277
	(0.0308)	(0.0188)	(0.0701)	(0.0326)
High Skilled	0.193***	-0.0134	0.624***	0.00919
	(0.0294)	(0.0216)	(0.0693)	(0.0337)
Observations	1764	1764	1764	1764
R^2	0.061	0.897	0.856	0.990
Dependent Variable: ***Canberra*** *CSI*				
Low Skilled	-0.0513*	0.0114	-0.589***	-0.00380
	(0.0295)	(0.0218)	(0.0711)	(0.0619)
High Skilled	0.0678**	-0.00525	0.613***	-0.00973
	(0.0281)	(0.0250)	(0.0703)	(0.0639)
Observations	1764	1764	1764	1764
R^2	0.012	0.840	0.830	0.959
Fixed Effects				
Bilateral	no	no	yes	yes
Origin-time	no	yes	no	yes
Destination-time	no	yes	no	yes

Table 11 shows results by skill level. Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. All three cultural similarity measures are reported, successively introducing different fixed effects. We distinguish between skilled and unskilled labor, categorized as high-school degree and above from the IAB data set. Since we use a different data set (smaller time frame and fewer countries) our number of observation reduce substantially. The full set of fixed effects from the baseline specification is too demanding, we therefore provide an alternative set of fixed effects that does not absorb a large part of the variation in the data.

Table 12: Panel Regression - Initial Cultural Similarity

	(1) **Euclidean**	(2) **Herfindahl**	(3) **Canberra**
Migration	0.0568***	0.0386***	0.0465**
	(0.0139)	(0.0117)	(0.0180)
Migration**Similar*	-0.177***	-0.0189	-0.391***
	(0.0593)	(0.0472)	(0.0737)
Trade	-0.0298	-0.0393	-0.0759
	(0.0369)	(0.0312)	(0.0478)
Observations	1,259	1,259	1,259
R^2	0.648	0.850	0.643
Fixed Effects	all	all	all

Table 12 looks at the speed of convergence by initial cultural similarity. Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1, Similar is a dummy variable defined as belonging to the 10% of most similar country pairs in 1995. Panel Regression (with country-pair FE, destination-time, origin-time FE) includes 24 countries for which we have WVS observations in waves 3,5, and 6.

Table 13: OLS Regression - Countries' Development Status

	(1)	(2)	(3)
	Euclidean	**Herfindahl**	**Canberra**
North-North Migration			
Migration	-0.00334	-0.0564*	-0.209***
	(0.0384)	(0.0316)	(0.0595)
Trade	0.0484	0.00482	-0.0660
	(0.0971)	(0.0798)	(0.150)
Observations	702	702	702
R^2	0.953	0.991	0.944
South-North Migration			
Migration	0.0541***	0.0367***	0.0616***
	(0.0151)	(0.0124)	(0.0192)
Trade	-0.0120	-0.0199	-0.0394
	(0.0256)	(0.0210)	(0.0326)
Observations	3,108	3,108	3,108
R^2	0.983	0.982	0.966
South-South Migration			
Migration	0.0111	0.0121	0.0129
	(0.0146)	(0.0112)	(0.0162)
Trade	-0.0392*	-0.0220	0.00725
	(0.0228)	(0.0175)	(0.0252)
Observations	3,173	3,173	3,173
R^2	0.958	0.981	0.960
Fixed Effects	all	all	all

Table 13 looks at cultural convergence by development status. Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1, OLS regression with full set of fixed effects (bilateral FE, destination-year FE, origin-year FE). Sample split into 3 categories: North-North for bilateral migration between OECD countries (members in 2014), South-South for bilateral migration between non-OECD countries, and South-North for bilateral migration between OECD and non-OECD.

Table 14: OLS Regression - Intensity of Interaction

	(1)	(2)	(3)	(4)	(5)	(6)
	Euclidean		**Herfindahl**		**Canberra**	
	REM	no REM	REM	no REM	REM	no REM
Migration	0.0278**	-0.00463	0.0229**	-0.00586	0.0312**	-0.00915
	(0.0114)	(0.0253)	(0.00909)	(0.0200)	(0.0137)	(0.0300)
Trade	0.0212	-0.0696	0.00514	-0.0304	-0.0156	0.0477
	(0.0184)	(0.0485)	(0.0147)	(0.0385)	(0.0221)	(0.0575)
Observations	5,177	1,178	5,177	1,178	5,177	1,178
R^2	0.963	0.981	0.976	0.989	0.945	0.978
Fixed Effects	all	all	all	all	all	all

Table 14 distinguishes between high interaction country pairs and low interaction country pairs. Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1. Full set of fixed effects is included. Sub-sample analysis between countries that have remittance flows and those that do not have recorded remittance flows to proxy intensity of interaction between diaspora and home community.

Table 15: OLS regression - Diverse versus Concentrated Destinations

	(1)	(2)	(3)	(4)	(5)	(6)
	Euclidean		**Herfindahl**		**Canberra**	
	concentrated	diverse	concentrated	diverse	concentrated	diverse
Migration	0.0269**	0.00266	0.0190**	0.00563	0.0248*	0.00783
	(0.0123)	(0.0208)	(0.00968)	(0.0166)	(0.0143)	(0.0267)
Trade	-0.0155	0.00674	-0.0207	0.0207	-0.0270	0.0559*
	(0.0219)	(0.0251)	(0.0172)	(0.0200)	(0.0254)	(0.0322)
Constant	0.148	-0.105	0.200	-0.367	0.397	-1.030
	(0.448)	(0.525)	(0.352)	(0.417)	(0.518)	(0.673)
Observations	3,521	3,462	3,521	3,462	3,521	3,462
R-squared	0.951	0.982	0.970	0.989	0.941	0.969
Fixed Effects	all	all	all	all	all	all

Table 15 presents results for countries who have a clear destination country. Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. In Table 15 we split the sample along the median HHI value (an emigration concentration index specifically created for this analysis), which lies at 0.57, and run the baseline regression with the full set of fixed effects and all three measures.